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Abstract: This Draft Environmental Impact Statement (EIS) has been prepared to analyze and disclose the estimated environmental effects of implementation of projects contained in Arapahoe Basin Ski Area’s accepted April 2006 Master Development Plan Amendment (MDPA). Arapahoe Basin is located on the White River National Forest in Summit County, CO. It operates in accordance with the terms and conditions of a Special Use Permit issued by the United States Forest Service. The MDPA focuses on enhancing the recreational experience at A-Basin by addressing issues related to the lift and terrain network, as well as parking. All projects are within A-Basin’s existing SUP area. The Proposed Action includes the following components:

Lifts

- Install a chairlift in Montezuma Bowl to provide lift-served skiing in this currently undeveloped portion of the existing SUP area.

- Upgrade the Exhibition lift with new technology in a slightly adjusted alignment.
**Terrain**
- Increase A-Basin’s skiable terrain and operational boundary by approximately 395 acres in Montezuma Bowl.

**Parking**
- Increase parking capacity by 23 percent via enlargements to the Lower Overflow and High Noon lots on the north side of Highway 6.

**Backcountry Access**
- Reconfigure backcountry access currently available from the top of the Lenawee/Norway lifts.

This Draft EIS discusses the purpose and need for the Proposed Action; alternatives to the Proposed Action; potential direct, indirect, and cumulative impacts of implementing each alternative; and project design criteria. Two alternatives are analyzed in the Draft EIS.

Comments on this DEIS will be accepted for 45 days from publication of the Notice of Availability (NOA) in the Federal Register. The NOA provides the sole means of calculating the close of the DEIS comment period.
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<td>Particulate Matter under 2.5 Microns</td>
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<tr>
<td>PM$_{10}$</td>
<td>Particulate Matter under 10 Microns</td>
</tr>
<tr>
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<td>People per Hour</td>
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<td>PSD</td>
<td>Prevention of Significant Deterioration</td>
</tr>
<tr>
<td>R2</td>
<td>USFS Region Two Sensitive Species</td>
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<tr>
<td>RA</td>
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<td>RGL</td>
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<td>ROD</td>
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<td>Skiers-at-one-time</td>
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<td>Sulfur Dioxide</td>
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<td>Description</td>
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<td>SOP</td>
<td>Standard Operating Procedure</td>
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<td>Surface Water Management Plan</td>
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<td>Threatened and Endangered</td>
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<td>Water Quality Control Commission</td>
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<td>WRIS</td>
<td>Wildlife Resource Information System</td>
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<td>WRNF</td>
<td>White River National Forest</td>
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</tbody>
</table>
EXECUTIVE SUMMARY

INTRODUCTION

The proposed projects analyzed in this environmental impact statement constitute a federal action (i.e., a decision), with potential to affect the quality of the human environment on National Forest System (NFS) lands. Therefore, these projects must be analyzed pursuant to the National Environmental Policy Act (NEPA) which directs Federal Agencies to carefully consider environmental concerns in the decision making process and provide relevant information to the public for review and comment.

The Forest Service has prepared this Draft Environmental Impact Statement (DEIS) in compliance with NEPA and other relevant Federal and State laws and regulations. This DEIS discloses potential direct, indirect, and cumulative environmental effects on the human and biological environment estimated to result with implementation of the Proposed Action.

SUMMARY OF THE PURPOSE AND NEED FOR THE PROPOSED ACTION

The Forest Service and Arapahoe Basin cooperatively determined general categories important for improving A-Basin’s on-mountain facilities and recreational opportunities. The Proposed Action was designed to respond to the following four primary planning issues:

1. Better disperse intermediate and advanced skiers throughout the SUP area.

A terrain capacity distribution analysis completed for the 2006 MDPA acknowledges a deficit of beginner, advanced-intermediate, and expert terrain and a surplus of novice, low intermediate and intermediate terrain.¹ This demonstrates that the skiing terrain currently provided at A-Basin is out of balance with its skier/rider market.

The Proposed Action would incorporate additional lift-served skiing into A-Basin’s trail network in Montezuma Bowl, which is intended to better balance skier distribution throughout A-Basin and provide more advanced-intermediate and expert terrain.

2. Address terrain capacity issues to accommodate current and anticipated demand.

Summit County ski areas account for roughly 50 percent of skier visits on the WRNF. The 2002 Forest Plan FEIS concluded that skier visitation in Colorado will increase by 800,000 skiers by 2010.² The majority of this growth is anticipated to take place in the WRNF, with Summit County experiencing the largest percentage of that growth due to its proximity to Front Range communities. The recent growth in

¹ Arapahoe Basin, 2006c p. 20
² USDA Forest Service, 2002b p. 3-442
A-Basin’s skier visitation (33 percent over the past three years, from 244,000 skier visits in 2001 to 328,000 in 2005) validates the 2002 Forest Plan FEIS projections.

The Proposed Action is designed to accommodate current and future visitation levels at A-Basin. This would be achieved by increasing guest capacities as well as skier distribution, and in the process providing a range of ability levels through upgrading the Exhibition lift and providing lift served skiing in Montezuma Bowl.

3. **Address deficiencies in A-Basin’s out-of-base lift capacity.**

Two chairlifts – Exhibition and Pallavicini – provide primary up-mountain access from A-Basin’s base area. Because Pallavicini serves predominately advanced terrain with limited services, most skiers begin their day on Exhibition. Exhibition, a fixed-grip triple chairlift installed in 1978, routinely experiences long wait times in the morning and after lunch. The 28-year old Exhibition lift also endures the most use due to its role in early and late season skiing.

The Proposed Action includes replacing the Exhibition lift with new technology which would increase out-of-base capacity and expedite mid-mountain access, thereby improving skier distribution to the mid-mountain area.

4. **Increase parking capacity to meet current and anticipated demand.**

Public parking at A-Basin is provided in the day-skiers parking areas and overflow parking along the shoulders of Highway 6, which have a combined capacity of 1,450 vehicles (including buses). There is currently a deficiency in parking capacity on peak days, especially during the spring.

Under the Proposed Action, parking capacity would increase and vehicular circulation through parking lots would be improved.

**SUMMARY OF THE ALTERNATIVES ANALYZED IN THE DEIS**

In addition to the requisite No Action Alternative (analyzed in this document as Alternative 1), one action alternative is analyzed.

**ALTERNATIVE 2 – THE PROPOSED ACTION**

The Proposed Action analyzed within this document follows Arapahoe Basin’s *April 2006 Master Development Plan Amendment* (this document will be referred to throughout this DEIS as the MDPA). The Forest Service has accepted the MDPA and has now moved into the environmental analysis phase in order to determine whether all, portions of, or modifications to the proposed projects will ultimately be approved for implementation on NFS Lands.

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3 Arapahoe Basin, 2006c
Executive Summary

The MDPA focuses on enhancing the recreational experience at Arapahoe Basin by providing for improvements to: the lift and terrain network, backcountry access and parking. All proposed projects are within A-Basin’s existing SUP area.

**Lifts**

- Install a chairlift in Montezuma Bowl to accommodate lift-served skiing in this undeveloped portion of the SUP area.
- Upgrade the Exhibition lift with new technology. The alignment of the upgraded lift would be slightly adjusted to provide for better skier circulation at mid-mountain.

**Terrain**

- Increase A-Basin’s skiable terrain and operational boundary by approximately 395 acres in Montezuma Bowl, including 48 acres of hike back terrain below the proposed lift’s bottom terminal. Approximately 37 acres of grooming are proposed to occur in Montezuma Bowl.

**Parking**

- Enlarge existing parking lots on the north side of Highway 6, leading to a 23 percent increase in parking capacity.

**Backcountry Access**

- Reconfigure backcountry access currently available from the top of the Lenawee/Norway lifts creating four new access points.

**ALTERNATIVE CONCEPTS CONSIDERED BUT ELIMINATED FROM ANALYSIS**

**ELIMINATION OF LIFT-SERVED SKIING IN MONTEZUMA BOWL**

The Forest Service received public comments indicating that lift-served skiing in Montezuma Bowl should not be approved on two primary grounds: 1) it would eliminate backcountry skiing opportunities on NFS lands; and 2) lift service in this area would be inconsistent with management direction for the Porcupine Peak Inventoried Roadless Area (IRA), which overlaps the southern and western portions of A-Basin’s SUP area.

The ID Team determined that an alternative analyzing the Proposed Action without lift-served skiing in Montezuma Bowl was unnecessary, as this concept is adequately addressed in the No Action Alternative. The reader is referred to Chapter 3, sections A (Recreation) and B (Roadless) for discussions/analyses of potential impacts to backcountry skiers and management direction for the Porcupine Peaks IRA.
**SNOWCAT SKIING ONLY IN MONTEZUMA BOWL**

During a public meeting held on January 20, 2006 to discuss backcountry access at A-Basin, an alternative concept of providing round-trip skiing in Montezuma Bowl via snowcat instead of lift service was raised. This concept was considered by the ID Team, but eliminated from further analysis because, again, it would accommodate only a relatively small percentage of A-Basin’s skiing clientele. Also, catering to fewer people with snowcat skiing in Montezuma Bowl would not address the purpose and need to disperse skiers more evenly throughout the SUP area and to address terrain capacity issues.

**PUBLIC INVOLVEMENT**

On November 17, 2005, a scoping notice providing a detailed description of the projects, the Purpose and Need for action, and maps of proposed projects was mailed to approximately 50 community residents, interested individuals, public agencies and other organizations. On November 22, 2005 a press release and legal notice were distributed to the Glenwood Post Independent and other key local and regional media which started the 45-day scoping period. On November 30, 2005, the Forest Service published a Notice of Intent (NOI) to prepare an EIS in the Federal Register. A total of 51 comment letters were received by the Forest Service.

**ISSUES**

Based on the results of public scoping and ID Team input, the Forest Service identified specific areas of concern and classified them as being either issues that drive alternatives, require additional design criteria or mitigation, or generally require in-depth analysis disclosure or non-issues. Issue statements, by resource area, are below. The reader is referred to Chapter 1 for indicators used to analyze each issue.

