BRECKENRIDGE SKI RESORT
MULTI-SEASON RECREATION PROJECTS
DRAFT ENVIRONMENTAL IMPACT STATEMENT

JANUARY 2015

USDA Forest Service
White River National Forest
Dillon Ranger District

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ABSTRACT

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS

WHITE RIVER NATIONAL FOREST
SUMMIT COUNTY, COLORADO

JANUARY 2015

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Abstract: This Draft Environmental Impact Statement (DEIS) has been prepared to analyze and disclose the estimated environmental effects of implementation of Breckenridge Ski Resort Multi-Season Recreation Projects. Breckenridge Ski Resort is located on the White River National Forest in Summit County, Colorado and operates in accordance with the terms and conditions of a Special Use Permit, which is administered by the United States Forest Service. The Proposed Action includes the following elements: Vista Haus and Independence SuperChair site plans; two zip lines; two canopy tours; two challenge courses; new and realigned mountain bike trails and mountain bike skills course; new hiking trails; additional off-highway vehicle tours; realignment of Four O'Clock Road; a climbing wall; expansion of the Vista Haus deck and Peak 7 Hut; an observation tower; and the addition of scenic chairlift rides on 6 Chair and Imperial Express.

Components of the Proposed Action are detailed in Chapter 2: Alternative 2 – Proposed Action.

This DEIS discusses the Purpose and Need for the Proposed Action; alternatives to the Proposed Action; potential direct, indirect, and cumulative impacts of implementing each alternative; and project design criteria. Three alternatives are analyzed in detail in this DEIS: Alternative 1 (No Action); Alternative 2 (the Proposed Action); and Alternative 3.

Comments on this DEIS will be accepted for 45 days from publication of the Notice of Availability (NOA) in the Federal Register. The NOA provides the sole means of calculating the close of the DEIS comment period.

Important Notice: Only those who submit timely and specific written comments will have eligibility to file an objection under 36 CFR §218.8. For objection eligibility, each individual or representative from each entity submitting timely and specific written comments must either sign the comment or verify identity upon request. Individuals and organizations wishing to be eligible to object must meet the information requirements in 36 CFR §218.25(a)(3). Comments received, including the names and addresses of those who comment, will become part of the public record for this project and will be subject to review pursuant to the Freedom of Information Act.

Executive Summary

EXECUTIVE SUMMARY

The proposed improvements analyzed in this document constitute a federal action, which has the potential to affect the quality of the human environment on public lands administered by the United States Department of Agriculture Forest Service (Forest Service). Therefore, these projects must be analyzed pursuant to the National Environmental Policy Act of 1969 (NEPA). Under NEPA, Federal Agencies must carefully consider environmental concerns in their decision making processes and provide relevant information to the public for review and comment.

The Forest Service has prepared this Draft Environmental Impact Statement (DEIS) in compliance with NEPA and other relevant federal and state laws and regulations. This DEIS contains analyses consistent with NEPA, Council on Environmental Quality (CEQ) regulations, and Forest Service policy. It discloses potential direct, indirect, and cumulative environmental effects on the human and biological environment anticipated to result with implementation of the Proposed Action or an additional action alternative. Additionally, it is intended to ensure that planning considers the environmental and social values of the project area and that potential resource conflicts are minimized or avoided.

A. SUMMARY OF THE PURPOSE AND NEED FOR THE PROPOSED ACTION

Over the past several decades, summer recreation activities have evolved to include a significant variety of activities and user experiences. Likewise, recreational use in the National Forests has evolved beyond the traditional activities and solitude-seeking experiences such as hunting, fishing, camping or hiking.

The goal of the Proposed Action is to introduce guests to the WRNF and encourage outdoor recreation and enjoyment of nature. BSR desires to provide a recreational experience that reduces the barriers that can be associated with recreating in a mountain environment. There is a desire to not only provide new experiences for current Forest users but to provide opportunities that will engage new users to visit and experience NFS lands. The full text of the Purpose and Need is stated in Chapter 1. The following four statements summarize the Purpose and Need for the proposed multi-season recreational projects:

- Adventure or thrill-based experiences that require little specialized knowledge, skills, equipment or familiarity with the mountain environment—elements which can be a barrier for visitors (e.g., families, the elderly/aging, or those with disabilities) desiring to engage in outdoor activities;
- Activity-based interaction with a forested, mountain environment in a controlled setting, offering an opportunity for users to interact with and learn about nature;
- Human-powered, active recreational experiences that cater to all ability levels; and
- Interpretive programs that offer an educational experience for users seeking to learn more about the environment.

There is a need for recreational and learning opportunities on public lands that include passive, active, and interactive forms of recreation to provide this comprehensive range of user experiences. In addition, there is a need for adequate access and support service infrastructure (e.g., roads, support buildings, restaurants) to meet current and anticipated summer use at BSR.

B. SUMMARY OF THE ALTERNATIVES ANALYZED IN THE DEIS

In addition to the No Action Alternative (analyzed in this document as Alternative 1), two action alternatives are analyzed. Refer to Chapter 2 for a full description of alternatives and Chapter 6 for alternative figures.

ALTERNATIVE 1 – NO ACTION

By definition, the No Action Alternative represents a continuation of existing management practices without changes, additions, or upgrades to existing conditions.

ALTERNATIVE 2 – PROPOSED ACTION

The projects proposed analyzed in this EIS are designed to respond to the identified Purpose and Need. The proposed projects are confined within BSR's SUP boundary (with the exception of one proposed mountain bike trail that connects to an existing trail outside of BSR's SUP – the Peaks Trail [refer to Figure 3]), and are located primarily across Peaks 7 and 8.

The Proposed Action includes the following elements, each of which is further defined in Chapter 2. All proposed activities are depicted in Figure 3.

Vista Haus and Independence SuperChair Summit Site Improvements

The Vista Haus and top of the Independence SuperChair areas would be utilized year-round and improvements for each area would provide guests with safer and more organized access to activities by developing and defining access pathways, rehabilitating redundant access roads, incorporating signage, increasing vegetative growth, and adding landscaping features.

Zip Lines

- Two zip lines:
    - Sawmill Zip Line would consist of two zip lines between three stations starting near the top of the Peak 8 SuperConnect crossing over the Sawmill Creek drainage to Peak 9 and back across Sawmill Creek drainage to end on *Four O'Clock* ski trail on Peak 8.
    - Peak 7 Zip Line would consist of three zip lines between four stations starting at the top of the Independence SuperChair and ending southwest of the Peak 7 base area.

Canopy Tours

- Two canopy tours:
  - The Sawmill Canopy Tour would begin south of the top terminal of the Peak 8 SuperConnect. The guided aerial tour would follow approximately eight zip line segments connecting ten stations (one segment would be a foot path), ending along *Four O'Clock* ski trail adjacent to the bottom station of the Sawmill Zip Line.
  - The Ore Bucket Canopy Tour would begin northwest of the top terminal of the Independence SuperChair on Peak 7. The guided tour would utilize a series of approximately nine zip lines connecting ten stations. From the top station, the tour would travel through existing gladed tree skiing terrain, ending along the *Angels Rest* ski trail and the Peak 7/8 Access Road on Peak 7.

Challenge Courses

- Two skills-based challenge courses, located west of the Vista Haus, would be self-guided through a series of wooden columns, platforms and rope walkways/bridges. One challenge course would be designed for those under ten years of age and a second course would be designed for older guests.

Proposed and Realigned Mountain Bike Trails and Skills Course

- Fifteen miles of new beginner mountain biking trails would be constructed on Peak 7 (14 miles new, 1 mile realigned).

Hiking Trails

- Approximately 1.5 miles of new hiking trails would be constructed at the top of the Colorado and Independence SuperChair, and another would access the lake at the bottom of Lake Chutes.

Off-Highway Vehicle Tours

- OHV tours would expand their current route to utilize the proposed Upper Four O'Clock Road realignment to access 6 Chair and the Imperial Express.

Upper Four O'Clock Road Realignment

- Drainage, erosion and steep grade currently present challenges on the existing Upper Four O'Clock Road alignment. It is proposed to realign the road to a reasonable grade to provide access the top of 6 Chair. This would result in 0.5 mile of new roadway.

Vista Haus Deck and Climbing Wall, and Peak 7 Hut Expansions

- The Vista Haus deck would be expanded by approximately 1,500 square feet on the south side of the building to accommodate summer guests. In addition, an approximately 40-foot tall climbing wall would be constructed adjacent to the Vista Haus expansion.
- Peak 7 Hut would be expanded by approximately 500 square feet. Both the interior space and outside deck would be expanded to provide increased space for guests and operations for all upper-mountain activities on Peak 7.

Observation Tower

- An observation tower is proposed at the bottom of Horseshow Bowl to provide guests with a view of the surrounding area. The tower would be approximately 30 feet tall, within a 20 feet by 20 feet footprint.

Existing Chairlift Operations, Scenic Chairlift Rides and Activities Access

- Chairlift operations would expand to include the Independence SuperChair, Imperial Express and 6 Chair in order to provide access to activities across Peaks 7 and 8 and scenic chairlift opportunities.

ALTERNATIVE 3

Alternative 3 was developed to respond to potential wildlife, high alpine ecosystem and visual impacts. Alternative 3 includes all projects identified in the Proposed Action, with the following exceptions and modifications (refer to Figure 4):

- Sawmill Zip Line – removed in response to potential wildlife impacts in the Sawmill Creek drainage.
- Ore Bucket Canopy Tour – removed in response to potential wildlife impacts in the Ore Bucket area on Peak 7.
- Claimjumper Canopy Tour – added as an alternative to Ore Bucket Canopy Tour. It would begin west of the top terminal of the Independence SuperChair and utilize a series of eight zip lines connecting ten stations (one segment would be a foot path). The tour would end along the *Angels Rest* ski trail near the Peak 7/8 Access Road.
- Proposed and Realigned Mountain Bike Trails – approximately one mile of mountain bike trail is removed to address potential wildlife impacts. The northern most mountain bike trail from the Peak 7 Hut to the 7/8 Access Road would be eliminated. The Peaks Trail Connector would follow a modified alignment, utilizing using existing ski trails and service roads. In total, approximately 14 miles of mountain bike trails (13 miles new, 1 mile realigned) are proposed.

- Hiking Trails – removed the hiking trail to the lake below Lake Chutes in response to potential impacts to the high alpine ecosystem.
- Off-Highway Vehicle Tours – removed use of Upper Four O'Clock Road to access the top of 6 Chair in response to potential impacts to the high alpine ecosystem.
- Observation Tower – relocated adjacent to the existing, previously-disturbed bomb cache, approximately 500 feet north of the Colorado SuperChair top terminal to lessen visual resource issues.
- Existing Chairlift Operations, Scenic Chairlift Rides and Activities Access – removed operation of 6 Chair and Imperial Express in response to potential impacts to the high alpine ecosystem.

C. PUBLIC INVOLVEMENT

In February 2014 a scoping notice was mailed to approximately 11 community residents, interested individuals, public agencies, and other organizations. The scoping package provided a brief description of the Proposed Action, the Purpose and Need for action, preliminary issues raised, and an illustrative map. This notice was specifically designed to elicit comments, concerns, and issues pertaining to the Proposed Action. A legal notice was published in the Glenwood Springs Post Independent, and a Notice of Intent (NOI) to prepare an Environmental Impact Statement was published in the Federal Register, on February 10, 2014. A public open house was held on March 5, 2014. Following media coverage of the proposal, other individuals obtained copies of the scoping package at the open house or sent requests to the Dillon District Ranger for information. In addition, the scoping package was posted on the WRNF website with a link to an online comment form. An e-mail address was provided for submitting electronic comments.

Seventy-one letters were received, and the Forest Service Interdisciplinary Team categorized each substantive comment in a comment disposition. The issues are addressed in Chapter 3 – Affected Environment and Environmental Consequences.

D. SUMMARY OF RESOURCE ISSUES ADDRESSED

Based on the results of public scoping, the Forest Service identified specific areas of public concern. Each of the following issue statements includes a list of indicators (see Chapter 1) which were identified as a means of measuring or quantifying the anticipated level of impact on a particular resource.

HUMAN ENVIRONMENT

Recreation

- Proposed projects within BSR's SUP area have the potential to affect the recreational experience at the ski area.

Scenery

- Development of proposed projects, including associated infrastructure, may be visible from Highway 9, the Town of Breckenridge and/or other relevant critical viewpoints.

Traffic

- Proposed projects may generate measurable increases in daily/seasonal visitation, thereby affecting traffic movement and volumes within the Town of Breckenridge, on Highway 9 between Frisco and Breckenridge, and on construction/maintenance access roads proximate to the ski area.

Cultural Resources

- Implementation of proposed projects and associated ground disturbance may affect previously unidentified cultural and heritage resources.

Social and Economic Resources

- Implementation of the proposed projects could potentially alter certain socioeconomic characteristics of Summit County or the Town of Breckenridge.

BIOLOGICAL ENVIRONMENT

Vegetation

- Plant communities (including Threatened, Endangered and Proposed Candidate, Region 2 Sensitive species, and regionally important plants) may be altered as a result of the proposed projects.
- Overstory vegetation and the presence of weeds may be altered as a result of the proposed projects.

Fish and Wildlife

- Development of proposed projects, including associated infrastructure, could affect individuals, populations, and/or habitat values for federally Proposed, Threatened or Endangered and/or Forest Service Rocky Mountain Region sensitive species (PTES) fish and wildlife species, Management Indicator Species (MIS), migratory birds, and species of local concern (SOLC).

Soil and Geology

- Ground disturbance, including tree clearing and grading, associated with construction and operation of proposed projects has potential to increase erosion/soil compaction and lead to a loss of soil organic matter.

Wetlands

- Identified wetlands throughout the project area could be temporarily and/or permanently affected by construction and implementation of proposed projects.

Watershed

- Implementation of proposed projects has the potential to affect stream and riparian health.

E. SUMMARY COMPARISON OF DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Table 2-4 found in Chapter 2 includes a summary comparison of environmental consequences, by resource, for alternatives 1, 2 and 3. Detailed information on affected environment and environmental consequences for each resource considered in this analysis can be found in Chapter 3.

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LIST OF ACRONYMS

AADT	Average Annual Daily Traffic
ADT	Average Daily Traffic
AF	Acre feet
AMI	Area Median Income
AMSL	Above Mean Sea Level
APE	Area of Potential Effect
BA	Biological Assessment
BE	Biological Evaluation
BEIG	Built Environment Image Guide
BMP	Best Management Practice
BSR	Breckenridge Ski Resort
CDA	Connected Disturbed Area
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CWA	Clean Water Act
DAU	Data Analysis Unit
DRD	Dillon Ranger District
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EO	Executive Order
ESA	Endangered Species Act
FPCA	Forest Plan Consistency Analysis
FSH	Forest Service Handbook
FSM	Forest Service Manual
FTE	Full-time equivalent
GIS	Geographic Information System
HUC	Hydrologic Unit Code
ID Team	Interdisciplinary Team
LAA	Likely to Adversely Affect
LAU	Lynx Analysis Unit
LCAS	Lynx Conservation and Assessment Strategy
LRMP	Land and Resource Management Plan
MA	Management Areas
MAII	May Adversely Impact Individuals
MIS	Management Indicator Species
MM	Management Measures
MOU	Memorandum of Understanding
MPB	Mountain Pine Beetle

NAAQS	National Ambient Air Quality Standards
NDIS	Natural Diversity Information
NE	No Effect
NEPA	National Environmental Policy Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NI	No Impact
NRHP	National Register of Historic Places
NOI	Notice of Intent
NRHP	National Register of Historic Places
OAHP	Office of Archeology and Historic Preservation
PDC	Project Design Criteria
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
PPH	People Per Hour
PSS	Palustrine Shrub/Scrub Wetland
R2	Region 2
ROD	Record of Decision
SFE	Single Family Equivalent
SHPO	State Historic Preservation Officer
SIO	Scenic Integrity Objective
SMS	Scenery Management System
SRLMD	Southern Rockies Lynx Management Direction
SUP	Special Use Permit
TES	Threatened, Endangered, and Sensitive species
TMDL	Total Maximum Daily Load
TOC	Threshold of Concern
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCA	United States Code Annotated
USDA	United States Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMP	Vegetation Management Plan
VPD	Vehicles Per Day
WCPH	Watershed Conservation Practices Handbook
WIZ	Water Influence Zone
WOUS	Waters of the United States
WRNF	White River National Forest

Chapter 1
Purpose and Need

1. PURPOSE AND NEED

A. INTRODUCTION

The proposed improvements at Breckenridge Ski Resort (BSR) analyzed in this document constitute a federal action, which has the potential to affect the quality of the human environment on public lands administered by the United States Department of Agriculture Forest Service (Forest Service). Therefore, these projects must be analyzed pursuant to the National Environmental Policy Act of 1969 (NEPA). Under NEPA, Federal Agencies must carefully consider environmental concerns in their decision-making processes and provide relevant information to the public for review and comment.

The Forest Service has prepared this Draft Environmental Impact Statement (DEIS) in compliance with NEPA and other relevant federal and state laws and regulations. This DEIS contains analyses consistent with NEPA, Council on Environmental Quality (CEQ) regulations and Forest Service policy. It discloses potential direct, indirect and cumulative environmental effects on the human and biological environment anticipated to result with implementation of the Proposed Action or another action alternative. Additionally, it is intended to ensure that planning considers the environmental and social values of the project area and that potential resource conflicts are minimized or avoided. The document is organized into eight chapters, and includes two appendices:

- **Chapter 1 – Purpose and Need:** provides information on the history of the project proposal, the purpose of and need for the project, and the proposal for achieving that purpose and need. Chapter 1 also details how the Forest Service informed the public of the proposal and how the public responded.
- **Chapter 2 – Description of Alternatives:** provides a detailed description of the No Action Alternative, the Proposed Action and an alternative (Alternative 3) that was formed in response to significant issues raised during scoping. This discussion also includes alternatives considered but eliminated from further analysis, and project design criteria. Finally, Chapter 2 provides a summary table of the environmental consequences anticipated to result from the implementation of each alternative.
- **Chapter 3 – Affected Environment and Environmental Consequences:** provides a description of the affected environment (i.e., existing conditions) by resource area, and describes the environmental effects of implementing the No Action Alternative, Proposed Action and Alternative 3. Chapter 3 is organized by resource topic.
- **Chapter 4 – Consultation and Coordination:** provides a list of preparers and agencies consulted during the development of this DEIS.
- **Chapter 5 – References:** provides complete references for documents cited within this DEIS.

- **Chapter 6 – Figures:** provides the maps, figures, visual simulations, and perspectives used throughout the analysis.
- **Chapter 7 – Glossary of Terms:** provides a definition of technical and non-technical terms used throughout this DEIS.
- **Chapter 8 – Index:** provides a list and page number of frequently used terms throughout this DEIS.
- **Appendices:** (A) cumulative effects information; and (B) proposed projects Forest Service Manual 2343 Screening Report for additional seasonal and year-round recreation at ski areas.

Additional documentation, including more detailed analyses of project area resources, may be found in the project administrative record located at the Dillon Ranger District office of the White River National Forest (WRNF).

B. BACKGROUND

BSR is located on the Dillon Ranger District of the WRNF, approximately 85 miles west of Denver, the largest metropolitan area in Colorado (refer to Figure 1 – Vicinity Map). BSR is accessed from the Colorado Front Range via Interstate 70 and Colorado State Highway 9. BSR opened to the public for lift-served Alpine skiing in 1961 and has since become one of the most frequently-visited ski resorts in the United States with skier visits numbering over 1.6 million annually.

BSR is owned and operated by Vail Resorts, Inc. under a Special Use Permit (SUP) from the Forest Service. In concert with growing market demand and the increasing expectations of the skiing public, BSR has evolved over the decades since its inception by adding new chairlifts, new and improved ski terrain, additional parking and day use facilities. While the ski area has traditionally focused on winter recreation, increased attention has been directed in recent years towards summer and multi-season activities to accommodate demand for year-round recreation in Summit County.

Peak 8 has traditionally been the focal point for summer and multi-season activities within BSR's SUP area and on private lands. The Breckenridge Summer Fun Park, located at the base of Peak 8, is the recreational activities hub during summer months. Most activities offered occur on private lands, although some, such as scenic chairlift rides, off-highway vehicle (OHV) tours, guided hikes, and mountain biking, also take place on National Forest System (NFS) lands within the SUP area. BSR currently offers the following activities for guests at the fun park (refer to Figure 2 – No Action Alternative):

- Gold Runner Mountain Coaster
- TenMile Flyer Zip line
- Alpine SuperSlide (alpine slide)
- Rockpile Climbing Wall
- Gemstone Panning
- Segway Off-Road Tours
- 4x4 Off-Road Tours
- Summer Day Camp

- SuperBungee Trampoline
- SuperPutt Mini Golf
- Mineshaft Maze
- Ripperoo's Bounce House
- Scenic Chairlift Rides
- Toddler Zone
- Snowfield
- BreckTreks Guided Hikes
- Mountain Biking

C. RELATIONSHIP TO PREVIOUS ANALYSES AND APPROVALS

This DEIS is consistent with and incorporates by reference several documents which are related to the management of BSR on NFS lands, including:[1]

- 2002 White River National Forest Land and Resource Management Plan;
- 2002 White River National Forest Land and Resource Management Plan, Final Environmental Impact Statement and Record of Decision;
- 2011 Breckenridge Ski Resort Vegetation Management Plan;
- 2012 Breckenridge Ski Resort Peak 6 Project, Final Environmental Impact Statement and Record of Decision; and
- 2012 White River National Forest Travel Management Plan, Final Environmental Impact Statement and Record of Decision.

D. PURPOSE AND NEED FOR THE PROPOSED ACTION

Summer recreational opportunities have been offered at BSR since the 1970s. These opportunities are important to BSR and its guests, providing outdoor recreation activities in and around the WRNF in a comfortable setting. The current summer guest experience at BSR is primarily defined by developed activities on private lands and dispersed activities on NFS lands. Specific to the activities on NFS lands within the BSR SUP area, guests primarily participate in both lift-served and non-lift-served hiking and mountain biking via the Colorado SuperChair and trails dispersed across Peaks 7, 8 and 9.

Due to ongoing, year-round tourism growth, BSR is becoming a summer destination for guests primarily from the United States, and from Colorado in particular. In both winter and summer, BSR caters to a broad spectrum of guests of all ages, abilities, and experience with the outdoors. Since 2010, the Breckenridge Summer Fun Park (located on private lands) has experienced approximately 18 percent annual growth in its summer activity usage. The proposed projects would complement these current

[1] These documents are part of the project file for this DEIS and are available for review at the Dillon Ranger District in Silverthorne, Colorado.

activities by offering an even broader range of passive and active recreation opportunities to engage visitors on NFS lands.

The philosophy for BSR's summer program on NFS lands is based on the premise that the National Forests are, and have always been, the greatest opportunity for guests to use and enjoy public lands. The summer program goal is to introduce guests to the WRNF and encourage outdoor recreation and enjoyment of nature. BSR desires to provide a recreational experience that reduces the barriers that can be associated with recreating in a mountain environment.

Over the past several decades, summer recreation activities have evolved to include a significant variety of opportunities and user experiences. Likewise, recreational use in the National Forests has evolved beyond the traditional activities and solitude-seeking experiences such as hunting, fishing, camping or hiking.

There is a desire to not only provide new experiences for current Forest users but to provide opportunities that will engage new users to visit and experience NFS lands. Currently at BSR, there is a lack of recreational opportunities that provide:

1. Adventure or thrill-based experiences that require little specialized knowledge, skills, equipment or familiarity with the mountain environment—elements which can be a barrier for visitors (e.g., families, the elderly/aging, or those with disabilities) desiring to engage in outdoor activities;
2. Activity-based interaction with a forested, mountain environment in a controlled setting, offering an opportunity for users to interact with and learn about nature;
3. Human-powered, active recreational experiences that cater to all ability levels; and
4. Interpretive programs that offer an educational experience for users seeking to learn more about the environment.

There is a need for recreational and learning opportunities on public lands that include passive, active, and interactive forms of recreation to provide this comprehensive range of user experiences.

There is a need for adequate access and support service infrastructure (e.g., roads, support buildings, restaurants) to meet current and anticipated summer use at BSR.

The Ski Area Recreational Opportunity Enhancement Act of 2011 (SAROEA) provides authority for mountain resorts operating on NFS lands to offer an expanded range of outdoor recreation activities in order to further recreational opportunities for the public, allow year-round utilization of existing resort facilities and stimulate job creation and economic growth within local communities. The proposed projects align with the intent of SAROEA, which is discussed in greater detail in Section J – Consistency with Policy of this chapter.

E. SUMMARY OF THE ACTION ALTERNATIVES

The projects analyzed in this DEIS are designed to enhance the summer and multi-season user experience within the BSR SUP area, and respond to the identified Purpose and Need. As described below under Section G – Public Involvement, the Proposed Action was introduced to the public in February 2014, when this project was scoped. The scoping notice indicated that the Proposed Action was being considered at that time, but that additional alternative actions could be considered as well in the EIS planning process. Alternative 3 is thus a logical outgrowth of the scoping process and is based on public concerns.

A summary of the action alternatives is provided here, with a detailed description presented in Chapter 2.

ALTERNATIVE 2 – PROPOSED ACTION

The Proposed Action includes the following elements, each of which is further defined in Chapter 2. Figure 3 – Proposed Action identifies the locations of all elements of the Proposed Action within the context of BSR's SUP area.

- Vista Haus and Independence SuperChair Summit Site Improvements
- Zip Lines
  - Sawmill Zip Line
  - Peak 7 Zip Line
- Canopy Tours
  - Sawmill Canopy Tour
  - Ore Bucket Canopy Tour
- Challenge Courses
  - Children's Course (under ten years old)
  - Regular Course
- Mountain Bike Trails (New and Realigned) and Skills Course
- Hiking Trails
- OHV Tours
- Upper Four O'Clock Road realignment
- Vista Haus Deck Expansion
- Climbing Wall
- Peak 7 Hut Expansion

- Observation Tower
- Scenic Lift Rides and Activities Access

ALTERNATIVE 3

Alternative 3 was developed to respond to several issues raised by the Forest Service and the public during the scoping process, including potential wildlife, high-alpine ecosystem and visual impacts. Alternative 3 includes the following elements, each of which is further defined in Chapter 2. Figure 4 – Alternative 3 identifies the locations of all elements of Alternative 3 within the context of BSR's SUP area.

- Vista Haus and Independence SuperChair Summit Site Improvements
- Zip Lines
    - Peak 7 Zip Line
- Canopy Tours
    - Sawmill Canopy Tour
    - Claimjumper Canopy Tour
- Challenge Courses
    - Children's Course (under ten years old)
    - Regular Course
- Mountain Bike Trails (New and Realigned) and Skills Course
    - Reduced mileage and modified alignments
- Hiking Trails
    - Removed trail to lake below Lake Chutes
- OHV Tours
    - OHV tours would continue under existing conditions
- Upper Four O'Clock Road realignment
- Vista Haus Deck Expansion
- Climbing Wall
- Peak 7 Hut Expansion
- Observation Tower

  - Relocated to existing disturbed area 500 feet north of the Colorado SuperChair top terminal
- Scenic Lift Rides and Activities Access
  - Does not include the use of 6 Chair or the Imperial Express

F. INTERAGENCY COORDINATION

In accordance with regulatory direction, and in furtherance of cooperative management among federal agencies charged with oversight of environmental and natural resources; federal, state, local, and tribal entities with a likely interest and/or jurisdiction in the Proposed Action were sent scoping notices and/or consulted prior to and throughout the NEPA process.

G. PUBLIC INVOLVEMENT

In February 2014, a scoping notice was mailed to community residents, interested individuals, public agencies, and other organizations. The scoping package provided a brief description of the Proposed Action, the Purpose and Need for action, preliminary issues raised and an illustrative map. This notice was designed to elicit comments, concerns and issues pertaining to the Proposed Action. A legal notice was published in the Glenwood Springs Post Independent, and a Notice of Intent (NOI) to prepare an Environmental Impact Statement was published in the Federal Register, on February 10, 2014. A public open house was held on March 5, 2014. The open house began with an on-mountain tour to the proposed project sites, then continued with a formal meeting at the Mountain Thunder Lodge in the Town of Breckenridge. Following media coverage of the proposal, other individuals obtained copies of the scoping package at the open house or sent requests to the Dillon District Ranger for information. In addition, the scoping package was posted on the WRNF website with a link to an online comment form. An e-mail address was provided for submitting electronic comments.

H. ISSUES AND INDICATORS

Based on the results of public scoping, the Forest Service identified specific areas of public concern. Issues generally require in-depth analysis and disclosure, and are often utilized to generate alternatives. In some cases, they can be addressed by project design criteria or mitigation measures. Each of the following issue statements includes a list of indicators which were identified as a means of measuring or quantifying the anticipated level of impact on a particular resource. While some indicators are necessarily qualitative in nature, every effort was made to utilize indicators that are quantitative, measurable and predictable.

HUMAN ENVIRONMENT

Recreation

Proposed projects within BSR's SUP area have the potential to affect the recreational experience at the ski area.

Analysis Area: BSR SUP area

Indicators:

- Quantitative analysis of existing and proposed multi-season recreation activities, including mileage and acreage of mountain bike trails by ability level and anticipated activity use per day
- Discussion of user/guest demand that currently exists in the area for multi-season recreation activities
- Discussion of guest circulation across the SUP area, including how many guests, where they would be and when they would be at certain locations
- Discussion of potential conflict between current and new users, particularly uphill and downhill mountain bike traffic
- Quantitative analysis of existing and proposed guest service space and seating
- Discussion of existing and proposed guest experiences for multi-season recreation activities, including potential noise conflicts with guests' experience doing various activities at BSR
- Discussion of season of use for each activity

Scenery

Development of proposed projects, including associated infrastructure, may be visible from Highway 9, the Town of Breckenridge and/or other relevant critical viewpoints.

Analysis Area: BSR SUP area as visible from identified critical viewpoints

Indicator:

- Discussion of the existing scenic integrity of the BSR SUP and potential changes to this condition
- Compliance with Forest Plan standards and guidelines for scenery management within the SUP area and from established critical viewpoints by meeting Scenic Integrity Objectives
- Compliance with the intent of the Built Environment Image Guide (BEIG) for all proposed structures
- Discussion of how proposed projects imitate landscape character
- Discussion of identified critical viewpoints used in this analysis, including:
    - Base Area of Peak 7 looking west

- Top of the Independence SuperChair Perspective Rendering
- Top of the Colorado SuperChair (Challenge Course)
- Top of the Peak 8 SuperConnect (Sawmill Zip Line and Canopy Tour)

Traffic

Proposed projects may generate measurable increases in daily/seasonal visitation, thereby affecting traffic movement and volumes within the Town of Breckenridge, on Highway 9 between Frisco and Breckenridge and on construction/maintenance access roads proximate to the ski area.

Analysis Area: Primary roadway networks accessing BSR and parking areas

Indicator:

- Historic and projected traffic counts for roadway networks accessing BSR for the summer operating season
- Comparison of anticipated traffic volumes with existing traffic volumes and the design capacities of roadway networks accessing BSR
- Quantification of existing and proposed parking capacity for day and destination visitors within BSR parking lots

Cultural Resources

Implementation of proposed projects and associated ground disturbance may affect previously unidentified cultural and heritage resources.

Analysis Area: BSR SUP area (Area of Potential Effect)

Indicator:

- Survey and documentation of the presence or absence of identified cultural resources
- Documentation of impacts to any potentially-eligible National Register of Historic Places (NRHP) sites

Social and Economic Resources

Implementation of the proposed projects could potentially alter certain socioeconomic characteristics of Summit County or the Town of Breckenridge.

Analysis Area: Summit County, Colorado

Indicator:

- Potential effects to socioeconomic indicators in Summit County, including: population, employment (part-time seasonal employment vs. full-time equivalents), Town/County tax revenue, housing, affordable housing and visitor spending

- Disclosure of compliance with Executive Order 12898, Environmental Justice

THE BIOLOGICAL ENVIRONMENT

Vegetation

Issue 1: Plant communities (including Threatened, Endangered and Proposed Candidate, Region 2 Sensitive species and regionally important plants) may be altered as a result of the proposed projects.

Analysis Area: BSR SUP area

Indicator:

- Impacts to any federally listed threatened and endangered species, Forest Service Region 2 sensitive species and WRNF species of local concern (SOLC) present in the Analysis Area

Issue 2: Overstory vegetation and the presence of weeds may be altered as a result of the proposed projects.

Analysis Area: BSR SUP area

Indicator:

- Quantification (acres) of proposed ground disturbance and overstory vegetation clearing effects by species/vegetation type

Fish and Wildlife

Development of proposed projects, including associated infrastructure, could affect individuals, populations and/or habitat values for federally Proposed, Threatened or Endangered and/or Forest Service Rocky Mountain Region sensitive species (PTES), fish and wildlife species, Management Indicator Species (MIS), migratory birds and species of local concern (SOLC).

Analysis Area: BSP SUP area and adjacent NFS lands

Indicator:

- Quantification (acres) and qualification of existing wildlife habitat and proposed alteration, fragmentation or removal of wildlife habitat, by species. Includes specifically lynx diurnal security habitat, winter forage habitat and denning habitat
- Discussion of effects to PTES species and MIS
- Discussion of and effects within immediate and adjacent LAUs
- Discussion and qualification of compensatory mitigation for impacts to lynx or other relevant species habitat

- Discussion of impacts to elk and mule deer summer range habitat with particular focus on the impacts to reproductive habitat. Description of the possible timing conflicts between deer/elk movement corridors/summer concentration areas with summer operating season
- Discussion of impacts to avian wildlife, in particular to the construction and maintenance of the zip lines
- Discussion of impacts aquatic species from effects water quality and stream health
- Discussion of the operational season for the proposed projects
- Discussion of restoration projects and rehabilitation areas

Soils and Geology

Ground disturbance, including tree clearing and grading, associated with construction and operation of proposed projects has potential to increase erosion/soil compaction and lead to a loss of soil organic matter.

Analysis Area: BSP SUP area

Indicator:

- Inventory and discussion of soil organic matter pre- and post-implementation of any project components involving grading or grading/clearing; discussion and analysis of organic matter transects to field-verify the depth of organic horizons for Mineral A and/or Organic O horizons
- Discussion and estimated quantification (acres) of temporary and permanent ground disturbance according to high/moderate/low erodibility soils classes and slope stability concerns, and particularly to the cut-and-fill process needed for the mountain bike trails
- Analysis of increased erosion hazard due to temporary and permanent ground disturbance
- Inventory of erodible soils by soil map unit and field verification of these properties
- Digitization of bare ground/low vegetation cover areas within SUP boundary

Wetlands

Identified wetlands throughout the project area could be temporarily and/or permanently affected by construction and implementation of proposed projects.

Analysis Area: BSR SUP area

Indicator:

- Quantification of wetlands and riparian areas existent within the project area (acres/linear feet)
- Disclosure of wetland functions and values within the project area

- Discussion of wetland communities and riparian areas classifications and disclosure of anticipated temporary and/or permanent impacts (acres/linear feet)
- Description of compliance with Executive Order (EO) 11990, Protection of Wetlands

Watershed

Implementation of proposed projects has the potential to affect stream and riparian health.

Analysis Area: BSR SUP area, including streams tributary to the Blue River

Indicator:

- Anticipated temporary and permanent changes in water yield (acre feet) and peak flows (cfs), and subsequent watershed effects
- Discussion of existing stream health conditions and water influence zone (WIZ) impacts, within the context of the following stream health metrics: bank stability, fine sediment, residual pool depth, wood frequency and macroinvertebrates. Evaluation of compliance with Watershed Conservation Practices Handbook and Forest Plan requirements
- Quantification of stream health through surveys that classify each channel and channel sensitivity to disturbance
- Qualitative and quantitative discussion of existing surface drainage conditions within the context of Forest Plan Standards for Management Area 8.25
- Quantification and discussion of existing drainage concerns and treatment areas, including areas of rilling and gullying
- Analysis of drainage management measures to maintain or improve stream health
- Quantification (acres) of impacts to the WIZ
- Quantification (acres) of connected disturbed area (CDA)
- Quantification of channel network extension (length of connected channel)
- Quantification (acres) of ground-disturbing activities located on highly erodible soils as it pertains to stream health
- Discussion of any Clean Water Act (CWA) impaired or threatened water body segments in the Analysis Area

I. SCOPE OF THE ANALYSIS

Scope consists of the range of actions, alternatives and impacts to be considered within this DEIS. Furthermore, it includes the spatial and temporal boundaries associated with the actions, alternatives and impacts as the scope of the analysis relates to the Purpose and Need. Individual project elements are

discussed in detail in Chapter 2 and illustrated in the alternative maps. A detailed scope of this environmental analysis is presented at the beginning of each resource section in Chapter 3. The Analysis Area is determined by individual resource analyses presented in Chapter 3 (e.g., the Watershed Analysis Area is spatially different from the Wildlife Analysis Area). Contingent upon approval, construction of proposed projects could begin as early as the summer of 2015. It is important to note that implementation of the projects could occur jointly, individually and/or at different points in time.

The CEQ has regulations for implementing NEPA that require federal agencies to consider the following types of actions, alternatives and impacts in an environmental document.[2]

ACTIONS

- *Connected Actions*: actions that are dependent on each other for their utility.
- *Cumulative Actions*: actions which, when viewed with other proposed actions, have cumulatively significant impacts and should therefore be discussed in the same impact statement.
- *Similar Actions*: actions which, when viewed with other reasonably foreseeable or proposed actions, have similarities that provide a basis for evaluating their environmental consequences together.

ALTERNATIVES

- No Action.
- The Proposed Action.
- Other reasonable courses of action identified in response to substantive issues.
- Mitigation measures (not in the Proposed Action).

IMPACTS

- *Direct impacts* are caused by the action and occur at the same time and place.
- *Indirect impacts* are later in time or farther removed in distance but are still reasonably foreseeable (i.e., likely to occur within the life of the project).
- *Cumulative impacts* are the result of the incremental effects of any action when added to other past, present and reasonably foreseeable future actions and can result from individually minor, but collectively significant actions taking place over an extended period of time.

[2] 40 CFR 1508.25

J. CONSISTENCY WITH FOREST SERVICE POLICY

WRNF LAND AND RESOURCE MANAGEMENT PLAN

BSR's operations carried out on NFS lands must comply with management direction provided in the 2002 Forest Plan. The 2002 Forest Plan includes 33 separate Management Areas for different portions of the Forest based on ecological conditions, historic development and anticipated future conditions. All components of the Proposed Action (Alternative 2) and Alternative 3 fall within the 8.25 Management Area – Ski Areas (Existing and Potential), which directs:

> *"Facilities may be intensively used throughout the year to satisfy a variety of seasonal recreational demands…Protection of scenic values is emphasized through application of basic landscape aesthetics and design principles, integrated with forest management and development objectives…Transportation systems provide convenient access to National Forest System lands in key portal locations with adequate public parking, base facilities, and community infrastructure. Base areas that serve as entrance portals are designed as gateways to public lands. They are architecturally designed to blend with the forest setting and contain convenient facilities and services that provide for the needs of forest visitors."*[3]

As part of this analysis, the alternatives and Purpose and Need were reviewed to determine consistency with the Forest-wide Goals and Objectives, as well as the specific Standards and Guidelines for Management Area 8.25. The action alternatives were compared against pertinent Forest-wide and Management Area standards and guidelines. The standards and guidelines are analyzed in Chapter 3.

The Purpose and Need is consistent with the 2002 Forest Plan General Recreation Standards and Guidelines. The 2002 Forest Plan acknowledges an increasing demand for recreation on the WRNF, and states:

> *"Satisfy demand for recreation services that are supplied by private-sector permittees at authorized sites or areas before new sites or areas are permitted."*[4]

The theme of Management Area 8.25 is discussed in the 2002 Forest Plan and states:

> *"Ski areas are developed and operated by the private sector to provide opportunities for intensively managed outdoor recreation activities during all seasons of the year. This management area also includes areas with potential for future development."*[5]

[3] USDA Forest Service, 2002b p. 3-80
[4] USDA Forest Service, 2002a p. 2-31
[5] USDA Forest Service, 2002b p. 3-80

2011 SKI AREA RECREATIONAL OPPORTUNITY ENHANCEMENT ACT

Most of the 122 ski areas operating on NFS lands in the United States are authorized under special use permits per the National Forest Ski Area Permit Act of 1986 (the 1986 Act).[6] As originally enacted, the 1986 Act authorized Nordic and alpine skiing at ski areas on NFS lands. In November 2011, Congress enacted SAROEA, which amended the 1986 Act to clarify the authority of the Secretary of Agriculture regarding additional recreational uses of NFS land subject to ski area permits, and for other purposes.

The purpose of SAROEA was to amend the 1986 Act in two ways:

1. To enable snow-sports (other than Nordic and alpine skiing) to be permitted on NFS land subject to ski area permits issued by the Secretary of Agriculture under section 3 of the National Forest Ski Area Permit Act of 1986; and
2. To clarify the authority of the Secretary of Agriculture to permit appropriate additional seasonal or year-round recreational activities and facilities on NFS land subject to ski area permits issued by the Secretary of Agriculture under section 3 of the National Forest Ski Area Permit Act of 1986.

SAROEA amended the 1986 Act by *striking* specific references to "Nordic and alpine" ski areas, facilities, operations and purposes and *inserting* more general language regarding "ski areas and associated facilities" and "skiing and other snow sports and recreational uses authorized by this Act." However, for the purposes of this analysis, the most important amendment to the 1986 Act is an insertion to section 3 regarding "Other Recreational Uses."

Per SAROEA, subject to the terms of a ski area permit, the Secretary may authorize a ski area permittee to provide such other seasonal or year-round natural resource-based recreational activities and associated facilities (in addition to skiing and other snow-sports) on NFS lands subject to a ski area permit as the Secretary determines to be appropriate.

Importantly, each activity and facility authorized by the Secretary shall:

- Encourage outdoor recreation and enjoyment of nature;
- To the extent practicable:
  - Harmonize with the natural environment of the NFS land on which the activity or facility is located; and
  - Be located within the developed portions of the ski area;
- Be subject to such terms and conditions as the Secretary determines to be appropriate; and
- Be authorized in accordance with:

[6] 16 USC 497

- The applicable land and resource management plan; and
- Applicable laws (including regulations).

Inclusions identified in SAROEA:
Activities and facilities that may, in appropriate circumstances, be authorized include:

- Zip lines;
- Mountain bike terrain parks and trails;
- Frisbee golf courses; and
- Ropes courses.

Exclusions identified in SAROEA:
Activities and facilities that are prohibited include:

- Tennis courts;
- Water slides and water parks;
- Swimming pools;
- Golf courses; and
- Amusement parks.

The Secretary may not authorize any activity or facility if the Secretary determines that the authorization would result in the primary recreational purpose of the ski area permit to be a purpose other than skiing and other snow-sports.

FOREST SERVICE MANUAL 2343.14

On April 17, 2014, the Forest Service released its Final Directives for Additional Seasonal and Year-Round Recreation Activities at Ski Areas. Forest Service Manual (FSM) 2343.14 includes this final direction and criteria to help authorized officers determine whether proposals for these activities are consistent with SAROEA. FSM 2343.14(1) includes criteria for evaluating additional seasonal and year-round recreation activities and associated facilities that may be authorized at ski areas. These activities and associated facilities must:

- Not change the primary purpose of the ski area to other than snow sports;
- Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities;
- To the extent practicable, be located within the portions of the ski area that are developed or that will be developed pursuant to the master development plan;

- Not exceed the level of development for snow sports and be consistent with the zoning established in the applicable master development plan;
- To the extent practicable, harmonize with the natural environment of the site where they would be located by:
    - Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape; and
    - Not requiring significant modifications to topography to facilitate construction or operations;
- Not compromise snow sports operations or functions; and
- Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and chairlifts.

FSM 2343.14(2) identifies seasonal or year-round recreation activities and associated facilities that may meet these criteria. FSM 2343.14(3) identifies seasonal or year-round recreation activities and associated facilities that may not be authorized. Additional seasonal and year-round recreation activities and associated facilities that are not specifically precluded in FSM 2343.14(3) will be evaluated case-by-case based on applicable regulations and directives. Appendix B analyzes the consistency of project elements with criteria outlined in FSM 2343.14 regarding the appropriateness of the summer recreation activities at BSR.

K. DECISION FRAMEWORK

Based on preliminary internal Forest Service and external public scoping, and evaluation of the context and intensity factors contained in 36 CFR 1508.27, the Forest Service has determined that an EIS will be necessary to review, analyze, and document the potential impacts to the human and biological environment anticipated to result from the implementation of the proposed projects. This DEIS is a disclosure rather than a decision document and its purpose is to provide sufficient environmental analysis to support a Record of Decision (ROD), which will be released in conjunction with a Final Environmental Impact Statement (FEIS).

Based on the analysis documented within this DEIS, the Responsible Official, the Forest Supervisor for the WRNF, will decide whether to select Alternative 2 (Proposed Action), Alternative 3, or the No Action Alternative. The Forest Supervisor is not required to choose either an action alternative or the No Action Alternative described herein, but may select components of an action alternative or develop an entirely new alternative created from components of each. In addition to determining which alternative to select, the Forest Supervisor will also determine any required Project Design Criteria (PDC), conservation measures, mitigation measures, and Best Management Practices (BMPs). The Forest Supervisor may also

require additional PDC, conservation measures, mitigation measures and/or BMPs not discussed within this document.

In compliance with Forest Service Handbook 1909.15 Chapter 18, the Forest Service will continually review the relevancy of the analysis and subsequent decision for new and changed conditions as any approved projects are advanced for implementation.

L. OTHER NECESSARY PERMITS, LICENSES, ENTITLEMENTS AND/OR CONSULTATION[7]

The Forest Service decision would apply only to NFS lands analyzed within this DEIS. However, other federal, state, and local entities may also have jurisdiction. Decisions by jurisdictions to issue or not issue approvals related to this proposal may be aided by the analyses presented in this DEIS. While the Forest Service assumes no responsibility for enforcing laws, regulations, or policies under the jurisdiction of other governmental agencies, Forest Service regulations require permittees to abide by applicable laws and conditions imposed by other jurisdictions. In addition to requisite Forest Service approvals, consultation with the following entities, or permits, may be required to implement any approved projects:

- U.S. Fish and Wildlife Service (USFWS), Endangered Species Act (ESA) Section 7 Consultation
- U.S. Army Corps of Engineers (USACE), Section 404 of the Clean Water Act Permit
- Summit County Construction Permit
- Federal Aviation Administration (FAA) Compliance

[7] Per 40 CFR 1502.25(b)

Chapter 2
Description of Alternatives

2. DESCRIPTION OF ALTERNATIVES

A. INTRODUCTION

Chapter 2 describes the alternatives considered within this environmental analysis and briefly summarizes the environmental consequences anticipated to result with the implementation of each. As required by the CEQ, the alternatives considered are presented in comparative form.[8] PDC, conservation measures, and Best Management Practices (BMPs), designed to lessen or avoid impacts anticipated to occur as a result of implementation of any of the action alternatives, are also detailed.

NEPA requires that an environmental analysis examine a range of alternatives, which are reasonably related to the purpose of the project.[9] Both CEQ Regulations and Forest Service Handbook direction emphasize that alternatives must meet the "reasonableness" criteria in order to warrant detailed analysis. Alternatives that were considered within the analysis process, but were determined not reasonable, were eliminated from detailed study with a brief discussion of the rationale for their elimination.[10]

The issues raised during the scoping process were utilized as the basis for determining the need for alternatives to the Proposed Action.

B. ALTERNATIVES CONSIDERED IN DETAIL

In addition to the Proposed Action, a second action alternative (Alternative 3) and the required No Action Alternative are analyzed in detail within this DEIS.

ALTERNATIVE 1 – NO ACTION

As required by NEPA, a No Action Alternative has been included in this analysis for review alongside the action alternatives.[11] By definition, the No Action Alternative represents a continuation of existing management practices without changes, additions, or upgrades to existing conditions. Brief descriptions of existing on-mountain facilities and services are provided below. The No Action Alternative is depicted in Figure 2.

The No Action Alternative provides a baseline for comparing the effects of the action alternatives. No new facilities or recreational opportunities would be approved under the No Action Alternative. Projects at BSR that have been previously-approved, but not yet implemented are analyzed in the Cumulative Effects sections of Chapter 3 and are detailed in Appendix A.

[8] 40 CFR 1502
[9] FSH 1909.15, Chapter 10, Section 12.33
[10] 40 CFR 1502.14(a)
[11] 40 CFR 1502.14(d)

ALTERNATIVE 2 – PROPOSED ACTION

The Proposed Action includes the following elements. Figure 3 identifies the locations of all proposed projects within the context of BSR's SUP area.

Vista Haus and Independence SuperChair Summit Site Improvements

The Colorado and Independence SuperChairs would become primary access points for guests participating in multi-season recreational activities at BSR. As such, the areas surrounding the tops of these chairlifts, including the Vista Haus and the Peak 7 Hut, would be utilized year-round. This use would be particularly evident during the summer months. These improvements would provide guests with safer and more organized access to activities by developing and defining access pathways, rehabilitating redundant access roads, incorporating signage, increasing vegetative growth, and adding landscaping features.

Zip Lines

Sawmill Zip Line

The Sawmill Zip Line would cross over the Sawmill Creek drainage between Peaks 8 and 9 twice. The zip line would be approximately 5,453 feet (1.03 miles) in length from its start just south of the top terminal of the Peak 8 SuperConnect to its end point on the *Four O'Clock* ski trail near the site of the Freeway Terrain Park and Pipe. The zip line would consist of two segments: 1) top station on Peak 8 to station 2 on the north side of Peak 9 near the *Volunteer* ski trail, and 2) station 2 to the bottom station next to the *Four O'Clock* ski trail on Peak 8. Due to the topography of this area, minimal overstory vegetation clearing would be necessary; however, where vegetation clearing is required, the corridor would be 16 feet wide to allow for zip line operation.

The zip line would consist of two cables spaced 8 feet apart. Because of the Sawmill Zip Line's height above ground level, a third, separate cable suspending aerial warning markers would be necessary above the two zip line cables, in accordance with Federal Aviation Administration (FAA) regulations. Platform dimensions for the top and bottom stations would be approximately 10 feet by 16 feet. Because takeoff and landing would both occur on the station 2 platform, it would measure 10 feet by 32 feet. The platforms would be elevated 20 to 30 feet above the ground. In locations where the grade permits, platforms would be constructed at a height level with typical maximum snow depth and situated to create a flat surface. Each station would require road access for construction, maintenance, emergency access and power. Permanent access roads would be constructed to an approximate width of 12 feet to accommodate construction and maintenance vehicles and four-wheelers in case of emergency evacuation after construction is complete. The stations would be constructed of wooden and/or natural-looking materials to the extent possible. Guy wires from each stations would be required for structural stability. Buck and rail fencing would enclose the areas where the guy wires tie into the ground. Fences would be primarily located on the uphill side of guy wires and stations. The three Sawmill Zip Line stations are

close to ski trails and the buck and rail fencing would be visible; however, the stations would be set against or in tree islands and the fencing would blend with the tree island background. A 10-foot by 10-foot shelter would be constructed adjacent to station 2 of the Sawmill Zip Line in case of inclement weather. The disturbance area of the shelter, fencing and access road has been incorporated into the overall activity disturbance for the analysis. Design capacity for the Sawmill Zip Line would be 48 people per hour (pph).

The Sawmill Zip Line would be accessed by riding the Colorado SuperChair from the Peak 8 base area to the Vista Haus and walking south to the top station. After riding the zip line, guests would return to the Peak 8 base area by hiking, riding the zip line on private lands or taking a shuttle on existing roads.

Peak 7 Zip Line

The Peak 7 Zip Line would be located south of the existing Independence SuperChair. The Peak 7 Zip Line would be approximately 6,890 feet (1.3 miles) in length, starting near the top terminal of the Independence SuperChair and ending southwest of the Peak 7 base area. The zip line would consist of three sections: 1) top station near the Independence SuperChair top terminal to station 2, located near the connector trail between the *Pioneer* and *Claimjumper* ski trails; 2) station 2 to station 3, located on skiers-right of the *Claimjumper* ski trail; 3) station 3 to the bottom station near the base of Peak 7. Overstory vegetation would be cleared where necessary to create a 16-foot corridor for zip line operation.

The Peak 7 Zip Line consists of two cables spaced 8 feet apart. Platform dimensions for the top and bottom stations would be approximately 10 feet by 16 feet. Where takeoff and landing are both required at stations 2 and 3, the platform would measure 10 feet by 32 feet. The top station would be elevated 10 to 20 feet, and the remaining stations would be constructed no higher than 50 feet above ground level. Road access to each station for construction, maintenance, and power would be necessary, utilizing existing clearings on ski trails where possible. Permanent access roads would be constructed to an approximate width of 12 feet to accommodate construction and maintenance vehicles and four-wheelers in case of emergency evacuation after construction is complete. The stations would be constructed of wooden and/or natural-looking materials to the extent possible. Guy wires from each stations would be required for structural stability. Buck and rail fencing would enclose the areas where the guy wires tie into the ground. Fences would be primarily located on the uphill side of guy wires and stations. The four Peak 7 Zip Line stations are close to ski trails and the buck and rail fencing would be visible; however, the stations would be set against or in tree islands and the fencing would blend with the tree island background. In addition, a small shelter, approximately 10 feet by 10 feet, would be constructed adjacent to station 2 of the Peak 7 Zip Line to provide protection from inclement weather. The disturbance area of the shelter, fencing and access road has been incorporated into the overall activity disturbance for the analysis. Design capacity for the Peak 7 Zip Line would be 48 pph.

The Peak 7 Zip Line would be accessed from the top of the Independence SuperChair. After riding the zip line, guests would return to the Peak 7 base area via a proposed hiking trail and an existing service road located near the bottom of the *Fort Mary B* ski trail.

Canopy Tours

Sawmill Canopy Tour

The Sawmill Canopy Tour would begin south of the top terminal of the Peak 8 SuperConnect. The guided aerial tour would follow approximately eight zip line segments connecting ten stations (one segment would be a foot path), ending along *Four O'Clock* ski trail adjacent to the bottom station of the Sawmill Zip Line. The total length of all segments would be approximately 6,338 feet (1.2 miles). Where the canopy tour crosses the Peak 8 SuperConnect lift line, guests would walk along a foot path, rather than riding a zip line, between stations. Natural features, such as topography and vegetation, as well as proximity to access roads, trails, and chairlifts would determine the exact height of each individual zip line cable; however, each station would be approximately 30 feet high. A single zip line cable would connect each station, thus an approximately 8- to 10-foot-wide corridor would be necessary for safe travel through the canopy. Approximate platform size at each station would be 12 feet by 12 feet. To provide for emergency, construction and maintenance access, an approximately 8-foot-wide permanent path would be constructed to each station. The stations would be constructed of wooden and/or natural-looking materials to the extent possible. Guy wires from each stations would be required for structural stability. Buck and rail fencing would enclose the areas where the guy wires tie into the ground. Fences would be primarily located on the uphill side of guy wires and stations. The Sawmill Zip Line stations are close to ski trails and the buck and rail fencing would be visible; however, the stations would be set against or in tree islands and the fencing would blend with the tree island background. In addition, a small shelter, approximately 10 feet by 10 feet, would be constructed adjacent to the bottom station of the Sawmill Canopy Tour to provide protection from inclement weather. The disturbance area of the shelter, fencing and access path has been incorporated into the overall activity disturbance for the analysis. Design capacity for the Sawmill Canopy Tour would be 24 pph.

The Sawmill Canopy Tour would be accessed by riding the Colorado SuperChair from the Peak 8 base area to the Vista Haus and walking to the top station. After completing the canopy tour, guests would return to the Peak 8 base area by hiking or taking a shuttle on existing roads.

Ore Bucket Canopy Tour

The Ore Bucket Canopy Tour would begin northwest of the top terminal of the Independence SuperChair on Peak 7. The guided tour would utilize a series of approximately nine zip lines connecting ten stations. From the top station, the tour would travel through existing gladed tree skiing terrain, ending along the *Angels Rest* ski trail and the Peak 7/8 Access Road on Peak 7. Total length of the canopy tour would be approximately 5,476 feet (1.1 miles). Natural features, such as topography and vegetation, as well as

proximity to access roads, trails, and chairlifts would determine the exact height of each individual zip line; however, each station would be approximately 30 feet high. A single zip line cable would connect each station, thus an approximately 8- to 10-foot-wide corridor would be necessary for safe travel through the canopy. Approximate platform size at each station would be 12 feet by 12 feet. To provide for emergency, construction and maintenance access, an approximately 8-foot-wide permanent path would constructed to each station. The stations would be constructed of wooden and/or natural-looking materials to the extent possible. Guy wires from each station would be required for structural stability. Buck and rail fencing would enclose the areas where the guy wires tie into the ground. Fences would be primarily located on the uphill side of guy wires and stations. The Ore Bucket Zip Line stations are close to ski trails and the buck and rail fencing would be visible; however, the stations would be set against or in tree islands and the fencing would blend with the tree island background. In addition, a small weather shelter, approximately 10 feet by 10 feet, would be constructed adjacent to the bottom station of the Ore Bucket Canopy Tour to provide protection from inclement weather. The disturbance area of the shelter, fencing and access path has been incorporated into the overall activity disturbance for the analysis. Design capacity for the Ore Bucket Canopy Tour would be 24 pph.

The Ore Bucket Canopy Tour would be accessed by riding the Independence SuperChair from the Peak 7 base area and walking west to the top station. After completing the canopy tour, guests would return to the Peak 7 base area by hiking or taking a shuttle on the Peak 7/8 Access Road.

Challenge Courses

Two skills-based challenge courses are proposed west of the Vista Haus. One challenge course would be designed for those under ten years of age and a second course would be designed for older guests. Each course would be self-guided and involves a series of wooden columns, platforms and rope walkways/bridges. Staff would be on-hand to assist guests as necessary. The challenge courses would contain multiple route options with varying degrees of difficulty and would be designed to accommodate a range of ages and skill levels. The combined footprint of both challenge courses would be approximately 1 acre. The challenge courses would be designed to blend with surrounding vegetation and landscape features. A small storage shelter constructed of wooden and/or natural-looking materials would be built adjacent to the challenge courses. The disturbance area of shelter has been incorporated into the overall activity disturbance for the analysis. Each tower would require concrete foundations. Upon construction completion, disturbed ground would be revegetated.

Proposed and Realigned Mountain Bike Trails and Skills Course

As part of this project, new mountain biking trails would be constructed on Peak 7, in addition to select improvements to the existing network of lift-served trails on Peaks 8 and 9. Existing mountain biking trails that would be upgraded to meet current mountain bike design guidelines include Pioneer, Dwight's, Game Trail, Swinger Switchbacks and Frosty's Challenge. New trails and spur routes on Peak 7 would

connect to existing trails on Peak 8. The new trails would be designed to accommodate lower ability levels, including families and children. Both the Colorado and Independence SuperChairs would be utilized for bike and guest transport. Overlook areas would be constructed along trails to provide opportunities for guests to rest and provide shelter from inclement weather. Five overlook shelters would be built within the new trail system. Each area would include a minimal, three sided shelter with a bench and interpretive information. The shelter footprint would be approximately 10 feet by 10 feet. The bike overlooks have been incorporated into the overall disturbance footprint used in the analysis.

In total, approximately 15 miles of mountain bike trails (14 miles new, 1 mile realigned) are proposed. New trails would be located primarily on Peak 7, while realigned trails would provide improvements on Peaks 8 and 9. In order to meet current recommendations for lower ability levels, all trails would be designed with an average grade of no more than 6 to 8 percent. New mountain bike trails would be constructed using a combination of hand tools and machinery, and would require grading and tree removal. Trails would be constructed to an average width of approximately 6 feet. Wetlands and/or sensitive ecological areas within the vicinity of the trails would be avoided or crossed with bridges.

In addition to new trails, a beginner mountain bike skills course would also be developed at the top of the Independence SuperChair. The skills course would include a short circuit trail to allow riders to become familiar with the mountain biking equipment and terrain they could encounter as they develop their skills and venture onto more challenging trails. The skills course would not include any buildings but would include limited, low visibility constructed features, such as logs, rocks piles and berms necessary to develop rider skills and confidence.

An additional trail is proposed outside of BSR's SUP area to connect to the existing Peaks trail (Forest Development Trail #45). The trail would leave the BSR SUP area north of the bottom terminal of the Zendo chairlift and would travel to the north, connecting to the Peaks trail near its crossing of South Barton Gulch.

Hiking Trails

Approximately 1.5 miles of new hiking trails are proposed. These trails would provide both independent and guided hiking opportunities and would include interpretive signage. New loop trails would be constructed at the top of both the Colorado SuperChair and the Independence SuperChair. Another trail would begin at the top of the 6 Chair and would access the lake at the bottom of Lake Chutes. Hiking trails would be constructed to a width of approximately 4 feet.

Off-Highway Vehicle Tours

Currently, BSR staff guide OHV tours along the Peak 7/8 Access Road to the top of the Independence and Colorado SuperChairs. Under the Proposed Action, OHV tours would utilize existing roads, as well as the proposed Upper Four O'Clock Road realignment, to access 6 Chair and the Imperial Express.

Operationally, the program would continue to follow existing protocol, which includes using resort hiking trails to provide interpretation for guests.

Upper Four O'Clock Road Realignment

The existing section of Upper Four O'Clock Road above the Vista Haus travels directly up the fall line and presents challenges for recreational users and service/access use by BSR staff. The road also exhibits drainage and erosion problems. The road would be realigned to climb to the bottom terminal of the Imperial Express along a more sustainable grade, resulting in 0.5 mile of new roadway approximately 25 feet wide. Existing portions of the Upper Four O'Clock Road that would no longer be used would be rehabilitated. Additional design to determine an exact route would be required prior to implementation.

Vista Haus Deck and Climbing Wall, and Peak 7 Hut Expansions

The existing Vista Haus would be expanded in size to better accommodate guests year-round. The proposed deck expansion would add approximately 1,500 square feet on the south side of the building. In addition, an approximately 40-foot tall climbing wall would be constructed adjacent to the Vista Haus. The climbing wall would be open during the summer months as weather permits and would be supervised by staff who would provide basic training and assistance to guests. Ropes, harnesses and helmets would be required and provided by BSR. Design capacity for the climbing wall would be 32 pph. The Vista Haus would serve as a guest service and operations center for all upper-mountain activities on Peak 8.

Located at the top terminal of the Independence SuperChair, the Peak 7 Hut would be expanded by approximately 500 square feet. Both the interior space and outside deck would be expanded to provide increased space for guests and operations for all upper-mountain activities on Peak 7. The Peak 7 Hut would continue to provide restroom facilities.

Observation Tower

An observation tower would be located on Peak 8 to provide guests with elevated views of the surrounding mountain landscape. The tower would be approximately 30 feet in height and have a footprint of 20 feet by 20 feet. The observation tower would be constructed of natural materials such as wood and/or stone. The tower would have handrails and other safety features, would be located adjacent to an existing hiking trail in the lower reaches of Horseshoe Bowl and would provide interpretive education opportunities for guests.

Existing Chairlift Operations, Scenic Chairlift Rides and Activities Access

While a large segment of summer guests would continue to access activities via the Colorado SuperChair, this proposal extends summer operations to the Independence SuperChair on Peak 7, and the Imperial Express and 6 Chair on Peak 8. The base area chairlifts would provide scenic rides from the base of Peaks 7 and 8, and would provide access to zip lines, canopy tours, hiking and mountain bike trails and

other activities. The 6 Chair and Imperial Express would provide BSR guests with access to more remote locations that would otherwise require a strenuous hike or mountain bike ride. Guests would access the 6 Chair via hiking on existing roads. From the top of the 6 Chair, guests would follow an existing road to the bottom of the Imperial Express, which they could ride to just below the summit of Peak 8, at 12,987 feet. No developed trails exist at the top of the Imperial Express, so guests would download via the Imperial Express and the 6 Chair to return to the Vista Haus. From the top of the 6 Chair, guests would also have the option to hike along a proposed trail to the lake at the bottom of Lake Chutes.

ALTERNATIVE 3

Alternative 3 was developed to respond to potential wildlife, high alpine ecosystem and scenery impacts. Alternative 3 includes all projects identified in the Proposed Action, with the following exceptions and modifications. Figure 4 identifies the locations of all proposed projects within the context of BSR's SUP area.

Zip Lines

Sawmill Zip Line

In response to potential wildlife impacts in the Sawmill Creek drainage, the Sawmill Zip Line is not included in Alternative 3.

Canopy Tours

Ore Bucket Canopy Tour

In response to potential wildlife impacts in the Ore Bucket area on Peak 7, the Ore Bucket Canopy Tour is not included in Alternative 3.

Claimjumper Canopy Tour

An alternative canopy tour is included in Alternative 3 to replace the Ore Bucket Canopy Tour. The Claimjumper Canopy Tour would begin west of the top terminal of the Independence SuperChair. The guided tour would utilize a series of eight zip lines connecting ten stations (one segment would be a foot path). The canopy tour would travel through trees and across ski trails to the south of the Independence SuperChair. The tour would cross the Independence SuperChair via a foot path, rather than a zip line, and would end along the *Angels Rest* ski trail at the Peak 7/8 Access Road. Total length of the canopy tour would be approximately 4,498 feet (0.85 mile). Natural features, such as topography and vegetation, as well as proximity to access roads, trails, and chairlifts would determine the exact height of each individual zip line; however, each station would be approximately 30 feet high. A single zip line cable would connect each station, thus an approximately 8- to 10-foot-wide corridor would be necessary for safe travel through the canopy. Approximate platform size at each station would be 12 feet by 12 feet. To provide for emergency, construction and maintenance access, an approximately 8-foot-wide permanent path would be

constructed to each station. The stations would be constructed of wooden and/or natural-looking materials to the extent possible. Guy wires from each station would be required for structural stability. Buck and rail fencing would enclose the areas where the guy wires tie into the ground. Fences would be primarily located on the uphill side of guy wires and stations. The Claimjumper Canopy Tour stations are in close proximity to ski trails and the buck and rail fencing would be visible; however, the stations would be set against or in tree islands and the fencing would blend with the tree island background. In addition, a small weather shelter, approximately 10 feet by 10 feet, would be constructed adjacent to the bottom station of the Claimjumper Canopy Tour to provide protection from inclement weather. The disturbance area of the shelter, fencing and access path has been incorporated into the overall activity disturbance for the analysis. Design capacity for the Claimjumper Canopy Tour would be 24 pph.

The Claimjumper Canopy Tour would be accessed by riding the Independence SuperChair from the Peak 7 base area and walking to the top station. After completing the canopy tour, guests would return to the Peak 7 base area by hiking or taking a shuttle on the Peak 7/8 Access Road.

Proposed and Realigned Mountain Bike Trails

To address potential wildlife and watershed impacts north of the Peak 7 terrain, the northernmost mountain bike trail identified in the Proposed Action that travels from the Peak 7 Hut to the 7/8 Access Road would be eliminated from the proposed trail network. The connector trail to the Peaks trail outside of BSR's SUP area would follow a modified alignment, utilizing using existing ski trails and service roads rather than clearing an entirely new corridor. All other mountain bike trails and the beginner skills course are identical between the Proposed Action and Alternative 3. In total, approximately 14 miles of mountain bike trails (13 miles new, 1 mile realigned) are proposed under Alternative 3. All design specifications identified in the Proposed Action are included in Alternative 3.

Hiking Trails

In response to potential impacts to the high alpine ecosystem, the hiking trail to the lake below Lake Chutes would not be constructed under Alternative 3.

All other hiking trails locations and specifications are identical between the Proposed Action and Alternative 3.

Off-Highway Vehicle Tours

In response to potential impacts to the high alpine ecosystem, OHV tours would not use the Upper Four O'Clock Road to access the top of 6 Chair. Existing OHV tours would continue to use the Peak 7/8 Access Road. Upper Four O'Clock Road would still be realigned, as described in the Proposed Action.

Observation Tower

To reduce scenery resource issues, the observation tower would be located adjacent to the existing, previously-disturbed bomb cache, approximately 500 feet north of the Colorado SuperChair top terminal.

All design specifications identified in the Proposed Action are included in Alternative 3.

Existing Chairlift Operations, Scenic Chairlift Rides and Activities Access

In response to potential impacts to the high alpine ecosystem, neither the 6 Chair nor the Imperial Express would be used to transport guests in the summer. Activities proposed in Alternative 3 would be served by the Colorado SuperChair and the Independence SuperChair.

C. APPLICABILITY OF ACTION ALTERNATIVES TO THE PURPOSE AND NEED

The Purpose and Need for the Proposed Action is stated in Chapter 1. Table 2-1 provides a cross-reference of the Purpose and Need and the individual projects identified in the action alternatives to meet the Purpose and Need components.

Table 2-1:
Applicability of the Purpose and Need to the Alternatives

Purpose Statement	Alternative 2 – Proposed Action	Alternative 3
Adventure or thrill-based experiences that require little specialized knowledge, skills, equipment, or familiarity with the mountain environment—elements which can be a barrier for visitors (e.g., families, the elderly/aging, or those with disabilities) desiring to engage in outdoor activities	◆ Sawmill Zip Line ◆ Peak 7 Zip Line ◆ Sawmill Canopy Tour ◆ Ore Bucket Canopy Tour ◆ Challenge Courses ◆ Climbing Wall	◆ Peak 7 Zip Line ◆ Sawmill Canopy Tour ◆ Claimjumper Canopy Tour ◆ Challenge Courses ◆ Climbing Wall
Activity-based interaction with a forested, mountain environment in a controlled setting, offering an opportunity for users to interact with and learn about nature	◆ Proposed and Realigned Mountain Bike Trails ◆ Hiking Trails ◆ Off-Highway Vehicle Tours ◆ Observation Tower ◆ Scenic Chairlift Rides	◆ Proposed and Realigned Mountain Bike Trails ◆ Hiking Trails ◆ Observation Tower
Human-powered, active recreational experiences that cater to all ability levels	◆ Proposed and Realigned Mountain Bike Trails ◆ Hiking Trails	◆ Proposed and Realigned Mountain Bike Trails ◆ Hiking Trails
Interpretive programs that offer an educational experience for users seeking to learn more about the environment	◆ Interpretive signs, kiosks and/or services incorporated into each activity	◆ Interpretive signs, kiosks and/or services incorporated into each activity
Adequate access and support service infrastructure (e.g., roads, support buildings, restaurants) to meet current and anticipated summer use at BSR.	◆ Upper Four O'Clock Road realignment ◆ Vista Haus Deck and Peak 7 Hut Expansion	◆ Upper Four O'Clock Road realignment ◆ Vista Haus Deck and Peak 7 Hut Expansion

D. PROJECT DESIGN CRITERIA INCORPORATED INTO ALTERNATIVES 2 AND 3

In order to minimize potential resource impacts from construction and implementation of any approved projects, Project Design Criteria (PDC) have been incorporated into alternatives 2 and 3 (Table 2-2).

PDC are devised in the pre-analysis and analysis phases to reduce environmental impacts and comply with applicable laws and regulations. They include, but are not limited to, BMPs, standards and guidelines and standard operating procedures.

The potential effects of implementing the Proposed Action and Alternative 3 (provided in Chapter 3) were analyzed with these PDC applied.

PDC come from Federal, State, and local laws, regulations and policies; forest plans, scientific research and from experience in designing similar projects. Many PDC are considered common practices which ski area managers have historically used in alpine and sub-alpine environments to prevent or decrease potential resource impacts. They are highly effective methods that can be planned in advance and adapted to site conditions, as needed.

Responsibility for ensuring that required PDC are implemented rests with BSR and the Forest Service. In all cases, the ultimate enforcement mechanism for implementation of the specified PDC would be the Record of Decision for the Final EIS, and would extend to the Forest Service Special Use Permit Administrator, the District Ranger and the Forest Supervisor.

Table 2-2:
Project Design Criteria

RECREATION
Where appropriate, fencing, flagging, signage and other safety mechanisms would be used to alert skiers to the location of zip line and canopy tour stations, guy wires, and other infrastructure.
All mountain biking trails will have appropriate signage to direct uphill and downhill traffic and prevent user conflict. BSR and the Forest Service will determine which trails are appropriate for downhill and uphill travel and sign them as such.
Unauthorized hiking and biking trails developed by third parties shall be promptly deconstructed and reclaimed the season that they are discovered.
SCENERY
Prior to development of above ground structures, facilities, features, including bridges, towers, chairlift structures, zip lines, canopy tours, etc., design plans will be reviewed and approved by the Forest Service as part of the White River Design Review Process. The proposed structures should meet the Built Environment Image Guide (BEIG) guidelines. The BEIG is found at http://www.fs.fed.us/recreation/programs/beig/.
Choose structure design, scale, and color of materials, location, and orientation to meet the scenic integrity level of the Project Area.
Stumps should be cut as low as possible to the ground to avoid safety hazard and lessen scenery impact.
All structures, facilities, features including bridges, towers, chairlift structures, zip lines, canopy tours, and all other above ground features will meet color guidelines. Bright colors are inappropriate for the forest setting. The colors should be muted, subdued colors because they blend well with the natural color scheme. The Forest Service Handbook No. 617, "National Forest Landscape Management for Ski Areas, Volume 2, Chapter 7," refers recommended colors for ski areas.
All structures, facilities, features including bridges, towers, chairlift structures, zip lines, canopy tours and all other above ground features will meet reflectivity guidelines. This includes any reflective surfaces (metal, glass, plastics, or other materials with smooth surfaces), that do not blend with the natural environment. They should be covered, painted, stained, chemically treated, etched, sandblasted, corrugated, or otherwise treated to meet the solar reflectivity standards. The specific requirements for reflectivity are as follows: Structures with exteriors consisting of galvanized metal or other reflective surfaces will be treated or painted dark non-reflective colors that blend with the forest background to meet an average neutral value of 4.5 or less as measured on the Munsell neutral scale.
Trees should be retained, where possible, to provide species and size diversity, maintain forest cover, and screen facilities.
Avoid straight edges where removing trees. The edges of the tree clearing areas, where the vegetation is removed, need to use a variable density cutting (feathering) technique applied to create a more natural edge that blends into the existing vegetative, where possible. Edges should be non-linear, and changes in tree heights along the edges of openings should be gradual rather than abrupt. Soften hard edges by selective removal of trees of different ages and heights to produce irregular corridor edges where possible.
Utilities must be buried as per Forest Plan Standard.
All facilities including trails and signs must meet Forest Service Accessibility Guidelines. Forest Service Outdoor Recreation Accessibility Guidelines: http://www.fs.fed.us/recreation/programs/accessibilty/

Table 2-2:
Project Design Criteria

CULTURAL
If undocumented historic and/or prehistoric properties are located during ground disturbing activities or planning activities associated with approved construction activities, all construction in the immediate vicinity would cease and they would be treated as specified in 36 CFR §800.11 concerning Properties Discovered During Implementation of an Undertaking.
VEGETATION
Pretreatment of existing infestations with approved herbicides within the Project Area should be conducted prior to project implementation. Herbicide choices and application rates for treatment are available from the District/Forest Weed Program Manager.
Ensure that prior to moving on to NFS lands all off-road equipment is free of soil, seeds, vegetative matter, or other debris that could contain or hold noxious weed seeds. "Off-road equipment" includes all construction machinery or off-highway vehicles, except for trucks, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. The project administrator will inspect the equipment prior to entrance onto the Forest to ensure that it is free of debris.
All disturbed ground will be re-vegetated with desirable plant species. Utilize seed mix approved by the Forest Botanist and certified to be free of weed species. Seed mixes that incorporate native plant species similar to those within the Project Area are desirable. Any mulch used in re-vegetation efforts must be certified to be free of weed species.
BSR should monitor Project Area for three years after completion for presence of invasive plants and successful establishment of desirable vegetation. Invasive plants should be retreated, as needed.
Avoid trampling of native plant communities through designation of formal paths in heavy use areas, and other appropriate means.
Adequately mark leave trees and trail clearing limits to avoid mistakes in clearing limits during construction.
Areas cleared of vegetation alongside trails should be fully reclaimed after construction, where possible.
Implement Forest Service approved re-vegetation guidelines to all disturbed sites.
Effective ground cover (mulch) upon completion of ground disturbing activities would meet minimum level of the pre-treatment habitat type.
Efforts should be made to retain or transplant seedlings and saplings to other areas to maintain vegetation over (with regards to lodgepole pine mortality).
Any Engelmann spruce that is felled must be either removed from the area or treated within one year after felling to prevent the buildup of spruce bark beetle. Treatments can include burning, burying or peeling the bark off felled Engelmann spruce.
BSR will sign and educate guests about the risks of forest fires from smoking on NFS lands.
All disturbed areas associated with this project shall be re-vegetated. Re-vegetation may include planting native trees and shrubs and seeding with native grasses and forbs. Reseed with a native seed mixture recommended by the Forest Botanist. Seeding and planting will be repeated until satisfactory re-vegetation is accomplished.

