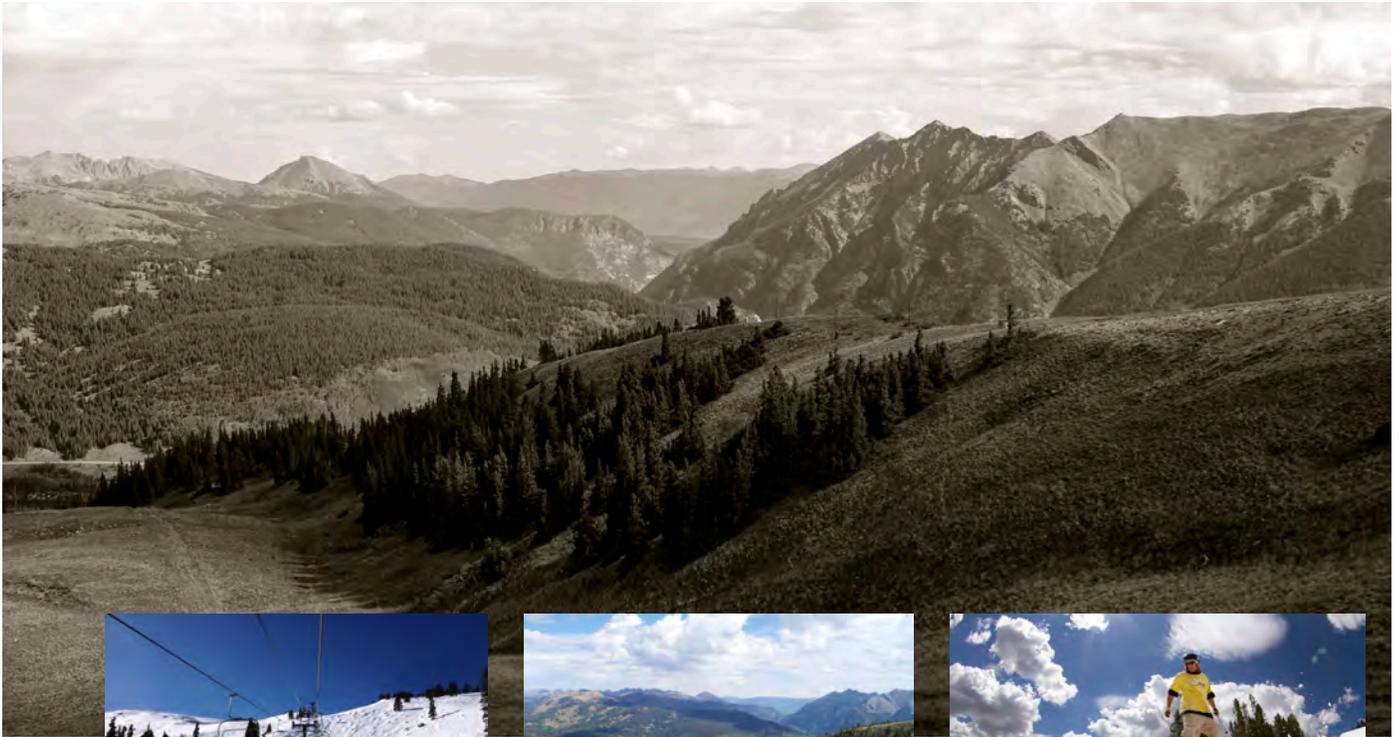




COPPER MOUNTAIN RESORT

2013 MOUNTAIN IMPROVEMENTS PROJECT

ENVIRONMENTAL ASSESSMENT



August 2013

USDA Forest Service
White River National Forest
Dillon Ranger District



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**COPPER MOUNTAIN RESORT
2013 MOUNTAIN IMPROVEMENTS PROJECT**

**ENVIRONMENTAL ASSESSMENT
SUMMIT COUNTY, COLORADO**

Proposed Action:
Copper Mountain Resort

Responsible Official:
Scott Fitzwilliams,
Forest Supervisor
White River National Forest
Glenwood Springs, CO

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Lead Agency:
USDA Forest Service
Dillon Ranger District
White River National Forest
Summit County, Colorado

Abstract: Copper Mountain Resort (CMR) operates under a Forest Service-issued special use permit (SUP) authorizing the use of 7,343 acres National Forest System (NFS) lands for the purposes of constructing, operating and maintaining a winter sports resort, including food services, rentals, retail sales, and other ancillary facilities. This Environmental Assessment (EA) has been prepared to analyze a proposal designed to improve the quality of the recreational experience at CMR, as well as add to CMR's operational efficiencies. The purpose of the proposed project is designed to:

- increase lift capacity and update antiquated lift infrastructure;
- enhance CMR's family atmosphere, learn-to-ski/ride experience, and teaching facilities;
- improve skier access, egress, and the on-snow experience at CMR; and
- improve CMR's environmental sustainability.

Components of the Proposed Action focus on addressing these needs through grading projects, new lifts, a new viewing deck, a teaching area, new trails and wind turbines.

This EA discusses the Purpose and Need for the proposal, the process used to develop alternatives, potential direct, indirect, and cumulative impacts of implementing the No Action Alternative (Alternative 1) and the Proposed Action (Alternative 2), and project design criteria (PDC). A Decision Notice and Finding of No Significant Impact has been prepared along with this EA. Forest Supervisor Fitzwilliams has approved the Proposed Action—analyzed as Alternative 2 in this EA.

Important Notice: The CMR 2013 Mountain Improvements Project was announced to the public through a Notice of Proposed Action published in the Glenwood Springs Post Independent on February 8, 2013, which initiated a 30-day public comment period. Because no substantive comments expressing concerns, or only supportive comments, were received during the comment period, the Forest Supervisor's decision is not subject to appeal per 36 CFR 215.6.

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LIST OF ACRONYMS

AADT	Average Annual Daily Traffic
AAQS	Ambient Air Quality Standards
ADT	Average Daily Traffic
AF	Acre-feet
AMSL	Above Mean Sea Level
AVO	Average Vehicle Occupancy
BA	Biological Assessment
BE	Biological Evaluation
BEIG	Built Environment Image Guide
BMP	Best Management Practice
CAA	Clean Air Act
CCC	Comfortable Carrying Capacity
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CWA	Clean Water Act
DMP	Drainage Management Plan
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EO	Executive Order
ESA	Endangered Species Act
FIS	International Ski Federation
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Geographic Information System
ID Team	Interdisciplinary Team
LRMP	Land and Resource Management Plan
MA	Management Areas
mg/l	Milligrams per liter
µg	Micrograms
MIS	Management Indicator Species
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxide

NOI	Notice of Intent
NRHP	National Register of Historic Places
PDC	Project Design Criteria
PM _{2.5}	Particulate Matter under 2.5 microns
PM ₁₀	Particulate Matter under 10 microns
PPH	People Per Hour
PSD	Prevention of Significant Deterioration
ROD	Record of Decision
SAOT	Skiers-at-one-time
SIO	Scenic Integrity Objective
SO ₂	Sulfur Dioxide
SUP	Special Use Permit
TES	Threatened, Endangered, and Sensitive species
TMDL	Total Maximum Daily Load
TOC	Threshold of Concern
USACE	US Army Corps of Engineers
USC	United States Code
USCA	United States Code Annotated
USDA	United States Department of Agriculture
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WCPH	Watershed Conservation Practices Handbook
WEPP	Water Erosion Prediction Project
WIZ	Water Influence Zone
WRNF	White River National Forest

Chapter 1

Purpose and Need

1. PURPOSE AND NEED

A. INTRODUCTION

The Proposed Action analyzed in this document constitutes a federal action which has the potential to affect the quality of the physical, biological and 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 White River National Forest (WRNF) has prepared this Environmental Assessment (EA) in compliance with NEPA and other relevant federal and state laws and regulations. This EA 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 from implementation of the Proposed Action. Additionally, it is intended to ensure that planning reflects the environmental and social values of the project area and that potential resource conflicts are minimized or avoided. The document is organized into six chapters:

- **Chapter 1 – Purpose and Need:** includes 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 (scoping).
- **Chapter 2 – Description of Alternatives:** provides a detailed description of the two alternatives that are analyzed in detail—No Action and the Proposed Action. This discussion also includes alternatives considered but eliminated from further analysis and Management Requirements and Project Design Criteria.
- **Chapter 3 – Affected Environment and Environmental Consequences:** provides a description of the affected environment (i.e., existing conditions) according to resource area and describes the environmental consequences of implementing the No Action Alternative and the Proposed Action. Chapter 3 is organized by resource topic.
- **Chapter 4 – Consultation and Coordination:** provides a list of preparers and agencies consulted during the preparation of this EA.
- **Chapter 5 – References:** provides complete references for documents cited within this EA.
- **Chapter 6 – Figures:** includes the figures that are referred to throughout the analysis.
- **Appendices – Appendix A: Cumulative Effects:** includes a table of cumulative effects projects and project descriptions.

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 WRNF.

B. BACKGROUND

Copper Mountain Resort (CMR) opened to the public in 1972 and operates under a Forest Service-issued special use permit (SUP) authorizing the use of 7,343 acres National Forest System (NFS) lands for the purposes of constructing, operating and maintaining a winter sports resort, including food services, rentals, retail sales, and other ancillary facilities. CMR is located partially on private land, and partially on the WRNF, in Summit County, Colorado. The vast majority of the skiing facilities (i.e., the lifts and trails) are located on NFS lands. The ski area is located approximately 75 miles west of Denver, and 20 miles east of Vail. The closest town is Frisco, which is approximately 7 miles northeast of the resort. CMR is accessed via exit 195 off of Interstate 70, and is located immediately adjacent to the interstate. The existing ski area provides approximately 2,488 acres of total skiable terrain. Elevations range from 9,710 feet at the base of the mountain to 12,300 feet at the summit.

C. RELATIONSHIP TO PREVIOUS ANALYSIS AND APPROVALS

This EA is consistent with, and incorporates by reference, two previous approvals under NEPA which are related to the management of CMR on NFS lands and germane to this current analysis. These documents are important to the scope of the current analysis as this EA relies on these previous approvals for authorization of overstory vegetation removal associated with several of the proposed projects.

The *2002 Copper Mountain Resort Environmental Assessment Kokomo Lift and Teaching Terrain Improvements and DN/FONSI*, approved Alternative 3 and all mitigation measures. This Decision included the installation of an upgraded Kokomo Lift (including 6.9 acres of overstory vegetation removal), development of the Kokomo Teaching Area (including 12.3 acres of overstory vegetation removal) and all necessary roads, snowmaking and power (including 0.2 acre of overstory vegetation removal). Total disturbance approved in this DN/FONSI was 32.4 acres of disturbance. The overstory vegetation removal approved for the Kokomo Lift realignment and upgrade provides the approval for the minimal overstory vegetation removal for the Kokomo Lift project assessed within this document.

The *2006 Copper Mountain Resort Trails and Facilities Improvements, Final Environmental Impact Statement and ROD (2006 ROD)* approved Alternative 5, with modifications. The 2006 ROD approved new trails, new snowmaking infrastructure and coverage, lifts, roads, buildings, guest services and infrastructure. The approved alternative also included 43 acres of programmatic/miscellaneous tree removal allocated by sub-watershed. However, to minimize potential impacts to stream health, the approval for miscellaneous tree removal precluded any clearing which would be completed within a Water Influence Zone (WIZ). Therefore, any projects requiring tree removal within a WIZ are not eligible to be authorized under the 43-acre miscellaneous approval. Within this analysis, tree removal for the proposed T-Rex connector trail, Enchanted Forest Access, and Woodward and Terrain Park Viewing

Deck relies upon the miscellaneous tree removal authorized by the 2006 ROD. In addition, in accordance with the terms of the SUP, CMR completed an update to the resort's Master Development Plan (MDP) in 2011 to outline plans for future development and improvements on NFS lands within the SUP area. All of the projects in this proposal are identified in, and consistent with, CMR's 2011 MDP, which has been reviewed and accepted by the WRNF. Consequent to accepting the MDP, the WRNF is now initiating a site-specific review and assessment as required by NEPA.

The 2011 MDP is designed to improve the overall recreational experience at CMR by accommodating existing and future guest expectations. Proposed projects specifically address: the resort's family atmosphere; on-mountain experience; teaching opportunities; lift infrastructure; environmental sustainability; and resort maintenance/operations.

Prior to the 2011 MDP, the WRNF prepared a Final Environmental Impact Statement (EIS) for a broad array of proposed projects at CMR. In January 2006, a Record of Decision (ROD) approved Alternative 5, as analyzed in detail in the Final EIS. However, due to changes in ownership and direction at CMR, few of the projects approved in that 2006 ROD have been implemented at this time. The 2006 Final EIS/ROD is relevant to CMR's 2013 Mountain Improvements Project because many of the currently proposed projects have similar or identical impacts to projects which were previously analyzed and approved. Thus, both the survey work and analysis that were conducted as part of the 2006 Final EIS process are still applicable and are tiered to in this EA, as appropriate.

D. PURPOSE AND NEED FOR THE PROPOSED ACTION

The Purpose and Need for Action is focused on improving the quality of the recreational experience at CMR, as well as add to CMR's operational efficiencies.

Need #1: Increase Lift Capacity and Update Antiquated Lift Infrastructure

Several lifts at CMR are antiquated, slow, and/or under-sized, which collectively has led to sub-optimal guest service and insufficient lift capacity. Especially during peak days, several of CMR's existing lifts do not meet the needs of guests or ski area managers in terms of long lift lines and choices for access to various areas of the mountain. Furthermore, the existing lifts constrain areas of the mountain which could be better utilized for teaching terrain.

Need #2: Enhance Copper Mountain's Family Atmosphere, Learn-to-Ski/Ride Experience, and Teaching Facilities

CMR is committed to promoting a family-friendly atmosphere and an outstanding learning experience. The resort is well-known for its teaching facilities, and especially for Woodward at Copper—the ski and snowboard training center—and associated on-mountain facilities. Maintaining an innovative and high quality family and learning experience requires constant attention to facilities, infrastructure, and services.

Need #3: Improve Skier Access, Egress, and the On-Snow Experience

Currently, there are a number of areas across CMR that present challenges for skiers and ski area managers. These include access trails between key areas of the mountain, egress areas, and areas surrounding existing infrastructure that could be improved for better maintenance and a more enjoyable on-snow experience. With CMR's extensive trail system, it is important to continuously identify areas that present challenges to providing logical and efficient movement between key areas of the mountain.

Need #4: Improve CMR's Environmental Sustainability

It is an ongoing goal of CMR to improve the resort's environmental sustainability through increased use of renewable energy. Considering the outstanding wind resources available at CMR, wind turbines present a great opportunity to partially offset some of the resort's power needs.

E. SUMMARY OF THE PROPOSED ACTION

The following projects are proposed to fulfill the needs described in the preceding section.

1. Lower Roundabout Grading
2. Kokomo Lift Replacement and Teaching Facilities
3. Woodward and Terrain Park Surface Lift
4. West Ridge Surface Lift
5. T-Rex Connector Trail
6. Enchanted Forest Improved Access
7. Spaulding Bowl Run-out Trail
8. Sierra Lift Tower Grading
9. Union Peak Wind Turbines
10. Woodward and Terrain Park Viewing Deck

**Table 1-1:
Summary of Projects as Related to Needs**

Proposed Project	Need #1	Need #2	Need #3	Need#4
Lower Roundabout Grading		x	x	
Kokomo Lift Replacement and Teaching Facilities	x	x		
Woodward and Terrain Park Surface Lift	x	x		
West Ridge Surface Lift	x			
T-Rex Connector Trail			x	
Enchanted Forest Improved Access			x	
Spaulding Bowl Run-out Trail			x	
Sierra Lift Tower Grading			x	
Union Peak Wind Turbines				x
Woodward and Terrain Park Viewing Deck		x		

F. PUBLIC INVOLVEMENT

Consistent with direction found in 36 CFR §215.5 (Legal Notice of Proposed Actions), the Proposed Action was published by the WRNF as a Notice of Proposed Action (NOPA) on February 8, 2013 in the Glenwood Springs Post Independent. The NOPA was prepared to solicit public comments on the Purpose and Need for Action, the Proposed Action and alternatives to the Proposed Action. Following the legal notice, the public had the opportunity to comment for 30 days; this constituted the only opportunity to comment on this project prior to release of the decision notice.

The WRNF received four comment letters: one from the Summit County Planning Department, one from the Summit County Board of County Commissioners, and two from members of the public.

Following the NOPA legal notice and comment period, the WRNF decided to remove the Storm King surface lift replacement out of the Proposed Action and review it as a Categorical Exclusion (CE). No substantive comments were received regarding the Storm King project; only one supporting comment was made by a member of the public. Given that the project was a lift replacement in its current alignment, this course of action was deemed appropriate. The Decision Memo for the CMR Storm King Surface Lift Replacement was signed by Scott Fitzwilliams, Forest Supervisor, on May 16, 2013.

G. ISSUES AND INDICATORS

Issues are unresolved conflicts that arise as a result of the Proposed Action. Through internal and public scoping, the Forest Service has identified the following issues that will be analyzed in detail in this EA. Analytical indicators are provided for each issue. In addition, Project Design Criteria (PDC) and Best Management Practices (BMPs)—identified to avoid or minimize impacts to resources—are included in Chapter 2.

HUMAN ENVIRONMENT

Recreation

Issue: By design, proposed projects would alter the recreational experience at CMR, particularly for beginners and families.

Analytical Indicators & Requirements:

- Discussion of CMR's ability to accommodate skiing of all ability levels, particularly beginners and families.
- Quantitative and qualitative analysis of existing and proposed guest service facilities and infrastructure.

Scenery

Issue: Proposed projects within CMR's developed lift and trail network may be visible from identified critical viewpoints.

Analytical Indicators & Requirements:

- Discussion of the Scenic Integrity Objectives (SIO) for the project area, as defined by the 2002 WRNF Land and Resource Management Plan.
- Documentation of the incremental effects to the scenic environment resulting from implementation of the proposed projects compared to historic landscape alterations within the SUP area.
- Discussion of the Forest Service's Built Environment Image Guide (BEIG) as applicable to proposed facilities.
- Viewshed analysis, from identified critical viewpoints, of proposed landscape alterations as compared to the existing condition.

Cultural Resources

Issue: Proposed projects and associated ground disturbing activities may affect known or unidentified cultural resources.

Analytical Indicators & Requirements:

- Summary of cultural surveys completed to date in the vicinity of the project area.
- Inventory project area for cultural resources and historic properties.

Social and Economic Resources

Issue: Proposed projects may affect the social and economic well-being of Summit County, particularly related to its recreation and tourism based economy.

Analytical Indicators & Requirements:

- Discussion of the socio-economic resources that would potentially be affected, including population, housing and the recreation industry.

BIOLOGICAL ENVIRONMENT

Wildlife and Aquatic Species

Issue: Implementation of proposed projects (including construction and use) could affect Threatened, Endangered and Sensitive (TES) and Management Indicator (MIS) wildlife and aquatic species.

Analytical Indicators & Requirements:

- Potential for the project to affect habitat for Region 2 Sensitive, Management Indicator, and Threatened/Endangered/ Candidate species.
- Analysis of physical stream health in the project area and the effects on aquatic life.
- Assessment of trout and macroinvertebrate populations in project area streams and at reference sites as based on field surveys.
- Documentation of presence/absence of, and impacts to, sensitive amphibians and their habitat within the project area.
- Identification of Lynx Analysis Unit (LAU) boundaries in relation to the project area; and documentation of vegetation alterations' impacts to lynx habitat.

Vegetation

Issue: Plant communities (including Threatened, Endangered, and Sensitive [TES] species, WRNF Species with an Identified Viability Concern [SIVC] and invasive plant species) may be impacted as a result of proposed projects.

Analytical Indicators & Requirements:

- Identification of threatened and endangered plant species and habitat present in the project area.
- Identification of Region 2 sensitive plant species and habitat present in the project area.
- Identification of WRNF species with an identified viability concern and habitat present in the project area.
- Quantification (acreage) of proposed ground disturbance and overstory vegetation removal.
- Identification of invasive species in the vicinity of the project area and use of BMPs to limit their spread.

Soils

Issue: Proposed ground disturbance may (individually and/or collectively) increase erosion and reduce soil organic matter.

Analytical Indicators & Requirements:

- Discussion of site-specific soil conditions and baseline inventory of soil organic matter.
- Area (acres) of temporary and permanent disturbance according to high/moderate/low erodibility soils classes.
- Analysis of increased erosion hazard due to ground disturbance.
- Analysis of slope stability and geological constraints associated with project components.

Watershed

Issue: Proposed ground disturbance (e.g., clearing and grading) may contribute sediment and reduce stream bank stability in on-mountain drainages and affect riparian habitat, wetlands and fisheries.

Issue: Project activities may cause changes in surface and groundwater hydrology that support streams and wetlands.

Issue: Proposed ground disturbance (e.g., clearing and grading) may affect the quantity of wetlands within the Project Area.

Analytical Indicators & Requirements:

- Identification/quantification of waters of the U.S., including wetlands in the vicinity of the project area.
- Identification of any Clean Water Act (CWA) impaired or threatened waterbody segments in the project area.
- Identification of clearing and grading in the Water Influence Zone (WIZ).
- Quantification of connected disturbed areas (CDA) in the vicinity of the project area.
- Quantification of changes in water yield or discharge to receiving streams from proposed grading.
- Narrative description of effects to wetland functions and values.

H. ISSUES NOT ADDRESSED

The following topics were not included in the EA, as the scope and scale of any potential effects related to them would be small and immeasurable:

- Traffic and Parking
- Air Quality

I. SCOPE OF THE ANALYSIS

Based on preliminary internal Forest Service analysis and external public scoping, and evaluation of the context and intensity factors contained in 36 CFR 1508.27, the Forest Service determined early on that an EA is appropriate to review, analyze, and document the potential impacts to the human, physical and biological environment anticipated to result from implementation of the Proposed Action.

Scope consists of the range of actions, alternatives, and impacts to be considered within this environmental analysis. It includes the geographical, spatial, and temporal boundaries associated with the actions, alternatives, and impacts. Individual project elements are discussed in detail in Chapter 2 and illustrated in Figure 2-1. A detailed scope of this environmental analysis is presented at the beginning of each resource section in Chapter 3.

The Council on Environmental Quality (CEQ) has regulations for implementing NEPA that require federal agencies to consider the following types of actions, alternatives, and impacts in an environmental document.¹

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 environmental document.
- 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.

J. CONSISTENCY WITH FOREST SERVICE POLICY

LAND AND RESOURCE MANAGEMENT PLAN CONSISTENCY

CMR'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 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

¹ 40 CFR 1508.25

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.”²

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 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.”³

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.”⁴

K. OTHER NECESSARY PERMITS, LICENSES, ENTITLEMENTS AND/OR CONSULTATION

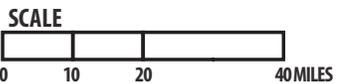
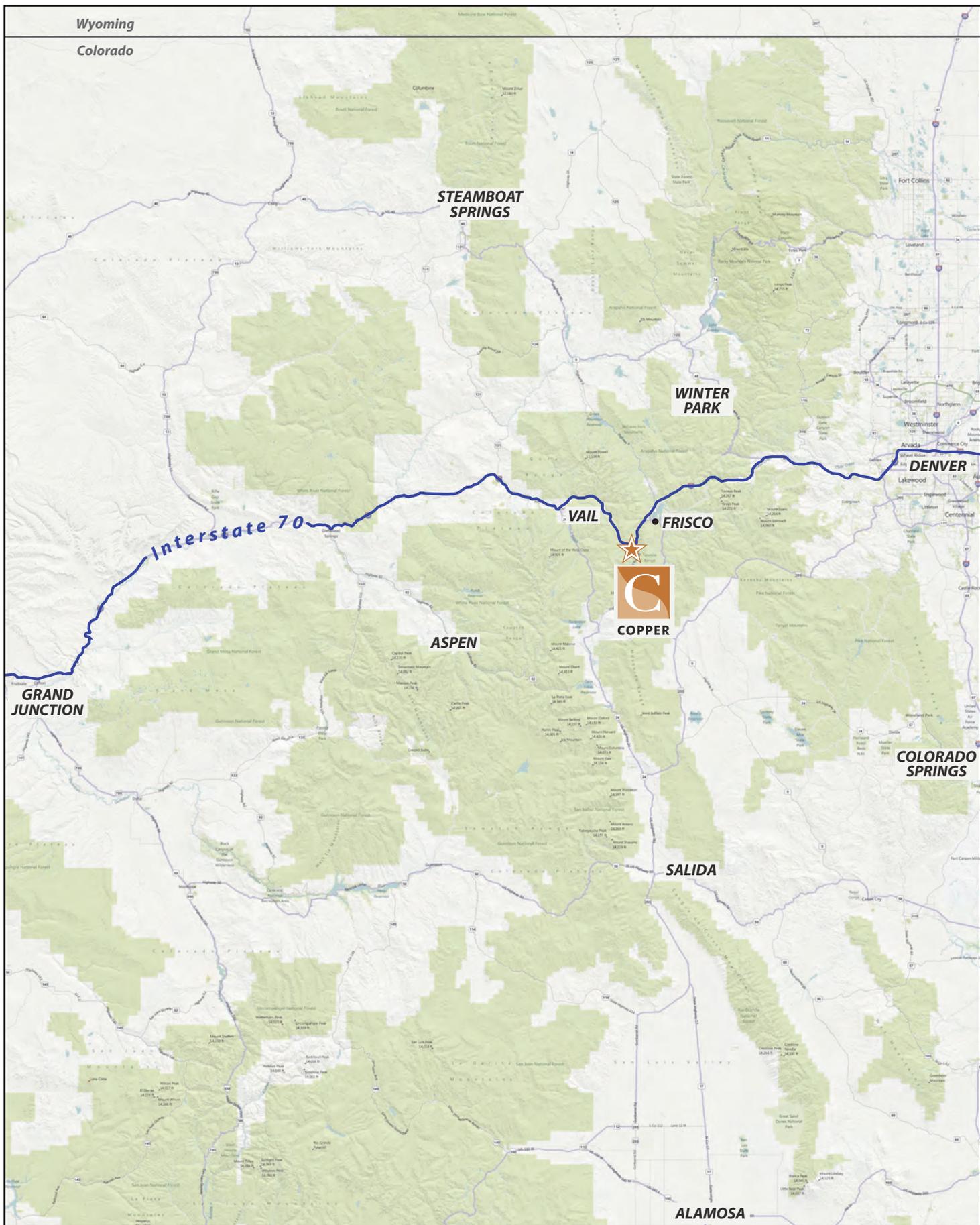
The Forest Service decision would apply only to NFS lands analyzed within this EA. However, other federal, state, and local entities may also have jurisdiction. Decisions by jurisdictions to issue or not issue approvals related to this proposal may be aided by the analyses presented in this EA. While 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
- Comply with Colorado Department of Public Health and Environment Stormwater Construction Activities Permit
- Summit County General Construction Permit
- Comply with the Army Corps of Engineers

² USDA Forest Service, 2002 p. 3-80

³ Ibid. p. 2-31

⁴ Ibid. p. 3-80



VICINITY MAP

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. The alternatives considered are presented in comparative form. Project Design Criteria (PDC) 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.⁵ Both CEQ Regulations and Forest Service Handbook direction emphasize that alternatives must meet the “reasonableness” criteria in order to warrant detailed analysis.

The issues raised during the scoping process (detailed in Chapter 1) were utilized as the basis for determining the need for alternatives to the Proposed Action.

B. ALTERNATIVES CONSIDERED IN DETAIL

NO ACTION

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

CMR’s skiable terrain totals 2,488 acres, including developed terrain on 125 trails totaling approximately 1,377 acres, and approximately 1,111 acres of undeveloped bowls and gladed skiing. All ability levels are served, from Beginner to Expert. The lift network consists of 21 ski lifts, including one high speed six-passenger lift, four high speed four-passenger chairs, five fixed-grip three-passenger chairs, five fixed-grip two-passenger chairs, two surface tows, and four conveyors. Under the No Action Alternative, CMR’s terrain and lift network would remain in its current extent and configuration.

PROPOSED ACTION

Components of the Proposed Action focus on addressing the needs that were identified in Chapter 1. Each proposed project element is identified on Figure 2. If approved, construction of the proposed improvements would occur primarily in the summer months and, given the short construction season at CMR’s higher elevations, could be expected to be completed over multiple construction seasons. In conjunction with any approved ground disturbing activities, BMPs would be implemented to avoid or minimize resource impacts (e.g., soil, water and vegetation). All disturbed areas will be revegetated and stabilized promptly.