**THE HUMAN ENVIRONMENT**

**Recreation**

- Proposed projects within A-Basin’s SUP area have the potential to affect the recreational experience at the ski area.

- Installation of the proposed Montezuma Bowl lift would entail relocating backcountry access points for NFS lands adjacent to A-Basin’s SUP area. Converting Montezuma Bowl to a lift-served skiing experience would alter the distribution of backcountry acreage immediately accessible from the ski area’s operational boundary.

**Roadless Areas**

- The 8,745-acre Porcupine Peak Inventoried Roadless Area (IRA) overlaps the southern and western portions of A-Basin’s 1,872-acre SUP area, including the Montezuma Bowl area. Development of lift-served skiing in Montezuma Bowl has the potential to change the characteristics of the Porcupine Peak Roadless Area.
Parking, Traffic and Ski Area Access

- Proposed improvements to A-Basin’s parking facilities would increase parking capacity and would affect vehicular circulation in the base area. Furthermore, proposed on-mountain projects may generate measurable increases in daily/seasonal visitation, thereby affecting traffic movement and volumes on Highway 6.

Scenic Resources

- Installation of the Montezuma Bowl lift would entail constructing a top terminal, and associated utility/skier corridor at a high elevation, exposed location. In addition, projects proposed on the front-side of A-Basin’s SUP area (including parking lot improvements and Exhibition lift upgrade) would be visible from Highway 6.

Cultural

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

Social & Economic Resources

- Implementation of the proposed projects could potentially alter certain socioeconomic characteristics of Summit County by improving lift and terrain capacities and increasing annual visitation.

Noise

- Snow management and avalanche safety through the use of explosives within Montezuma Bowl has the potential to generate noise audible in the Town of Montezuma.

THE BIOLOGICAL ENVIRONMENT

Vegetation

- Plant communities (including TES and regionally important plants) may be altered as a result of the proposed projects.

Water Resources

- Implementation of terrain modifications associated with lift terminal construction (vegetation removal, grading, utility installation/ burial) has the potential to affect water resources.

Wetlands and Riparian Areas

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

- Installation of the proposed Montezuma Bowl lift would necessitate vegetation removal and would increase human presence. Increased use of the area and disturbance to habitat could disrupt terrestrial wildlife, including Threatened, Endangered and Sensitive (TES) species and Management Indicator Species (MIS) that may utilize habitat within A-Basin’s SUP area.

Air Quality

- Proposed increases in vehicular traffic related to proposed improvements may have long and short term impacts to air quality.

SUMMARY COMPARISON OF DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Per direction provided in 40 CFR 1502.14, Table ES-1 provides a comparison of environmental impacts by alternative.
### Executive Summary

**Table ES-1:**

<table>
<thead>
<tr>
<th></th>
<th>Alternative 1 No Action</th>
<th>Alternative 2 Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RECREATIONAL OPPORTUNITIES</strong></td>
<td>No operational or infrastructural changes/additions would occur within the SUP area which would alter the recreational experience. A-Basin’s CCC would remain at 3,210 guests.ª</td>
<td>The addition of advanced-intermediate and expert terrain in Montezuma Bowl would enhance the recreational experience, by reducing skier congestion at the base area and better aligning A-Basin with its unique advanced skier demographic. Providing lift served skiing in Montezuma Bowl would provide more terrain options than currently available while reducing skier intermingling of differing abilities. Upgrading of the Exhibition lift would reduce congestion and lift lines at A-Basin’s base area. Realignment provides for better mid-mountain circulation in conjunction with implementation of the previously approved Midway Lodge via the 1999 ROD. A-Basin’s CCC would increase to 3,910 guests.</td>
</tr>
<tr>
<td><strong>Issue:</strong> Proposed projects within A-Basin’s SUP area have the potential to affect the recreational experience at the ski area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Issue:</strong> Proposed projects within A-Basin’s SUP area have the potential to affect the recreational experience at the ski area.</td>
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<tr>
<td><strong>ROADLESS AREAS</strong></td>
<td>No development associated with A-Basin’s operations would occur within the Porcupine Peak IRA.</td>
<td>The Porcupine Peak IRA is an area that experiences high recreational use and fragmentation. While the majority of Montezuma Bowl and the proposed lower two-thirds of the proposed lift are within the Porcupine Peak IRA, Amendment #02 to the 2002 Forest Plan removed all Forest-wide IRA guidelines from Management Areas 7 and 8. Forest-wide IRA guidelines are no longer relevant for the A-Basin</td>
</tr>
<tr>
<td><strong>Issue:</strong> The 8,745-acre Porcupine Peak Inventoried Roadless Area (IRA) overlaps the southern and western portions of A-Basin’s 1.872-acre SUP area, including the Montezuma Bowl area. Development of lift-served skiing in Montezuma Bowl has the potential to change the characteristic of the Porcupine Peak Roadless Area.</td>
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*a: A-Basin’s CCC is the number of guests allowed into the SUP area at any given time.*
### Executive Summary

#### Table ES-1:
Summary Comparison of Direct and Indirect Environmental Consequences

<table>
<thead>
<tr>
<th></th>
<th>Alternative 1</th>
<th>Alternative 2</th>
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</thead>
<tbody>
<tr>
<td><strong>No Action</strong></td>
<td>SUP area. No inconsistencies between proposed lift-served skiing in Montezuma Bowl and existing Roadless directives were identified.</td>
<td></td>
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<tr>
<td><strong>Proposed Action</strong></td>
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</table>

#### TRAFFIC, ACCESS AND PARKING

**Issue:** Proposed improvements to A-Basin’s parking facilities would increase parking capacity and would affect vehicular circulation in the base area. Furthermore, proposed on-mountain projects may generate measurable increases in daily/seasonal visitation thereby affecting traffic movement and volumes on Highway 6.

Visitation and associated vehicular traffic can be assumed to remain consistent with historic trends, with potential increases commensurate with regional population growth. A-Basin’s current parking lots (1,450 spaces) would continue to accommodate day skier parking needs on average days and would be over-capacity on above average days. However, A-Basin currently has approval to construct 100 additional spaces which, if developed, would alleviate congestion on most high-use days.

Attendance is projected to increase due to local and regional population growth, skier demand increases and improved on-mountain facilities. Winter and summer Average Daily Traffic (ADT) associated with increased attendance at A-Basin would be projected to increase.

An additional 231 proposed parking spaces, combined with the development of approximately 100 previously approved spaces, would ease congestion experienced on high-use days.

#### SCENIC RESOURCES

**Issue:** Installation of the Montezuma Bowl lift would entail constructing a top terminal, and associated utility/skier corridor at a high elevation, exposed location. In addition, projects proposed on the front-side of A-Basin’s SUP area (including parking lot improvements and Exhibition lift upgrade) would be visible from Highway 6.

No changes to the scenic environment within A-Basin’s SUP area. Therefore, A-Basin would continue to be consistent with the Scenic Integrity Objective (SIO) of “Very Low”.

With incorporation of project design criteria, including adherence to Forest Service Manual direction for scenic resources, all proposed projects were determined consistent with the Forest Plan SIO of “Very Low” for the identified managed viewsheds.

#### CULTURAL

**Issue:** Implementation of proposed projects and associated ground disturbance may affect previously unidentified cultural and heritage resources within the SUP area.

No impacts to identified or previously unidentified cultural resources within the A-Basin SUP would occur.

A Class III intensive cultural survey covering approximately 360 acres within Montezuma Bowl was conducted in September 2004. Identified cultural resources have been recommended as not eligible for listing on the NRHP by certified archaeologists, and as a consequence, a recommendation of “no historic properties” was made.
Table ES-1:
Summary Comparison of Direct and Indirect Environmental Consequences

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<thead>
<tr>
<th></th>
<th>Alternative 1 No Action</th>
<th>Alternative 2 Proposed Action</th>
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<tbody>
<tr>
<td><strong>SOCIAL AND ECONOMIC RESOURCES</strong></td>
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<tr>
<td>Issue:</td>
<td>Implementation of the proposed projects could potentially alter certain socioeconomic characteristics of Summit County by improving lift and terrain capacities and increasing annual visitation.</td>
<td>Generation of short-term employment related to construction.</td>
</tr>
<tr>
<td></td>
<td>Provides for no improvements that would directly impact day skier visitation.</td>
<td>No potential to specifically induce new resident population.</td>
</tr>
<tr>
<td></td>
<td>No changes to population, employment, housing or emergency services attributable to A-Basin ski area.</td>
<td>The increase in seasonal employment needed to operate new lifts, staff on-mountain guest services and for ski patrol is too small to detect within the economy of Summit County.</td>
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<td></td>
<td></td>
<td>Does not provide for additional accommodations for guests or employees.</td>
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<tr>
<td><strong>NOISE</strong></td>
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<tr>
<td>Issue:</td>
<td>Snow management and avalanche safety through the use of explosives within Montezuma Bowl has the potential to generate noise impacts audible in the Town of Montezuma.</td>
<td>Field testing was conducted in the Town of Montezuma in order to characterize ambient and anticipated noise levels due to avalanche control work. Noise impacts associated with the Proposed Action are no greater than ambient conditions when control work does not occur. Therefore, no additional noise disturbance to residents of the Town of Montezuma would be generated with the Proposed Action.</td>
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<td>The No Action Alternative would not result in any additional acoustic impacts within, or in the vicinity of the Town of Montezuma. Noise levels would not be expected to increase in relationship to existing trends.</td>
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<tr>
<td><strong>WILDLIFE</strong></td>
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<tr>
<td>Issue:</td>
<td>Installation of the proposed Montezuma Bowl lift would necessitate vegetation removal and would increase human presence. Increased use of the area and disturbance to habitat could disrupt terrestrial wildlife, including Threatened, Endangered and Sensitive (TES) species and Management Indicator Species (MIS) that may utilize habitat within A-Basin’s SUP area.</td>
<td>There will be no direct or indirect impacts on the Uncompahgre fritillary butterfly, Colorado pikeminnow, bonytail, humpback chub, razorback sucker, and bald eagle. There are no meaningful changes to which A-Basin or LAU 26 could support lynx or facilitate lynx movements as a result of Alternative 2.</td>
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<tr>
<td></td>
<td>No additional direct or indirect impacts or benefits to the animals and their habitats addressed in the analysis area.</td>
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</table>
Executive Summary

Table ES-1: Summary Comparison of Direct and Indirect Environmental Consequences

<table>
<thead>
<tr>
<th>Alternative 1</th>
<th>Alternative 2</th>
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<tr>
<td>No Action</td>
<td>Proposed Action</td>
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</table>

- The Proposed Action would be consistent with historic ski area operations, but would extend winter recreational use into a non-developed, lightly impacted area (Montezuma Bowl) within A-Basin’s SUP area.
- Alternative 2 would not extend the existing hours or seasons of operations at A-Basin.
- The moderate-term removal (i.e., until compensatory treatments became effective) of four patches of winter foraging habitat totaling 3.1 acres on both sides of the ski area would have no discernable effect on potential lynx home range viability or dispersal through A-Basin. No effective denning or security habitats would be affected.
- The Proposed Action would not impair landscape level movements, impair the ability of lynx to maintain a home range, or increase any lynx risk factors.
- With required Project Design Criteria (PDC), Alternative 2 would be consistent with all applicable, lynx-related provisions of the 2002 Forest Plan and ROD.