Table 2-2:
Project Design Criteria

FISH AND WILDLIFE
Surveys for migratory birds and threatened, endangered, and sensitive species shall be conducted by qualified biologists prior to the construction season if construction activities are proposed to start prior to July 15.
Construction of approved projects should occur, to the extent practicable, outside the portion of the nesting period (March 1 to July 15) of migratory birds (non-Forest Service threatened, endangered, and sensitive species) when active nests are present. Construction may occur within that nesting period if surveys show no nests or altricial young present, or as otherwise approved by the Forest Service Responsible Official.
If flamulated or boreal owl nests are located within project areas, direct mortality of eggs and/or nestlings shall be avoided by conducting tree removal in nesting habitat outside of the May 21 to July 15 nesting period, or as otherwise approved by the Forest Service Responsible Official.
If olive-sided flycatcher nests are located within project areas, direct mortality of eggs and/or nestlings shall be avoided by conducting tree removal in nesting habitat outside of the June 1 to July 15 nesting period, or as otherwise approved by the Forest Service Responsible Official.
Surveys for active raptor nests and avian cavity nesting activity shall be conducted by qualified biologists prior to the construction season. To allow for successful nesting and young rearing, no project ground disturbing activities shall be allowed within a quarter-mile of active raptor nests until after July 31, or as otherwise approved by the Forest Service Responsible Official. To protect breeding adults and young raptors in avian cavity nests, a no-activity buffer of 1 acre around detected cavity trees shall be implemented until July 31, or as otherwise approved by the Forest Service Responsible Official.
To reduce the risk for human/wildlife conflicts in areas where food or trash could be present, all trash containers should be bear proof and any locations that have food products stored outside of a building should have bear proof food containers.
During construction of the facility, contractors are required by Summit County code to provide a bear proof container on site for all edible and food related trash in order to minimize conflicts with black bears. No food products or food containers can be thrown in the larger roll-off type dumpsters.
Any new summer use developments should adhere to the Colorado Parks and Wildlife bear safety guidelines: Be Bear Aware.
All construction activities should be confined to daylight hours, excluding emergencies.
Workers should not bring dogs on site during construction.
No food or drink should be stored in construction vehicles. All windows should be kept closed and doors locked on all vehicles to prevent bear entry.
Reduce sediment sources (connected disturbed areas [CDA]) on existing and proposed trails and stream crossings to prevent impact to aquatic species.
SOILS AND GEOLOGY
During construction, maintenance and operations, stockpile top soil to the extent possible to maintain organic matter.
Prior to construction, soil surveys will be completed within the disturbance area to ensure no net loss of soil organic matter.

Table 2-2:
Project Design Criteria

Prior to construction, a detailed site erosion control plan will be prepared. This plan shall include the following components: • Silt fences, straw bales, straw wattles, and other standard erosion control BMPs shall be employed to contain sediment onsite. • Jute-netting or appropriate erosion-control matting on steep fill slopes (i.e., land with a slope angle of 35% or greater) will be utilized to protect soils and enhance conditions for vegetation re-establishment. • Promptly re-vegetate disturbed areas. Seed mixtures and mulches will be free of noxious weeds. To prevent soil erosion, non-persistent, non-native perennials or sterile perennials may be used while native perennials become established. The Forest Service must approve the seed mixtures prior to implementation, unless previously approved seed mixes are employed.
Prepare detailed site plans for concentrated use sites. Design sites to be resilient to increased foot traffic and other intended uses. Incorporate existing soils and native vegetation into site plans.
Reclaim disturbed areas promptly when use ends to prevent resource damage and invasion of noxious weeds. Ensure proper drainage, rip compacted areas, and apply a Forest Service-approved seed mix and fertilizer to facilitate re-vegetation.
Use existing roads unless other options will produce less long-term sediment. Reconstruct for long-term soil and drainage stability.
Vegetative buffers will be maintained adjacent to intermittent or perennial drainages and wetlands, to the extent possible. Where avoidance of the vegetative buffer is not possible, disturbance will be minimized.
In all areas where grading or soil disturbance will occur, a reassessment of the quantity (depths) of soil A and/or organic ground cover would be made to ensure no net loss of this material.
Soil-disturbing activities will be avoided during periods of heavy rain or excessively wet soils.
Areas determined to have been compacted by construction activities may require mechanical subsoiling or scarification to the compacted depth to reduce bulk density and restore porosity.
When logging over the snow, conditions should allow for 1 foot of packed snow to be continuous (i.e., not patchy) and competent enough so that wheeled or tracked vehicles do not break through. When logging over frozen ground, a minimum of 3 inches of continuous frozen ground should be present.
Ground cover, as a combination of re-vegetation, organic amendments and mulch applications, will restore depths of soil A and/or organic ground cover.
Maintain a no net disturbance gain through offsets and reclamation projects.
Disturb minimal ground for the bridges, trails and any other facility placing any excess material back to the area with grading to avoid piles of material and maintain a natural appearance. Any site grading will blend disturbance into the existing topography to achieve a natural appearance. Minimize cut and fill at the transition of proposed grading and existing terrain. Strip topsoil and save for re-vegetation.
WATERSHED AND WETLANDS
Watershed – Mountain Bike Trails Specific
Align trails using natural topography to create grade reversals or rolling dips to facilitate maintenance-free drainage. Use waterbars, ditches and cross drains only when grade reversals and rolling dips are not practical. Schedule annual maintenance of waterbars, ditches and cross drains to maintain function.
Design and construct mountain bike trails to drain runoff away from wetlands and stream channels.
Minimize tree removal and excavation in the water influence zone (WIZ).

Table 2-2:
Project Design Criteria

Minimize to the extent practicable grading within the WIZ for mountain bike trails, and construct mountain bike trail crossings over streams using bridges and/or boardwalks.
Avoid routing trails directly down the fall line. Place drainage structures above steep stretches of trail to minimize the amount of water that gets routed onto steeps. Increase the frequency of drainage features in steep areas.
Avoid routing trails down the bottom of ephemeral draws or other low spots so that water has somewhere to drain besides the trail tread.
Minimize streams crossings. If crossings cannot be avoided, use bridges, boardwalks, or other spanning structures to cross streams, wetlands and riparian areas. Locate crossings where local topography, drainage and soil conditions allow impacts to be minimized. Use rolling dips or grade reversals on the approach to streams to drain trail runoff into undisturbed soils rather than directly into streams.
Manage bike trails with seasonal closures as needed to avoid the development of ruts when soils are saturated.
Use specialized equipment designed for trail building where construction requires berms, banks, or other specialized trail features. Construct trails to the minimum width consistent with the intended use.
Identify and mark all abandoned portions of trails on the ground and schedule rehabilitation concurrent with the construction of trail re-routes. When rehabilitating abandoned trails, ensure an adequate number of drainage features such as check dams, water-bars and sediment traps, are installed to address minor erosion problems. Re-contour slopes where trails have become entrenched or where there are major erosion problems.
Clearly mark proposed trail alignments on the ground and schedule a field review with Forest Service specialists prior to initiating construction.
Install and maintain a structural perimeter (except for ingress and egress) around each skills park to contain sediment and to confine the disturbance within the approved footprint.
Watershed – General
BSR will be required to prepare grading plans for Forest Service approval prior to implementation.
In the water influence zone next to perennial and intermittent streams, lakes and wetlands, allow only those land treatments that maintain or improve long-term stream health and riparian ecosystem condition.
Locate new concentrated-use sites outside of the WIZ if feasible and outside riparian areas and wetlands always. Harden or reclaim existing sites in the WIZ to prevent detrimental soil and bank erosion. (WIZ boundaries adjacent to project areas should be clearly demarcated on the ground to prevent infringement during construction and operation.)
For ground-disturbing activities near perennial and intermittent streams, and ephemeral draws, minimize CDA by ensuring that roads, road ditches, and other disturbed areas drain to undisturbed soils rather than directly to streams and ephemeral draws. Manipulate drainage from disturbed areas as necessary using natural topography, rolling dips, waterbars, ditch-relief culverts, etc., to disconnect disturbed areas from streams.
Clearly mark all wetlands within the vicinity of any ground disturbing activities or tree felling and ensure that all equipment operators are aware of their presence. Keep heavy equipment out of streams, swales, and lakes, except to cross at designated points, build crossings, or do restoration work, or if protected by at least 1 foot of packed snow or 2 inches of frozen soil. Alternatively, where approved by the USFS on-site, designate a single wetlands crossing, lay down temporary construction mats to cross wetlands and limit the number of passes to the minimum number required. Do not disrupt water supply or drainage patterns into wetlands.
Fell trees into the inter-trail islands to improve Large Woody Debris density; however, fell trees in a way that protects vegetation in the WIZ from damage.

Table 2-2:
Project Design Criteria

Do not store excavated material in the WIZ.
Size culverts to easily pass sediment and debris transported by the stream to be crossed. Do not use culverts less than 18" in diameter to cross any stream channel.
Add or remove rocks, wood, or other material in streams or lakes only if such actions maintains or improves stream health. Avoid altering the stream bed and banks and maintain the natural character of the stream.
Outslope low standard roads to shed water rather than concentrating water on the road surface or in ditches.
Do not install culverts or conduct ground-disturbing activities near streams during spring runoff, or during periods of heavy precipitation.
Do not locate roads, trails, or other disturbed areas on slopes that show signs of instability, such as slope failure, mass movement, or slumps.
For projects that involve grading, define grading limits on the ground before construction by placing wattles, sediment fence, construction fence, or some physical barrier along the perimeter of the area to be graded. Ensure that all grading is confined within the specified grading limits.
For projects that would increase road traffic, or require road use by heavy construction equipment, apply road surfacing near stream crossings as needed to harden the road surface and minimize sediment delivery to streams.
Do not encroach fills or introduce soil into streams, swales, lakes, or wetlands. Install sediment waddles, sediment fencing, retention basins, or other applications before ground-disturbing activities begin. Favor applications that maintain functionality without maintenance, such as sediment retaining wattles. Service sediment retention applications before leaving the site and remove non-natural and non-biodegradeable materials. Favor applications that use natural or biodegradable materials that can be left on-site.
Keep all debris generated by project activities out of ditches, swales, and drainage channels.
For grading projects greater than 1 acre, prepare a grading plan and an erosion control plan. At a minimum, ensure that these documents meet the basic requirements for stormwater permitting through the State of Colorado Stormwater Management Program.
For roads, install cross drains to disperse ditch runoff into filter strips and minimize sediment delivery to streams. Construct sediment traps where possible, remove sediment when traps are 80% full and stockpile sediment in low-gradient upland sites. Make cuts, fills, and road surfaces strongly resistant to erosion.
For projects that involve logging operations, log over the snow when possible. Avoid ground skidding on slopes steeper than 40%.
A drainage management plan will be completed prior to construction of projects.
AIR QUALITY
Site improvements will be installed promptly in order to reduce the potential for dust emissions.
The area disturbed by clearing, earth moving, or excavation activities will be kept to a minimum at all times, allowing improvements to be implemented in sections.

E. DESIGN COMPONENTS AND ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

During the course of this NEPA process, one specific alternative (Alternative 3) to the Proposed Action was developed for full analysis and review. Additionally, throughout the planning stages, specific elements of the Alternative 2 projects were revised and modified. These modifications were the result of ground-truthing each project component by mountain planning and environmental specialists, as well as engineers, surveyors, and mountain operations personnel. These modifications reflect how improved, up-to-date information helped create a proposal which responds well to resources present within the Project Area and is sensitive to the underlying concerns of the community.

Several substantial design components were considered but eliminated from further detailed analysis prior to BSR's submission of their Multi-Season Recreation Project proposal to the Forest Service and the initiation of this EIS process. These planning concepts were eliminated from further review for several reasons including environmental impacts, prohibitive cost, and technical constraints. The following section presents a brief synopsis of the design and project elements considered and the rationale for their elimination.

F. DESIGN COMPONENTS CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

SAWMILL CANOPY TOUR

Locating Sawmill Canopy Tour stations outside of tree islands was considered in order to minimize required vegetation clearing. This design component was eliminated from consideration because it would not provide the same level of guest experience as is sought. Additionally, due to lodgepole pine mortality around the site of the Sawmill Canopy Tour, a majority of trees removed would be standing dead.

CHALLENGE COURSES

The initial proposal called for rectangular challenge course structures that would be highly visible and require larger footprints. This design component was eliminated from consideration because it would not have been subordinate to the natural environment, thus not meeting the intent of SAOREA and nor Region 2 screening requirements for summer activities.

BIKING TRAILS

The initial mountain bike trail system design on Peak 7 contained several stream and wetland crossings. While impacts to water resources would have been mitigated through design criteria, it was determined that a more suitable option would be to avoid interface between trails and water resources altogether. Trail system designs for the action alternatives were altered to avoid many stream and wetland crossings.

G. ALTERNATIVES CONSIDERED BUT ELIMINATED

The following section summarizes alternatives which were considered but eliminated from detailed analysis, and the rationale for their elimination.

SAWMILL ZIP LINE ON FOUR O'CLOCK RIDGE

An alternative route for the Sawmill Zip Line followed *Four O'Clock* trail down the ridgeline instead of crossing between Peaks 8 and 9. This alternative was eliminated from further analysis due to engineering feasibility issues. Given the topography and the fact that the zip line would have to clear ski trails, the alignment would require a mid-station tower height that would not be safe, nor would it blend with the natural landscape. Additionally, the Sawmill Canopy Tour would already be located along virtually the same alignment.

H. COMPARISON OF ALTERNATIVES

Table 2-3 provides a comparison of project elements associated with each alternative.

Table 2-3:
Comparison of Alternatives: Ground Disturbance

Component	Alternative 1 - No Action	Alternative 2 - Proposed Action	Alternative 3
ZIP LINES			
Sawmill Zip Line	No Implementation	0.8 acre (including access paths)	No Implementation
Peak 7 Zip Line	No Implementation	1.5 acres (including access paths)	1.5 acres (including access paths)
CANOPY TOURS			
Sawmill Canopy Tour	No Implementation	1.4 acres (including access paths)	1.4 acres (including access paths)
Ore Bucket Canopy Tour	No Implementation	1.7 acres (including access paths)	No Implementation
Claimjumper Canopy Tour	No Implementation	No Implementation	1 acre (including access paths)
OTHER			
Challenge Courses	No Implementation	1 acre	1 acre
Mountain Bike Trails	Currently 25.5 miles	Additional 14 miles resulting in 16.8 acres of disturbance	Additional 13 miles resulting in 14.2 acres of disturbance
Realigned Mountain Bike Trails	No Implementation	1 mile resulting in 1.3 acres of disturbance	1 mile resulting in 1.3 acres of disturbance
Skills Course	No Implementation	0.1 acre for skills course	0.1 acre for skills course
Hiking Trails	Currently 1.3 miles	Additional 1.5 miles resulting in 0.7 acres of disturbance	Additional 1.2 miles resulting in 0.6 acres of disturbance
Off-Highway Vehicle Tours	Currently to the top of Independence SuperChair	Add route to top of 6 Chair	No Implementation; To the top of Independence SuperChair
Four O'Clock Road Realignment	No Implementation	3.8 acres	3.8 acres
Observation Tower	No Implementation	0.1 acre	0.1 acre
Scenic Chairlift Rides	Colorado SuperChair, Chair 5, Rip's Ride and BreckConnect Gondola	Add operation of Independence SuperChair, 6 Chair, Imperial Express	Add operation of Independence SuperChair
Vista Haus Deck and Peak 7 Hut Expansions	No Implementation	0.25 acre	0.25 acre

I. SUMMARY COMPARISON OF DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Per direction provided in 40 CFR 1502.14, Table 2-4 provides a comparison of environmental impacts by alternative.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

<table>
<tr><th>Alternative 1</th><th>Alternative 2</th><th>Alternative 3</th></tr>
<tr><td colspan="3">RECREATION</td></tr>
<tr><td colspan="3">Issue: Proposed projects within BSR's SUP area have the potential to affect the recreational experience at the ski area.</td></tr>
<tr><td colspan="3">Indicator: Quantitative analysis of existing and proposed multi-season recreation activities, including mileage and acreage of mountain bike trails by ability level and anticipated activity use per day</td></tr>
<tr><td>
<table>
<tr><th></th><th>Guests Per Day</th><th>Percent of Total</th></tr>
<tr><td>Summer Fun Park – Base of Peak 8</td><td>2,900</td><td>83</td></tr>
<tr><td>Activities on Peak 7</td><td>100</td><td>3</td></tr>
<tr><td>Activities on Peak8</td><td>500</td><td>14</td></tr>
<tr><td>Total</td><td>3,500</td><td>100</td></tr>
</table>
<table>
<tr><th></th><th>Mountain Bike Trails (miles)</th></tr>
<tr><td>Beginner and Intermediate</td><td>14.7</td></tr>
<tr><td>Expert</td><td>10.8</td></tr>
<tr><td>Total</td><td>25.5</td></tr>
</table>
</td><td>
<table>
<tr><th></th><th>Guests Per Day</th><th>Percent of Total</th></tr>
<tr><td>Summer Fun Park – Base of Peak 8</td><td>2,925</td><td>45</td></tr>
<tr><td>Activities on Peak 7</td><td>1,300</td><td>20</td></tr>
<tr><td>Activities on Peak 8</td><td>2,275</td><td>35</td></tr>
<tr><td>Total</td><td>6,500</td><td>100</td></tr>
</table>
<table>
<tr><th></th><th>Mountain Bike Trails (miles)</th></tr>
<tr><td>Beginner and Intermediate</td><td>28.7</td></tr>
<tr><td>Expert</td><td>10.8</td></tr>
<tr><td>Total</td><td>39.5</td></tr>
</table>
</td><td>
<table>
<tr><th></th><th>Guests Per Day</th><th>Percent of Total</th></tr>
<tr><td>Summer Fun Park – Base of Peak 8</td><td>3,000</td><td>50</td></tr>
<tr><td>Activities on Peak 7</td><td>1,500</td><td>25</td></tr>
<tr><td>Activities on Peak 8</td><td>1,500</td><td>25</td></tr>
<tr><td>Total</td><td>6,000</td><td>100</td></tr>
</table>
<table>
<tr><th></th><th>Mountain Bike Trails (miles)</th></tr>
<tr><td>Beginner and Intermediate</td><td>27.8</td></tr>
<tr><td>Expert</td><td>10.8</td></tr>
<tr><td>Total</td><td>38.6</td></tr>
</table>
</td></tr>
<tr><td colspan="3">Indicator: Discussion of user/guest demand that currently exists in the area for multi-season recreation activities</td></tr>
<tr><td>Under Alternative 1, approximately 193,000 guests are project to visit BSR during the summer, based on a 2% annual growth rate for 5 years.</td><td>Under Alternative 2, approximately 325,000 guests are projected to visit BSR annually during the summer after full implementation (approximately 5 years).</td><td>Under Alternative 3, approximately 300,000 guests are projected to visit BSR annually during the summer after full implementation (approximately 5 years).</td></tr>
<tr><td colspan="3">Indicator: Discussion of guest circulation across the SUP area, including how many guests, where they would be, and when they would be at certain locations</td></tr>
<tr><td>Under existing conditions, approximately 17% of summer visitors to BSR travel up the mountain via chairlift, while the remaining 83% stay at the base areas/Summer Fun Park. This is not anticipated to change under Alternative 1.</td><td>Under Alternative 2, approximately 45% of guests would stay at the base areas/Summer Fun Park (on private lands), 35% would ride the Colorado SuperChair to participate in activities on Peak 8 (on NFS lands), and 20% would ride the Independence SuperChair to participate in activities on Peak 7 (on NFS lands).</td><td>Under Alternative 3, approximately 50% of guests would stay at the base areas/Summer Fun Park (on private lands), 25% would ride the Colorado SuperChair to participate in activities on Peak 8 (on NFS lands), and 25% would ride the Independence SuperChair to participate in activities on Peak 7 (on NFS lands).</td></tr>
</table>

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Discussion of potential conflict between current and new users, particularly uphill and downhill mountain bike traffic		
Some user conflict currently exists as hikers and uphill mountain bikers sometimes encounter mountain bikers riding downhill; however, the instances of this are minimal because of the number of users on the trails.	Under Alternative 2 there would be a higher quantity of use on hiking and mountain biking trails within BSR's SUP area. However, user conflicts would be minimized and managed through a combination of directional signage and separation of use. Signage at trail intersections would alert users to the possible presence of other types of users.	Same as Alternative 2.
Indicator: Quantitative analysis of existing and proposed guest service space and seating		
Base Area: Peak 8 base area food service includes T-Bar and Ski Hill Grill; Peak 7 base area includes Seven Restaurant. **On-Mountain:** No food service is available on-mountain during the summer. Peak 7 Hut (480 square feet) is available for restrooms and as a gathering space.	**Base Area:** Existing services would continue to be provided at the base areas. **On-Mountain:** Vista Haus would be expanded by 1,500 square feet and provide on-mountain summer guest services (including food services). Peak 7 Hut would be expanded by 500 square feet to accommodate anticipated use and continue to provide restrooms and shelter (no food service is proposed).	Same as Alternative 2.
Indicator: Qualitative analysis of existing and proposed guest experiences for multi-season recreation activities, including potential noise conflicts with guests' experience doing various activities at BSR		
Under existing conditions, guests can expect to encounter a high number of people near the Summer Fun Park and thus a louder environment. The experience is relatively less developed and quieter as guests move away from the Summer Fun Park area on the trail network. Alternative 1 includes no changes to existing conditions.	Under Alternative 2, guests near the Summer Fun Park would continue to encounter a high number of people and a relatively loud environment. The addition of activities on Peaks 7 and 8 (including zip lines, canopy tours, challenge courses, trails, scenic chairlift rides, and observation tower) would result in higher use in these areas. The areas around the top terminals of the Colorado SuperChair and Independence SuperChair would experience a relatively high concentration of use, which could result in some noise. However, this noise would be less than current levels at the Summer Fun Park, and would decrease as guests travel away from the top terminal areas. Users of the trails and other activities	Same as Alternative 2.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
	located away from the top terminal areas would encounter a quiet, dispersed recreation experience.	
Indicator: Discussion of season of use for each activity		
The majority of existing multi-season activities at BSR only operate during the summer season, with the exception of the TenMile Flyer Zip Line and the Gold Runner Coaster which also operate during the winter.	All proposed activities would operate during the summer. BSR could, in the future, operate the zip lines, canopy tours, and challenge courses during the winter. Additionally, the observation tower has the potential to be a winter lookout/destination.	Same as Alternative 2.
SCENERY		
Issue: Development of proposed projects, including associated infrastructure, may be visible from Highway 9, the Town of Breckenridge and/or other relevant critical viewpoints.		
Indicator: Discussion of the existing scenic integrity of BSR's SUP and potential changes to this condition		
Under Alternative 1, the scenery characteristics of BSR's SUP area would continue to be dominated by chairlifts and developed ski terrain.	The scenic integrity of BSR's SUP area is not anticipated to change under Alternative 2. Proposed projects would incrementally contribute to the developed character of BSR's SUP area. All proposed projects would be located within BSR's existing operational boundary.	Alternative 3 would have less impact on scenic characteristics compared with Alternative 2. In particular, Alternative 3 does not include the Sawmill Zip Line or the Ore Bucket Canopy Tour, and includes an alternate location for the Observation Tower. The Ore Bucket Canopy Tour is replaced in Alternative 3 with the Claimjumper Canopy Tour, which would be located in the developed trail network and therefore result in fewer scenery impacts. The Observation Tower in Alternative 3 would be located in a previously disturbed area defined by ski area infrastructure, and would therefore result in marginally fewer scenery impacts when compared with Alternative 2.
Indicator: Compliance with Forest Plan standards and guidelines for scenery management within the SUP area and from established critical viewpoints by meeting Scenic Integrity Objectives		
The SUP area would continue to meet, and in some cases exceed, the SIO of *Very Low* ("appears heavily altered").	The SUP would continue to meet the SIO of Very Low. None of the proposed projects are expected to increase scenery impacts to the character of the SUP area such that it would not meet the SIO of *Very Low*.	Same as Alternative 2.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Compliance with the intent of the Built Environment Image Guide (BEIG) for all proposed structures. Structures should meet Forest Plan scenery guidelines for materials, colors and reflectivity.		
Alternative 1 does not include any new projects.	Proposed structures would use wooden and natural-looking materials whenever possible. Final structure designs would comply with the intent of the BEIG.	Same as Alternative 2.
Indicator: Narrative description of how proposed projects imitate landscape character		
Alternative 1 does not include any new projects.	**Zip Lines, Canopy Tours, Challenge Courses and Observation Tower:** Structures would use natural or natural-looking materials whenever possible. While these structures would in some cases be taller than the tree canopy, screening vegetation would be maintained where possible to reduce visibility. Buck and rail fencing would also be used for safety purposes around guy wires and stations. The fencing would be visible from ski trails; however, the fencing would likely blend in with the forested background. **Mtn. Biking and Hiking Trails:** There is no infrastructure proposed and these projects would require minimal vegetation clearing and ground disturbance. **Building Expansions:** Expansions to the Vista Haus and Peak 7 Hut would comply with BEIG guidance. **Other Projects:** The OHV tours, Four O'Clock Road realignment, and chairlift operations would not require new infrastructure.	Same as Alternative 2. Note that Alternative 3 does not include the Sawmill Zip Line, the Ore Bucket Canopy Tour, and includes an alternate location for the Observation Tower. **Claimjumper Canopy Tour and Observation Tower:** Structures would use natural or natural-looking materials whenever possible. While these structures would in some cases be taller than the tree canopy, screening vegetation would be maintained where possible to reduce visibility. Buck and rail fencing would also be used for safety purposes around guy wires and stations. The fencing would be visible from ski trails; however, the fencing would likely blend in with the forested background.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Discussion of identified critical viewpoints used in this analysis, including: *Critical Viewpoint 1 – Base of Peak 7* *Critical Viewpoint 2 – Vista Haus* *Critical Viewpoint 3 – Peak 8 SuperConnect Top Terminal* *Critical Viewpoint 4 – Independence SuperChair Top Terminal 3D Perspective*		
Critical Viewpoint 1: Independence SuperChair is visible in the immediate foreground, developed ski terrain is prominent **Critical Viewpoint 2:** Some ski area infrastructure is visible, primarily view of undeveloped Horseshoe Bowl **Critical Viewpoint 3:** View of developed ski terrain on Peaks 8, 9, and 10 in the background distance zone **Critical Viewpoint 4:** Independence SuperChair and developed ski terrain is prominent	**Critical Viewpoint 1:** Bottom station of the Peak 7 Zip Line would be visible in foreground distance zone, third zip line station also visible **Critical Viewpoint 2:** Challenge Courses would be visible in the immediate foreground/foreground, partially screened by overstory vegetation **Critical Viewpoint 3:** Top station of the Sawmill Zip Line would be visible in the immediate foreground, second station of Sawmill Canopy Tour visible in the foreground **Critical Viewpoint 4:** Top station of the Peak 7 Zip Line, expansion of the Peak 7 Hut, mountain bike skills course, and multiple Ore Bucket Canopy Tour stations would be visible	Same as Alternative 2 with the following exceptions: **Critical Viewpoint 2:** The Observation Tower could potentially be visible from this location, generally behind the Challenge Courses **Critical Viewpoint 3:** The Sawmill Zip Line is not included in this alternative. Thus, only the second station of the Sawmill Canopy Tour would be visible **Critical Viewpoint 4:** The visibility of projects would be the same as Alternative 2 except that the Ore Bucket Canopy Tour is not included in Alternative 3, and instead, the Claimjumper Canopy Tour would be visible from this viewpoint, generally behind and left of the chairlift terminal
TRAFFIC		
Issue: Proposed projects may generate measurable increases in daily/seasonal visitation, thereby affecting traffic movement and volumes within the Town of Breckenridge, on Highway 9 between Frisco and Breckenridge, and on construction/maintenance access roads proximate to the ski area.		
Indicator: Historic and projected traffic counts for roadway networks accessing BSR for the summer operating season		
The 2013 traffic counts on Highway 9 at the intersection with Tiger Road recorded 19,000 average annual daily traffic (AADT), which is expected to increase to 23,190 AADT by 2034. The 2013 traffic counts at Highway 9 north of Boreas Pass Road recorded 11,000 AADT, which is expected to increase to 13,195 AADT by 2034.	Alternative 2 would result in an increase of 0.6% over existing AADT for Highway 9 at the intersection with Tiger Road.	Alternative 3 would result in an increase of 0.5% over existing AADT for Highway 9 at the intersection with Tiger Road.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Comparison of anticipated traffic volumes with existing traffic volumes and the design capacities of roadway networks accessing BSR		
The 2013 traffic counts at Highway 9 and Tiger Road recorded 19,000 AADT. In 2013, the daily hourly volume (DHV) was exceeded during peak hours on peak winter visitation days. Peak hours on peak summer visitation days did not exceed the DHV on Highway 9. As residential growth continues, it is anticipated that the number of peak days each season would increase, resulting in more days when peak traffic hours would exceed the DHV on Highway 9, possibly including peak summer days.	Alternative 2 would result in an average of approximately 112 additional vehicles (accounting for vehicles arriving and departing BSR). This would not contribute significantly to the total expected increase in traffic volumes at Highway 9 and Tiger Road related to general growth in Summit County. In 2013, the DHV was exceeded during peak hours on peak winter visitation days. Peak hours on peak summer visitation days did not exceed the DHV on Highway 9. As residential growth continues and with the small amount of additional traffic attributable to projects proposed under Alternative 2, it is anticipated that the number of peak days each season would increase, resulting in more days when peak traffic hours would exceed the DHV on Highway 9, possibly including peak summer days.	Alternative 3 would result in an average of approximately 92 additional vehicles (accounting for vehicles arriving and departing BSR). This would not contribute significantly to the total expected increase in traffic volumes at Highway 9 and Tiger Road (related to general growth in Summit County). In 2013, the DHV was exceeded during peak hours on peak winter visitation days. Peak hours on peak summer visitation days did not exceed the DHV on Highway 9. As residential growth continues and with the small amount of additional traffic attributable to projects proposed under Alternative 3, it is anticipated that the number of peak days each season would increase, resulting in more days when peak traffic hours would exceed the DHV on Highway 9, possibly including peak summer days.
Indicator: Quantification of existing and proposed parking capacity for day and destination visitors within BSR parking lots (incorporate by reference BSR Peak 6 EIS parking analysis)		
Under the No Action Alternative, 4,157 parking spaces are provided in BSR and Town of Breckenridge lots and on-street parking spaces.	Alternative 2 does not include provisions for expanded skier parking. An agreement between the Town of Breckenridge and BSR provides for managing use of existing visitor parking supply through pricing, issuing permits, coordinated transit service, and pedestrian access improvements. Existing parking supply is anticipated to meet summer parking demand.	Same as Alternative 2.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
CULTURAL RESOURCES		
Issue: Implementation of proposed projects and associated ground disturbance may affect previously unidentified cultural and heritage resources.		
Indicator: Survey and documentation of the presence or absence of identified cultural resources		
Five previously-recorded resources and five newly-recorded resources were found within the APE.	All inventory reports were submitted to the SHPO, concurring with the NHPA Section 106 process. SHPO concurred with a finding of *no historic properties affected* in a letter dated October 7, 2014.	Same as Alternative 2.
Indicator: Documentation of impacts to any potentially-eligible National Register of Historic Places (NRHP) sites		
Implementation of Alternative 1 would have "no effect" on any known NRHP listed or eligible historic properties.	Implementation of the Proposed Action was would have "no effect" on any known NRHP listed or eligible historic properties.	Implementation of Alternative 3 would have "no effect" on any known NRHP listed or eligible historic properties.
SOCIAL AND ECONOMIC RESOURCES		
Issue: Implementation of the proposed projects could potentially alter certain socioeconomic characteristics of Summit County or the Town of Breckenridge.		
Indicator: Potential effects to socioeconomic indicators in Summit County, including: population, employment (part-time seasonal employment vs. full-time equivalents), Town/County tax revenue, housing, affordable housing, and visitor spending		
Population: Population growth resulting from the No Action Alternative is expected to have a negligible effect on the baseline population trend.	Population: Same as Alternative 1.	Population: Same as Alternative 1.
Housing: The Town of Breckenridge and Summit County housing market is not anticipated to experience a measurable impact from the No Action Alternative.	Housing: Same as Alternative 1.	Housing: Same as Alternative 1.
Employment: Under the No Action Alternative, BSR would continue to employ approximately 349 workers (or 205 full-time equivalents [FTEs]) in the summer including full-time positions.	Employment: Alternative 2 would result in 44 new FTEs from direct employment by BSR in the summer. Additionally, approximately 18 FTEs would be generated outside BSR as a result of spending.	Employment: Alternative 3 would result in 37 new FTEs from direct employment by BSR in the summer. Additionally, approximately 15 FTEs would be generated outside BSR as a result of spending.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
Revenue: Under the No Action Alternative, BSR's summer economic impact accounts for approximately $23.8 million (1.42% of Summit County's Gross Regional Product [GRP]) from direct and secondary effects of spending.	Revenue: Under the Alternative 2, BSR's summer economic impact would add approximately $1.8 million to Summit County's Gross Regional Product (GRP) from direct and secondary effects of spending.	Revenue: Under Alternative 3, BSR's summer economic impact would add approximately $1.5 million to Summit County's Gross Regional Product (GRP) from direct and secondary effects of spending.
Indicator: Disclosure of compliance with Executive Order 12898, Environmental Justice		
No existing minority populations were identified where either: (a) the minority population of the affected area exceeds 50% or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Likewise, no low-income populations were identified in the affected area.	No changes or modifications would be approved under any Alternative that would directly or indirectly affect minority or low-income populations in Summit County.	Same as Alternative 2.
VEGETATION		
Issue 1: Plant communities (including Threatened, Endangered and Proposed Candidate, Region 2 Sensitive species, and regionally important plants) may be altered as a result of the proposed projects.		
Indicator: Identification and disclosure of impacts of any federally-listed threatened and endangered species, Forest Service Region 2 sensitive species, and WRNF species of local concern (SOLC) present in the Analysis Area		
No occupied habitat for any federally-listed threatened, endangered or Forest Service Region 2 sensitive species was observed. A total of nine SOLC were documented, including *Botrychium furculatum*, *B. hesperium*, *B. lanceolatum*, *B. minganense*, *B. neolunaria*; *Chionophila jamesii*, *Lycopodium annotinum* and *Menyanthes trifoliata*. Note: Because *Botrychium* spp. occur in mixed species aggregations and may not emerge every year, it is possible that the Forest Service R2 listed moonworts (*Botrychium ascendens*, *B. lineare*, and *B. paradoxum)* may be present among populations of common moonworts described above.	There would be no impacts to federally-listed threatened and endangered species. Due to the remote possibility that Forest Service R2 sensitive moonworts could occur in the Analysis Area, a determination of may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing (MAII) was made for three R2 sensitive *Botrychium* spp. *(Botrychium ascendens*, *B. lineare* and *B. paradoxum*.). A determination of no impact (NI) was made for the other 23 sensitive plants carried forward in the analysis. There would be no impacts to the following SOLC plants: *Chionophila jamesii*, *Lycopodium annotinum*	Same as Alternative 2 for federally-listed, Forest Service sensitive and SOLC plant species (i.e., 0.15 acre of occupied moonwart habitat would be directly impacted).

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
	and *Menyanthes trifoliata*. However, Alternative 2 would directly impact 0.15 acre of occupied moonwort habitat.	
Issue 2: Overstory vegetation and the presence of weeds may be altered as a result of the proposed projects.		
Indicator: Quantification (acres) of proposed ground disturbance and overstory vegetation clearing effects by species/vegetation type		
No additional ground disturbance or forest overstory vegetation clearing would occur as a result of the No Action Alternative. However, BSR would continue to implement projects in the Vegetation Management Plan to improve forest health during and after the MPB epidemic.	A total of 27 acres of ground disturbance and 15 acres of overstory vegetation clearing would occur under Alternative 2. The 15 acres of overstory removal includes 4 acres of lodgepole pine forest, 10 acres of spruce/fir forest. With implementation of the tree replacement PDC, there would be no long-term negative effects to forest overstory vegetation.	A total of 23 acres of ground disturbance and 11 acres of overstory vegetation clearing would occur under Alternative 3. The 11 acres of overstory removal includes 4 acres of lodgepole pine forest, 7 acres of spruce/fir forest. With implementation of the tree replacement PDC, there would be no long-term negative effects to forest overstory vegetation.
Indicator: Identification of design criteria and BMPs to avoid the spread of noxious or other undesirable weed species and to manage existing populations toward eradication or acceptable levels when eradication is not realistic		
Under the No Action Alternative, no new projects would be implemented. Weeds would continue to be controlled according to BSR's existing weed management plan.	Design criteria and BMPs to control and manage invasive weeds are found throughout Table 2-2. Implementation of these PDC will help managers not only control existing populations of undesirable weeds, but also prevent their spread into any previously un-infested areas.	Same as Alternative 2.
Indicator: Disclosure and analysis of WRNF noxious weed design features		
Under the No Action Alternative, no new projects would be implemented. Weeds would be continued to be controlled according to BSR's existing weed management plan.	Noxious weed design features prescribed by the WRNF have been incorporated into the PDC of Chapter 2. These include 1) pretreatment of existing infestations; 2) cleaning of all off-road equipment; 3) revegetation with approved seed mixes that are certified weed free; and 4) monitoring and treatment of the Project Area for three years. With implementation of PDC, no adverse impacts due to invasive weeds is expected to occur under Alternative 2.	Noxious weed design features prescribed by the WRNF have been incorporated into the PDC of Chapter 2. These include 1) pretreatment of existing infestations; 2) cleaning of all off-road equipment; 3) revegetation with approved seed mixes that are certified weed free; and 4) monitoring and treatment of the Project Area for three years. With implementation of PDC, no adverse impacts due to invasive weeds is expected to occur under Alternative 3.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
FISH AND WILDLIFE		
Issue: Development of proposed projects, including associated infrastructure, could affect individuals, populations, and/or habitat values for federally Proposed, Threatened or Endangered and/or Forest Service Rocky Mountain Region sensitive species (PTES) fish and wildlife species, Management Indicator Species (MIS), migratory birds, and species of local concern (SOLC).		
Indicator: Quantification (acres) and qualification of existing wildlife habitat and proposed alteration, fragmentation, or removal of wildlife habitat, by species. Includes specifically lynx diurnal security habitat, winter forage habitat, and denning habitat		
BSR's 5,700-acre SUP area contains a variety of habitat types which support a range of species. **Existing lynx habitat in SUP:** Winter Foraging: 990 acres Other: 205 acres Non Habitat 3,580 acres Private: 17 acres Unsuitable: 990 acres There is no lynx denning habitat within BSR's SUP area. Lynx diurnal security habitat is present within the Windows and Sawmill blocks, between Peaks 8 and 9.	Alternative 2 would result in the following impacts to habitat within BSR's SUP area: **Lynx Habitat Impacts:** Winter Foraging: 2 acres Other: 2 acres Non Habitat: 17 acres Private: <0.5 acre Unsuitable: 9 acres Alternative 2 is not anticipated to impact the effectiveness of lynx diurnal security habitat within BSR's SUP area. **Other Habitat Impacts:** Forb: 11 acres Grassland: 5 acres Barren: 1 acre Lodgepole Pine: 6 acres Spruce/Fir: 8 acres	Alternative 2 would result in the following impacts to habitat within BSR's SUP area: **Lynx Habitat Impacts:** Winter Foraging: 2 acres Other: 1 acre Non Habitat: 14 acres Private: <0.5 acre Unsuitable: 8 acres Alternative 3 is not anticipated to impact the effectiveness of lynx diurnal security habitat within BSR's SUP area. **Other Habitat Impacts:** Forb: 9 acres Grassland: 4 acres Barren: <0.5 acre Lodgepole Pine: 5 acres Spruce/Fir: 6 acres
Indicator: Description of the existing environmental baseline through quantification of current summer operations (operating chairlifts, hiking trails, bike trails, horseback riding trails, etc.) and comparison to proposed conditions		
The overall existing summer recreation operational boundary includes 1,530 acres of concentrated summer recreational activities. **Operational Statistics:** Projected Summer Visitation: 193,000 Chairlifts: 3 Colorado SuperChair Ridership: 600/day Mountain Biking Trails: 25 miles Hiking Trails: 1 mile	The Alternative 2 proposed summer recreation operational boundary would include 46 additional acres for a total area of 1,576 acres. **Operational Statistics:** Projected Summer Visitation: 325,000 Chairlifts: 6 Projected Colorado SuperChair Ridership: 2,275/day Projected Independence SuperChair Ridership: 1,300/day	The Alternative 3 proposed summer recreation operational boundary would not expand and would remain at 1,530 acres. **Operational Statistics:** Projected Summer Visitation: 300,000 Chairlifts: 4 Projected Colorado SuperChair Ridership: 1,500/day Projected Independence SuperChair Ridership: 1,500/day

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
	Mountain Biking Trails: 40 miles (15 miles of new and realigned trails) Hiking Trails: 3 miles	Mountain Biking Trails: 39 miles (14 miles of new and realigned trails) Hiking Trails: 2 miles
Indicator: Disclosure of effects to PTES and MIS species		
No effects to PTES and MIS species.	**Canada lynx:** May Affect, Likely to Adversely Affect (13 acres of impacts to lynx habitat) **Region 2 Sensitive Species:** Refer to Table 3G-5 for a disclosure of impacts. **MIS:** Alternative 2 would not measurably contribute to any negative trend in the Forest-wide population or habitat trend.	**Canada lynx:** May Affect, Likely to Adversely Affect (11 acres of impacts to lynx habitat) **Region 2 Sensitive Species:** Refer to Table 3G-5 for a disclosure of impacts. **MIS:** Alternative 3 would not measurably contribute to any negative trend in the Forest-wide population or habitat trend.
Indicator: Identification of and effects within immediate and adjacent LAUs		
No impacts to immediate or adjacent LAUs would occur.	While the net loss of 13 acres of somewhat functionally impaired lynx habitat would be relatively small at the project and LAU scales, this loss would increase the severity of the existing injury to the functionally impaired Swan River LAU and, by itself, lead to an adverse effect.	While the net loss of 11 acres of somewhat functionally impaired lynx habitat would be relatively small at the project and LAU scales, this loss would increase the severity of the existing injury to the impaired Swan River LAU and, by itself, lead to an adverse effect.
Indicator: Quantification and qualification of compensatory mitigation for impacts to lynx or other relevant species habitat with a comparison between alternatives		
No lynx or other species specific mitigation is included.	Same as Alternative 1.	Same as Alternative 1.
Indicator: Identification of impacts to elk and mule deer summer range habitat with particular focus on the impacts to reproductive habitat. Description of the possible timing conflicts between deer/elk movement corridors/summer concentration areas with summer operating season. Specifically, an outline of seasonal timing restrictions for affected species with listed status.		
No impacts to elk and mule deer.	Effects to elk would be minimal in most areas within the existing summer operational area because current levels of recreation and maintenance activities displace elk from those areas and adjacent buffer zones. However, some project components extending beyond the existing operational boundary have the potential to displace elk from relatively large habitat blocks that they occasionally use. While Alternative 2 would have additive, negative effects on elk, those effects would not be measurable on habitat	Alternative 3 would minimize most, but not all, of the negative displacement effects associated with Alternative 2. The Peak 7 Bowl Loop trail has the potential to displace elk from relatively isolated spruce-fir habitat on Peak 6, slightly outside of the current summer operations area. While Alternative 3 would have additive, negative effects on elk, those effects would not be measurable on habitat effectiveness within the DAU or elk population parameters at the Forest level.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
	effectiveness within the DAU or elk population parameters at the Forest level. Alternative 2 would likely result in lower summer deer use of the Project Area, particularly in Peak 7 terrain below treeline, as a result of the substantial increase in bike trails currently unused by summer recreationists. Alternative 2 would likely have slightly greater effects than Alternative 3 as a result of the proposed bike trail and canopy tour in the Ore Bucket area. Effects of Alternative 2 would not block or restrict deer movements.	Alternative 3 would likely result slightly less impacts to mule deer due to the reduction of a bike trail on Peak 7 and in the Ore Bucket area and the elimination of the Ore Bucket Canopy tour compared to Alternative 2. Effects of Alternative 3 would not block or restrict deer movements.
Indicator: Identification of impacts to avian wildlife, in particular to the construction and maintenance of the zip lines		
No impact to avian wildlife.	Avian nesting and foraging effectiveness could be impaired adjacent to the zip line activity corridors and while some affected birds could experience reduced recruitment, such potential effects would be limited to a low number of individual birds.	Avian nesting and foraging effectiveness could be impaired adjacent to the zip line activity corridors and while some affected birds could experience reduced recruitment, such potential effects would be limited to a low number of individual birds. The impact could be slightly less than Alternative 2 because Alternative 3 does not include the Sawmill Zip Line.
Indicator: Identification of impacts aquatic species from effects to water quality and stream health		
No impact to aquatic species.	Alternative 2 would continue to provide aquatic macroinvertebrate habitat in all Project Area streams and would not measurably contribute to any negative trend in the Forest-wide population or habitat trend of aquatic macroinvertebrates and trout that would affect achieving Forest Plan MIS objectives.	Alternative 3 would continue to provide aquatic macroinvertebrate habitat in all Project Area streams and would not measurably contribute to any negative trend in the Forest-wide population or habitat trend of aquatic macroinvertebrates and trout that would affect achieving Forest Plan MIS objectives. Compared to Alternative 2, Alternative 3 would have less negative potential effects on these indicator groups because of the smaller area of ground disturbances.
Indicator: Discussion of the operational season for the proposed projects		
Current activities would continue throughout the approximately 90-day summer operating season (mid-June to mid-September).	Current and proposed activities would occur throughout the approximately 90-day operating season (mid-June to mid-September).	Current and proposed activities would occur throughout the approximately 90-day operating season (mid-June to mid-September).

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Discussion of restoration projects and rehabilitation areas		
No restoration projects are included in the No Action Alternative.	PDC are included in Table 2-2 that include overstory vegetation, wildlife habitat and soils restoration projects.	PDC are included in Table 2-2 that include overstory vegetation, wildlife habitat and soils restoration projects.
GEOLOGY AND SOIL RESOURCES		
Issue: Ground disturbance, including tree clearing and grading, associated with construction and operation of proposed projects has potential to increase erosion/soil compaction and lead to a loss of soil organic matter.		
Indicator: Inventory and discussion of soil organic matter pre- and post-implementation of any project components involving grading or grading/clearing; identification and analysis of organic matter transects to field-verify the depth of organic horizons for Mineral A and/or Organic O horizons		
Since there would be no ground disturbance, thicknesses of mineral A and/or organic O horizons would continue to increase or decrease at existing rates.	Alternative 2 would disturb approximately 27 acres of soil by grading. Thicknesses of mineral soil surface and/or organic layers in these areas would be impacted from mixing and displacement from grading and vegetation clearing. Estimates of thicknesses of mineral soil surface and/or organic layers are in Table 3H-3 and 3H-4. In addition, prior to disturbance, an on-site assessment of thicknesses of soil A and organic layers would be performed.	Alternative 3 would disturb approximately 23 acres of soil by grading. Thicknesses of mineral soil surface and/or organic layers in these areas would be impacted from mixing and displacement from grading and vegetation clearing. Estimates of thicknesses of mineral soil surface and/or organic layers are in Table 3H-3 and 3H-4. In addition, prior to disturbance, an on-site assessment of thicknesses of soil A and organic layers would be performed.
Indicator: Identification and estimated quantification (acres) of temporary and permanent ground disturbance according to high/moderate/low erodibility soils classes and slope stability concerns, in particular to the cut and fill process need for the mountain bike trails		
Since there would be no temporary or permanent ground disturbance, Alternative 1 would not result in any changes to soil stability.	Alternative 2 would disturb approximately 27 acres of soil by grading, all of which would occur in soils with low erodibility potential. All cut and fill slopes would occur in soils with a slight limitation for cut and fill slopes. All disturbance would occur in areas with slight to moderately low landscape instability.	Alternative 3 would disturb approximately 23 acres of soil by grading, all of which would occur in soils with low erodibility potential. All cut and fill slopes would occur in soils with a slight limitation for cut and fill slopes. All disturbance would occur in areas with slight to moderately low landscape instability.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Analysis of increased erosion hazard due to temporary and permanent ground disturbance		
Since there would be no ground disturbances, Alternative 1 would not result in any changes to soil erosion hazard.	Alternative 2 would disturb approximately 27 acres of soil by grading. Even though all grading would occur in soils with low erodibility potential, grading actions are likely to increase risk of erosion.	Alternative 3 would disturb approximately 23 acres of soil by grading. Even though all grading would be in soils with low erodibility potential, grading actions are likely to increase risk of erosion.
Indicator: Inventory of erodible soils by soil map unit and field verification of these properties		
Soil erodibility K_w-factors for each soil map unit are contained in Table 3H-3 and 3H-4. All soils have low K_w-factors. K_w-factors were determined from soils at Peak 6.	Same as Alternative 1	Same as Alternative 1
Indicator: Digitization of bare ground/low vegetation cover areas within SUP boundary		
There are approximately 110 acres of bare ground and low vegetative cover within the SUP resulting from unintentional disturbance.	Under Alternative 2, some of the existing bare ground and low vegetative cover areas could be mitigated to offset proposed disturbances.	Same as Alternative 2.
WETLANDS		
Issue: Identified wetlands throughout the Project Area could be temporarily and/or permanently affected by construction and implementation of proposed projects.		
Indicator: Quantification of wetlands and riparian areas existent within the Project Area (acres/linear feet)		
A total of 16 acres of wetlands/riparian habitats were mapped within the Analysis Area including: 3 acres of PFO, approximately 4 acres of PSS, and 6 acres of PEM. In addition, 4 acres of open water associated with ponds and lakes were mapped.	Same as Alternative 1.	Same as Alternative 1.
Indicator: Disclosure of wetland functions and values within the Project Area		
No effects to functions and values of wetlands and riparian areas would occur.	Same as Alternative 1.	Same as Alternative 1.
Indicator: Narrative description of wetland communities and riparian areas classifications and disclosure of anticipated temporary and/or permanent impacts (acres/linear feet)		
A total of 16 acres of wetlands/riparian habitats were mapped for the Analysis Area including: 3 acres of PFO, approximately 4 acres of PSS, and 6 acres of PEM. In addition, 4 acres of open water associated with ponds and lakes were mapped.	Construction of mountain bike trails, two access paths to Sawmill Canopy Tour stations, and a Sawmill Zip Line Access Road would temporarily impact approximately 0.080 acre of wetlands. This includes approximately 0.012 acre to PFO, 0.024 acre to PSS,	Construction of mountain bike trails and two access paths to Sawmill Canopy Tour stations would temporarily impact approximately 0.062 acre of wetlands. This includes approximately 0.008 acre to PFO, 0.013 acre to PSS, and 0.041 acre to PEM.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
There would be no permanent or temporary impacts to wetlands or other waters of the U.S. under the No Action Alternative.	and 0.044 acre to PEM. There would be no permanent wetland impact associated with Alternative 2.	There would be no permanent wetland impact associated with Alternative 3.
Indicator: Description of compliance with EO 11990, Protection of Wetlands		
Not applicable.	In compliance with EO 11990, all wetland impacts were avoided and minimized to the most practicable extent possible.	In compliance with EO 11990, all wetland impacts were avoided and minimized to the most practicable extent possible.
WATERSHED		
Issue: Implementation of proposed projects has the potential to affect stream and riparian health.		
Indicator: Anticipated temporary and permanent changes in water yield (acre feet) and peak flows (cfs), and subsequent watershed effects		
No impacts to water yield or peak flows.	Water yields and peak runoff flow rates originating from the study watersheds would increase between 0 and 1.4 percent relative to existing conditions. Refer to Table 3F-12 and Table 3F-13 for more information.	Water yields and peak runoff flow rates originating from the study watersheds would increase between 0 and 1.0 percent relative to existing conditions. Refer to Table 3F-17 and Table 3F-18 for more information.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

<table>
<tr><th>Alternative 1</th><th>Alternative 2</th><th>Alternative 3</th></tr>
<tr><td colspan="3">Indicator: Discussion of existing stream health conditions and water influence zone (WIZ) impacts, within the context of the following stream health metrics: bank stability, fine sediment, residual pool depth, wood frequency, and macroinvertebrates. Evaluation of compliance with Watershed Conservation Practices Handbook and Forest Plan requirements</td></tr>
<tr><td>
<table>
<tr><th>Sawmill Gulch Stream Health Metric</th><th>Sawmill Gulch Stream Health Rating</th></tr>
<tr><td>Percent Fine Sediments</td><td>Robust</td></tr>
<tr><td>Percent Unstable Banks</td><td>Robust</td></tr>
<tr><td>Large Woody Debris (pieces/100 meters)</td><td>Diminished</td></tr>
<tr><td>Residual Pool Depth (meters)</td><td>Robust</td></tr>
</table>
<table>
<tr><th>Cucumber Creek Stream Health Metric</th><th>Cucumber Creek Stream Health Rating</th></tr>
<tr><td>Percent Fine Sediments</td><td>Robust</td></tr>
<tr><td>Percent Unstable Banks</td><td>Robust</td></tr>
<tr><td>Large Woody Debris (pieces/100 meters)</td><td>At-Risk</td></tr>
<tr><td>Residual Pool Depth (meters)</td><td>Robust</td></tr>
</table>
</td><td>With the implementation of PDCs, the proposed projects would not have a negative impact on existing stream health. Projects would be constructed near streams channels, requiring removal of selected trees within 0.12 acre of Cucumber Gulch WIZ and 1.5 acres of Cucumber Creek WIZ.
PDCs contained in Table 2-3 would ensure compliance with Forest Plan and Watershed Conservation Practices Handbook requirements.</td><td>With the implementation of PDCs, the proposed projects would not have a negative impact on existing stream health. Projects would be constructed near streams channels, requiring removal of selected trees within 0.1 acre of Cucumber Gulch WIZ and 1.1 acres of Cucumber Creek WIZ.
PDCs contained in Table 2-3 would ensure compliance with Forest Plan and Watershed Conservation Practices Handbook requirements.</td></tr>
<tr><td colspan="3">Indicator: Quantification of stream health through surveys that classify each channel and channel sensitivity to disturbance.</td></tr>
<tr><td>Refer to Table 3J-6 ad 3J-7 for a quantification of existing stream health.</td><td>Refer to Table 3J-6 ad 3J-7 for a quantification of existing stream health.</td><td>Refer to Table 3J-6 ad 3J-7 for a quantification of existing stream health.</td></tr>
</table>

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Qualitative and quantitative discussion of existing surface drainage conditions within the context of Forest Plan Standards for Management Area 8.25		
The 2009 Drainage Management Plan documented drainage features that needed to be repaired or replaced and identified areas where additional BMPs for erosion and/or sediment control were needed. A quantification of connected disturbed areas and roads is presented in Table 3J-8 and 3J-9.	With the implementation of PDCs contained in Table 2-2, there would be minimal impacts to surface drainage conditions and Forest Plan Standards would be met. Additionally, the Forest Service and BSR would coordinate to implement drainage rehabilitation projects to improve drainage conditions across the SUP.	With the implementation of PDCs contained in Table 2-2, there would be minimal impacts to surface drainage conditions and Forest Plan Standards would be met. Additionally, the Forest Service and BSR would coordinate to implement drainage rehabilitation projects to improve drainage conditions across the SUP.
Indicator: Quantification and discussion of existing drainage concerns and treatment areas, including areas of rilling and gullying		
Areas of rill and gully erosion were observed at the discharge of some road-side ditches and waterbars that lacked adequate BMPs for erosion control.	With the implementation of PDCs contained in Table 2-2, there would be minimal impacts to surface drainage conditions and Forest Plan Standards would be met. Additionally, the Forest Service and BSR would coordinate to implement drainage rehabilitation projects to improve drainage conditions across the SUP.	With the implementation of PDCs contained in Table 2-2, there would be minimal impacts to surface drainage conditions and Forest Plan Standards would be met. Additionally, the Forest Service and BSR would coordinate to implement drainage rehabilitation projects to improve drainage conditions across the SUP.
Indicator: Development and analysis of drainage management measures to maintain or improve stream health		
No Impacts.	PDCs included in Table 2-2 include measures to maintain or improve stream health.	PDCs included in Table 2-2 include measures to maintain or improve stream health.
Indicator: Quantification (acres) of impacts to the WIZ		
No Impact.	Projects would be constructed near streams channels, requiring removal of selected trees within 0.12 acre of Cucumber Gulch WIZ and 1.5 acres of Cucumber Creek WIZ	Projects would be constructed near streams channels, requiring removal of selected trees within 0.1 acre of Cucumber Gulch WIZ and 1.1 acres of Cucumber Creek WIZ.
Indicator: Quantification (acres) of connected disturbed area (CDA)		
13 acres of CDA.	Impacts within the WIZ (approximately 1.6 acres total) could lead to increased CDA. This acreage of CDA would be reduced with application of required PDCs for erosion and sediment control.	Impacts within the WIZ (approximately 1.2 acres total) could lead to increased CDA. This acreage of CDA would be reduced with application of required PDCs for erosion and sediment control.
Indicator: Quantification of channel network extension (length of connected channel)		
13,500 linear feet of roads are connected to stream channels.	PDC would minimize an increase in length of connected channel.	PDC would minimize an increase in length of connected channel.

Table 2-4:
Summary Comparison of Direct and Indirect Environmental Consequences

Alternative 1	Alternative 2	Alternative 3
Indicator: Quantification (acres) of ground-disturbing activities located on highly erodible soils as it pertains to stream health		
No Impact.	0 acres of disturbance would be located within highly erodible soils.	0 acres of disturbance would be located within highly erodible soils.
Indicator: Identification of any Clean Water Act (CWA) impaired or threatened water body segments in the Analysis Area		
No Impact.	None of the stream segments within the analysis area are listed on the Colorado State 303(d) list as impaired streams under the Clean Water Act.	None of the stream segments within the analysis area are listed on the Colorado State 303(d) list as impaired streams under the Clean Water Act.

J. IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The Preferred Alternative is the alternative which the agency believes would best fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. At this time, considering the environmental impacts to public lands and the opportunities for use of those lands that would benefit the most people over the longest term, the Responsible Official has not identified a Preferred Alternative.

Following review of public and agency comments on this DEIS, the Responsible Official will make a final determination as to which alternative, in part or in whole, best serves the public interest on NFS lands.

Chapter 3

Affected Environment and Environmental Consequences

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

Council on Environmental Quality (CEQ) regulations direct agencies to succinctly describe the environment that may be affected by the alternatives under consideration.[12] As such, Chapter 3 describes the existing physical, biological, social, and economic components of the Project Area which have potential to be affected by implementing any of the alternatives (i.e., the Affected Environment). Each Affected Environment description is followed by an Environmental Consequences discussion that provides an analysis of the potential effects of implementation of each of the alternatives.

Chapter 3 is organized by resource area, and follows the organization of issues and resources requiring further analysis (and indicators) as presented in Chapter 1. Each resource section in Chapter 3 is organized in the following order:

SCOPE OF THE ANALYSIS

The scope of the analysis briefly describes the geographic area(s) potentially affected by the alternatives for each issue and its indicator(s). The scope of analysis varies according to resource area and may be different for direct, indirect, and cumulative effects.

AFFECTED ENVIRONMENT

The Affected Environment section provides a description of the environment potentially affected, as based upon current uses and management activities/decisions.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

This section provides an analysis of direct and indirect environmental effects of implementing each of the alternatives, according to the issues or resources requiring additional analysis and indicators identified in Chapter 1. Cumulative effects are discussed separately.

Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable (i.e., likely to occur within the duration of the project).

[12] 40 CFR 1502.15

CUMULATIVE EFFECTS

Cumulative effects are the result of the incremental direct and indirect effects of any action when added to other past, present, and reasonably foreseeable future actions, and can result from individually minor but collectively major actions taking place over a period of time.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible commitment is a permanent or essentially permanent use or loss of resources; it cannot be reversed, except in the extreme long-term. Examples include minerals that have been extracted or soil productivity that has been lost. An irretrievable commitment is a loss of production or use of resources for a period of time. One example is the use of timber land for a logging road. Timber growth on the land is irretrievably lost while the land is a road, but the timber resource is not irreversibly lost because the land could grow trees in the near future. The Forest Service recognizes the fact that certain management activities will produce irreversible or irretrievable commitments of resources.

A. RECREATION

SCOPE OF THE ANALYSIS

The majority of BSR's multi-season (non-skiing) recreational opportunities are currently located on private lands adjacent to NFS lands at the Breckenridge Summer Fun Park. A limited number of activities, including hiking, biking, horseback riding and scenic chairlift rides are currently available on NFS lands within BSR's SUP area. This analysis focuses on multi-season (non-skiing) recreational opportunities on NFS lands within BSR's SUP area (5,700 acres), on adjacent lands and throughout Summit County, Colorado.

AFFECTED ENVIRONMENT

BSR has become one of the most visited ski resorts in North America, averaging over 1.6 million annual visits.[13] Recreation at BSR has typically been focused on winter activities within its SUP area, primarily skiing and snowboarding; however, in recent years BSR has become increasingly focused on providing multi-season (non-skiing) recreational activities.

In the Breckenridge area and the greater Summit County area, there are numerous summer recreational opportunities, including hiking, road/mountain biking, sightseeing, fishing, camping, horseback riding, rock climbing, kayaking, disc golfing, golfing, rafting, concerts, farmers markets and art fairs. These activities outnumber winter activities because of the breadth and diversity of activities, and are offered on NFS, Summit County, Town of Breckenridge and private lands.

The activities offered within BSR's SUP area represent a managed, consolidated option for some visitors within a much larger array of opportunities available to visitors of Summit County. The managed activities offered within BSR's SUP area and at the Summer Fun Park likely do not attract a significant number of destination or local/regional visitors to Summit County; rather they are an additional amenity for people who are already visiting the Town of Breckenridge throughout the summer. Likewise, the year-round activities offered at the Summer Fun Park are not considered to induce any measureable additional winter visitation to the ski area—people who are already coming to ski for multiple days may partake in them for a portion of their visit.

Visitation and Guest Distribution

The current summer recreational activities at BSR are focused at the Summer Fun Park at the base of Peak 8, with hiking and biking trails across Peak 8 and Peak 7. The Summer Fun Park opened in 1978 and has steadily grown in size and popularity. Since 2010, the Breckenridge Summer Fun Park has experienced approximately 18 percent annual growth in its summer activity usage. The park now hosts

[13] Breckenridge Ski Resort, 2010

approximately 175,000 visitors a season and provides a variety of activities, including zip lines, an alpine slide, an alpine coaster, a miniature golf course, a bungee-trampoline and several more activities.

The Town of Breckenridge and Summit County are popular year-round regional, national and international tourist destinations. The Town of Breckenridge averages approximately three million visitors annually.[14] Other resorts in Summit County offer summer recreational opportunities and events including Keystone, Cooper Mountain Resort and Arapahoe Basin. Towns in Summit County also host summer events including Frisco, Dillon and Silverthorne.

The Breckenridge Summer Fun Park, by itself, is not considered a vacation destination. Guests who visit the Summer Fun Park typically incorporate it as a single day experience across a multiple day vacation, during which they take advantage of other recreational opportunities (e.g., horseback riding one day, biking one day, rafting one day, etc.). People traveling from outside Summit County to specifically visit the Summer Fun Park contribute minimally to summer visitation at the ski area.

Demographics

Summer visitor demographics at BSR vary widely—from experienced outdoor enthusiasts to people who are new to the outdoors and everyone in between. From a recreational perspective, BSR attempts to provide something for everyone—from locals who are experienced cross county and downhill mountain bikers, to destination guests looking for an afternoon or days' worth of family activities. While multi-season activities currently offered at BSR are designed to cater to a diverse audience, recreating in a mountain environment can require a combination of prior experience, familiarity/comfort with the outdoors, and a certain level of physical fitness (especially at higher elevations). Furthermore, many visitors to the Town of Breckenridge are looking for activities that the whole family can enjoy.

Guest Distribution

To better define the summer recreational experience at BSR, guest distribution across the mountain was analyzed. Existing visitation and infrastructure capacity were key factors in determining where guests were on the mountain.

The majority of summer recreational opportunities at BSR are concentrated at the base of Peak 8 in or near the Summer Fun Park. Of the approximately 175,000 guests that visit BSR each summer, approximately 17 percent ride the Colorado SuperChair to mountain bike, hike, or enjoy the scenery on NFS lands. The remaining 83 percent of visitors participate in activities at the base of Peak 8 on private lands.

[14] RRC Associates, 2014

Resort Operations and Functions

BSR's approximately 175,000 summer visitors is small in comparison to the approximately 1.6 million annual winter visitors averaged over the past five seasons.[15] Thus, while summer visitation has been increasing at BSR, the primary use of the facilities occurs during the winter months.

Chairlifts, trails and mountain roads are prevalent throughout the ski area. While it is visually prominent, the summer infrastructure at the Summer Fun Park does not significantly interfere with snow sports activities. Much of the infrastructure at the Summer Fun Park is also used in the winter, including the base of Peak 8, Gold Runner Mountain Coaster, TenMile Flyer Zip Line, Rip's Ride Chairlift, 5 Chair and Colorado SuperChair. Summer recreation infrastructure outside of the Summer Fun Park, including hiking, mountain biking, and horse trails, does not interfere with snow sports activities because once there is snow on the ground these trails are not used and are not visible. In general, the summer operating season is approximately 90 days (mid-June through mid-September), depending on weather.

Recreational Experience

BSR accommodates a variety of users seeking different experiences. The concentration of guests and infrastructure at the Summer Fun Park (on private lands) contributes to the recreational experience offered at BSR. The alpine coaster, zip line, alpine slide, miniature golf course, gemstone panning and other infrastructure that has been installed over the years contribute to a setting that is defined by both the built and natural environment. The experience at the Summer Fun Park is defined by infrastructure and development, providing introductory and structured recreational opportunities for guests who might be less comfortable in remote or unsupervised recreational situations. Guests who visit BSR during the summer will typically spend at least some time, if not all, at the Summer Fun Park. The analysis will focus on activities occurring on NFS lands. The Summer Fun Park is considered in greater detail in the Cumulative Effects section.

Visitors coming to BSR during the summer primarily arrive by the complementary BreckConnect Gondola. The gondola originates in the Town of Breckenridge adjacent to the North and South Gondola parking lots. The BreckConnect was designed to accommodate winter use numbers and concentrated use periods which are much higher than summer use. As a result, summer lift lines at the BreckConnect Gondola are generally short in comparison to winter.

Hiking and Mountain Biking Trails

On NFS lands, visitors to BSR have a choice of less-structured recreation opportunities such as hiking and mountain biking. These activities are popular and widespread on NFS lands, and at ski areas. BSR is no exception; there are approximately 27 miles of hiking and mountain biking trails on NFS lands. The trail network is currently based out of Peaks 8 and 9 base areas, with the majority of trails on Peak 8. The

[15] Breckenridge Ski Resort, 2010

mountain biking trail network offers 25.5 miles of intermediate and expert ability level trails. The only beginner trail is a 1 mile trail located on private land near the base of Peak 8. The existing hiking trail network is approximately 1.3 miles that offers a traverse from Peak 7 to near Peak 8 and two trails that lead up to Peak 8. BSR works to caters to all ability levels with the network of existing trails; however, in general, the trail network is lacking for the beginner and intermediate users.

Table 3A-1 presents the mileage of existing trails by ability level. The reader is referred to Figure 2 – Alternative 1 for more information. These trails range in difficulty and length, but currently offer a more physically challenging and/or technical experience; beginner level trails are minimal. The recreational experience on the hiking and mountain biking trails is very different from that at the Summer Fun Park, as users encounter far fewer other guests and have the opportunity to interact more directly with the natural environment. The trails are much quieter and the scenery is more natural than the Summer Fun Park. All trails are lift-served via the Colorado SuperChair.[16] Trails are well-signed, and hiking and mountain biking trail maps are available. Some user conflict does exist as hikers and uphill mountain bikers sometime encounter mountain bikers riding downhill; however, instances of this are minimal because of the number of users on the trails. Stop signs at trail intersections for vehicles and guests traveling on the Peak 7/8 Access Road also minimize the potential user conflict. Guests who choose to ride or hike the trails within the SUP area (whether with a guide or on their own) typically do so with a level of comfort and confidence that they know where trails start and stop; and if necessary, help is available through BSR's staff. Currently, BSR registers approximately 4,000 mountain bike trips annually.

Table 3A-1:
Existing Trails by Ability Level

	Beginner	Intermediate	Expert	Total
Hiking (miles)	0.7	0.6	0.0	**1.3**
Mountain Biking (miles)	1.0	13.7	10.8	**25.5**

In addition to the 27 miles of trails within BSR's SUP area, there are hundreds of miles of hiking and biking trails on NFS and County lands throughout Summit County. Many mountain bikers ride the trails in and around BSR. The Peaks Trail in particular is a popular singletrack ride from Frisco to the Peak 7 base area. BSR and the Town of Breckenridge have discussed options for connecting the Peaks Trail to the BSR trail network. This would allow riders to continue riding south and connect to another popular trail, the Burro Trail or allow riders to ride down into Breckenridge by avoiding Cucumber Gulch.

Horse tours are also offered at BSR through the Breckenridge Stables, a private outfitter who establishes a temporary stable during the summer at the base of A-Lift on Peak 9. Horse trails and tours are commonly found on NFS lands, and at ski areas. Horse tours currently begin at the Breckenridge Stables where groups are outfitted, then ride between Peaks 9 and 10 to explore the Tenmile Range. Horse tours operate

[16] During the 2014 summer, the Colorado SuperChair was replaced. Lift-service to higher elevations was provided by the Independence SuperChair.

during the summer season and provide a more natural recreational experience than most of the activities offered at the Summer Fun Park. However, users' freedom to explore the environment is limited because this activity is guided.

Food Services

BSR has multiple food service facilities located at the Peaks 7 and 8 base areas. These facilities are important to the overall recreational experience because they allow visitors to remain at the mountain for the entire day and offer a place for visitors to relax and refuel when recreating. Restaurant space and seating are designed for winter capacities and do not reach capacity during the summer months. Currently, no food service facilities located within the SUP area remain open during the summer to the public. Current summer food service options are operated by private companies at the base of Peaks 7 and 8, including:

- Sevens Restaurant
- Ski Hill Grill
- T-Bar

Sevens Restaurant is located at the base of Peak 7 in the Grand Lodge and offers casual dining. Ski Hill Grill and T-Bar are located in the center of the Peak 8 base area. Ski Hill Grill offers a cafeteria-style casual dining experience, while T-Bar is an après ski bar that offers outdoor dining.

Currently no food service and limited other services (restrooms and first aid) are available on-mountain during the summer season. The Peak 7 Hut (480 square feet)—located at the top of the Independence SuperChair offers no food service, but guests frequently use it for restrooms and shelter. The Vista Haus (21,000 square feet)—at the top of the Colorado SuperChair on Peak 8—is not open during the summer. During the winter, the Vista Haus provides 700 indoor seats and 300 outdoor seats. The Vista Haus (the only on-mountain restaurant on Peak 8) is located at one of the most highly utilized areas of the mountain (during the winter) and could easily accommodate summer guests.

Chairlifts

Currently, BSR operates three chairlifts in the summer to provide access to on-mountain recreation: the Colorado SuperChair, 5 Chair and Rip's Ride. The Colorado SuperChair transports guests to the top of Peak 8 and provides access to the existing network of hiking and mountain biking trails. These chairlifts provide both one-way (for guests biking or hiking either up or down the mountain) and round-trip transportation.

Natural Resource-Based Recreation Opportunities

The existing multi-season activities at BSR on NFS lands provide limited opportunities to experience natural resource-based recreation. As defined in the FSM 2340.5, "natural resource-based recreation" is:

> *"A proposed activity that occurs in a natural setting where the visitor's experience is interdependent with attributes such as mountains, forests, geology, grasslands, water bodies, flora, fauna, and natural scenery."*

The primary activities on NFS lands at BSR are hiking, biking, horseback riding and sightseeing (via scenic chairlift rides and OHV tours). The experience of hiking and mountain biking are interdependent with the natural setting of the area and surrounding NFS lands. The terrain, vegetation, and scenery help define the recreational experience. Furthermore, participants can personalize their experience by setting their own pace and duration. The experiences of horseback riding and sightseeing via scenic chairlift rides or OHV tours offer less of an opportunity for guests to connect with nature, but are nonetheless influenced by the natural setting (the scenery, topography and mountain environment) within or near the SUP area.