⁵ USDA Forest Service, 2011

Lower Roundabout Grading

The existing width of the lower Roundabout trail is constrained immediately above the Union Creek base area and the base of the Kokomo Lift. This narrow area has never been remedied due to a large earthen berm in the current location of tower 3 of the Kokomo Lift and the presence of Union Creek where it enters a culvert and flows under the ski trail. As the Kokomo Lift is replaced, and tower 3 is removed/moved (described below), there would be an opportunity to re-grade and improve this present choke point. The project would entail re-contouring the current ski trail to establish a consistent skiable grade (+/-10 percent) for guests as they flow into the base area. Approximately 3.9 acres of ground disturbance, including 3.4 acres of re-grading an existing trail, 0.1 new grading and 0.4 acres of tree removal, would also be required to establish the necessary width. While the majority of this project would be located on private property, the disturbance area does extend onto adjacent National Forest System lands. The total project area on National Forest System land is approximately 1.6 acres.

Kokomo Lift Replacement and Teaching area

The existing Kokomo three-passenger chairlift is planned to be replaced with a new chairlift. The lift's top terminal would be located in approximately the same position as the existing Kokomo top terminal. The bottom terminal would be located adjacent to the Union Creek base facilities, on National Forest System land. This new lift would be used for round trip skiing as well as to transport beginning skiers and riders to two conveyor surface lifts that are planned for ease of access from the Kokomo Lift, on the gentle terrain north of the lift's top terminal. These conveyors and slopes would be used by CMR's Ski and Ride school, especially on peak days when overflow teaching terrain is needed. The proposed Kokomo Lift would be approximately 3,000 feet in length (it is currently 2,642 feet in length) and have a capacity of 1,800 people per hour. Roughly half of the new lift alignment would be located on private property.

Woodward and Terrain Park Surface Lift

A surface lift is planned to be located immediately to the west of the Catalyst Terrain Park features. The surface lift would be adjacent to the Union Creek Express Lift, providing roundtrip access to the Catalyst Terrain Park. This lift would primarily facilitate summer camps, which are presently hosted in conjunction with the Woodward training program, but would also be available to run in the winter at CMR's discretion. Roughly 1,080 feet in length, the lift would have a capacity of 600 people per hour and be located to the skier's left (west side) of *Loverly* trail. Minimal vegetation clearing on NFS lands would occur, totaling 0.2 acre.

West Ridge Surface Lift

Facilitating access into Copper Bowl, a surface lift is proposed to be located west of the existing Sierra Lift in the Union Meadows area. Presently, guests wishing to access Copper Bowl must hike from atop the Sierra Lift to gain the ridge which allows them to drop into Copper Bowl. The proposed surface lift would allow guests to ride the Sierra Lift, ski to the west and take the surface lift to the ridge and thereby

to Copper Bowl. This lift would be approximately 850 feet in length and have a capacity of 800 people per hour. To protect the lift from windscour, a snow fence would be installed along the windward (west) side of the lift for the majority of its length. Single phase power is present to the top of the existing Sierra Lift. At this time, CMR anticipates that an additional power line would need to be installed from the primary feed located near the Timberline Patrol station to the bottom terminal of the planned surface lift. The additional power line would be “stung” into the ground using a dozer and vibrating shoe, as was the existing power line in the mid-1990s. A short (465 feet) spur off on an existing access road would need to be constructed to reach the bottom terminal location. While equipment would be necessary at the top terminal location, access would be gained via a temporary construction access route without the need for a road.

T-Rex Connector Trail

The proposed T-Rex Connector trail would provide improved circulation for guests wishing to ski from within the Timberline Express, Union Creek Express, and Kokomo/Lumberjack/Union Creek areas. The existing terrain connection between these areas requires skiers and riders to utilize the Lower Woodwinds Traverse trail. This trail is low angle and off-camber making it difficult for skiers and very challenging for snowboarders. The planned trail would originate near the bottom terminal of the Timberline Express Lift and terminate adjacent to the top of the Kokomo Lift. This connector trail would be roughly 2,125 feet in length, have an average width of 50 feet and require approximately 2.3 acres of vegetation clearing. Additionally, ground re-contouring would be required in places (approximately 0.9 acre) to ensure an even, skiable grade along the length of the entire trail.

Enchanted Forest Access

The existing entrance to the popular Enchanted Forest trail is presently a narrow and winding track created each season via an assortment of portable snow fencing and extensive hand shoveling. The guest experience in this area remains poor throughout the season. To remedy this challenge, CMR proposes to rework the entrance through a combination of grading, rockwork (which may include rock stacking, blasting and relocation), and the construction of retaining wall segments on both the downhill and uphill sides of the traverse. Additionally, a structural boardwalk may be constructed in sections of the traverse to provide a skiable surface. The overall length of the traverse to be improved is approximately 1,150 feet and incorporates roughly 1.2 acres of grading. While the final design of the project has not yet been completed, the overall goal would be to ultimately create a new trail entrance, which is groomable and roughly one snowcat in width (+/-25 feet).

Spaulding Bowl Run-out Trail

The egress area of Spaulding Bowl is presently characterized by large boulders and talus which requires extensive snow cover before it can be open to the public for skiing. In many instances, the upper areas of Spaulding Bowl become skiable before CMR is able to open the egress trail. This proposed project would

recontour and smooth an adequate path out of the base of the bowl to allow grooming and skiing earlier in the season. Construction techniques would include rock removal, relocation and potentially blasting. Approximately 1,560 feet in length and varying width, the proposed grading area would be approximately 1.4 acres in total size. Of this total, 0.8 acre (910 linear feet) would be on National Forest System land with the remainder on private property owned by Powdr Corp.

Sierra Lift Tower 7 Grading

Since the original construction of the Sierra Lift, the terrain immediately surrounding tower 7 has been problematic for skiing, grooming and snow retention. CMR proposes to grade, smooth and rock pick this area to create a more easily prepared skiing surface and to remove the abrupt break-over. The total area proposed for disturbance is approximately 1.2 acres. The site would receive full revegetation/reclamation at the completion of the grading project.

Union Peak Wind Turbines

Furthering its commitment to sustainability and use of renewable energy, CMR proposes to install two vertical wind turbines in the vicinity of the Union Peak Ski Patrol Station. Capable of generating up to 2,000 kilowatt hours per year, these turbines would be approximately 24 feet in height and have a circumference of roughly 24 inches. They would be mounted on small concrete footers.

Woodward and Terrain Park Viewing Deck

Enhancing the Catalyst Terrain Park, a new viewing deck is proposed to be constructed around the existing “sound shack” located mid-way along the park adjacent to A-Road. Constructed primarily of wood, the deck would be approximately 25 feet by 37 feet in size. A minimal amount of tree clearing may be necessary to provide space behind the existing building.

**Table 2-1:
Summary of the Proposed Action**

Project Component	Linear Length (feet)	Veg. Clearing on NFS (acres)	Veg. Clearing on Private (acres)	Disturbance Area on NFS (acres)	Disturbance Area on Private (acres)
1. Lower Roundabout Grading	n/a	0.4	0.02	0.9	2.7
2. Kokomo Lift Replacement	2,900	0.3	1.2	ground dist. for towers	ground dist. for towers
3. Kokomo Teaching Facilities	n/a	0.5	0.1	1.8	0.3
4. Woodward and Terrain Park Surface Lift	1,080	0.2	n/a	0.2	n/a
5. West Ridge Surface Lift	850	n/a	n/a	n/a	n/a
6. T-Rex Connector Trail	2,125	2.3	n/a	0.7	0.7
7. Enchanted Forest Access	1,150	n/a	n/a	1.2	n/a
8. Spaulding Bowl Run-out Trail	1,560	n/a	n/a	1.4	n/a
9. Sierra Lift Tower 7 Grading	n/a	n/a	n/a	1.2	n/a
10. Union Peak Wind Turbines	n/a	n/a	n/a	<0.1	n/a

Note:

West Ridge surface lift includes constructing a 970-foot long snow fence and a 475-foot long utility trench.

C. MODIFICATIONS MADE TO PROPOSED ACTION

As mentioned in Chapter 1, the Proposed Action originally included the Storm King surface lift replacement. That project was removed from the Proposed Action and reviewed separately as a Categorical Exclusion, given that there were no substantive public comments received on it and because of its inconsequential nature as a lift replacement.

D. MANAGEMENT REQUIREMENTS INCORPORATED INTO PROPOSED ACTION (ALTERNATIVE 2)

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

PDC are devised in the pre-analysis and analysis phases to reduce environmental impacts that must be complied with by law and/or regulation. They include, but are not limited to, BMPs, standards and guidelines, and standard operating procedures.

PDC were designed by the Forest Service and specialists involved in this analysis. The potential effects of implementing the Proposed Action (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. The bulk of the PDC are considered common practices that 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 CMR and the Forest Service. In all cases, the ultimate enforcement mechanism for implementation of the specified PDC would be the Decision Notice and would extend from the Forest Supervisor to the District Ranger, to the Forest Service SUP Administrator.

**Table 2-2:
Project Design Criteria and Best Management Practices**

RECREATION
During construction, notices will be placed on trailheads and in the base village informing users of temporary trail closures and the location of construction activities.
SCENERY
Structures will be constructed of materials which blend with the landscape character, as is practicable, and shall meet FSM 2380 policy for color and reflectivity, which is 4.5 on the Munsell neutral value color scale.
To the extent possible, site grading will blend disturbance into the existing topography to achieve a natural appearance and minimize cuts and fills at the transition with proposed grading and existing terrain.
Utilities must be buried.
All disturbed areas shall be promptly revegetated after the site has been satisfactorily prepared.
All proposed facilities need to 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 will be covered, painted, stained, chemically treated, etched, sandblasted, corrugated, or otherwise treated to meet the solar reflectivity standards.
All proposed facilities need to meet color guidelines. Bright colors are inappropriate for the forest setting. The colors will be muted, subdued colors to blend with the natural color scheme. The Forest Service Handbook No. 617, "National Forest Landscape Management for Ski Areas, Volume 2, Chapter 7," refers recommended colors for ski areas on page 37 of that handbook. The colors are darker colors—greens, browns, navy blue, grays and black.
CULTURAL RESOURCES
Although site-specific surveys have been conducted, if undocumented historic and/or prehistoric properties are located during ground disturbing activities or planning activities associated with approved construction activities, they will be treated as specified in 36 CFR 800.11 concerning Properties Discovered During Implementation of an Undertaking.
WILDLIFE AND AQUATIC SPECIES
All construction activities will be confined to daylight hours, excluding emergencies.
Construction workers are prohibited from bringing dogs to the construction site.
Per Forest Service (Table ROD-4, #24–#27) direction, under which all proposed projects, other than lower Roundabout grading, considered herein were previously approved, CMR shall implement a compensatory conservation measure to minimize impacts resulting from the permanent loss of 2.38 acres of lynx winter foraging habitat on NFS lands.
Permanent (i.e., non-removable) sections of wind/snow fence will be no longer than approximately 100 yards without a gap to allow big game (e.g., elk and mule deer) movement. A barrier effect could be avoided by leaving approximate 12-foot wide gaps in the fence approximately every 100 yards and (a) installing temporary fencing across the gap at the beginning of the ski season and removing it at the end of the season (preferable), or (2) installing parallel, permanent, +/- 30-foot fence sections offset to the west from the main fence at each gap to function as a gate. A Forest Service resource specialist will approve the fence design. See the elk discussion in the MIS section for additional consideration re: fencing.
If boreal owl nests are detected within impact areas, direct mortality of eggs and/or nestlings could be avoided by conducting tree removal in potential nesting habitat outside of the May 21 to July 15 nesting (with eggs/young) period.

**Table 2-2:
Project Design Criteria and Best Management Practices**

<p>If olive-sided flycatcher nests are detected within impact areas, direct mortality of eggs and/or nestlings could be avoided by conducting tree removal in potential nesting habitat outside of the June 1 and July 15 nesting period.</p>
<p>If American pipit nests are detected within impact areas, direct mortality of eggs and/or nestlings could be avoided by conducting ground disturbing activities in potential nesting habitat outside of the June 22 to August 3 nesting (with eggs/young) period. In the event that ground disturbing activities cannot be scheduled outside of the June 22 to August 3 nesting period of the American pipit and the decision maker thinks avoidance of potential impacts to individual nests is warranted, the staked lift and fence corridors (each approximately 10 meters wide) could be surveyed by a qualified wildlife biologist prior to any ground disturbing activities to confirm that pipit nesting is not occurring. In the event that a nest(s) is located within proposed impact areas, an area with a radius of approximately 5 meters around the nest will be appropriately marked to exclude entry by construction personnel during the June 22 to August 3 nesting period, or until the nestlings fledge. A Forest Service wildlife biologist will approve the methodology and results of any such survey and authorize ground disturbance to proceed.</p>
<p>Macroinvertebrates data within Union Creek will be collected and analyzed in 2013 to establish an environmental baseline. If the bug analysis comes back showing the population is diminished then additional design criteria would be identified by Forest Service specialists.</p>
<p>VEGETATION</p>
<p>Since the site-specific field survey of the Woodward and Terrain Park Surface Lift was conducted on July 26, 2012, its proposed location was moved out of the linear intertrail island to the east of the existing <i>Loverly</i> trail and is now proposed to be sited along the skier’s left side of the trail. Therefore, only the upper one-third of the proposed disturbance area on the existing trail was adequately surveyed for plants during the July 26 survey. Prior to project construction, the remaining portion of the proposed disturbance area on the existing ski trail will be surveyed by a qualified botanist to clear it of plants of potential concern (<i>Botrychium</i> is unlikely, but the most likely of any sensitive plant to be present).</p>
<p>Disturbance areas identified by the Forest Service as requiring re-vegetation will be reseeded using native species where feasible, preferably collected from local genetic stock or seed available from local Forests’ Native Plant Materials programs. (Forest Plan Biodiversity Standard #1; Forest Plan Biodiversity Guideline #1; FSM 2070)</p>
<p>All mulch, hay and straw used shall be certified weed-free. A seed mix will be approved by the Forest Service. (Forest Plan Weeds Standard #3)</p>
<p>A re-vegetation plan will be prepared, including measures to adequately establish desirable vegetation.</p>
<p>NOXIOUS WEEDS</p>
<p>1) To minimize the spread of noxious weeds during construction, the following measures will apply:</p> <ol style="list-style-type: none"> a. Construction equipment will be cleaned prior to entry onto NFS land. b. Equipment may require Forest Service inspection prior to moving it from areas infested with invasive species of concern to areas free of such invasive species. Coordinate with the Forest Service Weed Program Manager. Take reasonable measures to make sure equipment is free of soil, seeds, vegetative matter, or other debris that could contain noxious weed seeds before moving into the project area. c. All equipment surfaces will be cleaned, especially drive systems, tracks and “pinch points” to ensure removal of potentially invasive debris. Reasonable measures include pressure-washing or steam cleaning in an offsite location so oil, grease, soil and plant debris can be contained and provide optimal protection of project areas. d. A Forest Service Representative shall be notified at least 24 hours in advance of off-road equipment arriving on the Forest, to provide the option of inspecting the equipment to ensure it has been cleaned as required. e. Equipment may also require inspection prior to moving it from areas infested with invasive species of concern to areas free of such invasive species. Those

**Table 2-2:
Project Design Criteria and Best Management Practices**

<p>areas can be identified prior to project implementation with the Forest Service Weed Program Manager.</p> <p>Reasonable measures include pressure-washing or steam cleaning in an offsite location so oil, grease, soil and plant debris can be contained and provide optimal protection of project areas. (Noxious Weed Standards #1 and 4 [p. 2-30]).</p>
SOILS
Prior to construction soil surveys will be completed within the disturbance area to ensure no net loss of soil organic matter.
<p>Prior to construction, a detailed site erosion control plan will be prepared. This plan shall include the following components:</p> <ul style="list-style-type: none"> • 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) to protect soils and enhance conditions for vegetation re-establishment
Disturbed areas will be promptly revegetated. 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.
Existing roads will be used for construction and routine maintenance of the proposed project components where possible
Vegetative buffers will be maintained adjacent to intermittent or perennial drainages and wetlands, to the extent possible. Where avoidance is not possible, impacts will be minimized in sensitive areas.
In all areas where grading or soil disturbance will occur, a reassessment of the quantity (depths) of soil A and/or organic ground cover will 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.
Ground cover, as a combination of revegetation, organic amendments and mulch applications, will restore depths of soil A and/or organic ground cover.
If machine piling of slash is done, piling will be conducted to leave topsoil in place and to avoid displacing soil into piles or windrows.
Burning slash piles on shallow soils (soils that are less than 50 centimeters/20 inches to bedrock or another root restricting layer) will be avoided.
When possible, slash piles will be burned with a minimum of 2 inches (and preferably 4 to 6 inches) of snow on the ground to reduce the consumption of soil organic matter (O horizon material or forest “duff”).
Burn pile size is limited per CDPHE (Colorado Department of Public Health and Environment) standards. These limit hand pile sizes to ≤ 300 cubic feet and machine pile size to $\leq 7,068$ cubic feet.
When possible, soils will be scarified and revegetate with a Forest Service-approved seed mix on slash pile burn sites. Utilize soil organic amendments (i.e., compost, biochar, humates) and biological inoculants (i.e., mycorrhizal fungi) will be utilized as appropriate during this process.
Where determined necessary during post construction monitoring activities, water bars (12 to 18 inches deep) will be constructed across all roads, trails, and other disturbed areas prior to seeding and fertilization at 50, 75, or 100-foot intervals as a function of slope angle, or as necessary, to disperse surface runoff. The frequency will be field-fit and will be sufficient to prevent rill erosion and sediment delivery channel formation.

**Table 2-2:
Project Design Criteria and Best Management Practices**

WATERSHED AND WETLANDS
Mitigate tree clearing within the Water Influence Zone on Forest Service lands by felling trees toward Union Creek to improve downed wood frequency in and near the channel.
For ground-disturbing activities near perennial and intermittent streams, and ephemeral draws, minimize Connected Disturbed Area 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.
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 or an approved material/structure designed for wetland crossings.
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.
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 ground vehicles out of wetlands unless protected by at least 1 foot of packed snow or 2 inches of frozen soil. Alternatively, where approved by the Forest Service 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.
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 will 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 wattles, 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-biodegradable 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.
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 revegetation.
Halt construction activities during periods of heavy precipitation or when soils are muddy and prone to rutting and compaction.

Chapter 3

Affected Environment and Environmental Consequences

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

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. Given nature of the Proposed Action, with a variety of projects, the scope of the environmental analysis is considerably different for human and biological resources.

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).

CUMULATIVE EFFECTS

Cumulative effects are the result of the incremental direct and indirect effects of any action when added to the effects of 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.

A. RECREATION

SCOPE OF THE ANALYSIS

As discussed in Chapter 1, CMR operates under a Forest Service Term SUP, which was re-issued December 10, 2009 and extends through December 31, 2049. CMR is located partially on private land and primarily on public (NFS) lands. This recreation analysis focuses on projects located on public lands within the SUP area, and adjacent private lands owned by CMR.

AFFECTED ENVIRONMENT

CMR is one of four resorts in Summit County, with many more world-class resorts within the region, each offering a wide range of terrain and facilities. This abundance and diversity has created a highly competitive market environment. CMR is categorized as one of the “Front Range Destination Resorts,” which includes Breckenridge, Keystone, Vail, Beaver Creek, Winter Park, and Steamboat Ski Resorts. The Aspen ski areas are not classified as major competitors in the front range destination skier market due to the increased distance and travel time from I-70 and Denver. CMR is one of the most accessible of these resorts, particularly to the Denver market, given its proximity to the Front Range and that it is directly off of I-70.

Developed Winter Recreation

The CMR SUP area contains four peaks (Copper Peak, Tucker Mountain, Union Peak, and Jacques Peak), with four bowls (Copper Bowl, Spaulding Bowl, Union Bowl, and Resolution Bowl), which offer in-bounds skiing to 12,441 feet. CMR has a base elevation of approximately 9,700 feet with the highest lift reaching an elevation of 12,313 feet. A typical ski season at CMR lasts from mid-November through mid-April.

Resort Capacity

Comfortable Carrying Capacity (“CCC”) is a planning tool used to determine the optimum level of daily utilization for a resort to facilitate a pleasant recreational experience. This is a planning figure only and does not represent a regulatory cap, or threshold, on visitation. CCC is used to ensure that capacities are balanced across facilities and are sufficient to meet anticipated demand. CCC is based on a comparison of uphill vertical lift supply (i.e., lift capacity) to downhill vertical skiing demand. The existing CCC of the lift and trail network at CMR is currently 12,230 guests per day.

Annual Visitation

The first season of downhill skiing at CMR began in 1971 with commercial skiing via snowcats accessing terrain within the SUP. The following season, CMR opened to the public with 5 ski lifts, 26 miles of trails, and 6 new buildings. During the 1972/73 season, CMR had more than 120,000 skier visits. From 2002/03 to 2007/08, CMR either approached or exceeded one million skier visitors per year. However,

after the 2005/06 season, which set the record of 1.13 million skier visits, CMR has experienced lower annual visitation, averaging 885,879 skier visits since the 2006/07 season. Table 3A-1 shows skier visitation to CMR over the last ten seasons.

**Table 3A-1:
Annual Skier Visits at CMR**

Season	Skier Days
2002/03	1,051,729
2003/04	928,847
2004/05	1,046,242
2005/06	1,132,021
2006/07	1,046,959
2007/08	934,870
2008/09	873,039
2009/10	834,089
2010/11	863,045
2011/12	763,272

Source: Colorado Ski Country USA and CMR

Lift Network

CMR's lift network currently consists of 21 ski lifts, which include:

- One high speed six-passenger lift: Super Bee
- Four high speed four-passenger (quad) chairs: American Eagle, American Flyer, Timberline Express, and Excelsior
- Five fixed-grip triple chairs: Resolution, Kokomo, Lumberjack, Rendezvous, and Sierra
- Five double fixed-grip chairs: Alpine, Pitchfork, Highpoint, Blackjack, and Mountain Chief
- Two surface tows: Storm King and Gem
- Four conveyors: The Glide, Easy Rider, Rugrat, and Slingshot

CMR also operates a conveyor lift that is dedicated to the tubing operation, named Stinger, bringing the total number of lifts to 22. Stinger is also available to the neighboring HOAs and public for better access to the Super Bee. The resort's total uphill design lift capacity has been calculated at 30,812 people-per-hour (pph).

Lifts Specific to the Project Proposal

The following lifts are discussed specifically based on the proposed projects: the Kokomo Lift and the Sierra Lift and Copper Bowl access.

Kokomo Lift

The Kokomo Lift is a fixed-grip, three-passenger chair located in the Kokomo teaching area of CMR. It serves teaching terrain and some repeat-ski terrain. It also provides access to the Lumberjack Lift, which is a longer lift, reaching higher on the mountain and serves popular Novice-level repeat skiing terrain.

The location of the bottom terminal of the Kokomo Lift has historically presented a challenge for beginner skiers, especially children. Approximately 350 linear feet, and nearly a 36-foot increase in elevation, are between the lift terminal and the base area buildings. The Slingshot conveyor can be used to reach the Kokomo Lift terminal, but it also serves as a teaching conveyor. Moving the bottom terminal to a location close to the base buildings would enable skiers, especially beginners and children, to access the lift easier.

Sierra Lift & Copper Bowl Access

The Sierra Lift accesses Union Bowl, Union Meadows and other Advanced and Expert ability level terrain. Because of frequent high winds, the top terminal of the lift is located well below the top of Union Peak; therefore, it is not possible to access Copper Bowl from the top of the Sierra Lift without hiking. Presently, guests wishing to access Copper Bowl from this point must hike up the ridge and then drop into Copper Bowl. The hike is relatively short (less than 500 feet in length) and a moderate pitch. When weather and conditions are suitable, an estimated 200 skiers make this hike on a weekend day. Alternatively, skiers have direct lift access to Copper Bowl by the Rendezvous Lift. Once in Copper Bowl, the Mountain Chief Lift serves this terrain.

Terrain

CMR's skiable terrain totals 2,488 acres, 1,377 acres of developed terrain across 125 trails and 1,111 acres of undeveloped bowls and gladed skiing terrain. In addition to traditional ski trails, glades, and bowls, CMR also offers skiers a variety of dedicated freestyle terrain. These areas include two halfpipes, a terrain park, and a slopestyle course. Snowmaking infrastructure is sufficient to cover approximately 333 acres of the developed, groomed terrain and ensures optimal snow conditions throughout the mountain.

Terrain Discussion Specific to the Project Proposal

Spaulding Bowl and Enchanted Forest

Spaulding Bowl and the Enchanted Forest areas are known for their challenging, undeveloped terrain (refer to Figure 2). Both, however, present challenges for CMR managers due to their harsh conditions and rugged access and egress trails. The current entrance of the Enchanted Forest trail is narrow, winding, and un-groomable, requiring extensive hand-work to maintain skiability. CMR struggles to maintain adequate snow coverage on this trail throughout the season. Similarly, the run-out trail for Spaulding Bowl is presently characterized by large boulders and talus which require extensive snow cover before

being skiable. Many seasons, the upper areas of Spaulding Bowl are skiable before CMR is able to open the egress trail.

Union Peak/Union Bowl/Union Meadows/Copper Bowl

The Union Peak, Union Meadows and Copper Bowl areas of CMR are characterized by natural openings, meadows, and above treeline open bowls (refer to Figure 2). These areas offer a variety of terrain for a range of ability levels (intermediate through expert).

Skiers can ski Union Bowl by either hiking to the top of Union Peak, from the Sierra Lift, or by traversing from the Sierra and Mountain Chief lifts. Union Bowl is above treeline and has steep, challenging terrain.

In addition, skiers can also access the large open area of Union Meadows from the top of the Sierra and Mountain Chief lifts.

Copper Bowl is located to the south of Union Peak and as previously noted, can be accessed via the Rendezvous Lift or hiking the ridge from the top of the Sierra Lift. The upper reaches of Copper Bowl are characterized by above treeline open bowls, while the lower elevations along treeline offer natural openings and tree skiing. Once in the bowl, Mountain Chief Lift serves repeat skiing in Copper Bowl.

Kokomo/Lumberjack Area and Teaching Terrain

The Kokomo/Lumberjack area is the primary beginner area and teaching terrain (refer to Figure 2). The slopes are gentle, wide, and groomed. They are located within the West Village portion of the mountain. As described under Lift Network, the Kokomo Lift has a long approval history, but remains in its original alignment with original infrastructure, which is slow and outdated. Nonetheless, this lift is important to bringing beginner level skiers to the *Roundabout* trail and teaching area. From there skiers can descend a short distance to reach the bottom of the Lumberjack Lift, which takes them to the top of the *Roundabout* trail for a longer run or linkages to other beginner terrain.

Additionally, there is a small teaching area located near the West Village base area, below the Kokomo lift terminal. It is for entry-level skiers, and is served by the Slingshot conveyor lift.

Catalyst Terrain Park

The Catalyst Terrain Park opened in 2009 (refer to Figure 2) and has an array of jumps and box or rail features, which vary from beginner to expert level. Catalyst Terrain Park is CMR's largest park/freeride area, and home to many events and competitions, including United States of America Snowboard and Freeski Association National Championships. Catalyst Terrain Park is served by the Union Creek quad lift. During the summer when race camps are in session, CMR transports Woodward campers to the park with shuttle busses/vans due to lack of snow above and below the park.

Woodward Training Facilities

CMR is the home of “Woodward at Copper” which is a ski and snowboard training camp dedicated to teaching and perfecting park and pipe skills. Augmenting Woodward’s state-of-the-art indoor facility, Camp Woodward also hosts on-snow, spring and summer ski and snowboard camps that run as late as August, snow-cover permitting. On the mountain, Camp Woodward utilizes the terrain park located on *Loverly* trail (refer to Figure 2). Currently, “campers” access the park by van, reloading the van after each run to get back to the top of the training hill.

DIRECT AND INDIRECT ENVIRONMENT CONSEQUENCES

Alternative 1 – No Action

No operational or infrastructural changes/additions would occur on NFS lands within the CMR SUP area as a result of the No Action Alternative. CMR would continue to focus on providing the current variety of winter recreation opportunities. The quality of wintertime recreation opportunities, including learning and family experiences and training facilities, would largely resemble current conditions, with a deficit of beginner through intermediate ability level terrain. As such, no direct, indirect or cumulative impacts to recreational resources would be expected under Alternative 1.

Visitation

Under Alternative 1, CMR would be expected to continue in the same visitation trend, experiencing moderate fluctuations in skier visitation, and averaging approximately 800,000 skier visits annually.

Resort Capacity

Under Alternative 1, CMR would maintain the current CCC of 12,230 guests per day. CMR would be expected to continue to exceed this CCC periodically throughout the season, on peak days during holiday weekends and during spring break in March. During high visitation periods it is inevitable that a degradation in the quality of the guest experience would be experienced (e.g., crowding on trails and longer lift lines).

Lift Network

Under Alternative 1, no changes to CMR’s lift network would occur. CMR would continue to operate 21 ski lifts to disperse guests across ski terrain during the winter season. Summer use would continue to require van access for the Woodward training camps.

Terrain Network

Under the No Action Alternative, no additions to the terrain network at CMR would occur. CMR would continue to offer developed lift-served skiable terrain on 125 trails totaling approximately 1,377 acres, serving all ability levels. The remainder of CMR’s skiable terrain would continue to be comprised of undeveloped bowls and gladed skiing totaling approximately 1,111 acres.