Vegetation

**Issue:** Plant communities (including TES and regionally important plants) may be altered as a result of the proposed projects.

- No additional direct or indirect impacts or benefits to the plants and habitats, including federally listed or R2 sensitive plant species.
- There will be permanent and short- to long-term disturbances (i.e., before reclamation restored areas to pre-disturbance conditions) to 16.63 acres of habitats within A-Basin’s SUP area (including the 3.1 acres of tree thinning associated with the lynx treatment area), including approximately 9.2 acres of tree clearing and thinning (including the 3.1 acres of tree thinning associated with the lynx treatment area) and an additional 7.4 acres of grading non-forested areas.
- No direct or indirect impacts on any listed or proposed plant species. No portion of the project area has been designated critical plant habitat by the Secretary of the Interior.
- No R2 sensitive plant species were detected in areas proposed for disturbance: Alternative 2 would have no direct impact on any R2 sensitive plant species.
Executive Summary

Table ES-1: 
Summary Comparison of Direct and Indirect Environmental Consequences

<table>
<thead>
<tr>
<th>Wetlands and Riparian Areas</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
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</thead>
<tbody>
<tr>
<td><strong>Issue:</strong> Identified wetlands and riparian areas throughout the SUP area could be temporarily and/or permanently affected by construction and implementation of proposed projects.</td>
<td>No impacts to jurisdictional and non-jurisdictional waters of the U.S., including wetlands would occur.</td>
<td>Disturbance to wetlands and waters of the U.S. would occur as a result of both temporary and permanent disturbance, including installation of proposed parking lots and stormwater management devices. However, sediment detention ponds to control sheet flow runoff would improve water quality downstream on the North Fork. Permanent wetland impacts would total 0.4 acre on NFS lands. Type conversion impacts from a Palustrine Forested (PFO) wetland to a Palustrine Emergent (PEM) wetland would occur with construction of the Montezuma Bowl lift.</td>
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<table>
<thead>
<tr>
<th>Water Resources</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
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</thead>
<tbody>
<tr>
<td><strong>Issue:</strong> Implementation of terrain modifications associated with lift terminal construction (vegetation removal, grading, utility installation/burial) has the potential to affect water resources.</td>
<td>No additional direct or indirect impacts or benefits to watershed resources or riparian habitats. Not expected to alter stream health or aquatic habitat conditions within the Lenawee or Arapahoe Basin watersheds.</td>
<td>Arapahoe Basin Watershed: approximately 0.1 acre of trees removed for realignment of the Exhibition lift, occurring outside of the Water Influence Zone (WIZ). Approximately 0.5 acre of grading to create the new top terminal pad for the re-aligned Exhibition lift, with approximately 0.1 acre within the WIZ. PDC would effectively disconnect the graded terrain associated with the top terminal of the re-aligned Exhibition lift from the WIZ, ensuring, along with completed and ongoing mitigation projects, that watershed conditions within the Arapahoe Basin watershed would be maintained or improved. Lenawee Watershed: 0.02 acre of grading associated with the construction of the lower terminal for the Montezuma Bowl lift would be accompanied by PDC that would ensure that the graded terrain associated with the terminal pad would be effectively disconnected from the Lenawee stream system, ensuring that stream health would be maintained or improved in this watershed. North Fork Snake River Watershed: approximately 0.22 acre of ground disturbance would occur around the existing lower terminal of the Exhibition lift to facilitate its retrofit and re-alignment. While this construction would occur within the WIZ of the North Fork, it would not represent a new impact since it would occur at an...</td>
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### Executive Summary

#### Table ES-1:
**Summary Comparison of Direct and Indirect Environmental Consequences**

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<tr>
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<tbody>
<tr>
<td><strong>No Action</strong></td>
<td></td>
<td>already disturbed site at the existing lower terminal pad. 3.5 acres of grading associated with the re-development and expansion of the High Noon parking lot would occur within the WIZ and create additional impervious surface. However, the parking lot projects and installation of sediment detention ponds would represent an improvement over existing drainage conditions at the High Noon lot and subsequently improve the water quality downstream on the North Fork.</td>
</tr>
</tbody>
</table>

**Air Quality**

*Issue: Proposed increases in vehicular traffic related to proposed improvements may have long- and short- term impacts to air quality.*

- No new projects would be authorized for NFS lands; and therefore, no short- or long-term impacts to air quality, as a result of actions on public lands, are associated with this alternative.
- Incremental increases in the number of vehicles associated with A-Basin would be minor in relation to traffic increases on Interstate 70 and Highway 6 due to population growth. Therefore, no detectable changes to current trends in air quality are anticipated as a direct result of the Proposed Action.

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*a - Comfortable Carrying Capacity (CCC) is defined as the number of guests which can be comfortably accommodated by a ski area at any point in time. It provides for a pleasant recreational experience by not overburdening a ski area’s facilities (including, but not limited to, parking, restaurant seating, restrooms, and uphill/downhill capacity). CCC is used by ski area planners and the Forest Service as a planning tool and does not, in itself, constitute a cap on visitation.*
1. PURPOSE AND NEED

INTRODUCTION

The proposed improvements analyzed in this document constitute a federal action, which has the potential to affect the quality of the human environment on public lands administered by the 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 process and provide relevant information to the public for review and comment.

Therefore, the Forest Service has prepared this Draft Environmental Impact Statement (DEIS) in compliance with NEPA and other relevant Federal and State laws and regulations. This DEIS discloses potential direct, indirect, and cumulative environmental effects on the human and biological environment estimated to result with implementation of the Proposed Action.

Potential direct, indirect, and cumulative environmental effects are identified in the Chapter 3. Additional documentation, including more detailed analyses of project area resources, may be found in the project administrative record located at the Dillon Ranger District of the White River National Forest (WRNF).

BACKGROUND

Arapahoe Basin Ski Area (A-Basin) is located in the Dillon Ranger District of the WRNF, 15 miles east of Dillon, Colorado. The ski area is accessed via Highway 6. A-Basin is approximately 1.5 to 2 hours driving time from the metropolitan Denver area via Interstate 70 and Highway 6 (refer to Figure 1 in Chapter 6). It can be accessed from the Town of Dillon or from Loveland Pass.

A-Basin is owned by Dundee Realty USA, LLC, and operates under a U.S. Department of Agriculture, Forest Service Ski Area Term Special Use Permit (SUP). A-Basin’s SUP covers approximately 1,872 acres of National Forest System (NFS) lands, which encompass 100 percent of the ski area’s lifts/terrain network, parking facilities, infrastructure and guest services.

In concert with growing market demand and the increasing expectations of the skiing public, A-Basin has evolved over the decades since its inception in 1946 by adding new chairlifts, new and improved ski terrain, additional parking and day lodge facilities. The area now includes two triple chairlifts (Exhibition and Lenawee), three double chairlifts (Pallavicini, Norway and Molly Hogan), a conveyor lift (Molly’s Magic Carpet), base area skier service buildings and 490 acres of skiable terrain.

1 At ski areas, one may see people using Alpine, snowboard, telemark, cross-country, and other specialized ski equipment, such as that used by disabled or other skiers. Accordingly, the terms “ski, skier, and skiing” in this document encompass all lift-served sliding sports typically associated with a winter sports resort.
The A-Basin’s Forest Service SUP requires the development of a Master Development Plan (MDP), which identifies management direction and opportunities for future management of the ski area on NFS lands. In September 1999, the Forest Service approved an MDP for A-basin which identified, among other things, improvements to lifts and guest services, snowmaking infrastructure and parking. The SUP in the 1999 MDP totaled 820 acres. With the 2002 White River National Forest Land and Resource Management Plan Revision (2002 Forest Plan), two adjacent areas – Montezuma Bowl and The Beavers – were incorporated into A-Basin’s SUP area, increasing the SUP acreage to 1,872 acres. In April 2006, A-Basin submitted a proposal to the Forest Service to amend their 1999 MDP, which was accepted, resulting in the 2006 Master Development Plan Amendment (2006 MDPA).

**SUMMARY OF THE PROPOSED ACTION**

The Proposed Action analyzed within this document follows A-Basin’s April 2006 MDPA. The Forest Service accepted the 2006 MDPA and has now moved into the analysis phase in order to determine whether all, portions of, or modifications to the proposed projects will ultimately be approved for implementation on NFS lands within A-Basin’s SUP area.

The 2006 MDPA was prepared to comply with specific provisions of A-Basin’s Forest Service-issued SUP and to assist A-Basin and the Forest Service in long-range planning efforts for NFS lands within the SUP area. The 2006 MDPA provides a detailed account of the resort’s existing and potential recreational assets, constraints and future needs. A-Basin is seeking a site-specific NEPA review of all projects identified in the 2006 MDPA which, if approved, are anticipated to be implemented over the next three-to-five years.

The 2006 MDPA focuses on enhancing the recreational experience at A-Basin by addressing issues related to the lift, parking and terrain network. All projects are within A-Basin’s existing SUP area.