More structured activities at BSR are offered at the Summer Fun Park on private lands. These activities include zip lines, a mountain coaster, an alpine slide, Segway tours, and rock climbing. These activities are located near the SUP area boundary and do rely on scenery, topography and the general mountain environment. In order for guests to access BSR's SUP to hike or mountain bike, the majority of guests enter via the Peak 8 base area and secondarily via the Peak 7 base area.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Alternative 1 does not include any new multi-season projects at BSR. The Summer Fun Park would continue to offer activities; however, selection of this alternative would not expand the current program and would not meet the growing multi-season recreational needs of BSR. Under Alternative 1, the average BSR visitor would be expected to partake in activities on the mountain or at the base area for a single day, or part of a day. Based on historic trends in summer visitation to BSR's SUP area (and expected future demand), annual summer visitation is expected to increase slightly (approximately 2 percent annually) from the current 175,000 visitors under the No Action Alternative. Breckenridge Fun Park has averaged approximately 18 percent annual growth in activity usage over the last five years. During this time, in conjunction with other smaller activities, the Fun Park added the TenMile Flyer Zip Line and GoldRunner Mountain Coaster. The majority of the 2 percent growth would occur at the Fun Park as BSR would continue to focus efforts on serving guests on private lands.

Visitation and Guest Distribution

Table 3A-2 provides a comparison of projected summer visitation and guest distribution at BSR under alternatives 1, 2 and 3. Guest distribution across the mountain was generally categorized into three areas: the Summer Fun Park, activities across Peak 8 (access via the Colorado SuperChair), and activities across Peak 7 (access via the Independence SuperChair). More detailed discussion of visitation and distribution can be found under each alternative's Visitation and Guest Distribution section.

Under Alternative 1 – No Action Alternative, summer visitation to BSR is expected to increase by approximately 2 percent annually. Full implementation of projects in alternatives 2 and 3 are expected to occur over approximately five to seven years. For comparative purposes, it is assumed 2 percent growth over five years for Alternative 1 visitation. This would result in approximately 193,000 visitors in five years. This is an additional 18,000 visitors. While this is an approximate 10 percent growth in visitation over five years, current BSR activities and infrastructure would be adequate.

In projecting summer visitation, historic visitation patterns on the BreckConnect Gondola, Colorado SuperChair and Summer Fun Park ticket sales were analyzed. Future summer visitation increases were considered in relation to the current and proposed mix of projects available at BSR. Potential new destination visitation to Summit County, as a result of either of the action alternatives, is considered minimal.

Table 3A-2:
BSR Projected Summer Visitation – Alternatives 1, 2 and 3

	Alternative 1		Alternative 2		Alternative 3	
	Visitation Projection	Percent of Total	Visitation Projection	Percent of Total	Visitation Projection	Percent of Total
Summer Fun Park – Base of Peak 8 (private lands)	160,190	83%	146,250	45%	150,000	50%
Activities On Peak 8 (NFS lands)	32,810	17%	113,750	35%	75,000	25%
Activities On Peak 7 (NFS lands)			65,000	20%	75,000	25%
Total	**193,000**	100%	**325,000**	100%	**300,000**	100%

Notes:
Visitation projections for alternative 1, 2 and 3 were assumed to be after full implementation of all activities (approximately five years from decision).
Activities on Peak 8 are accessed via the Colorado SuperChair and activities on Peak 7 are accessed via the Independence SuperChair.
Additional information on BSR projected summer visitation can be found in the project file.

Demographics

No changes to guest demographics would be anticipated under the No Action Alternative. Refer to the Affected Environment section for a discussion of current guest demographics.

Guest Distribution

No changes to guest distribution would be anticipated under the No Action Alternative. Refer to the Affected Environment section for a discussion of current guest distribution.

Resort Operations and Functions

There would be no changes to resort operations and functions anticipated under the No Action Alternative. Refer to the Affected Environment section for a discussion of current conditions. Snow sports infrastructure would continue to dominate BSR, and there would be no new conflicts with snow sports operations. Both summer and winter visitation would be anticipated to marginally increase under this alternative.

Recreational Experience

There would be no changes to the recreational experience at BSR. Refer to the Affected Environment section for a discussion of current activities.

Natural Resource-Based Recreation Opportunities

There would be no changes to the natural resource-based recreation opportunities offered at BSR under the No Action Alternative. Refer to the Affected Environment section for a discussion of natural resource-based recreation opportunities currently offered at BSR.

Alternative 2 – Proposed Action

All of the proposed projects at BSR would encourage outdoor recreation through their design and location. Because they are all located outside, they would inherently attract people to participate in outdoor recreation. In general, the proposed projects are integrated into the natural environment and would provide opportunities for users to engage with the natural setting. The proposed projects would provide a structured environment designed to comfortably introduce people to outdoor recreation activities. New users could build their confidence and comfort in outdoor recreation at BSR and then potentially explore other unstructured activities available elsewhere on NFS lands. While providing opportunities for new users, the proposed projects would also expand the range of opportunities for experienced users.

The Forest Service completed a screen of all proposed activities at BSR against criteria found at FSM 2343.14 – Additional Seasonal and Year-Round Recreation at Ski Areas, which is contained in Appendix B of this EIS. In addition, "Natural resource-based recreation," as defined in the FSM 2340.5 is discussed separately for each proposed activity.

Visitation and Guest Distribution

As a result of the additional activities included in Alternative 2, summer visitation to BSR is projected to increase to 325,000 guests. Nearly half of these guests would remain in the base areas and the other half would disperse throughout BSR's SUP on Peaks 7 and 8 (refer to Table 3A-2). Additional information on visitation by activity on a typical Saturday in July and annual visitation can be found in the Recreation Technical Report in the project file.

Demographics

No significant changes to guest demographics would be anticipated under Alternative 2. The goal of Breckenridge's summer recreation activities would be to provide opportunities for guests with a range of ability levels to connect with the natural environment. Refer to the Affected Environment section for a discussion of current guest demographics.

Guest Distribution

It is anticipated the proposed activities would generate interest from the approximately three million visitors to the Town of Breckenridge annually. BSR would be well positioned to accommodate these additional visitors by offering a variety of activities a whole family could enjoy and by introducing them to NFS lands. In general, the increase in anticipated use is balanced with an increase in supply of activities, food service venues, etc. Additional summer visitation to BSR under Alternative 2 is primarily attributable to redistributing people who are already coming to the Town of Breckenridge and Summit County area to recreate, and increasing the number and variety of activities available within BSR's SUP area (spanning a single day or multiple days).

The most concentrated use would continue to be focused at the Summer Fun Park at the base of Peak 8 as shown in Table 3A-2. Ticket sales and information for zip lines, canopy tours, OHV tours, and challenge courses would be based out of the Summer Fun Park. This area is a natural gathering place for families to meet, re-group and refuel. The remaining guests would be dispersed across Peaks 7 and 8.

Peak 8 is anticipated to experience higher use (35 percent of total visitation) under Alternative 2 partially due to its proximity to the Summer Fun Park and partially due to attractions such as scenic chairlift rides and uploading for hiking and mountain biking. Guests would also be riding Colorado SuperChair to access Peak 8 for the Sawmill Zip Line, Sawmill Canopy Tour, climbing wall, challenge courses, hiking, some mountain biking and the observation tower experience.

Peak 7 is expected to account for 20 percent of total visitation under Alternative 2. Peak 7 would become the mountain biking hub under Alternative 2, offering mountain bike rentals and a bike skills course for novice guests to practice using a mountain bike. Peak 7 would also offer the Peak 7 Zip Line, Ore Bucket Canopy Tour and some hiking opportunities.

Resort Operations and Functions

Under Alternative 2, snow sports will be the primary focus at BSR. While additional summer visitation is expected, winter visitation is anticipated to remain higher. In general, infrastructure that is dedicated to summer activities would remain subsidiary to the larger network of infrastructure that is in place to accommodate winter recreation. While the concentration of summer activities on Peaks 7 and 8 would impact the atmosphere and environment at these locations, as a whole, BSR's SUP area would still feel and function like a ski area.

Most of the proposed projects would not conflict with winter operations. Hiking and mountain biking trails are not used or visible in the winter. The proposed zip line and canopy tour stations could have some minor effects to winter users. For example, the second station of the Peak 7 Zip Line would be partly on *Claimjumper* ski trail. In this case, the tower would be located close to the tree island and would not create a bottleneck on the knoll. Another instance of potential conflict with winter users is the first tower of the Sawmill Zip Line, located between *Upper Four O'Clock* and *Psychopath* ski trails. However, the location of the tower is not in a primary ski way. The tower would be fenced on the uphill side to prevent collisions and other safety concerns, but is not expected to hinder skiable terrain. Another area of potential concern is the Ore Bucket area. The Ore Bucket Canopy Tour would be visible to snow sport users in the Ore Bucket gladed areas, however the canopy tour stations would be shorter than surrounding vegetation, would account for a small portion of the overall skiable terrain, and would not be located in primary ski ways. Lastly, the Vista Haus deck expansion is being proposed on the southeast side near popular ski trails such as *Springmeier*, *Four O'Clock*, *Spruce*, and *Tiger*, however, the expansion is 1,500 square feet and would not affect skier traffic or terrain in this heavily-used area during the winter.

Fencing around zip line and canopy tour stations and guy wires would be installed to prevent collisions and other safety concerns for skiers, but this infrastructure could impact the recreational experience for skiers in the trees or trail edges near these facilities. However, as skiers in the trees are accustomed to avoiding obstacles, the impact on the recreational experience is expected to be minimal. Additionally, at the scale of the SUP area, the frequency of encounters with this infrastructure would be negligible.

The visibility of zip line, canopy tour, observation tower and challenge course infrastructure could impact the winter recreational experience by detracting from the natural setting of the area. If feasible, the zip line, canopy tour, observation tower and challenge courses may operate during the ski season. The zip line and canopy tour infrastructure and operations would be visible to snow sports users as well as other summer recreationalists, including hikers and mountain bikers. The canopy tours would likely have the highest visibility due to their proximity to popular ski terrain (the Sawmill Canopy Tour would traverse *Frosty's Freeway* and *Southern Cross* ski trails and the Ore Bucket Canopy Tour would traverse the *Wanderlust* ski trail and *Ore Bucket* terrain) and relatively short distance between stations. The challenge courses would not be located in a primary ski way due to slope and access to the Vista Haus and would likely have little impact on winter sports users. Refer to Chapter 3, Section B – Scenery for more information.

Recreational Experience

In general, the projects and activities proposed in Alternative 2 would expand the variety of recreational opportunities available to visitors to the Breckenridge area and, specifically, at BSR. While on-mountain multi-season recreational activities at BSR represent one component of the many opportunities that are available throughout Summit County, providing additional activities within the SUP area could provide an incentive for guests to spend more time within the SUP area across a single day or multiple days. A

range of recreation opportunities would create a unique experience and satisfy a more diverse population of visitors at BSR.

The distribution of recreational opportunities under Alternative 2 would remain similar to existing activities, with the highest concentration of guests at the base of Peak 8. The addition of activities on Peaks 7 and 8 would provide further variety for families and novice outdoor recreationists. The zip lines, canopy tours, and hiking and mountain biking trails would each provide progressively more remote and dispersed recreation experiences. In general, developed, structured recreation would be focused at the base of Peak 8. The top of the Colorado and Independence SuperChairs would experience relatively concentrated use with increasingly dispersed recreation across Peaks 7 and 8. Once a guest leaves these high-use-concentration zone areas, they would have a sense of relative remoteness and would expect to see less people the farther they get from these zones. It is anticipated that there would be more people present at BSR under Alternative 2, but they would be accommodated by an increased supply of activities.

Increased noise and visual impacts from the proposed projects and anticipated increased visitation under Alternative 2 could impact the overall recreational experience at BSR. Infrastructure related to the canopy tours and zip lines could directly and indirectly impact winter recreation and would add incrementally to the modified landscape at BSR. The summer recreational experience across Peak 8 and Peak 7 could be affected by additional noise and visual impacts of new infrastructure and traffic on Peak 7/8 Access Road. However, the SUP area is currently the focus of developed and structured recreation (consistent with Management Area 8.25), so additional noise and visual impacts would be consistent with guest expectations at this location.

The addition of on-mountain activities has the potential to result in increased lift lines in the summer. However, summer use of chairlifts is generally expected to be less intense than winter use (i.e., there would be fewer total people). It is expected that summer use would not lead to unreasonably long lift lines. User conflicts—particularly on hiking and biking trails—would be expected to be minimal and would be managed through signage and separation of users.

Goal interference conflicts, which do not necessarily mean the goals of those recreating are incompatible, but the way people go about achieving their goals (recreating behaviors) may create conflict. People participating in the same activity, but with different behaviors viewed as appropriate, such as littering, level of noise or rowdiness, or level of crowding, creates conflicts.[17]

In the BSR summer use activities there are potentially several types of user goal interference conflicts that may arise due to activity style, which is conflict associated to users with higher skill levels having higher levels of conflict due to users being more focused on the objectives and experience of their specific

[17] Graefe and Thapa, 2004

activity. An example of this would be mountain bikers taking advantage of the new trail systems, but having some conflicts between advanced and beginner riders. Advanced riders may be more focused on their opportunity to ride to their skill level and find sharing trails with low level riders to conflict with their experience.

Another possible conflict that may occur with the changes in summer opportunities at BSR may be associated with resource specificity, users who have a high level of attachment to a place and feel there is no other place for them to recreate, so additional people in the area can create conflicts. An example of this may be local residents who have been using BSR as their 'backyard' for easy access to recreation opportunities in the summer may feel displaced with additional summer users in the area. Although there are many other places to recreating surrounding BSR, none may be as easy to access as the BSR area.

In general, the less experience, and less skill a person has in outdoor activities, the less conflict they are likely to have. The more experienced a user becomes, they come to expect certain behaviors and sometimes can be less tolerant of those with less knowledge or skills, creating conflicts. The opportunities provided at BSR for summer provides opportunities for those with limited outdoor experience and skill to gain knowledge and understanding. At the same time, BSR summer use does allow a trail system for those with greater experience in hiking and mountain biking to use other parts of the area.

Activities

Zip Lines

Zip lines are an outdoor adventure activity in which guests are propelled by the force of gravity through a forested area. From an elevated view, guests gain a different perspective of their surroundings. These activities require minimal physical strength making the activity accessible to nearly all guests. Overall, zip lines would offer guests an exhilarating experience combined with an opportunity for guests to enjoy the surrounding forest within BSR's SUP area and adjacent NFS lands. Refer to Chapter 2 for a more detailed description of individual zip lines.

Zip lines have the potential to increase the noise level in the surrounding areas, both from the guest and the interface between the cable and trolley. However, the noise would not likely adversely impact the user experience because participants would expect to hear and see the activity they are participating in. Other users in the area of zip lines could be impacted by the noise of guests on the zip lines (e.g., guests yelling as they travel approximately 500 feet off the ground over Sawmill Gulch). However, the noise would be short in duration but could be heard in the adjacent area.

The Sawmill and Peak 7 zip lines would provide a relatively short-duration activity, and allow visitors to explore the surrounding forested environment in a structured, non-strenuous way. Approximately 288 guests are anticipated to experience each zip line on a high volume day.[18] The Sawmill and Peak 7

[18] The number of guests was determined by a 48 person per hour design capacity and a 6-hour operating day.

zip lines would be accessible from the Colorado SuperChair and Independence SuperChair, respectively. The Sawmill Zip Line would offer guests a thrilling experience as they "fly" over Sawmill Creek Gulch, reaching heights of approximately 500 feet off the ground. The Sawmill Zip Line stations would all be located in developed portions of the ski area and would have minimal impacts on the recreational experience of other users in summer or winter because towers would be located off of ski trails. Zip line participants traversing Sawmill Gulch would be visible to other recreation users in the area, including users of the proposed Sawmill Canopy Tour, which would traverse under the zip line cables. General visibility is expected to be minimal, as the cables would likely blend into the background unless within close proximity. Refer to Chapter 3, Section B – Scenery for more information.

Conversely, the Peak 7 Zip Line would offer less adventurous guests an opportunity to experience the forest canopy and observe developed ski trails and other infrastructure from above. Guests would likely hear and see the Independence SuperChair during the activity.

Natural Resource-Based Recreation Opportunities Associated with Zip Lines

The experience of a zip line is dependent on a change in elevation and engagement with a mountain setting; the vertical relief, natural topography and vegetation of the area are essential to the user experience. Users of the zip lines would terminate at Four O'Clock Road for Sawmill Zip Line and Peak 7/8 Access Road for Peak 7 Zip Line. This would give guests an opportunity to continue to explore NFS lands by hiking or taking a shuttle to the base areas offering interpretive and sightseeing opportunities along the return trip.

The zip lines are designed to meet the needs of those guests seeking adventure and thrill-based experiences that require little specialized knowledge, skills or familiarity with the mountain environment. Zip lines may serve as one of the primary attractions of BSR's multi-season programming, generating excitement to experience the WRNF in a unique way. The zip lines allow limited direct physical access to the natural environment partly due to the speed at which guests will be traveling and that guests are harnessed and attached to a fixed line. However, zip lines would be located to incorporate natural resource assets into the experience to the extent possible as users are transported through a natural setting. While the zip line may not directly connect people with the natural environment in the traditional sense, they are part of a suite of activities that are partly designed to introduce NFS lands users to outdoor recreation and nature. These activities may lead to further exploration of NFS lands adjacent to the activity area (within BSR's SUP area) as well as NFS lands outside the permit boundary.

Canopy Tours

A canopy tour combines the adventure of zip lines with a more intimate forested setting. It utilizes short zip line features to travel from station to station and offers guests a unique experience during a two-to three-hour tour. These gravity-based activities are designed to provide fun and exciting experiences by giving guests a unique view of NFS lands within BSR's SUP area and surrounding terrain. Refer to Chapter 2 for a more detailed description of individual canopy tours.

By design and location, each canopy tour would offer different experiences for the user. The Sawmill Canopy Tour would be located on the north side of Sawmill Gulch below Four O'Clock Ridge. The tour would have an enclosed feeling as guests would be confined to the forest floor and landscape of the steep valley between Peaks 8 and 9. The tour would offer less expansive views of surrounding landscape and be in close proximity to developed ski terrain, but offer a more intimate feeling near Sawmill Creek. In contrast, the Ore Bucket Canopy Tour would be located in a more open area in the Cucumber Creek watershed and would offer views of Lake Dillon and areas north. The hummocky terrain, fens and kettle ponds are characteristic of the northeast aspect of Cucumber Creek.

These activities would provide an adventurous yet structured and guided experience which could be an effective intermediate step between the Peak 8 base area activities and dispersed mountain biking, for example, for novice outdoor recreationalists. Canopy tours would require minimal physical exertion and participants would learn the skills required to safely use harness and braking equipment. The equipment and skills required for participation in canopy tours are similar to rock climbing, and could encourage future interest in these activities commonly found on NFS lands.

These projects would positively affect the recreational experience for guests by providing a unique, long-duration, on-mountain activity. As such, for families and groups looking for a full day (or multiple days) of recreation, the canopy tours could represent an important component of their overall recreational experience. Approximately 144 guests would be expected to take part in a canopy tour per day.[19]

Natural Resource-Based Recreation Opportunities Associated with Canopy Tours

The proposed canopy tours would encourage outdoor recreation due to their location in a natural setting and their proximity to other numerous outdoor recreational opportunities. These activities are dependent on a change in elevation (gravity-based) and engagement with a mountain forest setting. The design and location of the canopy tours utilize the natural resource attributes of topography and overstory vegetation. Their layout and location within a forested stand would allow users to recreate in a natural setting and provide an experience reliant on these natural features. The canopy tours are based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, zip lines and activity itself replicate traditional climbing and mountaineering activities.

The Sawmill Canopy Tour and Ore Bucket Canopy Tour would terminate on Four O'Clock Road and Peak 7/8 Access Road, respectively. This would give guests an opportunity to continue to explore NFS lands by hiking or talking a shuttle to the base areas offering interpretive and sightseeing opportunities along the return trip.

While on a canopy tour, guests would move in and out of the forest canopy. At the towers, guests would be slightly below the canopy and able to see the lower forest structure. In the middle of each zip line

[19] The number of guests was determined by a 24 person per hour design capacity and a 6-hour operating day.

segment the rider would have an aerial view of the ski area and surrounding landscape. The experience of these activities stems from moving over/through the forest canopy, over natural topographic features. The natural topography and environment would define the adventure provided by this activity (e.g., Ore Bucket Canopy Tour would offer guests the opportunity to experience natural water features of Cucumber Creek and associated flora and fauna). Users would have limited direct physical contact with their setting, but at the stations between zip line segments they would be standing in the forest canopy which would offer a unique perspective of the immediate and surrounding landscape.

Challenge Courses

A challenge course is a series of activities typically constructed between elevated platforms and can have varying levels of difficulty. The proposed course is comprised of many different elements, including ladders, nets, swings, bridges, zip lines and equipment storage. Guests maneuver through the course while harnessed to a safety line. The course design would be located adjacent to overstory vegetation and give the guests a sense of climbing in a mountain environment.

The proposed challenge courses would provide an energetic and skills-based activity in a structured and semi-guided experience. The challenge courses could encourage users to continue to explore the natural environment and test their skills on other NFS lands. The challenge courses would require limited physical exertion and participants would learn the skills required to safely use harness and maneuvering through an unfamiliar environment. Approximately 192 guests per day could be accommodated.[20]

The challenge courses would be visible to summer and winter guests in the Vista Haus area. However, the visibility of these projects is not anticipated to detract from the recreational experience in this area because existing ski area infrastructure already dominates the landscape. Refer to Chapter 3, Section B – Scenery, for more information.

Natural Resource-Based Recreation Opportunities Associated with Challenge Courses

This activity would be located in a sparsely forested area near the Vista Haus and participants would be at roughly the same vertical height as the forest canopy in close proximity to trees and other natural features. There would be limited physical interaction with the environment, but like the canopy tours, this activity would provide a unique perspective in a mountain setting. Participation would be relatively structured, but participants would have the ability to stop at various locations around the course to examine or enjoy the setting. This activity has the potential to instill an awareness and appreciation of nature for guests of any age.

The activity encourages outdoor recreation by being located outdoors in a natural setting and in close proximity to other numerous outdoor recreational opportunities. The course is based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, equipment and

[20] The number of guests was determined by a 32 person per hour design capacity and a 6-hour operating day.

activity itself replicate traditional adventure, climbing and mountaineering activities. This activity could give guests the experience and confidence they need to explore similar activities elsewhere on NFS lands.

The desired experience and activity is dependent on the engagement with a mountain forest setting. The design and location of the course utilizes the natural resource attribute of vegetation (forested setting). Its layout and location adjacent to a forested stand would allow users to recreate in a natural setting and provide an experience reliant on these natural features.

Hiking Trails and Mountain Biking Trails

BSR proposes to develop approximately 1.5 miles of hiking trails and 15 miles of new and realigned mountain biking trails within and to the north of BSR's SUP area (a short segment of trail is proposed to connect the BSR trail network to the Peaks Trail, a popular mountain bike trail not within BSR's SUP). The trails would increase variety for users of these trails, particularly beginners. The recreational experience on these trails would be relatively more remote and adventurous than other activities at BSR. For example, the Lake Chutes hiking trail would provide a defined route to a high elevation environment that is unique within the Breckenridge area. In addition, a bike skills course would be constructed at the top of the Independence SuperChair (north of the chairlift terminal) to provide a controlled environment for beginners to familiarize themselves with the equipment and terrain they might encounter.

Under Alternative 2, Peak 7 would become the hub of mountain biking activity at BSR (refer to Figure 5 – Peak 7 Alternatives 2 and 3 Proposed Projects). Rental bikes, a bike skills course and the beginning of a number of trails would be located on Peak 7, and would be primarily served by the Independence SuperChair. The new mountain bike trails would offer beginner and intermediate users a variety of trails suitable to their ability level. The new trail system would be constructed using modern trail design techniques, which would make the experience more enjoyable and trails more sustainable. For example, the mountain bike trails would be wide and bermed to allow better "flow" as bikers descend while also incorporating new techniques for drainage management. The "flow" trails are designed to better accommodate beginner users because of their width and predictable surface.

Trail use is anticipated to increase across the hiking and mountain biking trail network from existing conditions of approximately 300 users per day to approximately 600 users per day on a high use weekend day. Additional information on projected BSR visitation can be found in the project file. With additional hiking and mountain biking trails and an increased dispersal of users across the trail network, riders would likely encounter other trail users less frequently, even with additional users. User conflicts would be minimized and managed through a combination of signage and separation of use. Signage at trail intersections would alert users to the possible presence of other types of users.

Natural Resource-Based Recreation Opportunities Associated with Hiking and Mountain Biking Trails

Hiking and mountain biking trails are commonly found on NFS lands and provide opportunities for constant, direct interaction with the physical environment. The trails would be designed to highlight

natural features such as topography, rock outcroppings and forested areas. Trail users are completely independent and free to move at their own pace and stop and investigate their surroundings at any point. The relative ease of lift-service to explore unique, high elevation environments would allow for a more diverse set of users on NFS lands. Experience gained hiking or mountain biking at BSR could build confidence in novice outdoor recreationists and encourage further exploration of NFS lands.

Observation Tower

The proposed observation tower would be located in Horseshoe Bowl, between the Colorado and Independence SuperChairs. This project would draw guests into a less-developed portion of BSR's SUP area. The observation tower would be designed to capture a panoramic view of the surrounding area, become a waypoint for hikers and offer guests an opportunity to gather and take photos at a destination. Accessed by the proposed hiking trail from the top of the Colorado SuperChair, hikers would travel north about 20 to 30 minutes to the proposed location. Natural materials, such as wood and stone, would be used to construct the tower and blend into the surrounding environment. Refer to Chapter 3, Section B – Scenery for more information on the visibility of this structure. Guests could expect to see other hikers on the access trail, but would not likely encounter or impact other uses such as mountain bikers and challenge course users. The tower would be visible to winter users, which could impact the winter recreational experience by detracting from the natural setting. However, it could be designed to be accessible during the winter for guests as a lookout and educational opportunity. Guests visiting the proposed observation tower would be met with views of the WRNF, the Tenmile Range, the Continental Divide and the Blue River Valley of Summit County.

Natural Resource-Based Recreation Opportunities Associated with the Observation Tower

The observation tower would encourage hiking and is designed to be a destination for guests. As guests hike through the forest, they can stop at their leisure and observe the natural surroundings. The recreational experience of the observation tower is dependent on the natural setting, primarily the views of Horseshoe Bowl, the Tenmile Range, the Continental Divide and the Blue River Valley of Summit County. The views afforded from the proposed observation tower could encourage visitors to pursue outdoor activities such as hiking in the future.

Climbing Wall

The proposed climbing wall would be incorporated into the Vista Haus deck expansion, located on the southeast side of the building. The wall would be approximately 40 feet in height and would be open during the summer months as weather permits. Because of its proximity to the Vista Haus and other proposed activities (beginning of the Sawmill Zip Line and Canopy Tour), guests would expect to hear and see other people in the area. Additionally, this location is easily accessible and would be apparent to guests traveling up the Colorado SuperChair.

The proposed climbing wall would provide a skills-based activity in a structured and controlled environment. This activity is based in other traditional, natural resource-based recreation activities that

occur on other NFS lands. The harnesses, zip lines and activity itself replicate traditional climbing and mountaineering activities. The climbing wall could encourage users to continue to explore the natural environment and test their skills on other NFS lands. The climbing wall would require some physical exertion and would challenge guests by climbing up a series of holds to reach the top of the wall.

Natural Resource-Based Recreation Opportunities Associated with the Climbing Wall

This activity would be located in a semi-open area near the Vista Haus. Guest would climb up 40 feet to roughly the height of the forest canopy. Participants would have limited physical interaction with the environment, but like the canopy tours and challenge course, this activity would provide a unique perspective in a mountain setting. Views from this activity could instill an awareness and appreciation of nature for guests of any age.

The activity encourages outdoor recreation by being located outdoors in a natural setting and in close proximity to other numerous outdoor recreational opportunities. The climbing wall is based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, equipment and activity itself replicates traditional adventure, climbing and mountaineering activities. This activity could give guests the experience and confidence they need to explore similar activities elsewhere on NFS lands.

Supporting Infrastructure and Guest Facilities

In addition to the proposed activities in Alternative 2, existing winter infrastructure would be utilized to transport guests to different parts of the mountain. The Colorado SuperChair would transport guests up Peak 8 to access the Sawmill Zip Line, Sawmill Canopy Tour, challenge courses, observation tower and hiking and mountain biking trails. The Independence SuperChair would transport guests up Peak 7 to access the Peak 7 Zip Line, Ore Bucket Canopy Tour and hiking and mountain biking trails. The Imperial Express and 6 Chair would also operate for access to the lake at the bottom of Lake Chutes and summit of Peak 8 high Alpine environment. While providing transportation for other recreation opportunities, chairlifts also provide a unique perspective on the forest and surroundings and allow access to NFS lands for those who might otherwise not be able to experience them.

Guest safety is a concern in Alpine environments or at high elevations, such as the 6 Chair and Imperial Express. In cases of inclement weather, guests at the top of Imperial Express would be directed to the 6 Chair Warming Hut. In cases of an emergency, staff with medical training would be present to assist. In general, first response and medical teams would integrate consistent with existing BSR operations.

Existing summer infrastructure would also be improved to enhance the current recreational experience. Upper Four O'Clock Road would be realigned for off-highway vehicle (OHV) tours to 6 Chair and the Imperial Express (the current system includes the Peak 7/8 Access Road and a spur route to the top of the Independence SuperChair). The proposed route would provide access to 6 Chair and the Imperial Express, thereby providing additional scenic chairlift ride opportunities and adding new options to existing OHV

tour operations. The program would continue to utilize specifically designed vehicles and trained guides for exploration and interpretive opportunities for guests of all ages. Tours would also integrate guided hikes and access to guest rest facilities.

Food service is an important component of the on-mountain recreational experience. New summer food service is proposed at the Vista Haus (top of Colorado SuperChair). The Vista Haus (21,000 square feet) could provide 700 indoor seats and 300 outdoor seats for summer guests. Offering guests an on-mountain food service would allow them to remain on the mountain and explore the NFS lands for longer periods of time. This service would accommodate expanded activities being proposed on Peak 8. In addition, the Peak 7 Hut, currently 480 square feet, would be expanded by approximately 500 square feet to accommodate anticipated use on Peak 7. No food service would be provided, but the Hut would continue to provide restroom facilities and a gathering space.

Alternative 3

Alternative 3 includes all Alternative 2 projects except for the Sawmill Zip Line, Ore Bucket Canopy Tour, the northernmost mountain biking trail (from the top of the Independence SuperChair to Peak 7/8 Access Road), the Lake Chutes hiking trail, and 6 Chair and Imperial Express summer operations. Alternative activities or locations are proposed in lieu of eliminated Alternative 2 activities. These activities include the Claimjumper Canopy Tour, relocated observation tower and alternate mountain biking trails.

Table 3A-2 portrays the likelihood that the omission of the above projects from Alternative 3 could have a disproportionate impact on summer visitation compared to Alternative 2. As discussed previously under Alternative 2, the Sawmill Zip Line is considered to be a potential draw for summer guests to BSR, attracting people who otherwise might not explore the ski area. By omitting this activity, visitation to other recreational opportunities would be expected to be reduced as compared to Alternative 2.

As a result of the activities included in Alternative 3, summer visitation to BSR is projected to increase to 300,000 guests. Nearly half of these guests would remain in the base areas and the other half would disperse throughout BSR's SUP on Peaks 7 and 8 (on NFS lands). The reduction in anticipated annual visitation compared to Alternative 2 would be due to a reduction in certain activities, primarily the Sawmill Zip Line and the high Alpine sightseeing activities. The Ore Bucket Canopy Tour would be replaced in Alternative 3 with the Claimjumper Canopy Tour, but the Alternative 3 activity would be located in a less unique setting and could have less guest utilization. Additional information on visitation by activity on a typical Saturday in July and annual visitation can be found in the Recreation Technical Report in the project file.

In general, impacts to recreation under Alternative 3 would be similar to those discussed above under Alternative 2. Refer to the Alternative 2 discussion for more information. The discussion below is specific to the differences between alternatives 2 and 3.

Canopy Tour

The Claimjumper Canopy Tour would be located south of the Independence SuperChair top terminal. The canopy tour is designed for less adventurous guests as the tour is in close proximity to current mountain operations. Guests would have views of the Town of Breckenridge and Mount Baldy as they travel down Peak 7. The tour would provide a slightly different experience than the Ore Bucket canopy tour because the tour would traverse through less dense vegetation and has no water features close by. Nonetheless, the canopy tour would draw guests onto Peak 7 and allow them to experience NFS lands from a unique perspective. The Claimjumper Canopy Tour would be similar to the other canopy tours in duration and overall experience.

Observation Tower

Alternative 3 includes an alternative location for the observation tower, approximately 500 feet north of the Colorado SuperChair top terminal near the proposed challenge course and existing, previously-disturbed avalanche explosives cache. The views from this location would be less dramatic and different because the setting of the tower would be defined by a less-natural environment. The view afforded in the original tower location (Alternative 2), however, would still be available (a 30-foot difference in elevation above treeline provides roughly the same view to the user. The recreation experience in this alternative location would be similar to guests and provide a valuable interpretation opportunity for guests that cannot make the 20 to 30 minute hike to the original location. The tower would likely see additional use compared to the Alternative 2 location given its proximity to the Peak 8 summit area.

Mountain Biking Trails

Alternative 3 includes a different route connecting the BSR trail network to the Peaks Trail. The Peaks Trail connector from the bottom terminal of Zendo Chair north is replaced with an alternative route connecting existing ski trails and roads from the BSR SUP boundary to the Peaks Trail. The user experience of the alternative Peaks Trail connector would be diminished when compared to the trail in Alternative 2, as riders would not ride through the forested areas, but rather on ski trails and mountain roads.

All other mountain bike trail alignments and the beginner skills course included in the Proposed Action are included in Alternative 3 (except for the northern most trail from the Peak 7 Hut to the Peak 7/8 Access Road) and includes approximately 14 miles of new and rerouted mountain bike trails.

Supporting Infrastructure and Guest Facilities

The OHV tours would not use the Upper Four O'Clock Road to gain access to the top of 6 Chair. However, Upper Four O'Clock Road would be realigned, as described in the Proposed Action. Limiting

the OHV tours would reduce the user experience by not providing access to higher elevations on the mountain.

CUMULATIVE EFFECTS

Scope of the Analysis

The effects analyzed in the cumulative effects section apply to all alternatives, including the No Action Alternative. For a detailed description of past, present, and reasonable foreseeable future projects, the reader is referred to Appendix A in this document. The following projects are expected to cumulatively have short- and long-term effects on overall multi-season recreational opportunities in BSR's SUP area and the Town of Breckenridge.

Temporal Bounds

The temporal bounds for this cumulative effects analysis for recreational extend from BSR's inception as a resort in 1961, through the foreseeable future in which BSR can be expected to operate.

Spatial Bounds

The spatial bounds for this cumulative effects analysis of recreation are limited to public and private lands in the vicinity of the BSR SUP area.

Past, Present, and Reasonably Foreseeable Future Projects

Recreation at BSR and in the Town of Breckenridge has been prevalent since BSR first opened in 1961. Skiing and other winter sports have become the driving force behind the Town of Breckenridge's tourist economy. During the summer, hiking, mountain biking, and horseback riding have been available, although in a more passive environment compared to winter recreation. Past projects have affected recreational opportunities at BSR, and this will continue to change over time. In general, the following projects have sculpted the recreational opportunities that many of the residents and visitors value today:

- Peak 8 Summer Fun Park
- BreckConnect Gondola
- Peaks 7 and 8 Base Areas Master Plan
- Tenderfoot Mountain Motorcycle Trail System EA
- Continued Town of Breckenridge and Upper Blue River Residential Build-Out

Peak 8 Summer Fun Park

The Summer Fun Park activities (located on private lands) are popular among visitors to Breckenridge, providing structured recreation tailored towards families. As the basecamp of summer recreation at BSR, the Summer Fun Park is typically busy with people recreating and relaxing, and it can be noisy. The types

of activities offered at the Summer Fun Park are best-suited for guests who are less familiar or comfortable with outdoor recreation. In general, the further guests travel from the Summer Fun Park, the more remote and adventurous the recreational experience becomes.

The Summer Fun Park has evolved since 1978 to include the following activities and amenities:

- Gold Runner Mountain Coaster
- TenMile Flyer Zip Line
- Alpine SuperSlide (alpine slide)
- Rockpile Climbing Wall
- Gemstone Panning
- Segway Off-Road Tours
- 4x4 Off-Road Tours
- Summer Day Camp
- SuperBungee Trampoline
- SuperPutt Mini Golf
- Mineshaft Maze
- Ripperoo's Bounce House
- Toddler Zone
- Snowfield
- BreckTreks Guided Hikes
- Mountain Biking
- Scenic Chairlift Rides

Figure 2 – Alternative 1 illustrates the existing multi-season activities that are available within BSR's SUP area, including Summer Fun Park activities.

As described above, the recreational experience at the Summer Fun Park is developed and is suited to families and the casual visitor who might not have much experience with outdoor recreation. These activities are structured and generally do not require high levels of physical fitness. There is a high concentration of use at the Summer Fun Park which contributes to a noisier atmosphere relative to other areas of BSR's SUP area. On busy days there can be lines for activities at the Summer Fun Park. Because of the nature of these activities, user conflicts are not a concern, although hikers and mountain bikers can expect to encounter a high number of users in this area.

The proposed projects would supplement existing activities at the Summer Fun Park. In particular, guests could be drawn to the area for a particular activity or suite of activities, and end up enjoying other activities on NFS lands or drawn further away from developed portions of BSR. The appeal of these new activities could also attract a larger number of users to NFS lands.

Summer Recreational Opportunities in the Area

Beyond BSR and in the broader context of Summit County, opportunities for recreational activities are abundant—on both private and NFS lands. Although summer is a short season in the mountain environment, summer recreational opportunities for different types of users outnumber winter recreational opportunities. These are primarily dispersed activities that depend on an individual's skills, fitness and

experience. They include (but are not limited to): hiking, road/mountain biking, sightseeing, fishing, camping, horseback riding, rock climbing, kayaking, and rafting. In addition to the 27 miles of hiking trails and mountain biking trails that are available at BSR, hundreds of miles of trails can be found on NFS lands throughout Summit County. Gravity riding and flow trails offered at BSR offer locals an alternative to cross-country singletrack trails, which are typical of mountain biking in and around Breckenridge. Numerous outfitters throughout Summit County provide guided services for activities such as rafting, fishing and horseback riding. Due to the heavy influence of the natural setting in Summit County, many of these outdoor activities—both dispersed/self-directed and guided—meet the Forest Service's definition of "natural resource-based recreation" as well as "encouraging outdoor recreation." The proposed projects would add cumulatively to the variety and supply of recreation in Breckenridge and Summit County. This could lead to an increase in use of other trails and areas on NFS lands.

Previously-approved, unimplemented projects at BSR include 6 Chair replacement and Peaks 7 and 9 facilities. Construction of these projects could enhance recreational opportunities available within BSR's SUP area by providing better access via the 6 Chair replacement or better guest facilities on Peaks 7 and 9. These projects would add to the developed nature of the SUP area, but would be consistent with Management Area 8.25. The incorporation of additional activities within BSR's SUP area under either action alternative would complement and diversify the range of developed and dispersed recreation that is currently available in Breckenridge. Cumulatively, the variety of multi-season recreational activities that would be offered in Breckenridge under either action alternative would further encourage people to engage in outdoor, natural resource-based recreation on NFS lands.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

No irreversible and/or irretrievable commitment of resources have been identified that may impact the recreational resources in association with the alternatives analyzed in this document.

B. SCENERY

SCOPE OF THE ANALYSIS

Analysis of the aesthetic environment requires an evaluation of the proposed project areas and their abilities to absorb the effects of both historic and ongoing human-induced and natural changes. Slope, natural vegetation types and patterns, topography and viewing distance are important factors in this analysis.

The scope of this scenery analysis includes BSR's entire 5,700-acre Forest Service-administered SUP area, extending from Peak 5 to Peak 10, but focuses on portions of the SUP where new projects are proposed, specifically Peaks 7 and 8. The development of facilities, infrastructure, and developed trails at BSR has occurred over the past four decades in which BSR has been managed as a developed recreation site on the WRNF.

Four critical viewpoints were identified by the ID Team as appropriate for assessing the scenic quality of the Project Area under existing and proposed conditions. These viewpoints include:

- *Critical Viewpoint 1* – Base of Peak 7 looking west/southwest (view of proposed Peak 7 Zip Line)
- *Critical Viewpoint 2* – Vista Haus looking northeast (view of proposed Challenge Course)
- *Critical Viewpoint 3* – Peak 8 SuperConnect Top Terminal looking south (view of proposed Sawmill Zip Line and Sawmill Canopy Tour)
- *Critical Viewpoint 4* – Independence SuperChair Top Terminal (3D perspective of Peak 7 Zip Line, Ore Bucket Canopy Tour, mountain bike skills park and Peak 7 hut expansion)

Refer to figures 6 through 9.

FOREST SERVICE SCENERY MANAGEMENT SYSTEM

The Scenery Management System (SMS) was adopted in 1995 as the primary scenery management direction by the Forest Service. The SMS is a systematic approach for assessing scenic resources in a Project Area and developing findings to help make management decisions on the project. The system is founded on an ecological aesthetic, which recognizes that management which preserves the integrity, stability, and beauty of the biotic community preserves the scenery.

Scenic Integrity Objectives and Landscape Character

Scenic integrity is a measure of the degree to which a landscape is visually perceived to be complete, indicating the degree of intactness and wholeness of the landscape character. An action can cause scenic resource change that can be objectively measured. By assessing the existing scenic character of an area in terms of pattern elements (form, line, color and texture) and pattern character (dominance, scale diversity

and continuity), it is possible to identify the extent to which the scenic character of a facility would exhibit scenic contrast with the landscape, or its converse, scenery compatibility.

The 2002 Forest Plan establishes acceptable limits of change for Scenic Resources.[21] The limits of acceptable change of a particular area (e.g., Forest Plan Management Area) are the documented Scenic Integrity Objectives (SIO), which serve as a management goal for scenic resources for that area. SIO provide a measure of visible disruption of landscape character and help locate and rank areas in need of scenic rehabilitation.

SIO range from "Very High" (unaltered environment) to "Unacceptably Low" (extremely altered environment). As indicated in the 2002 Forest Plan, the majority of BSR's SUP area is designated as *Very Low*, with the high-alpine areas of Peak 6 and Peak 10 designated as *Low*. All proposed projects are located in areas with an SIO of *Very Low*. This SIO refers to landscapes where the valued landscape character "appears heavily altered." The *Very Low* SIO is defined as:[22]

> *Deviations may strongly dominate the valued landscape character. They may borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, changes in vegetation types, or architectural styles outside the landscape being viewed. However, deviations must be shaped by and blend with the natural terrain so that elements such as unnatural edges, roads, landings and structures do not dominate the composition.*

The Forest Plan states that all NFS lands shall be managed to attain the highest possible scenic quality commensurate with other appropriate public uses, costs and benefits.[23]

SMS Distance Zones and Critical Viewpoints

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

- Immediate Foreground: This zone begins at the viewer and extends to about 300 feet. Individual leaves, flowers, twigs, bark texture and other details dominate this view.
- Foreground: This zone is usually limited to areas within 300 feet to 0.5 mile (not to exceed 0.5 mile) of the observer, but it must be determined on a case-by-case basis, as should any distance zoning. Generally, detail of landforms is more pronounced when viewed from within the foreground zone.

[21] USDA Forest Service, 2002a
[22] USDA Forest Service, 1995a
[23] USDA Forest Service, 2002a

- Middleground: Alterations in the middleground (0.5 to 4 miles from the observer) are less distinctive. Texture is normally characterized by the masses of trees in stands or uniform tree cover.
- Background: This zone extends from middleground (minimum of 4 miles between the observer and the area being viewed) to infinity. Shape may remain evident beyond 10 miles, especially if it is inconsistent with other landscape forms. Beyond 10 miles, alteration in landscape character becomes obscure.

This analysis focuses on impacts within the immediate foreground and foreground from viewpoints within the SUP area. From viewpoints outside BSR's SUP area (including locations in the Town of Breckenridge and along Highway 9), the developed ski trail and lift network is a dominant feature of the visual environment.

Forest Plan Standards and Guidelines

In addition to the SMS, the 2002 Forest Plan contains Forest-wide standards and guidelines which apply to resources across the WRNF.[24] While the 2002 Forest Plan contains no Forest-wide standards for scenery management, it offers the following guidelines that are applicable to this project:[25]

- Management activities should be designed and implemented to achieve, at minimum, the level of scenic integrity shown on the Scenic Integrity Objective Map.
- Plan, design and locate vegetation manipulation on a scale that retains the color and texture of the landscape character, borrowing directional emphasis of form and line from natural features.
- Choose facility and structure design, scale, color of materials, location and orientation to meet the scenic integrity objective on the Scenic Integrity Objective Map.
  Facilities, structures and towers with exteriors consisting of galvanized metal or other reflective surfaces will be treated or painted dark non-reflective colors that blend with the forest background to meet an average neutral value of 4.5 or less as measured on the Munsell neutral scale.

Management Area 8.25 standards and guidelines applicable to this project and the scenery resource include:

- Standard: Permanent outdoor advertising is not a needed public service and is not allowed.
- Guideline: Facilities are designed with an architectural theme intended to blend facilities with the natural environment.

[24] A *standard* is a course of action which must be followed; adherence is mandatory. A *guideline* is a preferred course of action designed to achieve a goal, respond to variable site conditions, or respond to an overall condition.
[25] USDA Forest Service, 2002a

- Guideline: Vegetation is retained to screen facilities from key viewpoints.
- Guideline: Roads are designed to minimize visual and resource impacts. They are constructed and maintained with good alignments and grades that minimize erosion.

Furthermore, the following information on the desired condition for scenic values is contained in Management Area 8.25:[26]

> *Protection of scenic values is emphasized through application of basic landscape aesthetics and design principles, integrated with forest management and development objectives. Reasonable efforts are made to limit the visibility of structures, ski lifts, roads, utilities, buildings, signs, and other man-made facilities by locating them behind landform features or by screening them behind existing vegetation. Facilities are architecturally designed to blend and harmonize with the national forest setting as seen from key viewpoints. Facilities that no longer serve a useful purpose are removed.*

The 2002 Forest Plan further states that it is a regional goal to "provide for scenic quality and a range of recreational opportunities that respond to the needs of the forest customers and local communities."[27]

Forest Service Manual

On April 17, 2014, the Forest Service released its Final Directives for Additional Seasonal and Year-Round Recreation Activities at Ski Areas. Forest Service Manual (FSM) 2343.14 includes this final direction and criteria to help authorized officers determine whether proposals for these activities are consistent with SAROEA. FSM 2343.14(1) includes criteria for evaluating additional seasonal and year-round recreation activities and associated facilities that may be authorized at ski areas. This guidance includes criteria specific to the visual impact of proposed activities and associated facilities. Activities and associated facilities must, to the extent practicable, harmonize with the natural environment of the site where they would be located by:

- Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape; and
- Not requiring significant modifications to topography to facilitate construction or operations.

This analysis includes a specific discussion of the proposed projects in relation to these criteria. See Appendix B for additional information.

[26] Ibid.
[27] Ibid.

The Built Environment Image Guide

The Built Environment Image Guide (BEIG) is a manual for the "thoughtful design and management" of the built environment contained within the national forests by province.[28] The Forest Service defines the built environment as "the administrative and recreation buildings, landscape structures, site furnishings, structures on roads and trails, and signs installed or operated by the Forest Service, its cooperators, and permittees."[29] The BEIG divides the United States into eight provinces which combine common elements from the ecological and cultural contexts over large geographical areas; the WRNF is within the Rocky Mountain Province. Site development, sustainability, and architectural character should conform to BEIG guidelines described for this Province.

AFFECTED ENVIRONMENT

Scenic Characteristics of the BSR SUP Area

BSR is located on the eastern face of the Tenmile Range, which is in the Gore/Mosquito Range subsection of the national ecological hierarchy for the WRNF. High elevation alpine peaks characterize the Gore/Mosquito subsection. The jagged peaks of the Gore range contrast with the rounded alpine summits of the Tenmile Range to the south. Landform features include scoured bowl-like cirque headwalls and floors, U-shaped valleys, couloirs, talus and scree slopes and rounded mountain slopes. This subsection is composed of north-south laying high relief granitic mountains.[30]

The Gore-Mosquito Ranges are dominated by alpine, sub-alpine, and montane life zones. The alpine zone is a bare, rocky region covered with snow for the greater part of the year, situated from approximately 11,000 feet to over 14,000 feet. The sub-alpine zone is described as the upper spruce/fir zone up to timberline, where the trees begin to be dwarfed. The montane life zone is characterized by extensive forest stands of lodgepole pine, aspen and the lower part of the Engelmann spruce belt. This zone also has mixed aspen and Engelmann spruce or grassy parks and aspens intermingled.

The BSR SUP area is characterized by continuous stands of mature, even-aged lodgepole pine, spruce and mixed conifer, as well as above-treeline terrain comprised of alpine herbaceous vegetation, small woody vegetation and rock outcrops. Similar vegetative conditions are found on adjacent NFS and non-federal land. Much of Summit County, and all of the Tenmile Range, was burned or was clear-cut between 1880 and 1900. Fire and insect activities have played a role in the makeup of the current vegetative mosaic, and therefore the scenic qualities of SUP area and beyond. Summit County has recently experienced mortality in lodgepole pine forested areas due to mountain pine beetle. Lodgepole pine mortality has spread

[28] USDA Forest Service, 2001
[29] Ibid.
[30] USDA Forest Service, 2002c Appendix P p. 6

throughout the County, changing the large-scale landscape appearance from the evergreen color of live trees to a brown color as lodgepole pines succumb to beetle kill.

Peaks 6 through 10 along the Tenmile Range are currently developed with BSR's network of terrain and associated infrastructure. Peak 6 and Peak 8 contain built infrastructure above treeline (Imperial Express, T-Bar top terminal, T-Bar ski patrol building and Kensho SuperChair). The existing trail network contains a large number of linear trail cuts and some modern trail design utilizing less rigid lines. For this reason, the existing terrain network is a major component of the foreground, middleground and background views of Peaks 6 through 10. In addition to snow-sports infrastructure, summer and multi-season recreational activities are concentrated at the base of Peak 8 on private land. There is some limited dispersed recreation across Peaks 7, 8, and 9 including hiking, mountain biking, horseback riding and Off-Highway Vehicle Tours.

BSR's traditional (below treeline) trails are the major contributing factor to the *Very Low* SIO classification ("appears heavily altered") for the developed portions of the SUP area. However, more recent trail design within Peak 7, which includes larger inter-trail tree islands and variable trail edges meet the *Low* SIO designation. The above treeline portions of the SUP area with built infrastructure (Peak 8) currently only meets the *Very Low* SIO due to the difficulty in blending the facility to meet the form, line, color and texture of the surrounding environment.

From within the ski area, winter and summer guests are met with views of developed and undeveloped portions of BSR's SUP area in the foreground and middleground distance zone, as well as panoramic views of scenic natural and developed landscapes overlooking the Town of Breckenridge and the Upper Blue River Valley, the Keystone Resort, Continental Divide, and west to Copper Mountain and the Gore Range from viewpoints at the summit of Peak 8 and the Tenmile Range.

Scenic Characteristics of Areas Proposed for Alteration

Peak 7

Developed trails on Peak 7 are visible in the foreground, middleground and background distance zones. Modern trail design techniques were used at Peak 7, resulting in larger inter-trail tree islands compared to trails on Peaks 8 through 10. This type of trail design allows the Peak 7 area to meet the *Low* SIO definition. Also, the trail edges on Peak 7 were scalloped and feathered to a greater degree, providing more natural scenic variations. The Independence SuperChair, installed in 2002, is only readily identifiable in the foreground (i.e., within 0.5 mile). In the early morning hours, the sunlight does reflect from the lift towers and cable making the chairlift more apparent for approximately 30 minutes each day.

The Peak 7 Hut and Ski Patrol building is located near the top terminal of the Independence SuperChair. This structure has a wood exterior and is only visible from the immediate foreground. The only other structure on NFS lands on Peak 7 is an above-ground water storage tank on lower Peak 7 that is not

visible from within or outside the ski area because of its heavily-screened location. The Peak 7/8 Access Road is well screened throughout Peak 7 and not visible from outside the ski area.

Many of the projects proposed on Peak 7 would be located in or near the developed trail network (including mountain biking trails, hiking trails, the Peak 7 Zip Line, the Claimjumper Canopy Tour, and the Peak 7 site improvements at the top of the Independence SuperChair). The scenic characteristics of the areas near these proposed projects are primarily defined by ski area infrastructure and prior vegetation clearing. The Ore Bucket Canopy Tour, however, would be located in an area that is currently less-developed. The Ore Bucket area is currently skied, but this area is a natural glade that does not resemble other developed ski trails at BSR. This area has sparse overstory vegetation, streams, parks, wetlands and other features unique within the BSR SUP area.

The SIO for Peak 7 is *Very Low*; current conditions meet this designation.

Peak 8

Peak 8 is defined by both above- and below-treeline lift-served and hike-to terrain. Below-treeline terrain on its south-facing aspect is served by the Peak 8 SuperConnect, while Chair 5, Rocky Mountain SuperChair and Colorado SuperChair serve the eastern aspect of Peak 8. Above-treeline terrain is served by 6 Chair, the T-Bar and the Imperial Express. The Imperial Express chairlift has been determined to be consistent with the SIO designation of *Very Low*.

The below-treeline trails on Peak 8 (which total approximately 490 acres) are easily identifiable in the foreground, middleground and background distance zones. However, chairlifts that serve below-treeline terrain are only readily identifiable in the foreground and middleground (i.e., within 1 mile). All of the trails on Peak 8 were constructed prior to the 2002 Forest Plan and previous 1984 Forest Plan that included scenery management. Still, the majority of trails on Peak 8 meet the SIO, with the exception of *Mach 1*, which is a south-facing trail with linear edges. This trail is only visible from elevated southern viewpoints. The location and existing visual screening of the Peak 7/8 Access Road minimize scenery impacts of this facility. The access road from the Vista Haus (Peak 8 on-mountain restaurant at the top of the Colorado SuperChair) to the 6 Chair top and Imperial Express bottom terminal (called the Four O'Clock Road) is visible from several viewpoints due to its steep, exposed route south of Cucumber and Horseshoe bowls.

Structural facilities on Peak 8 (on NFS lands) include: the Vista Haus (restaurant), T-Bar Hut (ski patrol), Peak 8 Summit (ski patrol) and 6 Hut (warming hut). With the exception of the Peak 8 Summit ski patrol facility that was constructed in 2005, the remaining facilities on Peak 8 are each over twenty years old. These older facilities lack a consistent architectural theme, but do blend with the landscape beyond the foreground. The T-Bar Hut, located above treeline and Horseshoe Bowl includes a natural stone exterior to blend well with the backdrop, but this facility does "sky-line" from northern viewpoints. Vegetation surrounding Vista Haus and 6 Hut has been retained to the greatest extent practicable (given the need for

efficient skier access) to provide a visual screen. The Peak 8 Summit facility was designed with the scenic resource in mind, and was constructed into the hill-slope to blend and screen the facility. No permanent outdoor advertising exists on NFS lands on Peak 8. Occasionally, a banner is hung on the exterior of the Vista Haus facing the Colorado SuperChair, advertising a breakfast special. All other signage on Peak 8 is for trail and lift signage, which all include a consistent design theme and coloration.

In the foreground (0 to 0.5 mile) and from some viewpoints in the middleground (0.5 to 4 miles), the T-Bar, 6 Chair and the Imperial Express are visible. The visibility of these chairlifts is enhanced when snow is on the ground, which contrasts the coloration of the chairlifts. Lift structures have all been colored to blend with the forest and landscape background to meet the SIO. On-mountain structures have historically been located to avoid "sky-lining" on exposed ridges and peaks; however, at some vantage points (primarily when viewed from the north—e.g., Highway 9 coming into Breckenridge) the T-Bar and Imperial Express are visible along the Peak 8 ridgeline.

Many of the projects proposed on Peak 8 would be located in or near the developed trail network (the Sawmill Zip Line, Sawmill Canopy Tour, Challenge Courses and the Peak 8 site improvements at the top of the Colorado SuperChair). The scenic characteristics of the areas near these proposed projects are primarily defined by ski area infrastructure and prior vegetation clearing. The Observation Tower, however, would be located in an area that is currently less-developed. The Horseshoe Bowl area is currently skied, but the setting of this area is primarily natural and unaffected by ski area infrastructure. Additionally, the hiking trail near the Lake Chutes would be located in a primarily undeveloped portion of BSR's SUP area. However, the Imperial Express chairlift is located in the vicinity of this project.

During the summer, guests use the Colorado SuperChair to access hiking and mountain biking trails on Peak 8. All existing summer activities on Peak 8 occur within the developed ski trail network. Existing mountain bike trails across BSR (primarily on Peak 8) are not visible beyond the immediate foreground. Other summer and multi-season activities at BSR are located in the Summer Fun Park at the Peak 8 base area (located on private lands). The Summer Fun Park includes zip lines, a mountain coaster, an alpine slide, a climbing wall, a miniature golf course and other developed activities. The concentration of activities, buildings and infrastructure at the base of Peak 8 creates a highly altered scenic environment.

The SIO for Peak 8 is *Very Low*, which is currently being met.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

No changes or modifications are included in Alternative 1 that would affect the scenic quality of BSR's SUP area. Generally speaking, the SUP area would continue to meet, and in some cases exceed, the SIO of *Very Low*.

Alternative 2 – Proposed Action

Implementation of the Proposed Action would incrementally contribute to the developed character of BSR's SUP area, which is identified in the 2002 Forest Plan as Management Area 8.25 – Ski Area (Existing and Potential). With adherence to management requirements (defined below), none of the proposed projects are expected to increase scenery impacts to the character of the SUP area, such that it would not meet the SIO of *Very Low*. These management requirements are:

1. All proposed structures, features, and facilities should be taken through the White River Design Review process for architectural character, design, material and color selections. Forest Service Landscape Architect involvement through the entire design and implementation process is necessary to appropriately design, site and implement projects so that they would meet of meet the SIO of *Very Low*. However, the goal would be to surpass the SIO of *Very Low*.

2. Comply with the character and guidelines for the Rocky Mountain Province BEIG when constructing any approved facilities. This includes considering the landscape, cultural and ecological character, as well as the architectural guidelines which include descriptions of appropriate siting, massing, scale, structure, materials, color and sustainability efforts.

3. Comply with accessibility guidelines, where possible.

Overall, the projects contained in Alternative 2 would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. All proposed projects would be consistent with the SIO of *Very Low*. Generally the proposed projects would be located in the existing developed trail network or otherwise near existing ski area infrastructure, which would reduce required vegetation clearing and the overall scenery impact. However, the location of these facilities in and near the existing trail network would increase the visibility for recreationalists within BSR's SUP area, particularly winter sports users. The facilities and structures would be designed to blend with the environment and would meet the intent of the BEIG. The zip lines, canopy tours and observation tower would likely be at least partially visible above the canopy from within BSR's SUP area. The cables associated with the zip lines and canopy tours would be visible from viewpoints within BSR's SUP area, including aerial markers on the Sawmill Zip Line. The spherical markers will not be less than 36 inches in diameter and be evenly spaced at intervals of 200 feet or a similar distance. Each marker will be a solid color, such as aviation orange, white or yellow.[31] The aerial markers could be approximately 500 feet off the ground at the highest point. It is unlikely that any projects would alter the scenic characteristics of BSR's SUP area as viewed from the middleground and background distance zones.

[31] FAA, 2007

In the following analysis, all projects are considered in terms of how they "harmonize with the natural environment," as defined and discussed in FSM 2343.14. The reader is referred to Appendix B of this document for additional information.

Vista Haus and Independence SuperChair Top Terminal Site Improvements

The site improvements near the top terminals of the Independence SuperChair and Colorado SuperChair would improve the scenic quality of these areas. Refer to the site improvements located in the project file for more information. While there would be additional structures in these areas including canopy tour infrastructure, challenge courses, etc., the site improvements do not include any new structures. Any disturbed areas would be re-vegetated or otherwise landscaped to improve scenic quality. Figure 9 depicts a three-dimensional perspective of the top terminal area of the Independence SuperChair, including these site improvements.

These projects would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

These projects would enhance the natural appearance of the area and would not require significant modifications to topography.

Zip Lines

The proposed zip lines would consist of two cables spaced 8 feet apart. The potential visibility of the cables is minimal due to their small size. The top and bottom stations would be approximately 10 feet by 16 feet, and mid-stations would be approximately 10 feet by 32 feet. Structures would consist of wooden and/or natural-looking materials to the extent possible. Stations would be no higher than approximately 50 feet above ground level. Additional information about the design of these structures is included in the project file. Access roads approximately 12 feet wide would be constructed to facilitate construction, maintenance and emergency access. Overstory vegetation would be cleared where necessary to create a corridor 16 feet wide for zip line operation. Stations would be secured by guy wires, and buck and rail fencing would enclose the areas where the guy wires tie into the ground. Because zip line stations are located close to ski trails, fencing would be required at the least on the uphill side around stations and guy wires for safety purposes; however, the stations would be set against or in tree islands and buck and rail fencing would blend with the tree island background. Both zip lines would include a small shelter, approximately 10 feet by 10 feet, located adjacent to one of the zip line stations for protection against inclement weather. Final zip line design would dictate the exact location of the weather shelter.

The Sawmill Zip Line would require minimal overstory vegetation clearing. Little to no vegetation clearing would be required for the first segment between the first and second stations because both stations would be located in existing cleared areas, and the terrain is steep near both stations which would result in the cable quickly reaching heights greater than the canopy. Similarly, only minimal vegetation

clearing would be required near the third station. Due to this minimal vegetation clearing, the zip line corridor would not have a significant impact on scenic quality in the Project Area. This project would traverse over developed ski terrain and forested blocks between Peaks 8 and 9. The top station of the Sawmill Zip Line would be visible in the immediate foreground from the top terminal of the Peak 8 SuperConnect (refer to Figure 8). The structure would also likely be visible in the foreground from other locations primarily on Peaks 8 and 9; however, it would be constructed close to ground level and would be partially screened by nearby trees. The second station, located on Peak 9 near the *Volunteer* ski trail, would likely be visible in the foreground from locations on Peak 8. This station would also be constructed close to ground level and could be partially screened by vegetation. The third station, located adjacent to the *Four O'Clock* ski trail on Peak 8, would require some vegetation clearing and would be visible in the immediate foreground from the *Four O'Clock* ski trail and the foreground from locations across Peaks 8 and 9. Aerial markers suspended above the first zip line segment would be visible from locations throughout the SUP. The spherical markers will not be less than 36 inches in diameter and be evenly spaced at intervals of 200 feet or a similar distance. Each marker will be a solid color, such as aviation orange, white or yellow.[32] The zip line cable would be approximately 500 feet in height at the highest point. It is expected that these structures would not be distinguishable from the middleground and background distance zones.

The Peak 7 Zip Line would require some overstory vegetation clearing on Peak 7, generally in the vicinity of the developed ski trail network. This project would be visible in the immediate foreground from the Independence SuperChair and from ski trails on Peak 7, specifically *Pioneer* and *Claimjumper*. The top station would be visible in the immediate foreground from the top terminal of the Independence SuperChair. The top station would be approximately 10 to 20 feet above ground level and it could be partially screened by surrounding vegetation. The top station of the Peak 7 Zip Line is depicted in Figure 9. The second station would be located on the edge of the connecter trail between *Pioneer* and *Claimjumper* ski trails and would be visible to users of these trails (namely winter recreationalists) in the immediate foreground. This station could be taller than the surrounding canopy. While it could be partially screened by vegetation, it would be visible in the foreground from locations across Peak 7 and Peak 8. The third station could potentially be taller than the surrounding canopy and could require some vegetation clearing on the edge of the *Claimjumper* ski trail. The final two stations would be visible in the immediate foreground for skiers on the *Claimjumper* ski trail. The bottom station would be visible from the bottom terminal of the Independence SuperChair and other base area facilities. The bottom station is depicted in Figure 6. It is expected that these structures would not be distinguishable from the middleground and background distance zones.

The proposed zip lines would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. These projects would be consistent with the SIO of *Very Low*.

[32] Ibid.

Harmonizing with the Natural Environment

These projects would add incrementally to the characteristics of BSR's SUP area as a modified landscape. The zip lines are designed to minimize tree removal and utilize natural materials in their construction. BEIG concepts and criteria would be incorporated into the final design. These projects would be subordinate to the surrounding vegetation and landscape. The zip lines would be located adjacent to and on the periphery of existing snow sports infrastructure. Many of the zip line segments would not require vegetation clearing due to terrain or location within existing ski trails. While the stations would be visible primarily in the immediate foreground, some stations could be visible above the canopy in the foreground.

These projects would require small amounts of vegetation clearing (approximately 0.2 acre for the Sawmill Zip Line and 0.8 acre for the Peak 7 Zip Line) and grading (approximately 0.7 acre for the Sawmill Zip Line and 0.6 acre for the Peak 7 Zip Line).

Canopy Tours

The proposed canopy tours would consist of a single cable connecting a number of stations. While the height of each station would vary based on local topography, they would generally be approximately 30 feet tall. Each station would measure approximately 12 feet by 12 feet. The platforms would be constructed of wooden and/or natural-looking materials to the extent possible. Additional information about the design of these structures is included in the project file. Guy wires from each platform would be required for structural stability. Buck and rail fencing would enclose the areas where the guy wires tie into the ground. Because canopy tour stations are located close to ski trails, fencing would be required at the least on the uphill side around stations and guy wires for safety purposes; however, the stations would be set against or in tree islands and buck and rail fencing would blend with the tree island background. In addition, a small weather shelter, approximately 10 feet by 10 feet, would be constructed adjacent to one of the canopy tour stations for the Sawmill and Ore Bucket canopy tours to provide protection from inclement weather. Final canopy tour design would dictate the exact location of the weather shelter. Overstory vegetation clearing along the cable segments would be required to maintain a corridor approximately 8 to 10 feet wide. Because these projects would be located within the forest canopy, vegetation clearing would be required for most segments.

The Sawmill Canopy Tour would generally be located in the vicinity of existing ski trails and lift infrastructure on Peak 8. The project would be visible in the immediate foreground for skiers on the *Tiger* ski trail, which the canopy tour would traverse a number of times, as well as *Frosty's Freeway*, *Goodbye Girl* and *Mach 1*. Stations and cable segments would also be visible from the Peak 8 SuperConnect. The top station of the Sawmill Canopy Tour would be visible from the top terminal of the Peak 8 SuperConnect. The second station is visible in Figure 8, downhill from the top station of the Sawmill Zip Line on the far side of the ski trail. The bottom station would utilize the same structure as the final station of the Sawmill Zip Line. Because the stations of the canopy tours would generally be approximately the

same height as surrounding trees, it is unlikely that these projects would be visible and distinguishable in the middleground and background distance zones. However, the vegetation clearing for the zip line corridors would likely be visible in the foreground distance zone.

The Ore Bucket Canopy Tour would be located in a generally undeveloped portion of Peak 7. The top station would be located northwest of the top terminal of the Independence SuperChair, and the first three or four towers could be visible from the top terminal area (refer to Figure 9). Stations and cable segments would traverse and be visible in the immediate foreground from the *Ore Bucket*, *Monte Cristo* and *Angels Rest* ski trails. Some stations could also be visible from the Independence SuperChair. This area is sparsely vegetated so clearing for the corridors would likely be less visible. Because the stations of the canopy tours would generally be approximately the same height as surrounding trees, it is unlikely that these projects would be visible and distinguishable in the middleground and background distance zones.

The proposed canopy tours would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. These projects would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

The canopy tours are designed to avoid tree removal, blend with the forest canopy and utilize natural materials in their construction (including the trees themselves). BEIG concepts and criteria would be incorporated into final design.

The canopy tours would be situated in discrete, forested locations located adjacent to and on the periphery of existing snow-sports infrastructure. Additionally, the canopy tours would operate within narrow corridors (less than an average ski trail) limiting their scenic footprint and requiring limited tree removal. The stations would be approximately the same height as the surrounding overstory vegetation and would therefore be partially screened which would make them more visually consistent with and subordinate to the vegetation and landscape of the area.

These projects would require small amounts of vegetation clearing (approximately 1.1 acres for the Sawmill Canopy Tour and 1.2 acres for the Ore Bucket Canopy Tour) and grading (approximately 0.5 acre for the Sawmill Canopy Tour and 0.8 acre for the Ore Bucket Canopy Tour).

Challenge Courses

The challenge courses would be located in a sparsely-vegetated area near the top terminal of the Colorado SuperChair. The project would be located slightly north of the top terminal, between the chairlift and the existing avalanche explosive cache area. These structures would be approximately 40 feet tall. The challenge courses would be visible in the immediate foreground/foreground from the Colorado SuperChair, the Vista Haus, and skiers descending from Horseshoe Bowl. See Figure 7 for a visual simulation of this project as seen from the Vista Haus. The final design of the challenge courses would incorporate guidance contained in the BEIG, and would blend with surrounding vegetation and landscape

features to the extent possible. However, the sparse vegetation in this area would limit the amount of potential screening. This project would be constructed on a slope and would include multiple levels and an irregular shape, as opposed to a "box-type" structure. A small storage shelter would be constructed of wooden and/or natural-looking materials. This structure would likely resemble other similar storage structures currently found across the SUP area. In Figure 7, the shelter is not visible due to the amount of low vegetation present.

The challenge courses would be located in an area of BSR's SUP that is currently developed and disturbed. It is unlikely that any components of this project would be visible and distinguishable from the middleground and background distance zones.

The proposed challenge courses would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. These projects would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

Due to the types of materials proposed for this project, it is likely that this project would be less visually intrusive than other infrastructure (e.g., chairlifts) already present throughout BSR's SUP area. The final design of the project would incorporate natural and natural-looking materials, and would consider the surrounding vegetation and landscape. Additionally, the height of the project would likely be similar to or less than the height of surrounding vegetation, and would thus be partially screened and visually subordinate to the surrounding landscape. This project would require minimal modifications to topography (approximately 0.5 acre of grading).

Proposed and Realigned Mountain Biking Trails and Skills Course

The proposed and realigned mountain biking trails would have minimal impacts on scenic quality. These trails would be located in developed areas of BSR's SUP area and would look very similar to the existing biking trails at BSR, which are not visible beyond the foreground distance zone. While the construction of these trails would require some vegetation clearing (approximately 11.5 acres), the areas of vegetation clearing would be very narrow corridors that would not be visible from beyond the immediate foreground (and then, only from certain angles). Overlook areas would be constructed to provide opportunities for guests to rest, view the scenery and take photographs, provide shelter from inclement weather and learn from educational signage. Approximately five overlooks would be built across the trail network and would be a minimal, three-sided shelter of wood or other natural-looking materials with a bench, approximately 10 feet by 10 feet. The overlook areas would not be visible from beyond the immediate foreground. The mountain biking skills course, located near the top terminal of the Independence SuperChair, would be visible in the immediate foreground and foreground from the Independence SuperChair. This project would include a dirt track with jumps, bumps and some low-profile obstacles constructed of wood or stone. The skills course is depicted in Figure 9.

The proposed and realigned mountain biking trails and skills course would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. These projects would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

Mountain biking trails are found throughout NFS lands and are generally considered to be visually subordinate to the vegetation and landscape. The proposed bike skills course would be visually subordinate to the ski area infrastructure located near the top terminal of the Independence SuperChair. These projects would require some vegetation clearing (approximately 11.5 acres) and grading (approximately 18.2 acres), but these modifications of topography would not result in significant impacts to scenic quality.

Hiking Trails

As with the mountain biking trails discussed above, the proposed hiking trails would have minimal impacts on scenic quality. These projects would include a small amount of vegetation clearing (approximately 0.7 acre) in order to clear a trail approximately 4 feet wide. It is anticipated that these projects would not be visible from viewpoints beyond the foreground distance zone.

The proposed hiking trails would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. These projects would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

Hiking trails are found throughout NFS lands and are generally considered to be visually subordinate to the vegetation and landscape. The proposed hiking trails would include minimal vegetation clearing (approximately 0.7 acre) and would not require significant modifications to topography.

Off-Highway Vehicle Tours

Off-Highway Vehicle (OHV) Tours would not require any additional infrastructure, vegetation clearing, or ground disturbance. The existing OHV tours and other vehicular traffic in BSR's SUP (e.g., maintenance and construction vehicles) are not considered to have scenery impacts, and this proposed project would be no different. Thus, this project would have no impact on the scenic quality of BSR's SUP area. OHV tours are currently offered along the Peak 7/8 Access Road, and while these tours would be expanded to utilize other existing roads and the proposed Upper Four O'Clock Road realignment to reach 6 Chair and the Imperial Express, this project would have short-term scenery impacts, primarily within the immediate foreground and foreground distance zones.

This project would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

This project would not require any new infrastructure, vegetation clearing or grading.

Upper Four O'Clock Road Realignment

The realignment of the Upper Four O'Clock Road above the Vista Haus could improve the scenic quality of this area. As discussed above, the alignment of the existing road is visible from several viewpoints due to its steep, exposed route south of Cucumber and Horseshoe bowls. The rehabilitation of the existing alignment would address erosion concerns and would be more sustainable in the long-term, and could make the road less visible. Grading would be required to construct the new road. Since this realignment would have similar or fewer scenery impacts compared with the current alignment, this project would not significantly alter the scenic quality of the area and would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

This analysis criterion is not relevant to this project because this project is not a summer activity.

Vista Haus Deck and Climbing Wall, and Peak 7 Hut Expansions

The Vista Haus deck would be expanded by approximately 1,500 square feet on the south side of the building. The Peak 7 Hut would be expanded by approximately 500 square feet. The expanded Peak 7 Hut is depicted in Figure 9. These structures would be consistent with the intent of the BEIG. It is not expected that these expansions would result in changes to scenic quality beyond the foreground distance zone. The proposed expansions would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. These projects would be consistent with the SIO of *Very Low*.