Teaching Terrain

Under Alternative 1, no additions to the terrain network at CMR would occur. The Kokomo/Lumberjack area would remain the primary teaching area, without improvements to the teaching or skiing experience.

Alternative 2 – Proposed Action

Visitation

Additional skiers are not expected to visit the resort as a direct result of any specific project included under the Proposed Action.

Resort Capacity

Under Alternative 2, the Kokomo Lift would be replaced and four new conveyor lifts (the Woodward/Terrain Park surface lift, the West Ridge surface lift, and two Kokomo teaching area conveyor lifts) would be added to CMR's lift network.

The T-Rex Connector, Enchanted Forest Access trail, Spaulding Bowl Run-Out trail, and grading projects would improve terrain quality and circulation; however, no major terrain additions are proposed. As a result, impacts to CMR's CCC would be related to an increase in lift capacity, increasing CCC by 420— from 12,230 to 12,690. This is considered inconsequential.

Lift Network

The three lift projects included in the Proposed Action would better accommodate existing users and facilitate circulation at CMR.

The proposed West Ridge surface lift would benefit expert-level skiers wanting to access Copper Bowl from the top of the Sierra Lift. The surface lift would eliminate the need to hike by providing lift access from the top terminal of the Sierra Lift to the ridge above the bowl. Given the high altitude location of the proposed surface lift, it would be expected that weather and snow conditions would lead to occasional closures, similar to the situation now when the ridge is closed to hiking. Snow cover is anticipated to allow the proposed West Ridge surface lift to run regularly from approximately late-December through early April.

The Kokomo Lift Replacement and Teaching Area would improve skiing at CMR for families and beginner skiers. As discussed in Chapters 1 and 2, there is a need to enhance the resort's family atmosphere, learn-to-ski experience, and teaching facilities; the Kokomo area is vital in doing so. The Kokomo Lift replacement would facilitate round-trip skiing on *Roundabout* and *Prospector* trails and transport beginning skiers to two new conveyor surface lifts accessible from the top terminal of the Kokomo Lift. The new alignment of the Kokomo Lift would improve access to the West Village base area by realigning the bottom terminal to be closer to, and nearly level with, the West Village base lodge

(“The Schoolhouse”). This would particularly improve the beginner guest skier experience by reducing the distance traveled and elevation gain necessary to access the mountain. In addition, by realigning the lift, towers along the lift line would be relocated outside the primary skiable route on *Roundabout* trail.

In addition to realigning the Kokomo Lift, two new surface lifts would be installed on the gentle terrain north of the top terminal of the Kokomo Lift. These surface lifts and terrain would provide a dedicated teaching area for first-time and younger skiers that is naturally separated from most other users (due to its location on the far west side of the resort) but still conveniently incorporated in to the West Village base area. These improvements would make the entire area more navigable and enjoyable for beginner skiers and families, as well as more conducive to lessons and teaching.

Finally, the Woodward and Terrain Park surface lift, would also improve skiing at CMR, especially related to the summertime training camps that are unique to the resort. In the summer, the surface lift would eliminate the need for a van to transport skiers from the bottom of the Terrain Park back to the top on service roads. This would improve the training and teaching experience, allowing skiers to lap the park more easily and frequently. During the winter, the lift would be available to facilitate repeat use of the key portions of the park, at times determined by CMR.

Terrain Network

The T-Rex connector trail, Lower Roundabout trail grading, Enchanted Forest traverse, Spaulding Bowl runout trail, and Sierra Lift tower 7 projects included under Alternative 2 would improve the terrain network at CMR, for beginner through expert ability levels and experiences. All improvements would occur within CMR’s SUP boundary and on adjacent private lands owned by CMR. The developed terrain network would increase slightly, from 1,377 acres to 1,380 acres with implementation of the T-Rex Connector trail (the only new proposed terrain under Alternative 2), an overall increase of less than a quarter of a percent.

Other terrain grading and resurfacing projects included under the Proposed Action would improve skier access, egress and the overall experience of skiing at CMR, in alignment with the Purpose and Need (#3).

The T-Rex Connector trail would provide more direct, fall-line egress between the Timberline Express and West Village areas. It would eliminate the need for skiers to use the Lower Woodwinds Traverse trail, which is low angle and off-camber, making it slow and very challenging for snowboarders.

The Lower Roundabout trail grading would alleviate congestion and variable terrain in the West Village base area and the bottom of the Kokomo Lift by providing a more consistent surface. Given the role of this area in serving beginner-level skiers, a more spacious, less constrained trail would be more navigable and enjoyable. The proposed relocation of the bottom terminal of the Kokomo would further improve this area as a whole.

Reworking uneven ground and rocks on the Enchanted Forest trail would allow CMR to provide better, more consistent snow coverage on this connector trail. By improving the ground surface, less snow would be required to provide adequate snow coverage allowing skiers to more easily access this area of the mountain, for a longer period during the season.

Recontouring a pathway from the Spaulding Bowl egress to the bottom terminal of Resolution Lift would result in less snow needed to cover obstacles on the route out of the bowl. This improvement would allow CMR to open the terrain earlier as snow conditions in the bowl allow.

The Sierra Lift tower 7 grading project would reduce an abrupt break-over onto a steep slope. This improvement would allow for grooming and enhance snow retention.

Teaching Terrain

The West Village base area is the portal to CMR's main teaching terrain. The *Roundabout* trail grading, coupled with the relocation of the Kokomo Lift's bottom terminal and towers, would ensure beginner level skiers can easily navigate this part of the mountain. The trail narrows at the bottom and has steep side slopes, causing a choke point especially for beginner skiers. The proposed grading would alleviate this choke point, and, coupled with the relocation of the Kokomo Lift bottom terminal, would improve skier circulation in the area.

Upgrading the Kokomo Lift would better serve beginner skiers by improving lift loading/unloading and decreasing the ride-time. Once off the lift, the new surface lifts at the top of Roundabout would facilitate use of the gentle terrain in this area and towards the Lumberjack Lift area. Collectively, these projects would create a more enjoyable and functional beginner and family experience at CMR, separate from more advanced and fast-paced terrain.

The Woodward and Terrain Park viewing deck would improve the more "alternative" on-mountain teaching experience at CMR. In particular, the viewing deck would allow coaches to have a better perspective on skiers. The deck would be elevated along the side of the terrain park giving coaches a more complete view of the features and athletes. Additionally, it would better facilitate filming associated with the training activities. While the viewing deck could be used throughout the season, it would be especially beneficial for the Woodward-at-Copper summer training camps, for which this area of CMR is focused during late-spring and summer when the resort is otherwise closed to skiing.

CUMULATIVE IMPACTS

The following past, present, and reasonably foreseeable future projects have been identified by the Forest Service as relevant from a cumulative effects context.

Temporal and Spatial Extent of Analysis

The spatial extent of the cumulative effects analysis is the CMR SUP area. The temporal bounds for this cumulative effects analysis for recreational resources extends from CMR's inception as a ski area in 1972, through the foreseeable future in which CMR can be expected to operate.

Past, Present and Reasonably Foreseeable Future Actions

The following past, present and reasonably foreseeable future actions with the potential to cumulatively affect recreational resources within the CMR SUP area have been identified:

The resort opened for skiing in 1972 with 26 miles of trails, 5 lifts, and 2 buildings. Over 120,000 lift tickets were sold the first season. The first lodging opened in 1973. World Cup races were hosted in 1976. Development continued throughout the 1970s and 1980s—with the first high-speed detachable lift being installed in 1986. In 1997, CMR started a multi-year, \$500 million redevelopment primarily focused on the Village at Copper. Two new detachable lifts were installed in 1998, Super Bee and Excelerator. The High Point Lift was replaced with the Union Creek Quad in 2011.

The CMR Master Development Plan (MDP) was completed in 2011. The MDP consisted of both previously approved/unimplemented projects, as well as newly proposed projects; many of which comprise the Proposed Action. Reasonably-foreseeable future projects (both previously approved and those that require future, site-specific NEPA analysis) include:

**Previously approved as part of the 2006 EIS*

***Previously approved as part of the 2002 EA*

Lift Replacements

- Upgrade the Alpine Lift to a detachable lift and extend the top terminal up mountain*
- Extend the Excelerator Lift base terminal slightly downhill
- Upgrade the American Flyer to higher capacity six-passenger lift
- Upgrade the Lumberjack Lift to a detachable lift
- Upgrade and re-align the Sierra Lift*

Lift Additions

- Construct a West to East connector lift between American Flyer and American Eagle to access new terrain and improve circulation (N Lift)

- Construct one new conveyor and relocate three existing conveyors (The Glide, Rugrat, and Slingshot) along teaching terrain adjacent to the bottom terminal of the Kokomo Lift (on private land)
- Construct lift to access Tucker Mountain*

Terrain Improvements

- Create approximately 56 acres of new skiing terrain on the frontside (between Alpine and Lumberjack)*
- Provide approximately 11 acres of new skiing terrain in the Resolution Lift area*
- Add lift-service to approximately 260 acres of terrain, which is currently hike-to access, via realignment of the Sierra Lift, and installation of the Tucker Lift*
- Create approximately 60 acres of additional gladed terrain across the ski area*
- Provide approximately 500 acres of terrain for Snowcat Tours within the bowl directly south of the ridgeline between Tucker Mountain and Jacques Peak

Guest Services

- Develop a new on-mountain food/guest service facility in the vicinity of the existing Flyers restaurant
- Upgrade or replace the existing Solitude Station Restaurant*
- Construct a warming hut with limited food and beverage service adjacent to the top of the Rendezvous Lift*
- Construct a picnic deck in Resolution area (on private land)*
- Construct a ski school facility with limited food and beverage in conjunction with the planned conveyor lifts at the top of the Kokomo Lift**
- Construct a new on-mountain guest warming hut/ski patrol station at the summit of Tucker Mountain in conjunction with the previously mentioned lift project*
- Install additional on-mountain restroom facilities as depicted on the Upgrade Plan

Snowmaking

- Add approximately 120 acres of snowmaking trails and connector segments on the front side of the mountain*

- Develop micro-hydroelectric capabilities, which will interface with existing and planned snowmaking infrastructure
- Construct an on-mountain snowmaking water storage reservoir

Operations

- Construct a new ski patrol duty station at the summit of Tucker Mountain*
- Construct a new snow-vehicle maintenance and mountain operations facility near the top of the American Eagle Lift*
- Develop minor connector roads to facilitate the installation of key projects
- Install additional radio communication infrastructure in support of CMR's communications network

Cumulatively, these past, present and reasonably-foreseeable future projects alter the recreational dynamic and create an intense, developed recreational experience at CMR. This is consistent with the terms and conditions of CMR's SUP, as well as the management direction of the 8.25 Management Area. The Proposed Action represents an incremental addition to the overall developed recreational theme and would improve the overall recreation experience at CMR and on the WRNF.

Considering the anticipated benefits and effects from the proposed projects in a cumulative context of past, present, and reasonably foreseeable future actions, the Proposed Action meets WRNF management standards and guidelines for developed and dispersed recreation.

B. SCENERY

SCOPE OF THE ANALYSIS

The Project Area (where proposed projects are located) for this scenery analysis is CMR's SUP area within the WRNF. Critical viewpoints (where projects have the potential to be viewed from) included in this analysis are from three perspectives: 1) within the ski area (foreground distance zone); 2) approximately 3 miles along I-70 westbound starting at Officer's Gulch and extending to the CMR base area (middleground distance zone); and 3) I-70 eastbound from the top of Vail Pass and extending intermittently for approximately 4 miles to the CMR base area (background distance zone).

Analysis of the SUP's aesthetic environment involved an evaluation of the project area's ability to absorb the effects of both historic and ongoing human modification. Slope, natural vegetation types and patterns, topography, and viewing distance are important factors in this analysis. The development of ski area facilities and developed trails on steep slopes, high-elevation and exposed terrain (i.e., skyline ridges), and in densely forested areas is more prone to visual contrast (and therefore perception) than development of the same facilities and trails would be on flatter, more sparsely vegetated areas.

FOREST SERVICE DIRECTION

Scenery Management System

National Forests, including the WRNF, follow the Scenery Management System (SMS) for the assessment and analysis of visual resources. The SMS is outlined in the manual "Landscape Aesthetics: A Handbook for Scenery Management."⁶

The goal of visual resource/landscape management on all NFS lands is to manage for the highest possible visual quality, commensurate with other appropriate public uses, costs, and benefits. The SMS pertains primarily to the social/cultural dimension of ecosystems management but also has links to biological and physical attributes.

SMS relies on three components:

- *Landscape character* – the overall visual and cultural impression of a landscape that gives it an identity. Landscape character descriptions are a combination of the objective information contained within ecological unit descriptions (EUD) and the cultural values that people assign to landscapes.
- *Scenic integrity* – A measure of the degree to which a landscape is visually perceived to be complete, including the amount of human-caused deviation in form, line, color, and texture in a landscape.

⁶ USDA Forest Service, 1995

- *Constituent information* – expectations, desires, preferences, acceptable levels of quality, behaviors, and values.

SMS Distance Zones

Landscape visibility can be subdivided into distance zones for classification, analysis, and simplification of inventory data. They are used to describe the part of a characteristic landscape that is being inventoried or evaluated. Viewing distance is important in determining how change is perceived in a landscape.

The three distance zones used for forest planning are:

- *Foreground (0 to 0.5 mile)*: The limit of this zone is based upon distances at which details can be perceived. Normally in foreground views, the individual boughs of trees form texture. Generally, detail of landforms and special landscape features (including human alteration) is more pronounced when viewed within the foreground zone.
- *Middleground (0.5 to 4 miles)*: Alterations in the middleground become much less distinctive. Texture is normally characterized by the masses of trees in stands or uniform tree cover. Individual tree forms are typically discernible in very open or sparse stands.
- *Background (4 miles to horizon)*: As the perspective shifts to the background, distance has a modifying and diluting effect to both landscape texture and color. In very open or sparse forest stands, textures begin to be lost. Shape, however, may remain evident beyond 10 miles, especially if it is inconsistent with other landscape forms. Beyond 10 miles, alteration in landscape character becomes obscure.

SMS Scenic Integrity Objectives

The Forest Service determines Scenic Integrity Objectives (SIOs) as part of the forest planning process. SIOs range from *Very High* (unaltered) to *Very Low* (heavily altered).

Table 3B-1:
Scenic Integrity Objectives within the Scenery Management System

Level	Description
Very High	Unaltered; the landscape character is intact
High	Appears unaltered; the landscape character appears intact
Moderate	Slightly altered; the landscape character appears slightly altered
Low	Moderately altered; the landscape character appears moderately altered
Very Low	Heavily altered; the landscape character appears heavily altered

AFFECTED ENVIRONMENT

Scenic Characteristics of Copper Mountain's SUP Area

The aesthetic impacts of the proposed changes within the project area were considered in relation to the overall existing development/recreational theme of the resort. The Management Direction for Management Area 8.25 states:

“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.”⁷

The SIO map that accompanies the Forest Plan identifies the CMR SUP area with an SIO of *Very Low*, where the valued landscape character “appears heavily altered.” Deviations may strongly dominate the valued landscape character; however, they must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition. The CMR SUP area is currently consistent with this direction; due to historic lift, trail and infrastructure development, it either achieves or exceeds the SIO of *Very Low*.

Dating back to 1971, the SUP area has been allocated to winter sports use and as such, CMR has evolved into a concentrated, developed, primarily winter recreational area. Much of CMR's skiable terrain is above timberline, utilizing naturally open faces and bowls. However, the majority of developed skiing terrain within the SUP area is below timberline. These trails have historically been designed to utilize natural openings and to avoid linear configurations by scalloping and feathering trail edges. While the existing CMR facilities, trails, and lift corridors have visually altered the natural patterns of the alpine forest character, it is difficult to distinguish between natural forest openings and human-made clearings in the higher-elevation portions of the ski area when viewed from the middleground distance zone. On-mountain structures have historically been located to avoid “skylining” on exposed ridges and peaks and are painted appropriate colors to blend with the natural surroundings.

⁷ USDA Forest Service, 2002 p.3-80

CMR's base area facilities and the majority of its north-, northeast-, and northwest-facing slopes and lifts are dominant in the foreground distance zone. They are also dominant in the middleground distance zone to motorists traveling east and west along I-70. The uniform width of many of the ski trails, coupled with the strong color contrast of forested areas and snow during the winter, reinforces this dominance. During the summer, the contrast between grass and forest vegetation slightly dampens the dominance.



View of CMR from west-bound I-70

For westbound motorists on I-70, CMR's facilities dominate the foreground distance zone in the western end of Tenmile Canyon, between Officer's Gulch and the approach to Vail Pass (approximately 1.5 miles, or just less than two to three minutes of driving time).⁸ In the foreground distance zone, none of CMR's above-timberline skiing is visible; only lifts and forested trails can be perceived.

For eastbound motorists on I-70, both above and below timberline facilities are visible. From this perspective, the distance zone gradually shifts from the background (atop Vail Pass), middleground (along the east side of Vail Pass), to the foreground distance zone as motorists approach and round the last corner on the eastern descent of the pass. The visual transition for motorists travelling from the top of Vail Pass to CMR spans 5 miles and lasts approximately five minutes.

On the approach to CMR, motorists exiting I-70 and continuing south on SH 91 have a clear view of CMR's base area and on-mountain trails and facilities. Visitors to CMR retain this view while proceeding

⁸ Temporal durations are appropriate for vehicles traveling at the posted speed limit.

to drop-off areas and parking lots. For motorists traveling south on SH 91, CMR's trails fall out of view after less than 1 mile.

Approximately 3.5 miles of the Colorado Trail run adjacent to the CMR SUP boundary, just within its northern border, from west to east, where it crosses SH 91 to access the Tenmile Range. This scenic trail has been assigned the more restrictive SIO of *High*. The Forest Plan has a guideline under Dispersed Recreation that states that "proposed activities should meet a SIO of High in the foreground of" the Colorado Trail; however, the Forest Plan also designates the SIO of the SUP area as *Very Low*.⁹ Typically, the more restrictive SIO would take precedence, but in this case, in which the foreground is heavily disturbed, it will be very difficult to nearly impossible to achieve this with future actions.

Mechanical grooming activities originate and terminate at CMR's maintenance shop, located west of SH 91 on private land in the base area. Grooming operations are primarily carried out at night when the slopes are closed to the public. After-hours grooming operations reduce potential conflicts between skiers and groomers and increase efficiency. Lights mounted atop snowcats are generally visible in all three distance zones but their intensity disperses rapidly with distance since the floodlights are focused on-slope.

Scenic Characteristics of the Project Areas

Specific project areas are discussed separately from the SUP area at large to provide the reader with information regarding the current visual characteristics in relation to the Proposed Action.

Roundabout Trail Grading and Kokomo Lift Replacement

The vast majority of this project area has been previously disturbed, related to development of the West Village base area. This area is primarily viewed from within the ski area (i.e., foreground views). Westbound traffic along I-70 would have an interrupted view of this area as they travel past CMR, with Center Village, West Village base area, and Lewis Ranch development being predominate in the foreground view.

Kokomo Teaching Terrain and Carpet Conveyors

The proposed teaching terrain and carpet conveyor in this area would be located at the top of the developed *Roundabout* ski trail, between the existing Kokomo Lift top terminal and the Lumberjack Lift bottom terminal. This area is viewed from within the ski area and a handful of Lewis Ranch home sites that are adjacent to the Lumberjack Lift bottom terminal. This area is not visible from I-70.

⁹ USDA Forest Service, 2002

Woodward Surface Lift and Terrain Park Viewing Deck

The proposed lift alignment and viewing deck are located in the Catalyst Terrain Park along *Loverly*. This area is in the foreground view for guests skiing in the immediate area and while riding the American Flyer and Union Creek lifts. For those traveling westbound along I-70, this area is absorbed into the middleground view of the overall developed ski area, while those traveling eastbound do not have a view of this area.

West Ridge Platter Lift and associated Mountain Road and Snowfence

This project area is entirely above treeline, directly west of the Mountain Chief and Sierra Lift top terminals. The project area is on a northwestern facing slope and can only be seen in background views from locations west of CMR (refer to Figure 5 – Vail Pass Critical Viewpoint Visual Analysis). The mountain road segment is proposed on an area that lies on a relatively flat slope when compared to the slope surrounding the project area. The slope is northeastern facing and is separated from the lift and snowfence by a small ridgeline running north-south. It is difficult to identify this project area along any viewpoint from the east, as it is absorbed in the background of an overall CMR view, and is not visible from the west.

T-Rex Connector Trail

This project area is located entirely in a large undeveloped tree island surrounded by numerous developed trails. This project area is within the range of distance that defines middleground for the viewer traveling along I-70, but due to the surrounding topography and relatively flat slopes of the project area, it cannot be seen from I-70. Therefore, this project can only be seen from viewpoints within the ski area itself.

Enchanted Forest Access Traverse Grading

This project area follows the existing Enchanted Traverse alignment, similar to the proposed West Ridge Platter. It can only be seen in the background from locations west of CMR (refer to Figure 2).

Spaulding Bowl Runout Trail Grading

This project area occurs just above treeline entirely within *Spaulding Bowl* which is only seen from viewpoints within the ski area itself.

Sierra Lift Tower 7 Trail Grading

Tower 7 is confined to the existing *Revenge* trail clearing. Traffic traveling westbound on I-70 can see roughly the upper third portion of *Revenge*, but due to the topography of CMR, this project area (in the middle third of *Revenge*) is out of view. This project area can only be seen in the foreground by those who are in the Sierra and Rendezvous terrain pods.

Union Peak Wind Turbines

This project area is directly adjacent to the Union Peak Patrol building. Depending on the viewpoint along I-70, this area is in the middleground to background distance zones (refer to Figure 2 – Vail Pass Critical Viewpoint Visual Analysis). Note that currently there are two Windspire wind turbines that were installed in 2012 at the top of the Excelerator Lift. They are approximately 24 feet in height with a circumference of roughly 2 feet, and are identical to those included in the Proposed Action. Because of their thin cylindrical structure, the turbines are not easily discernible from east- or westbound travelers on I-70; however, under certain conditions during the day, their reflective surface can be seen.



**Looking uphill at existing two Windspire Vertical Axis Wind Turbines
(Excelerator Lift on the left)**



Existing two Windspire Vertical Axis Wind Turbines
at the top of the Excelerator Lift

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Under the No Action Alternative, no changes or modifications would be approved that would affect the scenic quality of the SUP area. As discussed under Existing Conditions, CMR's traditional, below tree-line trails are the major contributing factor to the *Very Low* SIO classification for the SUP area.

Under the No Action Alternative, developed and undeveloped portions of CMR's SUP area would continue to meet or exceed the SIO of *Very Low*.

Alternative 2 – Proposed Action

All projects proposed throughout the project area are within the existing lift and trail networks at CMR (on both NFS and private lands). Due to the existing developed visual character of the project area, and distance of critical viewpoints from which proposed projects could be perceived (westbound I-70 looking

south, from Vail Pass rest area looking east, and from within the SUP area), implementation of Alternative 2 would represent an incremental visual addition to the appearance of CMR's SUP area. Aside from eastbound (and, to a lesser extent, westbound) travelers on I-70, the only other viewpoints are from within the ski area itself. Implementation of the project elements contained in the Proposed Action would not affect CMR's compliance with the SIO of *Very Low*.

To the casual observer traveling on I-70 (foreground/middleground/background distance zones), the proposed projects within the SUP area either would be blocked from view due to the topography of CMR or indistinguishable from the existing trails and lifts. It is reasonable to assume that anyone viewing the project area from the foreground distance zone (i.e., within the ski area) would expect to see lifts, trails and infrastructure. Even then, it would be difficult to distinguish elements of the Proposed Action from existing features. Regarding views from the Colorado Trail, the proposed projects would be difficult to discern from the existing condition.

Construction of new terrain and trail grading would result in temporary ground disturbance, which would be immediately revegetated upon the conclusion of construction (refer to Table 2-2 in Chapter 2). During construction and revegetation periods, these activities would be evident in the foreground distance zones. However, only CMR guests would see the project area in the foreground view. As revegetation efforts mature over time (two-to-five years), these disturbances would ultimately return to a condition similar to the present.

CUMULATIVE IMPACTS

The following past, present, and reasonably foreseeable future projects have been identified by the Forest Service as relevant from a cumulative effects context.

Temporal and Spatial Extent of Analysis

The spatial extent of the cumulative effects analysis is potentially as far away as a viewer can see or perceive the proposed action, including the two viewpoints from I-70. The temporal bounds for this cumulative effects analysis for recreational resources extends from CMR's inception as a ski area, through the foreseeable future in which CMR can be expected to operate.

Past, Present and Reasonably Foreseeable Future Actions

The development of trails, lifts, infrastructure, and skier facilities on NFS lands in the SUP area has occurred since CMR opened to the public in 1972. Development of the resort has occurred through numerous phases and projects. Each of these projects has gone through individual environmental analysis, as prescribed by NEPA. Cumulatively, these projects have transformed the CMR SUP into a place visually dominated by winter recreation facilities. The proposed projects continue this trend, although they only add incremental and insignificant visual alterations to current conditions.

Reasonably foreseeable future actions within the CMR SUP area with the potential to cumulatively affect visual resources include projects identified in the 2011 MDP that are not analyzed in the current proposal include a variety of terrain improvements, lift additions, lift replacements/realignments, new guest services facilities, and new operations infrastructure. A complete list of these projects can be found in Chapter3 Section A – Recreation.

In sum, CMR, has been, and is likely to be in the future a place of intensely developed winter recreation. Due to its nature as a developed ski area, it is reasonable to assume that the majority of viewers expect it to appear as such, and will continue this expectation into the future.

C. CULTURAL RESOURCES

SCOPE OF THE ANALYSIS

Section 106 of the National Historic Preservation Act (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.

In conjunction with this EA, Metcalf Archaeological Consultants (MAC) conducted a Class III cultural resources inventory for the proposed on-mountain developments at CMR. The project area is located in the SW/SW of Section 31 in T6S R78W, and in unsectioned portions of T6S R79W, T7S R78W, and T7S R79W. The total development is approximately 18.59 acres in size, of which approximately 7.21 acres were inventoried. The entire project lies on public land administered by the Dillon Ranger District of the WRNF. The area of potential effect (APE) is defined as the survey area.

This assessment is based on 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 the proposed project area. 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. The significance of NRHP eligibility of cultural resources is determined by the Forest Archaeologist in consultation with the State Historic Preservation Officer.

Topographically, the somewhat rugged nature of the area provides only limited areas that are suitable for prehistoric cultural sites. Because of this, expectations for the discovery of prehistoric cultural materials were low. Previous work in the area resulted in the discovery of numerous mining-related sites, mostly prospect pits; however, the majority of these are located around Copper Bowl well to the south of the project area. Few historic sites were expected in the project area, although historic isolated finds such as artifacts or prospects pits were likely.

The following analysis is a summary of MAC's report, which is contained in the project file.¹⁰ Additional information can be obtained by reviewing the complete report. All references are contained therein.

¹⁰ McKibbin, 2013

AFFECTED ENVIRONMENT

Historic Overview

Three manuscripts have been written about the Colorado Mountains' historic context. One, by Buckles and Buckles (1984), lists 11 historical periods starting with Exploration (1600s to 1821) and ending with a Post-World War II to Present period. The second context is by Mehls (1984), who provides a framework for identifying historical resources within Colorado by defining 18 historical periods beginning with Early Exploration and the Fur Trade (1761–1859) and ending with the Great Depression and World War II (1920–1945). The third and most recent context for Colorado's historic archaeology is by Church et al. (2007). This context uses a thematic, rather than a chronological approach, covering Colorado history in terms of the following themes: Colorado's Protohistoric and Historic Native Americans, Settlements, Victorian Mining Settlements, Ethnicity, Rural Agriculture, Industry, Linear Resources, Recreation, and Government.

The United States obtained the Louisiana Purchase, which included the territory that is now Colorado, in 1803 and sent expeditions west to document this new territory. It is during this time frame that the "contact-traditional cultures" were building economic relationships with the Spanish and other European traders. The period between 1820 and 1860 was characterized by more intensive migrations westward of American settlers as a result of the Louisiana Purchase. This led to heightened competition for resources and thus more cross-cultural conflicts. The Fur Trade was dwindling, and gold was discovered in the Colorado High Country in 1859, starting the Colorado Gold Rush. Although this did not greatly affect the northwest portion of Colorado directly, it did move settlers closer to the area and prompted Congress to establish the Colorado Territory in 1861.

The Late Contact Phase (1860–1881) of the Protohistoric Era is characterized by the initiation of U.S. Government and Indian relations, including displacement of Indian Nations onto reservations to stabilize new western territories for settlement. The Homestead Act was passed in 1862, opening new lands in the Colorado Territory and the west. In 1876, Colorado was established as a state, and by 1881, the Utes were relocated from western Colorado to eastern Utah.