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

**LIFTS**

- Install a chairlift in Montezuma Bowl to provide lift-served skiing in this currently undeveloped portion of the existing SUP area.
- Upgrade the Exhibition lift with new technology. The alignment of the upgraded lift would be slightly adjusted to provide for better skier circulation at mid-mountain.

**TERRAIN**

- Increase A-Basin’s skiable terrain and operational boundary by approximately 395 acres in Montezuma Bowl, including 48 acres of hike-back terrain below the proposed lift’s bottom terminal. Approximately 37 acres of grooming are proposed to occur in Montezuma Bowl.
Chapter 1: Purpose and Need

PARKING

- Increase parking capacity by 23 percent via enlargements to the Lower Overflow and High Noon lots on the north side of Highway 6.

BACKCOUNTRY ACCESS

- Reconfigure backcountry access currently available from the top of the Lenawee/Norway lifts creating four new access points.

RELATIONSHIP TO PREVIOUS ANALYSES AND APPROVALS

This DEIS incorporates by reference the 1999 Arapahoe Basin Final Environmental Impact Statement (1999 FEIS) and associated 1999 Record of Decision (1999 ROD).

The 1999 FEIS and associated 1999 ROD analyzed and authorized implementation of projects included in the 1997 A-Basin MDP. From this authorization, 95 acres of snowmaking coverage and associated infrastructure, a new Patrol Headquarters (PHQ) building, an upgraded Lenawee lift, a terrain park, and Molly’s Magic surface lift have been constructed and installed up through the 2005 construction season.

Approved, unimplemented projects from the 1999 ROD include:

- Construction of the Midway Lodge and Deck (including associated utilities) located at the top of the Exhibition lift (scheduled for construction in summer 2006)
- Norway lift Midway Station
- Lift upgrades - all lifts were approved for upgrading while maintaining their existing alignments and capacities
- Constructing a pedestrian underpass connecting the High Noon lot with base area facilities
- Lenawee lift mid-station
- Snowmaking - completion of phase 1 and all of phase 2 (including system installation and coverage, water withdrawal, bypass flow etc.)
- Development of a tubing park
- An additional surface lift
- Continued upgrades to base area buildings
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- Upgrading of the Last Chance lot (Upper Overflow lot) increasing capacity by 100 parking spaces
- Hiking/biking interpretive trail

Some projects that were authorized in the 1999 ROD and which have not yet been implemented have a direct tie to projects contained in the 2006 MDPA. These projects include:

- Relocation of the Exhibition top terminal in relation to the Midway Lodge to improve skier flow
- Development of the Midway Lodge located at the top of the Exhibition lift
- Upgrading the Last Chance lot (Upper Overflow lot) increasing capacity by 100 parking spaces
- Constructing a pedestrian underpass connecting the High Noon lot with base area facilities

PURPOSE AND NEED FOR THE PROPOSED ACTION

Purpose #1
Better disperse intermediate and advanced skiers throughout the SUP area.

Need:
A terrain capacity distribution analysis completed for the 2006 MDPA acknowledges a deficiency of beginner, advanced-intermediate, and expert terrain and a surplus of novice, low intermediate and intermediate terrain. This demonstrates that the skiing terrain currently provided at A-Basin is out of balance with its skier/rider market.

Objective:
The Proposed Action would incorporate additional lift-served skiing into A-Basin’s trail network in Montezuma Bowl, which is intended to better balance skier distribution throughout A-Basin and provide more advanced-intermediate and expert terrain.

Purpose #2
Address terrain capacity issues to accommodate current and anticipated demand.

Need:
Summit County ski areas account for roughly 50 percent of skier visits on the WRNF. The 2002 Forest Plan FEIS concluded that skier visitation in Colorado will increase by 800,000 skiers by 2010. The majority of this growth is anticipated to take place in the WRNF, with Summit County experiencing the largest percentage of that growth due to its proximity to Front Range communities. The recent growth in

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2 The Last Chance lot expansion as approved via the 1999 ROD has been renamed the Upper Overflow lot after implementation of the 1999 FEIS. Therefore, this previously-approved expansion is hereinafter referred to as the Upper Overflow lot.

3 Arapahoe Basin, 2006c p. 20

4 USDA Forest Service, 2002b p. 3-442
A-Basin’s skier visitation (33 percent over the past three years, from 244,000 skier visits in 2001 to 328,000 in 2005) validates the 2002 Forest Plan FEIS projections.

**Objective:**
The Proposed Action is designed to accommodate current and future visitation levels at A-Basin. This would be achieved by increasing guest capacities as well as skier distribution, and in the process providing a range of ability levels through upgrading the Exhibition lift and providing lift served skiing in Montezuma Bowl.

**Purpose #3**
Address deficiencies in A-Basin’s out-of-base lift capacity.

**Need:**
Two chairlifts – Exhibition and Pallavicini – provide primary up-mountain access from A-Basin’s base area. Because Pallavicini serves predominately advanced terrain with limited services, most skiers begin their day on Exhibition. Exhibition, a fixed-grip triple chairlift installed in 1978, routinely experiences long wait times in the morning and after lunch.

**Objective:**
The Proposed Action includes replacing the Exhibition lift with new technology which would increase out-of-base capacity and expedite mid-mountain access, thereby improving skier distribution to the mid-mountain area.

**Purpose #4**
Increase parking capacity to meet current and anticipated demand.

**Need:**
Public parking at A-Basin is provided in the day-skiers parking areas and overflow parking along the shoulders of Highway 6, which have a combined capacity of 1,450 vehicles (including buses). There is currently a deficiency in parking capacity on peak days, especially during the spring.

**Objective:**
Under the Proposed Action, parking capacity would increase and vehicular circulation through parking lots would be improved.

**PUBLIC INVOLVEMENT**
On November 17, 2005, a scoping notice providing a detailed description of the projects, the Purpose and Need for action, and maps of proposed projects was mailed to approximately 50 community residents, interested individuals, public agencies and other organizations. On November 22, 2005 a press release was distributed to key local and regional media and a legal notice was published in the Glenwood Post Independent which initiated a 45-day scoping period. On November 30, 2005, the Forest Service
Chapter 1: Purpose and Need

published a Notice of Intent (NOI) to prepare an EIS in the Federal Register. A total of 51 comment letters were received by the Forest Service.

Based on the 51 letters received, a comment disposition was completed, which documents the Forest Service Interdisciplinary (ID) Team’s categorization of each substantive comment. The comment disposition is a key component of the issues identification and alternative formulation process.\(^5\) The issues are addressed in Chapter 3 - Affected Environment and Environmental Consequences. Resource issues and indicators are listed below.

**ISSUES AND INDICATORS**

Based on the results of public scoping, the Forest Service identified specific areas of concern and classified them as being either “key issues” or “non-key issues.” Key issues may warrant the generation of an alternative, can be addressed by project design criteria or mitigation, or generally require in-depth analysis and disclosure. For this project, key issues, such as backcountry access, were addressed with in-depth analysis. Non-key issues are beyond the scope of the project, are already decided by law, regulation or policy, or are not relevant to the decision.

Each key issue below includes a list of indicators which were identified as a means of measuring or quantifying the anticipated level of impact on a particular resource. While some indicators are necessarily qualitative in nature, every effort was made to utilize indicators that are quantitative, measurable and predictable.

**THE HUMAN ENVIRONMENT**

**Recreation**

*Recreation Issue #1: Proposed projects within A-Basin’s SUP area have the potential to affect the recreational experience at the ski area.*

**Study Area:** Developed and undeveloped portions of A-Basin’s SUP Area

**Indicators:**

- Quantification of existing and proposed terrain acreage by ability level
- Discussion of skier terrain densities under the existing and proposed conditions
- Quantification of lift line wait times under existing and proposed conditions

\(^5\) The scoping comment disposition analysis is available in the project file.
Recreation Issue #2: Installation of the proposed Montezuma Bowl lift would entail relocating backcountry access points for NFS lands adjacent to A-Basin’s SUP area. Converting Montezuma Bowl to a lift-served skiing experience would alter the distribution of backcountry acreage immediately accessible from the ski area’s operational boundary.

Study Area: A-Basin’s SUP Area and adjacent NFS lands utilized for backcountry skiing

Indicators:
- Identification of existing and relocated backcountry access points
- Narrative discussion of the existing backcountry experience and changes anticipated from relocated access points and reduced backcountry acreage
- Extent (acres), and quantification of existing use, of backcountry areas accessed through access points within A-Basin’s SUP area

Roadless Areas

The 8,745-acre Porcupine Peak Inventoried Roadless Area (IRA) overlaps the southern and western portions of A-Basin’s 1,872-acre SUP area, including the Montezuma Bowl area. Development of lift-served skiing in Montezuma Bowl has the potential to change the characteristics of the Porcupine Peak Roadless Area.

Study Area: A-Basin’s SUP Area and Porcupine Peak IRA

Indicators:
- Quantification of overlapping acreage between the Porcupine Peak IRA and A-Basin’s SUP area
- Identification of Porcupine Peak IRA (map)
- Discussion of roadless area characteristics in Montezuma Bowl under existing and proposed conditions
- Narrative discussion of pertinent direction as contained in the May 13, 2005 Final Rule and associated Decision Memo on protection of Inventoried Roadless Areas (36 CFR part 294)
- Narrative discussion of the new 2002 Forest Plan Amendment #2, which removed the Inventoried Roadless guideline from designated 8.25 Management Areas
- Narrative discussion on current regulations for Inventoried Roadless Areas

Traffic, Parking, and Ski Area Access

Proposed improvements to A-Basin’s parking facilities would increase parking capacity and would affect vehicular circulation in the base area. Furthermore, proposed on-mountain projects may generate measurable increases in daily/seasonal visitation, thereby affecting traffic movement and volumes on Highway 6.
Chapter 1: Purpose and Need

Study Area: Highway 6 between Keystone and A-Basin ski areas

Indicators:
- Quantification of existing and proposed parking capacity
- Historic and projected traffic counts for Highway 6
- Comparison of anticipated winter traffic volumes with existing winter traffic volumes and the design capacities of Highway 6

Scenic Resources

Installation of the Montezuma Bowl lift would entail constructing a top terminal, and associated utility/skier corridor at a high elevation, exposed location. In addition, projects proposed on the front-side of A-Basin’s SUP area (including parking lot improvements and Exhibition lift upgrade) would be visible from Highway 6.