A climbing wall approximately 40 feet tall would also be constructed adjacent to the Vista Haus. It is unlikely that this project would be visible and distinguishable beyond the foreground distance zone. The Vista Haus area is already defined by ski area infrastructure and this project would add incrementally to that scenic character. This project would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

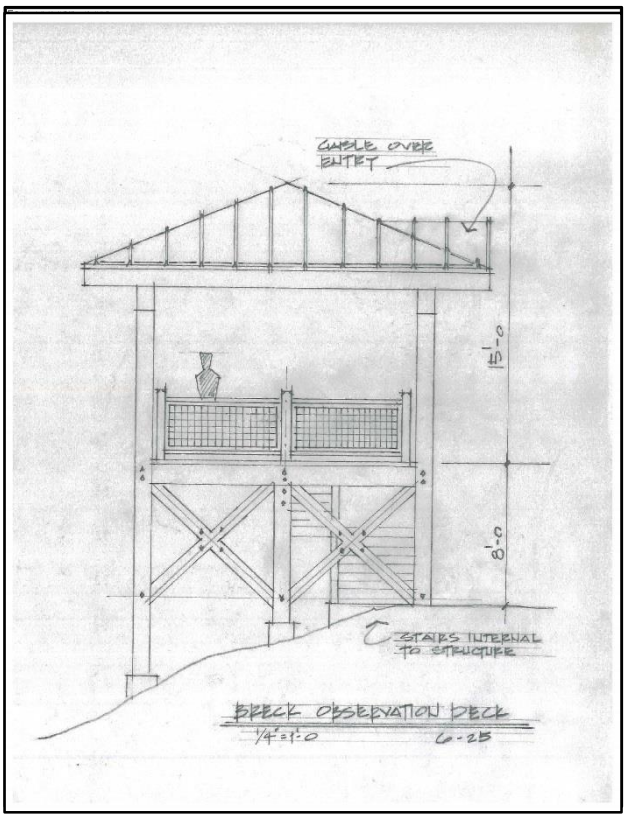
These projects would require approximately 0.5 acre of grading. The projects would be visually consistent with existing facilities.

Observation Tower

The proposed observation tower would be located on Peak 8. See Illustration 3B-1 for an example of an observation tower design. The observation tower would be constructed of natural materials such as wood and/or stone and would be consistent with the intent of the BEIG. The tower would be approximately 30 feet tall, and would have a footprint of approximately 20 feet by 20 feet. Some fencing could be installed around the structure for skier safety purposes. The structure would be visible in the immediate foreground and foreground for skiers on the T-Bar and in Horseshoe Bowl. It is not anticipated that the structure would be visible from the top terminal of the Colorado SuperChair or the Independence SuperChair or any locations beyond the foreground distance zone. The tower would likely be partially screened by surrounding overstory vegetation.

The proposed observation tower would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. The project would be consistent with the SIO of *Very Low*.

Illustration 3B-1:
Observation Tower Typical



Harmonizing with the Natural Environment

The proposed observation tower would resemble other structures located across BSR's SUP, including lodges, warming huts, etc. The structure would be designed to use natural materials whenever possible and would be partially screened by overstory vegetation. However, the structure would change the scenic character of the Horseshoe Bowl area by introducing a man-made structure into an otherwise primarily natural setting.

The structure would require some modification of topography (approximately 0.1 acre of vegetation clearing and grading).

Existing Chairlift Operations, Scenic Chairlift Rides and Activities Access

The summer operation of additional chairlifts would have no impact on scenic resources. These projects would require no new infrastructure, vegetation clearing, or ground disturbance.

Alternative 3

The direct and indirect environmental consequences for Alternative 3 would be identical to those described above for the Proposed Action, with the following exceptions and modifications.

Zip Lines

The Sawmill Zip Line is not included in Alternative 3. Impacts from the Peak 7 zip line would be identical to those described above for the Proposed Action.

Canopy Tours

The Ore Bucket Canopy Tour is not included in Alternative 3. The Claimjumper Canopy Tour is included as an alternative alignment. The Sawmill Canopy Tour on Peak 8 would be identical to the description provided in Alternative 2.

Claimjumper Canopy Tour

The scenery impact of this project would be similar to the impacts of the Sawmill and Ore Bucket canopy tours, discussed above under the Proposed Action. The Claimjumper Canopy Tour would be located in the vicinity of existing ski trails and lift infrastructure on Peak 7. The project would be visible in the immediate foreground for skiers on the *Pioneer, Claimjumper* and *Wirepatch* ski trails, which the canopy tour would cross. Stations and cable segments would also be visible from the Independence SuperChair. Because the stations of the canopy tours would generally be approximately the same height as surrounding trees, it is unlikely that these projects would be visible and distinguishable in the middleground and background distance zones. Because this project would be located within the forest canopy, vegetation clearing would be required for most segments. Because the canopy tour stations are located close to ski trails, fencing would be required at the least on the uphill side around stations and guy wires for safety purposes; however, the stations would be set against or in tree islands in most cases and buck and rail fencing would blend with the tree island background.

The Claimjumper Canopy Tour would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. This project would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

Refer to the discussion under Alternative 2. This project would require small amounts of vegetation clearing (approximately 0.7 acre) and grading (approximately 0.7 acre).

Proposed and Realigned Mountain Biking Trails

The mountain biking trails in Alternative 3 would have a similar impact to scenic quality to those discussed above under the Proposed Action. Alternative 3 excludes one trail segment that is included in Alternative 2, and utilizes a different alignment for the Peaks trail connector. Otherwise the mountain biking trails in Alternative 3 are identical to those in Alternative 2. Overall, the scenic impact of these

mountain biking trails would be similar to, and slightly less than, those discussed above under Alternative 2.

The proposed and realigned mountain biking trails and skills course would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. These projects would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

Refer to the discussion under Alternative 2. These projects would require some vegetation clearing (approximately 8.3 acres) and grading (approximately 15.5 acres).

Hiking Trails

Alternative 3 does not include a hiking trail to the lake below the Lake Chutes. All other hiking trails are identical to those in Alternative 2. Overall, the scenery impact of the proposed hiking trails would be similar to, and slightly less than, those discussed above under Alternative 2.

The proposed hiking trails would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. These projects would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

Refer to the discussion under Alternative 2. The proposed hiking trails would include minimal vegetation clearing (approximately 0.6 acre).

Off-Highway Vehicle Tours

Alternative 3 does not include OHV tours on the Upper Four O'Clock Road to access the top of 6 Chair. There would be no additional scenery impacts beyond those resulting from existing OHV tours on the Peak 7/8 Access Road.

Observation Tower

Alternative 3 includes an alternate location for the observation tower in response to scenery concerns with the location in the Proposed Action. The observation tower in Alternative 3 would be located approximately 500 feet north of the Colorado SuperChair top terminal adjacent to the previously-disturbed avalanche explosive cache. The design would be identical to that discussed above under the Proposed Action. The structure would likely be visible in the foreground from the Colorado SuperChair, when compared with Alternative 2. Because this location in previously disturbed and the scenic character is defined by ski area infrastructure, the observation tower would add incrementally to this character. Its location in a previously-disturbed area would lessen the scenic impact, when compared with Alternative 2.

The proposed observation tower would add incrementally to the scenic character of BSR's SUP area as a developed recreation site. The project would be consistent with the SIO of *Very Low*.

Harmonizing with the Natural Environment

As discussed above under Alternative 2, the observation tower would resemble other structures located across BSR's SUP, including lodges, warming huts, etc. The structure would be designed to use natural materials whenever possible. This project would be located in an area defined by existing ski area infrastructure, and would be visually consistent with and subordinate to the landscape.

The structure would require some modification of topography (approximately 0.1 acre of vegetation clearing and grading).

Existing Chairlift Operations, Scenic Chairlift Rides and Activities Access

The summer operation of additional chairlifts would have no impact on scenic resources. These projects would require no new infrastructure, vegetation clearing or ground disturbance.

CUMULATIVE EFFECTS

The effects analyzed in the cumulative effects section apply to all alternatives, including the No Action Alternative. For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in this document.

Scope of the Analysis

Temporal Bounds

The temporal bounds for this cumulative effects analysis of scenery resources extend from 1961 when BSR first opened as a ski area through the foreseeable future in which BSR can be expected to operate.

Spatial Bounds

The spatial bounds for this cumulative effects analysis of scenery resources are limited to public and private lands in the vicinity of the BSR SUP area.

Past, Present, and Reasonably Foreseeable Future Projects

Evidence of developed recreation at BSR dominates the scenic character of the Town of Breckenridge. Past development of BSR over the past five decades has involved overstory vegetation clearing and grading for the creation of trails and chairlifts, as well the construction of chairlifts, roads, infrastructure, buildings, and, more recently, the installation of summer and multi-season recreational activities. These alterations have cumulatively impacted the scenic character of the landscape over time, with many of these activities pre-dating both the original Visual Management System (VMS) and newer SMS guidance. Some of the buildings at BSR were constructed before the establishment of the BEIG. However, BSR will

increasingly move toward a consistent architectural theme as new facilities are constructed. Finally, the mountain pine beetle epidemic killed thousands of pine trees throughout BSR's SUP area, which has affected and will continue to affect the scenic characteristics of the Project Area until understory vegetation becomes dominant and dead standing trees either fall or are removed.

While the scenic characteristics of BSR's SUP area are primarily defined by decades of ski resort projects and development, persistent residential and commercial development continues to impact the landscape of the Town of Breckenridge and Summit County. Developments at ski areas throughout Summit County (including Keystone, Copper Mountain and Arapahoe Basin) also contribute to the scenic characteristics of the wider community. These developments continue to gradually alter the scenic quality of the landscape and make it less natural-looking. The mountain pine beetle epidemic and subsequent forest health projects have also had significant impacts on the scenic characteristics in the Analysis Area, including public and private lands throughout the Town of Breckenridge and Summit County.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The addition of summer and multi-season activities/infrastructure in the SUP area would represent irretrievable effects to scenic resources at BSR. However, this commitment of the scenic resource is not irreversible because facilities could be removed and, in time, areas could be reclaimed and revegetated, restoring their natural appearance.

C. TRAFFIC

SCOPE OF THE ANALYSIS

This chapter analyzes ski area access, traffic and parking related to BSR's existing and proposed multi-season recreation offerings. The scope of this analysis includes segments of State Highway 9 (Highway 9), Ski Hill Road/Lincoln Ave and Main Street within the Town of Breckenridge and its surrounding area. The road segments studied for the traffic, parking and ski area access resources include:

- Highway 9 between the Boreas Pass Road intersection (mile marker 86.2), and the Tiger Road intersection (mile marker 90.3).
- Ski Hill Road/Lincoln Avenue from Main Street to the existing Peak 7/8 base; and
- Main Street between South Park Avenue and North Park Avenue intersections.

Because neither action alternative is likely to increase winter visitation to the Town of Breckenridge and BSR, only summer traffic and parking are addressed in this chapter. Information on BSR's winter traffic generation and parking requirements can be found in the *2012 Breckenridge Ski Resort Peak 6 Final Environmental Impact Statement* (Record Of Decision signed, August 2012). However, certain figures relating to traffic and parking generated for the 2012 analysis are referenced in this chapter.

Under each action alternative, 90 percent of new summer visits to BSR are assumed to be made by visitors who are already coming to the region. These visits represent new visitors to BSR but not new visitors to the Town of Breckenridge. The remaining 10 percent of new summer visits to BSR are assumed to be made by new visitors to the region—these represent visitors who decide to come to BSR and Summit County as a result of the projects included in the action alternatives. The BSR summer operating season is assumed to be approximately three months, or 90 days, long.

AFFECTED ENVIRONMENT

The Town of Breckenridge, BSR and Summit County are popular year-round destinations for regional, national and international visitors. The Town of Breckenridge averages approximately three million visitors annually.[33] Other resorts and towns in Summit County also offer summer recreational activities and events. Although the primary attraction to BSR is for winter recreation (BSR averages 1.6 million skier visits annually), summer visitation at BSR has experienced consistent growth over the past five years, with approximately 18 percent annual growth since 2010. The Breckenridge Summer Fun Park now records approximately 175,000 summer visits, with approximately 80 percent being overnight visitors and 20 percent being day users.

[33] Breckenridge Ski Resort, 2010

Ski Area Access

Highway 9

BSR is accessed via Highway 9, the principal north-south corridor connecting Breckenridge to Interstate 70 (I-70) about 10 miles north in Frisco, and connecting to US 285 in Fairplay (Park County) approximately 23 miles south over Hoosier Pass. Colorado Department of Transportation (CDOT) classifies Highway 9 generally as a Regional Arterial for access management purposes. In the Town of Frisco, Highway 9 is a four-lane road with a raised median and several signalized intersections. Through a series of improvements starting in 2004, key segments of the former two- and three-lane highway between the Towns of Breckenridge and Frisco have been widened to four lanes, with right and left turn auxiliary lanes at key intersections. These improvements are still in progress.

The vast majority of the Town of Breckenridge and BSR visitors arrive via Highway 9 from the north, accessing the area from I-70 and the Front Range. A smaller number of guests arrive via Highway 9 from the south, arriving from cities such as Colorado Springs, Pueblo and other population centers south of Denver.

Bus Service

The consolidated Town and BSR "Free Ride" bus service provides connections from residential neighborhoods and parking lots to the Peaks 7, 8 and 9 ski portals and the Breckenridge Station. The Breckenridge Station intermodal center is central to Town and BSR access. Eight in-town Free Ride circulator routes access many locations within the Town and also connect with Summit Stage routes to access other parts of Summit County. Additionally, several lodging providers offer courtesy van service for their skiing guests. BSR reviews its transportation program annually and modifies the program in order to improve service between the Town and BSR.

Traffic

As stated above, Highway 9 is the sole route for traffic entering Breckenridge from the north and south. For the purpose of this analysis, Highway 9 traffic data for the year 2013 will represent the existing environmental baseline.

The following definitions are used in this analysis:

- "AADT" means the annual average two-way daily traffic volume. AADT represents the total traffic on a section of roadway for the year, divided by 365. It includes both weekday and weekend traffic volumes. Raw data is processed and converted to AADT volumes. AADT can be adjusted to compensate for monthly and daily fluctuations in traffic; the basic intent being to provide traffic volumes which best approximate the use of a given highway section for a typical day of year.
- "AVO" means average vehicle occupancy.

- "DHV" means design hourly volume which is the total traffic in both directions during the 30th highest hourly volume of the year.
- "Trip" means a single or one-direction vehicle movement with either the origin or the destination inside the Analysis Area. A vehicle leaving the highway and entering a property is one trip. Later, when the vehicle leaves the property it is a second trip.
- "VPD" means vehicles per day, which is the total two-way daily traffic volume on a section of roadway.

Average Annual Daily Traffic (AADT)

Highway 9 at Tiger Road

Highway 9, as it approaches the Town of Breckenridge from the north, has a permanent Automatic Traffic Recorder (ATR) located just south of Tiger Road (approximately 1 mile north of the Highway 9 Roundabout at Park Avenue). This ATR records directional traffic volumes by hour of day, for the entire year.[34] Traffic in other locations along Highway 9 in Breckenridge is recorded annually.[35] AADT near the south end of Breckenridge, south of Boreas Pass Road, totals about 38 percent of the traffic volume on Highway 9 at Tiger Road.

Table 3C-1 provides AADT data along Highway 9 at several points within the Analysis Area. For all locations, traffic volumes have increased since 2009. There was a slight decline in AADT south of Tiger Road in 2011, but that location showed a 5 percent increase in traffic volume between 2009 and 2013.

Table 3C-1:
Five-Year AADT on Highway 9 within the Study Area

Count Location on Highway 9	2009	2010	2011	2012	2013
on SH 9, s/o Tiger Rd	18,200	18,000	17,750	18,200	19,000
on N Park Ave, w/o Main St	9,300	--	--	--	11,000
on N Park Ave, n/o Watson Ave	10,500	--	--	--	14,000
on N Park Ave, s/o Ski Hill Rd	8,800	--	--	--	11,000
on S Park Ave, w/o Main St	8,300	--	--	--	8,800
on Main St, s/o S Park Ave	11,800	--	--	--	12,000
on Main St, n/o Boreas Pass Rd	10,400	--	--	--	11,000
on Main St, s/o Boreas Pass Rd	7,000	--	--	--	7,300

Source: CDOT Traffic Data Explorer (http://dtdapps.coloradodot.info/otis/TrafficData)

[34] CDOT, 2014
[35] Ibid.

Main Street

As shown in Table 3C-1, Main Street has also experienced increases in AADT over the past five years. The increases in traffic volume on Main Street have not been as significant as those on Park Avenue.

Ski Hill Road

The BreckConnect Gondola and limited public parking supply at the Peak 8 base area have reduced traffic use of Ski Hill Road from previous levels. No traffic counts were conducted on Ski Hill Road because no long-term increase in traffic is projected.

Table 3C-2 shows current and projected AADT for Highway 9 within the Analysis Area, as well as anticipated percent increase for each traffic counter location.

Table 3C-2:
2013 and 2034 Projected AADT on Highway 9

Traffic Counter Location	AADT 2013	Design Hourly Volume[a] (%)	Projected AADT 2034	Percent Increase (%)
on SH 9, s/o Tiger Rd	19,000	12	23,190	21
on N Park Ave, w/o Main St	11,000	12	11,462	4
on N Park Ave, n/o Watson Ave	14,000	11	15,470	11
on N Park Ave, s/o Ski Hill Rd	11,000	12	13,079	19
on S Park Ave, w/o Main St	8,800	13	9,354	6
on Main St, s/o S Park Ave	12,000	12	15,150	26
on Main St, n/o Boreas Pass Rd	11,000	12	13,195	20
on Main St, s/o Boreas Pass Rd	7,300	12	10,826	48

Source: Colorado Department of Transportation, 2014
[a] Design Hourly Volume is the thirtieth highest hourly traffic volume for the design year, commonly 20 years from the year of construction.

Peak Daily/Hourly Traffic Volumes on Highway 9

Vehicle travel in this area is significantly affected by the time of year, with higher daily and hourly volumes occurring during the winter season. The most recent traffic volume data on Highway 9 south of Tiger Road (for the year 2013) shows the five highest volume days were all winter season ski days. Table 3C-3 depicts the 25 highest days of total daily traffic volume recorded on Highway 9 at the Tiger Road ATR. Using the peak travel day volume as an indexed base, the highest summer day exhibits approximately 95 percent of the peak traffic volume. Days during summer months account for 8 of the 25 busiest days recorded in 2013.

Table 3C-3:
25 Highest Traffic Volume Days
2013 on Highway 9 s/o Tiger Road

Rank	Date	Day	Daily TOTAL	Index (%)
1	12/30	Mon	28,794	100.0
2	12/27	Fri	28,576	99.2
3	1/26	Sat	28,273	98.2
4	12/28	Sat	27,535	95.6
5	2/16	Sat	27,522	95.6
6	7/5	Fri	27,237	94.6
7	7/26	Fri	27,106	94.1
8	12/26	Thu	26,863	93.3
9	7/3	Wed	26,749	92.9
10	2/2	Sat	26,638	92.5
11	12/31	Tue	26,507	92.1
12	8/2	Fri	25,954	90.1
13	8/9	Fri	25,740	89.4
14	1/19	Sat	25,714	89.3
15	2/23	Sat	25,632	89.0
16	2/15	Fri	25,594	88.9
17	3/29	Fri	25,341	88.0
18	2/22	Fri	25,178	87.4
19	2/8	Fri	25,137	87.3
20	7/19	Fri	25,092	87.1
21	3/2	Fri	25,072	87.1
22	8/16	Fri	25,039	87.0
23	7/6	Sat	24,968	86.7
24	3/28	Thu	24,875	86.4
25	7/25	Thu	24,792	86.1

Peak hour traffic flow is used in determining operational level of service of the roadway; however, highways are designed to accommodate the 30th highest hourly volume approximately 20 years from build-out; not the peak hour traffic flow.[36] The DHV on Highway 9 south of Tiger road is 2,280 vehicles per hour.[37] The three peak periods during a given day are recognized as: **AM** (8:00 a.m. to 10:00 a.m.), **Mid-day** (10:00 a.m. to 2:00 p.m.) and **PM** (3:00 p.m. to 6:00 p.m.). Table 3C-4 summarizes the peak hour volumes experienced on Highway 9 on the peak summer day, Friday, July 5th, 2013. On this day, the AM peak hour was 9:00 a.m. to 10:00 a.m., mid-day peak hourly volumes occurred from 11 a.m.to

[36] TDOT, 2010
[37] CDOT, 2014

12 p.m. and the late afternoon peak was 5:00 p.m. to 6:00 p.m. These hourly volumes account for 6 percent, 8 percent, and 8 percent, respectively, of the daily total volume of 27,237 vehicles.

Table 3C-4:
Peak Traffic Volume Experience
Saturday, January 30, 2010 on Highway 9 s/o Tiger Road

Hour of Day	Peak Hour Traffic Volume			% of Daily Total
	NB	SB	Total	
AM Peak Hour	988	709	1,697	6
Mid-day Peak Hour	1,100	1,047	2,147	8
PM Peak Hour	1,066	1,114	2,180	8

Source: CDOT website, Traffic Counts.

The Breckenridge summer peak traffic periods indicate a busy day traffic congestion would be experienced over a mid to late afternoon three- to four-hour period on busy days. However, the total peak hour traffic volume on July 5, 2013—the busiest day of the summer season—did not exceed the DHV during peak traffic hours.

Parking

Parking for BSR and Town visitors is currently provided by ski area parking lots, town lots and on-street parking. Generally in summer, the in-town parking lots are intended for destination guests with lodging outside of Town. On-street parking is intended for those visiting Main Street business establishments. Other additional private lots in Town, not included in these counts, are intended for local business employees and patrons. Presumably, visitors staying at in-town lodging that is convenient to one of the free circulator routes would use parking provided by the respective lodging or would walk.

BSR/Town of Breckenridge Parking Management Plan

Approximately 1,520 spaces are currently provided in the combined total of the North and South Gondola, Gold Rush and Beaver Run lots. The Town of Breckenridge currently provides an additional 1,560 parking spaces for visitors in smaller lots throughout Town (including the F-Lot, East Sawmill and Tiger Dredge). An additional 500+ spaces are available in the expandable Satellite Lot on Airport Road, to accommodate demand on high visitor days and offer a parking alternative to the close-in lots. The Satellite Lot provides overflow parking on days when full parking conditions are anticipated in the Town core, typically only during the ski season.

Town lots provide parking in 17 defined locations throughout Town, and may charge fees depending on the season. On-street parking serves businesses and resort visitors along Main, Ridge and French Streets, and Lincoln and Adams Avenues, referred to here as zones. Because the Town and BSR's parking management plan accounts for peak winter days, parking supply is rarely exceeded throughout the

remainder of the year, including during summer months. Table 3C-5 summarizes the available day skier parking supply.

Table 3C-5:
Parking Supply by Provider

Parking Providers	# of Lots/Zones	Total Supply
Ski Area Parking Lots	4	1,520
Ski Area Satellite Parking Lot	1	500
City Parking Lots	17	1,560
On-Street Spaces[a]	7	577
Total Supply Available to Visitors		**4,157**

Source: Breckenridge Parking Sheet, 2013/14
[a] zones counted

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Independent of projects proposed at BSR, traffic along Highway 9 is expected to increase by 20 percent or more by 2034 due to anticipated growth within Summit County. Table 3C-6 estimates visitation to BSR during summer months associated with each alternative. It also includes new visitation to the area. As mentioned above, approximately 10 percent of the increased visitation is expected to be made by those who are new to the region. This number correlates to additional traffic expected in the area during summer months. These estimates have been used for the following analysis of traffic impacts under alternatives 1, 2 and 3.

Table 3C-6:
Increased Annual Summer Visitation

Alternative	Estimated Visitation	Visitation by Those New to the Region
Alternative 1	175,000	0
Alternative 2	325,000	15,000
Alternative 3	300,000	12,500

Alternative 1 – No Action

Under the No Action Alternative, no additional summer or year-round recreational activities are proposed within BSR's SUP area. As discussed in the Affected Environment, the summer activities offered at BSR are a popular attraction in Summit County, but other resorts and towns offer some of the similar opportunities as well. New visitation to NFS lands under the No Action Alternative is expected to experience minimal growth as no projects would be built on NFS lands.

Traffic

Because minimal growth to visitation of NFS lands is expected to occur under Alternative 1, no significant increases in traffic would be attributable to the summer activities at BSR. The number of vehicles associated with BSR's summer guests would likely be higher on weekends and during holiday periods (consistent with existing traffic counts), and presumably lower during mid-week periods.

In 2013, the DHV was exceeded during peak hours on peak winter visitation days. Peak hours on peak summer visitation days did not exceed the DHV on Highway 9. As residential growth continues, it is anticipated that the number of peak days each season would increase, resulting in more days when peak traffic hours would exceed the DHV on Highway 9, possibly including peak summer days.

Parking

No increase in parking demand is expected to occur under Alternative 1. Parking demand will continue to be met by existing parking supply within the Town and at BSR.

Alternative 2 – Proposed Action

Under Alternative 2, an increase of 15,000 new summer visitors to the Town and BSR is expected to occur upon full project implementation (assuming 90 percent of guests are already coming to Breckenridge and 10 percent are new visitors). This equates to an increase of approximately 167 visitors per day throughout the summer season.

Table 3C-7:
Alternative 2 Summer Traffic and Parking Associated with BSR Activities

Alternative	Existing	Anticipated
Annual BSR Summer Visits	175,000	325,000
New BSR Summer Visits	--	15,000
Total # of personal vehicles associated with BSR's additional day use visitors throughout the summer season (assumes AVO of 3.0) (vehicles)	--	5,000
Average Additional Daily Vehicles associated with BSR's day use summer activities, two-directions (90 days) (vehicles)	--	56
Average Additional Daily Traffic on Highway 9 associated with BSR's day use summer activities, two-directions (90 days) (vehicles)	--	112

Traffic

As is currently the case at BSR during the summer, expanded opportunities and activities across the SUP area under Alternative 2 would primarily serve to attract visitors already coming to the region, or for those already traveling through the area. However, due to the mix of existing and proposed activities, BSR is likely to attract additional summer visitation (estimated at approximately 10 percent of total increase), with commensurate traffic increases.

Upon full implementation, average additional daily vehicles on Highway 9 attributable to BSR's summer operations under Alternative 2 would total approximately 56 vehicles per day in one direction, or 112 vehicles in two directions. This increase equates to just over 12 additional vehicles per hour between roughly 9:00 a.m. and 6:00 p.m., would be minimal compared to existing traffic volumes, but would likely be higher on weekends and holidays. Over the summer season, the additional traffic would result in a 0.6 percent increase in traffic over existing AADT on Highway 9 at Tiger Road (assuming all traffic from BSR's summer activities passes through the Highway 9 and Tiger Road intersection).

In 2013, the DHV was exceeded during peak hours on peak winter visitation days. Peak hours on peak summer visitation days did not exceed the DHV on Highway 9. As residential growth continues and with the small amount of additional traffic attributable to projects proposed under Alternative 2, it is anticipated that the number of peak days each season would increase, resulting in more days when peak traffic hours would exceed the DHV on Highway 9, possibly including peak summer days.

Parking

The increase in parking demand expected under Alternative 2 would be met by existing Town and BSR parking lots. Because the supply of parking is sufficient for peak winter visitation, it would also be sufficient for peak summer visitation, which has been historically lower. The average increase of 56 vehicles per day attributable to projects in Alternative 2 would be met by existing parking supply.

Alternative 3

Under Alternative 2, an increase of 12,500 new summer visitors to the Town and BSR is expected to occur upon full project implementation (assuming 90 percent of guests are already coming to Breckenridge and 10 percent are new visitors). This is attributable to differences in the activities offered between Alternative 2 and Alternative 3. This equates to an increase of approximately 139 visitors per day throughout the summer season.

Table 3C-8:
Alternative 3 Summer Traffic and Parking Associated with BSR Activities

Alternative	Existing	Anticipated
Annual BSR Summer Visits	175,000	300,000
New BSR Summer Visits	--	12,500
Total # of personal vehicles associated with BSR's additional day use visitors throughout the summer season (assumes AVO of 3.0) (vehicles)	--	4,167
Average Additional Daily Vehicles associated with BSR's day use summer activities, two-directions (90 days) (vehicles)	--	46
Average Additional Daily Traffic on Highway 9 associated with BSR's day use summer activities, two-directions (90 days) (vehicles)	--	92

Traffic

As is currently the case at BSR during the summer, expanded opportunities and activities across the SUP area under Alternative 3 would primarily serve to attract visitors already coming to the region, or for those already traveling through the area. However, due to the mix of existing and proposed activities, BSR is likely to attract additional summer visitation (estimated at approximately 10 percent of total increase), with commensurate traffic increases.

Upon full implementation, average additional daily vehicles on Highway 9 attributable to BSR's summer operations under Alternative 2 would total approximately 46 vehicles per day, or 92 vehicles in two directions. This increase equates to just over 10 additional vehicles per hour between roughly 9:00 a.m. and 6:00 p.m., and would be minimal compared to existing traffic volumes, but would likely be higher on weekends and holidays. Over the summer season, the additional traffic would result in a 0.5 percent increase in traffic over existing AADT on Highway 9 at Tiger Road (assuming all traffic from BSR's summer activities passes through the Highway 9 and Tiger Road intersection).

In 2013, the DHV was exceeded during peak hours on peak winter visitation days. Peak hours on peak summer visitation days did not exceed the DHV on Highway 9. As residential growth continues and with the small amount of additional traffic attributable to projects proposed under Alternative 3, it is anticipated that the number of peak days each season would increase, resulting in more days when peak traffic hours would exceed the DHV on Highway 9, possibly including peak summer days.

Parking

The increase in parking demand expected under Alternative 3 would be met by existing Town and BSR parking lots. Because the supply of parking is sufficient for peak winter visitation, it would also be sufficient for peak summer visitation, which has been historically lower. The average increase of 46 vehicles per day attributable to projects in Alternative 3 would be met by existing parking supply.

CUMULATIVE EFFECTS

Scope of the Analysis

The effects analyzed in the cumulative effects section apply to all alternatives, including the No Action Alternative. For a detailed description of past, present, and reasonably foreseeable future projects, the reader is referred to Appendix A in this document. The following projects are expected to cumulatively have short- and long-term effects on traffic and parking.

Temporal Bounds

The temporal bounds for this cumulative effects analysis extend from 1986 (first year of CDOT automated traffic counter installation near Tiger Road) through Town build-out and to 2034.

Spatial Bounds

The spatial bounds of this cumulative effects analysis are limited to I-70, Highway 9, and Ski Hill Road.

Past, Present, and Reasonably Foreseeable Future Projects

- BSR Projects
- Implementation of the BreckConnect Gondola
- Ongoing Highway 9 Improvements
- I-70 Programmatic EIS

Since development of the ski area in 1961, BSR has become one of the most popular ski areas in the nation, with 1.6 million skier visits per year since 2006.[38] Resort visitation has affected traffic on Highway 9 and congestion within the Town of Breckenridge. In order to accommodate these levels of visitation within the Town infrastructure, road and parking improvements are ongoing, and the current level of service and parking accommodations are adequate, particularly during summer months.

In the fall of 2004, construction on Park Avenue in Breckenridge began to provide an alternative route from the north end of Town to the south end, improving circulation throughout the community and reducing congestion on Main Street particularly during peak arrival (AM) and departure (PM) hours. Construction was completed in 2006, and included a roundabout at the north intersection of Highway 9 (Main Street) and Park Avenue. The alternative route increased safety and mobility of drivers, transit, pedestrians and bicyclists within BSR. None of the project alternatives would increase peak day visitation; therefore, the existing level of service would persist.

When the BreckConnect Gondola was built in 2007, it consolidated parking and provided non-vehicular access directly from the resort to the Town. The gondola also reduced traffic on Ski Hill Road because the public has the option to access the mountain from the Town. Consolidating parking in the two gondola lots has encouraged people to park once to access the mountain and Town, therefore reducing congestion (traffic and parking) on Main Street. None of the project alternatives include parking or traffic projects; however, the BreckConnect Gondola improved access between the Town and BSR, particularly on peak days.

While this analysis indicates that increased skier visitation under alternatives 1, 2 and 3 would be insignificant to traffic volumes, traffic on I-70 (Colorado's major east-west corridor) is becoming a major issue. CDOT and the FHA began analyzing alternatives for the I-70 Mountain Corridor in January 2000 in order to address the underlying need to reduce congestion and to improve mobility and accessibility on I-70 between Glenwood Springs and C-470. The PEIS was undertaken because existing congestion along

[38] Breckenridge Ski Resort, 2010

I-70 is degrading the accessibility of mountain travel for Colorado residents, tourists and businesses, with projected increases in travel demand over the next 25 years and beyond.

The PEIS identifies that the need to relieve this congestion is especially acute for extended weekend travelers seeking access between the Denver metropolitan area and US 40 (to Grand County), as well as through the Eisenhower Tunnel to the Western Slope. Ultimately, the selected alternative identified in the 2011 ROD should result in greater accessibility to mountain communities along the I-70 corridor, benefiting Summit County economies, as well as ski areas.

Improved mobility would likely increase residential and visitor traffic, which is extremely variable depending on the extent of improvements. The alternatives analysis considers both population and visitation growth through 2034; therefore, in combination with any of the approved projects the cumulative effect of I-70 improvements would need to be managed through ongoing Highway 9 improvements, parking management and improved multi-modal transportation options to alleviate congestion on roads and parking in Summit County.

With annual growth in visitation as well as Town residential and commercial build-out the number of congested traffic days within Town would increase above the current level of 20 days per winter season. However, the Town of Breckenridge's 2008 Comprehensive Plan includes measures to improve capacity on Highway 9, manage parking and improve multi-modal transportation which would help alleviate congestion due to growth in population and visitation.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

No irreversible and/or irretrievable commitments of resources in relation to traffic, parking or ski area access have been identified in association with any of the alternatives analyzed in this document.

D. CULTURAL RESOURCES

SCOPE OF THE ANALYSIS

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires that federal agencies take into account the effects of a federal undertaking on any cultural resource that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). Cultural resources may refer to sites, areas, buildings, structures, districts, and objects which possess scientific, historic, and/or social values of a cultural group or groups as specified by 36 CFR 296.3.

This assessment is based on the built environment, as well as archaeological sources, that indicate the historic and prehistoric utilization of lands, such as hunting, gathering, grazing, timber harvesting and natural resource transport, within and adjacent to BSR's SUP boundary, known as the area of potential effect (APE). NRHP eligibility is evaluated in terms of the integrity of the resource; its association with significant persons, events or patterns in history or prehistory; its engineering, artistic or architectural values; or its information potentially relative to important research questions in history or prehistory.[39] The significance of NRHP eligibility of cultural resources is determined by the Agency Official, in this case, the Forest Supervisor, in consultation with the State Historic Preservation Officer.

AFFECTED ENVIRONMENT

The project area lies within the Southern Rocky Mountain Physiographic Province.[40] It is located on the east slope of the Tenmile Range, just north and west of the Continental Divide in the mountains of central Colorado. The project area is within the Upper Blue River Valley, approximately 1.4 miles west of the Town of Breckenridge, between 10,000 feet and 12,200 feet above sea level. Both hard rock and placer mining have played an important role in the history of the area, with miners primarily prospecting for gold, silver and zinc. In the present day, the area predominately is used for recreational activities, such as hiking, biking and skiing.

Historically, the project area was occupied and used by the Ute tribe. As American settlements grew in western Colorado in the late nineteenth century, fur trappers and miners began to occupy the area. Gold was discovered in the Blue River Valley in 1859, and Breckenridge was established as a town one year later.[41] By 1869, a lull in gold mining activities and a series of fires hindered the growth of Breckenridge. The combination of a second gold mining boom (1878) and the arrival of the Denver, South Park, and Pacific Railroad (1882) spurred a new age of growth for the area. Hydraulic mining and dredging became

[39] 36 CFR Section 60.4
[40] Fenneman, 1946
[41] Black, 1982

profitable in the early twentieth century through World War II.[42] BSR opened on December 18, 1961, signaling the transition of the town's economy from mining to tourism.[43]

A file search of the Colorado Office of Archaeology and Historic Preservation's (OAHP) *Compass* database was conducted on July 9, 2014, along with a GIS data request from the OAHP. General Land Office (GLO) plats were assessed for linear features (roads, ditches) and other features (houses, buildings, mines). Twenty-seven projects have been previously implemented within a 1 mile search buffer of the project area, including construction of ski trails, bike paths, pine beetle mitigation and timber projects. Thus, a number of archeological surveys have already been conducted in the searched area, including seven that overlap the project area.

Fifty-eight cultural resources have been previously identified as a result of these surveys. Nearly all of these sites are historic sites, including mining camps, cabins, sawmills and other logging and water control-related features. Three prehistoric sites – two open lithic scatters, and one open lithic scatter and historic trash scatter – have also been recorded. Thirty-six of the sites are recommended as not eligible for inclusion on the NRHP. None of the sites within the project area are eligible for inclusion on the NRHP. In addition to cultural sites, eleven isolated finds were documented in past inventories, none of which are eligible for inclusion on the NRHP.[44]

Cultural Resource Sites and Isolated Finds Inventory

The APE encompasses approximately 277 acres, and was inventoried by walking transects spaced no more than 20 meters apart. The entire area was surveyed to Class III standards. A site was defined as a locus of patterned human activity greater than 50 years of age and consisting of five or more prehistoric artifacts or greater than fifty historic artifacts with associated features. Isolated finds consist of less than five prehistoric artifacts, or forty-nine or less historic artifacts without associated features or potential for buried cultural deposits. Ten or more clustered mining prospect pits were recorded as a site; less than ten pits were recorded as an isolated find.

One new site (5ST1471), one previously-recorded site (5ST1305), four newly-recorded isolated finds (5ST209, 5ST1472, 5ST1473, 5ST1474, 5ST1476), and one previously-recorded isolated find (5ST209) were documented as a result of this survey. Additionally, three previously-recorded sites were investigated further.

[42] Chronic and Chronic, 1972
[43] Gilliand, 1980
[44] Metcalf Archaeological Consultants, 2014

Table 3D-1:
Sites

Smithsonian Number	Description	Newly Recorded
5ST1471	Log cabin and associated artifacts	Y
5ST1305	2 log structures and associated artifacts	N
5ST132	Lithic scatter	N
5ST178	Prospector pits, tailings piles	N
5ST211	Can scatter (solder dot)	N

The newly-recorded site (5ST1471) was noted as retaining little to no integrity, aside from materials and location. It is not associated with significant events or people, nor does it have any distinctive characteristics of a type, period or method of construction. There is little potential for buried cultural materials, and archival research is not likely to provide information about the history of the area. Thus, the site is recommended to not be eligible for the NRHP.

All of the previously-recorded sites were initially recommended to not be eligible for the NRHP. Surveyors did not observe any changes that would alter these conclusions.

Four newly-recorded isolated finds were documented along with one previously-recorded isolated find. The newly-recorded isolated finds are all recommended to be not eligible for inclusion on the NRHP.

Table 3D-2:
Isolated Finds

Smithsonian Number	Description	Newly Recorded
5ST1472	Prospector Pit	Y
5ST1473	Prospector Pit	Y
5ST1474	Prospector Pit	Y
5ST1475	Prospector Pit	Y
5ST209	Artifact	N

As a result of the cultural survey, five previously-recorded resources (four sites and one isolated find) and five new resources (one site and four isolated finds) within the project area were investigated or documented. All sites were recommended as not eligible for inclusion on the NRHP. The State Historic Preservation Office (SHPO) concurred with a finding of *no historic properties affected* in a letter dated October 7, 2014.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

New development projects within BSR's SUP area would not occur. BSR would continue to operate under its current configuration and capacity. Because no ground disturbance would take place under Alternative 1, there is no potential to affect historic sites within the APE.

Alternatives 2 and 3

The five sites and five isolated finds found within the project area were recorded and found to be not eligible for inclusion on the NRHP. These sites will not be affected, with implementation of PDC such as marking the limits of disturbance and avoiding known sites. Therefore, the action alternatives would have *no adverse effect* on any known resource.

Expectations for the discovery of additional prehistoric or cultural materials are low considering the topography and geography of the area. As stated in the PDC (Table 2-2), if previously-unknown cultural resources or artifacts are discovered during implementation of any approved projects, all ground disturbing activities will cease, and SHPO consultation will commence.

CUMULATIVE EFFECTS

Scope of the Analysis

The effects analyzed in the cumulative effects section apply to all alternatives, including the No Action Alternative. For a detailed description of past, present and reasonably foreseeable future projects within the cumulative effects analysis area, the reader is referred to Appendix A in this document.

Temporal Bounds

The temporal bounds for this cumulative effects analysis of cultural resources extend from 1961 when BSR first opened as a ski area through the foreseeable future in which BSR can be expected to operate.

Spatial Bounds

The spatial bounds for this cumulative effects analysis of cultural resources are limited to public and private lands in the vicinity of the BSR SUP area.

Past, Present, and Reasonably Foreseeable Future Projects

From a cumulative perspective, since implementation of projects contained in the action alternatives were determined to have *no adverse effect* on known NRHP listed or eligible historic properties, by definition, no cumulative impacts to cultural resources are identified specifically related to the BSR projects.

All projects listed in Appendix A would require the completion of requisite cultural surveys and to satisfy State and Federal requirements. As stated above, this project has been determined to have no adverse effect either independently or cumulatively to cultural resources.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Implementation of projects contained in the action alternatives were determined to have *no adverse effect* on known NRHP listed or eligible historic properties; therefore, there are no irreversible and/or irretrievable commitments of cultural resources.

E. SOCIAL AND ECONOMIC

SCOPE OF THE ANALYSIS

The multi-season recreational activities proposed at BSR have the potential to affect not only the physical environment but also the social and economic (socioeconomic) environment. A correlation exists between public use of NFS lands and the economies and societies of adjacent communities. This correlation encompasses many factors—such as seasonal tourism, population, visitor spending, employment, personal income and tax revenues—which are assessed and disclosed herein. The area of economic effect, or Analysis Area, for the proposed project is defined as Summit County, Colorado.

Definitions

Economic Impact Theory – A significant body of prior research regarding ski area operations makes it clear that by drawing non-local visitation to an area, resorts such as BSR can generate economic activity in the form of employment and visitor sales. These benefits accrue to both the resort and to local businesses that benefit from spending by visitors. Perhaps just as important, the direct dollars spent at resort areas and local businesses have a secondary (multiplier) impact, creating additional sales/jobs within the local and regional economy.

Economic Impacts – Economic impacts are typically defined at three levels:

- Direct – Employment and sales created as a direct impact of a business. On- and off-site construction jobs, resort-based jobs and non-resort jobs generated by visitor expenditures are included in this category.
- Indirect – Employment and sales created by industry-to-industry spending. For instance, increased food and beverage spending at BSR will result in the purchase of more supplies from food vendors. This revenue will allow the food vendors to create more employment. These are indirect jobs.
- Induced – Employment created by increased household spending. The additional jobs and income created by direct spending would allow consumers to increase their spending on goods and services. This spending will allow a number of businesses to create more jobs. These are induced jobs.

Economic impacts of the three alternatives were projected using a computer-based model—IMPLAN3.[45] IMPLAN3 is a broadly accepted model used by the Forest Service for making projections regarding employment and economic impacts, and is often used by the Forest Service in the preparation of EISs as part of the NEPA process. IMPLAN economic modeling requires the estimation of annual visitation, visitor spending, resort employment and construction costs in order to simulate the effect of these activities on the economy in terms of sales, employment, labor income and tax revenues. While IMPLAN modeling utilizes the most current observed industry interdependencies calibrated to the local and regional economy of Summit County, the results of any economic model are only as accurate as the data used to describe the proposed change (i.e., an alternative). Therefore, certain estimations and assumptions related to alternatives 1, 2 and 3 were made. As a result, the projected values presented in this analysis should not be considered precise, but rather accurate estimates of the potential economic impacts under alternatives 1, 2 and 3.

Construction activity at the resort and year-round visitation to the resort area generate economic activity in Summit County. In order to analyze the economic impacts of the proposed projects, the Forest Service and BSR have made reasonable estimates of the proposed construction budget and anticipated visitation to BSR. For the purposes of this analysis, construction of the project components is expected to occur over the three-year period from 2015 through 2017. The projection period for visitation-based impacts is from 2015 to 2019 and projections of annual spending are based on 2019 values. IMPLAN3 model values related to the Affected Environment, or existing condition, are estimated for 2014.

For the purposes of this analysis, winter visitation is expected to remain in its current trend under each alternative (i.e., none of the alternatives are designed, or expected, to increase winter visitation to the ski area). Therefore, the existing economic impact of BSR's winter visitors is disclosed in the Affected Environment, but only changes in summer visitation are analyzed for each alternative. Under each action alternative, the majority (90 percent) of new summer visits to BSR are assumed to be made by visitors who are already coming to the region, including the Town of Breckenridge. These visits represent new visitors to BSR but not new visitors to Summit County—they are BSR guests who already live in or would be staying in Summit County, but might visit BSR multiple times as a result of the action alternatives instead of visiting the ski area once (or not at all) as they stay in Summit County. As existing visitors to the region, the impact of their spending outside of BSR is already part of the existing economy of Summit County and is not reported as a new economic impact herein. The remaining 10 percent of new

[45] IMPLAN3 software guides users through the task of creating an impact study that tracks the effects of a modeled event (such as each alternative) against 440 unique sectors in the United States. The result is a detailed summary of economic impacts including: changes in jobs, household incomes, tax impacts, and GRP that can be used to show the effect of firms moving into an area, special events, introduction of new technologies, recreation and tourism, military base closures, changes in government spending and many more events. Additional information regarding IMPLAN3 software and be found at http://implan.com/index.php?option=com_content&view=article&id=889&Itemid=1482 and data used for the economic analysis is contained in the project file.

summer visits to BSR are assumed to be made by new visitors to the region—these represent visitors who decide to come to BSR and Summit County as a result of the projects included in the action alternatives. The spending impacts of these visitors are reported as new impacts to the Summit County economy.

Based on continued interest in summertime mountain recreation and recent visitation trends, new summer visitation is also expected under the No Action Alternative for the Breckenridge Summer Fun Park; however, it is expected new visitation to NFS lands under the No Action Alternative would see negligible growth.

In this analysis, existing and prospective new jobs are discussed as "employment positions" or "Full-Time-Equivalents" (FTEs). An employment position may be a year-round or seasonal job and either full-time or part-time, whereas one FTE provides sufficient work to keep one person employed full-time for one year. In seasonal industries, such as ski areas, one FTE may represent several employment positions.[46]

AFFECTED ENVIRONMENT

Breckenridge Ski Resort

Visitation

BSR is a four-season resort whose primary purpose is for winter recreation. Over the past five years for which data is available, BSR has experienced modest fluctuations in winter visitation, averaging about 1.6 million winter visits annually.[47] About 60 percent of BSR's winter visitors are overnight visitors and about 40 percent are day visitors.

While winter visitation at BSR has experienced ups and downs in the past five years, summer visitation to the ski area has experienced consistent growth during this same period (an average of about 3.5 percent growth each year).[48] BSR currently records approximately 175,000 summer visits. It is estimated that about 80 percent of BSR's summer visitors are overnight visitors and about 20 percent are day visitors.

Employment

As is true for most mountain resorts, BSR employs more workers in winter than in the summer. BSR currently employs approximately 1,720 workers (or 769 FTEs) in the winter and approximately 349 workers (or 205 FTEs) in the summer including full-time positions.[49] These are *direct* resort jobs (i.e.,

[46] A full time, year-round job is one FTE, but a part time seasonal job is half the hours every week and half of the year, equating to one quarter of an FTE (i.e., "half-of-a-half").
[47] Breckenridge Ski Resort, 2010
[48] Growth was determined from BreckConnect Gondola ridership.
[49] FTEs are explained under Scope of the Analysis.

employees of BSR) and are ongoing employment positions that are created each year in response to visitation to BSR. Tables 3E-1 and 3E-2 summarize the existing employment at BSR.

Table 3E-1:
BSR Baseline Employment

Employment Type	Full-Time	Part-Time	FTEs
Year-Round Employment	110	1	111
Winter Seasonal Employment	1,024	585	658
Summer Seasonal Employment	139	99	94
Annual Employment[a]	1,273	685	863

Source: USDA Forest Service, 2012; Annual average employment
[a] Conversions as follows: Full-Time Year-Round = 1.0 (Works full-time for 12 months); Part-Time Year-Round = 0.5 (Works part-time for 12 months); Full-Time Seasonal = 0.5 (Works full-time for about 6 months); Part-Time Seasonal = 0.25 (Works part-time for about 6 months).

Table 3E-2:
BSR Baseline Employment By Season

Winter Positions	Winter FTEs	Summer Positions	Summer FTEs
1,720	769	349	205

Source: USDA Forest Service, 2012; Annual average employment

Economic Impact of BSR on the Summit County Economy

Based on projections from the IMPLAN3 Model, BSR's winter visitors currently spend approximately $237.3 million each year. This *direct* spending generates a total annual output of approximately $336.3 million into the economy, which includes *direct* and *secondary* impacts. Approximately 3,926 FTEs and $115.3 million in labor income are generated each year in response to BSR spending.[50] This includes the 1,720 employment positions (769 FTEs) currently provided by BSR in the winter. BSR's economic impact currently accounts for approximately $207 million (11.0 percent) of the Gross Regional Product (GRP) of Summit County. Approximately $31.2 million in federal taxes and approximately $23.3 million in state and local taxes are generated each year by this economic activity. Table 3E-3 summarizes the impact of existing winter visitation.

[50] The Congressional Labor Office defines labor income as income that is derived from employment. This includes all compensation that is a return from work effort, and typically includes labor earnings (wages and salaries), employer-provided benefits (health insurance, life insurance, etc.) and taxes paid to the government on behalf of the employees. Employment created by the operation of and visitation to BSR produces labor income for employees and businesses in Summit County.

Table 3E-3:
Baseline Impact of BSR Winter Visitation

Impact Type	Employment (FTEs)	Labor Income	Total Value Added (GRP)	Total Output (Sales)
Direct Effect	3,170	$86,425,000	$144,204,000	$237,308,000
Secondary Effect	756	$28,923,000	$62,840,000	$99,037,000
Total Effect	3,926	$115,348,000	$207,044,000	$336,344,000

Source: IMPLAN, 2014

Based on projections from the IMPLAN3 Model, BSR's summer visitors currently spend approximately $28.1 million each year. This *direct* spending generates a total annual output of approximately $39.8 million into the economy, which includes *direct* and *secondary* impacts. Approximately 410 FTEs and $13.1 million in labor income are generated each year in response to BSR spending. This includes the 349 employment positions (205 FTEs) currently provided by BSR in the summer. BSR's summer economic impact currently accounts for approximately $23.8 million (1.4 percent) of the GRP of Summit County. Approximately $3.5 million in federal taxes and approximately $2.6 million in state and local taxes are generated each year by this economic activity. Table 3E-4 summarizes the impact of existing summer visitation.

Table 3E-4:
Baseline Impact of BSR Summer Visitation

Impact Type	Employment (FTEs)	Labor Income	Total Value Added (GRP)	Total Output (Sales)
Direct Effect	320	$9,639,000	$16,539,000	$28,121,000
Secondary Effect	89	$3,482,000	$7,251,000	$11,663,000
Total Effect	410	$13,121,000	$23,790,000	$39,784,000

Source: IMPLAN, 2014

To put winter versus summer visitor spending into context, the total effect of BSR's winter visitor spending ($336.3 million) is more than eight times that of the summer visitors ($39.8 million).

Population

From 1970 to 2000, Summit County experienced substantial population growth. According to population projections from the Colorado State Demography Office, the county is expected to continue to experience similar growth rates over the next two decades (refer to Table 3E-5 and 3E-6). Summit County's population growth from 2000 to 2010 was 8.4 percent, and population projections anticipate growth in Summit County to range between 1 to 3 percent annually into 2040.[51]

[51] Colorado Department of Local Affairs – State Demography Office, 2013

Table 3E-5:
Summit County Permanent Resident Population Estimates (1970–2010)

Area	1970	1980	1990	2000	2010[a]
INCORPORATED AREAS					
Breckenridge	548	818	1,285	2,408	4,540
Blue River	8	230	440	685	849
Dillon	182	337	553	802	904
Frisco	471	1,221	1,601	2,443	2,683
Montezuma	--	--	60	42	65
Silverthorne	400	989	1,768	3,196	3,887
Subtotal	*1,609*	*3,595*	*5,707*	*9,576*	*12,928*
UNINCORPORATED AREAS					
Lower Blue Basin	--	--	2,533	4,592	5,947
Snake River Basin	--	--	1,765	4,187	1,155
Ten Mile Basin	--	--	532	837	385
Upper Blue Basin	--	--	2,344	4,356	7,579
Subtotal	*1,056*	*5,253*	*7,174*	*13,972*	*15,066*
Total Summit County	**2,665**	**8,848**	**12,881**	**23,548**	**27,994**

Source: Summit County Planning Department Website, 2010
[a] The 1970–2010 population numbers are based on U.S. Census data.

Population projections are approximations that are affected by factors such as changes in assumptions (numbers of persons per household), transient residents, the number of second homes and second home owners converting into permanent residents. Table 3E-6 displays population projections and percent change for 2020, 2030 and 2040 for Summit County.

Table 3E-6:
Summit County Projected Permanent Population Projections (2010–2040)

Time Frame/Years	Percent Change	New Residents Added	Projected Ending Population
2010–2020	14.8	4,861	32,940
2020–2030	21.0	8,773	41,713
2030–2040	14.8	7,203	48,917

Source: U.S. Census Bureau and State Demographer

Housing

In 2013, Summit County prepared a Workforce Housing Needs Assessment outlining needs based on market and demographic changes in Summit County.[52] In addition, the Town of Breckenridge prepared a

[52] Rees Consulting, 2013

capacity analysis in 2008, which contained a detailed build-out analysis.[53] Together the reports stress the importance of housing, and more specifically affordable housing, in Summit County and communities within the county.

The 2013 Summit County Workforce Housing Needs Assessment assessed the impact of affordability, seasonal workers fluctuation, rental market and type and location of available housing options. The report notes housing affordability remains a problem in Summit County and recommends nine strategies including making transactions for deed restricted homes easier, preserving free market units occupied by employees and creating a housing rehabilitation program for rundown housing units.

The 2008 Town of Breckenridge Capacity Analysis concluded the Town was 77 percent built out and the bulk of the remaining residential single family equivalents (SFEs) are located in the Peak 7 & 8 Master Plan area (450.5 SFEs), the Highlands at Breckenridge (291 SFEs) and Wellington Neighborhood (148 SFEs). The remainder of available SFEs is spread out throughout town.

BSR Workforce Housing

According to current Town of Breckenridge estimates, 45 percent of employees who work in the Town of Breckenridge live in town; 60 percent live within the Upper Blue (including the Town of Breckenridge). Currently, there is a scarcity of deed-restricted units in the Town of Breckenridge. In the future as additional employment opportunities arise in the Town, the deficit of affordable housing may result in a larger portion of employees commuting into Town from other areas of the county (or other counties) where cheaper housing is available.

BSR currently provides approximately 500 employee housing beds. A portion of the beds are reserved for Town of Breckenridge employees and BSR lodging operations employees. During the summer, the workforce housing is not filled to capacity and could support more summer employees.

Race

Racial diversity is somewhat limited in Summit County—about 90 percent of the county's population is white, Hispanic or Latino.[54] Another 7 percent of the population in Summit County identified themselves as "Some Other Race," which are most often persons of Hispanic or Latino origins. The racial breakdown of Summit County is provided in Table 3E-7.

[53] Town of Breckenridge, 2008
[54] U.S. Census Bureau, 2010

Table 3E-7:
Race Within Summit County, 2010

Race	Population	Percent
White	25,103	89.7
Black or African American	230	0.8
American Indian and Alaska Native	87	0.3
Asian	278	1
Native Hawaiian and Other Pacific Islander	19	0.1
Some Other Race	1,842	6.6
Two or More Races	435	1.6

Source: U.S. Census Bureau, 2010

Economy

In 2010, Summit County's economy had a GRP of approximately $1.7 billion.[55] Travel and tourism is an important economic component of Summit County, contributing approximately $1 billion to the GRP of the county.[56] In this context, travel and tourism consists of sectors that provide goods and services to visitors to the local economy, as well as to the local population.[57] For the purposes of this analysis these sectors include: retail trade, passenger transportation, arts, entertainment and recreation, and accommodation and food services. Travel and tourism account for about 15 percent of total employment nationally and about 18 percent in the State of Colorado. In comparison, Summit County is much more dependent on tourism with approximately 63 percent of the total employment in the county attributed to travel and tourism sectors.[58] It should also be noted that the percentage of employment related to travel and tourism in Summit County is likely higher than reported, as second home construction and some other tourism related activities are not included in this calculation.

Employment Status

Employment status is a measure of the number of people who are jobless or employed in the local labor force. In 2012 Summit County had a labor force of 18,944, with 17,805 persons employed and 1,139 persons unemployed.[59] The most common metric of employment status is the unemployment rate, calculated as the number of people who are jobless, looking for jobs and available for work divided by the labor force. In 2012, Summit County's unemployment rate was 6 percent, which was higher than the state

[55] IMPLAN, 2014
[56] U.S. Department of Commerce, 2014
[57] Without additional research such as surveys, it is not known what exact proportion of the jobs in these sectors is attributable to expenditures by visitors, including business and pleasure travelers, versus by local residents. Some researchers refer to these sectors as "tourism-sensitive." They could also be called "travel and tourism-potential sectors" because they have the potential of being influenced by expenditures by non-locals. In this report, they are referred to as "travel and tourism."
[58] U.S. Department of Commerce, 2014
[59] U.S. Census Bureau, 2013

average (5.5 percent). This higher unemployment rate is partially influenced by the seasonal nature of employment in Summit County.[60]

Table 3E-8:
Summit County Labor Force, 2008–2012

Area	Labor Force	Employed	Unemployed	Unemployment Rate (%)
Summit County	18,944	17,805	1,139	6.0
State of Colorado	2,749,557	2,498,972	218,419	5.5

Source: U.S. Census Bureau, 2013

Income and Poverty

Household income and the proportion of the population below the poverty level are important measures of the ability of households and individuals to achieve economic security. In 2012, Summit County had a higher median household income ($64,680) and a lower percentage of the population below the poverty level (11.8 percent) than both the State of Colorado and the U.S. as a whole.[61] It is important to note that this figure is based on total personal income, from both labor (e.g., wages) and non-labor (e.g., investment income) sources. These figures are presented in Table 3E-9.

Table 3E-9:
Summit County Median Household Income and Percentage of Population below the Poverty Level

Geographic Area	Median household income including benefits	Percentage of Population Below the Poverty Level
United States	$51,371	15.0
Colorado	$58,224	12.9
Summit County	$64,680	11.8

Source: U.S. Census Bureau, 2013

Environmental Justice

Environmental justice speaks to concerns that federal decisions could disproportionately impact people of a particular ethnic or cultural heritage group, or people with low incomes. Executive Order 12898 (EO 12898) relates to environmental justice and requires, in brief, that each federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low-income populations.

[60] Ibid.
[61] Ibid.

The CEQ provides the following definitions in order to provide guidance for compliance with environmental justice requirements in NEPA:[62]

- "Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis."
- "Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty. In identifying low-income populations, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect."[63]

No existing minority populations were identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Likewise, no low-income populations were identified in the affected area.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Impacts Common to All Alternatives

While each of the action alternatives would generate economic activity in the form of sales, employment labor income and tax revenues, the overall socioeconomic trends in Summit County (population growth, racial diversity, a travel and tourism based economy and income and poverty) are expected to remain within their current trends under each alternative.

Population

Population growth projections expect Summit County's baseline resident population to grow to 48,917 year-round residents by 2040. This growth would represent a 43 percent increase over 2010 U.S. Census Bureau records.[64] Although some workers may relocate to Summit County to fill the new employment positions created by each alternative, this population projection accounts for a reasonable amount of job creation in the county such as what would be experienced under the action alternatives. Thus, population growth resulting from any of the action alternatives is expected to have a negligible effect on the baseline population trend.

[62] Council on Environmental Quality, 1997
[63] Ibid.
[64] U.S. Census Bureau, 2013

Housing

Housing availability in Summit County and the Town of Breckenridge is an ongoing issue; however, the action alternatives are not anticipated to measurably affect the housing markets of Breckenridge or Summit County. The majority of workers are anticipated to already be living in the area or enough employee housing would be available to accommodate the increase in summer employment.

Race

Racial diversity is somewhat limited in Summit County, with about 90 percent of the Summit County population identifying as white. None of the action alternatives are anticipated to measurably affect the racial breakdown of the county.

Economy

Historically, travel and tourism has been an important component of the Summit County economy. Currently, at least 63 percent of all employment in Summit County is related to travel and tourism operations.[65] None of the action alternatives are anticipated to affect this overall economic condition. BSR is expected to remain one of the primary economic drivers in Summit County for the foreseeable future under each alternative.

Income and Poverty

Measures of individual prosperity are closely related to the overall economic condition in a local economy. Travel and tourism is expected to remain a primary economic driver in Summit County under each alternative, and as such the nature of employment opportunities and compensation is also expected to remain in its current trend. Summit County can be expected to retain its relatively higher median household income ($64,680) and a lower percentage of the population below the poverty level (11.8 percent) than both the State of Colorado and the U.S. as a whole under each alternative.[66]

Environmental Justice

No changes or modifications would be approved under any alternative that would directly or indirectly affect minority or low-income populations in Summit County. The baseline conditions presented in the Affected Environment section above would be expected to continue into the future under each alternative.

[65] U.S. Department of Commerce, 2014
[66] U.S. Census Bureau, 2011

Alternative 1 – No Action

Breckenridge Ski Resort

Visitation

Based on continued interest in summertime mountain recreation and recent visitation trends, new summer visitation is expected to be approximately 2 percent under the No Action Alternative for the Summer Fun Park. However, new visitation to NFS lands under the No Action Alternative is expected to experience minimal growth as no projects would be built on NFS lands.

Employment

Under the No Action Alternative, BSR would continue to employ approximately 349 workers (or 205 FTEs) in the summer including full-time positions. As minimal growth occurs in the future, additional employees would be necessary over time.

Economic Impact of BSR Operations on the Summit County Economy

As new visitation to NFS lands is expected to be negligible under the No Action Alternative, minimal changes to the existing economic impact of summer visitation at BSR are anticipated. BSR's summer visitors would continue to spend approximately $28.1 million each year. This *direct* spending would continue to generate a total annual output of approximately $39.8 million into the economy, which includes *direct* and *secondary* impacts. Approximately 410 FTEs and $13.1 million in labor income would continue to be generated each year in response to BSR spending. This would include the approximately 349 employment positions (205 FTEs) currently provided by BSR in the summer. BSR's summer economic impact would continue to account for approximately $23.8 million (1.42 percent) of the GRP of Summit County. Approximately $3.5 million in federal taxes and approximately $2.6 million in state and local taxes would continue to be generated each year by this economic activity.

Alternative 2 – Proposed Action

Breckenridge Ski Resort

Visitation

Under the Proposed Action, BSR summer visitation is expected to increase by an additional 150,000 visits by 2019 for a total summer visitation of 325,000. However, only 10 percent (15,000) of these new visits are expected to represent new visitors to the region. Only the economic impacts resulting from these 15,000 new visitors to the region are reported for Alternative 2. It is anticipated that about 80 percent of these new visitors to the region would be overnight visitors and about 20 percent would be day visitors.

Economic Impact of BSR Operations on the Summit County Economy

Based on projections from the IMPLAN3 Model, new summer visitors to the region would spend approximately $2.1 million each year under the Proposed Action. This *direct* spending would generate a total annual output of approximately $3 million into the economy, which includes *direct* and *secondary*

impacts. Approximately 18 FTEs and $988,000 million in labor income would be generated outside of the resort each year in response to this spending. These new out-of-resort jobs would be created in addition to the 44 new FTEs that would be directly employed by BSR in the summer, combining for a grand total of 62 new FTEs created under the Proposed Action.[67] The new economic activity anticipated under the Proposed Action would contribute approximately $1.8 million (0.09 percent) to the GRP of Summit County. Approximately $267,000 in federal taxes and approximately $199,000 in state and local taxes would be generated each year by this economic activity. Table 3E-10 summarizes the impact of this new summer visitation to the region. As these impacts would result from new visitation to the region, they would be created each year *in addition to* the baseline impact of BSR's current visitors presented above in the Affected Environment.

Table 3E-10:
Impact of BSR Summer Visitation – Alternative 2

Impact Type	Employment (FTEs)	Labor Income	Total Value Added (GRP)	Total Output (Sales)
Direct Effect	12	$727,000	$1,244,000	$2,115,000
Secondary Effect	7	$262,000	$546,000	$878,000
Total Effect	18	$988,000	$1,790,000	$2,992,000

Source: IMPLAN, 2014

Construction Impacts

Construction of the Proposed Action is expected to occur in three construction seasons, from 2015 through 2017. The construction budget for the Alternative 2 projects was input to the IMPLAN3 model to provide estimates of *direct* and *secondary* employment, labor income, total value added and total output associated with the construction activity. Construction of the project components would generate a total output of approximately $18.1 million, which includes *direct* and *secondary* impacts. Approximately 130 FTEs and $5.6 million in labor income would be generated in the years of construction. This construction activity would account for approximately $8 million (0.4 percent) to the GRP of Summit County. Approximately $1.1 million in federal taxes and approximately $431,000 in state and local taxes would be generated by the construction activity. These impacts would be short-term—only affecting the economy from 2015 to 2017, the years in which construction activity would occur. Table 3E-11 summarizes the potential impact of construction of the Proposed Action on the Summit County economy.

[67] It is important to note that the 18 new out of resort FTEs would be created in response to new visitation to the region (15,000 visits), while the 44 new FTEs at BSR would be created in response to new visitation to the ski area (150,000 visits).

Table 3E-11:
Impact of Construction – Alternative 2

Impact Type	Employment (FTEs)	Labor Income	Total Value Added (GRP)	Total Output (Sales)
Direct Effect	89	$3,963,000	$5,007,000	$13,222,000
Secondary Effect	41	$1,673,000	$2,989,000	$4,916,000
Total Effect	130	$5,636,000	$7,995,000	$18,139,000

Source: IMPLAN, 2014

Alternative 3

Breckenridge Ski Resort

Visitation

Under Alternative 3, BSR summer visitation is expected to increase by an additional 125,000 visits by 2019 for a total summer visitation of 300,000. However, only 10 percent (12,500) of these new visits are expected to represent new visitors to the region. Only the economic impacts resulting from these 12,500 new visitors to the region are reported for Alternative 3. It is anticipated that about 80 percent of these new visitors to the region would be overnight visitors and about 20 percent would be day visitors.

Economic Impact of BSR Operations on the Summit County Economy

Based on projections from the IMPLAN3 Model, new summer visitors to the region would spend approximately $1.8 million each year under Alternative 3. This *direct* spending would generate a total annual output of approximately $2.5 million into the economy, which includes *direct* and *secondary* impacts. Approximately 15 FTEs and $824,000 in labor income would be generated outside of the resort each year in response to this spending. These new out-of-resort jobs would be created in addition to the 37 new FTEs that would be directly employed by BSR in the summer, for a grand total of 52 new FTEs created under Alternative 3.[68] The new economic activity anticipated under Alternative 3 would contribute approximately $1.5 million (0.08 percent) to the GRP of Summit County. Approximately $223,000 in federal taxes and approximately $165,000 in state and local taxes would be generated each year by this economic activity. Table 3E-12 summarizes the impact of this new summer visitation to the region. As these impacts would result from new visitation to the region, they would be created each year *in addition to* the baseline impact of BSR's current visitors presented above in the Affected Environment.

[68] It is important to note that the 15 new out of resort FTEs would be created in response to new visitation to the region (12,500 visits), while the 37 new FTEs at BSR would be created in response to new visitation to the ski area (125,000 visits).

Table 3E-12:
Impact of BSR Summer Visitation – Alternative 3

Impact Type	Employment (FTEs)	Labor Income	Total Value Added (GRP)	Total Output (Sales)
Direct Effect	10	$606,000	$1,037,000	$1,762,000
Secondary Effect	6	$218,000	$455,000	$731,000
Total Effect	15	$824,000	$1,492,000	$2,493,000

Source: IMPLAN, 2014

Construction Impacts

Construction of Alternative 3 is expected to occur in three construction seasons, from 2015 through 2017. The construction budget for the Alternative 3 projects was input to the IMPLAN3 model to provide estimates of *direct* and *secondary* employment, labor income, total value added and total output associated with the construction activity. In total, construction of the project components would generate a total output of approximately $16.3 million, which includes *direct* and *secondary* impacts. Approximately 117 FTEs and $5 million in labor income would be generated in the years of construction. This construction activity would account for approximately $7.2 million (0.4 percent) to the GRP of Summit County. Approximately $1 million in federal taxes and approximately $388,000 in state and local taxes would be generated by the construction activity. These impacts would be short-term—only affecting the economy from 2015 to 2017, the years in which construction activity would occur. Table 3E-13 summarizes the potential impact of construction of Alternative 3 on the Summit County economy.

Table 3E-13:
Impact of Construction – Alternative 3

Impact Type	Employment (FTEs)	Labor Income	Total Value Added (GRP)	Total Output (Sales)
Direct Effect	80	$3,567,000	$4,506,000	$11,900,000
Secondary Effect	37	$1,506,000	$2,690,000	$4,425,000
Total Effect	117	$5,072,000	$7,196,000	$16,325,000

Source: IMPLAN, 2014

CUMULATIVE EFFECTS

Forest Service decisions within BSR's SUP area, as well as the approval of private land development by the Town of Breckenridge and Summit County, have contributed to economic growth trends within Summit County over the past few decades. As discussed in the Affected Environment, BSR has driven both employment and sales impacts that accrue to both the ski areas and other area businesses.

As noted above, the estimation of economic impacts is related to visitation, as expenditures by visitors generate industry sales and support new jobs. No major increases in winter visitation as a result of Alternative 1, Alternative 2 or Alternative 3 are anticipated. However, increases in summer visitation are

anticipated under each alternative. While there are quantifiable economic impacts associated with increased visitation under each alternative, no cumulative effects are anticipated.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

No irreversible and/or irretrievable commitment of economic resources has been identified in association with any of the alternatives analyzed in this document.

F. VEGETATION

SCOPE OF THE ANALYSIS

The Analysis Area is approximately 5,700 acres in size and encompasses the BSR SUP boundary and a small portion of the Nordic SUP area along the proposed Peaks Connector trail. This analysis summarizes the more detailed Botanical Biological Report (Biological Assessment/Biological Evaluation and Specialist Report) contained in the project file.[69] The Botanical Biological Report and this analysis describe the existing condition and disclose anticipated impacts to Federally threatened, endangered, proposed, and Forest Service Region 2 sensitive plant species, other plant Species of Local Concern (SOLC), forest health, overstory vegetation and invasive non-native weeds.

AFFECTED ENVIRONMENT

Overstory Vegetation

In 2012, Breckenridge completed a comprehensive Vegetation Management Plan (VMP) to ensure active steps were being taken to benefit forest health across all forest vegetation types within BSR's SUP and to respond to the MPB outbreak.[70] The VMP outlines goals, objectives and desired future conditions for forest health within BSR's SUP, as well as vegetation management diagnosis.

For the purposes of this analysis, overstory vegetation was classified as lodgepole pine, spruce/fir and other. Within the SUP area, approximately 730 acres have been classified as lodgepole pine and 1,400 acres classified as spruce/fir. The remaining acreage is composed of ski trails, grasslands and barren areas. The number of disturbed overstory vegetation acres for each alternative is discussed in the Direct and Indirect Environmental Consequences section below.

Vegetation types within the Analysis Area include lodgepole pine forests (*Pinus contorta* ssp. *latifolia*), Engelmann spruce-subalpine fir forests (*Picea engelmannii-Abies bifolia*), alpine tundra, riparian and wetland habitats and disturbed ski-runs. Each of the vegetation types is briefly described below. A vascular plant species list for the Analysis Area is contained in the project file.

Lodgepole Pine Forest

Lodgepole pine forests occur at the lower elevations of the Analysis Area. MPB (*Dendroctonus ponderosae*) have affected many lodgepole pine stands and there are scattered large-diameter standing dead trees. In general, the understory of the lodgepole pine stands is relatively depauperate with scattered herbaceous species such as heartleaf arnica (*Arnica cordifolia*), fireweed (*Epilobium angustifolium*), sidebells wintergreen (*Orthilia secunda*) and mountain pussytoes (*Antennaria parvifolia*). Common

[69] Western Ecological Resource, 2014a
[70] Breckenridge Ski Resort, 2011

shrubs include buffaloberry (*Shepherdia canadensis*), kinnick-kinnick (*Arctostaphylos uva-ursi*) and common juniper (*Juniperus communis* ssp. *alpina*).

Engelmann Spruce – Subalpine Fir Forest

Spruce-fir forests dominate the middle elevations of the Project Area and are fragmented by numerous ski trails. In general, Engelmann spruce is dominant, with subalpine fir intergrading at the lower elevations. The understory density varies with degree of shading. Where the canopy is more open there is a high degree of tree regeneration and understory plants, while the closed canopy forests have little understory. Common understory plants include whortleberry (*Vaccinium myrtillus*), sickletop lousewort (*Pedicularis racemosa* subsp. *alba*), Whipple's penstemon (*Penstemon whippleanus*), sidebells wintergreen, skunkleaf polemonium (*Polemonium pulcherrimum*), heartleaf arnica, wolf currant (*Ribes wolfii*) and red elderberry (*Sambucus microbotrys*).

Alpine Tundra

Alpine tundra dominates the landscape above timberline. Much of the tundra within the vicinity of proposed project activities is dry and rocky. The alpine tundra supports a variety of native alpine plant species common to the region. These include perennial graminoids such as alpine fescue (*Festuca brachyphylla* subsp. *coloradensis*), spike trisetum (*Trisetum spicatum* subsp. *congdonii*), kobresia (*Kobresia myosuroides*), and forbs such as alpine avens (*Acomastylis rossii* subsp. *turbinata*), American bistort (*Bistorta bistortoides*), dwarf sagewort (*Artemisia scopulorum*), mountain dryad (*Dryas octopetala*), arctic gentian (*Gentianoides algida*), diamond-leaf saxifrage (*Micranthes rhomboidea*), onestem fleabane (*Erigeron simplex*), arctic bellflower (*Campanula uniflora*), alpine spring parsley (*Oreoxis alpina*), alpine and dwarf clovers (*Trifolium dasyphyllum* and *T. nanum*) and golden draba (*Draba aurea*), among many others. Scattered small shrubs of alpine and snow willow (*Salix arctica* var. *petraea* and *S. reticulata*) are also present.