With the relocation of Native Americans further west, American settlements grew rapidly in western Colorado. This growth was further fueled by oil and coal extraction, which began in 1872 in much of the State, although it did not take off in northwestern Colorado until the 1880s. The mining industry boom led to the expansion of commerce, transportation, and support industries in the west.

Completion of the Transcontinental Railroad across southern Wyoming in 1869 contributed greatly to increased settlement in northwestern Colorado, and the Denver & Rio Grande Railroad Company had developed lines from Denver to Salt Lake City, Utah, by 1883. These railways provided market access that had been previously unavailable to the farmers and cattle and sheep ranchers of the area, as well as the coal mines. Roadways were also expanding further west, bringing increasing volumes of

homesteaders, ranchers, and small settlements. During this time period, the mining and logging industries were at the forefront of the Colorado economy.

Farming and ranching became established very quickly following the removal of the Ute people in 1881. Homestead claims were made along the main rivers and streams through the 1880s and 1890s, with some claims made as late as the 1930s.

Gilliland (1999) has written a regional history for all of Summit County. Her book provides many details about the region and the towns that developed in the historical period. Acklen and Earls (1987) provides a summary of both the prehistory and history of the more immediate area surrounding the current project area. While trappers and explorers moved through the general area, European use and subsequent settlement of the landscape surrounding Copper Mountain began with the Colorado gold rush in 1859 when thousands emigrated to the Breckenridge area to try their fortunes in the gold fields. Graviline Gulch to the east of the project area became the center of mining activity around Copper Mountain. The easily accessible gold did not last, and the miners went elsewhere to seek their fortunes. By the end of the 1860s, the population in the area that later became Summit County had precipitously dropped to a few hundred.

Silver was discovered along Ten Mile Creek in 1879 and touched off another cycle of booming mining activities. Numerous towns sprang up along the creek, bringing more people into the area. Rich strikes in Leadville swelled the population to over 35,000, which brought a related boom and overexploitation of the forest resources. The forests in the Copper Mountain area were clear cut to supply the mines with support timbers, the smelters with fuel, the associated camps and towns with building materials, and new railroads with construction materials. By the 1890s, the mountains had been stripped of their forest covering and the smelters turned to coal coke.

After the silver crash of 1892, the area never recovered the boom times of the previous decades. Both cattle and sheep ranching were common economic pursuits, as well as hay growing, throughout the mining period, and they continue to be important economic endeavors. Advances in metallurgical processes allowed the exploitation of deposits that had been bypassed before, including molybdenum and gold that was more difficult to retrieve. The Climax Molybdenum mine started operations to take advantage of these advances. The main industries for the area into the 1940s were limited to ranching, few miners, and tourists. In 1946, the ski industry started in Summit County with the establishment of the Arapahoe Basin Ski Area, followed by Breckenridge in 1961, and finally Copper Mountain in 1972. The ski and tourist industry continue to be a large part of the economy of the county.

File Search

MAC conducted file searches for the project area, as well as a 1-mile buffer around the project area, prior to field work. The USFS was consulted about previous work conducted in the area, as well as cultural resources found. This data was compared against the records at the Colorado Office of Archaeology and Historic Preservation (OAHP). GIS data from OAHP was requested on 4/18/2013. No search of the OAHP on-line database, Compass, was performed since the GIS data and information available on Compass were the same. Compass was utilized to verify the classifications of sites and inventories.

Sixteen projects have been conducted in the area files searched (Table 3C-1). These include 13 projects for expansion and/or development of the Copper Mountain ski resort such as lift lines, snow fences, and ski runs; and three projects are related to the expansion of the Climax mine to the south of the project area. Three projects (OAHP #ST.FS.R1, ST.FS.R18, ST.FS.R56) overlap the majority of the proposed developments, all of which were conducted prior to 1995. The largest inventory covers the entire northern slope of Union Mountain and includes most of the proposed developments. It was conducted in 1976 for expansion of the ski resort (OAHP #ST.FS.R56). Two smaller projects, also performed for expansion of the ski resort, are on the west and south slope of Union Mountain (OAHP #ST.FS.R18) and on the crest and north and east slopes of Copper Mountain (OAHP #ST.FS.R1).

**Table 3C-1:
Previous Inventories within 1 Mile of Project Area**

OAHP Report No.	Legals (T/R/Sec)	Project Type	Project Description	Client	Company	Year
MC.FS.NR15	7S/78W	Linear	Ski runs	Breckenridge Ski	LOPA	1978
MC.FS.NR92	7S/79W	Block	Land Exchange	Climax	OSA/ANF, SJNF	1974
MC.FS.NR172	6S/78W/30, 31; 6S/79W	Block	Ski resort expansion	WRNF	WRNF	2005
MC.FS.R253	6S/78W; 7S/79W	Block	Land Exchange	AMAX	LOPA	1979
ST.CH.R2	6S/78W/29, 30	Linear	Highway interchange	CDOH	CDOH	1990
ST.FS.NR88	6S/78W/30	Linear	Bike trail	WRNF	WRNF	2011
ST.FS.R1	6S/78W; 7S/78W	Block	Ski resort expansion	Copper Mtn	Mariah	1986
ST.FS.R8	6S/78W/29, 32; 7S/78W	Block	Ski resort expansion	Copper Mtn	Mariah	1989
ST.FS.R18	7S/78W; 7S/79W	Block	Ski resort expansion	Copper Mtn	Mariah	1993
ST.FS.R35	6S/78W/31, 32; 7S/78W	Block	Ski resort expansion	SE Group	MAC	2002
ST.FS.R56	6S/78W/31; 6S/79W; 7S/79W	Linear	Ski resort expansion	Copper Mtn	Gordon and Kranzush	1976
ST.FS.R57	6S/79W; 7S/78W	Block	Ski resort expansion	Copper Mtn	Mariah	1984
ST.FS.R87	6S/78W/29, 32	Block	Ski resort facilities	WRNF	WRNF	2005

**Table 3C-1:
Previous Inventories within 1 Mile of Project Area**

OAHP Report No.	Legals (T/R/Sec)	Project Type	Project Description	Client	Company	Year
ST.FS.R92	7S/78W	Linear	Access road	WRNF	WRNF	1985
ST.FS.R94	6S/78W/29, 32; 7S/78W	Block	Ski resort facilities	SE Group	MAC	2007
ST.FS.R110	5S/78W	Block	Mine safety	WRNF	WRNF	2009

OAHP = Office of Archaeology and Historic Preservation; T/R/Sec = Township/Range/Section; NRHP = National Register of Historic Places; AMAX = Climax Molybdenum Company, Amax, Inc.; Breckenridge Ski = Breckenridge Ski Corporation; Climax = American Metal Climax Corporation; CDOH = Colorado Department of Highways; Copper Mtn = Copper Mountain, Inc.; ANF = Arapaho National Forest; LOPA = Laboratory of Public Archaeology; MAC = Metcalf Archaeological Consultants, Inc.; Mariah = Mariah Associates, Inc.; OSA = Office of the State Archaeologist; SJNF = San Juan National Forest; WRNF = White River National Forest

As a result of these projects, 87 cultural resources were identified and recorded, including 46 sites and 41 isolated finds and features. The 46 sites include five prehistoric lithic scatters and 41 historic sites (Table 3C-2). The historic sites include a variety of types, mostly associated with mining. These are isolated cabins, log structures, numerous mines and mining camps, a few prospect pits, and several trash dumps. Three railroad grades, including a segment of the Denver and Rio Grande railroad, a segment of Interstate 70, and a historic cattle trail have also been recorded. Finally, Compass provided no information about two sites (5ST329, 5ST431) other than a historic association. Eleven of the sites were not evaluated for eligibility to the NRHP and their status is unknown. The remaining 35 sites are listed on the Compass database as not eligible, 22 of which have OAHP concurrence. Two sites are within 100 feet of the current project, 5ST103 and 5ST429. Site 5ST103 was recorded in 1976 as a small scatter of wooden planks. It was revisited by MAC and is described in greater detail in the Results section below. Site 5ST429 includes two prospect pits, which would be recorded as isolated features by current USFS standards, and was recommended as not eligible. This site was not revisited in consultation with the USFS.

In addition to the sites, 41 isolated resources were recorded as a result of the inventories (Table 3C-3). Most of these resources are historic in age, but one was not indicated. Six of the resources are artifacts including glass, ceramics, enamelware cookware, cans, and miscellaneous metal, all of which is indicative of short term camps associated with mining, logging, and shepherding throughout the area. Thirty-three resources are features, and two are unknown. The isolated features include rock cairns, prospect pits, mining features that are likely prospect pits, cairns and associated mining features, and earthen features. The cairns are possibly claim markers or possibly USGS elevation markers. One such cairn, 5ST586, is located within 100 feet of one of the proposed developments and was revisited.

Topographically, the somewhat rugged nature of the area provides only limited areas that are suitable for prehistoric cultural sites. Because of this, expectations for the discovery of prehistoric cultural materials were low. Previous work in the area resulted in the discovery of numerous mining-related sites, mostly prospect pits; however, the majority of these are located around Copper Bowl well to the south of the

Chapter 3. Affected Environment and Environmental Consequences
C. Cultural Resources

project area. Few historic sites were expected in the project area, although historic isolated finds such as artifacts or prospect pits were likely. Conditions at the time of field work were conducive to the discovery of cultural resources with clear skies, moderate wind, and moderate temperatures. Snow cover was confined to the upper elevations, generally on north-facing slopes and just below the ridge lines where cornices develop over the winter. The exception was the eastern half of the survey corridor of the Woodward ski lift, which was under approximately 3 to 20 feet of snow on the edge of the adjacent groomed run for a summer ski school. This development will be surveyed once the snow has cleared.

**Table 3C-2:
 Previously Recorded Sites within 1 Mile of Project Area**

Site No.	Type	Site Name	Description	NRHP	In APE?
5ST101	Historic		Mining camp	NEx	No
5ST102	Historic		Miscellaneous log structure	Unknown	No
5ST103	Historic		Trash scatter, associated dirt road	Unknown	Yes
5ST104	Historic		Log corral and associated trash	Unknown	No
5ST108	Historic	Touring Cabins	Cabins	Unknown	No
5ST109	Historic		Miscellaneous log structure	Unknown	No
5ST110	Historic	Wheeler Ruins	Cabin	Unknown	No
5ST131	Prehistoric		Open lithic scatter	Unknown	No
5ST137	Prehistoric		Open lithic scatter	Unknown	No
5ST138	Prehistoric		Open lithic scatter	Unknown	No
5ST139	Prehistoric		Open lithic scatter	Unknown	No
5ST140	Historic		Habitation site with associated trash scatter	Unknown	No
5ST152	Historic	Wheeler Guard Station	Ranger cabin	NEx	No
5ST317	Historic		Trash scatter	NE	No
5ST329	Historic	Wheeler Junction	Abandoned site	NE	No
5ST332	Historic	Woodside Narrows	Railroad grade	NE	No
5ST428	Prehistoric		Open lithic scatter	NEx	No
5ST429	Historic		Prospect pits	NEx	Yes
5ST430	Historic		Mine and associated trash	NEx	No
5ST431	Historic		Other	NEx	No
5ST432	Historic		Log structure	NEx	No
5ST433	Historic		Log house	NEx	No
5ST478	Historic		Trash dump	NEx	No
5ST479	Historic		Trash dump	NEx	No
5ST480	Historic		Railroad grade	NEx	No
5ST481	Historic		Mining camp	NEx	No
5ST482	Historic		Mining camp	NEx	No
5ST483	Historic		Mine	NEx	No
5ST484	Historic		Cabin	NEx	No

**Table 3C-2:
Previously Recorded Sites within 1 Mile of Project Area**

Site No.	Type	Site Name	Description	NRHP	In APE?
5ST485	Historic		Mining camp	NEx	No
5ST486	Historic		Prospect pits	NE	No
5ST487	Historic		Mine	NE	No
5ST488	Historic		Prospect pits	NE	No
5ST582	Historic		Mine	NE	No
5ST583	Historic		Mine	NE	No
5ST584	Historic		Structure	NE	No
5ST585	Historic		Mine	NE	No
5ST892.1	Historic	Interstate 70	Interstate highway segment	NE	No
5ST1094	Historic	Spaulding Gulch Cabin Site	Cabin	NE	No
5ST1190	Historic	Copper Creek Mine	Isolated mine	NE	No
5ST1206.1	Historic	Denver & Rio Grande Railroad	Railroad grade segment	NEx	No
5ST1213	Historic		Cabin	NEx	No
5ST1214	Historic	Ten Mile Stock Bridge	Bridge	NEx	No
5ST1216.1	Historic	Ten Mile Stock Trail	Cattle trail segment	NEx	No
5ST1230	Historic		Trash dump	NEx	No
5ST1231	Historic		Trash dump	NEx	No

NRHP = National Register of Historic Places; OAHF = Office of Archaeology and Historic Preservation; NEx = Not eligible with OAHF concurrence; Unknown = Eligibility Unknown; APE = Area of Potential Effect

**Table 3C-3:
Isolated Resources within 1 Mile of Project Area**

Site No.	Type	Description	In APE?	Site No.	Type	Description	In APE?
5ST434	Unknown	No information	No	5ST605	Historic	Rock cairn	No
5ST435	Historic	No information	No	5ST606	Historic	Mining	No
5ST586	Historic	Rock cairn	Yes	5ST607	Historic	Mining	No
5ST587	Historic	Mining	No	5ST608	Historic	Mining	No
5ST588	Historic	Rock cairn	No	5ST609	Historic	Mining	No
5ST589	Historic	Mining	No	5ST610	Historic	Liquor bottle	No
5ST590	Historic	Rock cairn	No	5ST611	Historic	Mining	No
5ST591	Historic	Mining and rock cairns	No	5ST612	Historic	Earthen feature	No
5ST592	Historic	Mining	No	5ST613	Historic	Can	No
5ST593	Historic	Prospect pit	No	5ST614	Historic	Mining, rock cairn	No
5ST594	Historic	Rock cairn	No	5ST615	Historic	Earthen feature	No
5ST595	Historic	Rock cairn	No	5ST617	Historic	Enamelware	No
5ST596	Historic	Rock cairn	No	5ST618	Historic	Mining	No

**Table 3C-3:
 Isolated Resources within 1 Mile of Project Area**

Site No.	Type	Description	In APE?
5ST597	Historic	Mining	No
5ST598	Historic	Mining	No
5ST599	Historic	Mining	No
5ST600	Historic	Mining	No
5ST601	Historic	Rock cairn	No
5ST602	Historic	Rock cairn	No
5ST603	Historic	Rock cairn	No
5ST604	Historic	Mining	No

Site No.	Type	Description	In APE?
5ST619	Historic	Mining	No
5ST903	Historic	Mining	No
5ST1044	Historic	Ceramics	No
5ST1045	Historic	Can	No
5ST1046	Historic	Metal	No
5ST1181	Historic	Mining	No
5ST1189	Historic	Mining	No

APE = Area of Potential Effect

Inventory Results

As a result of this inventory, no new cultural resources were encountered, one previously recorded site (5ST103) was relocated and re-recorded, and one previously recorded isolated feature (5ST586) was not relocated and is presumed destroyed. The site is a scatter of historic milled lumber and is recommended as not eligible for inclusion on the NRHP.

5ST103

This previously recorded historic site was originally recorded in 1976 by Gordon and Kranzush as a small scatter of milled lumber and historic artifacts. Several square nails were noted embedded in the boards and scattered around the cluster, as well as two cans that likely dated to the same time period, although no other descriptive information is provided. The boards were noted to be laid out in a rough square alignment and it was speculated that the site could represent the remains of a small shed or other building. In addition to the lumber, a cluster of rocks in the southwest was suggested to have possibly been purposefully aligned. The site was not evaluated for eligibility and it was recommended that a historian inspect the site prior to disturbance.

MAC revisited the site because it lies within the APE of the current project. The plotted location was initially inspected, but no evidence of the site was observed. A careful reading of the site map indicated its location much closer to Union Gulch than is indicated by the plot, therefore, the search area was expanded to include the area nearer the gulch. The site was relocated in an area very similar to what was previously described; however, the plot is incorrect. MAC is submitting an updated GIS site location with this recording.

The site is located on a rocky knob on a bench above and northwest of northeast-flowing Union Gulch, a permanent stream that lies approximately 30 meters to the southeast. The surrounding landscape trends generally northeast at a 7 degree slope. Vegetation is mixed conifer dominated by fir trees with some

deadfall and a minimal understory of grasses and forbs. Union Gulch is lined with low willows. Ground visibility is very poor, less than 5 percent, because of a 3- to 5-centimeter layer of duff. Surface sediments are reddish brown clay sand residuum derived from the underlying granite. The rocky knob on which the site lies appears to be a collection of colluvially deposited granite boulders rather than an outcrop of bedrock. Inspection of the adjacent hiking/biking trail indicates there is no potential for buried cultural materials. The site has been heavily impacted by weathering and erosion, as well as incidental trampling by users of the hiking trail, which lies immediately adjacent to the north. Artifacts that had been previously identified were not relocated and may have been collected by users of the trail.

The site is composed of eight deteriorated boards of milled lumber in a small area that measures 6 feet by 10 feet located in a cleared area between six fir trees. One set of three fir trees grown together serves as the virtual datum since no physical datum was left per Forest Service request. The virtual datum is at the southwest side of the cluster. Each board is approximately 3.5 inches wide by 1 inch thick and range in length between 1 foot and 4 feet. One machine cut square nail about 1.5 inches long was noted embedded in one of the boards and represents the only diagnostic artifact at the site. A colorless condiment bottle missing its base was observed at the eastern edge of the cluster, although it is not diagnostic to the historic period. No other artifacts or features were noted. The site would have been recorded as an isolated find by current USFS standards.

NRHP Eligibility and Management Recommendations

The site is composed of a small pile of decomposing milled lumber with one square nail embedded in one of the boards, which gives a date range for the pile of approximately 1880–1900. The function that this pile of wood represents, however, is unknown. The original recording indicated it may have been a cabin based on the orientation of the boards, but the boards appear to have been laid on the ground surface in a somewhat random pattern. Additionally, there are very few boards present, which does not necessarily preclude the interpretation of the site as a structure, but there were no other artifacts noted, particularly additional nails that are more likely to have been missed during a possible dismantling of the structure. This site is as likely to represent a dump site and the artifacts removed from their original location, diminishing its interpretive value. The lack of additional artifacts, unknown function, and no potential for buried cultural materials indicates that the site lacks potential to provide meaningful information about historic land use and occupation in this area (Criterion D). Likewise, it does not meet any other criteria of eligibility to the NRHP and lacks all aspects of integrity. The site was not originally evaluated for eligibility, although it was recommended that additional work be performed. MAC has re-evaluated the site and recommends it as not eligible for inclusion on the NRHP. No further work is recommended.

5ST586

This isolated feature was recorded as a historic cairn in 1993 by Mariah Associates, Inc. It was described as a cairn consisting of approximately 100 cobbles and measuring 1.5 meters in diameter and 1.5 meters in height. Because of its location on a 20 degree slope, it was interpreted as a historic, possible USGS elevation marker. The resource was assessed as not eligible for inclusion on the NRHP.

MAC revisited the feature because it lies in the APE of the current project and to confirm its characterization as a historic feature. Cairns are features that can be of Native American origin and part of a prehistoric or protohistoric drive line, which are found on ridge systems above timberline, although they are not common. The recorded size of this feature is not a type commonly associated with prehistoric or protohistoric Native Americans; however, it could be part of a system of hunting blinds along a drive line. During the revisit, the general vicinity of the cairn was visually inspected from the top of the ridge to identify any likely cobble outcrop, which were more closely inspected, as well as a more intensive inspection of the area of where the site was plotted. While numerous outcrops and piles of cobbles were noted, none were determined to have been culturally modified. The smaller cobble piles were scattered and not indicative of any configuration that could be interpreted as a cairn, and the larger cobble piles were more obviously the result of colluvial erosion from the exposed bedrock on the ridge. The cairn is presumed to have been destroyed through erosion; however, it is possible that it was plotted in the wrong place and lies outside of the current APE.

NRHP Eligibility and Management Recommendations

The cairn was originally recorded as a historic isolated feature. Isolated features such as this type of cairn are considered not eligible for inclusion on the NRHP because they do not meet any criteria for eligibility. Additionally, the cairn was not relocated and is presumed destroyed. MAC did not observe any changes that would alter the resource's eligibility status of not eligible. No further work is recommended.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Under the No Action Alternative, none of the proposed ski area development projects would occur in the project area. Because no ground disturbance is proposed under the No Action Alternative, there is no potential to affect the historic sites surveyed within the APE.

Alternative 2 – Proposed Action

One previously recorded site (5ST103) was relocated and re-recorded and one previously recorded isolated feature (5ST586) was not relocated. The site, 5ST103, was originally unevaluated. During the revisit, the site was determined to be a small scatter of milled lumber with no integrity and no potential to provide meaningful data about the area's history. It was re-evaluated and is recommended as not eligible for inclusion on the NRHP. The isolated feature, 5ST586, was originally recommended as not eligible for

inclusion on the NRHP and MAC did not change the eligibility status of the resource. No further work is recommended for either resource.

Previous work in the area had resulted in the discovery of few resources on the north slope of Union Mountain and Copper Mountain. The vast majority of resources recorded on all slopes of these mountains are historic in age, most of which are related to the area's mining, although a few sites associated with sheepherding and possibly with timber harvesting were recorded. The areas surveyed for this project were small and in areas that were either too steep to retain any artifacts or within a heavily developed area and unlikely to retain any intact sites. The revisited site is ephemeral in nature, which is expected given the boom/bust cycles of the mining economy and the transient nature of sheepherding.

No new cultural resources were discovered and two previously recorded cultural resources were revisited. Site 5ST103 was relocated and rerecorded. It is a scatter of historic milled lumber and is recommended to be not eligible for inclusion on the NRHP. Resource 5ST586 was an isolated feature originally described as a historic cairn. It was not relocated and is presumed destroyed, although it may have been misplotted and is outside of the current APE. The resource is recommended as not eligible for inclusion on the NRHP. No further work is recommended for either resource. A finding of *no historic properties affected* is recommended for the project at this time.

CUMULATIVE EFFECTS

No effects to NHRP-eligible cultural resources were identified within the APE related to the Proposed Action; therefore, by definition, no cumulative effects would occur or require further analysis.

D. SOCIAL AND ECONOMIC RESOURCES

INTRODUCTION

Potential social and economic impacts of the proposed projects at CMR were raised as issues during the scoping process. CMR is integral to Summit County's recreation and tourism based economy, and the resort's success directly contributes to the sustainability of the economy and quality of life for residents of Summit County.

The scope of the socio-economic impact analysis provided in this EA includes Summit County, given the potential impacts of the proposed projects to housing, economy, and population of the proposed projects. Given the focused nature of the projects, and the history of environmental permitting done at CMR on National Forest land, this EA partially refers to the more extensive analysis of the 2006 EIS to infer potential impacts of the proposed projects.

AFFECTED ENVIRONMENT

Housing and Population

The U.S. Census Bureau indicates that in 2010 Summit County's full-time population was 27,994 people.¹¹ U.S. Census Bureau also estimates that in 2011 there were 30,005 housing units, approximately one-third of which were occupied full-time, the remainder being vacation properties/second homes.¹² According to population projections prepared by the State Demographer, Summit County is expected to gain approximately 20,193 new permanent residents between 2010 and 2030; representing an annual growth rate of 3.6 percent, or 72 percent total.¹³

The high degree of second homes and vacation properties poses a challenge for affordable housing for Summit County residents. The Summit Combined Housing Authority provides programs to assist full-time residents in their ability to rent and buy local homes, including deed-restricted homes, homebuyer education, down payment assistance, Section 8 housing, and other loan programs.¹⁴

Economic Considerations

As stated in the 2006 EIS, tourism is the primary contributor to the economic well-being of Summit County. Economic Base Analysis recorded by the Colorado Department of Local Affairs indicates that Tourism accounted for 59.59 percent of Summit County's jobs in 2011—far exceeding any other industry group.¹⁵

¹¹ U.S. Census Bureau, 2013

¹² Average household size is 2.45; 28,000 (population) divided by 2.45 is 11,428 housing units occupied full-time.

¹³ Summit County, 2013

¹⁴ Summit Combined Housing Authority, 2013

¹⁵ State of Colorado, 2013

CMR individually makes a substantial economic contribution to tourism regionally and statewide. During the 2008/09 season, CMR's skier visits contributed to 13.6 percent of the states total skier visits.¹⁶ It provides an important contribution to direct employment in the retail, lodging, and service sectors, as well as an indirect impact on other businesses that support those sectors.

Upgrades and improvements are critical for CMR to remain competitive. In recent years, the resorts that have seen the most growth in visitation and market share are those that continue to improve mountain and base area facilities and offer a higher-quality product.

CMR employs approximately two-thousand people, spread over a variety of jobs. These include part-time, full-time (FT) and seasonal positions:¹⁷

**Table 3D-1:
CMR Employment**

Status	Year 2013
Volunteer	483
Part-time seasonal	340
Core – 12 months	194
Regular – 11 months	53
Regular – 9 months	40
Regular – 10 months	50
FT seasonal; benefits	134
FT seasonal	586
On-call	56
TOTAL	1,936

Fiscal Considerations

Taxes paid by CMR to the federal and local taxes contribute directly to the overall road and school budgets of Summit County, fire and police protection, and other community services. The 2006 EIS (Chapter 3 Section J – Social and Economic Impacts) provides a complete description of the fiscal contributions that result from CMR visitation.

Environmental Justice

Executive Order 12898 on Environmental Justice requires all federal agencies to identify and consider disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority or low-income populations.

¹⁶ Colorado Ski Country USA, 2010

¹⁷ Copper Mountain Resort, 2013

The U.S. Census Bureau indicates that in 2010, 10.1 percent of Summit County's population lived below poverty level.¹⁸ It also indicated an increase in ethnic diversity: between 2000 and 2010 the Hispanic population (any race) increased approximately 73 percent, or 1,683 residents. Persons of Hispanic origin (any race) now make up 14.25 percent of Summit County's total permanent resident population.

For this project, no populations or issues were identified or considered in terms of environmental justice.

DIRECT AND INDIRECT ENVIRONMENT CONSEQUENCES

Alternative 1 – No Action

Under the No Action Alternative, no operational or infrastructural changes/additions would occur on NFS lands within the CMR SUP area. CMR would be expected to continue the same visitation trend, experiencing moderate fluctuations in skier visitation, averaging approximately 800,000 skier visits annually. As such, no direct, indirect or cumulative impacts to socio-economic resources would occur under Alternative 1.

Alternative 2 – Proposed Action

The proposed projects included under Alternative 2 would improve the recreational experience at CMR and would therefore help CMR remain viable in a highly competitive market of world-class ski areas. A slight increase in CMR's capacity would occur, although a measurable rise in visitation would not be expected (refer to Chapter 3 Section A – Recreation, for a complete description). By improving CMR's ability to meet the demands of the market, Summit County would benefit from a socioeconomic perspective.

During construction, the projects would be expected to add a small number of temporary jobs to Summit County and the surrounding area. Given the scope of the projects, this could occur over several years. The projects would directly lead to a handful of additional seasonal jobs at CMR, related to operating the proposed surface lifts (West Ridge, Woodward and terrain park, and Kokomo teaching area).

The proposed projects would not have a direct impact to permanent housing in Summit County. Temporary jobs associated with the construction would cause a minor demand in temporary housing that would end once the projects were completed.

¹⁸ U.S. Census Bureau, 2013

CUMULATIVE IMPACTS

Cumulatively, the proposed projects combined with improvement projects at other Summit County ski resorts would result in a positive impact to the area's socio-economic resources. The four resorts all contribute to Summit County's reputation as one of the country's premier ski destinations; "Summit County" is well-known in the marketplace for its collection of world-class resorts. To maintain that reputation—and thus reinforce the primary economy of Summit County—resorts must answer the needs and expectations of guests by providing a variety of terrain, optimal teaching facilities, and the latest technology in lifts and infrastructure.

E. WILDLIFE AND AQUATIC SPECIES

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.¹⁹ Species analyzed include those identified as listed proposed, threatened, endangered, Forest Service Region 2 (R2) sensitive and management indicator species (MIS).

The Project Area encompasses approximately 7,343 acres of NFS lands, and adjacent private land of the Copper Mountain Resort (CMR). Elevations range from 9,710 feet at the base of the mountain to 12,300 feet at the summit.

A Biological Assessment (BA), Biological Evaluation (BE) and MIS report were prepared for this project. The BA analyzes the potential effects on federally listed threatened, endangered, and proposed species. The BE provides a similar analysis regarding the potential effects of the Proposed Action on R2 Sensitive species in the area. The MIS report addresses species that the Forest Service uses as a means to monitor selected issues on the Forest as required by regulation.²⁰ In addition, migratory birds were addressed per the 2008 Forest Service Memorandum of Understanding with the United States Fish and Wildlife Service (USFWS) to promote the conservation of migratory birds.

The following analysis is a summary of the BA, BE and MIS report that are contained in the project file.²¹ Additional information can be obtained by reviewing the larger documentation there. All references are contained therein.