Study Area: A-Basin’s SUP Area as visible from identified critical viewpoints

Indicators:
- Compliance with Forest Plan standards and guidelines for scenery management within the SUP area and from established critical viewpoints
- Discussion of three identified critical viewpoints used in this analysis include:
  - Highway 6 approximately 1 mile north of A-Basin’s base area
  - Town of Montezuma, approximately 3 miles south of the Montezuma Bowl side of the SUP area
  - Various points along the shoulder of Highway 6 between Keystone Resort and the top of Loveland Pass

Cultural and Heritage Resources

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

Study Area: A-Basin’s SUP Area

Indicators:
- Documentation of presence or absence of identified cultural resources
- Potential for proposed construction activities and ground disturbance to affect previously unidentified or unknown cultural resources
- Documentation of impacts to any potentially-eligible NRHP sites
Social and Economic Resources

Implementation of the proposed projects could potentially alter certain socioeconomic characteristics of Summit County by improving lift and terrain capacities and increasing total annual visitation.

Study Area: Summit County
Indicator:
- Potential effects to socioeconomic indicators in Summit County, including: population, employment, and housing

Noise

Snow management and avalanche safety through the use of explosives within Montezuma Bowl has the potential to generate noise audible in the Town of Montezuma.

Study Area: Town of Montezuma
Indicator:
- Measured noise levels within the Town of Montezuma

THE BIOLOGICAL ENVIRONMENT

Vegetation

Plant communities (including Threatened, Endangered, and Sensitive [TES] species and regionally important plants) may be altered as a result of the proposed projects.

Study Area: A-Basin’s SUP Area
Indicators:
- Identification of any TES plant species present in the study area
- Quantification (acreage) of proposed ground disturbance and overstory vegetation removal effects by species
- Disclosure of impacts to TES plant species and overstory vegetation

Water Resources

Implementation of terrain modifications associated with lift terminal construction (vegetation removal, grading, utility installation/burial) has the potential to affect water resources.

Study Area: North Fork Snake River / Unnamed tributary to Snake River
Indicators:
- Discussion of stream health and water influence zone (WIZ) impacts, including stream bank stability and channel substrate. Evaluation of compliance with Watershed Conservation Practices Handbook requirements
• Discussion of storm water management design elements associated with Highway 6 and the proposed parking areas and potential stream health effects to the North Fork Snake River

**Wetlands and Riparian Areas**

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

**Study Area:** A-Basin’s SUP Area

**Indicators:**

• Area of wetlands and riparian areas existent within the project area (acres/linear feet) utilizing aerial photo interpretation and field confirmation

• Disclosure of potential impacts to wetland and riparian areas within the project area

• Narrative description of wetland communities and riparian areas classifications and disclosure of anticipated temporary and/or permanent impacts (acres/linear feet)

**Wildlife**

*Installation of the proposed Montezuma Bowl lift would necessitate vegetation removal and would increase human presence. Increased use of the area and disturbance to habitat could disrupt terrestrial wildlife, including TES species and Management Indicator Species (MIS) that may utilize habitat within A-Basin’s SUP area.*

**Study Area:** A-Basin’s SUP Area and surrounding NFS lands

**Indicators:**

• Identification of any TES and MIS terrestrial and aquatic species and habitats present in the study area

• Acreage of total proposed habitat alteration/removal by species

**Air Quality**

*Proposed increases in vehicular traffic related to proposed improvements may have long- and short-term impacts to air quality.*

**Study Area:** SUP Area and Summit County

**Indicators:**

• Compliance with State and Federal air quality regulations
CONSISTENCY WITH FOREST SERVICE POLICY

LAND AND RESOURCE MANAGEMENT PLAN CONSISTENCY

A-Basin’s operations carried out on NFS lands within the SUP area must comply with the management direction as 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. A-Basin’s SUP area falls 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. Base areas that serve as entrance portals are designed as gateways to public lands. Forested areas are managed as sustainable cover with a variety of species and age classes in patterns typical of the natural landscape character of the area. Protection of scenic values is emphasized through application of basic landscape aesthetics and design principles, integrated with forest management and development objectives.”

As part of this analysis, the Proposed Action and Purpose and Need were reviewed to determine consistency with the 2002 Forest Plan Forest-wide Goals and Objectives as well as the specific Standards and Guidelines for Management Area 8.25. The Proposed Action was compared against pertinent Forest-wide and Management Area standards and guidelines. No inconsistencies between the proposal and pertinent standards and guidelines were identified. The Forest Plan Consistency Analysis is contained in the project file.

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.”

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.”

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6 USDA Forest Service, 2002a
7 USDA Forest Service, 2002a p. 2-31
8 USDA Forest Service, 2002a p. 3-80
Chapter 1: Purpose and Need

The 2002 Forest Plan EIS further reinforces the reason for adding and providing lift services in Montezuma Bowl.

“Montezuma Bowl lies immediately south of Arapahoe Basin and is a logical expansion of the ski area. The site was previously inside the ski area boundary. The 800-acre bowl has long been recognized as having excellent potential for skiing and snowboarding. High altitudes generally assure quality snow conditions throughout the majority of the ski season. This area has potential to provide a back-bowl skiing experience on the sunny side of the mountain. The site has good views of surrounding National Forest System lands. The upper portion of Montezuma Bowl is above timberline and has good characteristics for skiing.”

FOREST SERVICE MANAGEMENT DIRECTION

The enabling authorities for the Forest Service are contained in many laws enacted by Congress and in the regulations and administrative directives that implement these laws. These authorities allow the Forest Service to provide recreation opportunities to facilitate the use, enjoyment, and appreciation of National Forests.

The Forest Service is authorized to approve certain uses of NFS lands under the terms of SUPs. Generally, SUPs for recreational developments are issued and administered for uses that serve the public, promote public health and safety, and protect the environment.

Downhill skiing is an important component of the recreation opportunities offered by National Forests. The National Recreation Strategy, a result of the 1987 President’s Commission for America’s Outdoors, gives the Forest Service a major role in providing recreation opportunities on National Forests through partnerships such as those with the ski industry.

DECISION FRAMEWORK

This Draft EIS is a disclosure rather than a decision document and its purpose is to provide sufficient environmental analysis to support a Record of Decision (ROD), which will be released in conjunction with a Final EIS. Based on the analysis documented within this Draft EIS, the responsible official, the Forest Supervisor for the WRNF, will decide whether to allow implementation, in whole or in part of the Proposed Action Alternative, or select the No Action Alternative. The Forest Supervisor is not required to choose either an action alternative or the No Action Alternative described in this Draft EIS but may select

9 USDA Forest Service, 2002b pp. 3-458 and 459
10 These laws include: the Organic Administrative Act (1897), the Weeks Act (1911), the Multiple Use Sustained Yield Act (1960), the Forest and Rangeland Renewable Resources Planning Act (1974), the National Forest Management Act (1976), and the National Forest Ski Area Permit Act (1986).
11 16 USC 497
12 USDA Forest Service, 1988
components of an action alternative or develop an entirely new alternative created from components of the No Action and the Proposed Action alternatives analyzed in this document.

OTHER NECESSARY PERMITS, LICENSES, ENTITLEMENTS AND/OR CONSULTATION

While the Forest Service decision would apply only to projects proposed on NFS lands within the A-Basin SUP area, implementation of any approved projects could warrant approvals and/or permits by other federal, state, and local jurisdictions. The US Army Corps of Engineers (USACE) has developed protocols for the delineation of wetlands. These procedures were followed for the delineation of wetlands within or adjacent to project element areas. The issuance of a permit under Section 404 of the Clean Water Act (CWA) may be necessary for implementation of certain approved projects.

While the Forest Service assumes no responsibility for enforcing laws, regulations, or ordinances 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 approvals, the following permits or approvals may potentially be required to implement the action alternative:

- USACE 404 Permit
- Summit County general construction permits
- National Pollution Discharge Elimination System (NPDES) permit
- Colorado Department of Transportation (CDOT) access permit
- Surface Water Management Plan (SWMP)

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13 Per 40 CFR 1502.25(b)
14 This list is not necessarily inclusive.
2. DESCRIPTION OF ALTERNATIVES

INTRODUCTION

Chapter 2 describes the alternatives considered within this environmental analysis and summarizes the environmental consequences anticipated to result with the implementation of each. As required by the Council on Environmental Quality (CEQ), 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 the Proposed Action, are also detailed.

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

The process used to develop alternatives to the Proposed Action followed external public scoping. 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.

ALTERNATIVES CONSIDERED IN DETAIL

This DEIS analyzes the No Action Alternative and the Proposed Action. In addition to the details of the No Action and Proposed Action alternatives, remaining unimplemented projects approved by the 1999 ROD would likely be constructed. These projects are listed in Chapter 1 and assessed cumulatively as reasonably foreseeable future actions in Chapter 3.

ALTERNATIVE 1 - NO ACTION

As required by NEPA, a No Action Alternative has been included in this analysis for review alongside the Proposed Action. By definition, the No Action Alternative represents a continuation of existing management practices without changes, additions, or upgrades of the existing conditions. Brief descriptions of existing on-mountain facilities and services are provided below. The No Action Alternative is depicted in Figure 2 in Chapter 6.

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15 40 CFR 1502
16 FSH 1909.15, Chapter 10, Section 12.33
17 40 CFR 15032.14(a)
18 40 CFR 1502.14(d)
Chapter 2: Description of Alternatives

**Guest Capacities**

Under the No Action Alternative, A-Basin’s Comfortable Carrying Capacity (CCC) would remain at 3,210 guests.\(^{19}\)

**Lifts**

Under the No Action Alternative, A-Basin’s lift network (consisting of two triple chairlifts, three double chairlifts and one surface conveyor lift) would remain in its current configuration.\(^{20}\) These lifts have a combined uphill capacity of 7,600 people per hour (pph).