Riparian and Wetland Habitats

Riparian and wetland habitats primarily occur at the headwaters of, and along, Cucumber Creek and Sawmill Creek. Small seeps are scattered throughout the Analysis Area. High quality wetland fens appear to be restricted to the Cucumber Gulch located east of the Analysis Area, which is a groundwater-fed fen wetland that has been identified by the Environmental Protection Agency (EPA) as an Aquatic Resource of National Importance (ARNI). However, there are localized areas of organic-rich topsoil associated with some of the better-developed wetlands. For a description of riparian and wetland habitat vegetation and potential direct and indirect effects to wetlands, refer to Chapter 3, Section I – Wetlands.

Note: all proposed project activities identified in alternatives 2 and 3 were surveyed for wetlands and other waters of the U.S.

Disturbed Lands – Ski Runs and Roadsides

Disturbed land and introduced plants occur on developed ski terrain as well as along edges of roads and along pipelines. The majority of the ski runs are dominated by non-native graminoids such as smooth brome (*Bromus inermis*), intermediate wheatgrass (*Thinopyrum intermedium*), timothy (*Phleum pratense*), and orchardgrass (*Dactylis glomerata*), as well as native colonizing forbs such as manyray goldenrod (*Solidago multiradiata*), pearly everlasting (*Anaphalis margaritacea*), spreading goldenbanner (*Thermopsis divaricarpa*), Whipple's penstemon (*Penstemon whippleanus*) and fireweed (*Epilobium angustifolium*). Small regenerating Engelmann spruce and subalpine fir trees occur in these areas as well.

Invasive Non-Native Weeds

Four species of Colorado Noxious Weeds were documented within the Analysis Area. These include scentless chamomile (*Matricaria perforata*), ox-eye daisy (*Leucanthemum vulgare*), yellow toadflax (*Linaria vulgaris*) and Canada thistle (*Cirsium arvense*). The scentless chamomile and ox-eye daisy are the most common and appear to be most abundant in disturbed ski runs near the base areas. Toadflax and Canada thistle appear to be relatively uncommon at this time, but are scattered throughout the lower elevations of the Analysis Area. Finally, one additional plant, reed canarygrass (*Phalaris arundinacea*), which is not a noxious weed but is considered an invasive wetland grass, was observed at the main service entrance to the ski area.

Pre-Field Review and Field Reconnaissance

A pre-field review was conducted of all Threatened, Endangered and Region 2 Sensitive (TES) and SOLC plants known or suspected to be present in the Analysis Area. This preliminary review included a review of the Regional Forester's Sensitive Plant List, a review of the Colorado Natural Heritage Program's Biological Database records for TES and SOLC plants present within the Analysis Area, a review of the USFWS Internet site (IPaC) for the most current listing of TES and candidate species and a review of Forest Service files and records for the Analysis Area.

Federally Listed and Proposed Plant Species

The USFWS plant species include the Federally Threatened Penland's alpine fen mustard (*Eutrema penlandii*) and the Federally Endangered Osterhout milkvetch (*Astragalus osterhoutii*). No critical habitats are currently designated within the Project Area for any listed plant species. The Osterhout's milkvetch is excluded from further analysis due to lack of suitable habitat and will not be discussed further in this analysis. Note: the WRNF also includes DeBeque phacelia (*Phacelia scopulina* var. *submutica*), Colorado hookless cactus (*Sclerocactus glaucus*) and Ute ladies'-tresses orchid (*Spiranthes diluvialis*) as potentially occurring on the planning unit. However none of these species is known in Summit County and there is no habitat within the Project Area for these species; thus, they are excluded from further discussion. Refer to Table 3F-1 for Summit County Federally Listed and Proposed Plants.

Eutrema penlandii – Penland Alpine Fen Mustard – Threatened

Penland alpine fen mustard is a small, perennial herb in the mustard family (Brassicaceae) that inhabits alpine wetlands that are permanently saturated and meltwater areas with flowing water. It grows in mats of mosses on streambanks that remain wet year-round.[71] It is also found in alpine fens on the lee side of mountain crests where deep wind-deposited snow accumulates.[72] It is endemic to Colorado and is only known from the Mosquito Range from Hoosier Pass to Mount Sherman in Park and Summit Counties at elevations of 11,800 to 12,800 feet. The surficial geologic formations of the known populations in Colorado include Leadville limestone and Manitou limestone. Potential habitat within the Action Area includes alpine habitats around small alpine streams and in the vicinity of the lake below Lake Chutes. There are no known limestone or other calcarous geologic formations within the area affected by project activities.[73]

Table 3F-1:
Federally Listed and Proposed Plants for Summit County, Colorado

Species	Habitat Description	Species Excluded from Analysis?	Rationale
Astragalus osterhoutii Osterhout's milkvetch	Highly seleniferous, grayish-brown clay soils derived from shale of the Niobrara, Pierre and Troublesome formations. Elev. 7,400–7,900'	Yes	No habitat within federal Action Area
***Eutrema penlandii* Penland alpine fen mustard**	**Alpine constantly moist areas, often near snowbeds. Elev. 11,800–12,800'**	No	Species Analyzed

Note: For purposes of this analysis, the federal Action Area is equal to the Analysis Area.

Region 2 Sensitive Species

FSM 2670 defines a Sensitive plant as one that is not presently listed as Threatened or Endangered by the USFWS, but for which concerns about the population viability have been identified as evidenced by:

1. Significant current or predicted downward trends in population numbers or density.
2. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

[71] Spackman et al., 1997
[72] Roy et al., 1993
[73] Wallace et al., 2003; Kellogg et al., 2002

The Regional Forester has identified Sensitive species for Region 2.[74] Table 3F-2 lists the 33 species either known or suspected to occur on the WRNF along with brief habitat descriptions, and shows the plant species either analyzed or excluded from further analysis and the rationale for exclusion.

Table 3F-2:
Forest Service Region 2 Sensitive Plant Species for the White River National Forest

Name	General Habitat and CO Range	Species Excluded from Analysis?	Rationale
Armeria maritima subsp. *sibirica** **Sea pink**	**Grassy tundra slopes, on wet, sandy, or spongy organic soils; 11,460–12,580'; Park and Summit counties, CO**	**No**	**Species Analyzed**
Astragalus leptaleus Park milkvetch	Ecotone of saturated and dry soils; moist swales and meadows; 6,000–10,000'; Chaffee, Custer, Eagle, Fremont, Gunnison, Jackson, Larimer, Park and Summit counties, CO	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
Botrychium ascendens **Upswept moonwort**	**Disturbed but stabilized subalpine areas; several sites in CO**	**No**	**Species Analyzed**
Botrychium lineare+ **Narrowleaf moonwort**	**Disturbed but stabilized sites, barren sites, grass or grass-herb forest meadows, aspen stands, upper montane to alpine, 7,900–12,500'; numerous east and west-slope counties**	**No**	**Species Analyzed**
Botrychium paradoxum **Paradox moonwort**	**Moist meadows to sparsely vegetated upland; one site in CO on west slope**	**No**	**Species Analyzed**
Braya glabella subsp. *glabella* **Smooth northern-rockcress**	**Calcareous substrates, especially Leadville limestone; sparsely vegetated gravelly slopes above timberline; 12,000–13,000'; Chaffee, Gunnison, Park and Pitkin counties, CO**	**No**	**Species Analyzed**
Carex diandra **Lesser panicled sedge**	**Montane and subalpine wetland fens; 7,000–9,600'; Boulder, Garfield, Grand, Jackson, Larimer and Saguache counties, CO**	**No**	**Species Analyzed**
Carex livida **Livid sedge**	**Mineral rich wetland fens; 9,000–10,100'; Boulder, Grand, Jackson, Larimer and Park counties, CO**	**No**	**Species Analyzed**
Cypripedium parviflorum Yellow lady's slipper	Moist forests including ponderosa pine, Douglas-fir, and aspen; 7,400–8,500' in CO; Clear Creek, Custer, Douglas, El Paso, Garfield, Huerfano, Jefferson, La Plata, Larimer, Las Animas, Montrose, Park, Pueblo and Teller counties, CO	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
Draba exunguiculata **Clawless draba**	**Alpine on rocky and gravelly slopes or fell fields; 11,700–14,000'; Boulder, Clear Creek, El Paso, Gilpin, Grand, Lake, Park and Summit counties, CO**	**No**	**Species Analyzed**

[74] USDA Forest Service, 2013b

Table 3F-2:
Forest Service Region 2 Sensitive Plant Species for the White River National Forest

Name	General Habitat and CO Range	Species Excluded from Analysis?	Rationale
Draba grayana **Gray's Peak draba**	**Alpine and subalpine on tundra, gravelly slopes or fell fields; 11,600–14,100'; Chaffee, Clear Creek, Gilpin, Grand, Huerfano, Larimer, Park, Pitkin, Saguache and Summit counties, CO**	**No**	**Species Analyzed**
Draba weberi **Weber's Draba**	**Splash zones, among the rocks along streams and lakes and spruce forests; 11,000'–11,500'; Park and Summit counties, CO**	**No**	**Species Analyzed**
Drosera rotundifolia **Roundleaf sundew**	**Among sphagnum peat moss on the margins of ponds, fens, and floating peat mats; 9,100–9,800'; Grand, Gunnison and Jackson counties, CO**	**No**	**Species Analyzed**
Epipactis gigantea Giant helleborine	Warm-water seeps and springs; 4,800–8,000'; Archuleta, Las Animas, Chaffee, Delta, Mesa, Montrose, Moffat, Saguache counties, CO	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
Eriogonum exilifolium Dropleaf buckwheat	Sagebrush flats; 7,500–9,000'; North and Middle Parks in Grand, Jackson and Larimer counties, CO	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
Eriophorum altaicum var. *neogaeum** **Altai cottongrass**	**Open areas with hydric soils, fens; 10,160–13,200'; Eagle, Gunnison, Hinsdale, La Plata, Mineral, Park, Pitkin, Saguache, San Juan and San Miguel counties; includes Eriophorum chamissonis**	**No**	**Species Analyzed**
Eriophorum chamissonis **Chamisoi cottongrass**	**Open areas with hydric soils, fens; 10,160–13,200'; Eagle, Gunnison, Hinsdale, La Plata, Mineral, Park, Pitkin, Saguache, San Juan and San Miguel counties; includes Eriophorum altaicum var. neogaeum**	**No**	**Species Analyzed**
Eriophorum gracile **Slender cottongrass**	**Montane and subalpine fens, saturated soils; 8,100–11,140'; Gunnison, Jackson, Larimer, Las Animas, Park, San Miguel and Summit counties, CO**	**No**	**Species Analyzed**
Festuca hallii ***Hall's Fescue***	**Alpine and subalpine grasslands and meadows; 8,500–11,500'; Huerfano & Larimer counties, CO**	**No**	**Species Analyzed**
Kobresia simpliciuscula **Simple kobresia**	**Fens and moist alpine areas; 8,970 to 12,800'; Boulder, Clear Creek, Grand, Gunnison, Park and Summit counties, CO**	**No**	**Species Analyzed**
Machaeranthera coloradoensis* **CO tansyaster**	**Gravelly areas in mountain parks, slopes and rock outcrops up to dry tundra; 7,600–13,000'; Dolores, Gunnison, Hinsdale, La**	**No**	**Species Analyzed**

Table 3F-2:
Forest Service Region 2 Sensitive Plant Species for the White River National Forest

Name	General Habitat and CO Range	Species Excluded from Analysis?	Rationale
	Plata, Lake, Mineral, Park, Pitkin, Gunnison, Rio Grande, Saguache and San Juan counties, CO		
Parnassia kotzebuei* **Kotzebue's grass of Parnassus**	**Alpine and subalpine, in wet rocky areas, amongst moss mats and along streamlets; 10,000–12,000'; north-central and southwestern CO, Boulder, Clear Creek, Garfield, Larimer, Grand, Park, San Juan, Summit counties, CO**	**No**	**Species Analyzed**
*Penstemon harringtonii** Harrington penstemon	Sagebrush communities, often on calcareous substrates; 6,800–9,000'; endemic to Eagle, Garfield, Grand, Pitkin, Routt, and Summit counties, CO	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities
Ptilagrostis porteri* **Porter's false needlegrass**	**Hummocks in fens and willow carrs; 9,350–12,000'; El Paso, Lake, Park and Summit counties, CO; Also, n. New Mexico.**	**No**	**Species Analyzed**
Ranunculus karelinii* **Ice cold buttercup**	**Alpine slopes among rocks and scree; 12,000–14,100'; central CO, including Chaffee, Clear Creek, Gunnison, Hinsdale, Lake, Ouray, Park and Summit counties, CO**	**No**	**Species Analyzed**
Rubus arcticus subsp. *acaulis* Dwarf raspberry	**Wetlands in willow carrs and mossy streamsides; 7,000–9,720'; Clear Creek, Grand, Park counties, CO**	**No**	**Species Analyzed**
Salix candida **Silver willow**	**Often associated with, but not restricted to rich and extremely rich fens; 8,900–10,400'; Lake, Larimer and Park counties, CO**	**No**	**Species Analyzed**
Salix serissima **Autumn willow**	**Wetland areas including marshes, fens, and bogs; 7,800–10,200'; Boulder, Custer, La Plata, Park, Larimer and Routt counties, CO**	**No**	**Species Analyzed**
Sphagnum angustifolium **Narrowleaf sphagnum**	**Acidic fens with high concentrations of iron and other ions; San Juan and Gunnison National Forests, CO**	**No**	**Species Analyzed**
Sphagnum balticum **Baltic sphagnum**	**Acidic fens with high concentrations of iron and other ions; San Juan National Forest, CO**	**No**	**Species Analyzed**
*Thalictrum heliophilum** *Sun-loving meadowrue*	Endemic to sparsely vegetated steep shale talus slopes of the Green River Formation; 6,300–8,800'	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities

Table 3F-2:
Forest Service Region 2 Sensitive Plant Species for the White River National Forest

Name	General Habitat and CO Range	Species Excluded from Analysis?	Rationale
Utricularia minor **Lesser bladderwort**	**Shallow water of subalpine ponds; 8,200–>10,000'; Boulder, Delta, Gilpin, Jackson, La Plata, Larimer, Montezuma and Park counties, CO**	**No**	**Species Analyzed**
Viburnum opulus var. *americanum* *American cranberry bush*	Riparian and riparian transition to cottonwood, river birch and hawthorn; 6,000–7,000'	Yes	No known or suspected plants or habitat in areas potentially affected by proposed project activities

Notes:
*= Species of viability concern (USFS, 2002).
+ = includes forms assigned to provisional name *Botrychium* "furcatum," to be subsumed under *B. lineare*.
List received from J. Proctor, Forest Service Botanist, dated February 2014.

Additional information regarding species descriptions and habitat is included in the project file.

Species of Local Concern

Plant SOLC are species that are suspected to be at risk at a Forest-wide scale, but that do not meet criteria to be classified as Region 2 Sensitive species because their populations are reasonably secure or stable within portions of Region 2 of the Forest Service. Plant SOLC include species with declining trends in only a portion of Region 2. Risk to SOLC viability may differ at national, regional and local scales. Species at the edge of their range may not merit regional Sensitive Species status, but may be important elements of biological diversity for the Forest/Grassland unit.

The 2002 Forest Plan does not include direction (standards or guidelines) for the management of plant SOLC. However, direction for the management of these species is provided in the FSM, which directs the Forest Service to "Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands."[75] Eighty-one SOLC plants are documented as occurring on or within 1 mile of the WRNF. A total of nine SOLC were documented within the Analysis Area during botanical surveys conducted in 2013 and 2014. Refer to Table 3F-3.

[75] Ibid.

Table 3F-3:
Species of Local Concern Results

Scientific Name	Common Name	Number of Locations	Estimated Number Individuals	Habitat and General Location
Botrychium echo *B. furculatum* *B. hesperium* *B. lanceolatum** *B. minganense* *B. neolunaria*	Moonworts	66	420	Previously disturbed habitats; 10,400–11,600’
Chionophila jamesii	Snowlover	3	85	Lake below Lake Chutes and above T-Bar Lift; 12,400 ft.
Lycopodium annotinum	Stiff clubmoss	1	2’ x 5’patch	Along Cucumber Creek near proposed Peaks Connector trail; 10,400’
Menyanthes trifoliata	Buckbean	1	100s	Wetland north of Independence SuperChair; 10,360’

*red-stem phenotype

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Table 3F-4 summarizes the impact to Region 2 Sensitive species resulting from alternatives 1 through 3.

Table 3F-4:
Summary of Determinations for TES Plant Species

Name	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3
FEDERALLY LISTED			
Eutrema penlandii Penland alpine fen mustard	NE	NE	NE
FOREST SERVICE SENSITIVE			
Armeria maritima subsp. *sibirica** Sea pink	NI	NI	NI
Botrychium ascendens Upswept moonwort	NI	MAII	MAII
Botrychium lineare+ Narrowleaf moonwort	NI	MAII	MAII
Botrychium paradoxum Paradox moonwort	NI	MAII	MAII
Braya glabella subsp. *glabella* Smooth northern-rockcress	NI	NI	NI
Carex diandra Lesser panicled sedge	NI	NI	NI
Carex livida Livid sedge	NI	NI	NI

Table 3F-4:
Summary of Determinations for TES Plant Species

Name	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3
Draba exunguiculata Clawless draba	NI	NI	NI
Draba grayana Gray's Peak draba	NI	NI	NI
Draba weberi Weber's draba	NI	NI	NI
Drosera rotundifolia Roundleaf sundew	NI	NI	NI
Eriophorum altaicum var. *neogaeum** Altai cottongrass	NI	NI	NI
Eriophorum chamissonis Chamisoi cottongrass	NI	NI	NI
Eriophorum gracile Slender cottongrass	NI	NI	NI
Festuca hallii Plains rough fescue	NI	NI	NI
Kobresia simpliciuscula Simple kobresia	NI	NI	NI
*Machaeranthera coloradoensis** Colorado tansyaster	NI	NI	NI
*Parnassia kotzebuei** Kotzebue's grass of Parnassus	NI	NI	NI
*Ptilagrostis porteri** Porter's false needlegrass	NI	NI	NI
*Ranunculus karelinii** Ice cold buttercup	NI	NI	NI
Rubus arcticus subsp. *acaulis* Dwarf raspberry	NI	NI	NI
Salix candida Silver willow	NI	NI	NI
Salix serissima Autumn willow	NI	NI	NI
Sphagnum angustifolium Narrowleaf sphagnum	NI	NI	NI
Sphagnum balticum Baltic sphagnum	NI	NI	NI
Utricularia minor Lesser bladderwort	NI	NI	NI

Notes:
*= Species of viability concern (USFS, 2002).
+ = includes forms assigned to provisional name Botrychium "furcatum," to be subsumed under B. lineare.
NE = No Effect; NI = No Impact; MAII = May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing

Alternative 1 – No Action

Under the No Action Alternative, there would be a continuation of existing management practices. There would be no new recreational facilities. Previously approved but not yet implemented projects would likely occur, but these projects have already undergone site-specific analysis and approval under NEPA. There would be no impacts to forest health or overstory vegetation under the No Action Alternative. Approximately 730 acres of lodgepole pine and 1,400 acres of spruce/fir would exist within BSR's SUP.

There would be no impacts to federally threatened, endangered, proposed, and Region 2 sensitive plant species and other plant SOLC.

Alternative 2 – Proposed Action

Overstory Vegetation

Under Alternative 2, there would be negligible impacts to overstory vegetation due to vegetation clearing, or grading and vegetation clearing. Approximately 4.4 acres of lodgepole pine would be impacted (3.9 acres for vegetation clearing and grading, 0.5 acre for vegetation clearing) by the proposed projects. This represents 0.6 percent of lodgepole pine stands within BSR's SUP. Approximately 10.4 acres of spruce/fir would be impacted (8.2 acres for vegetation clearing and grading, 2.2 acres for vegetation clearing) by the proposed projects. This represents 0.7 percent of spruce/fir stands within BSR's SUP.

In total, 14.8 acres of overstory vegetation would be cleared and 26.7 acres of ground disturbance (including barren, native meadow and ski trail areas) would occur under Alternative 2. The impacts to overstory vegetation would have a no net loss over the long-term because project design criteria (PDC) requires that trees removed be replaced to improve wildlife habitat and forest health (refer to Table 2-2). The PDC does not indicate the type of tree to be planted and thus, the composition of overstory vegetation stands could change.

Invasive Non-Native Weeds

Under Alternative 2, there would be no adverse impacts due to invasive non-native weeds. PDC and Best Management Practices (BMPs) would be followed to control and manage invasive weeds (refer to Table 2-2). PDC include 1) pretreatment of existing infestations, 2) cleaning all off-road equipment, 3) revegetation with approved seed mixes that are certified weed free and 4) monitoring and treatment of the Project Area for three years. Implementation of these PDC will help control existing populations of undesirable weeds, but also prevent their spread into any previously un-infested areas.

Federally Listed and Proposed Plant Species

Under Alternative, there would be no effect to Penland alpine fen mustard, which is Federally listed as Threatened. This plant was not located during the detailed field reconnaissance efforts and, therefore, was determined to be absent from the area of proposed projects.

Region 2 Sensitive Species

A determination of no impact was made for 23 of the 26 plant species. None of these species are known to occur in the Analysis Area, nor were documented during botanical survey work in 2013 and 2014. Thus, these species are presumed to be absent.

For the three Forest Service Sensitive moonwort species, no occurrences were found during the surveys that were focused in areas that would be directly impacted under Alternative 2. Therefore, it is unlikely that there would be any direct effects to these species. However, because occurrences of *Botrychium* spp. may not have been observed due to their small size and phenological development, there is a remote possibility of direct and/or indirect effects. Direct impacts could potentially result from trampling, breaking, crushing or uprooting of individuals as produced by machinery during the construction process for tower installation or removal. Individuals could also be directly impacted by smothering with slash, chips or soil, and could also have trees fall on them during forest overstory removal. Individuals impacted may die or experience reduced growth and development as well as reduced or eliminated seed-set and reproduction. If direct impacts are large enough, the reduced population size may change meta-population structure, potentially affecting species viability on the planning unit or range-wide.

Indirect effects to *Botrychium* spp. could also occur as a result of the Proposed Action. Increased light regime from forest overstory removal and creation of recreation trails or access routes could potentially benefit moonworts in the long run by creating open, disturbed sites that these plants prefer. Other indirect impacts, such as noxious weed invasion, altered hydrologic patterns, or increased dust from vehicular construction traffic may be a detriment to *Botrychium* spp., and impacted individuals may die or show reduced growth and reproduction. However, over time, disturbances related to the Proposed Action would stabilize and create additional habitat for moonworts, which would benefit these species as a whole.

It is anticipated that the direct and indirect impacts associated with Alternative 2 would be localized and not of sufficient intensity or scale to cause a significant effect. A determination of "may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing" (MAII) was made for three *Botrychium* spp. *(Botrychium ascendens*, *B. lineare* and *B. paradoxum*.), due to the remote possibility that the species could occur in the Analysis Area.

Species of Local Concern

Under the Proposed Action there would be no direct impacts to *Chionophila jamesii*, *Lycopodium annotinum* or *Menyanthes trifoliata*. However there would be direct impacts to 6,571 square feet (0.15 acre) of occupied moonwort (*Botrychium* spp.) habitat. Refer to Table 3F-5 for impact by proposed project component. This represents about 14 percent of all moonwort habitat identified during 2013 and 2014 field reconnaissance. The impacts would primarily be associated with the Upper 4 O'Clock Road realignment and the challenge courses; however, the Sawmill Canopy Tour and mountain bike trails would also impact some moonwort habitat.

Table 3F-5:
Impact Summary for *Botrychium* spp. SOLC (Alternatives 2 and 3)

Activity	Impact (sq. ft.)	Percent of Impact (%)
Upper 4 O'Clock Road Realignment	4,061	61.8
Sawmill Canopy Tour	277	4.2
Challenge Course	1,832	27.9
Mountain Bike Trails	401	6.1
TOTAL	**6,571 (0.15 acre)**	**100**

Indirect effects to *Botrychium* spp. could also occur as a result of Alternative 2. Increased light regime from forest overstory removal and creation of recreation trails or access routes could potentially benefit moonworts in the long run by creating open, disturbed sites that these plants prefer. Other indirect impacts, such as noxious weed invasion, altered hydrologic patterns, or increased dust from vehicular construction traffic may be a detriment to *Botrychium* spp., and impacted individuals may die or show reduced growth and reproduction. However, over time, disturbances related to Alternative 2 would stabilize and create additional habitat for moonworts, which would benefit these species as a whole.

There would be no indirect impacts to *Lycopodium annotinum* or *Menyanthes trifoliata* under Alternative 2, as PDC would be implemented to minimize soil erosion and sedimentation for all new construction activities (refer to Table 2-2). These SOLC occur 65 to 85 feet from proposed mountain bike trails, respectively. Finally, indirect impacts to *Chionophila jamesii,* which occur along the eastern edge of the lake below Lake Chutes, may occur as the result of increased pedestrian traffic to the area. Although there is no proposed hiking trail around the lake, it is conceivable that some visitors to this area would walk around the lake, compacting soil and potentially trampling some of the plants.

Alternative 3

Overstory Vegetation

Under Alternative 3, there would be negligible impacts to overstory vegetation due to vegetation clearing, or grading and vegetation clearing. Approximately 3.6 acres of lodgepole pine would be impacted (3.1 acres for vegetation clearing and grading, 0.5 acre for vegetation clearing) by the proposed projects. This represents 0.5 percent of lodgepole pine stands within BSR's SUP. Approximately 7.3 acres of spruce/fir would be impacted (5.7 acres for vegetation clearing and grading, 1.6 acres for vegetation clearing) by the proposed projects. This represents 0.5 percent of spruce/fir stands within BSR's SUP.

In total, 11 acres of overstory vegetation would be cleared and 23.2 acres of ground disturbance (including barren, native meadow and ski trail areas) would occur under Alternative 3. The impacts to overstory vegetation would have a no net loss over the long-term because PDC requires trees removed be

replaced to improve wildlife habitat and forest health (refer to Table 2-2). The PDC does not indicate the type of tree to be planted and thus, the composition of overstory vegetation stands could change.

Invasive Non-Native Weeds

Under Alternative 3, there would be no adverse impacts due to invasive non-native weeds. PDC and BMPs would be followed to control and manage invasive weeds (refer to Table 2-2). These PDC include 1) pretreatment of existing infestations, 2) cleaning all off-road equipment, 3) revegetation with approved seed mixes that are certified weed free and 4) monitoring and treatment of the Project Area for three years. Implementation of these PDC will help control existing populations of undesirable weeds, but also prevent their spread into any previously un-infested areas.

Federally Listed and Proposed Plant Species

Under the Alternative 3, there would be no effect to Penland alpine fen mustard, which is Federally listed as Threatened. This plant was not located during the detailed field reconnaissance efforts and, therefore, was determined to be absent from the area of proposed project activities.

Region 2 Sensitive Species

A determination of no impact was made for 23 of the 26 plant species. None of these species are known to occur in the Analysis Area, nor were documented during the botanical survey work of 2013 and 2014. Thus, these species are presumed to be absent.

For the three Forest Service Sensitive moonwort species, no occurrences were found during the surveys that were focused in areas that would be directly impacted under Alternative 3. Therefore, it is unlikely that there would be any direct effects to these species. However, because occurrences of *Botrychium* spp. may not have been observed due to their small size and phenological development, there is a remote possibility of direct and/or indirect effects. Direct impacts could potentially result from trampling, breaking, crushing or uprooting of individuals as produced by machinery during the construction process for tower installation or removal. Individuals could also be directly impacted by smothering with slash, chips or soil, and could also have trees fall on them during forest overstory removal. Individuals impacted may die or experience reduced growth and development as well as reduced or eliminated seed-set and reproduction. If direct impacts are large enough, the reduced population size may change meta-population structure, potentially affecting species viability on the planning unit or range-wide.

Indirect effects to *Botrychium* spp. could also occur as a result of Alternative 3. Increased light regime from forest overstory removal and creation of recreation trails or access routes could potentially benefit moonworts in the long run by creating open, disturbed sites that these plants prefer. Other indirect impacts, such as noxious weed invasion, altered hydrologic patterns, or increased dust from vehicular construction traffic may be a detriment to *Botrychium* spp., and impacted individuals may die or show

reduced growth and reproduction. However, over time, disturbances related to Alternative 3 would stabilize and create additional habitat for moonworts, which would benefit these species as a whole.

It is anticipated that the direct and indirect impacts associated with Alternative 3 would be localized and not of sufficient intensity or scale to cause a significant effect. A determination of "may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing" (MAII) was made for three *Botrychium* spp. *(Botrychium ascendens*, *B. lineare* and *B. paradoxum*.), due to the remote possibility that the species could occur in the Analysis Area.

Species of Local Concern

Under Alternative 3 there would be no direct or indirect impacts to *Chionophila jamesii*, *Lycopodium annotinum* or *Menyanthes trifoliata*. However there would be direct impacts to 6,571 square feet (0.15 acre) of occupied moonwort (*Botrychium* spp.) habitat. Refer to Table 3F-5 for impact by proposed project component. This represents about 14 percent of all moonwort habitat identified during 2013 and 2014 field reconnaissance. The impacts would primarily be associated with the Upper 4 O'Clock Road realignment and the challenge courses, however the Sawmill Canopy Tour and mountain bike trails would also impact some moonwort habitat.

Indirect effects to *Botrychium* spp. could also occur as a result of Alternative 3. Increased light regime from forest overstory removal and creation of recreation trails or access routes could potentially benefit moonworts in the long run by creating open, disturbed sites that these plants prefer. Other indirect impacts, such as noxious weed invasion, altered hydrologic patterns, or increased dust from vehicular construction traffic may be a detriment to *Botrychium* spp., and impacted individuals may die or show reduced growth and reproduction. However, over time, disturbances related to Alternative 3 would stabilize and create additional habitat for moonworts, which would benefit these species as a whole.

There would be no indirect impacts to *Lycopodium annotinum* or *Menyanthes trifoliata* under Alternative 3, as PDC would be implemented to minimize soil erosion and sedimentation for all new construction activities (refer to Table 2-2). Both of these SOLC occur 65 to 85 feet from proposed mountain bike trails, respectively.

CUMULATIVE EFFECTS

Scope of the Analysis

The effects analyzed in the section apply to all alternatives, including the No Action Alternative. Cumulative effects to sensitive plant species occur over time and across populations. Because no Threatened or Endangered species were found in the disturbance areas, Endangered Species Act cumulative effects are not evaluated. For a detailed description of past, present and reasonable foreseeable future projects, the reader is referred to Appendix A in this document.

Temporal Bounds

The temporal bounds for this cumulative effects analysis for vegetation extend from BSR's inception as a resort in 1961, through the foreseeable future in which BSR can be expected to operate.

Spatial Bounds

The spatial bounds for this cumulative effects analysis are limited to public and private lands in the vicinity of the BSR SUP area.

Past, Present, and Reasonably Foreseeable Future Projects

Past, present, and reasonably foreseeable actions that have cumulatively affected, and that will likely cumulatively affect, botanical resources within the Project Area are related to development of public and private lands dating back to the 1960s. These past, present and reasonably foreseeable actions include:

- Breckenridge Ski Resort – Master Development Plan projects
- Miscellaneous Recreation Activities/Projects
- Continued Town of Breckenridge and Upper Blue Residential Build-out
- Breckenridge Forest Health and Fuels EA
- Mountain Pine Beetle Effects (Upper Blue Watershed)
- Historic Mining Activities
- Tailor Lode Inholding
- Weber Gulch Hut

Alternative 1

The No Action Alternative would not result in any cumulative effects to *Botrychium ascendens*, *B. lineare* and *B. paradoxum* because these species would not be directly or indirectly impacted under the No Action Alternative.

Alternatives 2 and 3

For alternatives 2 and 3, there is a remote possibility of cumulative effects to the moonwort species, especially because the rarity of *Botrychium ascendens*, *B. lineare* and *B. paradoxum* make them extremely vulnerable to extirpation. Assuming presence of the above listed species, past actions likely had both positive and negative effects on *Botrychium* spp. Historic activities within the Analysis Area, such as ski trail development and forest thinning that reduced forest cover while minimizing ground disturbance and soil sterilization, likely benefitted moonworts by creating open habitats preferred by these species. However, introduction of invasive species, infrastructure development (e.g., buildings, lift tower foundations) and creation of new roads and trails may have been detrimental to moonworts by increasing competition for light, causing erosion and sedimentation and eradicating habitat. Present and future projects would likely cause similar effects to those in the past, and the actions and effects described above can be additive. Forest Service Standards as found in the Forest Plan mandate that, "*Activities will be*

managed to avoid disturbance to sensitive species that would result in a trend toward federal listing or loss of viability."[76] Thus, cumulative effects are not expected to contribute to increases in any current, or predicted, downward trend in Sensitive plant species population numbers, extent or habitat across the planning unit.

The evaluation of cumulative impacts for SOLC plant species is difficult due to a lack of information regarding species presence, absence and population numbers and extent. For the rare species analyzed in this document and the cumulative effects projects listed in Appendix A, it is unlikely that any significant cumulative impacts have occurred, are occurring or would occur. Should SOLC plant species be impacted by the Proposed Action or alternatives, those losses would be in addition to other collectively minor cumulative impacts occurring throughout the region. Overall, the Proposed Action and alternatives are not expected to lead to or contribute to appreciable cumulative effect to plant SOLC.

Additional information regarding cumulative effects to botanical species is presented in the project file.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Ground disturbance related to ski trail and chairlift development would represent an irretrievable effect to botanical resources within the SUP area and adjacent private lands. However, this is not considered an irreversible commitment because vegetation is a renewable resource. Should ground disturbance occur to the point where potential habitat is removed entirely, an irreversible commitment of this resource could occur. However, as stated in the analysis, Threatened and Endangered species were not identified in the areas of disturbance, and Region 2 Sensitive Plant Species could be avoided and impacts minimized if any were encountered.

[76] USDA Forest Service, 2002a

G. FISH AND WILDLIFE

SCOPE OF THE ANALYSIS

This wildlife analysis is tiered to the 2002 WRNF Forest Plan FEIS, and incorporates by reference the 2002 Forest Plan, as amended, as well as the 2008 Southern Rockies Lynx Amendment.[77] Species analyzed were identified as listed proposed, threatened, endangered, sensitive or management indicator species (MIS). A Biological Assessment, Biological Evaluation, Management Indicator Species, and Migratory Bird Report has been prepared and is in the project file.[78] All of these documents are hereby incorporated by reference and summarized below. The spatial scope of the wildlife analysis primarily includes the BSR SUP area, but it also extends to areas beyond the SUP area that could be impacted from a wildlife movement standpoint.

AFFECTED ENVIRONMENT

Sawmill and Ore Bucket Areas

The existing summer recreation operational boundary includes 1,530 acres of concentrated summer recreational activities, but does not include the Sawmill or Ore Bucket areas. The Sawmill and Ore Bucket areas currently provide habitat for a variety of species adjacent to the existing summer operation boundary at BSR. Impacts occur in these areas during the winter ski season, but during the summer months, these areas are relatively undisturbed by human activity. The Sawmill area includes Sawmill Creek and associated riparian habitat. The Ore Bucket area includes the headwaters of Cucumber Creek and associated riparian habitat.

Threatened and Endangered Species

Federal threatened and endangered species for the WRNF are displayed in Table 3G-1. Other listed and proposed species known to occur elsewhere on the WRNF or in Colorado were considered but dropped from detailed analysis because their habitats do not occur on the Dillon Ranger District, they have no affinity to Project Area habitats, and/or the Project Area is outside of the species' range.

A pre-field review was conducted of available information to assemble occurrence records, describe habitat needs and ecological requirements, and determine whether field reconnaissance was needed to complete the analysis.

No further analysis is needed for species that are not known or suspected to occur in the Project Area, and for which no suitable habitat is present. The following table documents the rationale for excluding a species.

[77] USDA Forest Service, 2002b and 2008b
[78] Thompson, 2014

Table 3G-1:
Threatened, Endangered, and Proposed Wildlife Species

Common and Scientific Name	Status	Rationale for Occurrence[a] (Habitat)/ Carried Forward in Analysis
Uncompahgre fritillary butterfly, *Boloria acrocnema*	FE	No suitable habitat (alpine snow willow stands >12,000' on peaks ≥12,600'). Project far outside species' distribution. / NO
Humpback chub, *Gila cypha*	FE	No additional water effects beyond those considered in prior consultations (far downstream in Colorado River) / NO
Bonytail chub, *G. elegans*	FE	No additional water effects beyond those considered in prior consultations (far downstream in Colorado River) / NO
Colorado pikeminnow, *Ptychocheilus lucius*	FE	No additional water effects beyond those considered in prior consultations (far downstream in Colorado River) / NO
Razorback sucker, *Xyrauchen texanus*	FE	No additional water effects beyond those considered in prior consultations (far downstream in Colorado River) / NO
Greenback cutthroat trout, *Oncorhynchus clarkii stomias*	FT	Habitat occupied by non-native fish. Outside of historical range. (isolated mountain stream headwaters) / NO
Canada lynx, *Lynx canadensis*	FT	Present in AA, potential forage/ travel habitat (montane and subalpine forests) / YES

Sources: USFWS Mar. 27, 2014 update, received from L. Roberts, USFS, pers. comm., July 30, 2014, as modified by USFWS (2014), and Western Ecosystems, Inc.
Notes: Other federally listed and proposed species are not listed in this table because the Project Area is outside of the species' range, their habitats do not occur in the Project Area, they have no affinities to Project Area habitats, and the management decisions associated with alternatives 2 and 3 would have "no effect" on the species, on their habitats, or on designated critical habitat. Species are listed phylogenetically. Federal status, listed after species, is as follows: FE = Federally Endangered, FT = Federally Threatened.
[a] in Action Area (AA)

Uncompahgre fritillary butterfly and greenback cutthroat trout were dropped from detailed analysis because their ranges do not include the Analysis Area, and habitat required during their life history is not found within the Project Area. The effects to the four big river fish due to water depletions have been previously analyzed. The effect of the proposed projects on Canada lynx is analyzed in detail.

Canada Lynx

The proposed summer activity areas would be generally concentrated in low quality hare habitat (including large areas of non-habitat and currently unsuitable habitat associated with the lodgepole zone where few or no hares remain) that are heavily used for summer and winter recreation. Such areas have limited value (largely as travel habitat) to lynx. The majority (65 percent) of the SUP area is "non-habitat," composed of the alpine and ski trails. The remaining 35 percent of the SUP area is classified as lynx habitat ("winter foraging," "other," or "currently unsuitable"). Winter foraging habitat composes 13 percent of the SUP area.

The 112-acre Windows block (the tree island between upper Peaks 8 and 9) provides effective summer diurnal security habitat (DSH). Furthermore, an eastern extension of the Windows block, the Sawmill block, largely involving the north-facing spruce-fir stand on the south side of Sawmill Creek, also provides effective summer DSH values. These two, large inter-trail islands not only occur approximately mid-way across (a south-north orientation) BSR's developed terrain in the spruce-fir zone, but they occur outside the southern edge of the existing Peak 8 and Peak 7 summer recreation operations area.

Within the BSR SUP area, summer human activities are confined to recreational use and maintenance/ construction. These two activity types differ in their potential effects on wildlife. Of the two types, recreational use represents the vast majority of human activity, even in heavy construction years.

At BSR, summer recreation occurs on Peaks 8 and 7, within areas that are presently disturbed and surrounded by disturbance. BSR operates three chairlifts for summer recreation activities on Peak 8: Colorado SuperChair, Rip's Ride, and Chair 5. The Colorado SuperChair is the only chairlift that BSR operates during the summer season that provides access for visitors onto NFS lands. Current summer recreational use totals approximately 175,000 guests, most of which remain on private lands at the base of Peak 8. The Colorado SuperChair transports approximately 40,000 guests up-mountain across the 90-day summer operating season for scenic chairlift rides, mountain biking (approximately 25 miles and 8,000 trips on trails) and hiking trails (approximately 1 mile of hiking trails and 5,000 users).

Region 2 Sensitive Species

Based on documented habitat affinities, the species highlighted in bold in Table 3G-2 below were determined to have potential habitat in the project areas. Sensitive species for which there is no habitat in the Project Area were eliminated from further analysis.

Table 3G-2:
Region 2 Sensitive Species Applicable to BSR

Common name, *Scientific name*	Rationale for Potential Project Effects (Habitat Affinity)
INSECTS	
Great Basin silverspot, *Speyeria nokomis nokomis*	No habitat (Wetlands supporting violet populations)
FISH	
Roundtail chub, *Gila robusta robusta*	No suitable habitat present (Far downstream in Colorado River)
Mountain sucker, *Catostomus platyrhynchus*	No suitable habitat present (Not known from Blue River)
Bluehead sucker, *Catostomus discobolus*	No suitable habitat present (Not known from Blue River)
Flannelmouth sucker, *Catostomus latipinnis*	No suitable habitat present (Larger west slope Colorado Rivers)
Colorado River cutthroat trout, *Oncorhynchus clarkii pleuriticus*	Historic and potential habitat (Isolated, headwater streams and lakes)
AMPHIBIANS	
Boreal western toad, *Bufo boreas boreas*	Potential habitat (Montane/subalpine ponds with willow wetlands)
Northern leopard frog, *Rana pipiens*	Potential habitat (Permanent wetlands)

Table 3G-2:
Region 2 Sensitive Species Applicable to BSR

Common name, *Scientific name*	Rationale for Potential Project Effects (Habitat Affinity)
BIRDS	
Northern goshawk, *Accipiter gentilis*	Potential habitat (Closed montane forests >7,500')
Northern harrier, *Circus cyaneus*	No habitat (Grasslands, agricultural lands, marshes & alpine)
Ferruginous hawk, *Buteo regalis*	No habitat (Plains, grasslands)
American peregrine falcon, *Falco peregrinus anatum*	Potential habitat (Cliffs, habitats concentrating/exposing vulnerable prey)
Bald eagle, *Haliaeetos leucocephalus*	No habitat (Open water bodies, big game winter range)
White-tailed ptarmigan, *Lagopus leucurus*	Present (Alpine habitat and upper elevation willow stands)
Greater sage grouse, *Centrocercus urophasianus*	No habitat (Sagebrush)
Columbian sharp-tailed grouse, *Tympanuchus phasianellus columbianus*	No habitat (Sagebrush and mountain shrub)
Flammulated owl, *Otus flammeolus*	No habitat (Old-growth ponderosa pine and aspen)
Boreal owl, Aegolius funereus	Potential habitat (Mature spruce-fir & mixed conifer)
Black swift, *Cypseloides niger*	No habitat (Waterfalls, cliffs)
Lewis' woodpecker, *Melanerpes lewis*	No habitat (Ponderosa pine and cottonwoods)
Olive-sided flycatcher, *Contopus cooperi*	Present (Open, upper elev. conifer forests)
Loggerhead shrike, *Lanius ludovicianus*	No habitat (Plains, low valleys, shrublands)
Purple martin, *Progne subis*	No habitat (Old-growth aspen)
Brewer's sparrow, *Spizella breweri*	No habitat (Sagebrush and other structurally similar shrublands)
Sage sparrow, *Amphispiza belli*	No habitat (Low elevation big sagebrush and sage/greasewood)
MAMMALS	
Pygmy shrew, *Microsorex hoyi montanus*	Potential habitat (Variety of subalpine habitats)
Fringed myotis, *Myotis thysanodes*	No habitat (Forests/woodlands to 7,500'; unknown on WRNF)
Hoary bat, *Lasiurus cinereus*	Potential habitat (Including mixed conifer and lodgepole pine forest)
Spotted bat, *Euderma maculatum*	No habitat (Cliffs, arid terrain)
Townsend's big-eared bat, *Corynorhinus townsendii townsendii*	No habitat (Structures, tree cavities <9,500')
American marten, *Martes americana*	Present (Conifer forests)
North American wolverine, *Gulo gulo luscus*	Potential travel habitat (Mountains)
River otter, *Lontra canadensis*	No habitat (Year-round open water and streamflows of ≥10 cfs
Rocky Mountain bighorn sheep, *Ovis canadensis canadensis*	Potential habitat (High visibility habitat near escape terrain)

Sources: USFS (2011), list updated Aug. 24, 2013 provided by A. Nettles, USFS, Sep. 22, 2014; and Western Ecosystems, Inc.
Notes: Other R2 species are not listed because they have not been found on the WRNF, they have no affinities to Project Area habitats, the Project Area is outside of the species' range or elevational distribution. Potential pre-field survey occurrence on the Project Area, potential for project effects, and habitat affinity is summarized for each species. Wildlife are listed phylogenetically.

Management Indicator Species

Management Indicator Species (MIS) are selected to determine how management actions are affecting wildlife resources (refer to Table 3G-3). Each species was chosen to answer specific questions about how these species use habitat and how habitat alterations through management decisions could affect the species. Species were selected based on the species reaction to changes in habitat and the ability to monitor the changes in the species populations or habitat use.

Table 3G-3:
Management Indicator Species

MIS Species	Monitoring Question Identified in 2002 Forest Plan Revision	Habitat Occupied by Species; Are species and habitat present in the Project Area?	Will Proposed Action (Alts. 2 and 3) affect (direct, indirect, or cumulative) the species, its habitat, or its management question?	Will Proposed Actions affect Forest-wide Population or Habitat Trends?	Is species addressed in other project documents?
Cave Bats	Are caves being managed so that bat species will continue to use the caves, and maintain populations in the areas adjacent to the caves?"	Caves, abandoned mines; Species Presence: No Habitat Presence: No	Species: No Habitat: No Is monitoring question Applicable to Project? No, project will not affect any cave resources.	Population trends: No Habitat trends: No	Yes, fringed myotis, spotted bat, and Townsend's big-eared bat are considered but eliminated from further discussion. Hoary bat is considered.
Elk	Does Forest motorized and non-motorized travel and recreation management result in effective use of habitat by large ungulates?"	Wide range of forest and non-forest habitats; Species Presence: Yes Habitat Presence: Yes	Species: Yes Habitat: Yes Is monitoring question applicable to project? Yes, but the loss of vegetation will not impact capability of elk habitat.	Population trends: No Habitat trends: No	Yes
Brewer's Sparrow	"Is sagebrush habitat being managed adequately to provide the quality and quantity of habitat for species dependent or strongly associated with sagebrush?"	Sagebrush; Species Presence: No Habitat Presence: No	Species: No Habitat: No Is monitoring question applicable to project? No, the project will not affect sagebrush habitats.	Population trends: No Habitat trends: No	Yes, considered but eliminated from further discussion.

Table 3G-3:
Management Indicator Species

MIS Species	Monitoring Question Identified in 2002 Forest Plan Revision	Habitat Occupied by Species; Are species and habitat present in the Project Area?	Will Proposed Action (Alts. 2 and 3) affect (direct, indirect, or cumulative) the species, its habitat, or its management question?	Will Proposed Actions affect Forest-wide Population or Habitat Trends?	Is species addressed in other project documents?
American Pipit	"Is the alpine grassland habitat being managed to provide habitat for those species dependent or strongly associated with alpine grassland habitat?"	Alpine Grassland; Species Presence: Yes Habitat Presence: Yes	Species: Yes Habitat: Yes Is monitoring question applicable to project? Yes	Population trends: No Habitat trends: No	Yes
Virginia's Warbler	"Does forest management maintain populations of species dependent on dense shrub habitat dispersed throughout the shrub cover types?"	Dense Shrub Habitats; Species Presence: No Habitat Presence: No	Species: No Habitat: No Is monitoring question applicable to project? No, the project will not affect shrub habitat within the elevation range of this bird.	Population trends: No Habitat trends: No	No
All Trout	"Does forest management maintain or improve the physical habitat quality for salmonids in mountain streams?"	Perennial streams and lakes; Species Presence: Yes Habitat Presence: Yes	Species: Yes Habitat: Yes Is monitoring question applicable to project? Yes	Population trends: No Habitat trends: No	Yes.
Macro-invertebrate Communities	"Does forest management maintain or improve water quality (including chemical aspects as well as sediment) such that aquatic faunal communities are similar between managed and reference sites?"	Perennial streams, intermittent streams, lakes and reservoirs; Species Presence: Yes Habitat Presence: Yes	Species: Yes Habitat: Yes Is monitoring question applicable to project? Yes	Population trends: No Habitat trends: No	Yes

Migratory Birds

In 2008, the Forest Service Chief signed a Memorandum of Understanding (MOU) with the USFWS to promote the conservation of migratory birds. This MOU was pursuant to Executive Order 131866, Responsibilities of Federal Agencies to Protect Migratory Birds.[79] The Executive Order directs agencies to take certain actions to further comply with the migratory bird conventions, the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act and other pertinent statutes. The purpose of the MOU is to strengthen migratory bird conservation by identifying strategies that promote conservation and avoid or minimize negative impacts on migratory birds.

Table 3G-4 presents a list of birds of conservation concern, as well as information about potential occurrence in the BSR Analysis Area.

Table 3G-4:
USFWS Birds of Conservation Concern

Species	General Habitat	Occurrence in BSR Analysis Area
Northern Harrier	Grasslands	No
Swainson's Hawk	Grasslands	No
Ferruginous Hawk	Prairie	No
Golden Eagle	Cliffs/grasslands	Yes, Project Area part of large hunting range; no local nests
Peregrine Falcon	Cliffs	Yes, Project Area may be part of large hunting range; eyrie non-local
Prairie Falcon	Cliffs	No
Gunnison sage-grouse	Sagebrush	No
Snowy Plover	Shorelines	No
Mountain Plover	Prairie	No
Solitary Sandpiper	Shorelines	No
Marbled Godwit	Wetlands	No
Wilson's Phalarope	Waterbodies/Shorelines	No
Yellow-billed Cuckoo	Deciduous Riparian	No
Flammulated Owl	Ponderosa pine/snags	No
Burrowing Owl	Plains/grasslands	No
Short-eared Owl	Parks/grasslands	No
Black Swift	Waterfalls/wet cliffs	No
Lewis's Woodpecker	Riparian Cottonwood	No
Williamson's Sapsucker	Montane forests/snags	No
Gray Vireo	Oak woodlands/scrub	No
Pinyon Jay	Pinyon/Juniper	No
Bendire's Thrasher	Rare spp of arid areas	No
Crissal Thrasher	No records in CO	No
Sprague's pipit	No records in CO	No
Virginia's warbler	Riparian scrub	No

[79] 66 Fed. Reg. 3853, 2001

Table 3G-4:
USFWS Birds of Conservation Concern

Species	General Habitat	Occurrence in BSR Analysis Area
Black-throated gray warbler	Oak scrub/riparian	No
Grace's warbler	Ponderosa pine	No
Sage sparrow	Sagebrush	No
Chestnut-collared longspur	Plains	No

More detailed information on the habitat requirements, status, distribution, abundance, and key habitat components of most species is on file at the Forest Service Supervisor's Office in Glenwood Springs, Colorado, and the USFWS's Western Colorado Field Office in Grand Junction, Colorado, and is not reviewed here.

Colorado Parks and Wildlife Endangered and Threatened Species

The current lists of Colorado endangered and threatened species and species of state special concern was considered for species that may occur on and around the Project Area. Those lists included 2 mollusks, 23 fish, 7 amphibians, 10 reptiles, 19 birds, and 13 mammals. None of those listed state species occur or have potential habitat that would be influenced by the action alternatives, or the species have been addressed above as part of other species lists. These species are not considered further in this analysis.

Species of Local Concern

Animal species of local concern (ASOLC) are those identified from comments received from Colorado Parks and Wildlife (CPW) and the public during scoping, unless otherwise noted. The Forest Service project biologist selected those species that are not on other lists associated with this analysis and that were of greater public concern warranting individual consideration. These species include mule deer, moose, and mountain goat.

Mule Deer

All available mule deer seasonal activity area distributions in the vicinity of the BSR Project Area were obtained from CPW and are shown on a map contained in the project file.[80] The only seasonal activity areas overlapping or in the vicinity of the BSR Project Area were "overall range" and "summer range," which covered the entire map. Seasonal activity areas not identified in the vicinity included "migration patterns," "winter range," "winter concentration area," "severe winter range," "resident population area," "migration corridor," "limited use area," "highway crossing," and "concentration area." Field surveys conducted at BSR extending back to 1991 confirms this data. A low number of somewhat habituated deer are present throughout the Project Area despite the high level of summer recreational activity. Deer use

[80] Colorado Parks and Wildlife, 2014

high level activity areas outside human use periods (dusk to dawn) and retreat to relatively isolated and unused habitat patches during the day.

Moose

Moose are present year-round in and around the Project Area as a low number of individuals and cow-calf groups. They are most common in the northerly portion of the BSR SUP area along and north of a mid-elevation reach of Cucumber Creek, but they can occur virtually anywhere, including in developed ski terrain and in the summer activities Project Area. There are probably no areas below treeline in the BSR Project Area where moose would not be expected to occur. Moose are generally displaced from active summer activity areas as well as adjacent buffer zones. Cervid parturition surveys conducted throughout the BSR SUP area and areas beyond did not detect evidence of moose calving, but most of those surveys were conducted at mid- to higher elevations associated with ski area proposals that represented suboptimal moose calving habitat. It is likely that moose calve locally, but not in the summer activities Project Area. Lone bulls and cows and cows with calves and young-of-the-year were detected within the Project Area during summer and winter tracking surveys.

All available moose seasonal activity area distributions in the vicinity of the BSR Project Area were obtained from CPW and are shown on a map contained in the project file.[81] The only mapped seasonal activity area overlapping the BSR Project Area was a crescent of "winter range" overlapping the lower, northeast portion of the developed Peak 7 terrain. A nearby mapped seasonal activity area was "migration pattern" which shows the general direction of moose movements on the east side of the Tenmile Range as oriented north-south. Below treeline, the entire Project Area should also considered overall range and summer range. Based on winter tracking surveys conducted between BSR's developed ski terrain and Spruce Creek, low numbers of individual moose also winter in that area above the subdivisions west of Highway 9.

Mountain Goat

Mountain goats are occasionally present in the Tenmile Range and all portions of the resort above timberline provide summer range, overall range, and migration corridors.[82] All available mountain goat seasonal activity area distributions in the vicinity of the BSR Project Area were obtained from CPW and are shown on a map contained in the project file.[83] Alpine areas along the crest of the Tenmile Range are mapped as "overall range" and "summer range" and a polygon of "winter range" occurs west of Peaks 9 and 8, overlapping the very top of Peak 9. No other mapped goat seasonal activity areas overlap or occur in the vicinity of the BSR Project Area. While the CPW polygons may be accurate, goats are only occasionally present in those areas and that habitat is not particularly effective because of the lack of escape cover (i.e., cliffs) that goats require for predator avoidance. As such, the current levels of summer

[81] Ibid.
[82] Velarde, 2014
[83] Colorado Parks and Wildlife, 2014

recreational, including hunting (5 permits for unit G-10 in 2014), are having relatively minor effects of got habitat effectiveness with the recreational influence of BSR summer and winter activities. Some conflicts exist between heavy summer (mostly) recreationist use along alpine and subalpine use areas associated with Quandary Peak (a popular 14'er a few miles south of BSR along the crest of the Tenmile Range).

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action Alternative reflects a continuation of existing operations and management practices at BSR without changes, additions or upgrades on NFS lands. Alternative 1 would result in no additional water diversions or depletions. Under Alternative 1, there would be 297 acre feet and 168 acre feet of unused diversions and depletions, respectively, which were authorized in prior Section 7 consultations.

Over the short term (<50 years), vegetation within the project areas would remain much the same. The project areas would continue to provide habitat for species present within the Project Area. Potential disturbance to these species would remain at current levels. Implementation of Alternative 1 would have no impact on threatened, endangered, Region 2 sensitive species, MIS, migratory birds, CPW species, or ASOLC.

Alternative 2 – Proposed Action

Sawmill and Ore Bucket Areas

The following paragraphs provide general wildlife impacts anticipated within the Sawmill and Ore Bucket areas. Note that there have been few specific studies on the effects of the types of proposed summer activities on the many groups and individual wildlife species that would be affected by the Proposed Action. As a result, the general effects of similar recreational on wildlife, how wildlife behaviorally and physiologically respond to different types and intensities of disturbances were extrapolated to the characteristics and setting of proposed activities.

Under Alternative 2, 29.4 acres of habitat would have the majority of their current values permanently converted, largely into facilities and non-forested disturbed areas. Under Alternative 3, 25.3 acres of habitat would have the majority of their current values permanently converted, largely into facilities and non-forested disturbed areas. Alternative 3 would have 4.1 acres (13.9 percent) less habitat impacts compared to Alternative 2. Impact acreages resulting from individual project components are contained in the project file.

Guest use of Alternative 2 summer activities areas would extend from approximately 8:00 a.m. to 5:00 p.m., June 15 to September 15 (approximately. 90 days), with peak use occurring in July and August. Alternative 2 project components would extend the daily, existing, summer operational boundary

by 3 percent (14 acres in Sawmill Creek area and 32 acres in the Ore Bucket area) as a result of activity associated with the Sawmill Zip Line, Ore Bucket Canopy Tour, and Ore Bucket Bike trail.

Summer activities extending beyond the current boundaries of regularly used summer activity areas (i.e., the Sawmill Zip Line, Ore Bucket Canopy Tour, and the Ore Bucket Bike trail) and those that bisect relatively large habitat blocks and inter-trail islands that are currently unused by summer recreationists (i.e., the Peak 7 bike and hiking trails, including the Peaks trail connection) would have the greatest effect on wildlife. Activities proposed adjacent to existing recreation hubs (e.g., the Vista Haus) would have little additional negative wildlife effect. There is also a vertical distance issue associated with some project components. For example, a rider on the Sawmill Zip Line may be approximately 500 vertical feet above habitat along Sawmill Creek and even noise from the zip line may not be discernable to wildlife over the noise of the creek. Most wildlife (i.e., all but elk and moose) that may be in forest cover below the Sawmill Zip Line might have no reaction.

The activities discussed above fall within the general progression of hiking, biking, zip lines, and canopy tours, ranging from least to most disturbing to wildlife. Hiking would be slow, confined to a narrow trail, and relatively quiet. Hiker disturbances would be most attenuated and confined in forest cover and most widespread in the alpine. Bike trails, zip lines, and canopy tours would present more acute disturbances, as fast moving humans (at least initially representing potential predators) would suddenly appear to wildlife along the corridor. Bikers would occur irregularly throughout the day as individuals and small groups moving quickly down trails, suddenly appearing in forest settings. People on zip lines and canopy tours would occur more regularly as individual, fast moving disturbances, spaced apart by several minutes to 15 to 30 minutes. Bikers would be relatively quiet, people on canopy tours would likely be noisier, and people on at least some (i.e., faster and more elevated) zip line segments would be the loudest. Activity-related noise and visual impacts below the forest canopy would be attenuated, but screams from elevated zip line segments could carry considerable distances (i.e., approximately 0.25 mile). While noise, per se, can have adverse effects to wildlife, it usually only alerts animals to a possible threat and unless that threat is verified by visual or olfactory cues, the noise may illicit no response.[84]

The visual and noise disturbances associated with the new hiking and biking trails, canopy tours, and zip lines would be most likely to adversely affect birds that may have started nesting in trees close to the passing recreationists.[85] Due to a lack of scientific information, it is uncertain how many such birds would be affected along all corridors, the effects to cavity nesters vs. non-cavity nesters, and the extent to which such birds would habituate to passing recreationists. Proposed new summer facilities operating hours (approximately 8:00 a.m. to 5:00 p.m.) would allow several undisturbed hours of foraging/chick feeding after dawn and a shorter period before dusk (important periods) for those birds that may be nesting within a recreation corridor's zone of influence, thereby reducing potential adverse effects. As a worst case

[84] Bowles, 1995
[85] Miller and Knight, 1995

scenario, while it is possible that avian nesting and foraging effectiveness could be impaired adjacent to the activity corridors and while some affected birds could experience reduced recruitment, such potential effects would be limited to a low number of individual birds, they would not measurably affect bird abundance or community composition in the Project Area, and the effects would be insignificant and discountable on the population and habitat trends of affected species at the scale at which they are considered, the WRNF.

In summary, human activity along the new recreational corridors within the Sawmill and Ore Bucket areas would have additional displacement effects involving a larger area than the acreage of direct habitat modification. Displacement effects would vary by recreational activity and wildlife species and be more benign in areas of existing recreational use.

During the construction period, species, if present, may be temporarily displaced by construction related activities, but those species would be expected to return to the remaining suitable habitat once construction is complete. Construction related impacts (e.g., short-term increases in sedimentation to streams) to aquatic species would be managed through the application of appropriate PDC. Stream health related impacts, and therefore affects to aquatic species, are addressed in Chapter 3, Section J –Watershed and in the analysis that follows.

Threatened and Endangered Species

Canada Lynx

Under Alternative 2, approximately 30 acres of habitat would be disturbed. Impact acreages resulting from individual project components are contained in the project file. Alternative 2 would impact 13 acres of lynx habitat and 17 acres of "non-habitat" on NFS lands. The physical modification of habitat associated with Alternative 2 summer activity components is easily quantified. However, there would also be additional noise and visual effects of some proposed activities (e.g., zip lines, canopy tours, and bikers and hikers on new trails) extending into habitats unused by humans in summer that would result in additional wildlife displacement from proposed activity corridors. The resulting reduced habitat effectiveness is qualified and quantified, below, first for the overall wildlife community, then specifically for lynx. While the net loss of 13 acres of somewhat functionally impaired lynx habitat would be relatively small at the project and LAU scales, this loss would increase the severity of the existing injury to the functionally impaired Swan River LAU and, by itself, lead to an adverse effect.

For Alternative 2, existing habitat connectivity across BSR's summer operational area has been negatively affected by a variety of factors. Some Alternative 2 project components would extend summer activities slightly outside of the existing summer operational area, further contributing to the existing reduced connectivity. Alternative 2 would also result in greater intensity of recreational activity within the current summer operational area. Therefore, Alternative 2 may affect and is likely to adversely affect Canada lynx. Nevertheless, summer habitat connectivity sufficient to meet the intent of the "maintain"

term in standard ALL S1 of the SRLA would remain across BSR's summer operational area under Alternative 2.

The Peaks trail connection would extend the summer operational boundary, but in and of itself would not impair habitat connectivity and it would meet the intent of the "maintain" term in the ALL S1 standard. The Sawmill Zip Line, the Ore Bucket Canopy Tour, and the Ore Bucket bike trail would extend summer activities beyond the existing summer operational use boundary and the boundaries of where habitat connectivity across the ski area is thought to be somewhat diminished by existing summer activities, habitat fragmentation, and low quality habitat. All other proposed summer activity upgrades would occur within BSR's existing, heavily-fragmented, heavily-recreated, summer operational boundary or sufficiently bordering high use areas such that lynx would not be expected to diurnally bed in those areas.

The concern associated with the Sawmill Zip Line, the Ore Bucket Canopy Tour, and the Ore Bucket bike trail is not the direct habitat losses. Little acreage would be disturbed and little of the forest along the corridors would be removed. As such, the on-ground habitat values of aerial tour and bike trail corridors would receive only minor, direct, additive, negative effects. The greater concern with these facilities is the disruptive visual (guests quickly flying by above the forest canopy), and aural (guest making noise as they fly over the canopy) effects on a lynx that might attempt a daybed below and in the vicinity (50 to 100 yards on each side of the line). To some extent, activities would also extend the zone of human activity beyond the current Peaks 7 and 8 zone of influence. While these three activity area extensions would not be into isolated, high quality, potential, summer habitats, they would be outside of the existing summer operational area.

Most facilities would be sited in low quality (non-habitat and currently unsuitable), fragmented habitat within heavily used, existing summer recreation areas that lynx would most likely only use occasionally during summer during extended movements. New bike trail use on Peak 7 and project components extending outside of existing activity area in Sawmill Creek and in the Ore Bucket area under Alternative 2 have the greatest potential of affecting lynx that might be occasionally present in the Project Area.

As previously stated, Alternative 2 project components would extend the daily, existing, summer operational boundary by 3 percent as a result of activity associated with the Sawmill Zip Line, Ore Bucket Canopy Tour, and Ore Bucket Bike trail. Some other Alternative 2 project components would also extend outside of the existing, summer operational boundary, but they would not affect summer lynx habitat, DSH, or habitat connectivity.

Region 2 Sensitive Species

Determinations to Region 2 sensitive species are presented in Table 3G-5. Detailed effects analysis by species is included in the Biological Evaluation found in the project file.

Table 3G-5:
Effects to Region 2 Sensitive Species – Alternatives 1 through 3

Common name, *Scientific name*	Determination		
	Alternative 1	Alternative 2	Alternative 3
INSECTS			
Great Basin silverspot, *Speyeria nokomis nokomis*	NI	NI	NI
FISH			
Roundtail chub, *Gila robusta*	NI	NI	NI
Mountain sucker, *Catostomus platyrhynchus*	NI	NI	NI
Bluehead sucker, *Catostomus discobolus*	NI	NI	NI
Flannelmouth sucker, *Catostomus latipinnis*	NI	NI	NI
Colorado River cutthroat trout, *Oncorhynchus clarkii pleuriticus*	NI	MAII	MAII
AMPHIBIANS			
Boreal western toad, *Bufo boreas boreas*	NI	MAII	MAII
Northern leopard frog, *Rana pipiens*	NI	NI	NI
BIRDS			
Northern goshawk, *Accipiter gentilis*	NI	MAII	MAII
Northern harrier, *Circus cyaneus*	NI	NI	NI
Ferruginous hawk, *Buteo regalis*	NI	NI	NI
American peregrine falcon, *Falco peregrinus anatum*	NI	MAII	MAII
Bald eagle, *Haliaeetos leucocephalus*	NI	NI	NI
White-tailed ptarmigan, *Lagopus leucurus*	NI	MAII	MAII
Greater sage grouse, *Centrocercus urophasianus*	NI	NI	NI
Columbian sharp-tailed grouse, *Tympanuchus phasianellus columbianus*	NI	NI	NI
Flammulated owl, *Otus flammeolus*	NI	NI	NI
Boreal owl, *Aegolius funereus*	NI	MAII	MAII
Black swift, *Cypseloides niger*	NI	NI	NI
Lewis' woodpecker, *Melanerpes lewis*	NI	NI	NI
Olive-sided flycatcher, *Contopus cooperi*	NI	MAII	MAII
Loggerhead shrike, *Lanius ludovicianus*	NI	NI	NI
Purple martin, *Progne subis*	NI	NI	NI
Brewer's sparrow, *Spizella breweri*	NI	NI	NI
Sage sparrow, *Amphispiza belli*	NI	NI	NI
MAMMALS			
Pygmy shrew, *Microsorex hoyi montanus*	NI	MAII	MAII
Fringed myotis, *Myotis thysanodes*	NI	NI	NI
Hoary bat, *Lasiurus cinereus*	NI	MAII	MAII
Spotted bat, *Euderma maculatum*	NI	NI	NI
Townsend's big-eared bat, *Corynorhinus townsendii townsendii*	NI	NI	NI
American marten, *Martes americana*	NI	MAII	MAII

Table 3G-5:
Effects to Region 2 Sensitive Species – Alternatives 1 through 3

Common name, *Scientific name*	Determination		
	Alternative 1	Alternative 2	Alternative 3
North American wolverine, *Gulo gulo luscus*	NI	MAII	MAII
River otter, *Lontra canadensis*	NI	MAII	MAII
Rocky Mountain bighorn sheep, *Ovis canadensis canadensis*	NI	MAII	MAII

Notes: Other Region 2 sensitive animals are not listed because they have not been found on the WRNF, they have no affinities to habitats on the Project Area, and the Project Area is outside of the species' range or elevational distribution. Proposed Action would have no impact on those species. Wildlife are listed phylogenetically.
NI = No impact; BI = Beneficial impact; MAII = may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing.

Management Indicator Species

Elk

Alternative 2 would have negative direct effects on elk as a result of additional habitat losses and fragmentation. However, the indirect effects associated with recreationist use of the additional proposed facilities would have the greatest effects on elk. These effects would be minimal in most areas within the existing summer operational area because current levels of recreational and maintenance activities displace elk from those areas and adjacent buffer zones. However, some project components extending summer recreational activities beyond the existing operational boundary have the potential to displace elk from relatively large habitat blocks that they occasionally use.

Operation of 6 Chair and Imperial Express and use of the Lake Chutes Lake trail have the potential to displace elk using the Windows block. The Ore Bucket Canopy Tour, Ore Bucket Bike trail, and the Peak 7 Bowl Loop trail have the potential to displace elk from relatively isolated habitat between Peak 7 and Peak 6. The Sawmill Zip Line would extend over an intact habitat block, but it is likely that elk are displaced from that habitat by existing summer activities. The Alternative 2 Peaks trail connection bisects lightly used (i.e., by Peak 6 maintenance and lesser recreational use) habitat that elk have already moved through by the time those activities start in summer.

While Alternative 2 would have additive, negative effects on elk, those effects would not be measurable on habitat effectiveness within the DAU or elk population parameters at the Forest level.

American Pipit

Ground disturbance associated with the hiking trails would result in a net loss of American pipit foraging and/or nesting habitat. The less than 1 acre of alpine disturbance area is smaller than this species' mean territory size and only a small portion of the disturbance areas represents potential nesting habitat.

Alternative 2 would not measurably contribute to any negative trend in the Forest-wide population or habitat trend of this MIS that would affect achieving Forest Plan MIS objectives.

Aquatic Macroinvertebrates and Trout

Alternative 2 includes a number of required, site-specific, watershed and aquatic resources management measures that would be implemented to avoid, minimize, and mitigate negative project component effects to aquatic habitat within and below the Project Area that could alter aquatic faunal communities. Alternative 2 could cause minor, short-term and permanent, ground disturbances that could increase runoff with the potential to increase erosion and sedimentation that could extend to local creeks. However, these potential effects are expected to be infrequent and minor to the extent that they would not cause changes to the hydrology, water quality, stream health, aquatic habitat, or macroinvertebrate communities within Project Area streams. Alternative 2 would continue to provide aquatic macroinvertebrate habitat in all Project Area streams and would not measurably contribute to any negative trend in the Forest-wide population or habitat trend of aquatic macroinvertebrates and trout that would affect achieving Forest Plan MIS objectives.

Migratory Birds

No bird nests were detected in proposed impact areas during field surveys, although suitable nesting habitat is present in some areas for some migratory birds known to inhabit the Project Area and additional nest surveys would be conducted pre-construction. The project has been designed, to the extent practicable, to minimize incidental take through the implementation of PDC. Construction may occur within that nesting period if surveys show no nests or altricial young present, or as otherwise approved by the Forest Service. It is possible that undetected active nests of migratory birds could occur in impact areas during tree removal, possibly resulting in the incidental take of eggs and altricial young. Under such circumstances, the Proposed Action would be consistent with the USFS/USFWS MOU because of the attempt to reduce take of migratory birds.

Species of Local Concern

Mule Deer

Alternative 2 would likely result in lower summer deer use of the Project Area, particularly in Peak 7 terrain below treeline, as a result of the substantial increase in bike trails and other proposed summer activities bisecting inter-trail islands and habitat blocks currently unused by summer recreationists. Affected forest cover now functions as refugia, where deer can retreat from human activity areas during the day before returning to those areas “after hours.” Deer would be displaced from much of the Peak 7 terrain reducing the availability and effectiveness of otherwise suitable “after hours” habitat on Peaks 7 and 8. Negative project effects would be largely the result of increases in the levels and distribution of human activity within an existing intensely-used to lightly used summer recreation area, rather than the relatively small amount of habitat loss. Alternative 2 would likely have slightly greater effects than

Alternative 3 as a result of the proposed bike trail and canopy tour in the Ore Bucket area. Effects of Alternative 2 would not block or restrict deer movements.

Moose

Primary moose habitat (isolated lakes, marshes, and phreatophytic shrub lands, including willows) would not be directly affected by Alternative 2. However, as described above for deer, negative project effects would be largely the result of increases in the levels and distribution of human activity within an existing intensely-used to lightly used summer recreation area, rather than the relatively small amount of habitat loss. Moose would be temporarily displaced from active construction areas and it may take some time (years) for them to return to those areas and resume using developed ski area terrain as they do now. In addition to the current extent of moose displacement from active summer activity areas, there would be additional terrain, habitat, and buffer zones adjacent to that terrain that moose would avoid and/or use less frequently as a result of the slight expansion of proposed activities to the north and south. The additional affected terrain represents a small portion of the home range of individual moose. Effects of Alternative 2 would not block or restrict moose movements.

Mountain Goat

Alternative 2 could have additive effects on goat use of the alpine as a result of proposed scenic chairlift rides extending to just below the summit of Peak 8 and the hiking trail up to Lake Chutes Lake. Potential effects would be limited to additional goat displacement from summer foraging and travel habitat on the east side of the range in the event that any goats were present in the vicinity of new, active, proposed activity areas. Because none of the new proposed activities would extend to the Tenmile ridgeline or areas to the west, it is unlikely that any existing and additional displacement would fragment or isolate habitats from areas north and south of BSR. Mountain goat breeding (November to December) would be mutually exclusive with proposed summer activities. No known, suitable, mountain goat parturition areas occur in the vicinity of the proposed summer activity areas and that activity (early June) would be mutually exclusive with the preparation and use of new proposed summer activities. Higher quality goat habitat along and west of the crest of the Tenmile range would remain isolated from proposed Alternative 2 activities because no dispersed hiking would extend from the scenic chairlift ride or other proposed project components into those areas. No other Alternative 2 project components would extend beyond current summer activity use areas or occur in higher quality goat habitat. It is possible, though unlikely, that if conflicts between summer recreationists and goats in the vicinity of Quandary resulted in greater goat use in habitats overlapping BSR, that existing and future summer recreational activity should not meaningfully negatively affect that goat use.

Alternative 3

Sawmill and Ore Bucket Areas

Alternative 3 projects would not extend into the Sawmill and Ore Bucket areas; therefore, impacts to wildlife species are not anticipated.