AFFECTED ENVIRONMENT

Threatened, Endangered and Proposed Species

Table 3E-1 identifies federally-listed and proposed animal species present on the WRNF, potentially present on the Dillon Ranger District, and/or potentially affected by management decisions associated with the Proposed Action. Other listed and proposed species known to occur elsewhere on the WRNF and/or in Colorado were considered, but dropped from analysis because (1) they were not identified by the USFWS or Forest Service as potentially present on the DRD, (2) their habitats do not occur on the DRD or in the analysis area, (3) they have no affinities to analysis area habitats, (4) the analysis area is outside of the species' range or does not contain potential habitat, and (5) the management decision associated with the Proposed Action would have no effect on the species, on their habitats, or on designated critical habitat.

¹⁹ USDA Forest Service, 2002a; 2008a

²⁰ 36 CFR 219.19

²¹ Thompson, 2013a,b

**Table 3E-1:
Federally Listed and Proposed Animal Species Potentially Affected**

Common, Scientific Name	Status	Species Analyzed (Y/N)	Rationale for Exclusion from Analysis ^a (Habitat)
Penland alpine fen mustard, <i>Eutrema penlandii</i>	T	Y	Species analyzed (Unoccupied habitat; rocky alpine crevices, streambanks, and wetlands >11,800 ft.)
Uncompahgre fritillary butterfly, <i>Boloria acrocynema</i>	E	N	No habitat; project far outside species' distribution (Alpine snow willow stands >12,000 ft. on peaks ≥ 12,600 ft.)
Humpback chub, <i>Gila cypha</i>	E	N	No additional CO River water depletions beyond previously authorized limits (Far downstream in Colorado River)
Bonytail chub, <i>G. elegans</i>	E	N	No additional CO River water depletions beyond previously authorized limits (Far downstream in Colorado River)
Colorado pikeminnow, <i>Ptychocheilus lucius</i>	E	N	No additional CO River water depletions beyond previously authorized limits (Far downstream in Colorado River)
Razorback sucker, <i>Xyrauchen texanus</i>	E	N	No additional CO River water depletions beyond previously authorized limits (Far downstream in Colorado River)
Greenback cutthroat trout, <i>Oncorhynchus clarkii stomias</i>	T	Y	Species analyzed (Isolated mountain stream headwaters)
North American wolverine, <i>Gulo gulo luscus</i>	P	Y	Species analyzed (Potential, unoccupied habitat; historic range; remote mountains and alpine areas)
Canada lynx, <i>Lynx canadensis</i>	T	Y	Species analyzed (Present in AA; potential forage/travel habitat; montane and subalpine forests) ^a

^a In the species' respective action area (AA).

Note: 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 Alternative 2 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: E = Endangered, T = Threatened, P = Proposed. Potential pre-field survey occurrence on the project area and habitat affinity is summarized for each species. Candidate species are addressed in the Biological Evaluation portion of this document.

Source: List: USFWS March 16, 2012, received from L. Roberts, USFS, pers. comm., July 11, 2012, updated Feb. 4, 2013, and current as of Feb. 13, 2013 (L. Roberts, USFS, pers. comm.) and Western Ecosystems, Inc.

Of the above listed species, only the Greenback cutthroat trout, North American wolverine, and Canada lynx were further analyzed. Only the Canada lynx was evaluated in detail after the Greenback cutthroat trout and North American wolverine were dropped from further consideration after finding that the Proposed Action would have “no effect” or was “not likely jeopardize” the species.

Canada Lynx

Canada lynx in the contiguous United States was listed as threatened effective April 24, 2000. The Canada lynx has been classified by the State of Colorado as a State endangered species since 1976. On September 17, 2010, the CDOW (now CPW) announced that the lynx reintroduction project had successfully accomplished its goal of establishing a breeding population in the Southern Rockies.

The Southern Rockies Ecosystem represents the extreme southern edge of the range of lynx in North America. Canada lynx occur primarily in spruce-fir and lodgepole pine forests, at elevations between

8,000 and 12,000 feet. On a landscape scale, Canada lynx habitat includes a mosaic of early seral stages that support snowshoe hare populations and late seral stages of dense old-growth forest that provide high quality denning and security habitat.

Because of the patchy, discontinuous distribution of lynx habitat in Colorado, maintaining landscape-level habitat connectivity may be paramount to maintaining a viable population. Colorado lynx habitats are not only constrained by broad alpine zones and non-forested valleys, but also by towns, reservoirs, highways, and other human developments that fragment and isolate montane and subalpine lynx habitats. Any continuously forested corridor between mountain ranges supporting lynx habitat that is relatively free of human development has the potential to be an important landscape linkage.

The Canada Lynx Conservation Assessment and Strategy (LCAS) indicated that project planning should evaluate the effects to lynx habitat within designated Lynx Analysis Units (LAU) exceeding 25,000 acres in the southern Rocky Mountain Geographic Area. LAUs are intended to provide the smallest scale at which the effects of management actions on lynx habitat are quantitatively evaluated. LAUs do not represent actual lynx home ranges, but their scale should approximate the size of an area used by an individual lynx. For the purposes of this analysis, the Canada lynx action area includes the Tenmile LAU, and those portions of highways serving CMR, including I-70 (over Vail Pass and to Denver) and Highways 91 and 6.

The 2002 Forest Plan and Southern Rockies Lynx Amendment (SRLA) identified Forested Landscape Linkages (Management Area 5.5 on the WRNF) to be managed as key landscape linkages for lynx and other carnivores. The goal of linkage areas is to ensure population viability through population connectivity. Linkage areas are areas of movement opportunities between habitat blocks that may be separated by intervening areas of “non-habitat” such as basins, valleys, agricultural lands, or where lynx habitat naturally narrows between blocks. They exist on the landscape and can be maintained, degraded, or severed by management activities and human infrastructure, such as high-use highways, subdivisions, or other developments. The Forest Service does not consider lynx linkages to be “corridors” (which imply only travel routes), but broad areas of habitat where animals can find food, shelter, and security that also provide connectivity between larger habitat blocks. However, characteristics of some of the linkages considered herein are largely limited to highway crossing locations. Such linkage zones would be expected to support greater use by transient or nomadic individuals. The Herman Gulch and Loveland Pass lynx linkage areas are the two linkages that would be crossed by CMR-related traffic coming from the east (Denver); the Vail Pass lynx linkage area would be crossed by CMR-related traffic coming from the west (which is far less substantial).

Region 2 Sensitive Species

R2 sensitive species represent those that are declining in number or occurrence or whose habitat is declining, either of which could lead to federal listing if action is not taken to reverse the trend, and species whose habitat or population is stable but limited. From the updated R2 sensitive species list, a subset of species, including one insect, five fish, two amphibians, seventeen birds, and eight mammals (Table 3E-2), was determined to be present or potentially present on the WRNF.²²

**Table 3E-2:
Region 2 Sensitive Animal Species that Potentially Occur in the Project Area**

Common name, Scientific name	Rationale for Potential Project Effects (Habitat Affinity)
INSECTS	
Great Basin silverspot, <i>Speyeria nokomis nokomis</i>	No habitat (Wetlands supporting violet populations)
FISH	
Roundtail chub, <i>Gila robusta robusta</i>	No suitable habitat (CO River up through Glenwood Canyon)
Mountain sucker, <i>Catostomus platyrhynchus</i>	No suitable habitat (small to medium streams below 7000'; four populations documented on the Rifle and Blanco Districts)
Bluehead sucker, <i>Catostomus discobolus</i>	No suitable habitat (CO River up to Alkali Creek) Canyon)
Flannelmouth sucker, <i>Catostomus latipinnis</i>	No suitable habitat (CO River & larger tribs.)
Colorado River cutthroat trout, <i>Oncorhynchus clarkii pleuriticus</i>	No suitable habitat (Isolated, headwater streams and lakes)
AMPHIBIANS	
Boreal western toad, <i>Anaxyrus boreas boreas</i>	No breeding habitat (Subalpine marshes and wet meadows; ponds, margins of streams; 8,500–11,000')
Northern leopard frog, <i>Lithobates pipiens</i>	No habitat (Permanent wetlands)
BIRDS	
Northern goshawk , <i>Accipiter gentilis</i>	Pot. habitat (Closed montane forests > 7,500')
Northern harrier, <i>Circus cyaneus</i>	No habitat (Grasslands, agricultural lands, marshes, & alpine)
Ferruginous hawk, <i>Buteo regalis</i>	No habitat (Plains, grasslands)
American peregrine falcon, <i>Falco peregrinus anatum</i>	No habitat (Cliffs, habitats concentrating/exposing vulnerable prey)
Bald eagle, <i>Haliaeetus leucocephalus</i>	No habitat (Open water bodies, big game winter range)
White-tailed ptarmigan , <i>Lagopus leucurus</i>	Pot. habitat (Alpine habitat and upper elevation willow stands)
Greater sage grouse, <i>Centrocercus urophasianus</i>	No habitat (Sagebrush)
Columbian sharp-tailed grouse, <i>Tympanuchus phasianellus columbianus</i>	No habitat (Sagebrush and mountain shrub)
Flammulated owl, <i>Otus flammeolus</i>	No habitat (Old-growth ponderosa pine and aspen)
Boreal owl , <i>Aegolius funereus</i>	Pot. habitat (Mature spruce-fir & mixed conifer)
Black swift, <i>Cypseloides niger</i>	No local nesting habitat (Waterfalls, cliffs)

²² USDA Forest Service, 2011

**Table 3E-2:
 Region 2 Sensitive Animal Species that Potentially Occur in the Project Area**

Common name, Scientific name	Rationale for Potential Project Effects (Habitat Affinity)
Lewis' woodpecker, <i>Melanerpes lewis</i>	No habitat (Ponderosa pine and cottonwoods)
Olive-sided flycatcher , <i>Contopus cooperi</i>	Present (Open, upper elev. conifer forests)
Loggerhead shrike, <i>Lanius ludovicianus</i>	No habitat (Plains, low valleys, shrublands)
Purple martin, <i>Progne subis</i>	No habitat (Old-growth aspen)
Brewer's sparrow, <i>Spizella breweri</i>	No habitat (Sagebrush and other structurally similar shrublands)
Sage sparrow, <i>Amphispiza belli</i>	No habitat (Low elevation big sagebrush and sage/greasewood)
MAMMALS	
Pygmy shrew , <i>Microsorex hoyi montanus</i>	Pot. habitat (Variety of subalpine habitats)
Fringed myotis, <i>Myotis thysanodes</i>	No habitat (Forests/woodlands to 7,500'; unknown on WRNF)
Hoary bat , <i>Lasiurus cinereus</i>	Pot. habitat (Including mixed conifer and lodgepole pine forest)
Spotted bat, <i>Euderma maculatum</i>	No habitat (Cliffs, arid terrain)
Townsend's big-eared bat, <i>Corynorhinus townsendii townsendii</i>	No habitat (Structures, tree cavities <9,500')
American marten , <i>Martes americana</i>	Present (Conifer forests)
River otter, <i>Lontra canadensis</i>	No habitat (Year-round open water and streamflows of ≥ 10 cfs)
Rocky Mountain bighorn sheep, <i>Ovis canadensis canadensis</i>	No habitat (High visibility habitat near escape terrain)

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. Species in **bold** are potentially present and/or are discussed in the text.

Source: USDA Forest Service, 2011

With the exception of white-tailed ptarmigan (*Lagopus leucurus*), no R2 sensitive animal species were detected in any of the CMR Mountain Improvements project component areas. However, prior wildlife surveys at CMR, including those in habitat types similar to those in project component areas, have detected individuals or suitable habitat for the northern goshawk (*Accipiter gentilis*), boreal owl (*Aegolius funereus*), olive-sided flycatcher (*Contopus cooperi*), pygmy shrew (*Microsorex hoyi montanus*), and American marten (*Martes americana*).

With respect to white-tailed ptarmigan, northern goshawk, boreal owl, olive-sided flycatcher, pygmy shrew, and American marten, it was determined that Alternative 2 "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." It was concluded that there would be no direct or indirect effects on these species, and they are not discussed further in this analysis.²³ Hoary bat (*Lasiurus cinereus*) was recently added to the R2 sensitive species list, has potentially suitable habitat in portions of the project area, and it is described below to update the CMR project file.

²³ The Biological Assessment, in the project filed, includes additional information on these species.

Hoary Bat

The hoary bat is a solitary species, roosting primarily among foliage in deciduous and coniferous trees, often along the edges of clearings. They have been observed in a number of forested cover types, including mixed conifer, lodgepole pine, ponderosa pine, pinyon-juniper, and riparian areas with cottonwood and willow. Hoary bats forage on a wide variety of insects, especially moths.

Because of this species' dependence on trees with foliage for summer roosts, insect, disease and large-scale disturbances, such as the current mountain pine beetle epidemic, pose a substantial, imminent threat to hoary bat populations. The only known roost locations of hoary bats in R2 were in live lodgepole pine trees, and the individuals located in that study preferred trees that were larger and had greater canopy cover than random. The bark beetle epidemic in R2 has killed more than 3 million acres of pine forests, decreasing the quality and quantity of this vital roosting habitat. Forest lands in R2 are often surrounded by unsuitable roosting habitat, so the Forests likely provide important roosting opportunities across the Region. The species has been documented on the WRNF and is considered in detail because of insufficient information on their distribution on the Forest.

The hoary bat analysis area for this project extends outward from individual project component areas in mixed conifer and lodgepole habitats to the furthest extent of any nocturnal foraging range that bats roosting in the project area might use. Based on nightly foraging ranges of other similar bats, the hoary bat analysis area could extend several miles beyond the proposed disturbance areas.

Management Indicator Species

MIS are those whose response to management activities can be used to predict the likely response of a larger group of species with similar habitat requirements. In addition, selected MIS should be those whose change in population would be directly attributable to the management action. MIS are to be evaluated at the Forest-wide scale. Therefore, project-level activities are evaluated in relation to how they affect Forest-wide population and habitat trends.

From the current list of Forest-wide MIS, aquatic macroinvertebrates, all trout, American pipit (*Anthus rubescens*), and elk (*Cervus elaphus*), were identified as project MIS, based on Forest Plan selection criteria and the presence or potential occurrence of these organisms and their habitats on NFS lands that could be affected by the Proposed Action.²⁴ These project MIS are discussed below. Other MIS were not selected as project MIS because they do not occur on NFS lands in the project area and they and their associated habitats on NFS lands would not be affected by the Proposed Action. Table 3E-3 summarizes the analysis and rationale of the MIS evaluation for the Proposed Action.

²⁴ USDA Forest Service, 2002b,c; 2005c; 2006b

**Table 3E-3:
 White River National Forest Management Indicator Species**

MIS Species	Habitat Occupied by Species? Are species and habitat present in the analysis area?	Will Proposed Action affect (direct, indirect, or cumulative) the species or its habitat?
Elk (<i>Cervus elephus</i>)	Wide range of forest and non-forest habitats Species Presence: Yes Habitat Presence: Yes	Species – Alt. 1: No; Alt. 2: Yes Habitat – Alt. 1: No; Alt. 2: Yes
American Pipit (<i>Anthus rubescens</i>)	Alpine Grassland Species Presence: Yes Habitat Presence: Yes	Species – Alt. 1: No; Alt. 2: Yes Habitat – Alt. 1: No; Alt. 2: Yes
Aquatic Macroinvertebrates	Perennial streams, intermittent streams, lakes and reservoirs Species Presence: Yes Habitat Presence: Yes	Species – Alt. 1: No; Alt. 2: Yes Habitat – Alt. 1: No; Alt. 2: Yes
All Trout (brook, brown, rainbow, CR cutthroat)	Perennial streams and lakes Species Presence: Yes Habitat Presence: Yes	Species – Alt. 1: No; Alt. 2: Yes Habitat – Alt. 1: No; Alt. 2: Yes

Source: Thompson, 2013a

Aquatic Macroinvertebrates

Aquatic macroinvertebrates were selected to address the trends and conditions of flowing waters only. Because of their wide distribution and their sensitivity to disturbance and pollutants, aquatic macroinvertebrates are widely used to monitor the health of streams and rivers. This group was not chosen as a MIS because of any viability concerns, there is not a viability concern for this species on the WRNF, viability is not expected to become a concern through implementation of this project or continued implementation of the Forest Plan, and viability of this MIS will not be addressed further in this document. The aquatic macroinvertebrate analysis areas for this project include those streams draining the project area (including Union, West Tenmile, and Tenmile Creeks above Dillon Reservoir) that could be affected by sediments and increased flows from proposed Alternative 2 disturbance areas.

Aquatic macroinvertebrates are those invertebrates that spend at least part of their life cycle in water. These include worms, mollusks, mites, and insects. Insects are by far the most common. Most insect species spend just the immature phase (larval or nymph phase) in water. Aquatic macroinvertebrate communities are influenced by the timing of flows and water quality in the streams in which they live. Geology, elevation, temperature, gradient, and substrate distribution are other factors that commonly influence macroinvertebrate communities. As habitats are degraded, either by chemical pollutants, increased sediment, or unfavorable changes in flow regime (especially severe reductions), the response of the macroinvertebrate community is typically a reduction in the number of species which occur there and especially the number of sensitive species.

As part of the 2006 EIS, the WRNF collected stream health data on several response reaches of interest within the CMR SUP area. Data have been collected for some reaches on Wheeler Gulch, McKenzie Gulch (a smaller tributary to Wheeler), Union Creek, and Copper Creek. Roundabout Basin, Union Gulch, Loverly Basin, Wheeler Gulch and Spaulding Gulch are the watersheds where ground disturbance could occur. Of these, Union Creek and Wheeler Gulch are the only watersheds large enough to contain third-order streams. Both the upper Wheeler Gulch and McKenzie Gulch reaches exhibit Robust stream health with respect to bank stability. However the reach near the base of CMR (above the culvert that goes under *Roundabout* trail) exhibits measured bank instability of almost 19 percent. The WRNF surveyed one reach in Union Creek near the base of the mountain. This reach has measured bank instability of 16.6 percent. As a result, this portion is categorized as Diminished for stream bank stability.

While overall conditions of project area streams are relatively clean and healthy, it is likely that CMR's cumulative hydrologic effects have not maintained or improved water quality in affected on-mountain creeks as a result of snowmaking. As a result of seasonal water quality and local stream habitat changes, aquatic faunal communities may differ (based on Forest Service criteria) between managed (CMR) and reference (natural baseline) sites. That issue will continue to be evaluated via project and Forest-wide monitoring. On-going ski area operations and maintenance would continue to require management to reduce negative effects to hydrology and water quality that could further impair aquatic macroinvertebrate communities.

All Trout (Brook, Brown, Rainbow, & Colorado River Cutthroat)

Fish communities are used to evaluate the existing condition of the project area and the potential effects of the Proposed Action. Total trout (including brook [*Salvelinus fontinalis*], brown [*Salmo trutta*], rainbow [*Oncorhynchus mykiss*], Colorado River cutthroat trout [*O. clarkii pleuriticus*], and their hybrids, hereinafter MIS trout, or trout) density, or the number of all trout individuals per 100 meters of stream, is an MIS, and a useful measure of habitat quality. Decreased habitat quality can result from changes in channel morphology and increased sedimentation.²⁵ Fall spawning fish (brook and brown trout) could potentially be affected by water depletions when eggs are in the gravels. Egg mortality can result from flow reductions dewatering egg deposition areas and increasing anchor ice occurrence. This group was not chosen as a MIS because of any viability concerns, there is not a viability concern for this MIS group on the WRNF, viability for this MIS group is not expected to become a concern through implementation of this project or continued implementation of the Forest Plan, and viability of this MIS group will not be addressed further. The all trout analysis areas for this project include those streams draining the project area (including Union, West Tenmile, and Tenmile Creeks above Dillon Reservoir) that could be affected by sediments and increased flows from proposed disturbance areas.

²⁵ USDA Forest Service, 2002d

Stream conditions on the WRNF as a whole are generally in good (i.e., somewhat near reference) condition and Forest-wide trout populations are expected to move toward reference (i.e., better) conditions as more conservative habitat protection measures are implemented and as habitat improves.²⁶ For brook and brown trout *in ski areas* (where winter water depletions were expected to increase), the Forest Plan estimated stable habitat quantity, decreasing habitat quality of spawning and rearing areas, and unknown future population trends for the two species over the life of the Plan.²⁷ Current Forest management should create a positive trend in trout populations, with better protections in place and proactive projects to improve damaged areas. Aquatic MIS populations are being maintained or, in some cases, increasing Forest-wide, during the plan period, with increasing habitat quality. The Forest Service will continue implementing the protocol to monitor trout populations and habitat trend across the WRNF.

The USFS electroshocked Union Creek and did not find any fish present. West Tenmile Creek, downstream of the project area, supports a recreational fishery.

American Pipit

American pipit (*Anthus rubescens*) was selected as a MIS to answer the question, “Is the alpine grassland habitat being managed to provide habitat for those species dependent or strongly associated with alpine grassland habitat?”²⁸ Population trend for this species is supposed to indicate trend for the quality and quantity of habitat for other alpine grassland species. Alpine grasslands are the primary habitat for American pipits on the WRNF. The primary risk factors affecting alpine grassland communities on the WRNF have been identified as recreation and livestock management. Alpine areas are very sensitive to disturbances that alter vegetation cover, since the soils are very unstable and have low fertility, and the vegetation is slow growing. This species was not chosen as a MIS because of any viability concerns, there is not a viability concern for this species on the WRNF, viability is not expected to become a concern through implementation of this project or continued implementation of the Forest Plan, and viability of this MIS will not be addressed further.²⁹ The American pipit analysis areas for this project include the WRNF and the furthest extent of any home range that could overlap the proposed disturbance areas. The existing CMR SUP area boundary would likely contain all potential impacts to American pipits that could be affected by the Proposed Action.

American pipits are summer residents in alpine portions of the CMR project area. They are most common along the main ridgeline through the resort and its persistent leeward snowfields, but they also range downward to more xeric alpine grasslands where they nest. The project components associated with the Union Meadows project occur in foraging and potential nesting habitat of one or more pipit pairs.

²⁶ USDA Forest Service, 2002c,d,f

²⁷ USDA Forest Service, 2002d, pp. 3-187–190

²⁸ USDA Forest Service, 2002b, p. 3-132; USDA Forest Service 2005c; 2006b

²⁹ USDA Forest Service, 2002b

American pipits have also been detected during summer in ski terrain elsewhere on CMR, and at Breckenridge, Keystone, Ski Cooper, Vail, Monarch, A Basin, and Wolf Creek Ski Areas, and are probably also present on other Colorado ski areas extending sufficiently into the alpine. Skiing and ski area management of alpine areas does not generally result in ground disturbance or measurable effects of alpine vegetation communities and is mutually exclusive with summer pipit habitat use.

American Elk

Elk were selected as a MIS to answer the question “Does Forest motorized and non-motorized travel and recreation management result in effective use of habitat by ungulates?”³⁰ Forest-wide, the elk population is increasing, but the population is decreasing in some areas as a result of intentional management. Under the selected Forest Plan alternative, elk habitat quantity across the WRNF is expected to remain stable, habitat quality is expected to remain stable or increase, and the future elk population trend is unknown. Part of the uncertainty with future population trends is that elk numbers are affected by weather and hunting levels that are independent of Forest Service control. The main MIS concern for elk is habitat effectiveness and their ability to disperse across the Forest. Elk were selected as a project-level MIS for CMR’s Mountain Improvements Project because they are seasonally present. The Forest Service is implementing the elk monitoring protocol, in cooperation with CPW, to monitor population and habitats trends across the WRNF. This species was not chosen as a MIS because of any viability concerns, there is not a viability concern for this species on the WRNF, viability is not expected to become a concern through implementation of this project or continued implementation of the Forest Plan, and viability of this MIS will not be addressed further. The elk analysis areas considered herein includes the furthest home ranges of elk overlapping the project area (generally southern Summit County) and the WRNF.

In Colorado, the breeding season for elk begins in early September, peaks during the last week of September and first week of October, and is over by late October. Calving grounds are carefully selected by the cows and are generally in locations where cover, forage and water are in close proximity. Calving sites occur in the middle to upper portions of summer range and often occur in the same general area each year. Hiking and other recreational activities in or near elk calving areas can impact reproductive success.

The State of Colorado has the responsibility for the management of wildlife populations. The CPW has specific elk management goals and objectives that have been developed in cooperation with landowners, the public and federal land management agencies. These plans help guide the State’s direction in the management of elk, increasing and decreasing harvest quotas in attempts to balance herd numbers with habitat availability.

The Project Area is in DAU E-13, which comprises all of Summit County and the southern part of Grand County. DAU E-13 contains 1,369.2 square miles (876,288 acres), with 35 percent (479.1 square miles

³⁰ USDA Forest Service, 2002c

[306,624 acres]) of this DAU within the WRNF. CMR's SUP area represents a small portion (approximately 0.9 percent) of the home ranges of herds within DAU E-13. Because of habitat conditions and the proximity of the Project Area to SH 91 and I-70, elk are not present in the Project Area. Elk may be occasionally be present during winter and spring and fall migration when animals are at lower elevations.

Migratory Birds

In 2008, the Forest Service Chief signed a MOU with the USFWS to promote the conservation of migratory birds. This MOU was pursuant to the Responsibilities of Federal Agencies to Protect Migratory Birds. 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.

The MOU outlined that the Forest Service shall evaluate the effects of agency actions on migratory birds within the NEPA process, with a focus on species of management concern along with their priority habitats and key risk factors. An evaluation of the effects of the Proposed Action to bird species and habitats of management concern is included in the various sections herein. 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.

Other migratory birds are considered individually in this document as listed species, R2 sensitive species, and MIS.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action Alternative reflects a continuation of existing operations and management practices without changes, additions, or upgrades of the existing conditions within the SUP boundary. As such, Alternative 1 would have no effect on any of the species considered herein, their habitats, or designated critical habitat.

Alternative 2 – Proposed Action

Threatened and Endangered Species

Canada Lynx

Under Alternative 2, there would be a net loss of 15.04 of vegetation types on all lands and 13.43 acres of vegetation types on NFS lands only. There would be a permanent loss of 4.74 of forest on all lands and 3.42 acres of forest on NFS lands only.

Under the Proposed Action, 2.62 acres of winter foraging habitat and 2.3 acres of other habitat would be converted into non-habitat on NFS and private lands. These effects would have no measurable effect on

Tenmile LAU habitat parameters. In addition, 10.11 acres of non-habitat would be temporarily disturbed. On NFS lands only, 2.38 acres of winter foraging habitat and 1.24 acres of other habitat would be converted into non-habitat.

Indirect effects resulting from the Proposed Action would be those associated with secondary or subsequent development, the effects of highway traffic volume increases, and dispersed recreation effects within the action area that would be initiated by, or result from, the implementation of the Proposed Action. Under Alternative 2, CMR is not expected to generate any secondary development from additional residents or employees. Temporary employees and contractors that would implement the project components would be mostly local, in-county commuters, or contractors that overnight at existing hotels. Implementation of the relatively modest mountain improvements would result in no additional, measurable, resort-related traffic or dispersed recreation resulting from the Proposed Action. The direct and indirect effects of the proposed CMR Mountain Improvements Project would be consistent with all applicable SRLA management direction (2009). While the collective habitat losses, land use, and human activity within the Tenmile LAU, including considerable recent habitat modifications associated with the mountain pine beetle epidemic, have degraded lynx habitat values and impaired habitat connectivity, the relatively small and benign additive impacts associated with the Proposed Action on lynx foraging, sheltering, breeding, and dispersal would meet the definitions of “insignificant” and “discountable” (per the USFWS and NMFS).

Therefore, the Proposed Action warrants a may affect, but is not likely to adversely affect Canada lynx.

R2 Sensitive Species

Impacts to R2 sensitive species are summarized in Table 3E-4, below.