Terrain on the front-side of A-Basin near the base area is, and would continue to be, serviced by the Exhibition triple chairlift, the Pallavicini double chairlift, the Molly Hogan double chairlift and Molly’s Magic surface lift, all of which serve terrain located on the lower to mid-mountain. The Norway double chairlift and Lenawee triple chairlift would continue to service all of the trails on the mid- to upper-portion of A-Basin’s skiable terrain. Out-of-base lift access (distributing guests to the mid- to upper-portion of the mountain) would continue to be provided by the Exhibition and Pallavicini lifts with capacities of 1,800 and 1,200 pph, respectively.

**Terrain Network**

Under the No Action Alternative, A-Basin’s skiable terrain would remain at 490 acres, its operational boundary at approximately 700 acres, and the SUP boundary at 1,872 acres.

A-Basin’s skiing trail network is comprised of 78 named trails, including maintained and groomed ski trails, open bowls, tree skiing, glades and chutes. While the natural topography of the A-Basin SUP area skews toward the higher skill classes, the formalized trail network would continue to accommodate the entire range of skier ability levels.

**Backcountry Access Points**

Under the No Action Alternative, backcountry access would not change. Backcountry skiers would continue to access Thurman’s Gulch (to the east of the SUP area), Montezuma Bowl (to the south of the SUP area) and The Beavers (to the west of the SUP area) through one access point, located above the Lenawee lift on the A-Basin / Montezuma Bowl ridgeline.

**Parking**

No improvements to A-Basin’s Lower Overflow or High Noon lots would occur under the No Action Alternative. The combined capacity of the five parking lots would remain at approximately 1,450

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\(^{19}\) CCC is defined as the number of guests which can be comfortably accommodated by a ski area at any point in time. It provides for a pleasant recreational experience by not overburdening a ski area’s facilities (including, but not limited to, parking, restaurant seating, restrooms, and uphill/downhill capacity). CCC is used by ski area planners and the Forest Service as a planning tool and does not, in itself, constitute a cap on visitation.

\(^{20}\) All chairlifts are fixed-grip.
vehicles. The only potential for improvement to the parking situation would be from the all ready approved Upper Overflow lot proposal as per the 1999 ROD.

**ALTERNATIVE 2 - PROPOSED ACTION**

The Proposed Action would increase uphill and downhill capacities as well as provide for additional parking capacity. A-Basin is seeking site-specific NEPA review of all projects identified in the MDPA (Master Development Plan Amendment) which, if approved, would likely be implemented within approximately three-to-five years. The Proposed Action is structured to meet the Purpose and Need by improving the overall quality of A-Basin’s on-mountain experience and strategically replacing outdated infrastructure and improving terrain.

The Proposed Action is depicted on figures 3A and 3B in Chapter 6.

**Guest Capacities**

With respect to guest capacities for the lift and trail system on public land, the Proposed Action would increase A-Basin’s CCC to approximately 3,910 guests, an increase of 700 guests or 22 percent.

**Lifts**

The Proposed Action calls for the upgrading of the Exhibition lift with new, higher capacity technology. In addition, a lift would be installed in Montezuma Bowl. These two lift projects would increase A-Basin’s hourly lift capacity from 7,600 people per hour (pph) to 11,400 pph, an increase of 3,800 pph.

Originally installed in 1978, the Exhibition triple chairlift (1,800 pph) would be upgraded with new technology, providing an uphill capacity of up to 2,600 pph. The upgraded Exhibition lift would have a slightly modified alignment. Tree clearing and grading associated with the realignment would total 0.6 acre. The lower terminal would remain in its current location while the top (drive) terminal would be relocated approximately 20 vertical feet uphill and approximately 185 feet to the southwest. Relocating the top terminal of this lift would allow more room for skier circulation around the future Midway Lodge (per the 1999 ROD). The upgraded Exhibition lift is intended to provide more efficient uphill transport of guests and reduce lift line wait times in the base area.

The proposed upgrades to the Exhibition lift are depicted on Figure 3A in Chapter 6.

The Montezuma Bowl lift is proposed to have an uphill capacity of up to 2,400 pph. The lift is proposed to be approximately 4,150 feet in slope length with a vertical rise of 1,115 feet. The upper terminal of the proposed top-drive lift would be situated approximately 500 feet southeast of the top terminal of the existing Lenawee lift, at an elevation of 12,465 feet, on the southwest side of the ridge separating Montezuma Bowl from A-Basin’s front side (refer to Figure 3B in Chapter 6). This location was proposed to minimize the visibility of the top terminal. All construction equipment would gain access to the proposed top terminal area by utilizing existing service roads and through the construction of a 10-
12-foot wide, 500-foot long access route across the talused slope between the top terminal of the Lenawee lift and the top terminal of the proposed Montezuma Bowl lift. This proposed access route would serve as a power line corridor for the proposed chairlift and a groomed skiway in the winter.

The bottom terminal would be constructed at an elevation of 11,350 feet. Construction of the bottom terminal in this remote location can be accomplished without construction of a road, and all equipment and tools would be transported to the bottom terminal by a combination of the following methods: helicopter, over-the-snow (via snowcat or snowmobile), or carried down by hand in the summer. Grading and tower excavation would be accomplished by utilizing low-impact excavating equipment and hand digging.21

Construction of the Montezuma Bowl lift would entail approximately 2.2 acres of tree clearing and/or grading. Excess fill material created as a result of construction of the top terminal would be deposited in an existing, natural terrain depression on the ridge line immediately south of the top terminal of the Lenawee lift. The reader is referred to Table 2-1 for details of this disturbance.

**Terrain Network**

By design, the Proposed Action minimizes tree removal in Montezuma Bowl by creating strategic “collector” trails intended to funnel skiers to the lift corridor and bottom terminal. As depicted in Table 2-1, total tree clearing and grading proposed in conjunction with terrain in Montezuma Bowl is 2.2 acres.

Adding lift-served skiing within Montezuma Bowl would increase A-Basin's existing overall lift-served terrain acreage from approximately 490 to 837 acres. The Montezuma Bowl area would add approximately 175 acres of intermediate terrain and 150 acres of advanced and expert terrain, all accessible for round-trip skiing via the proposed Montezuma Bowl lift (refer to Figure 3B in Chapter 6).

In addition to lift-served terrain in Montezuma Bowl, approximately 48 acres of terrain below the bottom terminal of the Montezuma Bowl lift are proposed to be offered as “hike-back” terrain. By entering this roped and signed area, skiers could descend an additional 250 vertical feet. Two ropes would be installed in conjunction with the hike-back terrain (refer to Figure 3B in Chapter 6), with the top rope at the entrance to the “hike-back” terrain requiring minimal tree clearing (approximately 20 trees) to allow a ski patroller and toboggan to safely return to the Montezuma Bowl lift bottom terminal. Signage placed in conjunction with the first rope would inform skiers that this point is the boundary of the lift-served ski terrain in Montezuma Bowl, and that proceeding beyond it would entail hiking back to the Montezuma Bowl lift. A second rope, located approximately 250 vertical feet below, would be signed to indicate that it represents A-Basin’s operational boundary, and that terrain below is not patrolled or maintained, with no mechanism provided for getting back to the operational boundary of the ski area.

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21 “Low-impact” refers to excavating equipment that is specifically designed to have low ground pressure.
Snow Grooming

Snow grooming of approximately 37 acres of advanced-intermediate terrain is proposed within Montezuma Bowl. This is proposed to occur on high traffic areas to provide intermediate level guests with access to the bottom terminal of the proposed Montezuma Bowl lift. Furthermore, a single groomed path would extend approximately 600 linear feet below the proposed Montezuma Bowl lift’s bottom terminal location, terminating in a turnaround point for a snowcat. This would ease the ascent to the bottom terminal of the Montezuma Bowl lift for guests who descend the 250 vertical feet into the hike-back terrain. This lower extension would require selective tree thinning along a currently sparsely forested drainage and would utilize existing clearings for the snowcat turnaround point.

Additionally, an approximately 3,000-foot long path along the west ridge of Montezuma Bowl is proposed to be groomed and would require no tree removal. This groomed path would include a parallel roped closure on the northern side of the path to restrict use within high avalanche prone areas and provide access to an additional backcountry access point (discussed below). Additionally, this path is designed to provide safe ingress into Montezuma Bowl.

Backcountry Access Points

The Proposed Action includes a reconfiguration of backcountry access. The existing backcountry access point located on the ridge line above (south) of the top terminal of the Lenawee lift would be removed and backcountry access to The Beavers, Thurman’s Bowl, The Rock Pile and areas below Montezuma Bowl would be gained via four new access points. The reader is referred to Figure 3B in Chapter 6 for the four proposed access point locations.

1. An access point for Thurman’s Bowl would be located on the eastern side of the ridge line approximately 700 feet east of the proposed top terminal of the Montezuma Bowl lift.

2. A new access point for The Beavers would be located on the ridge line approximately 700 feet west of the top terminal of the Norway lift.

3. A component of the Proposed Action includes grooming the western ridgeline of Montezuma Bowl for approximately 3,000 feet below the proposed The Beavers access point. A western access point for The Rock Pile area would be located roughly 1,000 feet further below the limit of the proposed groomed route.

4. A fourth backcountry access point would be located at the southern boundary of A-Basin’s operational boundary at the snowcat turnaround point approximately 250 vertical feet below the Montezuma Bowl lift bottom terminal. The southern backcountry access point would allow guests to exit A-Basin’s operational and SUP boundary and descend to Montezuma Road.
Chapter 2: Description of Alternatives

Parking

To meet current parking demand, and commensurate with projections for future visitation, the Proposed Action includes provisions for increasing total ski area parking capacity. The Proposed Action would create an additional 136 parking spaces in the Lower Overflow lot (for a total of roughly 286 spaces) by modifying the Lower Overflow Lot into a switchback parking lot/road entering from Highway 6 at the current entrance to the Last Chance Lot and traversing to the east side of the High Noon Lot (refer to Figure 3A in Chapter 6). A guard rail is proposed along the shoulder of the Lower Overflow lot to restrict the ability for vehicles to directly enter Highway 6.

The existing High Noon Lot is proposed to be widened and re-graded to add an additional 95 parking spaces (for a total of roughly 495 spaces). In conjunction with the re-grading of the High Noon Lot, a series of sediment detention basins are proposed along the west edge of the parking area, parallel with Highway 6. The modifications to Lower Overflow and High Noon lots would create a 19 percent increase in total parking spaces over existing conditions.