Threatened and Endangered Species

Canada Lynx

Under Alternative 3, approximately 25 acres of habitat would be disturbed. Impact acreages resulting from individual project components are contained in the project file. Alternative 3 would impact 11 acres of lynx habitat and 14 acres of "non-habitat" on NFS lands. While the net loss of 11 acres of somewhat functionally impaired lynx habitat would be relatively small at the project and LAU scales, this loss would increase the severity of the existing injury to the impaired Swan River LAU and, by itself, lead to an adverse effect.

For Alternative 3, no project components would extend summer activities outside of the existing summer operational area, further contributing to the existing reduced connectivity. Alternative 3 would result in greater intensity of recreational activity within the current summer operational area. Therefore, Alternative 3 may affect and is likely to adversely affect Canada lynx. Nevertheless, summer habitat connectivity sufficient to meet the intent of the "maintain" term in standard ALL S1 of the SRLA would also remain across BSR's summer operational area under Alternative 3.

Region 2 Sensitive Species

Determinations to Region 2 sensitive species are presented in Table 3G-5. Detailed effects analysis by species is included in the Biological Evaluation found in the project file

Management Indicator Species

Elk

Alternative 3 would minimize most, but not all, of the negative displacement effects associated with Alternative 2. The Peak 7 Bowl Loop trail has the potential to displace elk from relatively isolated spruce-fir habitat on Peak 6, slightly outside of the current summer operations area. The Alternative 3 Peaks trail connection would largely follow the Peak 6 maintenance road, but it would introduce an additional activity corridor outside the existing operations area, though elk would likely have migrated through the affected habitat before and after virtually of the summer use.

While Alternative 3 would have additive, negative effects on elk, those effects would not be measurable on habitat effectiveness within the DAU or elk population parameters at the Forest level.

American Pipit

Ground disturbance associated with the hiking trails would result in a net loss of American pipit foraging and/or nesting habitat. The less than 1 acre of alpine disturbance area (Alternative 3 is less than Alternative 2) is smaller than this species' mean territory size and only a small portion of the disturbance areas represents potential nesting habitat.

Alternative 3 would not measurably contribute to any negative trend in the Forest-wide population or habitat trend of this MIS that would affect achieving Forest Plan MIS objectives.

Aquatic Macroinvertebrates and Trout

Alternative 3 includes required, site-specific, watershed and aquatic resources management measures that would be implemented to avoid, minimize, and mitigate negative project component effects to aquatic habitat within and below the Project Area that could alter aquatic faunal communities. Alternative 3 could cause minor, short-term and permanent, ground disturbances that could increase runoff with the potential to increase erosion and sedimentation that could extend to local creeks. However, these potential effects are expected to be infrequent and minor to the extent that they would not cause changes to the hydrology, water quality, stream health, aquatic habitat, or macroinvertebrate communities within Project Area streams. Alternative 3 would continue to provide aquatic macroinvertebrate habitat in all Project Area streams and would not measurably contribute to any negative trend in the Forest-wide population or habitat trend of aquatic macroinvertebrates and trout that would affect achieving Forest Plan MIS objectives. Compared to Alternative 2, Alternative 3 would have less negative potential effects on these indicator groups because of the smaller area of ground disturbances.

Migratory Birds

No bird nests were detected in proposed impact areas during field surveys, although suitable nesting habitat is present in some areas for some migratory birds known to inhabit the Project Area and additional nest surveys would be conducted pre-construction. The project has been designed, to the extent practicable, to minimize incidental take through the implementation of PDC. Construction may occur within that nesting period if surveys show no nests or altricial young present, or as otherwise approved by the Forest Service. It is possible that undetected active nests of migratory birds could occur in impact areas during tree removal, possibly resulting in the incidental take of eggs and altricial young. Under such circumstances, Alternative 3 would be consistent with the USFS/USFWS MOU because of the attempt to reduce take of migratory birds.

Species of Local Concern

Mule Deer

Alternative 3 would likely result in lower summer deer use of the Project Area, particularly in Peak 7 terrain below treeline, as a result of the substantial increase in bike trails and other proposed summer activities bisecting inter-trail islands and habitat blocks currently unused by summer recreationists. Affected forest cover now functions as refugia, where deer can retreat from human activity areas during the day before returning to those areas “after hours.” Deer would be displaced from much of the Peak 7 terrain reducing the availability and effectiveness of otherwise suitable “after hours” habitat on Peaks 7 and 8. Negative project effects would be largely the result of increases in the levels and distribution of human activity within an existing intensely-used to lightly used summer recreation area, rather than the relatively small amount of habitat loss. Alternative 3 would likely have slightly lesser effects than Alternative 2 because projects in the Ore Bucket area are removed. Effects of Alternative 3 would not block or restrict deer movements.

Moose

Primary moose habitat (isolated lakes, marshes, and phreatophytic shrub lands, including willows) would not be directly affected by Alternative 3. However, as described above for deer, negative project effects would be largely the result of increases in the levels and distribution of human activity within an existing intensely-used to lightly used summer recreation area, rather than the relatively small amount of habitat loss. Other moose impacts would be similar to what is described for the Proposed Action.

Mountain Goat

Alternative 3 should have no negative effects on mountain goats because there are no project components that would extend into the alpine where goats may be uncommonly present.

CUMULATIVE EFFECTS

Scope of the Analysis

For a detailed description of past, present, and reasonably foreseeable future projects within the cumulative effects Analysis Area, the reader is referred to Appendix A in this document. Past projects, including past BSR projects, are considered within the Affected Environment description as they are a component of the baseline condition.

Temporal Bounds

The temporal bounds for this cumulative effects analysis extends from prior to BSR's development as a ski area in 1961, through the foreseeable future in which BSR can be expected to operate (BSR's current 40-year SUP expires December 31, 2029; however, this analysis assumes the SUP would be reissued).

Spatial Bounds

The spatial bounds of this wildlife cumulative effects analysis varies by species and is discussed above in the Affected Environment.

Past, Present, and Reasonably Foreseeable Future Projects

- Past BSR Projects
- Tailor Lode Property
- Arapahoe Basin Ski Area EIS
- Future Residential Growth in Summit County and Swan River LAU

Projects identified by the Forest Service and listed as reasonably foreseeable in Appendix A with relevance to wildlife are included in the cumulative effects analysis. Some of those projects are also reasonably certain, and their effects on lynx and other wildlife species are considered in more detail in wildlife technical documents. The reasonably foreseeable projects would have effects on lynx habitat

resulting from the additive loss of lynx habitat and wildlife habitat in general and impaired habitat connectivity include the Tailor Lode Property project and the Arapahoe Basin Ski Area expansion project.

Virtually all residential development resulting from projected population growth will occur on private lands within towns and in surrounding unincorporated subdivisions, most of which do not support lynx habitat, but do support general wildlife habitat, including habitat for certain Region 2 sensitive species and MIS. There could be parcels developed along the margins of lynx habitat that would result in relatively small, additional losses of effective foraging and travel habitats. This growth will also cause incremental increases in traffic along Highways 9, 6 and I-70 in the Swan River LAU and other LAUs along Summit County access corridors. It may be assumed that this increase in traffic may further inhibit connectivity and increase road-kill probabilities, although existing traffic levels, particularly those along I-70.

As described in the wildlife technical reports contained in the project file, the action alternatives would result in varying levels of cumulative impacts for the variety of species considered.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The amount of habitat modifications, as well as disturbances during the summer season, could irretrievably affect some individual members of various wildlife species, but are not considered irreversible.

H. SOILS AND GEOLOGY

SCOPE OF THE ANALYSIS

The Analysis Area for geology and soil resources proposed for direct disturbance includes the BSR SUP area, which is approximately 5,700 acres. This analysis summarizes the more detailed Geology and Soils Specialist Report contained in the project file.[86] The geology summary is based on a review of the Breckenridge Quadrangle geologic map and the Frisco Quadrangle geologic map.[87] The soil summary is based on a review of the Soil Survey of the Holy Cross Area and from field notes of a soil verification project for the Peak 6 EIS.[88] In addition, a Water Erosion Protection Project (WEPP) model was developed to estimate soil erosion amounts from proposed mountain bike trails and access paths and roads.

FOREST PLAN DIRECTION

Pursuant to the Forest Plan, as amended, soils, aquatic and riparian system management measures and design criteria are provided in the 2002 Forest Plan and the Watershed Conservation Practices Handbook (WCPH) to ensure applicable Federal and State laws are met on NFS lands in Region 2.[89]

WRNF 2002 Forest Plan

8.25 Ski Areas – Existing and Potential

Soils Standard 1. Effective ground cover (mulch) upon completion of ground disturbing activities will meet minimum levels of pre-treatment habitat type (Aspen 95 percent, Lodgepole Pine 90 percent, Spruce-Fir 95 percent).

Soils Guideline 1. Ground cover as a combination of revegetation and mulch applications, should meet the requirements in Table 3H-1, one and two years following completion of ground disturbing activities.

Table 3H-1:
Soils Guideline 1 – Ground Cover Requirements

Erosion Hazard Class	Year 1 Minimum Effective Ground Cover (%)	Year 2 Minimum Effective Ground Cover (%)
Low	20–30	30–40
Moderate	30–45	40–60
High	45–60	60–75
Very High/Severe	60–90	75–90

[86] Western Ecological Resource, 2014c
[87] Wallace et al., 2003; Kellogg et al., 2002
[88] USDA Forest Service, 1995b; Landtype Resources, 2010
[89] USDA Forest Service, 2002a; USDA Forest Service, 2006

Soils

Guideline 1. Conduct an onsite slope stability exam in areas identified as potentially unstable. Potentially unstable land is described as having a "high" or "very high" instability ranking. Limit intensive ground-disturbing activities on unstable slopes identified during examinations.

Applicable WCPH Management Measures

Hydrologic Function

11.2 Manage land treatments to maintain enough organic ground cover in each activity area to prevent harmful increased runoff.

Riparian Areas and Wetlands

12.4 Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.

Sediment Control

13.3 Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.

13.4 Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage.

Soil Quality

14.2 Maintain or improve long-term levels of organic matter and nutrients on all lands.

AFFECTED ENVIRONMENT

Geology

The Analysis Area lies within the Rocky Mountain physiographic region ranging from 9,800 to 12,500 feet above mean sea level (amsl). This region is dominated by Precambrian bedrock with numerous isolated remnants of sedimentary rocks, primarily of Cretaceous age (65 to 135 million years old). The Williams Fork Mountains and the Tenmile Range form an inter-montane structural trough, which extends from south of Breckenridge through the county in a north-northwesterly direction. The trough is bounded along the southwest by the Gore and Tenmile Ranges, to the east by the Continental Divide and to the south by Hoosier Pass. Upper Cretaceous rocks of Pierre shale dominate the eastern edge of the trough along the Continental Divide. East of the Pierre exposures, separating them from Precambrian is the Williams Range thrust fault, which has caused the Precambrian formations to overlay sediments that are up to 4,000 feet deep. Precambrian rocks occurring along the Williams Fork, Gore and Tenmile Ranges consist of gneiss and schist, greenstone, granite and related rocks. Upper Cretaceous rocks of the Benton shale and Niobrara formation occur to the west of the Pierre exposures. Sedimentary rocks ranging in age from Pennsylvanian Maroon formation (280 to 325 million years ago), to the Upper Cretaceous Pierre shale are common south of Breckenridge, and in the Kokomo Pass region. Quaternary glacial and stream

deposits (less than three million years old) occupy an extensive area along the Blue River Valley, which runs the length of Summit County and approximately 1,000 feet east of BSR's SUP boundary. Early and Late Tertiary intrusive rocks (200 to 240 million years ago) are common in large portions of southern Summit County.[90] Refer to the 1998 EA for a more detailed description of geologic characteristics of the area.[91]

Geology underlying the BSR SUP boundary is dominated by glacial moraine and Terrace gravel. Terrace gravel extends upslope from below the BSR's base portals, to a horizontal band located at an approximate elevation of 10,000 feet. Precambrian rock dominates above the tree line.[92]

Within the Analysis Area, six landslide deposits were identified. The largest landslide deposit within the area of proposed disturbances, is a 1 kilometer-diameter intermediate-age landslide deposit (Qlsi) of middle Holocene to late Pleistocene age. It occurs on the eastern flank of Peak 8 at the upper ends of the existing Rocky Mountain SuperChair and the Colorado SuperChair. Two undivided landslide deposits (Ols) of Holocene to middle Pleistocene age occur on the steep slopes above Sawmill Gulch near the proposed Sawmill Canopy Tour and Zip Line. Two other undivided landslide deposit lies just north and east of the proposed Peak 7 hiking loop, and an inactive rock glacier deposit (Qr) forms a bench along the northern portion of the proposed Peak 7 hiking loop.

Soils

Most of the soils within the Analysis Area formed in glacial till, slope alluvium, colluvium or residuum derived from igneous and metamorphic rocks. They occur on steep mountain slopes, summits and ridges with slopes ranging from 5 to 150 percent. The soils are very rocky, weakly developed and generally have low fertility.

The soils have formed in a cold climate with a mean annual air temperature of 26 to 38 degrees Fahrenheit (°F) and a soil temperature at 50 centimeters of less than 46°F (classified as a "Cryic" soil temperature regime).[93] The frost-free period is about 25 to 55 days. Soil temperature has a pronounced effect on the activity of biological and chemical forces that act upon soil development. Biological life, though still active, is drastically reduced when soil temperatures fall below 41°F, and when soil temperatures fall below 32°F soil reactions are significantly slowed.[94] The cold climate and high elevation of the Analysis Area limit the rate of soil formation.

[90] Taranik, 1974
[91] USDA Forest Service, 1998
[92] US Geological Survey, 1951
[93] Soil Survey Staff, 2006
[94] USDA NRCS, 2009

Soil Map Units

There are fourteen soil map units and five miscellaneous map units within the Analysis Area defined in the Soil Survey of the Holy Cross Area (1995). Soil map units contain either one dominant soil; a complex, which contains two or more dissimilar components that could not be reasonably mapped separately; or an association, which is a unit composed of two or more kinds of soils that are large enough to be delineated individually at a scale of 1:24,000. A miscellaneous map unit is one that has little or no soil. The acreages of each map unit that occur within the Analysis Area and soil characteristics important to revegetation are listed in Table 3H-2.

There are eight soil map units and two miscellaneous map units that would be affected by the action alternatives; these map units are 254D, 290B, 290C, 604D, 901B, 901D, 904A, CQ and W. Below is a brief description of each of the soils that would be affected by the action alternatives. Soil taxonomic classifications are in parenthesis.

Table 3H-2:
Map Units Identified within the SUP Boundary

Map Unit	Area (acres)	Drainage Class	Available Water Capacity	Runoff	Effective Rooting Depth
SOIL MAP UNITS					
Soils with fluvial and lacustrine deposits on valley bottoms, flood plains, and basins					
100A – Cryaquolls-Borohemists association, 0 to 15% slopes	392				
Cryaquolls (Taxonomic Great Group)		Variable	Variable	Variable	>40”
Borohemists (Taxonomic Great Group – obsolete)		Very poorly	Low	Slow	>40”
Soils influenced by glacial processes on morainal features					
225B – Leighcan family-Cryaquolls complex, 0 to 25% slopes	28				
Leighcan (loamy-skeletal, mixed, superactive Typic Dystrocryepts)		Somewhat excessively	Slow	Slow	>60”
Cryaquolls (Taxonomic Great Group)		Very poorly	Moderate	Moderate	>60”
254D* Rock outcrop-Leighcan-Hechtman families complex, 40 to 150% slopes	31				
Rock Outcrop		N/A	N/A	N/A	N/A
Leighcan (loamy-skeletal, mixed, superactive Typic Dystrocryepts)		Somewhat excessively	Low	Moderate	20–40”
Hechtman (loamy-skeletal, mixed, superactive Lithic Haplocryepts)		Somewhat excessively	Low	Rapid	<20”
290B* Leighcan family, 5 to 40% slopes	1,860				
Leighcan (loamy-skeletal, mixed, superactive Typic Dystrocryepts)		Somewhat excessively	Low	Slow	>60”

Table 3H-2:
Map Units Identified within the SUP Boundary

Map Unit	Area (acres)	Drainage Class	Available Water Capacity	Runoff	Effective Rooting Depth
290C* Leighcan family, till substratum, 40 to 60% slopes	173				
Leighcan (loamy-skeletal, mixed, superactive Typic Dystrocryepts)		Somewhat excessively	Low	Slow	>60”
Soils derived from metamorphic or crystalline rocks on mountain slopes					
604C Leighcan family, 40–60% slopes	255				
Leighcan (loamy-skeletal, mixed, superactive Typic Dystrocryepts)		Somewhat excessively	Low	Moderate	>20”
604D* Leighcan family – Rock outcrop complex, 5–40% slopes	180				
Leighcan (loamy-skeletal, mixed, superactive Typic Dystrocryepts)		Somewhat excessively	Low	Moderate	>20”
Rock Outcrop		N/A	N/A	N/A	N/A
650B Leighcan – Leighcan family, moderately deep complex, 5–40% slopes	67				
Leighcan (loamy-skeletal, mixed, superactive Typic Dystrocryepts)		Somewhat excessively	Low	Moderate	>40”
Leighcan family (loamy-skeletal, mixed, superactive Typic Dystrocryepts)		Somewhat excessively	Low	Moderate	20–40”
670C Leighcan-Tolby families complex, 40–60% slopes	145				
Leighcan (loamy-skeletal, mixed, superactive Typic Dystrocryepts)		Somewhat excessively	Low	Moderate	>20”
Tolby(sandy-skeletal, mixed, Typic Dystrocryepts)		Excessively	Very low	Moderate	>20”
High elevation soils occupying the sub alpine and alpine zones					
901B* Moran family-Rubble land complex, 5–40% slopes	397				
Moran (loamy-skeletal, mixed, superactive Typic Humicryepts)		Somewhat excessively	Low	Moderate	>20”
Ruble Land		N/A	N/A	Slow	N/A
901D* Moran family-Rock outcrop-Teewinot family complex, 40–150% slopes	1,345				
Moran (loamy-skeletal, mixed, superactive Typic Humicryepts)		Somewhat excessively	Low	Moderate	>20”
Rock Outcrop		N/A	N/A	N/A	N/A
Teewinot (loamy-skeletal, mixed, superactive Lithic Humicryepts)		Well	Moderate	Rapid	<20”
904A* Moran family, 0–25% slopes	44				
Moran (loamy-skeletal, mixed, superactive Typic Humicryepts)		Somewhat excessively	Low	Moderate	>60”

Table 3H-2:
Map Units Identified within the SUP Boundary

Map Unit	Area (acres)	Drainage Class	Available Water Capacity	Runoff	Effective Rooting Depth
908A Moran family-Cryaquolls-Borohemists complex, 0–25% slopes	108				
Moran (loamy-skeletal, mixed, superactive Typic Humicryepts)		Somewhat excessively	Low	Moderate	>60”
Cryaquolls (Taxonomic Great Group)		Variable	Variable	Variable	>60”
Borohemists (Taxonomic Great Group – obsolete)		Very poorly	Low	Slow	>40”
908B Moran family-Rock outcrop-Cryaquolls complex, 0–40% slopes	128				
Moran (loamy-skeletal, mixed, superactive Typic Humicryepts)		Somewhat excessively	Low	Moderate	>20”
Rock Outcrop		N/A	N/A	N/A	N/A
Cryaquolls (Taxonomic Great Group)		Variable	Variable	Variable	>40”
MISCELLANEOUS MAP UNITS					
CQ* Cirque land, 40–150% slopes	178	N/A	N/A	N/A	N/A
RL Rubble lands	46	N/A	Low	Low	0
RO/RL Rock outcrop-Rubble land complex, 0–40% slopes	218	N/A	N/A	N/A	0
UNCL	96	N/A	N/A	N/A	N/A
W* Water, 0–5% slopes	8	N/A	N/A	N/A	N/A
TOTAL	**5,699**				

Source: USDA Forest Service, 1998
Notes:
Available Water Capacity refers to the volume of water that should be available to plants if the soil, inclusive of rock fragments, were at field capacity.
Runoff refers to the degree to/rate at which precipitation, once interfaced with the soil, flows as a result of gravitational forces. Greater rates of Runoff are generally consistent with greater erosion risk.
* Soil Map Units potentially affected by the action alternatives
N/A = not applicable

Soils that would be affected by the action alternatives are rocky (loamy- or sandy-skeletal), have low available water-holding capacity, generally have low fertility and have thin organic layers (refer to Table 3H-3). These soil characteristics can pose revegetation limitations following ground disturbance activities, such as grading and tree removal, which can lead to soil erosion and reduction of soil fertility. Rock fragments, however, serve to armor the soils and make them less erodible. Soil organic matter allows water infiltration, conserves soil moisture, and provides fertility for stabilizing vegetation and thereby reduces erosion hazards, runoff, and soil compaction.

A Forest Service goal is to maintain or improve long-term levels of soil organic matter and nutrients. The range of thicknesses of mineral A and organic O horizons for each soil that would be impacted by the

action alternatives are listed in Table 3H-3. These thicknesses were taken from the field notes of a soil verification project for the Peak 6 EIS.[95] This project revealed that organic and mineral surface horizons are generally very thin, which is common for mountain forested soils.

Table 3H-3:
Thicknesses of Surface Horizons (A,A/E and E if at Surface) and Organic Horizons (Oe/Oi)

Map Unit	Soil	Range of Thicknesses of Organic Horizons (Oe/Oi) (cm)	Range of Thicknesses of Surface Horizon (A, A/E and E if at Surface) (cm)
254D	Leighcan Hechtman	1.5 to 5 1 to 4	4 to 15 6 to 8
290B	Leighcan	1.5 to 5	4 to 15
290C	Leighcan	1.5 to 5	4 to 15
604D	Leighcan	1.5 to 5	0.6
901B	Moran*	0.6	30
901D	Moran Teewinot	0.6 1	30 13
904A	Moran	0.6	30

Source: USDA Forest Service, 1995b
* Taken from the Soil Survey of the Holy Cross Area

Geologic and soil interpretations could affect ski area development and impact surrounding lands. However, all soils within the areas of proposed disturbance have low erodibility potential (K_w-factor) throughout the entire soil profile. Erodibility potential in subsoil layers is generally lower than in the surface/subsurface layers because of higher rock content than in the surface/subsurface layers.

Soil map units have either low or moderate potentials for landslide and debris flows, except for map unit 254D. Forest-wide, this map unit has high debris flow potential, in part due to the very steep slopes (up to 150 percent), but in the areas of proposed disturbance the slope of this map unit is about 70 percent. In addition, there would only be 0.1 acre of disturbance in this map unit from both action alternatives. In reality, this map unit within the area of proposed disturbances likely has a moderate potential for debris flow rather than a high potential because of the gentler gradients. The WRNF landscape stability model shows all areas of disturbances as having slight, low or moderately low landscape instability, except for a short segment of the proposed Peak 7 hiking loop, which has moderately high landscape instability.

All map units have severe limitations for off-road vehicle roads and trails because of one or more limitations, including steep slopes, cliffs and unstable talus, presence of large rocks, erosion hazard, compaction and/or rutting. Most soils have moderate limitations for foot trails and paths because of steep slopes, except map unit 904A, which has slight limitations. All rock outcrops have severe limitations for foot trails and paths, but they would be avoided. Most map units have severe limitations for improved

[95] Landtype Resources, 2010

unsurfaced roads, generally because of steep slopes, and in some map units because of cliffs and unstable talus, shallow soils to bedrock, and the abundance of large rocks. Other soil map units with limitation include: 254D and 901D (severe limitations for cut and fill slopes because of steep slopes and/or sandy materials), 604D (severe limitation for cut and fill slopes because of rock outcrop), and 290B and 901B (slight limitations for cut and fill slopes).

Even though many map units have severe limitations for roads and trails, this does not imply that the map unit is entirely unsuitable for that use, but can usually be overcome with proper design and mitigation measures. However, these ratings indicate that frequent maintenance and erosion control measures would be required to control erosion and sedimentation to waterways.[96] Some severe limitations can be overcome by avoiding cliffs, unstable talus and very steep slopes. Sedimentation to waterways and erosion from compacted roads and trails on steep slopes can be minimized with proper PDC and soil amendments, which are discussed under the Direct and Indirect Environmental Consequences section.

Bare Ground and Low Vegetative Cover Areas

WRNF specialists identified seven priority areas within the Analysis Area as having significant bare ground and low vegetative cover that may have a hydrologic connection to wetlands or other waterways.[97] These areas were identified as potentially being suitable for mitigation to offset proposed disturbances. National strategic goals of the Forest Plan that are applicable to bare ground and low vegetative cover areas include:[98]

- Rehabilitate soils that are in unsatisfactory condition.
- Restore hydrologic balance of degraded watershed areas by stabilizing soil, controlling surface run-off and erosion, reducing flood potential, and improving long-term soil productivity.
- Protect national forest watersheds by implementing practices designed to retain soil stability, improve or maintain site productivity, secure favorable conditions of water flow, and reserve or enhance aquatic values.

A certified professional soil scientist and hydrologist conducted an assessment of these priority areas in August 2014. In summary, the bare ground and low vegetative cover areas lack organic and mineral A horizons, and generally contain 1 to 25 percent vegetative cover and 30 to 70 percent rock cover. Erosional pedestals were common in most areas, rills were common on steeper slopes, and water flow patterns were noted in some areas. Four of the seven priority areas were identified as having a potentially significant hydrologic connection to either wetlands or waterways.

[96] USDA Forest Service, 1995
[97] Ivey, 2014; McMullen, 2014
[98] USDA Forest Service, 2002a Appendix AA

Soil amendments can significantly improve soil quality and enhance land stability in these areas. Mulch can conserve soil moisture and protect seed establishment, fertilizers can supplement low inherent fertility, topsoil can provide a healthy plant growth medium to help ensure successful plant establishment and surface netting in conjunction with mulch can reduce erosion hazards. BSR prepared a Drainage Management Plan to identify areas having drainage concerns and to recommend actions needed to rehabilitate ski area resources impacted by surface runoff resulting from ground disturbances such as grading and tree clearing activities.[99] The bare ground and low vegetative cover areas selected for mitigation to offset acreages of proposed disturbances, and other PDC identified to minimize soil erosion and sedimentation to waterways and to improve soil quality in these areas, are discussed in the Drainage Management Plan.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Under the No Action Alternative, new development projects would not occur. The resort would continue to operate under its current configuration and capacity. Because no ground disturbance is proposed under the No Action Alternative, there is no potential to affect geologic and soil resources within the Analysis Area as a result of the No Action Alternative.

Alternative 2 – Proposed Action

Alternative 2 would have soil resource disturbances related to the Sawmill Canopy Tour, Peak 7 Zip Line, Peak 7 Bike Skills Course, Horseshoe Bowl hiking loop and Peak 7 hiking loop, most mountain biking trails, the Observation Tower, Peak 7 Hut and Vista Haus building and deck expansion, snowmaking reroute, the Upper Four O'Clock Road realignment and utility lines on Peak 8 and the bottom of Peak 7.[100] Project implementation related to Alternative 2 would result in 26.7 acres of grading (12.1 acres of this grading would require vegetation clearing) and 2.7 acres of vegetation clearing without grading. Refer to Table 3H-4 and Table 3H-5 for alternatives 2 and 3 soil impacts by disturbance type and proposed activity.

[99] Breckenridge Ski Resort, 2009
[100] GIS disturbance files are located in the project file.

Table 3H-4:
Disturbances Common to Alternatives 2 and 3

Disturbance Type	Alternative 2 (acres)	Alternative 3 (acres)
Grading	14.6	14.3
Grading/Vegetation Clearing	12.1	8.9
Grading Subtotal	**26.7**	**23.2**
Vegetation Clearing Only	2.7	2.1
TOTAL	**29.4**	**25.3**

Table 3H-5:
Disturbance Acres of Alternatives 2 and 3 by Proposed Activity

Proposed Activity	Soil Disturbed by Grading		Soil Disturbed by Grading/Veg Clearing		Soil Disturbed by Vegetation Clearing Only	
	Alt 2 (acres)	Alt 3 (acres)	Alt 2 (acres)	Alt 3 (acres)	Alt 2 (acres)	Alt3 (acres)
Zip lines	1.3	0.6	0.1	--	0.9	0.8
Canopy Tours	0.8	0.7	0.5	0.5	1.8	1.3
Observation Tower	--	--	0.1	0.1	--	--
Utility Lines	0.2	0.2	--	--	--	--
Challenge Course	0.5	0.5	--	--	--	--
Hiking Trails	0.7	0.6	--	--	--	--
Biking Trails and Reroutes	6.6	7.2	11.4	8.3	--	--
Road Realignment	3.8	3.8	--	--	--	--
Bike Skills Course	0.1	0.1	--	--	--	--
Hut Improvements	0.5	0.5	--	--	--	--
Snowmaking Reroute	0.1	0.1	--	--	--	--
TOTAL	**14.6**	**14.3**	**12.1**	**8.9**	**2.7**	**2.1**

Disturbance types would impact soil resources differently. The soil disturbance resulting from grading and grading/vegetation clearing would displace the organic layer and the soil surface layer, at a minimum. Soil disturbance would also result from areas of vegetation removal without grading, where some soil displacement would be inevitable. Areas of only vegetation clearing should, however, experience significantly less soil disturbance than graded areas. All vegetation would be removed and tree stumps would be cut flush to the ground. Refer to Table 3H-5 for disturbance acreages for proposed activity in alternatives 2 and 3.

The direct impacts resulting from Alternative 2 would increase soil erosion and sedimentation, change soil physical and chemical characteristics reducing soil productivity, produce permanent loss of soil resources, and result in a potential increase in landslide and slump hazards, especially at cut-and-fill

slopes. Refer to Table 3H-6 for direct impacts to soil resources. No disturbance activities would affect soils having a severe erodibility hazard, although some soil loss from disturbances is expected. There would be 0.3 acre of grading along utility lines and the snowmaking reroute that would later be reclaimed following project completion. Mountain bike trail cut-and-fill slopes are not included since their acreages are not known at this time; however, they would require reclamation. Mountain bike and hiking trails would be compacted and would result in a new permanent disturbance. Soil compaction would likely lead to an increase in localized runoff and erosion. Alternative 2 would have slightly greater than an acre of soil resource that would be permanently replaced with structures.

Table 3H-6:
Direct Impacts to Soil Resource from Alternatives 2 and 3

Disturbance Type	Alternative 2 (acres)	Alternative 3 (acres)
Soils disturbed by grading that would have high erosion hazard	0.0	0.0
Disturbed areas that would be later reclaimed so there would be changes to soil physical and chemical characteristics	0.3	0.3
Areas where soils would be permanently compacted from hiking and mountain biking trails	18.8	16.1
Permanent loss of soil resources	1.2	1.1
Grading disturbance in areas having high landslide potential	0.0	0.0
Grading disturbance in areas having high debris flow potential	0.1*	0.1*

Source: USDA Forest Service, 1995b
* Forest-wide rating from Soil Survey of the Holy Cross Area; actual site rating is probably moderate because of shallower gradient.

Soil losses and sedimentation due to erosion would be long-term, but would return to natural rates once vegetation is re-established, stabilizing reclaimed areas. This would occur about three to five years following reclamation. Over-steepened and south- and west-facing cut slopes may require more than five years for the vegetation ground cover to reach pre-disturbance levels without soil amendments. Due to mixing of soil horizons, soil profile characteristics and soil productivity would be drastically changed over pre-construction conditions. Decreases in soil productivity would be long-term in all reclaimed areas. The loss of soil resources would be long term and permanent. Increases in landslide/slump potential at cut and fill slopes and areas of wet soils would also be long term.

A WEPP model was developed to analyze sedimentation delivery into waterway for the Upper Four O'Clock Road realignment and segments of mountain bike trail vulnerable to erosion. Results of the WEPP model indicate that there would be a high probability of erosion and sediment delivered to waterways, but with the proper implementation and maintenance of erosion control PDC, these impacts would be minimized and sedimentation to waterways would be minor.

The results demonstrate that the closer the cross-drain spacing, the lesser amount of erosion that is generated from the Upper Four O'Clock Road. With cross drain spacing of 200 feet, erosion and

sedimentation to waterways decreases precipitously compared to having no cross drains. The results also demonstrate that outsloped rutted roads would contribute the greatest amount of erosion and sedimentation to waterways. Both erosion and sedimentation would be reduced with insloped roads with rocked ditches. A road with a gravel surface is significantly more resistant to erosion than natural road surfaces if no cross drains are utilized. However, with proper cross-drain spacing, a naturally-surfaced, insloped road with a rock ditch is nearly as effective in controlling erosion and sedimentation as a gravel-surface, insloped road with a rock ditch. These results would also apply to proposed construction/operation access roads. In addition, Forest Service PDC calls for cross drain spacing at a maximum of 270 feet for a moderately erodible soil on a 15 percent slope, or 410 feet for a low erodible soil on a 15 percent slope, but should be reduced if warranted by onsite factors.[101]

The model predicted that there would be erosion from new mountain bike trails and sediment would reach waterways where trails cross drainages; however, it also predicted that there is likely erosion from existing trails and where they cross waterways, sediment reaches these waterways. With the use of drain dips or rolling grade dips, which not only divert water off the trail into the forest, but are easy for riders to negotiate, the amount of erosion from the trail and sedimentation to waterways is significantly reduced.

Even though the predicted erosion and sedimentation values are, at best, within plus or minus 50 percent of the actual value, the results do demonstrate that erosion and sedimentation to waterways could occur. However, this can be controlled with proper road and trail design and appropriate erosion control measures.

These direct impacts would be mitigated with the proper use of PDC. PDC commonly used on WRNF lands are shown in Table 2-2. Breckenridge would develop a project design criteria that would include the use of BMPs and revegetation measures of disturbances. To minimize erosion and sedimentation to waterways, the Upper Four O'Clock Road realignment and construction/operation access roads should be insloped with rock ditches with some cross drains. New mountain bike trails and construction/operation access paths should utilize drain dips or other cross drains, especially above water crossings, to direct water off trails into the forest and away from waterways.

Alternative 3

Soil resource disturbance for Alternative 3 would be similar to Alternative 2. The differences between Alternative 2 and 3 are described in Chapter 2 – Description of Alternatives. Alternative 3 would have 4.1 fewer acres of total disturbance compared to Alternative 2. This includes 3.5 fewer acres of grading and grading/vegetation clearing, and 0.6 acre less of vegetation clearing without grading. In addition, there would be 2.7 fewer acres of soil permanently compacted from biking and hiking trails and 0.1 acre less of soil resources permanently lost. Refer to Alternative 2 – Proposed Action section for a more detailed

[101] USDA Forest Service, 2006

discussion on direct impacts to soil resources. In total, project implementation related to Alternative 3 would result in 23.2 acres of grading (8.9 acres of this grading would require vegetation clearing) and 2.1 acres of vegetation clearing without grading. Refer to tables 3H-4, 3H-5 and 3H-6 for a summary comparison of impacts for alternatives 2 and 3.

CUMULATIVE EFFECTS

Scope of the Analysis

Cumulative effects to soil resources would be associated primarily with potential soil loss from erosion and loss of soil productivity, largely stemming from soil organic matter displacement. Ski-related development within the Analysis Area has increased impermeable surfaces and soil compaction, and reduced soil productivity between pre-development and present conditions.

If PDC are properly implemented and maintained, onsite erosion and potential increases in sedimentation to waterways would be minimized. In addition, implementation of projects identified in the Drainage Management Plan would help control soil losses and sedimentation within the Analysis Area.

Temporal Bounds

The temporal bounds for this cumulative effects analysis for the geology and soils resource extend from BSR's inception as a destination resort in 1961 through the foreseeable future in which BSR can be expected to operate.

Spatial Bounds

The spatial bounds for this cumulative effects analysis are limited to soils resources within the Project Area (soils directly or indirectly effected by the project components).

Past, Present, and Reasonably Foreseeable Future Projects

Past, present, and reasonably foreseeable future projects with potential to cumulatively affect soil and geology resources within the Project Area include other projects proposed at BSR.

BSR development has resulted in vegetation clearing, grading, and installation of facilities across BSR's 5,700-acre operational boundary. Over five decades of resort development, there has been a loss soil organic content (organic O- and mineral A-horizons) and increased impermeable surfaces within these soil map units. These past ski area activities have resulted in approximately 127 acres of bare ground within the analysis area.[102] More recent losses of soil organic content due to development are required by Forest Plan to be offset by rehabilitation projects. The majority of this disturbance has been revegetated;

[102] This acreage of existing bare ground within the analysis area is based on a bare ground soils analysis that is not finalized. This acreage is subject to change.

however, these sites require ongoing rehabilitation and management in order to address the impacts of vegetation removal and grading, return soil organic matter and facilitate successful revegetation to the area.

BSR has a current Drainage Management Plan and is required by the Forest Service to implement erosion control techniques such as water bars and revegetation that are constantly monitored and managed to minimize impacts to soil and water resources. These management plans have been effective in the stabilization of soils within the operational boundary; however, soil compaction and productivity reflect changes in land use, management, and vegetative cover between pre-development and present day conditions. In addition, snowmaking has increased site moisture and therefore, increased the potential for mass soil movement within the SUP area; although as referenced in the Affected Environment, mass movement potential remains low to moderate within the Project Area. The reader is referred to the Drainage Management Plan and Chapter 3, Section J – Watershed for a more detailed description of soil resource concerns.

A PDC contained in Table 2-2 requires that there would be no net loss of soil organic material. BSR and the Forest Service will use the results of the bare ground analysis to coordinate and implement future soil reclamation and rehabilitation projects (including soil amendments) to address past impacts. When considered cumulatively, if the action alternatives are carefully managed with effective erosion control, considering the low to moderate erodibility of soil management units these projects could be implemented without further impacts to the soils resource, and would not affect the soil management unit as a whole.

Cumulatively, construction on NFS lands and private lands within the Project Area have changed sediment yield, soil compaction and impermeable surface between pre-development conditions and present day ski area development. Changes in sediment yield and soil compaction are primarily temporary and associated with construction activities; however, permanent developments such as roads and buildings would continue to result in increased impermeable surfaces.

In the context of past, present and reasonably foreseeable effects, the contribution of the action alternatives to overall long-term cumulative impacts is minimal, 1.2 acres for Alternative 2 or 1.1 acres for Alternative 3, with respect to permanent structures being constructed. Again, ongoing implementation of projects contained in the Drainage Management Plan would help manage soil movement and sedimentation within BSR's SUP boundary.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Approximately 1.2 acres or 1.1 acres of soil resources would be permanently lost due to structures under alternatives 2 and 3, respectively. These minor irreversible and/or irretrievable commitments of soil resources have been identified, but the effect would be negligible.

I. WETLANDS

SCOPE OF THE ANALYSIS

BSR is located within the upper Blue River watershed in Summit County, Colorado. The Analysis Area focuses on 312 acres across Peaks 7 and 8. Approximately 16.2 acres of wetlands were mapped in the Analysis Area. Detailed wetland mapping efforts focused on areas that would have potential disturbance, including proposed mountain bike trails, zip line station locations, canopy tour station locations, hiking trails and the Upper Four O'Clock Road realignment. The wetland and riparian habitats described are based on field observation within the Analysis Area; however, these descriptions are typical of the wetland and riparian habitats found across BSR's SUP area. For a more detailed discussion of wetlands assessment in the Analysis Area, refer to the *Wetland Specialist Report*.[103]

FOREST PLAN DIRECTION

Pursuant to the Forest Plan, as amended, soils, aquatic and riparian system management measures and design criteria are provided in the Region 2 WCPH to ensure applicable Federal and State laws are met on NFS lands in Region 2.[104]

Applicable WCPH Management Measures

Hydrologic Function

11.1 Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff.

Riparian Areas and Wetlands

12.1 In the Water Influence Zone (WIZ) next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian ecosystem condition.

12.3 Conduct actions so that stream pattern, geometry, and habitats maintain or improve long-term stream health.

12.4 Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.

12.6 Manage water use facilities to prevent gully erosion of slopes and to prevent sediment and bank damage to streams.

[103] Western Ecological Resource, 2014b
[104] USDA Forest Service, 2002a and 2006

EXECUTIVE ORDER 11990

Additional direction regarding wetlands management for the U.S. Army Corp of Engineers (USACE) and Forest Service is provided by Executive Order 11990 – Protection of Wetlands. Presidential Executive Order (EO) 11990 requires federal agencies to avoid to the extent practicable, long- and short-term adverse impacts associated with the destruction or modification of wetlands. More specifically, EO 11990 directs federal agencies to avoid new construction in wetlands unless there is no reasonable alternative. EO 11990 states further that where wetlands cannot be avoided, the Proposed Action must include all practicable measures to minimize harm to wetlands. As required by EO 11990 and Section 404 of the Clean Water Act, avoidance and minimization measures must be considered through the planning process. Therefore, this section also identifies planning constraints with regard to terrain development.

AFFECTED ENVIRONMENT

Wetland Descriptions

The Analysis Area is 312 acres across Peaks 7 and 8. Approximately 16.2 acres of wetlands were mapped in the Analysis Area, including: 2.6 acres of forested wetlands (PFO), approximately 4.1 acres of scrub-shrub wetlands (PSS) and 6.0 acres of emergent wetlands (PEM). In addition, 3.5 acres of open water associated with ponds and lakes were mapped.

The riparian and wetland habitats occurring within the Analysis Area are typical of upper montane, subalpine and alpine wetlands of the region. Riparian and wetland habitats primarily occur at the headwaters of, and along, Cucumber Creek and Sawmill Creek. In addition, there are small seeps scattered throughout the Analysis Area. High quality wetland fens appear to be restricted to Cucumber Gulch, located east of the Analysis Area, which supports a groundwater-fed fen wetland that has been identified by the Environmental Protection Agency as an Aquatic Resource of National Importance (ARNI). However, within the Analysis Area, there are localized areas of organic rich topsoil associated with some of the more well-developed wetlands. No fens were identified or mapped as occurring within the Analysis Area.

The hydrology for wetlands within the Analysis Area is primarily provided by groundwater, with a smaller contribution from surface water flowing into and through the wetlands. The groundwater system is fed by precipitation recharge that occurs on the steep slopes of the Tenmile Range to the west. Most of the precipitation in the Analysis Area occurs as snowfall, averaging 175 inches annually.[105] In addition, snowmaking activities may increase the snowfall depths within some locations of the Analysis Area. As snowmelt occurs, generally between April and May, melt water moves downward through the glacial till and colluvium, toward the underlying bedrock. When the groundwater encounters this less permeable

[105] National Climatic Data Center, 2014

bedrock, it is diverted to the land surface, forming springs, seeps and small intermittent streams. Perennial streams convey surface water into the Analysis Area, which produces saturated soil conditions along the stream banks and on the adjacent floodplains, where present. Finally, runoff from summer rains and pooled snowmelt are additional surface water sources to the wetland systems of the Project Area.

The riparian and wetland habitats occurring within the Analysis Area are typical of subalpine and alpine wetlands of the region. Forested wetlands are characterized by an overstory of Engelmann spruce and subalpine fir with an understory of chiming bells (*Mertensia ciliata*), arrowleaf groundsel (*Senecio triangularis*), heartleaf bittercress (*Cardamine cordifolia*), Fendler cowbane (*Oxypolis fendleri*), bishop's cap (*Mitella pentandra*), brook saxifrage (*Micranthes odontoloma*), softleaf sedge (*Carex disperma*) and millet wood rush (*Luzula parviflora*). Scrub-shrub wetlands are comprised of planeleaf and barrenground willows (*Salix planifolia*, *S. brachycarpa*) with an understory comprised of marsh marigold (*Psychrophila leptosepala*), queen's crown (*Clementsia rhodantha*), water sedge (*Carex aquatilis*) and heartleaf bittercress. Finally, herbaceous wetlands are variable. Snowmelt basin wetlands tend to be dominated by black alpine sedge (*Carex nigracans*) while herbaceous wetlands along small streamlets or seeps are dominated by brook saxifrage, arrowleaf groundsel, splitleaf Indian paintbrush (*Castilleja rhexifolia*), Parry's primrose (*Primula parryi*), elephant's head (*Pedicularis groenlandica*), monkey flower (*Mimulus guttatus*), Fendler cowbane and saffron butterweed (*Packera crocata*).

Wetland Functions and Values

Wetlands are often described in terms of their functions and values. Functions refer to the ecological role or processes that a wetland performs. Values refer to the importance of these functions to the environment or to humans. However, these terms are interrelated and most often the distinction between functions and values is not made. Wetland functions can be generally categorized into three major groups: hydrology, water quality, and habitat. Wetlands do not necessarily perform all functions, nor do they perform all functions to the same degree. The location, vegetation and hydrology of a wetland often determine which functions it performs. The assessment of wetland functions and values is an important tool in analyzing the effects of a proposed project on the Forest Plan goal of ecosystem health and in prescribing the management measures and design criteria of the WCPH.

The major wetland functional groups which were evaluated include: hydrology functions (*groundwater discharge, groundwater recharge, velocity reduction, erosion protection* and *floodwater retention/peak flood reduction*); water quality functions (*sediment removal, nutrient retention and removal*); and *wildlife habitat* functions. For a detailed review and explanation of each of these wetland functions, please see Adamus et al. 1991. The four areas in which these wetland functional groups were applied are Cucumber Creek headwaters, wetlands on ski trails, forested wetland seeps and lakes/ponds.

The qualitative assessment of wetland functions considered the overall condition of wetlands relative to the other wetlands in the Analysis Area and to similar wetlands in Summit County. In general terms, these

assessments rank the effectiveness of a function by considering both the presence of a particular process as well as the opportunity for that process to occur based on the wetland type and location. The assessments represent the average conditions for each group of wetlands or wetland complex. A summary of the ranking system is presented below in table 3I-1. These rankings have been adapted from Cooper (1988). Table 3I-2 is a summary of the Analysis Area wetland functions and their ratings. For a complete discussion of the ratings of each BSR wetland complex, please see the associated *Wetland Specialist Report*. Finally, the overall condition of each wetland complex was rated as being poor, fair or good depending on the extent and magnitude of existing disturbances.

Table 3I-1:
Qualitative Wetland Assessment Rankings

Ranking	Description
None	Available observations and/or data confirm absence or prevention of a function
Low	Short duration, small volumes of water, or absence of opportunity cause the function to be insignificant
Moderate	The combined effects of size, frequency, and opportunity indicate the function occurs regularly but is not high quality or the dominant function
High	Function is very effective, because the wetland covers a large area and/or receives a large volume of water, there is a long duration, or it provides an unusual quality
Very High	Extremely significant function owing to its uniqueness, size, duration, and opportunity

Cucumber Creek Headwaters

The majority of the mapped wetlands occur in the headwaters of Cucumber Creek along small perennial or intermittent streams. These wetlands are classified as a Palustrine system, forested, scrub-shrub and emergent wetland classes, with saturated and seasonally flooded water regimes. Water for these wetlands is provided by a high groundwater table associated with several intermittent and perennial streams, as well as localized seeps. In addition, seasonal snow melt contributes to the hydrology budget of these wetlands. Overall, these wetlands and riparian habitats appear to be in good condition.

Table 3I-2:
Analysis Area Wetland Assessment Summary

	Hydrology	Water Quality	Wildlife Habitat	Overall Condition
Cucumber Creek Headwaters	Low-Moderate	Moderate	High	Good
Wetlands on Ski Trails	Low-Moderate	Low	Low-Moderate	Fair
Forested Wetland Seeps	Low-Moderate	Low	Low-Moderate	Good
Lakes/Ponds	Low-Moderate/ Insignificant	Low	Moderate-High	Good

Wetlands on Ski Trails

Several areas of wetlands occur on ski trails and have been historically disturbed by grading. These wetlands support a variety of herbaceous plants and small wetland shrubs along with non-native

opportunistic species. The wetlands are classified as a Palustrine system, scrub-shrub and herbaceous wetland classes, with a saturated water regime. Many of these wetlands occur as small seeps. However, the volume of water discharged is variable based on the size of the individual wetland. There are no large continuous streams produced from these wetlands and there are no areas of fens in these wetlands. The condition of the wetlands on ski trails appears to be fair. The wetlands are threatened by erosion and sedimentation from the adjacent ski trails. In addition, in some cases the scrub-shrub vegetation may be periodically pruned back to provide safe ski conditions.

Forested Wetland Seeps

Forested wetland seeps occur scattered throughout the Analysis Area, but are not connected to the larger tributary system. These wetlands are classified as a Palustrine system, forested wetland class with a saturated water regime. Many of these wetlands occur as small seeps. Overall, the forested seep wetlands appear to be in good condition.

Lakes/Ponds

Two perennial alpine lakes and one seasonal pond occur within the Analysis Area. These aquatic habits are classified as a Palustrine system with an aquatic bed class. The overall condition of these aquatic habitats appears to be good and no adverse effects from the adjacent land uses were noted during field reconnaissance.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action Alternative would result in a continuation of existing operations and management practices at BSR because no other summer recreation facilities and improvements would be developed under this alternative. Wetland and riparian systems would continue to resemble existing conditions.

Alternative 2 – Proposed Action

In accordance with EO 11990, the Proposed Action was designed to avoid and minimize impacts to wetlands wherever possible. Although some temporary impacts to wetlands would occur, permanent impacts to wetlands would be avoided.

Under the Proposed Action, mountain bike trails would cross small wetland streams in 30 locations, potentially impacting 0.057 acre of wetlands (refer to Figure 10 – Peak 7 Water Resources and Alternatives 2 and 3 Proposed Projects). Impacts would be extremely minimal and all crossings would be bridged or constructed with boardwalks set on diamond pier foundations. Diamond piers are environmentally-friendly foundations that do not cause any permanent wetland impacts. Such piers are

generally not regulated by the USACE.[106] Two access paths for construction equipment may potentially impact an additional 0.022 acre of wetlands for the Sawmill Canopy Tour, and a road needed for construction of a Sawmill Zip Line station would temporary impact another 0.001 acre of wetlands. Refer to Table 3I-3 and Figure 3 – Alternative 2.

Indirect impacts to wetlands may include the effects of shading from bridges or boardwalks on herbaceous wetland vegetation and the pruning back of scrub-shrub wetlands containing willows. Such impacts could potentially affect the species composition of small areas of wetlands, but would not change the overall wetland functions and values. Other indirect impacts to wetlands could potentially include increased erosion or sedimentation from proposed mountain bike trails; however, PDC (refer to Table 2-2) would be implemented to ensure that all temporary disturbances are revegetated quickly and that mountain bike trails are constructed in ways to reduce impacts to wetlands and other waters of the U.S.

Table 3I-3:
Wetland Impacts – Alternative 2

Name	Number of Impacts	Wetland Class*	Impact Area (acre)	Impact Type
Mountain Bike Trails	7	PFO	0.012	Temporary
Mountain Bike Trails	6	PSS	0.024	Temporary
Mountain Bike Trails	17	PEM	0.021	Temporary
Subtotal	*30*		*0.057*	
Sawmill Canopy Tour Access Path	2	PEM	0.022	Temporary
Sawmill Zip Line Access Road	1	PEM	0.001	Temporary
Subtotal	*3*		*0.023*	
Total	**33**		**0.080**	

* PFO = Palustrine Forested, PSS = Palustrine Scrub-Shrub, PEM = Palustrine Emergent (Cowardin et al., 1979)

Forest Plan Consistency

Alternative 2 projects proposed would require appropriate PDC in order to avoid impacts to wetlands. Additional PDC are included in Table 2-2 as a result of the analysis of potential impacts to the watershed resources. Correct implementation of the PDC (e.g., construct wetland crossings with boardwalks set on diamond pier foundations) would ensure consistency with the WCPH and would not adversely impact wetlands.

[106] McWhirter, 2014

Alternative 3

In accordance with EO 11990, Alternative 3 was designed to avoid and minimize impacts to wetlands wherever possible. Although some temporary impacts to wetlands would occur, permanent impacts to wetlands would be avoided. Under Alternative 3, proposed mountain bike trails would cross small wetland streams in 24 locations, potentially impacting 0.040 acre of wetlands (refer to Figure 10 – Peak 7 Water Resources and Alternatives 2 and 3 Proposed Projects). As with the Proposed Action, impacts would be minimal and all crossings would be bridged or constructed with boardwalks set on diamond pier foundations, which are environmentally-friendly foundations that do not cause any permanent wetland impact. Such foundations are generally not regulated by the USACE.[107] Two access paths for construction equipment may potentially impact an additional 0.022 acre of wetlands for the Sawmill Canopy Tour. Refer to Table 3I-4 and Figure 4 – Alternative 3.

Forest Plan Consistency

Alternative 3 projects proposed would require appropriate PDC in order to avoid impacts to wetlands. Additional PDC are included in Table 2-2 as a result of the analysis of potential impacts to the watershed resources. Correct implementation of the PDC (e.g., construct wetland crossings with boardwalks set on diamond pier foundations) would ensure consistency with the WCPH and would not adversely impact wetlands.

Table 3I-4:
Wetland Impacts – Alternative 3

Name	Number of Impacts	Wetland Class*	Impact Area (acre)	Impact Type
Mountain Bike Trails	5	PFO	0.008	Temporary
Mountain Bike Trails	4	PSS	0.013	Temporary
Mountain Bike Trails	15	PEM	0.019	Temporary
Subtotal	*24*		*0.040*	
Sawmill Canopy Tour Access Path	2	PEM	0.022	Temporary
Subtotal	*2*		*0.022*	
TOTAL	**26**		**0.062**	

* PFO = Palustrine Forested, PSS = Palustrine Scrub-Shrub, PEM = Palustrine Emergent (Cowardin et al., 1979)

CUMULATIVE EFFECTS

When combined with all past, present and reasonable foreseeable future actions, both the Proposed Action and Alternative 3 would maintain wetland quantity and quality within BSR's SUP area; hence, the cumulative impacts to wetlands would be negligible.

[107] Ibid.

Scope of the Analysis

The effects analyzed in the cumulative effects section apply to all alternatives, including the No Action Alternative. For a detailed description of past, present, and reasonable foreseeable future projects, referred to Appendix A in this document.

Temporal Bounds

The temporal bounds for this cumulative effects analysis for the wetlands resource extend from BSR's inception as a resort in 1961, through the foreseeable future in which BSR can be expected to operate.

Spatial Bounds

The spatial extent of the cumulative effects analysis is wetlands within the Analysis Area.

Past, Present, and Reasonably Foreseeable Future Projects

The cumulative influence of the Proposed Action and Alternative 3 considered in this analysis is generally very small with relation to wetland impacts within the scale of BSR's SUP (5,700 acres) and the greater Blue River Watershed (435,200 acres). When combined with all past, present and reasonable foreseeable future actions, including the development of the Peaks 6 and 7 terrain, installation of BreckConnect Gondola, Imperial Lift and 6 Chair installation, Peaks 7 and 9 facilities and VMP, both the Proposed Action and Alternative 3 would maintain wetland quantity and quality within BSR's SUP area; hence, the cumulative impacts to wetlands would be negligible.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

No irreversible and/or irretrievable commitment of resources have been identified that may impact wetlands in association with the alternatives analyzed in this document.

J. WATERSHED

SCOPE OF THE ANALYSIS

The scope of the analysis of water resources focuses on riparian and wetlands resources within the Sawmill Gulch, Cucumber Gulch, Cucumber Creek and South Barton Gulch watersheds (the study watersheds) on NFS and adjacent lands at BSR. The surface area comprised by the study watersheds totals approximately 5,990 acres. The study watersheds are described in more detail in the Affected Environment section, below.

FOREST PLAN DIRECTION

Pursuant to the 2002 Forest Plan, as amended, stream health management measures and design criteria are provided in the Region 2 WCPH to ensure applicable Federal and State laws are met on NFS lands in Region 2.[108] The WCPH contains several Management Measures (MM) which are environmental goals to protect aquatic and riparian systems. MM of relevance regarding watershed resources are outlined below:

Applicable WCPH Management Measures

- MM-1. Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff.
- MM-2. Manage land treatments to maintain enough organic ground cover in each activity area to prevent harmful increased runoff.
- MM-3. In the water influence zone (WIZ) next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian ecosystem condition.
- MM-4. Design and construct all stream crossings and other instream structures to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life.
- MM-5. Conduct actions so that stream pattern, geometry, and habitats maintain or improve long-term stream health.
- MM-6. Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.
- MM-8. Manage water use facilities to prevent gully erosion of slopes and to prevent sediment and bank damage to streams.
- MM-9. Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography, and climate.

[108] USDA Forest Service, 2002 and 2005

- MM-10. Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands.
- MM-11. Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.
- MM-12. Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage.
- MM-16. Apply runoff controls to disconnect new pollutant sources from surface and groundwater.

Relevant WCPH Definitions

Additionally, the WCPH provides definitions for some terms that are important to conveying information in this report:

Concentrated-Use Site: Areas designed and managed for high density of people or livestock, such as developed recreation sites and livestock watering areas.

Connected Disturbed Areas (CDAs): High runoff areas like roads and other disturbed sites that have a continuous surface flow path into a stream or lake. Hydrologic connection exists where overland flow, sediment or pollutants have a direct route to the channel network. CDAs include roads, ditches, compacted soils, bare soils and areas of high burn severity that are directly connected to the channel system. Ground disturbing activities located within the water influence zone should be considered connected unless site-specific actions are taken to disconnect them from streams.

Ephemeral Stream: A stream that flows only in direct response to precipitation in the immediate locality (watershed or catchment basin), and whose channel is at all times above the zone of saturation.

Hydrologic Function: The ability of a watershed to infiltrate precipitation and naturally regulate runoff so streams are in dynamic equilibrium with their channels and floodplains.

Intermittent Stream: A stream or reach of stream channel that flows, in its natural conditions, only during certain times of the year or in several years. It is characterized by interspersed, permanent surface water areas containing aquatic flora and fauna adapted to the relatively harsh environmental conditions found in these types of environments.

Gully: An erosion channel greater than 1 foot deep.

Permanent Stream: A stream or reach of a channel that flows continuously or nearly so throughout the year and whose upper surface is generally lower than the top of the zone of saturation in the areas adjacent to the stream.

Rill: An erosion channel less than 1 foot deep.

Stream Health: The condition of a stream versus reference conditions for the stream type and geology, using metrics such as channel geometry, large woody debris, substrate, bank stability, flow regime, water chemistry and aquatic biota.

Stream Health Class: A category of stream health. Three classes are recognized in the Rocky Mountain Region: robust, at-risk and diminished. These classes are recommended to be used for assessing long-term stream health and impacts from management activities.

Stream Order: A method of numbering streams as part of a drainage basin network. The smallest unbranched mapped tributary is called first order, the stream receiving the tributary is called second order and so on.[109]

Swale: A landform feature lower in elevation than adjacent hill slopes, usually present in headwater areas of limited areal extent, generally without display of a defined watercourse or channel that may or may not flow water in response to snowmelt or rainfall. Swales exhibit little evidence of surface runoff and may be underlain by porous soils and bedrock that readily accepts infiltrating water.

Water Influence Zone: The land next to water bodies where vegetation plays a major role in sustaining long-term integrity of aquatic systems. It includes the geomorphic floodplain (valley bottom), riparian ecosystem, and inner gorge. Its minimum horizontal width (from top of each bank) is 100 feet or the mean height of mature dominant late-seral vegetation, whichever is most.

AFFECTED ENVIRONMENT

Project Area Description

BSR is located in the Central Rocky Mountains of Colorado, approximately 80 miles west of Denver, Colorado. The resort is situated at elevations ranging from 9,650 and 12,200 feet, receiving most of its annual precipitation as snow during the winter months. Average annual precipitation ranges from 20 inches at the lower elevations to 29 inches at the higher elevations. Monthly mean temperatures during the winter months are between 15 and 23 degrees Fahrenheit; average temperatures for the summer months range between 46 and 53 degrees Fahrenheit.[110]

[109] EPA, 1980
[110] PRISM Climate Group, 2013

Streams in the study watersheds generally flow in a southwest-to-northeast direction and are all tributaries to the Blue River. The Blue River flows north from its headwaters atop Hoosier Pass into Dillon Reservoir, proceeding through Summit County into Green Mountain Reservoir, before its confluence with the Colorado River near Kremmling, CO. Among the study watersheds, Cucumber Gulch is the most heavily influenced by ski area development relative to baseline (pre-development) forested area (refer to Table 3J-1).

Table 3J-1:
Study Watersheds – Comparison of Baseline and Existing Conditions

Watershed	Drainage Area (acres)	Forested Area		
		Baseline	Existing	
		(acres)	(acres)	(% of Baseline)
Sawmill Gulch	1,740	734	446	61%
Cucumber Gulch	1,000	854	437	51%
Cucumber Creek	1,131	779	654	84%
South Barton Gulch	2,118	1,715	1,489	87%

None of the stream segments within the analysis area are listed on the Colorado State 303(d) list as impaired streams under the Clean Water Act.[111]

Watershed

Water Yield

Runoff hydrographs for the study watersheds were developed following the methodologies presented in the WRENSS Procedural Handbook, as updated by Troendle, Nankervis, and Porth, 2003, and supplemented by the Colorado Ski Country USA (CSCUSA) Handbook.[112] In summary, the WRENSS Model generates a water balance using seasonal precipitation and vegetation type and density (distributed by watershed aspect). The Model then computes the amount of water potentially available for runoff. The water balance of the WRENSS Model is coupled with a snowmaking hydrology computation process developed through the CSCUSA study. Together, these calculations produce estimates of water yield typical of subalpine mountain watersheds. For each study watershed, the WRENSS Model distributes the calculated annual yield using simulated hydrographs based on hundreds of years of data recorded at several different gauging stations. The simulated hydrographs represent the normalized distributions of the annual yield in 6-day intervals throughout the year. It is important to note that the computations do not include routing of runoff water through the watershed to the stream system. Thus, the water yield hydrographs do not represent streamflow per se, but rather basin-wide water yield to the receiving waters.

[111] State of Colorado CDPHE, 2012
[112] EPA, 1980; Troendle et al., 2003; Colorado Ski Country USA, 1986

In other words, the WRENSS hydrologic model was developed to simulate expected changes in streamflow as the result of silvicultural activities, not streamflow itself.

Water yields and distribution hydrographs were modeled for baseline, existing, and potential (alternatives 2 and 3) conditions using monthly average precipitation and temperature data for each watershed. The purpose of this modeling effort is to estimate the effects of existing and potential projects on the watersheds' yield and peak flow. The baseline hydrographs modeled conditions prior to any human impacts, such as ski trail development, taking place in these watersheds.

Under current conditions, the study watersheds' yields are affected by tree removal associated with ski area development and by the input of additional water in the form of snowmaking. Water yields and peak flows calculated using the WRENSS Model for each study watershed are summarized in Table 3J-2, for both baseline and current conditions assuming average precipitation and temperatures. Hydrograph plots that depict the temporal distribution of these water yields were also developed using the WRENSS Model. These modeled hydrographs reveal flow characteristics reflective of the current ski trail system and snowmaking applications. In general, snowmelt hydrographs influenced by vegetative clearing and snowmaking have higher intensity peak flows which occur earlier in the runoff season as compared to pre-development conditions. This is a consequence of the higher volume and rate of snowmelt due to decreased canopy interception and evapotranspiration, increased solar radiation in cleared areas, and also due to the snowmaking water input (additional to natural precipitation) to the affected watersheds.

Table 3J-2:
WRENSS Model Output for Baseline and Existing Conditions – Average Precipitation

Watershed	Baseline Conditions		Existing Conditions	
	Water Yield (acre-feet)	Peak Flow (cfs)	Water Yield (acre-feet)	Peak Flow (cfs)
Sawmill Gulch	1,945	17.4	2,693	27.5
Cucumber Gulch	750	4.2	1,561	15.4
Cucumber Creek	990	7.3	1,524	14.5
South Barton Gulch	1,532	9.8	1,816	13.5

It is important to emphasize that Table 3J-2 depicts the modeled yield and peak flow values corresponding to average precipitation for the study watersheds. The watershed yield and peak flow can vary significantly from year to year due to natural variability of precipitation patterns. For example, modeling a typical wet year, with annual precipitation about 20 percent higher than the average year produced estimated yields 29 to 54 percent higher than those corresponding to the average precipitation year. Similarly, a typical dry year with annual precipitation equal to 80 percent of the average generated watershed yields approximately 61 to 71 percent as compared to average year yields. The modeled results for the typical dry and wet years are shown in Table 3J-3.

Table 3J-3:
WRENNS Model Output for Existing Conditions – Dry, Average, and Wet Years

Watershed	Dry Year		Average Year		Wet Year	
	Water Yield (AF)	Peak Flow (cfs)	Water Yield (AF)	Peak Flow (cfs)	Water Yield (AF)	Peak Flow (cfs)
Sawmill Gulch	1,903	18.4	2,693	27.5	3,722	39.4
Cucumber Gulch	1,142	10.8	1,561	15.4	2,019	20.4
Cucumber Creek	1,068	9.9	1,524	14.5	2,029	19.6
South Barton Gulch	1,104	7.3	1,816	13.5	2,791	22.3

Stream Health

The WCPH defines stream health as the condition of a stream compared to the condition of a minimally disturbed reference stream of similar type and geology. Stream health is categorized as robust, at-risk or diminished using numerical criteria for fine sediment loading, percentage of unstable banks, residual pool depths and wood loading.

Stream Health Definitions

The Forest Plan adopted the WCPH for direction on projects that affect water resources. As described above, the WCPH mandates several MM of relevance regarding stream health and water resources effects. To facilitate the evaluation of stream health compliance in the context of the WCPH MM, the WCPH outlines several key definitions relevant to the quantification of stream health. The definitions of Stream Health and Stream Health Class are provided in the Forest Plan Direction section above.

The stream health classification is obtained by comparing metrics surveyed in a study reach against those surveyed in its corresponding reference reach. Reference stream reaches are located in watersheds with little or no development and represent natural conditions that are attainable for a given channel type, climate, geology, aspect and slope. Reference stream reaches provide an analytical control against which to compare the conditions found in study reaches. Study reaches are located downstream from areas impacted by natural events (e.g., forest fires) or activities such as logging and ski area development.

Stream health classes are used for assessing long-term stream health and impacts from management activities. In this context, Management Measure MM-3 included in the WCPH states that “only those actions that maintain or improve long-term stream health and riparian ecosystem condition” shall be allowed. Definitions of relevant stream health metrics are listed below. Table 3J-4 summarizes the definitions of stream health classes.

Table 3J-4:
Stream Health Classes for Attainment of Forest Plan Standards (WCPH)

Stream Health Class	% of Reference	Habitat Condition
Robust	> 74 or < 126[a]	Stream exhibits high geomorphic, hydrologic and/or biotic integrity relative to its natural potentials condition. Physical, chemical and/or biologic conditions suggests that State assigned water quality (beneficial, designated or classified) uses are supported.
At-Risk	59 to 73 or 127 to 141[a]	Stream exhibits moderate geomorphic, hydrologic and/or biotic integrity relative to its natural potential condition (as represented by a suitable reference condition). Physical, chemical and/or biologic conditions suggest that State assigned water quality (beneficial, designated or classified) uses are at risk and may be threatened.
Diminished	< 58 or > 141[a]	Stream exhibits low geomorphic, hydrologic and/or biotic integrity relative to its natural potential conditions (as represented by a suitable reference condition). Physical, chemical and/or biologic conditions suggest that State assigned water quality (beneficial, designated or classified) uses may not be supported.

[a] For metrics that increase with decreasing stream health, such as fine sediment and unstable stream banks.

Potential Management Effects to Stream Health

Metric:

Unstable Banks: A streambank showing evidence of the following: breakdown (clumps of bank are broken away and banks are exposed); slumping (banks have slipped down); tension cracking or fracture (a crack visible on the bank); or vertical and eroding (bank is mostly uncovered, less than 50 percent covered by perennial vegetation, roots, rocks of cobble size or larger, logs of 0.1 meter in diameter or larger, and the bank angle is steeper than 80 degrees from the horizontal). Undercut banks are considered stable unless tension fractures show on the ground surface at the back of the undercut.[113]

Causal Mechanism(s):

Increased Runoff: The WCPH lists increased runoff as one the major sources of stream impacts. Several investigators have demonstrated that increases in peak discharge and annual volume of runoff can negatively impact the stability of streambanks.[114]

Impacts to Riparian Vegetation: Many land use activities can lead to accelerated bank erosion. Riparian vegetation provides internal bank strength. Removal of native riparian vegetation may lead to weakened internal bank strength and subsequent decrease in bank stability.[115]

Channel Network Extension: Roadside drainages frequently connect directly to the stream channel and result in a net increase in the length of the existing channel network within the watershed. This increases

[113] Overton et al., 1997
[114] David, 2008
[115] Rosgen, 2006

the efficiency of flow routing within the watershed, increasing peak flows and subsequent erosion and sediment transport. The WCPH outlines the following Design Criterion under MM-1: "In each 3rd order and larger watershed, limit connected disturbed areas so that the total stream network is not expanded by more than 10 percent. Progress toward zero connected disturbed area as much as feasible." Roads are usually a primary source of channelized connection between disturbed soils and the stream channel. Because roadside drainage ditches provide an efficient mechanism for capturing runoff and frequently drain to a stream system, a direct link between the road-generated sediment source and the stream system is easily created. A second potential source of connected disturbance could be sparsely vegetated ski trails with drainage water bars that connect directly to the stream system.

Connected Graded Terrain: In terms of the effect of proposed management activities upon bank stability conditions in affected stream reaches, ultimately the area of disturbance and/or snowmaking that is directly connected to the stream system is the variable of management concern. The WCPH clearly documents the relationship between CDAs and effects to peak flows in the associated stream system. Likewise, the effect of channel network extension and the increased efficiency of hydraulic routing have been well documented by several investigations, including references in the Zero Code of the WCPH.[116]

Metric:

Percent Surface Fines: The effect of land disturbances such as roads, roadside ditches, ski trails and utility corridors within forested watersheds tend to cause an increase in exposed and compacted surface soils and therefore increase erosion and sediment transport. An increase of sediment load input to the stream network of a watershed is often indicated by higher percentages of fine-grained particles on the channel bed. Fine sediment deposition can diminish habitat by aggradation, or filling in, of pool systems. Pools are important components of habitat for many fish species and other aquatic organisms. Filling by fines affects pool habitat by reducing volume, particularly during low flow conditions, and obliterating substrate cover.

Causal Mechanism(s):

Connected Disturbed Area: High-runoff areas, like roads and other disturbed sites, having a continuous surface flow path into a stream or lake. Hydrologic connection exists where overland flow, sediment, or pollutants have a direct route to the channel network. CDAs include roads, ditches, compacted soils, bare soils and areas of high burn severity that are connected to the channel system. Ground-disturbing activities located within the WIZ should be considered connected unless site-specific actions are taken to disconnect them from the streams. CDAs provide a measure of the extent to which a stream reach is influenced by direct, channelized connections between disturbed soils and the stream network itself.

[116] Burroughs and King, 1989; Troendle and Olsen, 1994

Metric:

Wood Frequency: Sustainable woody debris recruitment is recognized as an important riparian function in mountain channels. Standing dead trees provide habitat for nesting species in the riparian zone and contribute detritus and insects to streams. Once in streams, coarse woody debris helps maintain channel structure by storing sediment and encouraging pool scour. Large woody debris (LWD) reduces stream energy by interrupting the continuous slope of channel beds and creating turbulence. In streams supporting fisheries, LWD also helps provide stable fish habitat by retaining spawning gravel and by serving as rearing cover.

Causal Mechanism(s):

Vegetation Removal in WIZ: Recruitment of LWD is dependent upon maintenance of riparian vegetation structure and function. Removal of vegetation within the WIZ has been demonstrated to have a negative impact upon maintenance of adequate wood frequency.

Existing Stream Health

The WRNF evaluates stream health using a standard Forest Service physical habitat survey protocol.[117] Under this protocol streams that may be affected by proposed management activities are surveyed and compared to reference streams with similar morphology and geology. Reference streams represent natural conditions that are considered the best conditions attainable. For streams that are third-order and larger, stream health surveys are typically conducted downstream from proposed management activities in reaches that are considered to have the potential to respond to altered flow conditions or sediment loading upstream.[118] Quantitative stream health surveys are not routinely conducted on second-order and smaller streams due to high natural variability in bed and bank characteristics; however, these smaller streams are often evaluated using qualitative observations of bed and bank characteristics which may indicate localized erosion or sediment storage.

As mentioned in the Potential Management Effects to Stream Health Section, disturbance of the WIZ has a direct effect on stream health metrics, such as LWD, and fine sediments. The WCPH states the importance of the WIZ in the protection of interacting aquatic, riparian and upland functions. Furthermore, Management Measure MM-3 includes design criteria requiring that new concentrated-use sites be located outside the WIZ if practicable. Table 3J-5 compares the extent of the WIZ estimated for pre-development, or baseline, against existing conditions. Relative to baseline conditions, most of the tree removal within the WIZ has occurred in the Cucumber Gulch watershed.

[117] Overton et al., 1997
[118] Montgomery and Buffington, 1998

Table 3J-5:
Impacts to Forested Areas in the WIZ – Baseline vs. Existing Conditions

Watershed	Baseline (acres)	Existing (acres)	Existing (% of Baseline)
Sawmill Gulch	103	73	71%
Cucumber Gulch	123	58	47%
Cucumber Creek	123	108	88%
South Barton Gulch	213	195	92%

The WRNF evaluated the condition of two third-order stream reaches in the study area (Sawmill Gulch and Cucumber Creek). Stream health surveys were conducted on August 13th, September 27th, and October 2nd of 2014. Ten reference streams, surveyed in previous years, were used to characterize reference conditions for the evaluation of Sawmill Gulch and Cucumber Creek. Both Sawmill Gulch and Cucumber Creek are rated as "Robust" for percent of fine sediments on the stream bed, residual pool depth, and bank stability, whereas Sawmill Gulch and Cucumber Creek are rated less than "Robust" for LWD (refer to Table 3J-6 and Table 3J-7).[119] Prior surveys conducted by the WRNF on South Barton Gulch classified this stream as "Robust" in all four health metrics.[120]

Cucumber Gulch flows across NFS lands as first and second-order streams from their headwaters to an elevation of approximately 10,000 feet where the streams flow into culverts under private land at the Peak 8 Base Area. Cucumber Gulch water emerges from the culverts below Ski Hill Road as a third-order stream flowing on Summit County lands. Because the third-order Cucumber Gulch channel is not on NFS lands, a formal stream health survey is not available for this watershed. However, visual inspections of Cucumber Gulch second-order tributaries show some degree of channel erosion, such as headcutting and bank sloughing.[121] For example, the Drainage Management Plan developed by BSR in 2009 (2009 DMP) identified approximately 290 feet of first-order streams tributary to Cucumber Gulch where channel erosion was evident.[122] These reaches are located directly downstream from disturbed terrain; a more detailed discussion of this issue follows below.