**Table 3E-4:
Determination Summary of Proposed Action Effects on R2 Sensitive Animal Species**

Common name, <i>Scientific name</i>	Determination
INSECTS	
Great Basin silverspot, <i>Speyeria nokomis nokomis</i>	NI
FISH	
Roundtail chub, <i>Gila robusta</i>	NI
Mountain sucker, <i>Catostomus platyrhynchus</i>	NI
Bluehead sucker, <i>Catostomus discobolus</i>	NI
Flannelmouth sucker, <i>Catostomus latipinnis</i>	NI
Colorado River cutthroat trout, <i>Oncorhynchus clarkii pleuriticus</i>	NI
AMPHIBIANS	
Boreal western toad , <i>Bufo boreas boreas</i>	NI
Northern leopard frog , <i>Rana pipiens</i>	NI

**Table 3E-4:
 Determination Summary of Proposed Action Effects on R2 Sensitive Animal Species**

Common name, <i>Scientific name</i>	Determination
BIRDS	
Northern goshawk , <i>Accipiter gentilis</i>	MAII
Northern harrier, <i>Circus cyaneus</i>	NI
Ferruginous hawk, <i>Buteo regalis</i>	NI
American peregrine falcon, <i>Falco peregrinus anatum</i>	NI
Bald eagle, <i>Haliaeetus leucocephalus</i>	NI
White-tailed ptarmigan , <i>Lagopus leucurus</i>	MAII
Greater sage grouse, <i>Centrocercus urophasianus</i>	NI
Columbian sharp-tailed grouse, <i>Tympanuchus phasianellus columbianus</i>	NI
Flammulated owl, <i>Otus flammeolus</i>	NI
Boreal owl , <i>Aegolius funereus</i>	MAII
Black swift, <i>Cypseloides niger</i>	NI
Lewis' woodpecker, <i>Melanerpes lewis</i>	NI
Olive-sided flycatcher , <i>Contopus cooperi</i>	MAII
Loggerhead shrike, <i>Lanius ludovicianus</i>	NI
Purple martin, <i>Progne subis</i>	NI
Brewer's sparrow, <i>Spizella breweri</i>	NI
Sage sparrow, <i>Amphispiza belli</i>	NI
MAMMALS	
Pygmy shrew , <i>Microsorex hoyi montanus</i>	MAII
Fringed myotis, <i>Myotis thysanodes</i>	NI
Hoary bat , <i>Lasiurus cinereus</i>	MAII
Spotted bat, <i>Euderma maculatum</i>	NI
Townsend's big-eared bat, <i>Corynorhinus townsendii townsendii</i>	NI
American marten , <i>Martes americana</i>	MAII
River otter, <i>Lontra canadensis</i>	NI
Rocky Mountain bighorn sheep, <i>Ovis canadensis canadensis</i>	NI

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.

Source: Thompson, 2013

With respect to white-tailed ptarmigan (*Lagopus leucurus*), northern goshawk (*Accipiter gentilis*), boreal owl (*Aegolius funereus*), olive-sided flycatcher (*Contopus cooperi*), pygmy shrew (*Microsorex hoyi montanus*), and American marten (*Martes americana*), the Alternative 2 impact areas represent an insignificant proportion of the total potential range and habitat available to these species on the Forest. Indirect effects associated with this project would have no impact on these species. With respect to white-tailed ptarmigan (*Lagopus leucurus*), northern goshawk (*Accipiter gentilis*), boreal owl (*Aegolius funereus*), olive-sided flycatcher (*Contopus cooperi*), pygmy shrew (*Microsorex hoyi montanus*), and

American marten (*Martes americana*), Alternative 2 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.

Hoary Bat

Alternative 2 could impact individual hoary bats through the loss of potential roosting/foraging habitat associated with mixed conifer stands and any remaining mature lodgepoles that survive the mountain pine beetle epidemic. The Alternative 2 impact areas represent an insignificant proportion of the total potential range and habitat available to this species on the Forest. The probability that this species would be present in those small areas of potentially suitable habitats proposed for hut-related disturbance when it is so rare on the WRNF is unlikely.

Management Indicator Species

Indirect effects to MIS warranting consideration for this project would be those associated with the effects of any secondary or subsequent development and dispersed recreation that would be initiated by, or result from, Alternative 2. However, Alternative 2 is not expected to generate any secondary development or dispersed recreation effects from additional residents, employees, or guests that would affect MIS.

Aquatic Macroinvertebrates

There are two project components associated with the Proposed Action that closely approach a stream, (1) lower *Roundabout* trail grading and tree removal and (2) *Kokomo Lift* replacement. The lift replacement would span Union Creek and have little potential to generate negative stream effects to the stream. Most of the Roundabout grading has already occurred (2.6 acres on private lands and 0.8 acre on NFS lands) an additional approximate 0.4 acre of new grading would occur (0.02 acre on private and 0.36 on NFS lands). However, 0.4 acre of tree removal would occur for the Kokomo Lift alignment adjacent to Union Creek (0.37 on private lands and 0.04 on NFS lands), just above the existing *Roundabout* trail where the creek enters a culvert and flows under the ski trail.

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. With proper implementation of the stream health-related PDCs and BMPs, Alternative 2 would continue to provide aquatic macroinvertebrate habitat in all streams associated with the CMR project area. Furthermore, Alternative 2 would not measurably contribute to any negative trend in the Forest-wide population or habitat trend of aquatic macroinvertebrates that would affect achieving Forest Plan MIS objectives, and the project would remain in compliance with 2002 Forest Plan direction and the WCPH.

All Trout (Brook, Brown, Rainbow, & Colorado River Cutthroat)

There are two project components associated with the Proposed Action that closely approach a stream, (1) lower *Roundabout* trail grading and tree removal and (2) Kokomo Lift replacement. The lift replacement

would span Union Creek and have little potential to generate negative stream effects to the stream. Most of the Roundabout grading has already occurred (2.6 acres on private lands and 0.8 acre on NFS lands) an additional approximate 0.4 acre of new grading would occur (0.02 acre on private and 0.36 on NFS lands). However, 0.4 acre of tree removal would occur for the Kokomo Lift alignment adjacent to Union Creek (0.37 on private lands and 0.04 on NFS lands), just above the existing *Roundabout* trail where the creek enters a culvert and flows under the ski trail. The USFS electroshocked Union Creek and did not find any fish present. This is a shallow, high gradient reach separated from West Tenmile Creek by several hundred feet of culvert.

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. With proper implementation of the stream health-related PDCs and BMPs, Alternative 2 would continue to provide effective salmonid habitat in all streams associated with the CMR analysis area. Furthermore, Alternative 2 would not measurably contribute to impaired spawning success or to any negative trend in the Forest-wide population or habitat trend of aquatic trout that would affect achieving Forest Plan MIS objectives, and the project would remain in compliance with 2002 Forest Plan direction and the WCPH.

American Pipit

Ground disturbance and facilities associated with the Union Meadows projects would result in a net loss of American pipit nesting and/or foraging habitat. The total alpine disturbance area is slightly smaller than this species' mean territory size. It is unknown if any pipits would be nesting in or immediately adjacent to proposed disturbance areas during the construction season. Based on displaying male density observed during field surveys, pipit density in the vicinity of alpine disturbance areas is far lower than what would be associated with full occupancy at one pair per 1.4 acres. Therefore, it is most likely that adults with established territories overlapping disturbance areas would be displaced from foraging habitat to adjacent, unoccupied habitat. However, the construction season would overlap the nesting period. If construction started prior to nesting, adults would be displaced from foraging habitat and a potential nesting area, but there would be no loss of construction year recruitment as a result of destruction of a nest with eggs/young or nest (with eggs/young) abandonment. If construction began after eggs were laid and a nest was located in an impact area, there would be a loss of recruitment if birds did not reneest and fledge the same number of young they would have otherwise (unlikely, as second clutches are generally smaller). Project Design Features have been incorporated into the Proposed Action to minimize potential recruitment impacts to pipits. Regardless, Alternative 2 would result in a small net loss of habitat used by American pipits and other species associated with alpine grasslands. Potential direct effects would have no discernable effect on this species' Forest-wide population and habitat trends.

The limited alpine grassland habitat modifications and the mutually exclusive winter activities associated with Alternative 2, versus summer pipit use, indicate that with implementation of the Proposed Action,

ski area management would continue to provide habitat in the CMR SUP area for the pipit. Alternative 2 would not result in, or contribute to, any meaningful direct or indirect effects to American pipits. 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.

American Elk

The relatively small acreage of habitat conversion to trails would have no meaningful effect on elk habitat use or habitat effectiveness. Implementation of a recommended PDC would facilitate big game movements. The width of gate openings in fence sections is not critical. It would be most practical to size gate openings to the width between supporting posts (approximately 12 feet). Ten-foot-wide gate openings are adequate minimums. Gates (approximately every 100 yards) should be opened after the ski season closes, but before May 15, and closed before ski season opening (November 1 to 15). These dates would accommodate the earliest spring migratory movements after mild-winters, avoid disturbances during calving, and would accommodate the latest fall movements during falls with low snowfall. Summer construction activities could displace elk from access corridors and the active construction areas if elk occur in those areas coincident with human activities. Construction activity displacement effects could persist for years and while full recovery cannot be assumed, it is possible that elk use could largely return to former levels after about seven years, as long as human use remains near current environmental baseline levels.³¹ Full recovery to baseline levels is likely because elk use the project area only in spring through fall when the type of construction activities associated with the Proposed Action are being conducted in most years.

Indirect effects to elk warranting consideration for this project would be those associated with the effects of any secondary or subsequent development, dispersed recreation, and highway traffic effects connected to the action area that would be induced or initiated by, or result from, Alternative 2. Under Alternative 2, CMR is not expected to generate any secondary development from additional residents or employees. Temporary employees and contractors that would implement the project components would be mostly local, in-county commuters, or contractors that overnight at existing hotels. Additional dispersed recreation resulting from the Proposed Action would be confined to winter when few, if any, elk would be present in the project area. Implementation of the relatively modest mountain improvements would result in no additional, measurable, resort-related traffic associated with the Proposed Action.

Migratory Birds

In the event that nests of the two R2 bird species and one MIS bird species known or suspected of occurring on the project area are detected within impact areas, direct mortality of eggs and/or nestlings could be avoided by conducting tree removal in potential nesting habitat outside of the nesting period(s).

³¹ Morrison et al., 1995

Such a construction closure would also avoid incidental take for other migratory birds possibly nesting in and adjacent to project disturbance areas during those time intervals. However, it is possible that undetected active nests of the above R2/MIS bird species and/or other migratory bird species 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 not be entirely consistent with the Forest Service/USFWS MOU.

CUMULATIVE EFFECTS

Past, present, and reasonably foreseeable future project that have affected and will affect the resources considered herein extend from historic, persistent, mining and logging effects, to more recent transportation (e.g., I-70, Highways 9 and 6, and numerous Forest and private roads) and water developments (e.g., Dillon, Green Mountain, and other smaller reservoirs and their management affecting rivers and creeks). In addition, existing and continued build out of residential, commercial, and municipal developments related to the towns of Keystone, Dillon, Breckenridge, Frisco, Silverthorne and outlying developments are considered, as are the more widespread contemporary effects of year-round recreational development and use (e.g., alpine and Nordic ski areas, bike, hiking, and jeep trails, etc.).

There are no reasonably foreseeable future actions on non-NFS lands warranting consideration in this analysis.

Threatened and Endangered Species

Canada Lynx

There are no projects identified by the Forest Service or other parties that meet criteria as reasonably foreseeable that that could affect Canada lynx or its habitat in the action area.

R2 Sensitive

Hoary Bat

The indirect effects associated with this project would have no impact on the hoary bat. There are no reasonably foreseeable projects considered in this analysis that would contribute additional cumulative effects to this species. Nevertheless, because potential hoary bat habitat would be removed and altered, Alternative 2 “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.”³²

³² Thompson, 2013

Management Indicator Species

Aquatic Macroinvertebrates

Past and present actions that have affected aquatic macroinvertebrates and their habitat in the aquatic macroinvertebrate analysis area include historic mining, historic logging, road and dispersed recreational trail developments, and ski area and secondary resort development. These effects are relatively minor compared to ski area development largely associated with tree removal for ski trails and the addition of snowmaking. These actions have diverted and modified stream channels to some extent and resulted in short-term to long-term perturbations to water quality and aquatic faunal communities compared with control streams. One watershed (Wheeler Gulch) has been affected so significantly that further tree removal has been denied because sufficient mitigation measures are not available in order to adequately offset effects to water resources.³³

There are no reasonably foreseeable projects considered in this analysis that would contribute additional cumulative effects to these species. Stream conditions on the WRNF as a whole are generally in good (i.e., somewhat near reference) condition and Forest-wide aquatic macroinvertebrates are expected to move toward reference (i.e., better) conditions as more conservative habitat protection measures are implemented and as habitat improves.³⁴

All Trout (Brook, Brown, Rainbow, & Colorado River Cutthroat)

In and around the project area, past actions have had mostly negative effects to native trout and their habitat and beneficial and negative effects to the non-native trout considered in this MIS group. Past and present actions that have affected trout and their habitat in the vicinity of the project area include historic mining, historic and contemporary logging, other habitat modifications (including alpine and Nordic ski area development), secondary resort development, water diversions and impoundments, road building, the effects of recreational activities, and CPW management (i.e., restocking). These actions have eliminated and degraded existing habitat, presumably also affecting fall spawning, and introduced non-native trout to streams presumably occupied by CRCT. Introductions of non-native brook, brown, and rainbow trout into Colorado in the late 1800s clearly benefitted these species, while these same introductions and other factors negatively affected CRCT.

There are no reasonably foreseeable projects considered in this analysis that would contribute additional cumulative effects to these species. Stream conditions on the WRNF as a whole are generally in good (i.e., somewhat near reference) condition and Forest-wide aquatic macroinvertebrates are expected to

³³ USDA Forest Service, 2006b

³⁴ USDA Forest Service, 2002c,d,f

move toward reference (i.e., better) conditions as more conservative habitat protection measures are implemented and as habitat improves.³⁵

American Pipit

Past and present actions in the American pipit analysis area, including CMR development and historic mining, have had little impact on alpine grasslands and American pipits. There are no reasonably foreseeable projects considered in this analysis that would contribute additional cumulative effects to this species.

American Elk

Past actions, largely associated with historic mining, logging, and reservoir developments and more recent ski resort and supporting infrastructure developments (in particular secondary residential and commercial developments and traffic increases), have affected seasonal elk habitats in southern Summit County. Actions earlier than the 1950s, when elk first began recolonizing the valley, affected unoccupied habitat; however, the resulting habitat losses, modifications, and distributions of human developments and activities in the valley established a baseline for how elk utilize the landscape today in response to present actions.

There are no reasonably foreseeable projects considered in this analysis that would contribute additional cumulative effects to this species.

³⁵ Id.

F. VEGETATION

SCOPE OF THE ANALYSIS

This section provides a general discussion of common plant species known to occur on NFS lands in and near the Project Area. The Project Area encompasses approximately 7,343 acres of NFS lands, and adjacent private land of CMR. Elevations range from 9,710 feet at the base of the mountain to 12,300 feet at the summit.

All proposed projects are on NFS lands within CMR's SUP area, with one exception—the proposal to re-contour lower Roundabout to establish a consistent skiable grade. While the majority of this project would be located on private property, the disturbance area does extend onto adjacent National Forest System lands.

The project file includes the 2013 Biological Assessment (BA) and 2013 Biological Evaluation (BE) that were prepared specifically to analyze the Proposed Action. The BA and BE analyze listed proposed, threatened, endangered, and Forest Service Region 2 (R2) sensitive species.³⁶ This analysis of botanical resources summarizes the BA and BE, and is tiered to the WRNF Forest Plan FEIS. It incorporates by reference the 2002 Forest Plan, as amended.³⁷ All references are contained herein.

AFFECTED ENVIRONMENT

Plant surveys were completed for federally-listed species, Forest Service Region 2 (R2) sensitive species, and WRNF Species of Local Concern (SOLC) for individual project component areas. Field surveys were conducted specifically for this project on July 26 and August 6, 2012.

Threatened and Endangered Species

Only one of the thirteen threatened and endangered plants federally listed for Colorado has been documented in the general vicinity of the CMR project area. Penland alpine fen mustard (*Eutrema penlandii*) has been found in Summit County on Hoosier Ridge, approximately 20 miles southeast of the project area.³⁸ There are no records of this plant outside the Hoosier Ridge area that extends south to Mount Sherman in the Mosquito Range. This mustard is found above 11,800 feet in rocky crevices where there is moisture during the growing season (primarily from snowmelt), and rooted in mosses on stream banks, in hummock areas, or other sub-irrigated mossy areas. *Eutrema* flowers from mid-July through mid-August, and is in fruit after this time period.

³⁶ Thompson, 2013

³⁷ USDA Forest Service, 2002

³⁸ Spackman et al., 1997

The project areas most closely approaching potential habitat for this species include the Union Meadows lift and snowfence and the proposed wind turbines site. However, the disturbance areas were found not to represent potential *Eutrema* habitat and no *Eutrema* was detected during the surveys.

Region 2 Sensitive Species

No R2 sensitive plants were detected during the botanical surveys of all project component areas, with the exception of a portion of the Woodward and Terrain Park Surface Lift area, which was not fully surveyed as a result of the proposed location being moved after the initial site-specific field survey. The upper one-third of the proposed disturbance area was adequately surveyed, but the remaining portion of the area should be surveyed by a qualified botanist to clear it of plants of potential concern. The initial survey concluded that *Botrychium* is unlikely, but the most likely of any sensitive plant to be present.

Species of Local Concern

With the exception of a single *Botrychium neolunaria* found along the private/NFS property line just above the Union Creek base area in an area outside of proposed disturbance, no SOLC were detected on, or adjacent to, project component areas during systematic surveys conducted in 2011. While some existing ski trails and wetlands appeared superficially suitable to support moonworts (*Botrychium* sp.), no additional plants were located and those areas are considered to be currently unsuitable habitat.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action Alternative provides a baseline for comparing the effects of the action alternatives. The No Action Alternative essentially reflects a continuation of existing management practices without changes, additions, or upgrades. Thus, there would be no impact to any plant species.

Alternative 2 – Proposed Action

Threatened and Endangered Species

The BA indicated that no *Eutrema* or potential habitat for it has been found at CMR. The Proposed Action was found to have “no effect” on this species and it was dropped from further consideration. Forest Service Rare Plant Species Field Survey forms and Rare Plant Species Element Occurrence forms were completed and are on file at the Dillon Ranger District.

Region 2 Sensitive Species

Based on the BA/BE the Proposed Action would have “no impact” on any R2 sensitive plants. Although it is thought that there is potential for *Botrychium*, and further surveying should occur in the Woodward and Terrain Park Surface Lift area, a determination of “no impact” was concluded. Table 3D-1 identifies R2 sensitive plants, some of which are potentially present in the Project Area.

**Table 3F-1:
Summary of Proposed Action Effects on R2 Sensitive Plants**

Common name, <i>Scientific name</i>	Determination
PLANTS	
Sea pink, <i>Armeria maritima ssp. sibirica</i>	NI
Park milkvetch, <i>Astragalus leptaleus</i>	NI
Trianglelobe moonwort , <i>Botrychium ascendens</i>	NI
Slender moonwort , <i>Botrychium lineare</i>	NI
Peculiar moonwort , <i>Botrychium paradoxum</i>	NI
Smooth rockcress, <i>Braya glabella</i>	NI
Lesser panicled sedge, <i>Carex diandra</i>	NI
Livid sedge, <i>Carex livida</i>	NI
Yellow lady's slipper , <i>Cypripedium parviflorum</i>	NI
Clawless draba, <i>Draba exunguiculata</i>	NI
Gray's Peak whitlow-grass, <i>Draba grayana</i>	NI
Weber's draba, <i>Draba weberii</i>	NI
Roundleaf sundew, <i>Drosera rotundifolia</i>	NI
Giant helleborine, <i>Epipactis gigantea</i>	NI
Dropleaf buckwheat, <i>Eriogonum exilifolium</i>	NI
Altai cotton-grass, <i>Eriophorum altaicum var. neogaeum</i>	NI
Chamisso's cotton-grass, <i>Eriophorum chamissonis</i>	NI
Slender cotton-grass, <i>Eriophorum gracile</i>	NI
Hall fescue, <i>Festuca hallii</i>	NI
Simple bog sedge, <i>Kobresia simpliciuscula</i>	NI
Colorado tansy-aster, <i>Machaeranthera coloradoensis</i>	NI
Kotzebue's grass-of-Parnassus, <i>Parnassia kotzebuei</i>	NI
Harrington penstemon, <i>Penstemon harringtonii</i>	NI
Porter feathergrass, <i>Ptilagrostis porteri</i>	NI
Ice cold buttercup, <i>Ranunculus karelinii</i>	NI
Dwarf raspberry , <i>Rubus arcticus ssp. acaulis</i>	NI
Sageleaf willow, <i>Salix candida</i>	NI
Autumn willow, <i>Salix serissima</i>	NI
Narrowleaf peatmoss, <i>Sphagnum angustifolium</i>	NI
Baltic sphagnum, <i>Sphagnum balticum</i>	NI
Sun-loving meadowrue, <i>Thalictrum heliophilum</i>	NI
Lesser bladderwort, <i>Utricularia minor</i>	NI
American cranberrybush, <i>Viburnum opulus var. americanum</i>	NI

Other R2 sensitive plants are not listed because they have not been found on the WRNF, they have no affinities to habitats on the project area, the project area is outside of the species' range or elevational distribution, and the Proposed Action would have no impact on those species. Species in bold are potentially present in the project area.

NI = No impact.

MAII = may impact individuals, but is not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing.

Determinations in this table only consider NFS lands that may be directly, indirectly, or cumulatively affected by the Proposed Action, which R2 species determinations are based on.

Species of Local Concern

With the exception of a single *Botrychium neolunaria* found along the private/ NFS property line just above the Union Creek base area, no SOLC were detected on or adjacent to project component areas during systematic surveys conducted in 2011. The isolated *Botrychium neolunaria* find was located outside the area of proposed disturbance and would not be impacted.

CUMULATIVE EFFECTS

Past, present, and reasonably foreseeable future actions in the Project Area include wildfire prevention and control, grading, private land development, and the development and maintenance of the SUP as a recreational area. As concluded by the BA and BE reports, the Proposed Action would have no impacts to threatened, endangered or R2 sensitive species, or SOLC, which by definition indicates no cumulative effects on those plant species. Similarly, there were no reasonably foreseeable projects considered that would contribute additional cumulative effects to project area R2 sensitive plant species.

G. SOILS

SCOPE OF THE ANALYSIS

The scope of analysis for soil resources includes areas proposed for direct disturbance in the Roundabout Basin, Union Gulch, Loverly Basin, Wheeler Gulch and Spaulding Gulch. This analysis is based on review of the Holy Cross Area Soil Survey. In addition, fieldwork characterization of soil properties would be required prior to any project implementation to characterize soil organic content (organic O and mineral A) horizons. This would ensure compliance with Watershed Conservation Practices Handbook (WCPH) management measures regarding the maintenance and improvement of this resource.

FOREST PLAN DIRECTION

Both the 2002 Forest Plan and the WCPH provide soil management measures to guide land treatments within the WRNF. The following direction applies to the proposed CMR projects.

WRNF 2002 Forest Plan Soils Guidelines

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.

Forest Service Watershed Conservation Practices Handbook (WCPH)

Hydrologic Function

- 11.1 Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff.
- 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

- 13.1 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.
- 13.2 Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands.

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

The project area is located near the confluence of Middle Tenmile and West Tenmile creeks between the elevations of 9,711 and 12,441 feet above mean sea level (amsl). In this location, and at this elevation, it receives much of its precipitation in the form of snow. Winter precipitation (October through April) makes up more than half of annual precipitation, with approximately 120 inches of total snowfall. The climate and elevation of the project area limit the rate of soil formation.

Geology of CMR

Northern portions of the CMR SUP, from West Tenmile Creek south, are made up of unconsolidated Pleistocene age deposits. These deposits are predominantly young glacial drift (Bull Lake and younger), unsorted bouldery glacial deposits and associated sand and gravel deposits. Glacial deposits are generally found along valley bottoms associated with larger drainages.

Higher elevation geology is dominated by the Maroon Formation (Permian and Pennsylvanian age). The Maroon Formation contains maroon and grayish-red sandstone, conglomerate, and mudstone; the lower part intertongues with Eagle Valley Formation or (Evaporitic facies) which underlies the Maroon in places. The Maroon formation thins to the northeast to its depositional margin along the west flank of the Gore Range.

Precambrian biotitic gneisses and migmatite are found on the east-facing slope between the summit area and Tenmile Creek. This area contains minor interlayered hornblende gneiss and calc-silicate rocks. Parent material is primarily greywacke and shale.

At higher elevations on the east-facing slope between the summit area and Tenmile Creek is the Pennsylvanian-aged Minturn Formation. Gray, pale-yellow, and red sandstone, grit, conglomerate, and shale, and scattered beds and reefs of carbonate rocks characterize these areas.

Pockets of Laramide intrusive rocks (Eocene, Paleocene, and Upper Cretaceous age) are found, primarily at higher elevations. These intrusions contain quartz monzonite, granodiorite, and quartz diorite porphyries in stocks, sill, and dikes.

Soil Map Units and Distribution at CMR

Twenty-eight soil units were mapped within the drainages at CMR. These soils can be broadly grouped into six soil taxonomic units: Cryoborolls – Cryaquolls, Leighcan, Scout, Leadville, Tolby, Moran, Handran-Eyre.³⁹ Mapped miscellaneous land types include cirque lands, rock outcrops, mire land, and standing water. These are discussed in detail in the 2006 Copper Mountain Resort Trails and Facilities Improvements, Final Environmental Impact Statement, Table 3G-1 summarizes the general soil unit characteristics.

**Table 3G-1:
General Characteristics of Mapped Soil Units**

Map Unit/ Name	Area in SUP (acres)	Drainage Class	Available Water Capacity^a	Runoff^b	Effective Rooting Depth
104A	171.17				
Cryoborolls		well	moderate	moderate	> 60”
Cryaquolls		very poorly	moderate	moderate	> 60”
204D	79.00				
Leighcan		somewhat exc.	low	moderate	> 20–40”
Rock Outcrop		N/A	N/A	N/A	N/A
212 B, C	1139.15				
Scout		somewhat exc.	low	moderate	> 60”
220 C	3.95				
Leadville		well	moderate	moderate	> 60”
225 B	219.50				
Leighcan		somewhat exc.	low	slow	> 60”
Cryaquolls		very poorly	moderate	moderate	> 60”
226 B	314.66				
Leadville		well	moderate	moderate	> 60”
Cryaquolls		very poorly	moderate	moderate	> 60”
254 D	80.63				
Rock Outcrop		N/A	N/A	N/A	N/A
Leighcan		somewhat exc.	low	moderate	20–40”
Hechtman		somewhat exc.	low	rapid	< 20”
290 B, C	807.03				
Leighcan		somewhat exc.	low	slow	> 60”
351 C	229.42				
Scout		somewhat exc.	low	moderate	> 20”
353 C	8.18				
Scout		somewhat exc.	low	moderate	> 20”

³⁹ Cryoborolls – Cryaquolls components are classified at the “Great Group” rather than the “Family” level that many of the named soil components are for the Project Area.

**Table 3G-1:
General Characteristics of Mapped Soil Units**

Map Unit/ Name	Area in SUP (acres)	Drainage Class	Available Water Capacity ^a	Runoff ^b	Effective Rooting Depth
360 C	2.88				
Leadville		well	moderate	moderate	> 20"
367 B	313.87				
Scout		somewhat exc.	low	moderate	> 20"
Leadville		well	moderate	moderate	> 20"
604 C, D	836.53				
Leighcan		somewhat exc.	low	moderate	> 20"
Rock Outcrop		N/A	N/A	N/A	N/A
650 B	141.70				
Leighcan		somewhat exc.	low	moderate	> 40"
Leighcan		somewhat exc.	low	moderate	20–40"
654 D	161.21				
Tolby		excessively	very low	moderate	> 20"
Rock Outcrop		N/A	N/A	N/A	N/A
Hiwan		excessively	very low	rapid	> 20"
670 C	425.37				
Leighcan		somewhat exc.	low	moderate	> 20"
Tolby		excessively	very low	moderate	> 20"
901 B, D	1462.05				
Moran		somewhat exc.	low	moderate	> 20"
Ruble Land		N/A	N/A	slow	N/A
Rock Outcrop		N/A	N/A	N/A	N/A
Teewinot		well	moderate	rapid	> 20"
908 A, B	519.14				
Moran		somewhat exc.	low	moderate	> 60"
Cryaquolls		well	moderate	moderate	> 60"
Borochemists		excessively	low	slow	> 40"
Rock Outcrop		N/A	N/A	N/A	N/A
932 B, D	271.5				
Handran-Eyre		somewhat exc.	low	moderate	> 20"
CQ	231.47				
Cirque Land		N/A	N/A	N/A	N/A
ML	8.44				
Mire Land		N/A	N/A	N/A	N/A
RO/RL	126.70				
Rock Outcrop		hydro group D	N/A	high	N/A
Rubble Land		hydro group A	low	low	N/A

**Table 3G-1:
General Characteristics of Mapped Soil Units**

Map Unit/ Name	Area in SUP (acres)	Drainage Class	Available Water Capacity ^a	Runoff ^b	Effective Rooting Depth
W	2.39				
Water		N/A	N/A	N/A	N/A

Notes:

^a 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.

^b 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.

exc. = excessively

N/A = not applicable

Source: USDA Forest Service, 1998

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Because no new grading is included in Alternative 1, potential impacts to soil resources would be minimal as a result of the No Action Alternative. However, on-going ski area operations and maintenance would continue to require management to reduce erosion and loss of soil organic material within CMR.