Tree clearing and grading associated with parking lot improvements would total approximately 2.9 acres (refer to Table 2-1 for more information). Combined with previously approved improvements to the Upper Overflow Lot (via the 1999 ROD), this would increase A-Basin’s total parking capacity to 1,781 vehicles, a 23 percent increase from existing conditions.

Utilities

A utility corridor for a three phase power line would be installed from the top terminal of the Lenawee lift to the top terminal of the proposed Montezuma Bowl lift. As stated above, in conjunction with this installation, a 10- to 12-foot wide, graded access route would allow vehicular access for maintenance purposes to the top terminal of the Montezuma Bowl lift during the summer. In the wintertime, this route would provide a groomed skiway for guests to access the ridgeline and Montezuma Bowl.

MODIFICATIONS MADE TO THE PROPOSED ACTION

As scoped, the Proposed Action proposed a permanent all terrain vehicle (ATV) access route in Montezuma Bowl to expedite construction and maintenance of the Montezuma Bowl lift. The ATV route was withdrawn from the Proposed Action, after it was determined that the lift can be constructed and maintained without vehicular access and that resource impacts could be further reduced by doing so. As noted in the Proposed Action description, all equipment and tools would be transported to the bottom terminal by a combination of the following methods: helicopter, over-the-snow (via snowcat or snowmobile) in the spring, or carried down by hand in the summer. Grading and tower excavation would be accomplished by utilizing low-impact excavating equipment and hand digging. Maintenance access to the lift’s bottom terminal would be accomplished in the spring when the snowpack is sufficient to support snowcats/snowmobiles and in the summer by foot access.
Chapter 2: Description of Alternatives

ALTERNATIVE CONCEPTS CONSIDERED BUT ELIMINATED

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives or alternative components that were not analyzed in detail. Alternatives must meet the purpose and need of the proposed action.

ELIMINATION OF LIFT-SERVED SKIING IN MONTEZUMA BOWL

The Forest Service received public comments indicating that lift-served skiing in Montezuma Bowl should not be approved on two primary grounds: 1) it would eliminate backcountry skiing opportunities on NFS lands; and 2) lift service in this area would be inconsistent with management direction for the Porcupine Peak Inventoried Roadless Area (IRA), which overlaps the southern and western portions of A-Basin’s existing SUP area.

The ID Team determined that an alternative analyzing the Proposed Action without lift-served skiing in Montezuma Bowl was unnecessary, as this concept is adequately addressed by the No Action Alternative which would not change the quantity of backcountry ski terrain or any roadless characteristics in the Porcupine Peak IRA. The reader is referred to Chapter 3, Sections A (Recreation) and B (Roadless) for discussions/analyses of potential impacts to backcountry skiers and management direction for the Porcupine Peaks IRA.

SNOWCAT SKIING ONLY IN MONTEZUMA BOWL

During a public meeting held on January 20, 2006 to discuss backcountry access at A-Basin, an alternative concept of providing round-trip skiing in Montezuma Bowl via snowcat instead of lift service was raised. This concept was considered by the ID Team, but eliminated from further analysis because, again, it would accommodate only a relatively small percentage of A-Basin’s skiing clientele. In addition, catering to only a relative few people with snowcat skiing in Montezuma Bowl would not address the purpose and need to disperse skiers more evenly throughout the SUP area and to address terrain capacity issues.

COMPARISON OF ALTERNATIVES

Table 2-1 provides a comparison of project elements associated with each alternative.

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22 40 CFR 1502.14
### Table 2-1:
Summary Comparison of Alternatives

<table>
<thead>
<tr>
<th></th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Action</td>
<td>Proposed Action</td>
</tr>
<tr>
<td><strong>GUEST CAPACITIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alpine CCC</td>
<td>3,210 guests</td>
<td>3,910 guests</td>
</tr>
<tr>
<td><strong>TERRAIN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUP area</td>
<td>1,872 acres</td>
<td>1,872 acres</td>
</tr>
<tr>
<td>Operational Boundary</td>
<td>701 acres</td>
<td>1,096 acres</td>
</tr>
<tr>
<td><strong>Montezuma Bowl Terrain:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lift-served</td>
<td>N/A</td>
<td>347 acres</td>
</tr>
<tr>
<td>Hike-back</td>
<td>N/A</td>
<td>48 acres</td>
</tr>
<tr>
<td>Total</td>
<td>N/A</td>
<td>395 acres</td>
</tr>
<tr>
<td>Lift-served, Skiable Acreage</td>
<td>490 acres</td>
<td>837 acres</td>
</tr>
<tr>
<td>Grooming in Montezuma Bowl</td>
<td>N/A</td>
<td>36.7 acres</td>
</tr>
<tr>
<td><strong>LIFT NETWORK</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aerial Chairlifts:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition</td>
<td>1,800 pph</td>
<td>Upgraded, ~2,600 pph</td>
</tr>
<tr>
<td>Pallavicini</td>
<td>1,200 pph</td>
<td>No Change</td>
</tr>
<tr>
<td>Molly Hogan</td>
<td>1,000 pph</td>
<td>No Change</td>
</tr>
<tr>
<td>Norway</td>
<td>1,200 pph</td>
<td>No Change</td>
</tr>
<tr>
<td>Lenawee</td>
<td>1,800 pph</td>
<td>No Change</td>
</tr>
<tr>
<td>Montezuma Bowl Lift</td>
<td>N/A</td>
<td>Proposed, ~2,400 pph</td>
</tr>
<tr>
<td><strong>Surface Lifts:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Molly’s Magic Carpet</td>
<td>600</td>
<td>No Change</td>
</tr>
<tr>
<td><strong>PARKING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Riser Lot (spaces)</td>
<td>650</td>
<td>650</td>
</tr>
<tr>
<td>High Noon Lot (spaces)</td>
<td>400</td>
<td>495</td>
</tr>
<tr>
<td>Last Chance Lot (spaces)</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Upper Overflow Lot (spaces)</td>
<td>50^a</td>
<td>50^a</td>
</tr>
<tr>
<td>Lower Overflow Lot (spaces)</td>
<td>150</td>
<td>286</td>
</tr>
<tr>
<td>Total Spaces</td>
<td>1,450</td>
<td>1,681</td>
</tr>
<tr>
<td><strong>GROUND &amp; VEGETATION DISTURBANCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Parking</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing w/out Grading</td>
<td>N/A</td>
<td>1.2 acres</td>
</tr>
<tr>
<td>Grading Non-Forested Areas</td>
<td>N/A</td>
<td>1.7 acres</td>
</tr>
<tr>
<td>Total</td>
<td>N/A</td>
<td>2.9 acres</td>
</tr>
<tr>
<td><strong>Montezuma Bowl Lift</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing w/out Grading: Lift Corridor</td>
<td>N/A</td>
<td>0.5 acre</td>
</tr>
<tr>
<td>Tree Clearing &amp; Grading: Bottom Terminal</td>
<td>N/A</td>
<td>0.3 acre</td>
</tr>
</tbody>
</table>
Table 2-1: Summary Comparison of Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grading Non-Forest Areas: access corridor, upper &amp; lower terminal locations</td>
<td>N/A</td>
<td>1.4 acres</td>
</tr>
<tr>
<td>Total disturbance</td>
<td>N/A</td>
<td>2.2 acres</td>
</tr>
<tr>
<td>Montezuma Bowl Terrain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing w/out Grading</td>
<td>N/A</td>
<td>1.2 acres</td>
</tr>
<tr>
<td>Selective Tree Thinning w/out Grading</td>
<td>N/A</td>
<td>1.7 acres</td>
</tr>
<tr>
<td>Hike-back Terrain Tree Clearing w/out Grading</td>
<td>N/A</td>
<td>0.03 acre</td>
</tr>
<tr>
<td>Total</td>
<td>N/A</td>
<td>2.9 acres</td>
</tr>
<tr>
<td>Exhibition Lift Upgrade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing w/out Grading</td>
<td>N/A</td>
<td>0.1 acre</td>
</tr>
<tr>
<td>Grading Non-forested Areas</td>
<td>N/A</td>
<td>0.5 acre</td>
</tr>
<tr>
<td>Total</td>
<td>N/A</td>
<td>0.6 acre</td>
</tr>
<tr>
<td>TOTAL TREE CLEARING, THINNING AND GROUND DISTURBANCE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing w/out Grading</td>
<td>N/A</td>
<td>1.83 acres</td>
</tr>
<tr>
<td>Tree Thinning w/out Grading</td>
<td>N/A</td>
<td>1.7 acres</td>
</tr>
<tr>
<td>Tree Clearing and Grading</td>
<td>N/A</td>
<td>2.6 acres</td>
</tr>
<tr>
<td>Grading Non-forested Areas</td>
<td>N/A</td>
<td>7.4 acres</td>
</tr>
<tr>
<td>Tree Thinning associated with Lynx Treatment Area</td>
<td>N/A</td>
<td>3.1 acres</td>
</tr>
<tr>
<td>Total Forest and Non-forest Affected</td>
<td>N/A</td>
<td>16.63 acres</td>
</tr>
</tbody>
</table>

a - Previously-approved additions to the Upper Overflow lot would increase its capacity to 150, bringing total vehicular capacity at A-Basin’s parking lots to approximately 1,550 and 1,781 for alternatives 1 and 2 respectively.

IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The Preferred Alternative is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. At this time, considering the environmental impacts to public lands and the opportunities for use of those lands that would benefit the most people over the longest term, the Decision Maker prefers Alternative 2 – the Proposed Action.