[119] Anderson, 2014
[120] USDA Forest Service, 2009
[121] Anderson, 2007
[122] Resource Engineering, 2009

Table 3J-6:
Sawmill Gulch Stream Health Value and Rating

Stream Health Metric	Diminished Health Threshold	Robust Health Threshold	Measured Value	Stream Health Rating
Percent Fine Sediments	>34	<30	0.6	Robust
Percent Unstable Banks	>15.6	<13.9	7.5	Robust
Large Woody Debris (pieces/100 meters)	<4	>5	3	Diminished
Residual Pool Depth (meters)	<0.11	>0.13	0.16	Robust

Table 3J-7:
Cucumber Creek Stream Health Value and Rating

Stream Health Metric	Diminished Health Threshold	Robust Health Threshold	Measured Value	Stream Health Rating
Percent Fine Sediments	>30	<27	12.7	Robust
Percent Unstable Banks	>15.2	<13.5	8.0	Robust
Large Woody Debris (pieces/100 meters)	<14	>18	16	At-Risk
Residual Pool Depth (meters)	<0.10	>0.13	0.21	Robust

Existing Connected Disturbed Area

The 2009 DMP was developed by BSR to assess the condition of its mountain drainage network and to identify areas where drainage projects could be implemented. As part of this effort, BSR conducted an extensive GPS survey and created a comprehensive GIS database of its various drainage features, such as culverts, road-side ditches and waterbars. The 2009 DMP documented drainage features that needed to be repaired or replaced and identified areas where additional BMPs for erosion and/or sediment control were needed. The direct relationship between concentrated flows and soil erosion was evident during the 2009 DMP field survey. For instance, areas of rill and gully erosion were observed at the discharge of some road-side ditches and waterbars that lacked adequate BMPs for erosion control.

Information collected for the 2009 DMP was also used to calculate the spatial extent of CDAs, in the context of the Peak 6 Project EIS. Connected disturbed areas were delineated using the GPS data coupled with analysis of aerial imagery and GIS tools, and following Forest Service recommendations and guidelines. As part of the analysis completed for the BSR Multi-Season Recreation Projects EIS, an update to the 2009 DMP was undertaken. Site visits were conducted during the field seasons of 2013 and 2014 in the study watersheds in order to update the 2009 DMP. The 2013–2014 field investigation documented several of the rehabilitation and improvement projects listed in the 2009 DMP that were implemented in the last five years. For example, damaged culverts were replaced, drainage channels were improved and sediment traps were cleaned and/or enlarged. Data collected during the field investigation

was incorporated into BSR's GIS database and the spatial extent of CDAs was recalculated. The investigation revealed that implementation of the 2009 DMP projects combined with proper maintenance of BSR's roads and overall good condition of ski area BMPs for erosion and sediment control, have contributed to a significant reduction in the extent of CDAs as compared to conditions existing in 2009 (refer to Table 3J-8 and Table 3J-9). An update to BSR's 2009 DMP, which will include all of the watersheds within BSR, is anticipated to be issued in 2015.

Table 3J-8:
Connected Roads within the Study Watersheds – Existing Conditions

Watershed	Natural Stream Channel Length[a] (ft)	Road Drainage Connected Length[b] (ft)	Percent Increase of Channel Length
Sawmill Gulch	40,087	5,885	15%
Cucumber Gulch	35,557	3,330	9%
Cucumber Creek	28,945	4,287	15%
South Barton Gulch	47,938	0	0%

[a] Derived from GIS and field data analysis. Includes stream channels of Order 1 and higher.
[b] Within BSR only.

Table 3J-9:
Connected Disturbed Areas within the Study Watersheds – Existing Conditions

Watershed	Existing Disturbed Areas[a] (acres)	Connected Disturbed Areas[a] (acres)	Percent Disturbed Areas that are Connected
Sawmill Gulch	103	5	5%
Cucumber Gulch	336	3	1%
Cucumber Creek	139	5	4%
South Barton Gulch	138	0	0%

[a] Within BSR only.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Under the No Action Alternative, BSR would continue its current summer and winter seasonal operations. Additional tree removal or terrain grading would not occur with selection of this alternative. This alternative would have no direct or indirect effects on the riparian and wetland resources.

Alternative 2 – Proposed Action

The Proposed Action involves tree clearing on 14.8 acres and grading on 26.7 acres. The total disturbance associated with the proposed projects would be 29.4 acres since a combination of tree removal and

grading would occur on 12 acres. It is important to note that the proposed tree removal is mostly associated with "linear" projects such as zip lines and mountain bike trails. In other words, the Proposed Action would remove selected trees, as necessary, within 14.8 acres but would not clear-cut 14.8 acres of forests. For example, a 16-foot wide corridor would be needed for a safe operation of the proposed zip lines while canopy tours would require 10-foot wide corridors. Corridors required for the proposed mountain bike trails would be 6 feet wide on average, up to 15 feet at switchbacks. Depending on the location, minimal removal of overstory vegetation would be required for the proposed projects as tree spacing in the project areas often exceeds 10 feet.

The proposed realignment of a steep section of the Upper Four O'Clock Road would improve safety and also address an ongoing drainage problem, as the existing road reaches grades as high as 35 percent. Such steep grades provide conditions for high runoff velocities which result in rill and gully erosion within the road prism and at the discharge of road ditches and waterbars. The proposed realignment would require one half mile of terrain grading or about 3.7 acres (no vegetation removal). The new road section would comply with all WRNF requirements for road construction.

Table 3J-10 summarizes the proposed disturbance and associated projects for the study watersheds (a more detailed description of the proposed impacts is included in the Stream Health paragraphs). Table 3J-11 provides a comparison between pre-development, existing, and proposed forest acreage.

Table 3J-10:
Proposed Projects per Watershed

Watershed	Proposed Projects Summary	Proposed Activity (acres)[a]	
		Tree Clearing[b]	Terrain Grading
Sawmill Gulch	Sawmill Canopy Tour and Zip Line: cable alignments, stations, access paths; Sawmill Zip Line access road; Peak 8 Utility Line (temporary disturbance); Chair 6 road realignment; mountain bike trails; hiking trail to Lake Chutes lake.	1.20	3.72
Cucumber Gulch	Peak 7 Zip Line cable, stations, and access road; Sawmill Zip Line and Canopy Tour station; Observation Tower; mountain bike trails; Horseshoe Bowl Loop and Peak 7 egress hiking trails; Vista Haus addition; Peak 8 Utility Line (temporary disturbance); Bottom Peak 7 Utility Line (temporary disturbance); Chair 6 road realignment; Challenge Course; Snowmaking pipeline reroute (temporary disturbance).	4.57	9.32
Cucumber Creek	Claimjumper Canopy Tour access paths and stations; Ore Bucket Canopy Tour hiking trail, stations, cable alignment and access paths; Peak 7 Zip Line access road, cable alignment, and stations; Peak 7 Bike Skill course; Peak 7 Loop hiking trail; mountain bike trails; Peak 7 Hut addition.	8.48	12.93
South Barton Gulch	Peaks Trail mountain bike trail.	0.16	0.16
TOTAL		**14.41**	**26.13**

[a] These acreages differ slightly from the numbers presented in Chapter 2 of this document due to the presence of some overlapping projects and rounding.
[b] The reported acreage refers to the "activity envelope" where tree removal would take place. For example, tree spacing often exceeds the proposed mountain bike trail width of 6 feet.

Table 3J-11:
Comparison of Existing and Proposed Impacts to Forests

Watershed	Baseline Forested Areas (acres)	Existing Forested Areas		Proposed Forested Areas (Cumulative)	
		Surface Area (acres)	Percent of Baseline Forest	Surface Area (acres)	Percent of Baseline Forest
Sawmill Gulch	734	446	61%	445	61%
Cucumber Gulch	854	437	51%	432	51%
Cucumber Creek	779	654	84%	646	83%
South Barton Gulch	1,715	1,489	87%	1,488	87%

Water Yield

Hydrologic computations performed using the WRENSS hydrologic model show that water yields and peak runoff flow rates originating from the study watersheds would increase between 0 and 1.4 percent relative to existing conditions. These potential changes in water yields and peak flow rates are a consequence of the proposed tree removal. Within each watershed, tree removal reduces the amount of water intercepted, stored, and transpired by the vegetation; therefore an increase in water yield may be expected as a result of tree removal. Table 3J-12 and Table 3J-13 summarize the increases in annual water yield and peak runoff flow rates modeled for the Proposed Action under average climatic conditions.

Table 3J-12:
Estimated Changes to Annual Yield – Alternative 2

Watershed	Water Yield (AF)			Change Relative to Existing Yield	Cumulative Change Relative to Baseline Yield
	Baseline	Existing	Proposed		
Sawmill Gulch	1,945	2,693	2,694	0.0%	39%
Cucumber Gulch	750	1,561	1,567	0.3%	109%
Cucumber Creek	990	1,524	1,539	1.0%	55%
South Barton Gulch	1,532	1,816	1,816	0.0%	19%

Table 3J-13:
Estimated Changes to Peak Runoff – Alternative 2

Watershed	Peak Runoff Flow (cfs)			Change Relative to Existing Rate	Cumulative Change Relative to Baseline Rate
	Baseline	Existing	Proposed		
Sawmill Gulch	17.4	27.5	27.6	0.1%	59%
Cucumber Gulch	4.2	15.4	15.5	0.5%	274%
Cucumber Creek	7.3	14.5	14.7	1.4%	101%
South Barton Gulch	9.8	13.5	13.5	0.0%	37%

Relative to existing conditions, the modeled increases in yield and runoff peak flow would be very small as compared to the natural variability of the study watersheds hydrology. As stated above, during a typical wet year, the study watersheds may produce an annual yield between approximately 29 and 54 percent higher than the average. Also during a typical wet year, peak flows may increase more than 32 percent due to larger snowpacks. The reader is referred to Table 3J-3 for detailed information on expected yields and peak flows during typical dry, average, and wet years.

Stream Health

As discussed under the Existing Stream Health section, the fine sediments, bank stability and residual pool depth were surveyed well within the range for the “Robust” class for Sawmill Gulch, Cucumber Creek and South Barton Gulch. Although Cucumber Gulch cannot be classified as either “Robust,” “At-Risk,” or “Diminished,” indications of localized bank instability and channel erosion have been observed

in second-order tributaries of this watershed. BSR has dedicated significant resources to address these erosion problems, including development of a mountain-wide DMP, implementation of mitigation projects, such as the Parklane Snowmaking Drainage Control, and overall improvement of the Resort's BMPs for erosion and sediment control.

Impacts to the WIZ

The Proposed Action would involve tree removal within areas of the study watersheds, including the WIZ. Specifically, mountain bike trails would be constructed near streams channels, requiring removal of selected trees within 0.12 acre of Cucumber Gulch WIZ and 1.5 acres of Cucumber Creek WIZ. MM-3 included in the WCPH states that only those projects that maintain or improve long-term stream health should be allowed in the WIZ next to perennial and intermittent streams. Tree removal within the WIZ could negatively affect the LWD stream health metric, depending upon the spatial extent of the activity. Tree clearing in the WIZ would occur within 1.5 acres in the Cucumber Creek watershed while only 0.12 acre of the Cucumber Gulch's WIZ would require removal of selected trees. As stated above, most of the proposed tree removal is associated with "linear projects" such as construction of mountain bike trails. Impacts to the WIZ in terms of reduction of the basal area and/or forest cover density would be much lower than the 1.5 acres described above.[123] In addition, recruitment of coarse woody debris would be mitigated by felling trees into inter-trail islands within the WIZ to improve LWD density. No tree removal is proposed for the Sawmill Gulch and South Barton Gulch WIZs. No terrain grading would occur within the WIZ of the study watersheds, as all stream crossings would be bridged or constructed with boardwalks set on diamond pier foundations.

Connected Disturbed Areas

Terrain grading may impact stream health in metrics such as unstable banks and channel sedimentation if graded areas are connected to the stream channel. In order to minimize impacts to the watershed resources and avoid the creation of additional CDAs as a result of mountain bike trail construction, BSR should construct all stream and wetland crossings as simple bridges and/or raised boardwalks. In addition, approach sections to stream and wetland crossings should be constructed with a reversed grade, so runoff and sediment drain away from these watershed resources. BSR will develop, in coordination with the USFS, appropriate PDC to ensure impacts due to construction of mountain bike are minimized and that trails are built to meet relevant standards.

Additional disturbance outside of the WIZ (refer to Table 3J-10) would result from implementation of the proposed projects. For example, terrain grading would be needed to construct sections of mountain bike trails, zip line and canopy tour stations, hiking trails and the Upper Four O'Clock Road realignment. Approximately 68 percent of the total 26.7 acres of proposed grading would be associated with

[123] Basal area (BA) is the area of the cross section of a tree stem, including the bark, measured at breast height (4.5 feet above the ground). Forest cover density is an index, theoretically ranging from zero to less than one, which represents the efficiency of three-dimensional canopy system to utilize the energy input to transpire water. EPA, 1980.

construction of mountain bike trails. Although the vast majority of the proposed mountain bike trails would be located outside of the WIZ, the proposed trails should be constructed with waterbars and/or drain dips adequately spaced to minimize flow velocities, and sloped to drain runoff into well vegetated areas and away from water bodies. The proposed grading needed for realignment of the existing Upper Four O'Clock Road would be beneficial to the watershed condition, as the existing road is steep and constitutes a significant source of sediment. Construction of the required emergency access paths to the different canopy tour and zip line stations would be designed and constructed to accommodate all-terrain vehicles, also referred to as four-wheelers. Emergency access paths would be 12 feet wide and would be constructed in compliance with USFS specifications for this type of trail, including proper drainage features and BMPs for erosion and sediment control. Temporary disturbance of 0.1 acres within an existing ski trail would be required to reroute a 250-foot section of snowmaking pipeline. Utility line work would need an additional temporary disturbance of 0.23 acres, associated with approximately 2,000 feet of trenching within existing ski trails and roads. Areas to be excavated within the ski trails would be re-vegetated after completion of the pipeline and utility projects. All the proposed grading must be constructed following USFS guidelines and should include adequate design, implementation and maintenance of BMPs for erosion and sediment control.

Forest Plan Consistency

Alternative 2 projects proposed for the study watersheds would require appropriate PDC in order to "maintain or improve" stream health in accordance with WCPH MM. The relatively small areas of grading and tree removal, and associated increases in watershed yield and peak flow that would result from construction of the Alternative 2 projects would not have a negative impact on the existing stream health of the study watersheds if implemented with the PDC listed in Table 2-2.

Additional PDC were included in Table 2-2 as a result of the analysis of potential impacts to the watershed resources. Correct implementation of the PDC and proper maintenance of associated BMPs for erosion and sediment control would ensure consistency with the WCPH and would not adversely impact the health of the study watersheds.

Alternative 3

Alternative 3 was developed to respond to wildlife, high-alpine ecosystem, and visual and recreation concerns. It includes several of the projects contained in the Proposed Action, except for the Sawmill Zip Line, the Ore Bucket Canopy Tour, and the hiking trail to Lake Chutes lake. Instead, Alternative 3 includes a new canopy tour (Claimjumper Canopy Tour) and modified hiking and mountain bike trails. The reader is referred to the Alternative 2 paragraphs of this Chapter for additional detail concerning direct impacts on watershed resources (such as width of mountain bike trails and zip line corridors). Chapter 2 includes additional detail regarding conceptual differences between the two action alternatives.

Potential impacts associated with Alternative 3 projects include tree removal on 11 acres and 23.3 acres of grading. In summary, Alternative 3 projects would require approximately 3.34 fewer acres of tree removal compared to Alternative 2; similarly, Alternative 3 would require approximately 2.63 fewer acres of grading. Table 3J-14 summarizes the different projects included in Alternative 3. Table 3J-15 displays a comparison between pre-development, existing, and Alternative 3 forest acreage. Table 3J-16 compares the potential terrain grading and tree removal acres for both action alternatives.

Table 3J-14:
Alternative 3 Projects per Watershed

Watershed	Proposed Projects Summary	Proposed Activity (acres)[a]	
		Tree Clearing[b]	Terrain Grading
Sawmill Gulch	Sawmill Canopy Tour alignment, stations, and access paths; Sawmill Zip Line stations; Peak 8 utility line work (temporary disturbance); mountain bike trails; Chair 6 road realignment.	1.1	3.3
Cucumber Gulch	Claimjumper Canopy Tour access paths, stations, and alignment; Sawmill Canopy Tour Station; Peak 7 Zip Line access road, alignment, and stations; Challenge Course; Horseshoe Bowl Loop and Peak 7 egress hiking trails; mountain bike trails; Observation Tower; snowmaking pipeline reroute (temporary disturbance); Chair 6 road realignment; Peak 8 and Bottom Peak 7 utility line work (temporary disturbance); Vista Haus addition.	4.6	9.2
Cucumber Creek	Claimjumper Canopy Tour access paths, alignment, and stations; Peak 7 Zip Line access paths, alignment, and stations; Peak 7 Loop hiking trail; mountain bike trails; Peak 7 Hut addition.	5.4	10.7
South Barton Gulch	Peaks Trail mountain bike trail.	0.0	0.1
TOTAL		**11.1**	**23.3**

[a] These acreages differ slightly from the numbers presented in Chapter 2 of this document due to the presence of some overlapping projects and rounding.
[b] The reported acreage refers to the "activity envelope" where tree removal would take place. For example, tree spacing often exceeds the proposed mountain bike trail width of 6 feet.

Table 3J-15:
Comparison of Existing and Alternative 3 Impacts to Forests

Watershed	Baseline Forested Areas (acres)	Existing Forested Areas		Alternative 3 Forested Areas (Cumulative)	
		Surface Area (acres)	Percent of Baseline Forest	Surface Area (acres)	Percent of Baseline Forest
Sawmill Gulch	734	446	61%	445	61%
Cucumber Gulch	854	437	51%	432	51%
Cucumber Creek	779	654	84%	649	83%
South Barton Gulch	1,715	1,489	87%	1,489	87%

Table 3J-16:
Comparison of Potential Tree Removal and Terrain Grading – Alternative 2 vs. Alternative 3

Watershed	Terrain Grading		Tree Removal[a]	
	Alt. 2 acres	Alt. 3 acres	Alt. 2 acres	Alt. 3 acres
Sawmill Gulch	3.72	3.31 (-0.41)	1.20	1.12 (-0.08)
Cucumber Gulch	9.32	9.39 (+0.07)	4.57	4.58 (+0.01)
Cucumber Creek	12.93	10.70 (-2.23)	8.48	5.37 (-3.11)
South Barton Gulch	0.16	0.10 (-0.06)	0.16	0.0 (-0.16)

[a] These surface areas do not represent clear-cut acreages; instead, tree removal would occur, as necessary, within the specified acreage.

Water Yield

Hydrologic computations by the WRENSS model indicate that implementation of Alternative 3 projects would result in slight increases of watershed yield and peak flow rates (between 0 and 1.0 percent as compared to existing conditions). As discussed under the Proposed Action, tree removal reduces the amount of water intercepted, stored, and transpired by the vegetation which results in increases in watershed yield and changes in the time distribution and intensity of flow rates. Table 3J-17 and Table 3J-18 display the calculated changes in annual watershed yield and peak runoff flow rates modeled for Alternative 3 under average climatic conditions.

Table 3J-17:
Estimated Changes to Annual Yield – Alternative 3

Watershed	Water Yield (AF)			Change Relative to Existing Yield	Cumulative Change Relative to Baseline Yield
	Baseline	Existing	Alternative 3		
Sawmill Gulch	1,945	2,693	2,694	0.0%	39%
Cucumber Gulch	750	1,561	1,567	0.3%	109%
Cucumber Creek	990	1,524	1,533	0.6%	55%
South Barton Gulch	1,532	1,816	1,816	0.0%	18%

Table 3J-18:
Estimated Changes to Peak Runoff – Alternative 3

Watershed	Peak Runoff Flow (cfs)			Change Relative to Existing Rate	Cumulative Change Relative to Baseline Rate
	Baseline	Existing	Alternative 3		
Sawmill Gulch	17.4	27.5	27.6	0.1%	59%
Cucumber Gulch	4.2	15.4	15.5	0.5%	273%
Cucumber Creek	7.3	14.5	14.7	1.0%	100%
South Barton Gulch	9.8	13.5	13.5	0.0%	37%

Relative to existing conditions, the modeled increases in yield and runoff peak flow would be very small as compared to the natural variability of the study watersheds' hydrology. As discussed in the Affected Environment section, during a typical wet year the study watersheds may produce an annual yield between approximately 29 and 54 percent higher than the average. Also during a typical wet year, peak flows may increase more than 32 percent due to larger snowpacks. The reader is referred to Table 3J-3 for detailed information on expected yields and peak flows during typical dry, average, and wet years.

Stream Health

The fine sediments, bank stability and residual pool depth metrics were surveyed to be well within the range for the "Robust" class for Sawmill Gulch, Cucumber Creek and South Barton Gulch. A formal stream health survey was not conducted for Cucumber Gulch because this stream is of second-order as it flows through NFS lands. However, indications of localized bank instability and channel erosion have been observed in Cucumber Gulch stream channels. BSR has dedicated significant resources to address these erosion problems, including development of a mountain-wide DMP, implementation of mitigation projects, such as the Parklane Snowmaking Drainage Control, and overall improvement of the Resort's BMPs for erosion and sediment control.

Impacts to the WIZ

Alternative 3 projects would require the removal of a small amount of trees within areas of the study watersheds, including the WIZ. Tree removal in the WIZ would occur within 1.1 acres in the Cucumber Creek watershed while only 0.1 acres of tree clearing would take place in the Cucumber Gulch's WIZ. MM-3 included in the WCPH states that only those projects that maintain or improve long-term stream health should be allowed in the WIZ next to perennial and intermittent streams. Depending on its spatial extent, tree removal within the WIZ could negatively affect the LWD stream health metric. However, most of the proposed tree removal is associated with "linear projects" such as construction of mountain bike trails, zip lines and canopy tours. Such projects would require relatively narrow construction corridors, often not much wider than the existing tree spacing (please see Alternative 2 for additional detail). Therefore, actual tree removal would be relatively small within the specified acreage and impacts to the WIZ in terms of reduction of the basal area and/or forest cover density would be much lower than the 1.2 acres described in above. In addition, recruitment of LWD would be improved by felling trees into

the inter-trail islands within the WIZ. Similar to Alternative 2, terrain grading would not occur within the WIZ of the study watersheds, as all stream crossings would be constructed as bridges and/or boardwalks.

Connected Disturbed Areas

Implementation of Alternative 3 projects would require impacts such as terrain grading (outside of the WIZ) and tree removal. In total, 23.3 acres would be graded and tree removal would occur within 11.1 acres. As discussed above, terrain grading and tree removal activities are associated with linear projects (e.g. mountain bike trails, zip lines) with relatively narrow construction corridors. Terrain grading projects may impact stream health metrics such as stream bank stability and fine sediments. Although these metrics were classified as "Robust," Alternative 3 projects must include appropriate PDC in order to minimize impacts and maintain or improve stream health. Specifically, all stream and wetland crossings must be constructed as bridges and/or boardwalks, and sections of trails approaching these crossings must be constructed and maintained to drain runoff and sediment away from the wetlands and streams, in order to avoid creation of new CDA. Adequate PDC, including drainage features and BMPs for erosion and sediment control, must be developed for all ground-disturbing activities. All ground-disturbing activities must be constructed in accordance with USFS guidelines and should include design, implementation and maintenance of adequate BMPs for erosion and sediment control. Refer to the Alternative 2 section for additional detail on direct impacts to watershed resources.

Forest Plan Consistency

Alternative 3 projects proposed for the study watersheds would require that PDC be designed and implemented to "maintain or improve" stream health in accordance with WCPH MM. The relatively small areas of grading and tree removal, and associated increases in watershed yield and peak flow that would result from construction of the Alternative 3 projects would not have a negative impact on the existing stream health of these watersheds if implemented with the PDC listed in Table 2-2.

Additional PDC were included in Table 2-2 as a result of the analysis of potential impacts to the watershed resources. Correct implementation of the PDC and proper maintenance of associated BMPs for erosion and sediment control would ensure consistency with the WCPH and would not adversely impact the health of the study watersheds.

CUMULATIVE EFFECTS

Scope of the Analysis

The effects analyzed in the cumulative effects section apply to all alternatives, including the No Action Alternative. For a detailed description of past, present, and reasonably foreseeable future projects, the reader is referred to Appendix A in this document.

Spatial Bounds

The stream health effects of increased peak flows are most evident in the directly affected on-mountain drainages (the study watersheds). These watersheds are tributary to the Blue River, where the effects of changes in flow are comparatively small relative to the hydrology of the much larger Blue River Basin. Thus, from a stream health and water yield perspective, the Blue River as it flows near the base of BSR defines the downstream spatial boundary for analysis of water yield and stream health cumulative effects.

Temporal Bounds

The temporal extent of the analysis commences with conditions before the development of BSR, extending through the history of BSR to the present, and includes the lifespan of current proposed projects as well as those that are current reasonably foreseeable future actions. In general, the temporal bounds extend 10 to 20 years into the future from the date of this document.

Present and Reasonably Foreseeable Future Actions

- Breckenridge Ski Resort Projects
- Forest Health and Fuels Projects
- Historic Mining Activities
- Transportation Projects
- Forest Service Programmatic Projects
- Resort and Residential/Commercial Development Projects
- Tailor Lode Inholding
- Weber Gulch Hut

Watersheds subjected to activities associated with ski area management, including trail construction and snowmaking, tend to exhibit cumulative changes to channel conditions, with differing corresponding dynamic equilibria, as compared to watersheds in undeveloped conditions. These changes are caused by increases in peak snowmelt magnitude and duration due to the effects of trail clearing, trail grading and snowmaking. Affected channel reaches typically exhibit long term, continuing adjustments to their dynamic equilibria due to accelerated water inputs caused by both snowmaking and trail construction. It is anticipated that ski area activities would continue to require adequate management, including maintenance and improvement of the on-mountain drainage network, to avoid or minimize potential impacts to watershed resources. Future implementation of projects would require site specific analyses in order to avoid or minimize additional impacts to the extent practicable.

Timber harvest, heavy metals mining and associated tailings and waste rock, road construction and development for Highway 9, Forest Service projects, recreation projects and private residential

development have affected watershed resources on WRNF and private lands within the Blue River watershed (For more detail on these projects refer to Appendix A, Cumulative Effects). Ongoing human influence within the Blue River watershed has substantially altered land cover, resulting in changes to riparian ecosystems and hydrologic function via a variety of impact mechanisms:

- Increasing peak flows due to stormwater runoff from developed areas;
- Increases in stream temperature due to loss of shading from removal of riparian vegetation;
- Increased erosion and sediment transport within the watershed due to residential, mining and transportation development;
- Sediment impacts within the Blue River watershed associated with traction sanding on Highway 9;
- Snowmaking diversions for BSR;
- Impacts to fisheries habitat caused by timber harvest, mining, development, grazing and transportation; and
- Impacts to water quality caused by heavy metals loading from mining waste rock and tailings.

Cumulatively, these changes have resulted in an altered watershed ecosystem. Considering the project effects in addition to past, present, and reasonably foreseeable future actions, existing concerns regarding the condition of the watersheds and health of the streams are expected to continue under Alternative 1. However, under Alternative, 1 BSR would continue to work with the WRNF with the purpose of protecting the mountain's natural resources through mitigation and improvement of the on-mountain drainage infrastructure. BSR has dedicated substantial resources to proactively develop its 2009 DMP, which assessed the current condition of the on-mountain drainage network and prioritized areas where drainage conditions could be improved. An update to the 2009 DMP is expected to be issued in 2015.

Considering the project effects in addition to past, present and reasonably foreseeable future actions, implementation of either action alternative is anticipated to maintain stream health through successful implementation of PDC as described in Chapter 2 and in the Environmental Consequences section above. By maintaining the health of surface drainage, the Action Alternatives would not exhibit any negative influence upon watershed conditions in a cumulative context.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

No irreversible or irretrievable commitments of watershed resources associated with any of the alternatives have been identified.

Chapter 4
Consultation and Coordination

4. CONSULTATION AND COORDINATION

A. PREPARERS

FOREST SERVICE TEAM

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

Scott Fitzwilliams	White River National Forest Supervisor, Responsible Official
Bill Jackson	Dillon Ranger District, Line Officer
Jan Cutts	Dillon District Ranger, Line Officer (retired)
Roger Poirier	Winter Sports Program Manager, SO
Shelly Grail-Braudis	Snow Ranger, Dillon RD
Peech Keller	NEPA Coordinator, Dillon RD
Elizabeth Roberts	Wildlife Biologist/Botanist, SO
Ashley Nettles	Wildlife Biologist, Dillon RD
Justin Anderson	Hydrologist, SO
Donna Graham	Landscape Architect, SO
Jon Hare	Fisheries Biologist, Dillon RD
Brian McMullen	Soil Scientist, SO
Andrea Brogan	Archaeologist, SO
Julie Schaefers	Social Scientist, RO

CONSULTANT TEAM

The use of a third party consulting firm for preparation of an EIS is addressed in the Code of Federal Regulations at 40 CFR Title 40, Part 1506.5(c). If an EIS is prepared with the assistance of a consulting firm, the firm must execute a disclosure statement, as indicated below:

> *Except as provided in §§1506.2 and 1506.3 any environmental impact statement prepared pursuant to the requirements of NEPA shall be prepared directly by or by a contractor selected by the lead agency or where appropriate under §1501.6(b), a cooperating agency. It is the intent of these regulations that the contractor be chosen solely by the lead agency, or by the lead agency in cooperation with cooperating agencies, or where appropriate by a cooperating agency to avoid any conflict of interest. Contractors shall execute a disclosure statement prepared by the lead agency, or where appropriate the cooperating agency, specifying that they have no financial or other interest in the outcome of the project. If the document is prepared by contract, the*

> *responsible Federal official shall furnish guidance and participate in the preparation and shall independently evaluate the statement prior to its approval and take responsibility for its scope and contents. Nothing in this section is intended to prohibit any agency from requesting any person to submit information to it or to prohibit any person from submitting information to any agency.*

Furthermore, the use of a third party contractor in preparing an EIS is specifically addressed by the Council on Environmental Quality (CEQ) in its "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" in question #17a.[124] Per this CEQ direction:

> *When a consulting firm has been involved in developing initial data and plans for the project, but does not have any financial or other interest in the outcome of the decision, it need not be disqualified from preparing the EIS. However, a disclosure statement in the draft EIS should clearly state the scope and extent of the firm's prior involvement to expose any potential conflicts of interest that may exist.*

Accordingly, disclosure statements were signed by all entities that make up the third party consulting team. These disclosure statements are included in the project record. SE Group has been involved in several other projects at BSR.

SE Group

Travis Beck	Senior Project Manager
Kristen Poehling	Assistant Project Manager/Environmental Analyst
Kelly Owens	Environmental Analyst/Biologist
Caroline McHugh	GIS Manager/Environmental Analyst
Mike Beach	Environmental Analyst
Mitch LeFevre	Landscape Architect
Paula Samuelson	Document Production Specialist

Metcalf Archeological Consultants, Inc.

Melissa Elkins	Principal Investigator
Cody Anderson	Project Director

Western Ecosystems, Inc.

Rick Thompson	Wildlife Biologist

[124] Council on Environmental Quality, 1981

Resource Engineering, Inc.

Raul Passerini, P.E.	Water Resources Engineer

Western Ecological Resource, Inc. – Boulder, CO

David Buscher	Soil Scientist/Ecologist
Rea Orthner	Ecologist
Lex Ivey	GIS Specialist

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

FEDERAL GOVERNMENT

U.S. Fish and Wildlife Service

U.S. Army Corps of Engineers

Advisory Council on Historic Preservation

Environmental Protection Agency

TRIBAL GOVERNMENT

Ute Indian Tribe

Ute Mountain Ute Tribe

STATE GOVERNMENT

Colorado Department of Transportation

State Historic Preservation Office

Colorado Department of Natural Resources

Colorado Division of Water Resources

Colorado Parks and Wildlife

LOCAL GOVERNMENT

Summit County

Town of Breckenridge

Summit Water Quality Committee

LOCAL MEDIA

Denver Post

Summit Daily News

OTHER ORGANIZATIONS

Breckenridge Nordic Center

Friends of the Routt Backcountry

GoBreck

Rocky Mountain Initiative

Rocky Mountain Wild

INDIVIDUALS WHO COMMENTED DURING SCOPING OR WHO HAVE PARTICIPATED IN THE NEPA PROCESS

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Stan Wagon
Pete Walker
Tim Webb
Jerry Weiss
Tim West
Bryan and Sue Whitcomb
Alan Whitlock
Jennifer Wolinetz
Chad Zanca
Tim Zander

Chapter 5
References

5. REFERENCES

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Chapter 6

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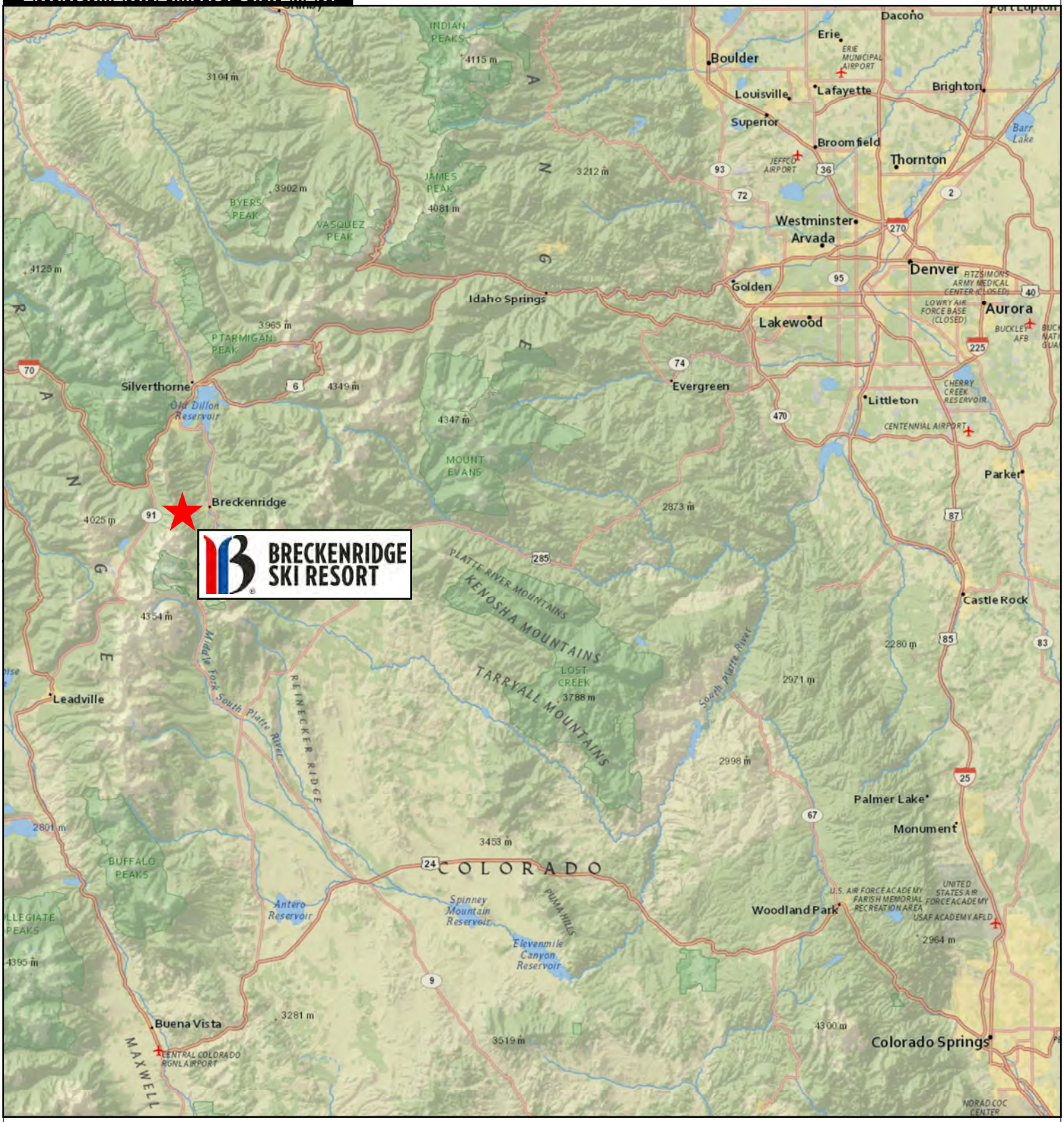
WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS
ENVIRONMENTAL IMPACT STATEMENT

Figure 1: Vicinity Map

0 10 20 Miles

N W E S



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WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS
ENVIRONMENTAL IMPACT STATEMENT

Figure 2: Alternative 1 – No Action

Existing:

- Lifts
- Summer Lift Operations
- Tenmile Flyer Zip Line
- Alpine Coaster
- Alpine Slide
- Mountain Bike Trails
- Peaks Trail
- Hiking Trails
- Roads
- Primary Maintenance Roads
- SUP Boundary

0 550 1,100 Feet

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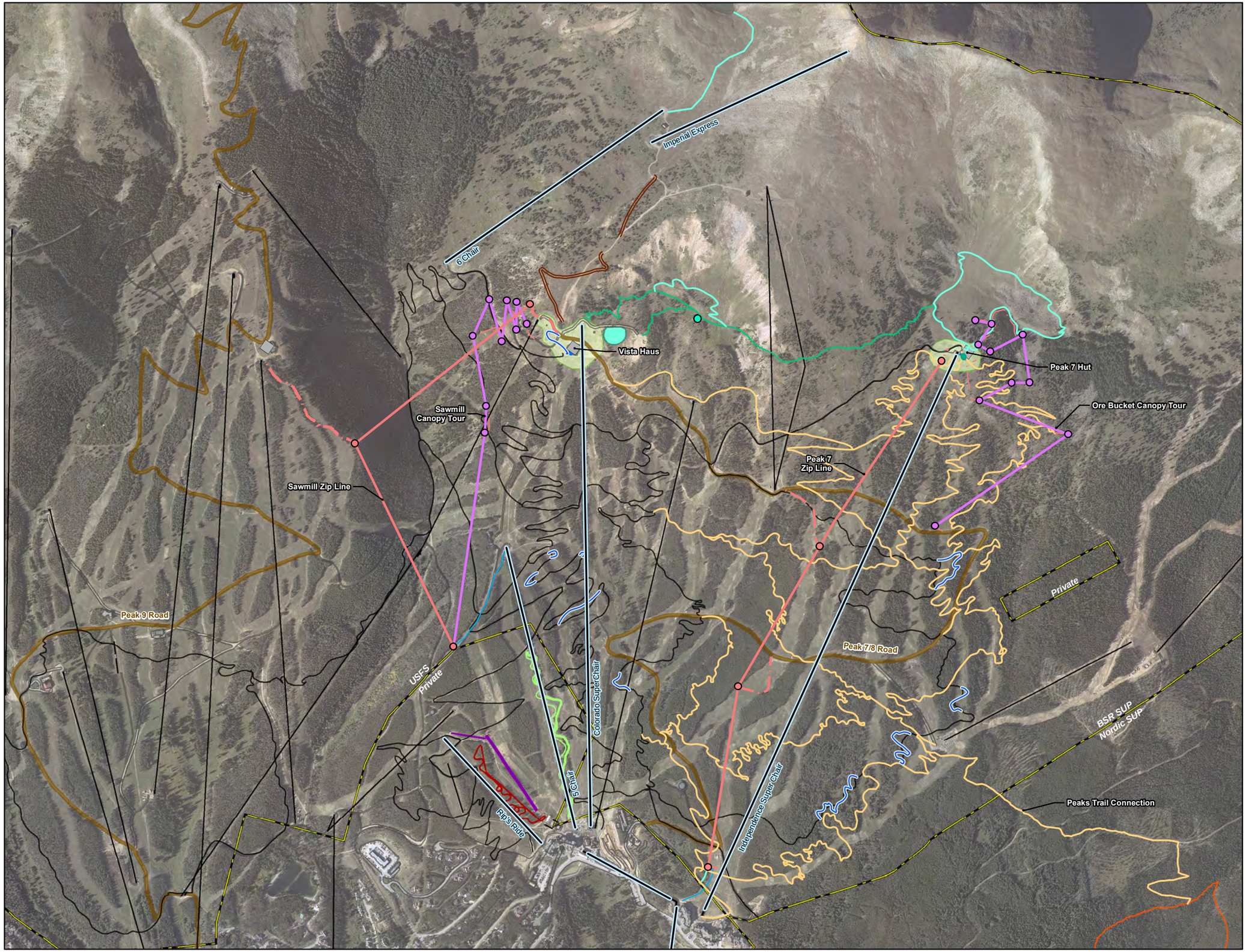

WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS
ENVIRONMENTAL IMPACT STATEMENT

Figure 3: Alternative 2 – Proposed Action

Proposed Projects:

- Zip Line Stations
- Zip Line Cables
- Canopy Tour Stations
- Canopy Tour Cables
- Deck/Building Expansions
- Observation Tower
- Vista Haus Challenge Courses Area
- Vista Haus and Indep. Chair Site Work
- Bike Skills Course
- Mountain Biking Trails
- Mountain Bike Trail Reroutes
- Hiking Trails
- 4 O'Clock Road Realignment
- Utilities
- Constr/operations access path
- Constr/operations access road
- Summer Lift Operations

Existing:

- Lifts
- Tenmile Flyer Zip Line
- Alpine Coaster
- Alpine Slide
- Mountain Bike Trails
- Peaks Trail
- Hiking Trails
- Roads
- Primary Maintenance Roads
- SUP Boundary

0 550 1,100 Feet

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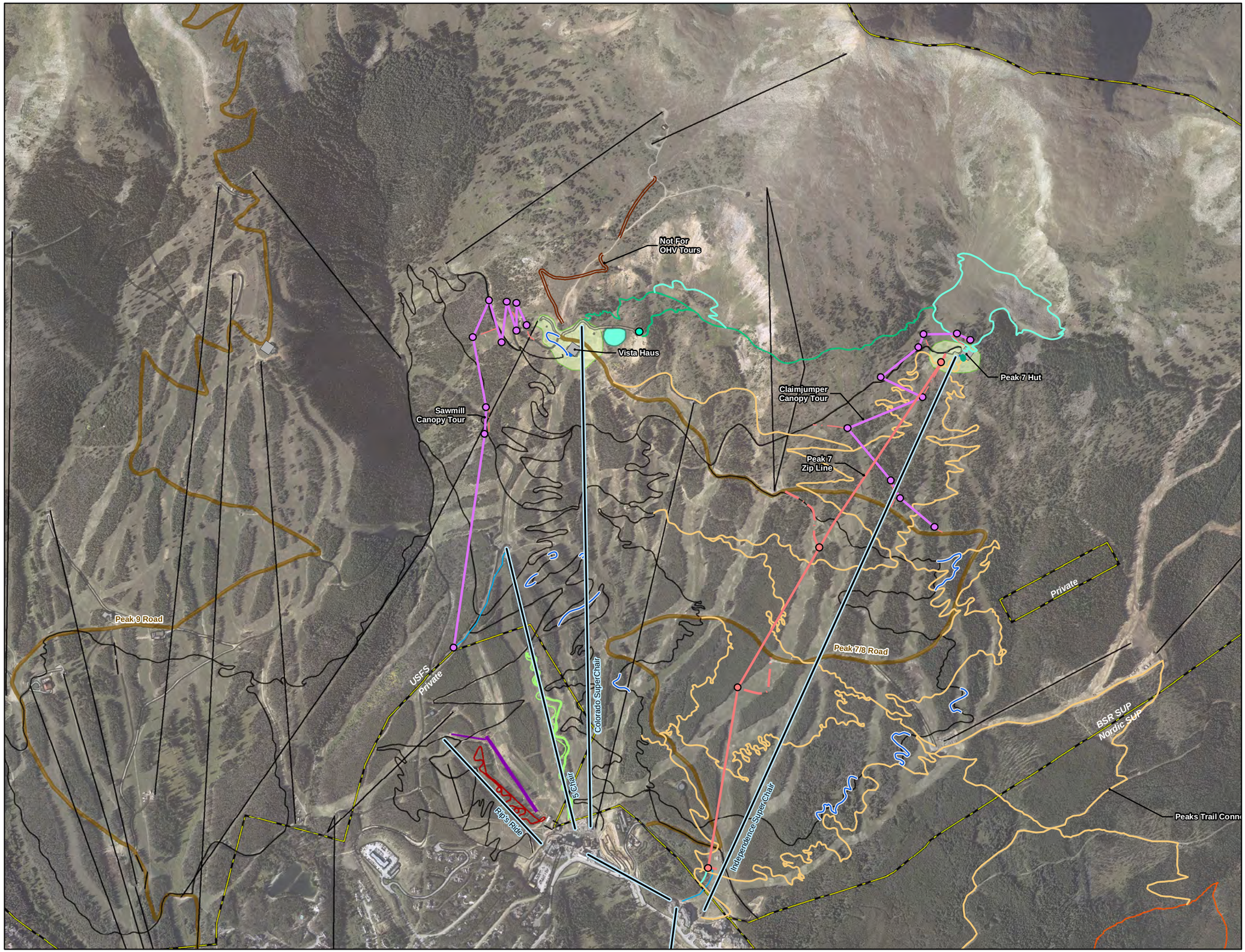

WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS

ENVIRONMENTAL IMPACT STATEMENT

Figure 4: Alternative 3

Proposed Projects:

- Zip Line Stations
- Zip Line Cables
- Canopy Tour Stations
- Canopy Tour Cables
- Deck/Building Expansions
- Alternative Lookout tower
- Vista Haus Challenge Courses Area
- Vista Haus and Indep. Chair Site Work
- Bike Skills Course
- Mountain Bike Trails
- Mountain Bike Trail Reroutes
- Hiking Trails
- 4 O'Clock Road Realignment
- Utilities
- Constr/operations access path
- Constr/operations access road
- Summer Lift Operations

Existing:

- Lifts
- Tenmile Flyer Zip Line
- Alpine Coaster
- Alpine Slide
- Mountain Bike Trails
- Peaks Trail
- Hiking Trails
- SUP Boundary

0 550 1,100 Feet

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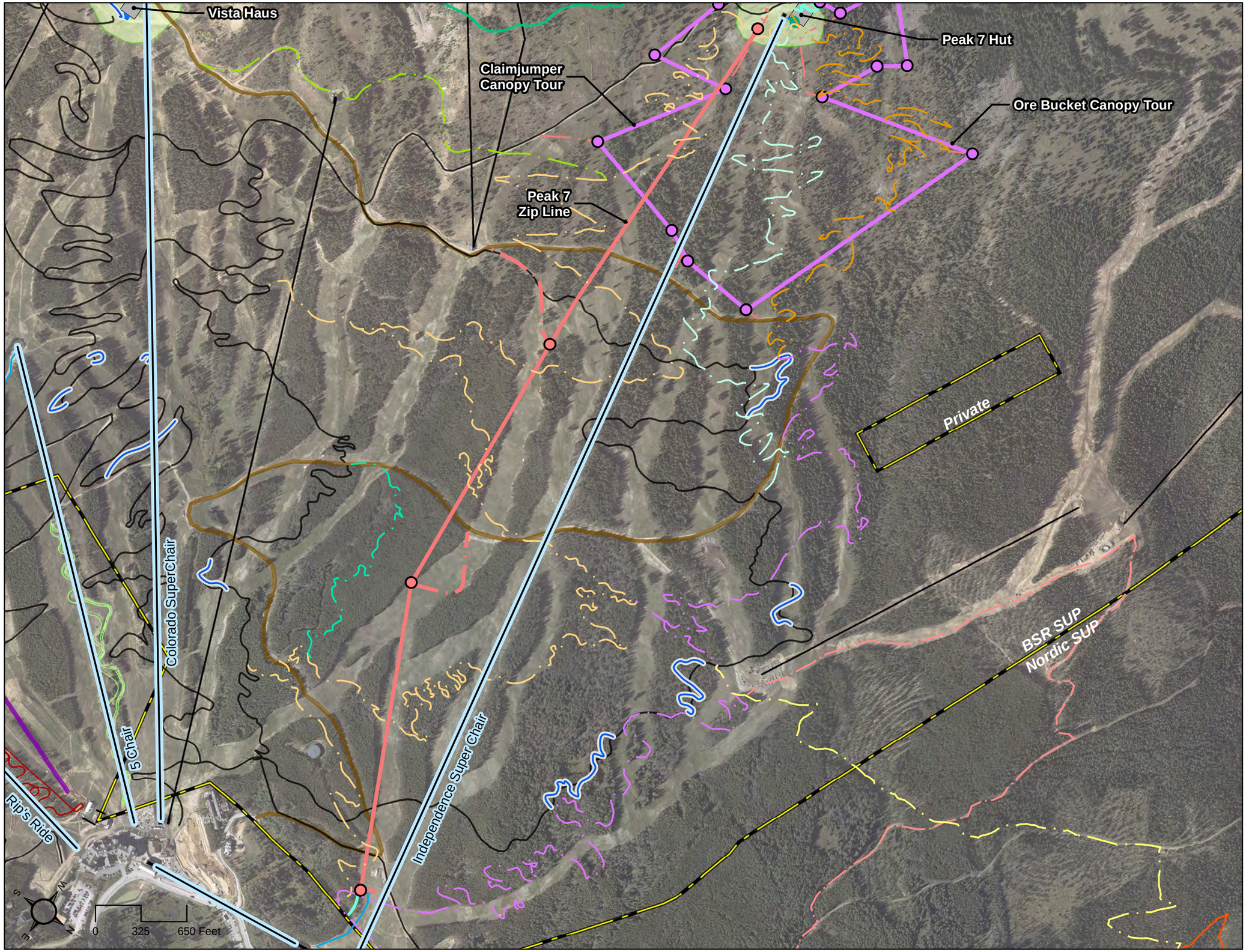

WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS
ENVIRONMENTAL IMPACT STATEMENT

Figure 5: Peak 7 Alternative 2 and 3 Proposed Projects

Proposed Mountain Bike Trails: Trail Number / Ability Level / Alternative

- Trail 1 / Beginner / Alt 2 and 3
- Trail 2 / Beginner / Alt 2 and 3
- Trail 3 / Beginner / Alt 2 and 3
- Trail 4 / Beginner / Alt 2 and 3
- Trail 5 Upper / Beginner / Alt 2
- Trail 5 Lower / Beginner / Alt 2 and 3
- Peaks Trail Connector / Beginner / Alt 2
- Peaks Trail Connector / Beginner / Alt 3

Other Proposed Projects:

- Zip Line
- Canopy Tour
- Deck/Building Expansions
- Vista Haus Challenge Courses Area
- Vista Haus and Indep. Chair Site Work
- Bike Skills Course
- Mountain Bike Trail Reroutes
- Hiking Trails
- Utilities
- Constr/operations access path
- Constr/operations access road
- Summer Lift Operations

Existing:

- Lifts
- Tenmile Flyer Zip Line
- Alpine Coaster
- Alpine Slide
- Mountain Bike Trails
- Peaks Trail
- Hiking Trails
- Primary Maintenance Roads
- SUP Boundary

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Existing Conditions

Alternative 2 – Proposed Action and Alternative 3

WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

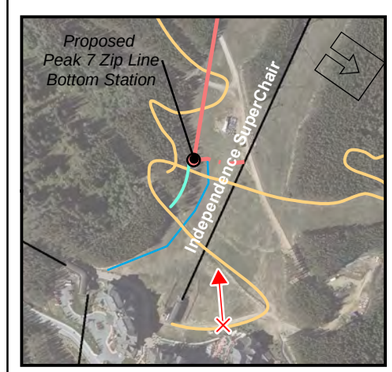
BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS
ENVIRONMENTAL IMPACT STATEMENT

Figure 6:
Critical Viewpoint 1–
Base of Peak 7
Visual Simulation

Viewpoint Details:
Looking west/southwest towards the Independence Superchair, Horseshoe Bowl, and Peak 8 Summit. View of the proposed Peak 7 Zip Line.

Distance from bottom station of proposed Peak 7 Zip Line:
- approximately 700 feet

Distance from Peak 8 Summit:
- approximately 2 miles



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Existing Conditions

Alternative 2 – Proposed Action and Alternative 3

WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

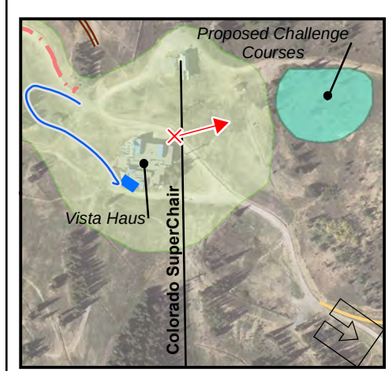
BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS
ENVIRONMENTAL IMPACT STATEMENT

Figure 7:
Critical Viewpoint 2–
Vista Haus
Visual Simulation

Viewpoint Details:
Looking northeast towards the T-Bar, ski patrol warming hut, and north side of Horseshoe Bowl. View of the proposed Challenge Courses.

Distance from proposed Challenge Courses:
- approximately 400 feet

Distance from ski patrol hut:
- approximately 0.5 mile



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Existing Conditions

Alternative 2 – Proposed Action

Alternative 2 – Proposed Action

WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS
ENVIRONMENTAL IMPACT STATEMENT

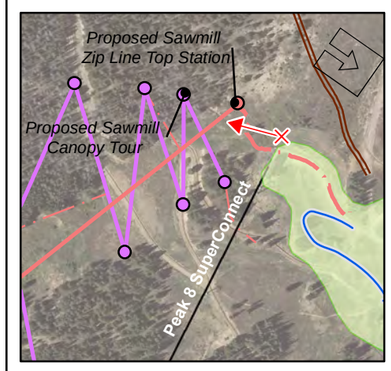
Figure 8:
Critical Viewpoint 3–
Peak 8 SuperConnect Top Terminal
Visual Simulation

Viewpoint Details:
Looking south. View of the proposed Sawmill Zip Line and Sawmill Canopy Tour.

Distance from top station of proposed Sawmill Zip Line:
- approximately 150 feet

Distance from Peak 10:
- approximately 2 miles

Note: Alternative 3 does not include the Sawmill Zip Line. However, the second station of the Sawmill Canopy Tour would still be visible from this location.



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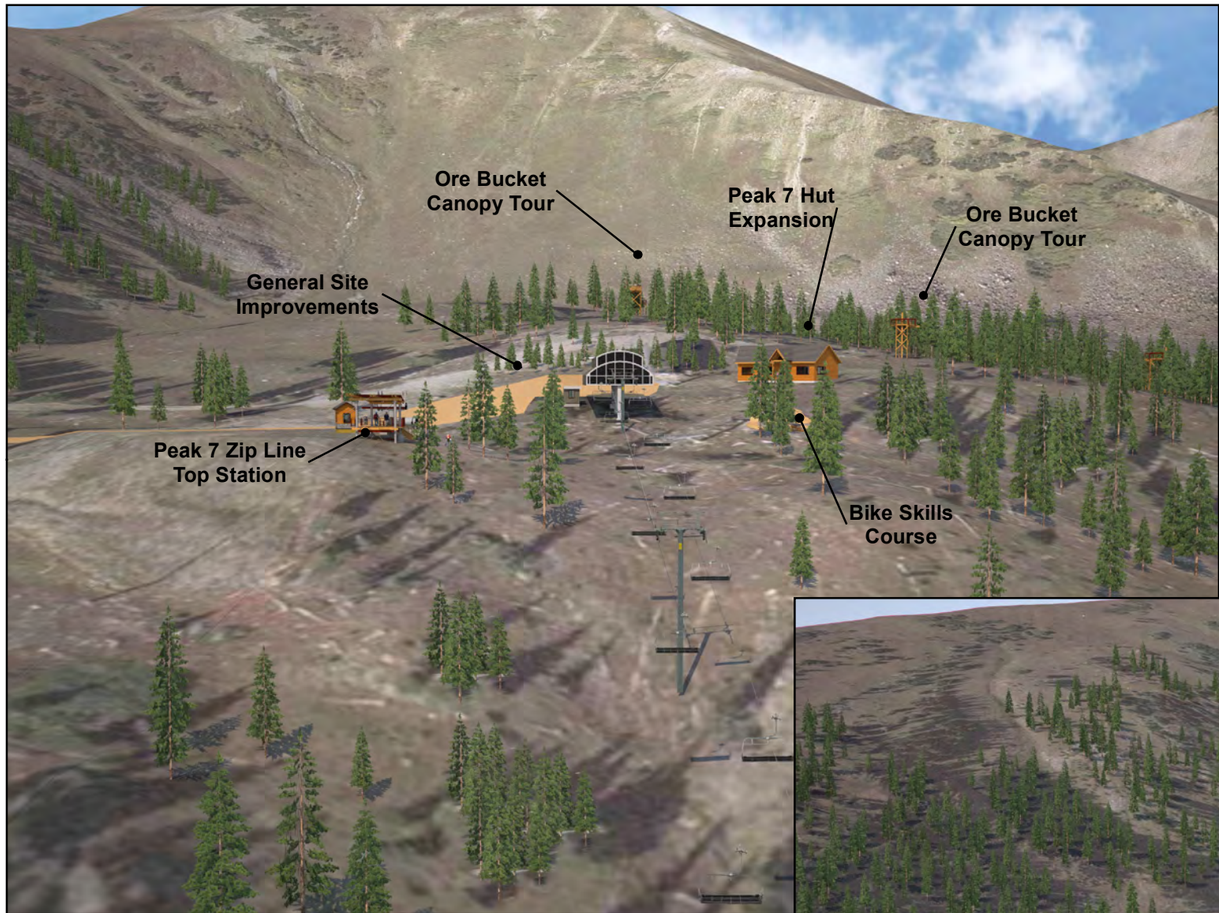
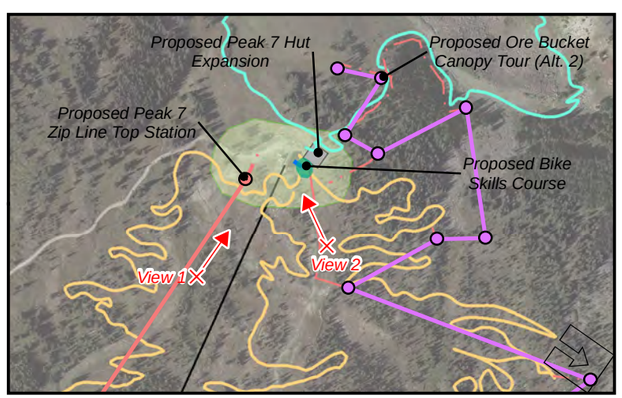
Alternative 2 – Proposed Action – *View 1*





Alternative 2 – Proposed Action – *View 2*

WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS
ENVIRONMENTAL IMPACT STATEMENT

Figure 9:
Critical Viewpoint 4–
Independence SuperChair
Top Terminal
3D Perspective

Perspective Details:
These 3D perspectives depict the proposed activities in the vicinity of the top terminal of the Independence SuperChair, including the Peak 7 Zip Line, mountain bike skills park, Ore Bucket Canopy Tour, and Peak 7 hut expansion.

View 1 looks west towards the top terminal of the Independence Superchair and the Peak 7 Summit.
View 2 looks southwest towards the top terminal of the Independence Superchair and the Peak 8 Summit.

These 3D perspectives depict the projects in Alternative 2 that would be located near the top terminal of the Independence SuperChair. Note that these renderings include the Ore Bucket Canopy Tour, but do not include the Claimjumper Canopy Tour which is a component of Alternative 3.

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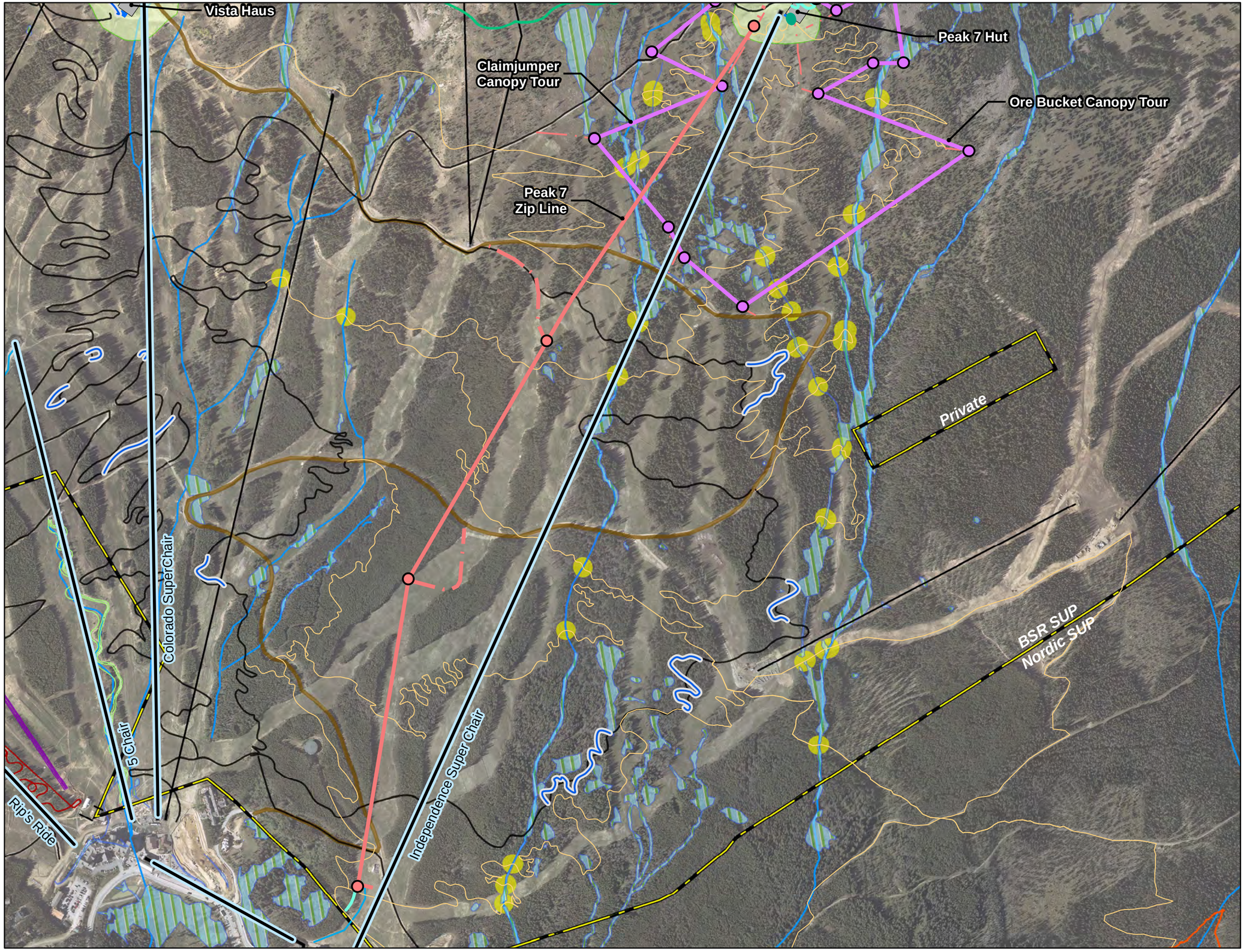

WHITE RIVER NATIONAL FOREST
DILLON RANGER DISTRICT

BRECKENRIDGE SKI RESORT MULTI-SEASON RECREATION PROJECTS
ENVIRONMENTAL IMPACT STATEMENT

Figure 10: Peak 7 Water Resources and Alternative 2 and 3 Proposed Projects

Proposed Projects:

- Zip Line Stations
- Zip Line Cables
- Canopy Tour Stations
- Canopy Tour Cables
- Deck/Building Expansions
- Vista Haus Challenge Courses Area
- Vista Haus and Indep. Chair Site Work
- Bike Skills Course
- Mountain Biking Trails
- Mountain Bike Trail Reroutes
- Hiking Trails
- Utilities
- Constr/operations access path
- Constr/operations access road
- Summer Lift Operations

Existing:

- Lifts
- Tenmile Flyer Zip Line
- Alpine Coaster
- Alpine Slide
- Mountain Bike Trails
- Peaks Trail
- Hiking Trails
- Primary Maintenance Roads
- SUP Boundary

Water Resources:

- Wetlands
- Streams
- Intersection of Water Resources and Mountain Bike Trails

0 325 650 Feet

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January 2015

Chapter 7

Glossary

7. GLOSSARY

Ability Level: The relative rank to trails. The three ability levels are as follows: beginner, intermediate, and expert.

Acre foot: The amount of water necessary to cover 1 acre to a depth of 1 foot; equals 43,560 cubic feet or 325,851 gallons.

Action Alternatives: Any alternative that includes upgrading and/or expansion of existing winter and summer recreational development within the area.

Affected environment: The physical, biological, social, and economic environment that would or may be changed by actions proposed and the relationship of people to that environment.

Alternative: One of several conceptual development plans described and evaluated in the EIS.

Analysis Area: The geographical area and/or physical, biological, and social environments which are analyzed for specific resources in the EIS.

Annual Average Daily Traffic (AADT): Annual average two-way daily traffic volume represents the total traffic on a section of roadway for the year, divided by 365. It includes both weekday and weekend traffic volumes.

Army Corps of Engineers (USACE): The federal agency charged with enforcing the Clean Water Act by regulation of dredge and fill activities in waters of the United States, including wetlands.

Artifact: A simple object (such as a tool or ornament) showing early human workmanship or modifications.

Average Daily Traffic (ADT): Average daily two-way traffic volume represents the total traffic on a section of roadway for a given day or sampling period, but not necessarily for a given year. It is equivalent to VPD, defined below.

Background distance zone: A landscape viewing area visible to a viewer from approximately 3 to 5 miles to infinity. Also, in economics, naturally occurring; uninduced.

Baseline condition: The existing dynamic conditions prior to development, against which potential effects are judged.

Best Management Practices (BMPs): Methods, measures, and practices specifically adopted for local conditions that minimize or avoid impacts to resources. BMPs include, but are not limited to, construction practices, structural and nonstructural controls, operations protocol, and maintenance procedures.

Biological Evaluation: An evaluation conducted to determine whether a proposed action is likely to affect any species which are listed as sensitive (USFS), candidate (USFS), or other special designations.

Canopy: The more-or-less continuous cover of leaves, needles and/or branches collectively formed by the crowns of adjacent trees in a stand or forest.

Clean Water Act: An act that was enacted by the U.S. Congress in 1977 to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. This act was formerly known as the Federal Water Pollution Control Act (33 U.S.C. 1344).

Cooperating agency: A federal agency, other than a lead agency, which has jurisdiction by law or special expertise with respect to any environmental impact associated with the proposed action or one of the alternatives. A state or local agency or an Indian tribe may be a cooperating agency with agreement from the lead agency.

Corridor: A linear strip of land identified for the present or future location of transportation or utility rights-of-way within its boundaries. Also, a contiguous strip of habitat suitable to facilitate animal dispersal or migration.

Council on Environmental Quality (CEQ): An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

Cover: Vegetation used by wildlife for protection from predators and weather conditions, or in which to reproduce.

Critical habitat: A formal designation pursuant to the Endangered Species Act which may be applied to a particular habitat that is essential to the life cycle of a given species, and if lost, would adversely affect that species. Critical habitat can have a less formal meaning when used outside the context of the Endangered Species Act.

Cubic feet per second (cfs): Unit measure of streamflow or discharge, equivalent to 449 gallons per minute or about 2 acre feet per day.

Cultural resource: Cultural resources are the tangible and intangible aspects of cultural systems, living and dead, that are valued by a given culture or contain information about the culture. Cultural resources include, but are not limited to sites, structures, buildings, districts, and objects associated with or representative of people, cultures, and human activities and events.

Cumulative impact: The impact on the environment which results from the incremental impact of the action when added to other past, present and reasonable foreseeable future actions regardless of what agency or person undertakes such other actions. Each increment from each project may not be noticeable but cumulative impacts may be noticeable when all increments are considered together.

Daily Hourly Volume: The total traffic in both directions during the 30th highest hourly volume of the year.

Day Visitor: Visitors that arrive in the morning and drive back home at the end of the day (as opposed to a Destination Visitor”).

Destination Visitor: A visitor that stays overnight within the resort community (as opposed to a Day Visitor”).

Developed recreation site: An area with characteristics that enable to accommodate, or be used for intense recreation. Such sites are often enhanced to augment the recreational value. Improvements range from those designed to provide great comfort and convenience to the user to rudimentary improvements in isolated areas.

Direct impact: An effect which occurs as a result of an action associated with implementing the proposal or one of the alternatives, including construction, operation, and maintenance.

Dispersed recreation: Recreation that occurs outside of a developed recreation site and includes such activities as scenic driving, hunting, backpacking, and recreation activities in primitive environments.

Distance zone: One of three categories used in the visual management system to divide a view into near and far components. The three categories are (1) foreground, (2) middleground, and (3) background. See individual entries.

District Ranger: The official responsible for administering the National Forest System lands on a Ranger District.

Diversity: The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

Ecosystem: The system formed by the interaction of a group of organisms and their environment, for example, marsh, watershed, or lake.

Effects: Results expected to be achieved from implementation of the alternatives relative to physical, biological, economic, and social factors. Effects can be direct, indirect, or cumulative and may be either beneficial or detrimental.

Endangered species: An official designation for any species of plant or animal that is in danger of extinction throughout all or a significant portion of its range. An endangered species must be designated in the Federal Register by the appropriate Federal Agency Secretary.

Environmental analysis: An analysis of alternative actions and their predictable short- and long-term environmental effects, which include physical, biological, economic, social and environmental design factors and their interactions.

Environmental Assessment (EA): A concise public document required by the regulations implementing the National Environmental Policy Act which briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

Environmental Impact Statement (EIS): A disclosure document required by the National Environmental Policy Act (NEPA) that documents the anticipated environmental effects of a proposed action that may significantly affect the quality of the human environment.

Environmental Protection Agency (EPA): The federal agency charged with lead enforcement of multiple environmental laws, including review of Environmental Impact Statements.

Erosion: The detachment and movement of soil from the land surface by wind, water, ice, or gravity.

Erosion control: Materials, structure, and techniques designed to reduce erosion. Erosion control may include rapid revegetation, avoiding steep or highly erosive sites, and installation of cross-slope drainage structures.

Erosion hazard: Soil ratings to predict the erosion hazard or potential to be eroded.

Forage: All browse and non-woody plants used for grazing or harvested for feeding livestock or game animals.

Forb: Any non-grass-like plant having little or no woody material on it. A palatable, broadleaved, flowering herb whose stem, above ground, does not become woody and persistent.

Foreground distance zone: The landscape area visible to an observer from the immediate area to 0.5 mile.

Forest Service: The agency of the United States Department of Agriculture responsible for managing National Forests and Grasslands.

Forest Supervisor: The official responsible for administering the National Forest System lands in a Forest Service administrative unit who reports to the Regional Forester.

Forest Plan: A comprehensive management plan prepared under the National Forest Management Act of 1976 that provides standards and guidelines for management activities specific to each National Forest. The WRNF Forest Plan was approved in 2002.

Full-Time Equivalent (FTEs): Sufficient work to keep one person employed full-time for one year. In seasonal industries one FTE may be represented by several employment positions.

GIS: Geographic information system, a computer mapping system composed of hardware and software.

Glades: Trees stands that are naturally thin, or have been thinned specifically in varying degrees to improve the skiing experience by increasing the spacing between individual trees. Stands with tree clearing to the extent that they can be groomed are described as "Groomable Glades."

GPS: Global Positioning System, a satellite-based surveying system.

Grading: The practice of moving or re-contouring earthen materials to achieve a specified slope in the landform.

Groundwater: Subsurface water in the part of the ground that is wholly saturated.

Guest Services Facilities or Guest Services: Facilities or services that are supplied by a resort—both on-mountain and at the base area—to accommodate guests' needs and to enhance the quality of the recreational experience. Examples of guest services facilities include: restaurants, warming huts, general information desks, resort lost and found departments, restrooms and lounges, ski school, daycare, public lockers and ticketing facilities, patrol, first aid clinics, etc.

Guideline: Is a preferred course of action designed by policy to achieve a goal, respond to variable site conditions, or respond to an overall condition.

Habitat: The sum of environmental conditions of a specific place that is occupied by an organism, a population, or a community.

Habitat type: A classification of the vegetation resource based on dominant growth forms. The forested areas are more specifically classified by the dominant tree species.

Hydric soils: Soils characterized by, or requiring an abundance of moisture, used in the identification of wetlands.

Impacts: See effects.

Indicator species: An animal species used to represent a group of species that utilize the same habitat. For monitoring purposes, the well-being of the indicator species is assumed to reflect the general health of the community.

Indirect impact: Secondary consequences to the environment resulting from a direct impact. An example of an indirect impact is the deposition of sediment in a wetland resulting from surface disturbance in the upland.

Instream flow: The volume of surface water in a stream system passing a given point at a given time.

Interdisciplinary Team (ID Team): A group of individuals each representing specialty resource areas assembled to solve a problem or perform a task through frequent interaction so that different disciplines can combine to provide new solutions.

K-factor: A measure of soil erodibility based on soil texture, organic matter, structure and runoff potential.

Management Area 8.25: According to the 2002 Forest Plan, is administered for "winter sports activities and other intensively managed outdoor recreation opportunities for large numbers of national and international visitors in highly developed settings."

Management direction: A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them.

Management emphasis: Long-term management direction for a specific area or type of land.

Management indicator species (MIS): A representative group of species that are dependent of a specific habitat type. The health of an indicator species is used to gauge function of the habitat on which it depends.

Management practice: A specific activity, measure, course of action, or treatment.

Master Development Plan (MDP): A document that is required as a condition of the ski area term special use permit, designed to guide resort planning and development in the long- and short-term – typically across both public and private lands.

Middleground distance zone: The landscape area visible to a viewer from 0.5 mile to about 3 to 5 miles.

Mitigation: Actions taken to avoid, minimize, or compensate for adverse environmental impacts.

Mountain Roads: On-mountain primary and secondary roads that provide summertime access to mountain buildings and lift terminal locations.

National Environmental Policy Act (NEPA): A law enacted by Congress in 1969 that requires federal agencies to analyze the environmental effects of all major federal activities that may have a significant impact on the quality of the human environment.

National Forest Management Act (NFMA): A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of regulations to guide that development.

National Forest System (NFS) lands: National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.