Alternative 2 – Proposed Action

Geology

The projects were compared with the White River National Forest stability model and were found to primarily occur within areas of “Slight” risk for mass movement (approximately 84 percent of the project disturbance occurs within this ranking). Only two projects occur within areas with “Low” and “Moderately Low” stability risk, the Sierra Lift tower 7 trail grading and the Enchanted Forest access traverse. These projects account for approximately 10 percent of the project disturbance occurring in areas that exhibit “Low” stability and 6 percent of the project disturbance occurring in areas that exhibit “Moderately Low” stability. These stability rankings are not limiting to the proposed projects. As these rankings are derived from a model rather than strictly empirical data, field surveys and project implementation would still pay attention to visible indicators of landscape instability such as tension cracks and rill/gully erosion.

Soils

As displayed in Table 3G-1, implementation of the Proposed Action would result in approximately 15.3 acres of disturbance (clearing and grading + tree removal) from trail construction and reconstruction and lift installation projects. Approximately 11.5 acres of ground disturbance (including 1.7 acres of tree removal) and 3.8 acres of tree removal (without grading) would be required. In areas where grading is

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G. Soils

proposed, topsoil would be removed and soils would be temporarily compacted; however, with the exception of top and bottom lift terminals and tower footers, soils would be mechanically decompacted and stockpiled topsoil would be re-spread to facilitate revegetation success.

Where lifts are proposed to be installed, there would be a loss of soil resources within the soil management unit on the WRNF; however, this level of loss would not affect any of the soil management units as a whole.

**Table 3G-2:
Project Disturbance By Soil Map Unit**

Disturbance/Soil Map Unit		Acres	Kw
CLEARING & GRADING		1.5	
212B – Scout family, till substratum, 5–40% slopes. Scout = Loamy-skeletal, mixed superactive Ustic Haplocryepts, Very deep, somewhat excessively drained soils.	Roundabout trail grading 0.4	0.4	0.08
226B – Leadville family-Cryaquolls complex, 0–25% slopes. Leadville =Loamy skeletal, mixed superactive Ustic Glossocryalfs. Very deep, well drained soils. Cryaquolls- wet Mollisol, hydric soil.	Kokomo Teaching Area=0.2	0.33	0.24
	Roundabout trail grading=0.1		
	T-Rex connector trail=0.03		
367B – Scout-Leadville families complex, 5–40% slopes	T-Rex connector trail=0.7	0.7	0.08
GRADING		5.4	
212B – Scout family, till substratum, 5–40% slopes. Loamy-skeletal, mixed superactive Ustic Haplocryepts. Very deep, somewhat excessively drained soils.	Enchanted Forest Access Traverse=0.2	0.9	0.08
	Woodward surface lift=0.04		
	Sierra Lift tower 7 trail grading=0.7		
	Woodward surface lift=0.04		
226B – Leadville family-Cryaquolls complex, 0–25% slopes. Leadville =Loamy skeletal, mixed superactive Ustic Glossocryalfs. Very deep, well drained soils. Cryaquolls-wet Mollisol, hydric soil.	Kokomo teaching area=1.3	1.3	0.24
367B – Scout-Leadville families complex, 5–40% slopes.	T-Rex connector trail=0.2	0.2	0.08
901B – Moran family-Rubble land complex, 5–40% slopes. Moran= Loamy-skeletal, mixed, superactive Typic Humicryepts. Very deep, well drained soils.	West Ridge surface lift=0.01	0.01	0.10
901D – Moran family-Rock outcrop-Teewinot family complex, 40–150% slopes. Teewinot= Loamy skeletal, mixed, superactive Lithic Humicryepts. Well drained shallow to hard bedrock.	Enchanted Forest access traverse=1.0	1.7	0.10
	Sierra Lift tower 7 trail grading=0.5		
	West Ridge surface lift=0.2		
CO8654-CQ – Cirque land, 40–150% slopes	Spaulding Bowl Runout=1.4	1.4	NA

**Table 3G-2:
Project Disturbance By Soil Map Unit**

Disturbance/Soil Map Unit		Acres	Kw
RE-GRADING		3.4	
212B – Scout family, till substratum, 5–40% slopes. Loamy-skeletal, mixed superactive Ustic Haplocrypts. Very deep, somewhat excessively drained soils.	<i>Roundabout</i> trail grading=2.3	2.3	0.08
226B – Leadville family-Cryaquolls complex, 0–25% slopes. Leadville =Loamy skeletal, mixed superactive Ustic Glossocryalfs. Very deep, well drained soils. Cryaquolls-wet Mollisol, hydric soil.	<i>Roundabout</i> trail grading=1.1	1.1	0.24
Grand Total		10.3	

Notes:

^a The Kw factor represents the whole soil’s susceptibility to erosion based on soil texture and rock fragment content. For purposes of this analysis, highly erodible soils are those with Kw > 0.27.

Table 3G-1 shows disturbance associated with each of the proposed projects. Generally, grading associated with the proposed projects would occur in areas where soils have been disturbed by grading and lift installation in the past and much of the disturbance would be considered re-grading. However, the run-out from Spaulding Bowl would be new disturbance and requires some blasting of boulders to create a more even surface. In addition, the T-Rex connector trail would occur in a relatively large forested stand, where no previous ski area infrastructure has been developed. Data collected from the inventory and characterization of soil organic matter quantities prior to implementation of any approved projects would serve as a baseline for the existing condition vis-à-vis soil organic matter. As final construction plans are approved by the Forest Service, these surveys would be completed to ensure compliance with the above management measures. If any of the proposed projects are approved, upon completion of construction, reassessments of the quantity (depths) of soil in the A horizon and/or organic ground cover would be made to ensure no net loss of this material, consistent with the WCPH. To ensure organic ground cover is maintained, post treatment slash would be returned to the site. Where needed, carbon-rich soil amendments such as compost, composted biosolids, biochar, or a combination of these materials will be added to restore site organic matter and nutrients if post-implementation surveys show a net loss of soil organic material. Seed mixtures and mulches would be free of noxious weeds and persistent/invasive exotic plants.

Soils proposed for disturbance under Alternative 2 were identified as having low to moderate erosion potential, as identified by the Kw factor in Table 3G-1 above. These soils have management and usage limitations of slight to severe limitations on cut and fill slope stability, improved unsurfaced road stability, foot trails and path stability and revegetation.⁴⁰ The Kokomo Lift replacement and teaching area, *Roundabout* trail grading and T-Rex connector trail would occur within areas mapped with soils from the

⁴⁰ USDA Forest Service, 2006

Leadville series, an Alfisol with high clay content and a Kw factor of 0.24. The Enchanted Forest Access traverse, Sierra Lift tower 7 trail grading and the West Ridge surface lift would all occur within areas mapped with soils from the Teewinot series that is shallow to bedrock. Areas mapped within the Leadville and Teewinot families will be field-verified prior to implementation and appropriate construction designs and/or avoidance may be necessary.

Implementation of the following soil management requirements and PDCs would minimize erosion and impacts to soil organic material in the project area:

1. Prior to construction soil surveys will be completed within the disturbance area to ensure no net loss of soil organic matter.
2. 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 percent or greater) to protect soils and enhance conditions for vegetation re-establishment.
3. Promptly revegetate disturbed areas. Seed mixtures and mulches would 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.
4. Existing roads will be used for construction and routine maintenance of the proposed project components where possible.
5. Vegetative buffers will be maintained adjacent to intermittent or perennial drainages and wetlands, to the extent possible. Where avoidance is not possible, impacts will be minimized in sensitive areas.
6. 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.
7. Soil-disturbing activities will be avoided during periods of heavy rain or excessively wet soils.
8. 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.
9. Ground cover, as a combination of revegetation, organic amendments and mulch applications, should restore depths of soil A and/or organic ground cover.

CUMULATIVE EFFECTS

Temporal and Spatial Extent of Analysis

The spatial extent of the soils cumulative effects analysis is the CMR SUP area. The temporal bounds for this cumulative effects analysis extends from CMR's inception as a ski area, through the foreseeable future in which CMR can be expected to operate.

Past, Present and Reasonably Foreseeable Future Actions

The development of trails, lifts, infrastructure, and skier facilities on NFS lands in the SUP area has occurred since 1972. Over four 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. Approximately 11.5 acres of ground disturbance are included in the Proposed Action; however, most (aside from lift installation) would be temporary. When considered cumulatively, if the Proposed Action is 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.

H. WATERSHED

SCOPE OF THE ANALYSIS

The scope of this analysis includes the West Tenmile and Middle Tenmile Creek Watersheds including streams and wetlands within the CMR SUP boundary. Specifically, project-related ground disturbance is proposed within the following sub-watersheds: Roundabout Basin, Union Gulch, Lovely Basin, Wheeler Gulch and Spaulding Gulch. This analysis incorporates information from the Copper Mountain Resort Trails and Facilities Improvements, Final Environmental Impact Statement – January 2006.

The scope of the analysis was determined appropriate to assess the following issues identified by the Forest Service Interdisciplinary Team:

- Proposed ground disturbance (e.g., clearing and grading) may contribute sediment and reduce stream bank stability in on-mountain drainages and affect riparian habitat, wetlands and fisheries.
- Project activities may cause changes in surface and groundwater hydrology that supports streams and wetlands.
- Proposed ground disturbance (e.g., clearing and grading) may affect the quantity of wetlands within the Project Area.

These issues will be analyzed quantitatively and qualitatively by:

- Identification/quantification of Waters of the U.S., including wetlands in the vicinity of the project area.
- Identification of any Clean Water Act (CWA) impaired or threatened waterbody segments in the project area.
- Identification of clearing and grading in the Water Influence Zone (WIZ).
- Quantification of connected disturbed areas (CDA) in the vicinity of the project area.
- Quantification of changes in water yield or discharge to receiving streams from proposed grading.
- Narrative description of effects to wetland functions and values.

FOREST PLAN DIRECTION

The WCPH includes Management Measures (MM) that are environmental goals to protect soil, aquatic and riparian systems.⁴¹

- 11.1 Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff.

⁴¹ USDA Forest Service, 2006c

- 11.2 Manage land treatments to maintain enough organic ground cover in each activity area to prevent harmful increased runoff.
- 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.
- 13.1 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.
- 13.2 Construct roads and other disturbed sites to minimize sediment discharges into streams, lakes, and wetlands.
- 13.3 Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.

EXECUTIVE ORDER 11990

Additional direction regarding wetlands management for the USACE and Forest Service is provided by Executive Order 11990 – Protection of Wetlands. Presidential Executive Order 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, the Order directs federal agencies to avoid new construction in wetlands unless there is no reasonable alternative. The Order states further that where wetlands cannot be avoided, the proposed action must include all practicable measures to minimize harm to wetlands. As required by Executive Order 11990 and the CWA, avoidance and minimization measures must be considered through the planning process.

AFFECTED ENVIRONMENT

CMR is located in west-central Colorado approximately 65 air miles west of Denver, CO and is located between the elevations of 9,711 and 12,441 feet above mean sea level (amsl). In this location and at this elevation, it receives much of its precipitation in the form of snow. Winter season precipitation (October

through April) makes up over 50 percent of annual precipitation, with approximately 120 inches of total snowfall.⁴²

There are 12 primary watersheds within the Copper SUP: Copper, Far East, Follett, Formidable, Graveline, Guller, Jacque, Loverly, Roundabout, Spaulding, Union and Wheeler. The spatial extent of each of these watersheds is outlined in the following table.

**Table 3H-1:
Watersheds at Copper**

Watershed	Watershed Area (acres)
Copper	927.7
Far East	710.3
Follett	269.2
Formidable	510.4
Graveline	276.8
Guller	2115.3
Jacque	1297.2
Loverly	206.2
Roundabout	352.4
Spaulding	364.6
Union	1033.2
Wheeler	996.0

Specifically, project-related ground disturbance is proposed within the following five watersheds: Roundabout Basin, Union Gulch, Loverly Basin, Wheeler Gulch and Spaulding Gulch. There are no CWA impaired water bodies within the Project Area.

Stream Health

CMR sits at the confluence of two streams—Tenmile Creek and West Tenmile Creek. Trans-basin diversions from the upper reaches of Tenmile Creek into Robinson Reservoir in the Eagle River Basin and through Fremont Pass Ditch into the Arkansas River basin affect the flows in Tenmile Creek.⁴³ The many named and unnamed channels on CMR ultimately flow into these creeks.

The WRNF utilizes a stream sampling survey methodology for measuring and quantifying specific stream health metrics, including: fine sediment, large woody debris, residual pool depth, and unstable banks. For the purposes of evaluating conditions in comparison to WCPH standards, the reference value is defined

⁴² USDA Forest Service, 2006

⁴³ Wright Water Engineers, 1998

by the value corresponding to the 85th percentile of the reference population. The following table outlines the WRNF habitat stream health conditions as a function of observed percentage of reference conditions.

**Table 3H-2:
Habitat Stream Health Classes**

Habitat Condition Percent of Reference	Habitat Condition Class
74–100 %	Robust
59–73 %	At-Risk
< 59 %	Diminished

Source: USDA Forest Service, 2006c

The 2006 EIS engaged intensive field stream sampling surveys to assess stream health at CMR. There are many factors that influence stream health conditions. Operationally, various activities related to ski area operation such as trail clearing, snowmaking, utilities installation, and road development and use all contribute to changes in the surface water hydrology of the watershed, and therefore have influence upon all of the relevant stream health metrics to varying degrees. Of specific concern to stream health is ground disturbance that occurs within the water influence zone (WIZ). The WIZ is defined as 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 the top of each bank) is 100 feet or the mean height of mature dominant late-seral vegetation, whichever is most. The WIZ protects interacting aquatic, riparian, and upland functions by maintaining natural processes and resilience of soil, water, and vegetation systems.⁴⁴ Specific to the proposed projects, tree removal and ground disturbance in the WIZ can impact unstable banks caused by hydrologic connections between high-runoff areas and the channel network, known as Connected Disturbed Areas (CDAs) and large woody debris recruitment which impacts stream health and function.⁴⁵

All of the channels at CMR have adjusted to some degree over time. To help understand differences among stream channels and the kinds of changes that can be expected from the effects of land use, a stream channel classification has been devised that places channels into classes with similar attributes and behaviors.⁴⁶ Using this classification system the stream channels on CMR largely fall into the Rosgen Level I “Aa+” and “A” stream types. These tend to be steep gradient systems that are often entrenched and in some cases can be characterized as step-pool systems. These systems have high sediment transport

⁴⁴ USDA Forest Service, 2006

⁴⁵ Ibid. 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.

⁴⁶ Rosgen, 1996

capacities due to their steep gradients (the gradients of these channels often exceed 10 percent) and high confinement.⁴⁷

Roundabout Basin, Union Gulch, Loverly Basin, Wheeler Gulch and Spaulding Gulch are the watersheds where proposed ground disturbance would occur, resulting in potential disturbance within the WIZ. Of these, Union Creek and Wheeler Gulch are the only watersheds large enough to contain third-order streams. Stream health data have been collected for two reaches on Wheeler Gulch, one reach on McKenzie Gulch (a smaller tributary to Wheeler), one reach on Union Creek, as well as one reach on Copper Creek. Since Copper Creek is not in the current project area it is not discussed further. The lowest reach on Wheeler Gulch is utilized as the response reach in the Wheeler/McKenzie Gulch combined watershed.

Project Area Status

The stream health status including fine sediment, large woody debris, residual pool depth, and unstable banks for the surveyed response reaches within the CMR SUP area is outlined as follows:

Fine Sediment: The effect of land disturbances such as roads, roadside drainages, ski trail waterbars, and utility corridors within forested watersheds tend to cause an increase in exposed surface soils and therefore increased erosion and sediment transport. Sediment transport within the stream network of the watershed is often indicated by higher percentages of fine-grained particles within the channel substrate. In practice, the steep gradients and high flow velocities exhibited by the class A/Aa+ channels at CMR tend to flush sediment downstream to gentler-gradient channel systems. Thus, Union Creek measured *Robust* for this metric, and Wheeler Gulch measured *Robust* and *At-Risk* within the two reaches analyzed.

Large Woody Debris: Large woody debris provides habitat for species and help to maintain channel structure by storing sediment and encouraging scour. Large woody debris (LWD) provides material for fish habitat, stream energy dissipation and organic matter for the stream ecosystem. Recruitment of LWD is dependent on riparian vegetation. Removal of vegetation within the WIZ has been shown to impact wood frequency.⁴⁸ Ski area construction and operations has resulted in removing LWD within riparian areas and the WIZ, reducing LWD within the Union Creek watershed to less than 10 pieces per 100 meters; this frequency is *Diminished* for stream health metrics. The reaches on Wheeler Gulch were found to be *Robust*.⁴⁹

Residual Pool Depth: Residual pool depth is the difference in bed elevation between a pool and the downstream riffle crest. Pool depth and frequency is controlled by the amount of large woody debris,

⁴⁷ Ibid. Confinement refers to a stream channel's ability to widen as stage increases. Highly confined channels cannot readily widen and therefore tend to direct their erosive energies downward, deepening over time.

⁴⁸ USDA Forest Service, 2002; 2012

⁴⁹ USDA Forest Service, 2006b

channel slope, and substrate. Pools provide important habitat for aquatic organisms but can be highly sensitive to watershed disturbance and connected disturbed area because fine sediment settles out in the bottom of the pool.”⁵⁰ Using the Rosgen classification system the stream channels on CMR largely fall into the Rosgen Level I “Aa+” and “A” stream types. These tend to be steep gradient systems that are often entrenched and in some cases can be characterized as step-pool systems. These systems have high sediment transport capacities due to their steep gradients (the gradients of these channels often exceed 10 percent) and high confinement.⁵¹ Union Creek Measures *Robust* and the Wheeler Gulch reaches are *Robust*.⁵²

Unstable banks: Unstable banks show evidence of breakdown, slumping or vertical and eroding bank (a bank that is uncovered by vegetation, roots or rocks and the bank angle is steeper than 80 degrees).⁵³ Both the upper Wheeler Gulch and McKenzie Gulch reaches exhibit *Robust* stream health with respect to bank stability. However the lower reach of Wheeler Gulch and Union Creek near the base of CMR (above the culvert that goes under *Roundabout* trail) exhibits measured bank instability of almost 19 and 17 percent, respectively. In Wheeler Gulch the measured reach had significant bank undercutting and trees falling into the channel. In Union Creek, approximately 700 feet uphill of the *Roundabout* trail, the stream is situated within a confined, steep sided gorge, with minimally vegetated slopes composed of highly weathered soils. These reaches are categorized as having *Diminished* stream health relative to bank stability.

Connected Disturbed Area

A GIS and field review was done to estimate CDA within Union Creek and Wheeler Gulch. Segments of roads and trails that intersect the WIZ were assumed to be connected to the stream channel network because roadside drainage frequently connect directly to the stream when they are within 100 feet each side of the channel. The connection of roadside drainage increases direct routing of runoff flow within the watershed, increasing peak flows and subsequent erosion and sediment transport. Therefore, the length of road and trail segments that intersect the WIZ equals the length of the stream channel extension. The WCPH outlines the following Design Criterion: “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.”

⁵⁰ Ibid.

⁵¹ Rosgen, 1996. Confinement refers to a stream channel’s ability to widen as stage increases. Highly confined channels cannot readily widen and therefore tend to direct their erosive energies downward, deepening over time.

⁵² USDA Forest Service, 2006b

⁵³ USDA Forest Service, 2012

**Table 3H-3:
CDA Existing Road Infrastructure
Third-Order Watersheds**

Watershed	Natural Stream Channel Length ^a (ft)	Road Drainage Connected Length ^b (ft)	Connected Disturbed Area ^c (acres)	Percent Increase of Channel Length ^d (%)
Union Creek	34,945	7,087	3.82	20.3
Wheeler	23,104	16,437	9.22	71.1

a Derived from GIS and Field Survey

b WRNF Field Survey Data

c WRNF Field Survey Data

d = (b) divided by (a)

Table 3H-3 reveals that of the watersheds at CMR, Wheeler Gulch is the most influenced by direct expansion of the stream network to include roadside ditches and drainage and Union Creek exhibits moderate levels of channel network expansion. Both primary third-order watersheds exhibit existing levels of channel network increase that are above the 10 percent maximum threshold identified in the WCPH.

Wetlands

Field surveys were completed to identify wetlands within or adjacent to potential ground disturbance and GIS information was used to identify other wetlands within the watersheds where proposed projects would occur (Roundabout Basin, Union Gulch, Loverly Basin, Wheeler Gulch and Spaulding Gulch). Wetlands were identified consistent with delineation protocols disclosed in the Corps of Engineers Wetlands Delineation Manual [1987 Manual] (Environmental Laboratory 1987), the 2008 Western Mountains, Valleys and Coast Regional Supplement [Regional Supplement] and pertinent Regional guidance letters and public notices. Approximately 258 acres of wetlands were identified within these watersheds and are summarized in Table 3H-4.

**Table 3H-4:
Area of Wetlands by Watershed**

Watershed	Acres of Wetlands
Loverly Basin	20.9
Roundabout Basin	65.2
Spaulding Gulch	8.8
Union Gulch	98.4
Wheeler Gulch	65.1
Grand Total	258.4

By hydrogeomorphic wetland classification, these wetlands are generally slope wetlands associated with groundwater discharge and some riverine wetlands where dominant water sources are overbank flow.⁵⁴ Wetland classification based on the Cowardin classification system classifies wetlands primarily by dominant plant community. Four types of wetlands were delineated within this study area. The wetlands within the study area are primarily groundwater fed through seeps within the existing ski trails and have low chroma, hydric mineral soils.

Shrub Wetlands (Palustrine Scrub Shrub [PSS])

Shrub dominated wetlands consist of woody vegetation less than 20 feet tall, and are very common at CMR. They are usually found at lower elevations with the low growing wolf willow (*Salix wolfii*) being the dominant species. Other common shrub species include plain leaf willow (*Salix planifolia*), coyote willow (*Salix exigua*), montane willow (*Salix monticola*), and speckled alder (*Alnus incana*).

Herbaceous Wetlands (Palustrine Emergent [PEM])

Wetlands that are dominated by herbaceous emergent vegetation include wet meadows and hillside seeps. Typical wetland plant species found in emergent wetlands at CMR include blue joint grass (*Calamagrostis canadensis*), water sedge (*Carex aquatilis*), marsh marigold (*Caltha leptosepala*), globe flower (*Trollius laxus*), blue bells (*Mertensia ciliata*), forget-me-not (*Myosotis alpestris*), and monkshood (*Aconitum columbine*).

Herbaceous/Shrub Wetlands (Palustrine Scrub/Shrub [PEM/PSS])

This wetland class combines the plant species found in herbaceous and shrub wetlands. This wetland type may represent a successional plant community. In some instances herbaceous/shrub wetlands occur in previously disturbed areas.

Forested Wetlands (Palustrine Forested)

Forested wetlands are typically dominated by a spruce/fir forest (*Picea engelmannii* and *Abies lasiocarpa*), quaking aspen (*Populus tremuloides*), or a successional stage combining the conifer species with the aspens. The understory consists of species typical of palustrine emergent wetlands including monkshood, bitter cress (*Cardamine cordifolia*), marsh marigold, globe flower, and blue bells.

Some of the wetlands delineated were disturbed during previous resort development by grading, rerouting water and/or vegetation removal. Many of these disturbances were authorized and/or occurred prior to the CWA and/or were authorized by a 404 Permit. Wetlands that have been previously disturbed are in various stages of regeneration and continue to exhibit the necessary characteristics of a wetland under “atypical situations” though hydric soil, vegetation or hydrology indicators may have been lacking at the

⁵⁴ USACE, 2008

time of the delineation. These wetlands that have been previously disturbed are generally reduced in value for wildlife due to impacts that have reduced vegetative cover and or changed characteristics of the hydrology.

Wetlands within the Study Area offer varying degrees of value as wildlife and plant habitat, water storage locations and for water filtration. Some wetlands disturbed during trail development or lift, facility or utility construction lack depth of soils, vegetation or hydrologic flow, reducing their function and value to the habitat and water resources.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Alternative 1—the No Action Alternative—reflects a continuation of existing operations and management practices within the Project Area, without major changes, additions, or upgrades on NFS lands. On-going ski area operations and maintenance would continue to require management of drainage issues to maintain consistency with WCPH Management Measures.

Alternative 2 – Proposed Action

Stream Health

There would be approximately 14.0 acres of disturbance associated with the proposed projects, approximately 1 acre of tree removal with grading, 3.7 acres of tree removal and 9.4 acres of grading. The proposed Kokomo Teaching Area, the Spaulding Bowl runout, the T-Rex connector trail and the Enchanted Trail Access traverse are all located well outside the WIZ and therefore have little potential to impact stream health and CDA. With implementation of appropriate drainage management and site rehabilitation, impacts to the watershed would be negligible. The following drainage management and site rehabilitation PDC have been activities have been identified to maintain consistency with WCPH MM:

- Avoid soil-disturbing activities during periods of heavy rain or wet soils,
- Install cross drainage to disperse runoff away from the WIZ and into well vegetated areas,
- Construct trails with out-slope and rolling grades,
- Use filter strips and sediment traps if needed to keep sand-sized sediment on the land and disconnected from streams and wetlands, and
- When accessing the project location, crews should remain on established routes, and wherever possible, confine activities to existing trails.
- Maintenance or restoration of organic ground cover to minimize pedestals, rills and surface runoff, and
- Revegetation treatments would include certified local native plants as practicable.

Refer to Table 2-2 – Project Design Criteria and Best Management Practices in Chapter 2 for an outline of PDCs for all resources.

Table 3H-5 shows the type of disturbance, by project, in each watershed.

**Table 3H-5:
Project Disturbance by Watershed**

Watershed Project	Disturbance Type	Area (acres)
LOVERLY BASIN		
Kokomo Lift replacement	Tree removal	0.06
Roundabout	Re-grading	2.2
	Tree removal	0.4
Woodward surface lift	Grading	0.04
	Tree removal	0.2
<i>Total</i>		2.9
ROUNABOUT BASIN		
Kokomo Lift replacement	Tree removal	0.7
Kokomo teaching area	Clearing & Grading	0.2
	Grading	1.3
	Tree removal	0.3
TRex connector trail	Tree Removal	1.0
<i>Total</i>		3.5
SPAULDING GULCH		
Spaulding Bowl runout trail	Grading	1.4
<i>Total</i>		1.4
UNION GULCH		
Kokomo Lift replacement	Tree Removal	0.7
Roundabout trail grading	Re-grading	1.3
	Tree removal	Individual Trees ~5
T-Rex connector trail	Clearing & Grading	0.73
	Grading	0.17
	Tree removal	0.64
West Ridge surface lift	Grading	0.2
<i>Total</i>		2.6
WHEELER GULCH		
Enchanted Forest access traverse	Grading	1.2
Sierra Lift tower 7 trail grading	Grading	1.2
<i>Total</i>		2.4
Grand Total		14.0

Clearing within the WIZ

As discussed in Chapters 1 and 2, tree removal has been approved as a result of previous NEPA analyses (the 2002 EA and 2006 EIS); however, to ensure the project is consistent with WCPH Management Measures, tree removal is analyzed with respect to stream health in this analysis.

Tree removal within the WIZ reduces bank strengthening vegetation, while simultaneously increasing peak flows (from reduced evapotranspiration and water storage capacity). Under Alternative 2, approximately 5 acres of tree removal would occur. Of these, approximately 0.4 acre (0.37 on private lands and 0.04 on NFS lands) would occur within the WIZ (associated with the Kokomo Lift replacement project), in addition approximately five trees would be removed within the WIZ on private lands associated with the Roundabout grading projects; all of the disturbance within the WIZ is within the Union Gulch Watershed.

Due to the limited amount of clearing associated with the Proposed Action (0.4 acre within the WIZ), effects to bank stabilizing vegetation and runoff would be negligible. Therefore the Proposed Action would be consistent with the following WCPH Management Measures:

- 11.1 Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff.
- 11.2 Manage land treatments to maintain enough organic ground cover in each activity area to prevent harmful increased runoff.

However, impacts to LWD recruitment from vegetation removal within the WIZ are linked to impacts to channel structure and function. Currently, Union Creek is rated as *Diminished* in terms of wood frequency; less than 10 pieces of LWD were identified per 100 meters.⁵⁵ The loss of 0.4 acre of tree cover in the WIZ would affect future recruitment of wood into the stream, but only in a small, isolated area. Although most of the WIZ would remain intact along Union Creek, the stream currently exhibits a *Diminished* condition for LWD.

For the project to be consistent with WCPH Management Measures 12.1 and 12.3 (12.1 In the 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.) the Forest service has identified the following PDC and mitigation for the loss of overstory vegetation within the WIZ in the Union Gulch watershed:

⁵⁵ USDA Forest Service, 2006b

- 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.
- 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.
- 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 ground vehicles out of wetlands unless 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.
- Halt construction activities during periods of heavy precipitation or when soils are muddy and prone to rutting and compaction.
- Mitigate the 0.4 acre of tree clearing within the WIZ on NFS lands by felling trees toward Union Creek to improve downed wood frequency in and near the channel.

To ensure consistency with Management Measure 12.1, monitoring on Union Creek would include collecting and analyzing Macroinvertebrates data within this reach of Union Creek 2013 to establish an environmental baseline.

Connected Disturbed Areas

Approximately 10 acres of proposed grading are analyzed in this watershed and wetlands analysis. This is attributable to installation of the Woodward and West Ridge surface lifts, *Roundabout* trail grading, developing the Kokomo Teaching Area, construction of the Spaulding Bowl runout, grading under the Sierra Lift, developing the T-Rex connector trail and improvements to the Enchanted Forest Access traverse. The projects have been reviewed and were determined to be consistent with WCPH Management Measures 13.1 through 13.3 which ensure new road developments are minimized. As it pertains to impacts to the watershed, grading reduces stabilizing organic matter and increases exposed soils. Because of the locations of most of the project areas (well outside the WIZ) and limited to the extent of the proposed ground disturbance, only the grading associated with the *Roundabout* trail has potential to impact stream health and increase connected disturbed area (refer to Figures 4 and 5).

Grading within the WIZ

The proposed *Roundabout* trail grading would necessitate approximately 3.5 acres of ground disturbance, 3.4 acres of which would be re-grading an existing trail. Approximately 0.1 acre of new grading would be required, including removal of approximately five trees that are currently located on the northeast side of

Union Creek. Of the total *Roundabout* trail project, approximately 0.7 acre of ground disturbance would occur within the WIZ (approximately 0.6 acre on private lands and 0.1 acre on NFS lands).

Grading within the WIZ increases direct routing of runoff flow within the watershed, which can increase peak flows and subsequent erosion and sediment transport. Peak flows, erosion and sediment transport all effect stream health metrics: fine sediment, residual pool depth and unstable banks. Union Creek measured *Robust* for fine sediment and residual pool depth. Due to the minimal amount of grading within the WIZ, with implementation of PDC to control erosion any changes to fine sediment and residual pool depth would be small relative to existing conditions. Erosion control PDC include:

- For ground-disturbing activities near perennial and intermittent streams, and ephemeral draws, minimize Connected Disturbed Area 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.
- 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.
- 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.
- Do not encroach fills or introduce soil into streams, swales, lakes, or wetlands. Install sediment wattles, 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-biodegradable 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.
- 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 revegetation.

Measurements of the existing condition of Union Creek show bank instability is 16.6 percent. As a result, it is categorized as *Diminished* for stream bank stability. Past activities, including trail clearing and snowmaking, in combination with historic impacts such as timber harvest for mining and railroad construction in the Union Creek watershed have resulted in degraded stream bank stability. In addition, it

is possible that the existing geologic environment along the response reach of interest may be contributing to bank instabilities.

**Table 3H-6:
Proposed Disturbance within the WIZ**

Project	Disturbance Type	Watershed	Area (acres)	Connected Disturbed Area (acres)	Percent Increase of Channel Length
<i>Roundabout</i> trail	Grading	Union Creek	0.7 (0.10 on NFS lands)	3.82 same as existing	20.3% same as existing

Therefore, as part of the proposed design of the *Roundabout* trail grading, a retaining wall would be installed along the edge of the grading closest to the stream. It would be built up ranging from 5 to 10 feet to ensure the trail is sloped north and away from Union Creek, toward the armored drainage ditch that parallels Lewis Ranch Road. Prior to implementation, construction and drainage management plans would identify appropriate measures to keep fill materials and construction area runoff out of Union Creek. These plans would need to be reviewed and accepted by the Forest Service hydrologist. After construction, water bars would be installed at 3-to-5 percent slopes to route water away from Union Creek. A revegetation plan would be submitted to the Forest Service which includes amending the soil surface as identified by the Forest Service soil scientist to improve revegetative success. No change in discharge to receiving streams from proposed grading are anticipated, therefore the proposed projects would have no impacts to bank stability. With proper implementation of the PDCs identified above and outlined in Table 2-2 Project Design Criteria and Best Management Practices (refer to the PDCs under the stream health heading), there would be no further impacts to stream health and the project would remain in compliance with 2002 Forest Plan direction and the WCPH.

Wetlands

There would not be ground disturbance within wetlands from any of the proposed projects. Construction access to the Spaulding Bowl egress trail would require crossing wetlands, therefore the following PDC was identified to minimize the potential for impacts to wetland function and values from these crossings:

- 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 ground vehicles out of wetlands unless 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.

With implementation of appropriate drainage management and site rehabilitation (application of soils amendments and revegetation, refer to the PDCs under the stream health heading) there would be no

impacts to wetlands and the projects would comply with Management Measure 12.4 to maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.

In addition, during the planning process, CMR determined an alignment for the Woodward surface lift that would avoid wetlands; the proposed projects comply with Executive Order 11990.

CUMULATIVE EFFECTS

The following past, present, and reasonably foreseeable future projects have been identified by the Forest Service as relevant from a cumulative effects context.

Temporal and Spatial Extent of Analysis

The spatial extent of the watershed cumulative effects analysis is the CMR SUP area and overlapping watersheds. The temporal bounds for this cumulative effects analysis extends from CMR's inception as a ski area, through the foreseeable future in which CMR can be expected to operate.

Past, Present and Reasonably Foreseeable Future Actions

The development of trails, lifts, infrastructure, and skier facilities on NFS lands in the SUP area has occurred since 1972. Over four decades of resort development, there has been tree clearing, grading, and ski area infrastructure that have resulted in impacts to stream health, namely a reduction LWD recruitment, decreased bank stability and increased connected disturbed areas which have expanded the stream channel network above the 10 percent maximum threshold identified in the WCPH. Therefore according to stream health metrics, Union Creek is *Diminished* for LWD and bank stability. When considered cumulatively with the proposed projects, which would result in additional overstory tree removal within the WIZ in Union Gulch for construction of the Kokomo Lift replacement, the proposed projects would require mitigation to be consistent with WCPH Management Measures 12.1 to maintain or improve long-term stream health and riparian ecosystem condition. To maintain consistency with WCPH Management Measures, when clearing 0.4 acre within the WIZ in the Union Creek watershed, CMR would fell trees toward Union Creek to improve downed wood frequency in and near the channel.

Chapter 4

Consultation and Coordination

4. CONSULTATION AND COORDINATION

A. LIST OF PREPARERS

FOREST SERVICE TEAM

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

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Shelly Grail Braudis	Snow Ranger, Dillon Ranger District
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Elizabeth Roberts	Wildlife Biologist, Supervisor's Office
Jared Pierce	Landscape Architect, Supervisor's Office
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This EA was prepared by:

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Melissa Sherburne	Environmental Planner/GIS Analyst
Kelly Owens	Biologist
Paula Samuelson	Production Specialist
Paul Donegan	Environmental Planner

Metcalf Archaeological Consultants

Anne McKibbin	Principal Archeological Investigator
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Western Ecosystems Inc.

Rick Thompson	Biologist
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B. AGENCIES, ORGANIZATIONS, TRIBAL GOVERNMENTS, AND PERSONS CONTACTED

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U.S. Environmental Protection Agency Sarah Fowler, Region 8

TRIBAL GOVERNMENT

Ute Mountain Ute Indian Tribe
Ute Indian Tribe
Southern Ute Indian Tribe

STATE GOVERNMENT

Colorado Parks and Wildlife

LOCAL GOVERNMENT

Summit County Commissioners
Summit County Government
Summit County Open Space and Trails
Summit County Planning Department
Town of Frisco

LOCAL MEDIA

Summit Daily News
Glenwood Post Independent

OTHER ENTITIES AND ORGANIZATIONS

Rocky Mountain Wild
Wilderness Workshop
Climax Molybdenum
Colorado Department of Transportation
The Village at Copper
Copper Mountain Consolidated Metro District
Copper Mountain Resort Association

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H. Arthur Graper

Chapter 5

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Chapter 6

Figures

6. FIGURES

FIGURE 1: NO ACTION ALTERNATIVE

FIGURE 2: PROPOSED ACTION ALTERNATIVE

FIGURE 3: VAIL PASS CRITICAL VIEWPOINT VISUAL ANALYSIS

FIGURE 4: LOWER ROUNDABOUT CONCEPTUAL GRADING PLAN

FIGURE 5: WATERSHEDS, WETLANDS, AND STREAMS

FIGURE 6: WRNF STABILITY MODEL WITH PROPOSED ACTION

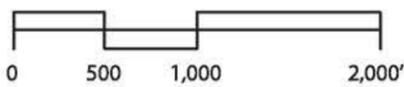


ALTERNATIVE 1 NO ACTION

FIGURE 1

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20' Contour Interval



Prepared by:



LEGEND

- SUP Boundary
- Existing Lift
- Existing Trail

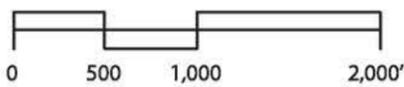


ALTERNATIVE 2 PROPOSED ACTION

FIGURE 2

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20' Contour Interval

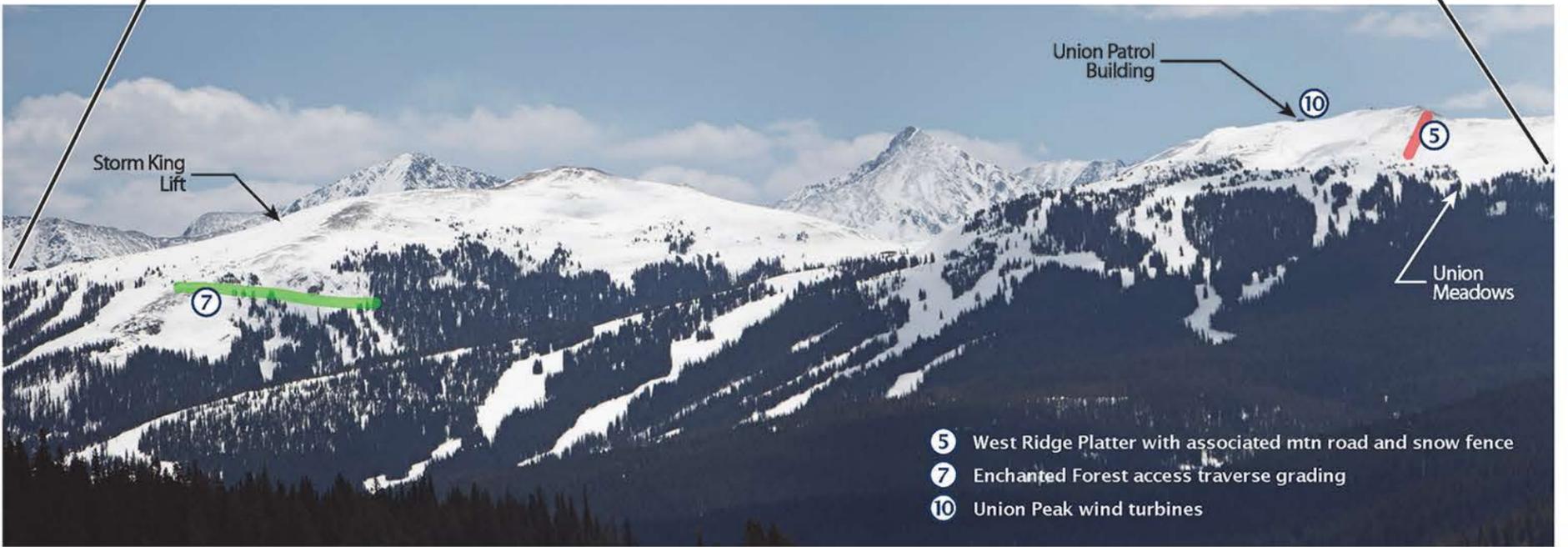


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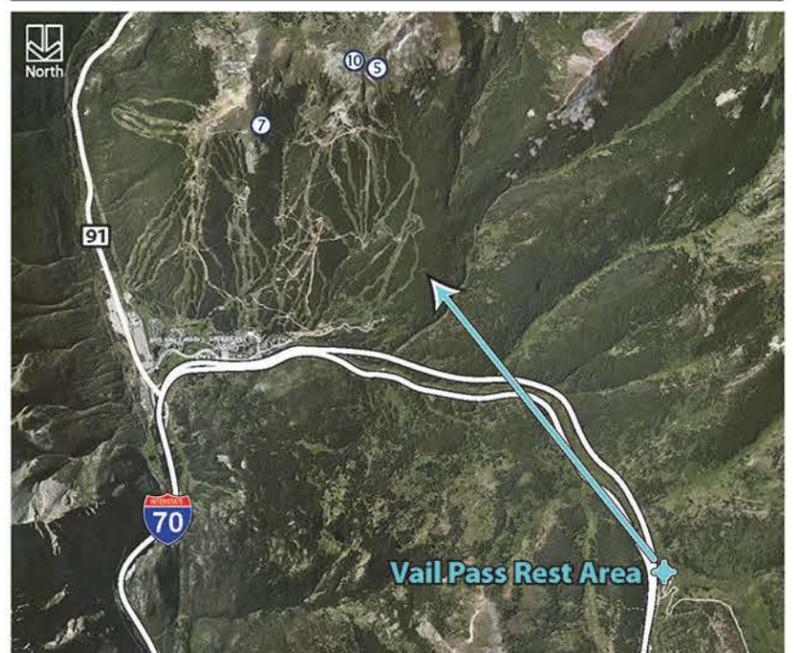
- ① Roundabout trail grading
- ② Kokomo lift replacement
- ③ Kokomo teaching terrain and carpet conveyors
- ④ Woodward surface lift alignment
- ⑤ West Ridge Platter with associated mtn road and snow fence
- ⑥ T-Rex connector trail
- ⑦ Enchanted Forest access traverse grading
- ⑧ Spaulding Bowl runout trail grading
- ⑨ Sierra lift tower 7 trail grading
- ⑩ Union Peak wind turbines
- ⑪ Woodward and terrain park viewing deck

Vail Pass Rest Area Viewpoint Photo (shot at human eye focal length equivalent)



Project Area Detail

Viewpoint

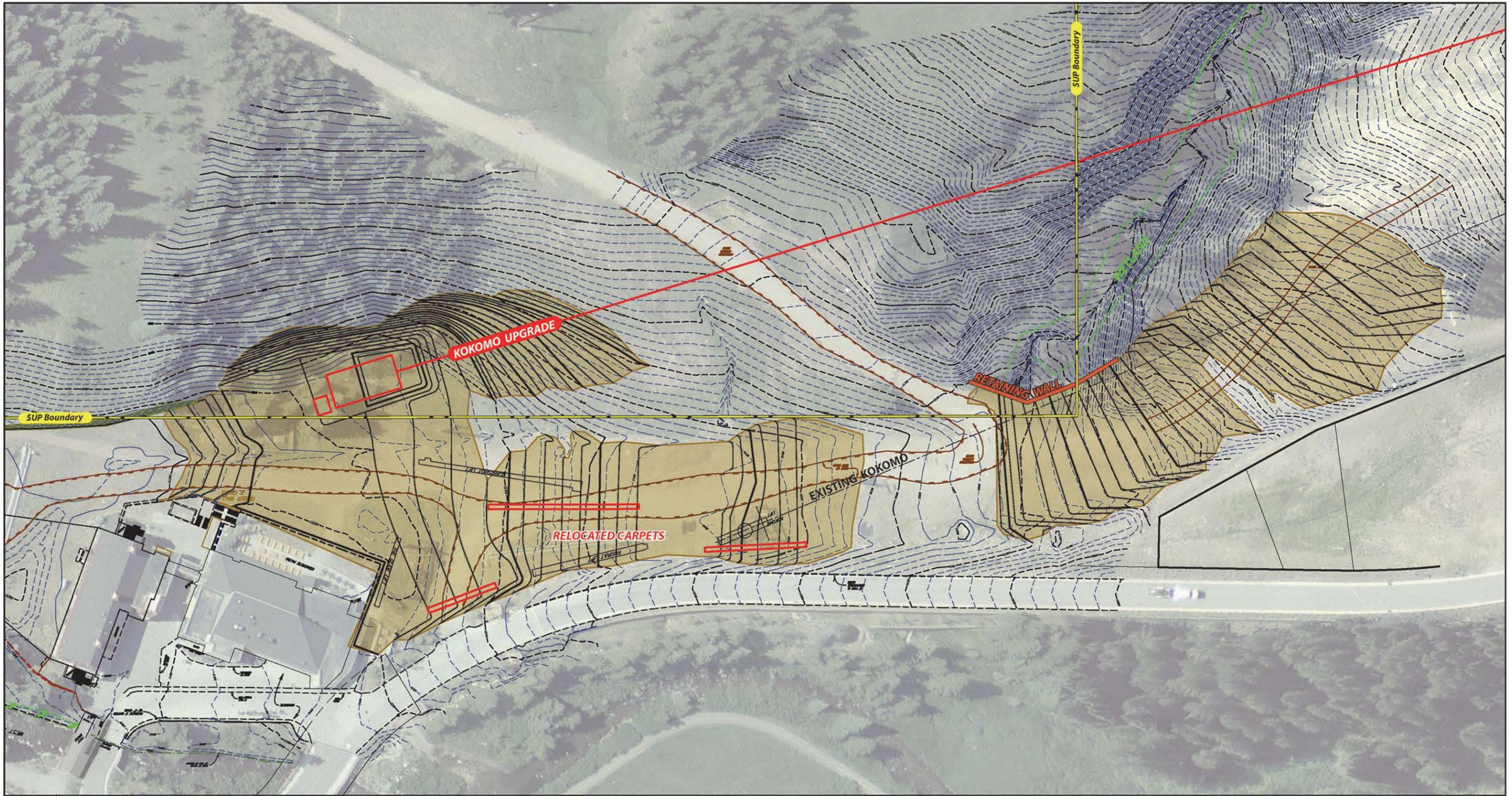


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VAIL PASS
CRITICAL VIEWPOINT VISUAL ANALYSIS
FIGURE 3

Prepared by:



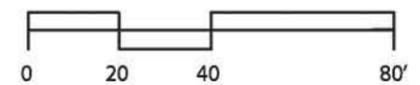


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LOWER ROUNDABOUT CONCEPTUAL GRADING PLAN

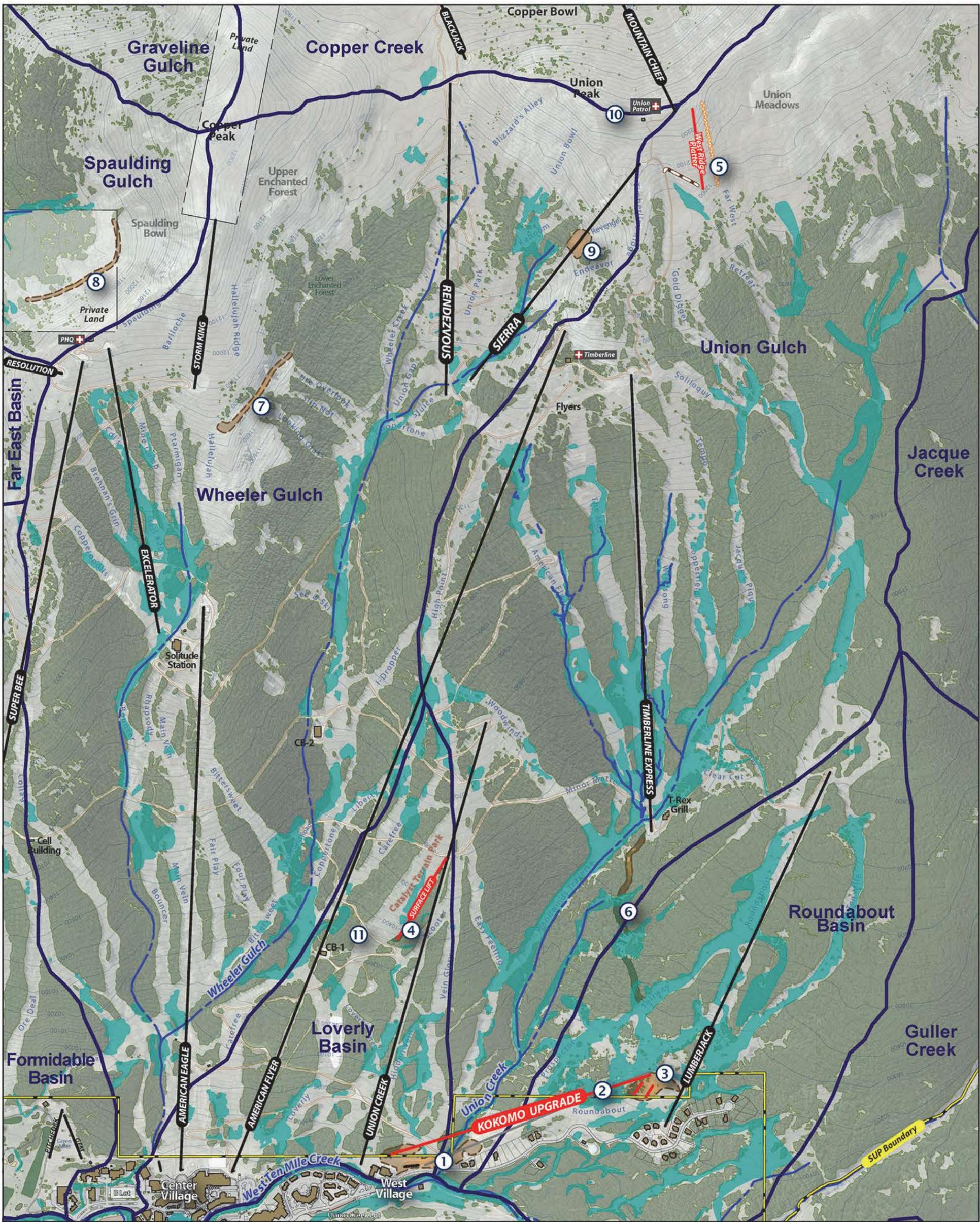
FIGURE 4

2' Contour Interval



Prepared by:



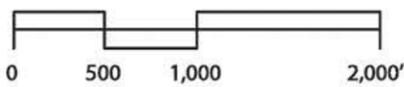


WATERSHEDS, WETLANDS, AND STREAMS

FIGURE 5

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20' Contour Interval

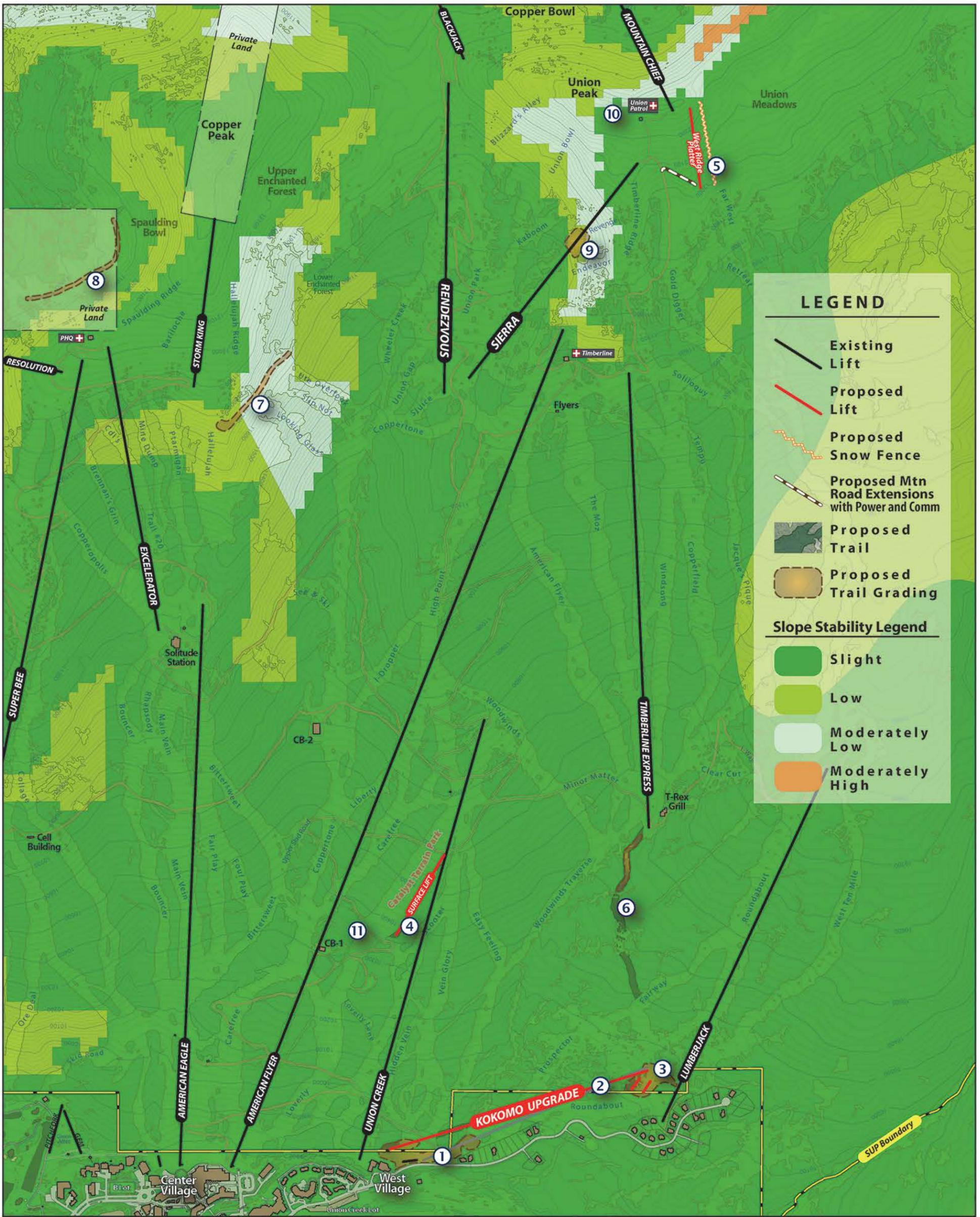


Prepared by:



LEGEND

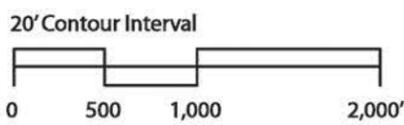
- Watershed
- Stream
- Wetland



WRNF STABILITY MODEL WITH PROPOSED ACTION

FIGURE 6

COPPER



Prepared by:



- ① Roundabout trail grading
- ② Kokomo lift replacement
- ③ Kokomo teaching terrain and carpet conveyors
- ④ Woodward surface lift alignment
- ⑤ West Ridge Platter with associated mtn road and snow fence
- ⑥ T-Rex connector trail
- ⑦ Enchanted Forest access traverse grading
- ⑧ Spaulding Bowl runout trail grading
- ⑨ Sierra lift tower 7 trail grading
- ⑩ Union Peak wind turbines
- ⑪ Woodward and terrain park viewing deck

Appendices

Appendix A: Cumulative Effects Projects

APPENDIX A: CUMULATIVE EFFECTS PROJECTS

Table A-1 identifies past, present, and reasonably foreseeable future projects have been identified by the Forest Service as relevant to Alternatives 1 and 2 from a cumulative effects context. All of these projects have been approved and are part of the environmental baseline conditions. Detailed descriptions of approved projects are provided in the technical and NEPA documents that are incorporated herein by reference. Projects are on NFS lands, unless otherwise noted.

**Table A-1:
Cumulative Effects Matrix**

Project Name	Project Location	Project Description	Project Approval/ Implementation	Project Area (acres/length)	Resources Potentially Affected
Copper Mountain Resort Trails and Facilities Improvements EIS	Within SUP area	Includes the replacement and upgrading of two existing lifts, development of two new lifts, expanding on-mountain snowmaking coverage, creation of additional skiing trails and glades, the renovation and expansion of an existing on-mountain restaurant, construction of a snow vehicle maintenance shop with fuel storage, the development of two skier warming facilities, and upgrading one existing ski patrol facility.	ROD dated January 2006, Implementation underway	Various	Wildlife Watershed Wetlands Soils & Geology Scenery Recreation Air Traffic Cultural Socioeconomics
Summit County Tenmile Recreation Path EA	Project located on the east side of Highway 91 near the Interstate 70 interchange. The recreation path will connect to the Highway 91/Copper Road intersection and Highway 91 south of Copper Mountain Resort's parking areas.	Summit County operates recreation pathways on National Forest System lands under a Special Use Permit. The EA analyzed a proposed new segment of recreation path that connects to Highway 91 at two locations: 1) Copper Road intersection and 2) south of the Copper Mountain Resort parking lot, east of Highway 91.	DN dated December 6, 2011, Implementation underway	Approx. 4,500 ft in length	Wildlife Watershed Wetlands Soils & Geology Scenery Recreation Socioeconomics
Copper Mountain Corn Lot Expansion and Tenmile Creek Stream Health Analysis EA (Tenmile Creek Facilities Improvements and Restoration Project)	Within the SUP, east of Highway 91.	Expand size of Corn Lot parking area along with potential bicycle and hiking trailhead and trail improvements; analyze potential stream health improvement projects for Tenmile Creek to improve floodplain connectivity, enhance riparian wildlife habitat, and re-establish a more natural, meandering stream pattern (beginning at Stock Bridge, located at the southeast corner of the Corn Lot, and continuing downstream approximately 0.7 mile).	DN dated September 2008, Implementation underway	Approx. 13 acres	Wildlife Watershed Wetlands Soils & Geology Scenery Recreation Traffic