National Historic Preservation Act (NHPA): An act that was enacted by the U.S. Congress in 1966 to protect historic sites and artifacts (16 U.S.C. 470). Section 106 of the Act requires consultation with members and representatives of Indian tribes.

National Register of Historic Places: A listing maintained by the National Park Service of areas which have been designated as historically significant. The register includes places of local and state significance, as well as those of value to the nation in general.

No action alternative: The management direction, activities, outputs, and effects that are likely to exist in the future if the current trends and management would continue unchanged. Under NEPA, it means following the current approved Forest Plan management direction and guidance.

Objective: A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.

Preferred alternative: The alternative selected from the range of alternatives which is favored by the lead agency.

Project area: The area encompassed by the development proposal including base area and the permit area.

Project Design Criteria (PDC): Specific measures designed to minimize or avoid impacts anticipated to occur as a result of implementation of the action alternatives. PDC are incorporated within the proposal of specified action alternatives.

Record of Decision (ROD): A document prepared within 30 days after the final EIS is issued which states the agency's decision and why one alternative was favored over another, what factors entered into the agency's decision, and whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why not.

Revegetation: The re-establishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as seedbed preparation, reseeding, and mulching.

Rilling: Erosion by concentrated overland flow.

Riparian habitat or area: Land situated along the bank of a stream or other body of water and directly influenced by the presence of water (e.g., streamsides, lake shores, etc.).

Scenic integrity: State of naturalness or, conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation for the existing landscape character in a national forest.

Scenic Integrity Objectives (SIOs): The objectives that define the minimum level to which landscapes are to be managed from an aesthetics standpoint. There are five objectives that describe the landscape in varying degrees from naturalness: Very High (Unaltered), High (Appears Unaltered), Moderate (Slightly Altered), Low (Moderately Altered), Very Low (Heavily Altered).

Scenery management: The art and science of arranging, planning and designing landscape attributes relative to the appearance of places and expanses in outdoor settings.

Scoping process: A process that determines the issues, concerns, and opportunities which should be considered in analyzing the impacts of a proposal by receiving input from the public and affected agencies. The depths of analysis for these issues identified are determined during scoping.

Sediment: Solid material, both organic and mineral, that has been transported from its site of origin by air, water, or ice.

Sensitive species: Species which have appeared in the Federal Register as proposed additions to the endangered or threatened species list; those which are on an official State list or are recognized by the

Regional Forester to need special management in order to prevent them from becoming endangered or threatened.

Short-term: In this analysis, short-term describes the period from construction up to five years after project completion.

Significant impact: A somewhat subjective judgment based on the context and intensity of the impact. Generally, a significant impact is one that exceeds a standard, guideline, law, or regulation.

Ski Area Recreational Opportunity Enhancement Act (SAROEA): A 2011 Act amending the National Forest Ski Area Permit Act of 1986 to clarify the authority of the Secretary of Agriculture regarding additional recreational uses of NFS land subject to ski area permits, and for other purposes. Among its provisions, SAROEA expands the authority of the Secretary to authorize other seasonal or year-round natural resource-based recreational activities and associated facilities on National Forest System land subject to a ski area permit as the Secretary determines to be appropriate.

Soil: A dynamic natural body on the surface of the earth in which plants grow, composed of mineral and organic materials and living forms.

Soil productivity: The capacity of a soil for producing plant biomass under a specific system of management. It is expressed in terms of volume or weight/unit area/year.

Special Use Permit (SUP): A legal document, similar to a lease, issued by the U.S. Forest Service. These permits are issued to private individuals or corporations to conduct commercial operations on National Forest System lands. They specify the terms and conditions under which the permitted activity may be conducted.

Special-use permit area: Area of National Forest System lands encompassed within the SUP.

Stand: A community of trees or other vegetation, which is sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities and to thus, form a management entity.

Standard: A course of action which must be followed; adherence is mandatory.

Summer Operational Boundary: Within the SUP boundary, the boundary which defines the current extent to which summer activities occur.

Threatened species: Any species which is likely to become an endangered species within the foreseeable future and which has been designated in the Federal Register as a threatened species.

Understory: Low-growing vegetation (herbaceous, brush or reproduction) growing under a stand of trees. Also, that portion of trees in a forest stand below the overstory.

U.S. Fish and Wildlife Service (USFWS): The agency of the Department of the Interior responsible for managing wildlife, including non-ocean going species protected by the Endangered Species Act.

Vehicles Per Day (VPD): The total two-way daily traffic volume on a section of roadway.

Vehicle trips: The number of times vehicles use a segment of road.

Visual resource: The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

Water rights: The legal right to use water.

Watershed: The entire area that contributes water to a drainage system or stream.

WCPH: Watershed Conservation Practices Handbook. A Forest Service Region 2 manual suggesting design criteria and guidelines for watershed projects.

WEPP: Water Erosion Prediction Project. A computer erosion model developed by the USDA Agricultural Research service (ARS) in cooperation with the Forest Service to model the physical processes involved in soil erosion mechanics, to produce erosion estimates.

Wilderness: Under the 1964 Wilderness Act, wilderness is undeveloped federal land retaining its primeval character and influence without permanent improvements of human habitation. It is protected and managed so to preserve its natural conditions.

Winter Range: That part of the home range of a species where 90 percent of the individuals are located during the winter at least five out of ten winters.

WIZ (Water Influence Zone): The land next to water bodies where vegetation plays a major role in sustaining long-term integrity of aquatic systems. It includes the geomorphic floodplain (valley bottom), riparian ecosystem, and inner gorge. Its minimum horizontal width (from top of each bank) is 100 feet or the mean height of mature dominant late-seral vegetation, whichever is most.

WRENSS: The Environmental Protection Agency's Handbook *An Approach to Water Resources Evaluation of Non-Point Silvicultural Sources* (WRENSS).

Chapter 8

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Appendices

APPENDIX A: CUMULATIVE EFFECTS PROJECTS

The following past, present, and reasonably foreseeable future projects have been identified by the Forest Service *as relevant* for analysis in alternatives 1, 2 and 3 from a cumulative effects context. Basic information provided here for each project is complimented in corresponding analyses in Chapter 3. Not all resources will be affected by all of these projects. More detailed information project descriptions follow Table A-1. Cumulative effects analyses presented in Chapter 3 resource sections are based on these descriptions and the best available information for each project. Projects are located on National Forest System lands, unless otherwise noted.

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
BRECKENRIDGE SKI RESORT PROJECTS						
Summer Master Development Plan Addendum	Within BSR SUP	BSR prepared a Master Development Plan (MDP) addendum to include summer activities on NFS lands, within the SUP area.	Accepted: 2013	Areas within the developed ski area on Peaks 7 and 8	Swan River	Wildlife Watershed Wetlands Scenery Recreation Vegetation
Master Development Plan	Within BSR SUP and on adjacent private lands within ski area operational boundary	BSR prepared a Master Development Plan (MDP), which was accepted by the Forest Service in January 2008. The projects in the MDP that are not part of the Proposed Action and/or Alternative 3 would require site specific NEPA analysis prior to implementation but are considered reasonably foreseeable future actions.	Accepted: 2008	Areas within the developed ski area on Peaks 7, 8, 9 and 10	Swan River	Wildlife Watershed Wetlands Scenery Recreation Vegetation

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
Development of Peak 6 Terrain	Within BSR SUP	Peak 6 development included approximately 550 acres of skiable terrain, a six-person chairlift on Peak 6 and a four-person chairlift extending onto Peak 7.	Implemented: 2013	70 acres of cleared trails within a 500-acre project area	Swan River	Wildlife Watershed Wetlands Scenery Noise Socio-econ Recreation Geology and Soils
Development of Peak 7 Terrain	Within BSR SUP	Peak 7 development included 165 acres of skiable terrain and a six-person chairlift.	Implemented: 2002	165 acres of cleared trails within a 400-acre project area	Swan River	Wildlife Watershed Wetlands Scenery Noise Socio-econ Recreation
Peak 8 Fun Park	0.0–0.5 mile (private lands)	The Peak 8 Fun Park consists of various developed recreation opportunities, including miniature golf, walking maze, bungee-trampoline, climbing wall, bounce house, off-road segway tours, duck races, gemstone panning, zip line, alpine slide, and mountain coaster.	Implemented: 1990s to present	Approximately 30 acres	Swan River	Wildlife Watershed Wetlands Scenery Noise Socio-econ Recreation
BreckConnect Gondola	0.0–1.0 mile (private lands)	The BreckConnect Gondola runs from the Breckenridge Transportation Center, to the Shock Hill neighborhood and the bases of the Peaks 7 and 8.	Implemented: 2007	The BreckConnect Gondola is approximately 6,940’ long	Swan River	Wildlife Scenery Recreation

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
Imperial Lift EA	Within BSR SUP	The Imperial Express is 2,547 feet long (600–800 pph capacity), providing lift served access to 399 acres of terrain in the Peaks 7, 8, and 9 bowls	Implemented: 2005	Lift served access to 235 acres of terrain	Swan River	Wildlife Scenery Recreation
6 Chair EA	Within BSR SUP	Upgrade 6 Chair from 2-person (1,200 pph) to 4-person lift (1,600 to 2,400 pph), same length as existing 3,242 feet.	Approved: 2005 Implementation: Future	Higher capacity access to 140 acres of lift served terrain	Swan River	Wildlife Wetlands Recreation
Peaks 7 and 9 Facilities EA	Within BSR SUP	The 2003 Decision Notice approved the development of the 400 seat Peak 7 Restaurant below the Peak 7/8 Summer Road and between the Claimjumper and Pioneer trails. This is also the location of the previously approved Independence SuperChair mid-terminal unload terminal.	Approved: 2003 Implementation: Future	<1 acre	Swan River	Wildlife Scenery Recreation
Vegetation Management Plan	Within BSR SUP and on adjacent private lands within ski area operational boundary	The VMP provides management options including tree removal, sanitation and salvage, and patch cuts for forest stands within the 5,756-acre SUP to improve forest health. The 5-year plan includes primarily removal of dead and dying lodgepole pine.	Accepted: 2011 Implementation: Ongoing	Select stands across the 5,756-acre SUP	Swan River	Wildlife Watershed Scenery Recreation Forest Health

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
RESORT AND RESIDENTIAL/COMMERCIAL DEVELOPMENT PROJECTS						
Peak 7 and 8 Base Areas Master Plan	0.1 mile	Master Plan includes development of the Peaks 7 and 8 base area. The Master Plan is reviewed and accepted by the Town of Breckenridge.	Amended April 2008, Implementation: Ongoing	251 acres	Swan River	Wildlife Vegetation Watershed Wetlands Scenery Noise Socio-econ Traffic
Grand Colorado on Peak 8 (Peak 8 base area)	0.1 mile	A five-story ski-in/ski-out high-end condominium complex with approximately 80 units located at the base of Peak 8.	Implemented: 2013 to present	3 acres	Swan River	Wildlife Vegetation Watershed Wetlands Scenery Noise Socio-econ Traffic
Development of One Ski Hill Place (Peak 8 base area)	0.1 mile	A five-story ski-in/ski-out high-end condominium complex located at the base of Peak 8.	Implemented: 2009 to present	2.6 acres	Swan River	Wildlife Watershed Wetlands Scenery Noise Socio-econ

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
Development of Crystal Peak Lodge (Peak 7 base area)	0.1 mile	A five-story, 45-suite, ski-in/ski-out high-end condominium complex located at the base Peak 7.	Implemented: 2008 to present	3 acres	Swan River	Wildlife Watershed Wetlands Scenery Noise Socio-econ
Development of Grand Lodge at Peak 7 (Peak 7 base area)	0.1 mile	A five-story, 114 unit, ski-in/ski-out condominium complex located at the base of Peak 7.	Implemented: 2009 to present	5.5 acres	Swan River	Wildlife Watershed Wetlands Scenery Noise Socio-econ
Tailor Lode Access	Surrounded by BSR SUP area	The proponent proposes to establish documented and legal access to the Tailor Lode, serving a potential single family residence. The proposed route would use existing timber roads through the Breckenridge Nordic Center and BSR SUP areas.	Scoping Stage	10 acres	Swan River	Vegetation Wildlife
Tenderfoot Mountain Motorcycle Trail System EA	~9.5 miles	Creates an approximately 21-mile singletrack trail system in the Tenderfoot/Frey Gulch area north of Hwy 6 between Dillon and Keystone. Includes 13 miles of new trail construction and 8 miles of reconstruction.	Approved: 2014 Implementation: Ongoing	21 miles	Snake River	Recreation

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
Weber Gulch Hut	5 miles	Construction of Weber Gulch Backcountry Hut for both winter and summer use. The hut will be one or two stories and between 1,400 and 2,000 square feet in size. It would accommodate 16 guests.	Approved: 2014	3 mile non-motorized access route, up to 2,000-square foot building	Swan River	Wildlife Vegetation Scenery Recreation
Continued Town of Breckenridge and Upper Blue Residential Build-out	0.1–7 miles (private lands)	According to the Town of Breckenridge 2011 Overview Report, the Town of Breckenridge is approximately 73 percent built out.	Ongoing	County-wide	Swan River	Wildlife Watershed Socio-econ Scenery Traffic/Parking Air
LOCAL SKI AREA PROJECTS						
Arapahoe Basin MDP Update	14–15 miles	Master Plan update to include the Beavers for lift-served skiing, as well as multi-season recreation projects, including a zip line, challenge course, and canopy tour.	Accepted: 2012	Increase operational boundary by approximately 475 acres	Snake River	Recreation Traffic Socio-econ Wildlife
Arapahoe Basin 2013 Improvements EIS	14–15 miles	Analysis of the Beavers for lift-served skiing, as well as multi-season recreation projects, including a zip line, challenge course, and canopy tour.	Under Analysis. Implementation: Future	Approximately 434 acres	Snake River	Recreation Traffic Socio-econ Wildlife

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
Keystone Resort Master Development Plan	7.5–10 miles	The Keystone Resort Master Development Plan (MDP) includes a new/upgraded lifts, trails, snowmaking, mountain bike trails and guest service facilities throughout the resort's SUP.	Accepted: 2009	8,536 acres across the SUP	Snake River	Wildlife Vegetation Watershed Wetlands Scenery Noise Socio-econ Recreation Traffic
Keystone Resort Dercum Mountain Improvements Projects EA	7.5–10 miles	The 2014 DN approved nine miles of new mountain bike trails, a new Adventure Point facility, and various ski-related improvements	Implemented: 2014	Approximately 500 acres across the SUP	Snake River	Wildlife Vegetation Watershed Recreation Traffic
Copper Mountain Resort Master Development Plan	2.3 miles	CMR's 2011 MDP identifies various winter and year-round improvements, including new and upgraded lifts and terrain, snowmaking, additional hiking and mountain biking trails, a spring/summer superpipe, mountain coaster, zip lines, ropes course, and a bike park.	Approved: 2011 Implementation: Ongoing	7,686-acre SUP	Tenmile	Wildlife Vegetation Watershed Wetlands Scenery Noise Socio-econ Recreation Traffic
Vail Mountain Recreation Enhancements Project EIS	~15.5 miles	The 2014 Draft ROD approved several multi-season recreation projects, including canopy tours, a mountain coaster, hiking and mountain biking trails, and an adventure course, among others.	Under Analysis	16 acres; Up to 55 miles of trails		Recreation Socio-Econ

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
FOREST HEALTH AND FUELS PROJECTS						
Forest-wide Hazardous Tree Removal and Fuels Reduction Project Revision 1 EA	0–100 miles	Removal of hazard trees within 150' of roads and trails and 200' of recreation sites on the White River National Forest over the next ten years. Lodgepole pine affected by the mountain pine beetle will be targeted for removal.	Approved: 2010 Implementation: Ongoing	Forest-wide		Forest Health Recreation
Breckenridge Forest Health and Fuels EA	0.5 miles	A forest health and fuels reduction project covering approximately 5,600 acres of forest within the wildland-urban interface surrounding Breckenridge.	Approved: 2011 Implementation: Ongoing	Approximately 5,600 acres (from Hoosier Pass to Dillon Reservoir)	Swan River	Wildlife Watershed Scenery Air Recreation Forest Health
North Summit Wildland Urban Interface Fuels Reduction Project	12.5 miles	A forest health and fuels reduction project covering approximately 1,095 acres of forest within the wildland-urban interface surrounding Highway 9 near Silverthorne.	Approved: 2010 Implementation: Ongoing	Approximately 1,095 acres along 20 miles from Silverthorne to Sierra Bosque Subdivision on Green Mountain Reservoir	Blue River	Wildlife Watershed Air Recreation Forest Health

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
Red Tail Ranch WUI	2.0 miles (NFS and private lands)	Removal of 116 acres of dead lodgepole on Forest System Lands adjacent the ranch and 300 acres of private lands. Slash burning may be completed in 2011.	Approved: 2008 Completed: 2010	Tree removal occurred across approximately 600 acres (486 acres on the ranch and 116 acres of NFS lands)	Swan River	Wildlife Watershed Scenery Air Forest Health
1988 Gold Hill Clear Cuts	0.1 mile	A forest health project between Cucumber Creek and Middle Barton Creek in 1988. The cleared area is approx. 200 acres and is located in the BSR and Breckenridge Nordic Center SUP areas. To clear this timber, several timber roads were constructed.	Completed: 1988	Approximately 200 acres in 10 patches	Swan River	Wildlife Watershed Scenery Forest Health
Ophir Mountain Forest Health and Fuels Reduction Project EA	3.5 miles	A forest health and fuels reduction project covering approximately 1,700 acres of forest within the wildland-urban interface from the Summit County Commons in Frisco, to Coyne Valley Rd. near Breckenridge.	Approved: 2011 Implementation: Ongoing	Approximately 1,500 acres between Frisco and Coyne Valley Rd.	Swan River/ Snake River	Wildlife Watershed Air Forest Health Recreation
FOREST SERVICE PROGRAMMATIC PROJECTS						
WRNF Travel Management Plan	0.1–100 miles	The Forest Service approved a comprehensive travel management plan (TMP) for the WRNF. The TMP proposes ways to accommodate and balance the transportation needs of the public and provide adequate access for forest and resource management, while still allowing for protection of natural resources.	Approved: 2011	2,275,956 acres	Forest-wide	Wildlife

Table A-1:
Cumulative Effects Matrix

Project (Project Status)	Project Location (Straight Line Distance to BSR SUP)	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Lynx Analysis Unit where the Project is Located	Resources Potentially Affected
TRANSPORTATION PROJECTS						
Ongoing Highway 9 Widening	0.5–6.5 miles	CDOT has been conducting road construction activities on Highway 9 between Hoosier Pass and Interstate 70 since 2004 and is anticipated to continue into the foreseeable future.	Ongoing: since 2004	Approximately 10.5 miles along, and including, Highway 9	Swan River/Snake River	Traffic Air
Final I-70 PEIS	8.2–48 miles	CDOT and the FHA began analyzing alternatives for the I-70 Mountain Corridor in January 2000 in order to address the underlying need to reduce congestion and to improve mobility and accessibility on I-70 between Glenwood Springs and C-470.	Approved: 2011 Implementation: Ongoing	150 miles along, and including, I-70		Wildlife Watershed Wetlands Scenery Noise Socio-econ Recreation Traffic
HISTORIC DEVELOPMENT ACTIVITIES						
Mining Activities in Summit County	0.1–15 miles	The Breckenridge area was heavily mined in the 1800s and has led to water quality issues and past stream channel degradation in many tributaries to the Blue River.	N/A	County-wide	Swan River/Snake River	Watershed

A. BRECKENRIDGE SKI RESORT PROJECTS

MASTER DEVELOPMENT PLAN

BSR prepared a Master Development Plan (MDP), which was accepted by the Forest Service in January 2008. Additionally, in 2013 BSR prepared a MDP Addendum which assessed existing seasonal and year-round facilities and operations, and identified future improvements to current offerings. The addendum focused on identifying activities that were consistent with BSR's setting while supporting snow sports as the primary driver for recreation. Seasonal and year-round projects discussed in the MDP Addendum are included in the Proposed Action and/or Alternative 3 of this analysis. The projects in the MDP that are not part of the Proposed Action and/or Alternative 3 are considered reasonably foreseeable future actions. Previously-approved project are presented under subsequent headings. The MDP includes:

Peak 6

- Development of over 500 acres of mainly intermediate and expert-level ski terrain served by two lifts (approved as part of the 2012 Peak 6 EIS)

Peak 7

- Development of beginner ski terrain with associated lifts, and relocation of Peak 7 Avalauncher to better serve north bowls

Peak 8

- Installation of two new lifts, upgrade to four lifts and Vista Haus, construction of new food and beverage satellite facility, and service road improvements between Peaks 8 and 9
- Development of a ski school teaching area and associated lifts, development of previously-approved snowmaking, and addition to terrain park on Park Lane trail (on private land)

Peak 9

- Upgrade/construction of existing and proposed lifts, and terrain improvements

Peak 10

- Snowmaking and terrain improvements

EXISTING SUMMER AND YEAR-ROUND ACTIVITIES

Summer and year-round activities are currently offered on both private lands and NFS lands within BSR's SUP area. These activities exist on Peaks 7 to 10, but are focused around Peak 8. Existing activities include:

Peak 7

- Mountain biking and hiking trails on NFS lands

Peak 8

- Summer Fun Park activities (on private lands): miniature golf, walking maze, bungee-trampoline, climbing wall, bounce house, off-road segway tours, duck races, gemstone panning, zip line, alpine slide, and mountain coaster
- Summer activities (on NFS lands): scenic chairlift rides, hiking trails, mountain bike trails, guided hiking tours, and OHV tours

Peak 9

- Hiking and mountain biking trails on NFS lands

Peak 10

- Mountain biking trails on lower portions of Peak 10 on NFS lands

PREVIOUSLY-APPROVED, NOT YET IMPLEMENTED PROJECTS

6 Chair

As part of the 2005 DN/FONSI, the Forest Service approved the upgrade of 6 Chair in the existing alignment with an increase in uphill capacity.

Independence SuperChair Mid-Terminal Unload

As part of the May 2003 DN/FONSI the Independence SuperChair mid-terminal unload station was approved.

Peak 7 Restaurant

As part of the October 2003 *Supplemental* DN/FONSI, the Forest Service approved the development of the Peak 7 Restaurant in an alternate location. The previously-approved Peak 7 Restaurant was originally approved by the Forest Service via the 1998 DN/FONSI to be constructed atop the Independence SuperChair. The alternate location of the Peak 7 Restaurant is now approved to be developed just downhill of the Peak 7/8 Summer Road and between the *Claimjumper* and *Pioneer* trails at approximately 10,550 feet elevation. Previously-approved utilization of the facility may include winter daytime as well as summer day and nighttime usage (i.e., weddings, etc.). The previously-approved restaurant is designed with a capacity of 400 seats and amenities to include food service, guest warming, and toilets. An approximately 40,000-gallon underground water storage tank was also approved to serve the Peak 7 Restaurant. It will be located upslope of the Peak 7/8 Summer Road in the existing *Claimjumper* trail in line with the previously-approved water line.

The Peak 7 Restaurant will be designed to meet the guidelines and goals of the Built Environment Image Guide. Prior to construction all architectural design elements must be approved by the Forest Service.

In conjunction with the proposed relocation of the Peak 7 Restaurant site, a mid-station unload for the Independence SuperChair is proposed. The mid-station unload would provide better, more direct access to the alternate location of the Peak 7 Restaurant for lower ability level skiers by not requiring them to ride to the top and then ski more advanced level terrain to reach the skier services provided at the proposed restaurant location. It would also allow for restaurant access during summer months. The mid-unload would require approximately 1 acre of ground disturbance within the existing *Pioneer* trail immediately below the existing Peak 7 road.

BRECKCONNECT GONDOLA

The BreckConnect Gondola opened in January 2007 linking the Town of Breckenridge to BSR.

Starting in town at the Breckenridge Transportation Center, BreckConnect Gondola has terminals at both the Peak 7 and Peak 8 base areas, as well as a mid-station located in the Shock Hill neighborhood. The Gondola has changed how guests access the Resort. Based on first-scan data at chairlifts, prior to the Gondola, 60 percent of guests accessed BSR via Peak 9 and 40 percent accessed the mountain through Peak 8. Currently, 47 percent of guests access through Peak 9, 46 percent access through Peak 8, and 7 percent access through Peak 7.

IMPERIAL EXPRESS

Approved and constructed in 2005, the Imperial Express was installed as a bottom drive, detachable, four-person chair with a very low capacity—approximately 600 to 800 persons per hour. The top terminal is located approximately 170 vertical feet from the summit of Peak 8 at an elevation of 12,830 feet. Prior to the Imperial Express, all of the skiable terrain (399 acres) in the Peaks 7, 8 and 9 bowls was considered hike-to terrain. Installation of this lift eliminated the need to hike Peaks 7 and 8 and—all of which were previously within BSR's ski area operational boundary.

DEVELOPMENT OF PEAK 6 TERRAIN AT BSR

The Peak 6 terrain opened at BSR in 2013 with approximately 339 acres of lift-served ski terrain, 143 acres of hike-to ski terrain, a detachable six-person chairlift (Kensho SuperChair) and a fixed-grip quad (Zendo Chair), a restroom facility at the junction of the two chairlifts, and a ski patrol/warming hut adjacent to the top terminal of the Kensho SuperChair.

DEVELOPMENT OF PEAK 7 TERRAIN AT BSR

The Peak 7 terrain opened at BSR in 2002 with approximately 182 acres of skiable terrain on lower Peak 7, a detachable six-person chairlift, and a ski patrol/warming hut adjacent to the top terminal. In 2008 the bottom terminal of the Independence SuperChair was extended downslope approximately 300 feet to provide a guest connection with the BreckConnect Gondola terminal and the Crystal Peaks Lodge development on private lands.

VEGETATION MANAGEMENT PLAN

A Vegetation Management Plan (VMP) was collaboratively developed by BSR and the WRNF in 2010 to manage for the long-term forest health within the ski area boundary. This management plan not only looks at the need to remove dead and dying trees for aesthetics and public safety, but also the long-term maintenance of healthy forest stands within the SUP area. The intent of the VMP is to manage forest stands toward more long-lived species with less risk of insect disease mortality. The widespread MPB epidemic initiated this planning process.

The BSR VMP provides management options, including tree removal, sanitation and salvage, and patch cuts to improve forest health and reduce the accumulation of fuels within the permit area. The VMP uses a variety of prescriptions to improve stand structure, reduce tree densities, increase species diversity, and consequently, forest health at BSR. By removing dead, diseased and MPB susceptible lodgepole pine by thinning, sanitation, salvage and patch cuts BSR and the WRNF would manage future insect and disease risk and reduce fuel loads.

Any implementation of the VMP requires Forest Service authorization in a Breckenridge Ski Resort operating or construction plan, or an analysis and decision under NEPA planning direction.

B. RESORT AND RESIDENTIAL/COMMERICAL DEVELOPMENT PROJECTS

PEAKS 7 AND 8 MASTER PLAN

The 2003 Peaks 7 and 8 Master Plan was amended in April 2008 amended by the developer and accepted by the Town of Breckenridge. The Master Plan includes 475.3 residential SFEs planned across 251.4 acres at the bases of Peak 7 and 8. In addition, the Master Plan includes 19.5 commercial SFEs 57 guest services facilities SFEs. The Master Plan includes a requirement of 1 parking space/unit (except single-family and lock off units, which shall comply with the Town's Off-Street Parking Regulations). The following developments are components of the Master Plan.

Grand Colorado on Peak 8

Grand Colorado on Peak 8 is expected to be completed in 2016 and is located at the base of the Colorado and Rocky Mountain SuperChairs. Approximately 80 residences ranging from suites to four-bedroom units. The property will feature an indoor and outdoor aquatics center, outdoor fireplaces and grills, a family fun center, three private theaters, a rooftop garden, and a lobby bar.

One Ski Hill Place

Construction of One Ski Hill Place was completed in spring 2010. One Ski Hill Place includes 88 condo-hotel units (99,532 square feet), with 6,141 square feet of commercial space and 23,660 square feet of guest services. Total development is 252,827 square feet. The building's highest point is 76 feet. The

development includes 107 interior parking spaces 84 percent underground) and 26 additional exterior spaces. One Ski Hill Place also includes the new cafeteria for Peak 8 (replacing the Bergenhof building), a large bar, and ample outdoor seating. Employee and traffic volume generation quantities were not a required component of the approval process with the Town of Breckenridge. 5,816 square feet of employee housing is provided off-site. A component of the approval process for the development of base area facilities at Peaks 8 and 7, as well as ski terrain and the Independence SuperChair on Peak 7, U.S. Army Corps of Engineers issued a Section 404 Permit for waters of the U.S., including wetlands impacts. The permit authorized the discharge of fill material to 0.7 acre of wetlands in the Cucumber Gulch watershed and 0.21 acre of temporary impacts for utility lines (sewer, water and snowmaking) in the Cucumber Gulch watershed. During the development permit review process, the Town of Breckenridge established the Cucumber Gulch Overlay Protection District, which includes the protection of wetlands and the creation of conservation easements. The Town of Breckenridge granted a variance for the construction of the BreckConnect Gondola. Annual monitoring reports have been prepared and submitted to the U.S. Army Corps of Engineers during and post construction to ensure success of created and protected wetlands, plant species, and hydrologic function down slope from the developments.

Grand Lodge on Peak 7

The initial phase of Grand Lodge on Peak 7 opened in May 2009. The site is approximately 5.5 acres. Grand Lodge on Peak 7 is located at the base of the Independence SuperChair. It consists of 114 units ranging from suites to four-bedroom residences.

Crystal Peak Lodge

Phase 1 was completed in May 2009 and Phase 2 in December 2009. Crystal Peak Lodge includes 46 units with interval ownership (58,609 square feet), 500 square feet of commercial space (including a restaurant), and 1,292 square feet of guest services space. Total development is 105,552 square feet. The building's highest point is 73 feet, 9 inches. The development includes 46 parking underground spaces and 19 surface parking spaces. Employee and traffic volume generation quantities were not a required component of the approval process with the Town of Breckenridge. Wetland impacts and requirements are presented above in the discussion of One Ski Hill Place.

TAILOR LODE PROPERTY

The WRNF has received a proposal to establish documented and legal access to the Tailor Lode property, a 10.3-acre privately-owned parcel located between Peaks 7 and 6 in the Cucumber Creek area. The proposed access road would cross the Breckenridge Nordic Center SUP area and the BSR SUP area, following the existing Peak 6 maintenance road to a point just east of the bottom terminal of the Kensho SuperChair. From there, a new road, 1,500 feet in length, would be constructed to the south to access the property. Construction access to the property would also follow this route. In the winter, the property would be accessed via over-the-snow vehicle or non-motorized equipment by following the Monte Cristo

and Lost Horizon ski trails from the Peak 8 base area to the point where the proposed access road crosses under the Zendo Chair on the Delirium trail. The proposed access road would then be followed to the property. The proponent would be required to secure a building permit from the Summit County Building Department prior to construction.

Recently conducted surveys have concluded that the project will not impact wetlands, botany, or cultural resources. A legal right to access to the property for "reasonable use and enjoyment" is established by the Alaska National Interest Lands Conservation Act (ANILCA). At this time, it is expected that the environmental analysis will take the form of a Categorical Exclusion (CE).

WEBER GULCH HUT

The WRNF has issued a draft Decision Notice (DN) approving the Summit Hut Association's (SHA) proposal for the Weber Gulch Backcountry Hut.

The Weber Gulch Backcountry Hut site is located at an approximate elevation of 11,500 feet on the northern aspect of Baldy Mountain, east of Breckenridge, within the Dillon Ranger District of the WRNF. The Weber Gulch Backcountry Hut is authorized for use only between the third week of November and April 30th of each year. The hut will likely be assembled in modular sections off-site then transported to the construction site via helicopters and OHVs. In general the design parameters are:

- One or two stories;
- Between 1,400 and 2,000 square feet in size; and
- Accommodations not to exceed 16 overnight guests.

The proposed non-motorized, public access route will total 3.5 miles in length. Approximately 2.2 miles of Sallie Barber Road and Nightmare on Baldy trail will be used, and approximately 1.3 miles of new trail will be constructed. Total vertical gain between the proposed parking area and the hut is roughly 1,050 feet.

Construction and maintenance access will follow Mt. Baldy Road to an existing 4WD road just beyond the Iowa Mill. The Upper Trail of Tears is approved to be widened to create a 50-inch wide OHV trail. This route would then join the public access route for the final 3,300 feet to the hut. This route would be closed to public OHV use. The final 3,330 feet of the route will be closed to summer use to minimize disturbance to Canada lynx, other forest carnivores, and elk.

CONTINUED TOWN OF BRECKENRIDGE AND UPPER BLUE RESIDENTIAL BUILD-OUT

The Town of Breckenridge 2011 Overview Report is the most current account of community history, statistics, development, and projections.[1] According to the Town of Breckenridge 2011 Overview Report, the Town of Breckenridge is approximately 73 percent built out.[2] Other community documents that describe future build-out of the Upper Blue Basin and projections include: the Joint Upper Blue Basin Master Plan, the Town of Breckenridge Comprehensive Plan, the Town of Breckenridge Vision Plan, the Countywide Comprehensive Plan, and the Upper Blue Basin Master Plan.

The Summit County Planning Department has summarized residential build-out by basin in Summit County. The following includes statistics for the Upper Blue Basin.

Table A-2:
Upper Blue Basin Residential Build-Out Statistics

Upper Blue Basin	Total Units Built to Date	Remaining Units to be Built[a]	Additional Subdivision Potential[b] (In Units)	Absolute Build-Out[c] (In Units)	Absolute Build-Out (%)	Realistic Build-Out[d] (In Units)	Realistic Build-Out (%)
Unincorporated Areas	3,505	1,539	694	5,738	61.08	4,949	70.82
Town of Blue River	660	178	0	838	78.76	838	78.76
Town of Breckenridge	6,943	2,347	0	9,290	74.74	8,989	77.24
Total	**11,108**	**4,064**	**694**	**15,145**	**70.01**	**14,776**	**75.18**

Source: Summit County Planning Department, http://co-summitcounty.civicplus.com/DocumentCenter/View/179, 2014.
[a] Remaining Units to be Built includes vacant single family residential lots or multi-family units which are permitted by zoning, but not yet built.
[b] Additional Subdivision Potential in Units refers to additional units that could be created by further subdivision under existing zoning classifications.
[c] Absolute Build-out is the sum of total units built to date, remaining units to be built, and additional units that could be created through subdivision. Absolute build-out represents "ultimate build-out," or the total number of units that could potentially be built if every property were subdivided and developed to the maximum density allowed under current zoning regulations. Absolute build-out does not factor in site constraints that could preclude realization of the full development potential allowed under existing zoning regulations. Absolute Build-Out % Formula: (Total Units Built to Date ÷ Absolute Build-Out) x 100
[d] Realistic build-out is a more likely picture of the build-out that may occur. Factors that affect realistic build-out include, but are not limited to the following: constrained property sizes in areas such as Heeney; development constraints such as wetlands and steep slopes; access constraints; unrealized subdivision potential on rural agricultural properties (due to property owners' desires, future conservation easements, open space purchases, etc.); and constrained development due to water rights issues. Realistic Build-out % Formula: (Total Units Built to Date ÷ Realistic Build-out) x 100 Affordable workforce housing and accessory apartments are likely to be constructed in the upcoming years and subsequently would impact "realistic build-out." However, the realistic buildout does not account for affordable workforce housing or accessory apartments that could be constructed in the future. A goal contained in the Housing Element of the Countywide Comprehensive Plan is to increase the stock of affordable workforce housing throughout the County by at least 2,500 units, and accessory apartments by at least 100 units.

As Summit County, and more specifically the Upper Blue Basin, approaches build-out, the community will continue to experience the realities of a growing population in terms of demand for community and commercial services.

[1] Town of Breckenridge, 2011
[2] Ibid.

C. RECENT DEVELOPMENTS AT SUMMIT COUNTY SKI AREAS

KEYSTONE RESORT

Existing summer activities at Keystone Resort on private lands include horseback and wagon rides, boating, fishing, disc golf, mini golf, and a kid's play park. On NFS lands, Keystone Resort offers hiking, mountain biking, scenic chairlift and gondola rides, summer tubing, mountaintop yoga, and wedding venues.

Keystone Resort prepared an MDP, which was accepted by the Forest Service in September 2009. The MDP is considered a reasonably foreseeable future action. New mountain bike trails totaling approximately 9 miles were identified in the MDP and approved as part of the 2014 Dercum Mountain Improvements Projects EA.

COPPER MOUNTAIN RESORT

Copper Mountain Resort (CMR) offers a variety of summer activities on both private and NFS lands. Many of these activities have been developed in recent years and are based out of Center Village. On private lands, CMR offers digglers (off-road scooters), go-karts, bumper and paddle boats, bungee jumping, climbing wall, mini golf, zip line, and tumble bubbles. On NFS lands, CMR offers scenic chairlift rides, mountain biking, and hiking trails.

Additional summer activities identified in CMR's 2011 MDP include hiking and mountain biking trails, a spring/summer superpipe, mountain coaster, zip lines, ropes course, and a bike park, all on NFS lands.

ARAPAHOE BASIN SKI AREA

The WRNF is currently conducting a NEPA analysis of projects included in Arapahoe Basin Ski Area's (A-Basin) accepted 2012 Master Development Plan. The WRNF has scoped a ski area enhancement project and is preparing an EIS to analyze and disclose the potential environmental effects of implementing the projects, as directed by the NEPA. All of the proposed projects are within A-Basin's existing Forest Service-administered SUP boundary.

The proposed projects include: incorporating The Beavers into A-Basin's operational boundary and providing lift access and trails within the Beavers terrain (the area is proposed to be patrolled and avalanche control/snow safety work would be conducted throughout the proposed terrain); a new lift is proposed to improve access to Montezuma Bowl; the Pallavicini and Molly Hogan lifts would be replaced with more current lift technology in similar alignments with lifts that provide similar hourly capacities; the Norway lift would be removed; the snowmaking water storage reservoir would be expanded; and a zip line and challenge/ropes course is proposed to be installed.

D. FOREST HEALTH AND FUELS PROJECTS

FOREST-WIDE HAZARDOUS TREE REMOVAL AND FUELS REDUCTION PROJECT

The general goal of the project is to remove hazardous trees from roadways, trails, high-use areas, culturally significant sites, and administrative areas to reduce the possibility of personal or property damage from falling debris resulting from the MPB epidemic that has been active on the WRNF.

The WRNF has begun implementing the selected alternative to meet the goal for providing for public safety in and around administrative sites, developed recreation sites, and along road and trail corridors by reducing risks associated with falling trees and hazardous fuels. Implementation is ongoing Forest-wide.

NORTH SUMMIT WILDLAND URBAN INTERFACE FUELS REDUCTION PROJECT

The Forest Service has begun creating defensible space on approximately 1,095 acres of wildland-urban interface on NFS lands along the Highway 9 corridor from the neighborhoods of Wilderness north to Sierra Bosque. These communities were identified in the Summit County Community Wildfire Protection Plan as having high hazard fuels risks due to the current MPB outbreak. When complete, this project will reduce hazardous fuels within a 600-foot strip along the boundary of National Forest/private development. Implementation is ongoing.

BRECKENRIDGE FOREST HEALTH AND FUELS PROJECT

The Forest Service has begun implementing a forest health and fuels reduction project within the wildland-urban interface of Breckenridge and surrounding communities. These treatments are intended to expedite forest regeneration, salvage dead and dying lodgepole pine killed by MPB and would create 400- to 600-foot community protection zones (CPZ). The project encompasses approximately 5,700 acres of forest that extend from Farmers Corner on the north, to the Golden Horseshoe on the east, to Hoosier Pass on the south, and along the base of the Tenmile Range on the west. Implementation is ongoing.

OPHIR MOUNTAIN FOREST HEALTH AND FUELS REDUCTION PROJECT EA

The Forest Service has begun treating approximately 1,700 acres of forest within and adjacent to the wildland-urban interface that have been severely affected by MPB. The project area extends from Summit County Commons to the north, along Highway 9 the east, Coyne Valley Road on the south, and along the base of the Tenmile Range on the west. These activities are designed to lower the existing and accumulating fuel loads following the MPB epidemic and expedite regeneration of the forested areas located in the Ophir Mountain area. This project is also be expected to result in improvements for other forest resources, such as scenery and recreation over the long term (30+ years) following the ongoing MPB epidemic. The salvage of dead and dying lodgepole pine may also provide for some cost recovery to help offset the cost of treatment.

The type of treatment prescribed is the same for all of the proposed units. This type of treatment, or prescription, is identified as "clear cut with leave trees" and would allow for the removal of dead trees, trees currently infested with MPB, trees susceptible to being infested with MPB, or windthrow-prone trees while retaining the healthy living trees within a given stand. Due to the retention of live or non-infested trees many areas proposed for treatment would not be clear cut entirely; instead, clear cuts would at times be smaller than the larger unit boundary on the maps and would also retain individual trees of various species within their boundaries. Implementation is ongoing.

RED TAIL RANCH WUI

Between 2008 and 2010, timber removal included approximately 415 acres of NFS and private land adjacent within and adjacent to the Red Tail Ranch northwest of Breckenridge. Disposal of timber included the hauling off-site and burning of slash.

1988 GOLD HILL CLEAR CUTS

The Forest Service implemented a forest health project between Cucumber Creek and Middle Barton Creek in 1988. The previously-cleared area is approximately 200 acres in the 10 clear cuts within the BSR and Breckenridge Nordic Center SUP areas (other areas were also cleared across the east side of the Tenmile Range). To clear this timber, several logging roads were constructed for access.

E. FOREST SERVICE PROGRAMMATIC PROJECTS

WRNF TRAVEL MANAGEMENT PLAN

The USDA Forest Service approved a comprehensive travel management plan for the White River National Forest. The travel management plan and supporting environmental impact statement (EIS) present ways to accommodate and balance the transportation needs of the public and provide adequate access for forest and resource management, while still allowing for protection of natural resources.

Travel management is the integrated planning of, and providing for, movement of people and products to and through National Forest System lands. A travel management plan provides clear, specific direction on the appropriate levels of land, water, and air access opportunities to be made available. Implementation on the Travel Management Plan is ongoing Forest-wide.

F. TRANSPORTATION PROJECTS

I-70 PROGRAMMATIC EIS

CDOT and the FHA began analyzing alternatives for the I-70 Mountain Corridor in January 2000 in order to address the underlying need to reduce congestion and to improve mobility and accessibility on I-70 between Glenwood Springs and C-470. The I-70 Mountain Corridor PEIS was undertaken because existing congestion along I-70 is degrading the accessibility of mountain travel for Colorado residents,

tourists, and businesses, with projected increases in travel demand over the next 25 years and beyond. A Final PEIS was released in February 2011 the ROD was released in June 2011. Tier 2 implementation in ongoing.

The PEIS identified that the need to relieve this congestion is especially acute for extended weekend travelers seeking access between the Denver metropolitan area and US 40 (to Grand County), as well as through the Eisenhower Tunnel to the Western Slope. The Preferred Alternative includes non-infrastructure components, the Advanced Guideway System, and highway improvements. This multimodal solution is anticipated to improve transportation safety and efficiency to mountain communities along the I-70 corridor, benefiting Summit and Eagle County economies, as well as ski areas.

HIGHWAY 9 IMPROVEMENTS – FRISCO TO BRECKENRIDGE

CDOT has been conducting road construction activities on Highway 9 since 2004 and is anticipated to continue into the foreseeable future. Overall, the project entails widening the highway corridor from two to four lanes. This will increase safety and mobility of drivers, transit, pedestrians and bicyclists. Also included in these are projects are intersection improvements and roundabouts.

G. HISTORIC DEVELOPMENT ACTIVITIES

Summit County was heavily mined in the 1800s, primarily for gold and silver. The result of the heavy metals mining is the associated tailings and waste rock effects to water quality.

Breckenridge Ski Resort Multi-Season Recreation Activities Project
October 2014

FSM 2343 Screening – Additional Seasonal and Year-Round Recreation at Ski Areas

The following tables disclose how the proposed activities at Breckenridge Ski Area meet Forest Service direction that further clarifies appropriateness of additional seasonal and year-round activities at ski areas on National Forest System (NFS) lands. Table 1.1 includes findings common to all proposed activities. Tables 1.2 – 1.8 include findings specific to the nature of individual activities.

1.1 Findings Common to all Proposed Activities

FSM Direction	Screening Criteria	Activity Findings
2343.14 (1)	These activities and associated facilities must:	
2343.14 (1)(a)	Not change the primary purpose of the ski area to other than snow sports	The proposed activities will individually and collectively supplement existing summer visitation and will increase visitation by a small amount when compared to winter use visits. Revenue from snow sports activities exceed and are projected to continue to exceed revenue from summer uses. The proposed activities will not change the primary purpose of the ski area to other than snow sports.
(1)(b)	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	All proposed summer activities would encourage outdoor recreation and are aimed at attracting families to participate. Many visitors are attracted to BSR because of the high alpine, forested landscape that surrounds the town. The natural resource-based nature of the proposed activities varies by activity and is discussed in the following tables.
(1)(c)	To the extent practicable, be located within the portions of the ski area that are developed or that will be developed pursuant to the master development plan	All activities and associated facilities will be located within the portions of the ski area that are planned for development in the master development plan. All activities would occur within the Special Use Permit boundary and the current developed winter operational boundary.
(1)(d)	Not exceed the level of development for snow sports and be consistent with the zoning established in the applicable master development plan	The level of development for snow sports will not be exceeded with these proposals. Summer uses would continue to be subordinate to the snow sports activities at the ski area. The design and location of these facilities and activities are consistent with the vision, zoning and proposed uses found in the Breckenridge Ski Resort 2013 Master Development Plan Addendum. Activities are all located within and consistent with direction of Zones 1 through 3 as described in the MDP Seasonal and Year-Round Activities and Facilities Zones.

(8)(a)	MDP: Establish zones to guide placement and design of additional seasonal or year-round recreation facilities, basing the zones on the existing natural setting and level of development to support snow sports	The Breckenridge Ski Resort 2013 Master Development Plan Addendum established zones for placement and design of additional seasonal or year-round recreation facilities. Zones were based on existing natural settings and the existing level of development within the ski area to support snow sports. Five zones were created that differ in their access, remoteness, naturalness and proximity to infrastructure.
(8)(b)	MDP: Depict the general location of the facilities	The Breckenridge Ski Resort 2013 Master Development Plan Addendum lists each of BSR's proposed activities by zone (Addendum pages 31-33). The general locations of these proposed facilities and corresponding zones are depicted in the Zoning Designations Figure of the Addendum.
(8)(c)	MDP: Establish an estimated timeframe for their construction.	The Breckenridge Ski Resort 2013 Master Development Plan Addendum and project proposal includes this information. BSR expects to implement Phase 1 projects (proposed in this EIS process) within 1 to 5 years subsequent to review and approval in accordance with NEPA procedures and decision requirements.
(9)	Utilize the Scenery Management System (FSM 2380), Built Environment Image Guide (Publication FS-710), and the Recreation Opportunity Spectrum (FSM 2310) to ensure that additional seasonal or year-round recreation activities and associated facilities are located and constructed to harmonize with the surrounding natural environment.	Preliminary screening indicates conformance with this planning guidance. Detailed analysis and determinations will be made in NEPA analyses and post-NEPA processes (including the Building Design Review process, and Construction Plan and Operating Plan approval processes) to ensure compliance before implementation may occur. As indicated in the 2002 Forest Plan, the majority of BSR's SUP area has a SIO level of *Very Low*, with the high-alpine areas of Peak 6 and Peak 10 designated as *Low*. All proposed projects are located in areas with an SIO of *Very Low* and would likely be consistent with this designation. This SIO refers to landscapes where the valued landscape character "appears heavily altered." All facilities will comply with the character and guidelines for the Rocky Mountain Province BEIG. This includes considering the landscape, cultural and ecological character, as well as the architectural guidelines which include descriptions of appropriate siting, massing, scale, structure, materials, color, and sustainability efforts.
(11)	The acreage necessary for additional seasonal or year-round recreation activities and associated facilities may not be considered in determining the acreage encompassed by a ski area permit. Permit area expansions must be based on needs related to snow sports rather than additional seasonal or year-round recreation.	All proposed activities would be located within the existing special use permit and winter operations boundaries.

1.2 Activity: Sawmill Zip Line

FSM Direction	Screening Criteria	Activity Findings
2343.14 (1)(b)	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	The zip line will afford visitors scenic views of the surrounding mountain landscape and vegetation. The activities encourage outdoor recreation by being located outdoors in a natural setting and in close proximity to other numerous outdoor recreational opportunities. The desired experience and activity is dependent on a change in elevation (gravity-based) and engagement with a mountain forest setting. The design and location of the zip lines utilize the natural resource attributes of topography, mountain scenery (foreground and background views of the ten mile range) and vegetation (layout and location within and adjacent to a forested stand) to make it sufficiently natural resource-based. The layout and location within a forested stand allows users to recreate in a natural setting and provide an experience reliant on these natural features. The zip lines are based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, zip lines, and activity itself replicates and is rooted in traditional climbing and mountaineering practices.
(1)(e)	To the extent practicable, harmonize with the natural environment of the site where they would be located by:	
(1)(e)(1)	Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape	The activity is visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape. **Design**: The zip line is designed to minimize and avoid tree removal, blend with the forest canopy (towers), and utilize natural materials in its construction. BEIG concepts and criteria will be incorporated into final design. **Location and Layout**: The zip line is situated in a discrete, forested locations located adjacent to and on the periphery of existing snow sports infrastructure. Three tower stations which are located within or adjacent to forested stands of similar height range to blend towers from multiple viewpoints. Each tower location is adjacent to ski slopes and pods that include existing ski lifts to blend in with existing facilities. **Height and Massing**: The zip line operates within narrow corridors (16" and less than an average ski trail) limiting its visual footprint and requiring limited tree removal. Zip line cables will be visible as they extend far above the canopy at times but are small in diameter and would be similar to appearance as the ski lift cables nearby. Tower stations would have guy wire re-enforcements. These guy wires would extend into forested areas and be subordinate to this vegetation. Fences (e.g. buck and rail) would be required to minimize wire/user conflicts. These fences would be similar to the multiple snow and safety fences used throughout the resort.
(1)(e)(2)	Not requiring significant modifications to topography to facilitate construction or operations	Little to no modification to topography would be required to construct and operate the zip line. Tower footings and support structures have minimal footprints to reduce soils disturbance and would be located in areas requiring minimal to no grading.

(1)(f)	Not compromise snow sports operations or functions	The zip line is situated adjacent to and span existing ski runs. This will result in no substantial change in snow sports operations. Tree skiing opportunities may be compromised in some forested areas but would have little effect on the winter sports user experience resort-wide. Towers, associated guy lines and fences would have minimal footprints and would be avoided by skiers just as trees and fences are currently avoided.
(1)(g)	Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts.	No additional parking lots, lifts, or lodges will be required for this activity. The zip line will be primarily accessed through existing lifts. The Peak 8 pod has existing facilities that will be used in summer to cater to guest needs.
(7)	Encourage holders to utilize existing facilities to provide additional seasonal or year-round recreation activities.	
(4)	Factors that may affect whether other additional seasonal or year-round recreation activities and associated facilities besides those listed in paragraph 2 may be approved under paragraph 1 of this section include but are not limited to: The degree to which visitors are able to engage with the natural setting; The extent to which the activities and facilities could be expected to lead to exploration and enjoyment of other NFS lands; and The similarity of the activities and associated facilities to those enumerated in paragraph 2 or paragraph 3 of this section.	The design, setting and location of this zip line meets the intent and appropriateness criteria of agency direction. Visitors are able to directly engage with the natural setting to a moderate degree. Once guests are harnessed, the zip line allows little direct physical access to the natural environment since it is comprised of towers and users are fixed in their harnesses on fixed cables. However, the towers and cables are positioned within the canopy at key locations to provide guests with an intimate view of and closeness with the forest canopy and individual trees. The time spent in these areas by guests would be minimal, and the amount of canopy exposure would be small compared to that of the canopy tours. For a majority of the activity time, guests would be descending lines at higher speeds far above the canopy. The view of the natural setting of the Sawmill Creek drainage would be dramatic and very different from any other activity in the proposed suite of projects. The zip lines are based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, zip lines, and activity itself replicates and is rooted in traditional climbing and mountaineering practices.
(5)	Do not approve additional seasonal or year-round recreation activities and associated facilities when the visitor's experience is not interdependent with attributes common in National Forest settings.	See responses provided for (1)(b).
(6)	Allow temporary activities that rely on existing facilities, such as concerts or weddings, even if they are not necessarily interdependent with a National Forest setting, provided they are enhanced by it. Do not authorize new permanent facilities solely for these activities.	N/A

1.3 Activity: Peak 7 Zip Line

FSM Direction	Screening Criteria	Activity Findings
2343.14 (1)(b)	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	The zip line will afford visitors scenic views of the surrounding mountain landscape and vegetation. The activities encourage outdoor recreation by being located outdoors in a natural setting and in close proximity to other numerous outdoor recreational opportunities. The desired experience and activity is dependent on a change in elevation (gravity-based) and engagement with a mountain forest setting. The design and location of the zip lines utilize the natural resource attributes of topography, mountain scenery (foreground and background views of the ten mile range) and vegetation (layout and location within and adjacent to a forested stand) to make it sufficiently natural resource-based. The layout and location within a forested stand allows users to recreate in a natural setting and provide an experience reliant on these natural features. The zip lines are based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, zip lines, and activity itself replicates and is rooted in traditional climbing and mountaineering practices.
(1)(e)	To the extent practicable, harmonize with the natural environment of the site where they would be located by:	
(1)(e)(1)	Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape	The activity is visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape. **Design**: The zip line is designed to minimize tree removal, blend with the forest canopy (towers), and utilize natural materials in its construction. BEIG concepts and criteria will be incorporated into final design. **Location and Layout**: The zip line is situated along current developed ski trails and existing snow sports infrastructure. Four tower stations are located adjacent to forested stands of similar height range to blend towers from multiple viewpoints. Each tower location is adjacent to ski slopes and pods that include existing ski lifts to blend in with existing facilities. **Height and Massing**: The zip line operates within narrow corridors (16" and less than an average ski trail) limiting its visual footprint and requiring limited tree removal. Zip line cables will be visible as they extend far above the canopy at times but are small in diameter and would be similar to appearance as the parallel ski lift cables of the Independence SuperChair. Tower stations would have guy wire re-enforcements. These guy wires would extend into forested areas and be subordinate to this vegetation. Fences (e.g. buck and rail) would be required to minimize wire/user conflicts. These fences would be similar to the multiple snow and safety fences used throughout the resort.

(1)(e)(2)	Not requiring significant modifications to topography to facilitate construction or operations	Little modification to topography would be required to construct and operate the zip line. Tower footings and support structures have minimal footprints to reduce soils disturbance and would be located in areas requiring minimal grading.
(1)(f)	Not compromise snow sports operations or functions	The zip line is situated adjacent to and span existing ski runs. This will result in no substantial change in snow sports operations. Tree skiing opportunities may be compromised in some forested areas but would have little effect on the winter sports user experience resort-wide. Towers, associated guy lines and fences would have minimal footprints, be located on the periphery of ski trails, and would be avoided by skiers just as trees and fences are currently avoided.
(1)(g)	Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts.	No additional parking lots, lifts, or lodges will be required for this activity. The zip line will be primarily accessed through existing lifts. The Peak 7 pod has existing facilities that will be used in summer to cater to guest needs.
(7)	Encourage holders to utilize existing facilities to provide additional seasonal or year-round recreation activities.	
(4)	Factors that may affect whether other additional seasonal or year-round recreation activities and associated facilities besides those listed in paragraph 2 may be approved under paragraph 1 of this section include but are not limited to: The degree to which visitors are able to engage with the natural setting; The extent to which the activities and facilities could be expected to lead to exploration and enjoyment of other NFS lands; and The similarity of the activities and associated facilities to those enumerated in paragraph 2 or paragraph 3 of this section.	The design, setting and location of this zip line meet the intent and appropriateness criteria of agency direction. Visitors are able to directly engage with the natural setting to a moderate degree. Once guests are harnessed, the zip line allows little direct physical access to the natural environment since it is comprised of towers and users are fixed in their harnesses on fixed cables. However, the towers and cables are positioned within the canopy at key locations to provide guests with an intimate view of and closeness with the forest canopy and individual trees. The time spent in these areas by guests would be minimal, and the amount of canopy exposure would be small compared to that of the canopy tours. For a majority of the activity time, guests would be descending lines at higher speeds above the canopy and adjacent to ski trails. The zip lines are based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, zip lines, and activity itself replicates and is rooted in traditional climbing and mountaineering practices.
(5)	Do not approve additional seasonal or year-round recreation activities and associated facilities when the visitor's experience is not interdependent with attributes common in National Forest settings.	See responses provided for (1)(b).
(6)	Allow temporary activities that rely on existing facilities, such as concerts or weddings, even if they are not necessarily interdependent with a National Forest setting, provided they are enhanced by it. Do not authorize new permanent facilities solely for these activities.	N/A

1.4 Activity: Canopy Tours (Sawmill, Ore Bucket and Claim Jumper)

FSM Direction	Screening Criteria	Activity Findings
2343.14 (1)(b)	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	The canopy tours will afford visitors scenic views of the surrounding mountain landscape and vegetation. The activities encourage outdoor recreation by being located outdoors in a natural setting and in close proximity to other numerous outdoor recreational opportunities. The desired experience and activity is dependent on a change in elevation (gravity-based) and engagement with a mountain forest setting. The design and location of the canopy tours utilize the natural resource attributes of topography, mountain scenery (foreground and background views of the ten mile range) and vegetation (layout and location within and adjacent to a forested stand) to make them sufficiently natural resource-based. Their layout and location within forested stands allows users to recreate in a natural setting and provide an experience reliant on these natural features.
(1)(e)	To the extent practicable, harmonize with the natural environment of the site where they would be located by:	
(1)(e)(1)	Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape	The activity is visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape. **Design:** The canopy tours are designed to minimize and avoid tree removal, blend with the forest canopy (towers), and utilize natural materials in their construction. BEIG concepts and criteria will be incorporated into their final design. **Location and Layout:** The canopy tours are situated in discrete, forested locations located adjacent to and on the periphery of existing snow sports infrastructure. Each tour features up to ten tower stations that are located within forested stands to blend towers from multiple viewpoints. **Height and Massing:** The canopy tours operate within narrow corridors (far less than an average ski trail) limiting their visual footprint and requiring limited tree removal. Canopy tour cables will be visible mostly to users as they are contained within the canopy at most times. They would be similar to appearance as the ski lift cables nearby but visually broken up or hidden due to their location within the canopy. Most tower stations would have guy wire re-enforcements. These guy wires would extend into forested areas and be subordinate to the surrounding vegetation. Fences (e.g. buck and rail) would be required to minimize wire/user conflicts. These fences would be similar to the multiple snow and safety fences used throughout the resort.
(1)(e)(2)	Not requiring significant modifications to topography to facilitate construction or operations	Little to no modification to topography would be required to construct and operate the canopy tours. Tower footings and support structures have minimal footprints to reduce soils disturbance and would be located in areas requiring minimal to no grading.

(1)(f)	Not compromise snow sports operations or functions	The majority of each canopy tour will be situated in forested settings. This will result in no substantial change in snow sports operations. Tree skiing opportunities may be compromised in some areas but would have little effect on the winter sports user experience resort-wide. Towers, associated guy wires and fences would have minimal footprints and would be avoided by skiers just as trees and fences are currently avoided.
(1)(g)	Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts.	No additional parking lots, lifts, or lodges will be required for this activity. The zip line will be primarily accessed through existing lifts. The Peak 7 and 8 pods have existing facilities that will be used in summer to cater to guest needs.
(7)	Encourage holders to utilize existing facilities to provide additional seasonal or year-round recreation activities.	
(4)	Factors that may affect whether other additional seasonal or year-round recreation activities and associated facilities besides those listed in paragraph 2 may be approved under paragraph 1 of this section include but are not limited to: The degree to which visitors are able to engage with the natural setting; The extent to which the activities and facilities could be expected to lead to exploration and enjoyment of other NFS lands; and The similarity of the activities and associated facilities to those enumerated in paragraph 2 or paragraph 3 of this section.	The design, setting and location of these canopy tours meet the intent and appropriateness criteria of agency direction. Visitors are able to engage with the natural setting to a high degree. The canopy tour allows little direct physical access to the natural environment since it is comprised of towers and users are fixed in their harnesses on fixed cables. However, the towers and cables are positioned within the canopy for most of the activity duration and provide guests with an intimate view of and closeness with the forest canopy and individual trees. With multiple stations and a much slower, guided route within the canopy (versus a faster, longer experience above the canopy associated with zip lines), there is much opportunity for guests to view, explore and learn about the forested setting. These natural resource assets are key part of the natural resource-based experience. The canopy tours are based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, zip lines, and activity itself replicates and is rooted in traditional climbing and mountaineering practices.
(5)	Do not approve additional seasonal or year-round recreation activities and associated facilities when the visitor's experience is not interdependent with attributes common in National Forest settings.	See responses provided for (1)(b).
(6)	Allow temporary activities that rely on existing facilities, such as concerts or weddings, even if they are not necessarily interdependent with a National Forest setting, provided they are enhanced by it. Do not authorize new permanent facilities solely for these activities.	N/A

1.5 Activity: Challenge Courses

FSM Direction	Screening Criteria	Activity Findings
2343.14 (1)(b)	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	The courses are based in other traditional, natural resource-based recreation activities that occur on NFS lands. The harnesses, equipment and activity itself replicates traditional adventure, climbing and mountaineering activities. The desired experience and activity is dependent on the engagement with a forested mountain setting. The design and location of the courses utilize the natural resource attribute of vegetation (forested setting) and mountain scenery. Their layout and location within a forested stand allows users to recreate in a natural setting and provide an experience reliant on these natural features.
(1)(e)	To the extent practicable, harmonize with the natural environment of the site where they would be located by:	
(1)(e)(1)	Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape	The activity is visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape. **Design**: The courses are designed to avoid tree removal, blend with the existing trees and forest canopy, and utilize natural materials in its construction. BEIG concepts and criteria will be incorporated into final design. **Location and Layout**: The courses are situated in a discrete, forested location located adjacent to and on the periphery of existing snow sports infrastructure at the Peak 8 area. **Height and Massing**: The courses operate within a forested location requiring limited to no tree removal. Course height will be similar to the surrounding canopy when viewed from the Vista Haus, top station of the Colorado SuperChair and distant viewpoints. The structures are elongated across the project area with multiple stations and towers to avoid a multi-story, box like structure. This better aligns with the natural topography of the area and better blends with the existing vegetation and landscape.
(1)(e)(2)	Not requiring significant modifications to topography to facilitate construction or operations	Little modification to topography would be required to construct and operate the courses. Tower footings and support structures have minimal footprints to reduce soils disturbance.
(1)(f)	Not compromise snow sports operations or functions	The courses are situated outside of existing ski runs and will result in no substantial change in snow sports operations. The course will have little, if any, effect on the winter sports user experience given the location of this structure and the amount of other similar terrain available within the resort.
(1)(g)	Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts.	No additional parking lots, lifts, or lodges will be required for this activity. The course will be primarily accessed through existing lifts.
(7)	Encourage holders to utilize existing facilities to provide additional seasonal or year-round recreation activities.	

(4)	Factors that may affect whether other additional seasonal or year-round recreation activities and associated facilities besides those listed in paragraph 2 may be approved under paragraph 1 of this section include but are not limited to: The degree to which visitors are able to engage with the natural setting; The extent to which the activities and facilities could be expected to lead to exploration and enjoyment of other NFS lands; and The similarity of the activities and associated facilities to those enumerated in paragraph 2 or paragraph 3 of this section.	SAROEA and guiding direction considers ropes courses and zip lines appropriate if criteria are met. The design, setting and location of the challenge courses meet the intent and appropriateness criteria of this direction. Visitors are able to engage with the natural setting to a moderate degree. The challenge courses allows little direct physical access to the natural environment since it is comprised of fixed towers and users are fixed in their harnesses on fixed routes. However, the towers and cables are positioned within the canopy at key locations to provide guests with an intimate view of and closeness with adjacent trees and underlying vegetation. These natural resource assets are key part of the natural resource-based experience.
(5)	Do not approve additional seasonal or year-round recreation activities and associated facilities when the visitor's experience is not interdependent with attributes common in National Forest settings.	See responses provided for (1)(b).
(6)	Allow temporary activities that rely on existing facilities, such as concerts or weddings, even if they are not necessarily interdependent with a National Forest setting, provided they are enhanced by it. Do not authorize new permanent facilities solely for these activities.	N/A

1.6 Activity: Observation Tower

FSM Direction	Screening Criteria	Activity Findings
2343.14 (1)(b)	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	The tower design is modeled after traditional Forest Service fire lookout towers located throughout the western United States. The desired experience is dependent on the engagement with a forested mountain setting. The design and location of the tower utilize the natural resource attribute of vegetation (forested setting) and mountain scenery. Its layout and location within a forested stand allows users to recreate in a natural setting and provide an experience reliant on these natural features.
(1)(e)	To the extent practicable, harmonize with the natural environment of the site where they would be located by:	

(1)(e)(1)	Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape	The structure is visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape. **Design**: The tower is designed to avoid tree removal, blend with the existing trees and forest canopy, and utilize natural materials in its construction. BEIG concepts and criteria will be incorporated into final design. **Location and Layout**: In Alternative 2 (Proposed Action), the tower is located at the bottom of Horseshoe Bowl just below treeline. In Alternative 3, the tower is located adjacent to an existing hiking trail north of the top terminal of the Colorado SuperChair by the resort avalanche explosive cache area. **Height and Massing**: The tower design and height are the same under both alternatives. Tower height would be similar to the height of the surrounding vegetation and require limited or no tree removal.
(1)(e)(2)	Not requiring significant modifications to topography to facilitate construction or operations	Little modification to topography would be required to construct and operate the courses. Tower footings and support structures have minimal footprints to reduce soils disturbance.
(1)(f)	Not compromise snow sports operations or functions	Under Alternative 2, the tower is located at the bottom of Horseshoe Bowl. This will result in no substantial change in snow sports operations. The tower will have little, if any, effect on the winter sports user experience given the location of this structure and the amount of other similar terrain available within the resort. Under Alternative 3, given the tower's location away from ski routes and traffic, the location will result in no substantial change in snow sports operations.
(1)(g)	Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts.	No additional parking lots, lifts, or lodges will be required for this structure. The tower will be primarily accessed through existing lifts.
(7)	Encourage holders to utilize existing facilities to provide additional seasonal or year-round recreation activities.	
(4)	Factors that may affect whether other additional seasonal or year-round recreation activities and associated facilities besides those listed in paragraph 2 may be approved under paragraph 1 of this section include but are not limited to: The degree to which visitors are able to engage with the natural setting; The extent to which the activities and facilities could be expected to lead to exploration and enjoyment of other NFS lands; and The similarity of the activities and associated facilities to those enumerated in paragraph 2 or paragraph 3 of this section.	Observation towers are not listed in Paragraph 2 of the FSM direction. The tower is not an activity or ride as such but a guest facility designed to enhance the guest experience. It is more similar to a restaurant or guest service facility than an activity or structure consistent with SAROEA direction. It is consistent with direction in paragraph 3 of FSM 2343.11 – Policy: "*Encourage additional seasonal or year-round recreation opportunities that connect visitors to the natural environment and that may include a range of active to passive recreation, natural and cultural resource interpretation, and conservation education supporting the Forest Service's mission…*" Visitors are able to engage with the natural setting to a moderate degree. The tower allows little direct physical access to the natural environment yet will provide guests with elevated views of the surrounding vegetation and the Ten Mile range. The tower is designed to provide a unique interpretation opportunity to educate guests on agency history, natural

		resources, fire management, forest management and the surrounding environment. It is very likely that guests learning about the surrounding lands will desire to further explore those lands – inside the resort boundaries and beyond. The design and operation of the observation tower is similar to other facilities allowable and present on NFS lands. They are iconic structures on forested lands across the mountain west. Observation towers in many areas are available for rental for guests to further explore their public lands. Tower design not only follows BEIG and architectural guidelines; they represent the architectural goals and themes many guidelines aim to achieve. The structure would be similar in thematic design (color, line, form) as those facilities associated with the zip line, canopy tour and ropes course.
(5)	Do not approve additional seasonal or year-round recreation activities and associated facilities when the visitor's experience is not interdependent with attributes common in National Forest settings.	See responses provided for (1)(b).
(6)	Allow temporary activities that rely on existing facilities, such as concerts or weddings, even if they are not necessarily interdependent with a National Forest setting, provided they are enhanced by it. Do not authorize new permanent facilities solely for these activities.	N/A

1.7 Activity: Mountain Bike Trail System and Beginning Park

FSM Direction	Screening Criteria	Activity Findings
2343.14 (1)(b)	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	The design and location of the trails utilize all the natural resource attributes listed in the FSM definitions for natural resource-based recreation.
(1)(e)	To the extent practicable, harmonize with the natural environment of the site where they would be located by:	
(1)(e)(1)	Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape	The activity is visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape. Trails are situated throughout the mountain and given their lack of physical infrastructure, they blend in well with the surrounding environment and landscape. Small associated structures (rest area shelters) would be subordinate to the landscape and existing facilities.

		The beginner park would not include additional facilities or buildings. It would consist of low profile features that would be subordinate to the existing facilities (e.g. Peak 7 hut) and blend in well with the existing landscape.
(1)(e)(2)	Not requiring significant modifications to topography to facilitate construction or operations	Little modification to topography would be required to construct and operate the trails. While some trails would require some soils disturbance and earth work (for example: berming on mountain bike trails), overall impact would be minimal and insignificant as these trail prisms would maintain overall natural slope angles and mountain contours.
(1)(f)	Not compromise snow sports operations or functions	Trails are operated in summer and would be covered in snow during winter. None of the trails would compromise snow sports operations or functions. The skills park and associated infrastructure would be removed/covered with snow in the winter and not compromise snow sports operations.
(1)(g)	Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts.	No additional parking lots, lifts, or lodges will be required for this activity. Trails will be primarily accessed through existing lifts (Colorado and Independence SuperChairs) or base areas.
(7)	Encourage holders to utilize existing facilities to provide additional seasonal or year-round recreation activities.	
(4)	Factors that may affect whether other additional seasonal or year-round recreation activities and associated facilities besides those listed in paragraph 2 may be approved under paragraph 1 of this section include but are not limited to: The degree to which visitors are able to engage with the natural setting; The extent to which the activities and facilities could be expected to lead to exploration and enjoyment of other NFS lands; and The similarity of the activities and associated facilities to those enumerated in paragraph 2 or paragraph 3 of this section.	SAROEA and guiding direction considers mountain bike trails appropriate. The trails allow direct physical access to the natural environment and are designed and located to incorporate natural resource assets into the experience.
(5)	Do not approve additional seasonal or year-round recreation activities and associated facilities when the visitor's experience is not interdependent with attributes common in National Forest settings.	See responses provided for (1)(b).
(6)	Allow temporary activities that rely on existing facilities, such as concerts or weddings, even if they are not necessarily interdependent with a National Forest setting, provided they are enhanced by it. Do not authorize new permanent facilities solely for these activities.	N/A

1.8 Activity: Vista Haus Climbing Wall

FSM Direction	Screening Criteria	Activity Findings
2343.14 (1)(b)	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	The wall is based in other traditional, natural resource-based recreation activities that occur on other NFS lands. The harnesses, equipment and activity itself replicates traditional adventure, climbing and mountaineering activities. The desired experience and activity is dependent on the engagement with a forested mountain setting. The design and location of the climbing wall utilizes the natural resource attribute of mountain scenery. The layout and location within a mountain setting allows users to recreate in a natural setting and provide an experience reliant on these natural features.
(1)(e)	To the extent practicable, harmonize with the natural environment of the site where they would be located by:	
(1)(e)(1)	Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape	The activity is visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape. **Design**: The wall would be approximately 40 feet high and designed to blend in with the background environment. BEIG concepts and criteria will be incorporated into final design. **Location and Layout**: The wall is located adjacent to and on the periphery of existing snow sports infrastructure at the Peak 8 summit area at the top of Colorado SuperChair. **Height and Massing**: The wall will be constructed within a mountain location requiring limited to no tree removal. Wall height should blend in with the mountain backdrop and be screened by the Vista Haus facility.
(1)(e)(2)	Not requiring significant modifications to topography to facilitate construction or operations	Little modification to topography would be required to construct and operate the wall.
(1)(f)	Not compromise snow sports operations or functions	The wall is situated outside of existing ski runs and will result in no substantial change in snow sports operations. The climbing wall will have little, if any, effect on the winter sports user experience given the location of this structure and the amount of other similar terrain available within the resort.
(1)(g)	Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts.	No additional parking lots, lifts, or lodges will be required for this activity. The course will be primarily accessed through existing lifts.
(7)	Encourage holders to utilize existing facilities to provide additional seasonal or year-round recreation activities.	
(4)	Factors that may affect whether other additional seasonal or year-round recreation activities and associated facilities besides those listed in paragraph 2 may be approved under paragraph 1 of this section include but	SAROEA and guiding direction is silent on the appropriateness of climbing walls. Visitors are able to engage with the natural setting to a moderate degree. The climbing wall allows little direct physical access to the natural environment but is positioned

	are not limited to: The degree to which visitors are able to engage with the natural setting; The extent to which the activities and facilities could be expected to lead to exploration and enjoyment of other NFS lands; and The similarity of the activities and associated facilities to those enumerated in paragraph 2 or paragraph 3 of this section.	to provide great views of the Ten Mile range and the surrounding area. While the wall would be artificial rock, it would provide a very similar experience of rock climbing in the area. It is likely that guests participating in and learning about climbing in the outdoors will desire to further explore climbing, mountaineering, and similar activities on other NFS lands. The design and operation of the climbing wall is similar to other facilities present on NFS lands. The act of climbing on the wall is very similar to the experience that the ropes course provides; one that requires similar physical motion and endurance. Both require participants to be fully harnessed and attached to ropes as they engage in the activity.
(5)	Do not approve additional seasonal or year-round recreation activities and associated facilities when the visitor's experience is not interdependent with attributes common in National Forest settings.	See responses provided for (1)(b).
(6)	Allow temporary activities that rely on existing facilities, such as concerts or weddings, even if they are not necessarily interdependent with a National Forest setting, provided they are enhanced by it. Do not authorize new permanent facilities solely for these activities.	N/A