Following review of public and agency comments on this DEIS, the Decision Maker will make a final determination as to which alternative, in part or in whole, best serves the public interest on NFS lands. Based on public and agency comments, modification of the preferred alternative may occur between Draft and Final EIS.
SITE SPECIFIC PROJECT DESIGN CRITERIA INCORPORATED INTO THE PROPOSED ACTION

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

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

PDC were designed by the Forest Service, A-Basin, 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 provided in Table 2-2 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 A-Basin management and the Forest Service. In all cases, the ultimate enforcement mechanism for implementation of the specified PDC would be the Record of Decision for the Final EIS, and would extend to the Forest Service Special Use Permit Administrator, the District Ranger and the Forest Supervisor.
Table 2-2:
Project Design Criteria Incorporated into the Proposed Action

<table>
<thead>
<tr>
<th>SCENIC RESOURCES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural topographic features and vegetation buffers would be used to minimize the appearance of any approved parking facilities along Highway 6. Trees and shrubs of appropriate sizes and species composition would be planted to screen contrasting developments.</td>
<td>Facility and structure design, scale, color of materials, location, and orientation would be considered to meet the scenic integrity level of the project area.</td>
</tr>
</tbody>
</table>
| Structures would be constructed of materials which blend with the landscape character as is practicable. Lift components shall meet FSM 2380 policy for color and reflectivity, which is 4.5 on the Munsell neutral value color scale. Colors and building design plans would be submitted to the Forest Service for approval prior to the beginning of construction. | Follow FSM guidelines (Section 2380):  
  - The scenic character will be protected through appropriate siting of buildings and the use of low-impact materials and colors (e.g., indigenous construction materials, such as stone and wood, as well as low-reflective glass and roofing materials).  
  - Remain in context with the landscape (i.e., rustic, craftsman, and country lodge styles).  
  - Architecture should follow the Forest Service’s Built Environment Image Guide (BEIG). |

<table>
<thead>
<tr>
<th>CULTURAL AND HERITAGE RESOURCES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Although site-specific surveys have been conducted and results are presented in Chapter 3, if undocumented historic and/or prehistoric properties are located during ground disturbing activities or planning activities associated with approved construction activities, they would be treated as specified in 36 CFR 800.11 concerning Properties Discovered During Implementation of an Undertaking.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VEGETATION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Except as noted within descriptions of individual project components requiring tree removal, all new ski trails, selectively thinned areas, individual tree removal, lift corridors, and lift terminal sites would be constructed by “flush cutting” removed trees. With this method, stumps would be cut to a height of 4 inches or less from the ground surface; the process may also include stump grinding. This trail preparation method avoids the need to disturb the remaining stumps and/or surrounding soils, thereby minimizing overall ground disturbance and existing vegetation.</td>
<td>Revegetation would use native plants. Genetically local (at the ecological subsection level) seeds would be used if available. Seed mixtures and mulches will be noxious weed-free. 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.</td>
</tr>
<tr>
<td>Effective ground cover (mulch) upon completion of ground disturbing activities would meet minimum level of the pre-treatment habitat type.</td>
<td>Leave trees, islands, and tree clearing limits would be adequately marked to minimize mistakes in clearing limits during construction.</td>
</tr>
</tbody>
</table>
Table 2-2: Project Design Criteria Incorporated into the Proposed Action

<table>
<thead>
<tr>
<th><strong>WATERSHED RESOURCES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to approved construction activities on NFS lands, A-Basin would prepare the following plans for Forest Service approval:</td>
</tr>
<tr>
<td>• Grading</td>
</tr>
<tr>
<td>• Erosion control</td>
</tr>
<tr>
<td>• Pre-construction erosion control/drainage management plans</td>
</tr>
<tr>
<td>• Post-construction revegetation plans</td>
</tr>
</tbody>
</table>

Before grading, existing topsoil resources would be removed, either by machine or by hand, and stockpiled in an area where soils storage would not cause a resource impact. Subsequent to the grading activities, this topsoil would be re-spread, mulched and re-seeded for use in the final restoration of the site.

Soil-disturbing activities would be avoided during periods of heavy rain or wet soils.

Wetlands proximate to potentially disturbed areas would be identified and flagged prior to the initiation of approved construction related activities. Construction limits would be clearly defined and any identified wetlands would be completely avoided.

Prior to construction of the re-located Exhibition lift upper terminal site, A-Basin would develop a site grading and drainage plan for review and approval by the Forest Service. The grading and drainage plan would include structural and non-structural measures to ensure that snowmelt and runoff generated by new impervious surfaces and graded areas is effectively disconnected from the stream system.

Prior to construction of the proposed Montezuma Bowl lift lower terminal site, A-Basin would develop a site grading and drainage plan for review and approval by the Forest Service. The grading and drainage plan would include structural and non-structural measures to ensure that snowmelt and runoff generated by new impervious surfaces and graded areas is effectively routed away from the Lenawee Creek WIZ, dissipated within vegetated zones, and thereby disconnected from the stream system.

<table>
<thead>
<tr>
<th><strong>WETLANDS AND RIPARIAN AREAS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>BMPs would be applied for all ground disturbing activities to avoid sediment migration from ground disturbance into wetlands.</td>
</tr>
<tr>
<td>Wetlands proximate to potential disturbance zones of project elements would be re-identified and flagged prior to the initiation of construction related activities. Construction limits would be clearly defined prior to construction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>WILDLIFE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to parking lot construction activities, calling surveys should be conducted to determine if nesting boreal owls are present near the parking lots. If nesting owls are present, tree removal should be delayed until after any nesting birds present have fledged their young (after approximately July 15). This measure would avoid construction season recruitment loss if any birds are nesting in tree removal areas.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>AIR QUALITY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>To the extent feasible, site improvements would be installed promptly in order to reduce the potential for dust emissions. The area disturbed by clearing, earth moving, or excavation activities would be kept to a minimum at all times, allowing improvements to be implemented in sections.</td>
</tr>
<tr>
<td>Grading areas, including lift terminal areas, would be watered as necessary and practical to prevent excessive amounts of dust. In the absence of natural precipitation, watering of these areas would occur as practical.</td>
</tr>
</tbody>
</table>
### Table 2-2:
Project Design Criteria Incorporated into the Proposed Action

<table>
<thead>
<tr>
<th>GEOLOGY AND SOILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot access would be used for construction and routine maintenance of the Montezuma Bowl lift.</td>
</tr>
<tr>
<td>Low-impact methods would be used, such as hand tools to dig and install tower footers along the Montezuma Bowl lift alignment.</td>
</tr>
<tr>
<td>Surface netting in conjunction with mulching would be used to reduce the erosion hazard.</td>
</tr>
<tr>
<td>Vegetative buffers would be maintained adjacent to any intermittent or perennial drainages and wetlands, to the extent possible.</td>
</tr>
<tr>
<td>In all areas where grading or soil disturbance will occur, topsoil would be stockpiled and re-spread following slope grading and prior to re-seeding.</td>
</tr>
<tr>
<td>Soil-disturbing activities would be avoided during periods of heavy rain or wet soils.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>When logging over the snow, conditions should allow for 1 foot of packed snow to be continuous (i.e., not patchy) and competent enough so that wheeled or tracked vehicles do not break through. When logging over frozen ground, a minimum of 3 inches of continuous frozen ground should be present.</td>
</tr>
<tr>
<td>Ground cover, as a combination of revegetation and mulch applications, should meet requirements for the one and two years following completion of ground disturbing activities.</td>
</tr>
</tbody>
</table>
Chapter 2: Description of Alternatives

COMPENSATORY LYNX CONSERVATION MEASURES INCORPORATED INTO THE PROPOSED ACTION

The following mitigation measures specific to lynx are considered highly effective in response to impacts resulting from permanent loss of lynx winter foraging habitat, which are identified in the wildlife analysis presented in Chapter 3. The source of these measures is the Record of Decision (ROD) for the 2002 Forest Plan FEIS.\textsuperscript{23} Additional information on these measures is contained in the 2006 Biological Assessment for Arapahoe Basin Ski Area Upgrading, on file at the Dillon Ranger District.\textsuperscript{24}

As required by Term and Condition 2 in the 2002 Forest Plan ROD, A-Basin would be required to implement a compensatory conservation measure to minimize impacts resulting from the permanent loss of 3.1 acres of lynx winter foraging habitat associated with Alternative 2.\textsuperscript{25} Although the WRNF will be part of the Southern Rockies Lynx Amendment (SRLA) and will adopt direction mandated within the finalized SRLA via the amendment process (where this ROD provision may be rescinded), in the meantime, the Forest will continue to implement all applicable lynx-related conservation measures provided in the Forest Plan and Terms and Conditions in the Forest Plan ROD.\textsuperscript{26}

To minimize impacts resulting from the permanent loss of lynx winter foraging habitat under Alternative 2, an equal or greater acreage of low value habitat will be treated to enhance habitat values of lynx, snowshoe hares, and secondary prey species. The treatment area would be located within the Snake River Lynx Analysis Unit (LAU). As such, enhanced habitat values would be available to any lynx that might be affected by the current Proposed Action. Treatment is proposed in areas outside of A-Basin’s SUP boundary that are unlikely to be skied and would provide enhanced effective habitat undisturbed by human use.

Proposed treatments would consist of six to seven 0.5-acre patch cuts or three, 1-acre patch cuts, where all lodgepole pine whose live horizontal foliage has lifted above the winter foraging height of snowshoe hares (≥ 10 feet off the ground) would be felled and left. Felled trees would not be limbed or burned to provide better cover for hares and enhance potential lynx denning values. Trees would be felled in random directions that would avoid damage to all spruce and fir trees and to those lodgepoles being retained. In one or two areas where a greater number of trees would be cut, lodgepole pines would be felled inward into a pile (i.e., “jack-strawed”) to create an area of greater slash cover for hares. Trees would be cut off at waist level so the stump could continue to provide wildlife values.

Tree cutting would primarily occur in the fall (September) after mountain pine beetles fly to reduce beetle infection levels and the number of broods that may be produced by the resulting downed woody debris.

\textsuperscript{23} USDA Forest Service, 2002d
\textsuperscript{24} Thompson, 2006a
\textsuperscript{25} USDA Forest Service, 2002e
\textsuperscript{26} USDA Forest Service, 2002a, e and 2004; Giezentanner, 2005
Seedlings may be planted at a later date if adequate restocking (natural regeneration) does not occur within six years of the treatment. Tree planting will be done with spruce seedlings at a rate of about 300 seedlings per acre. Treatment implementation will be adjusted so that the total treatment area is at least equal to or greater than the area of winter foraging habitat lost to Alternative 2. If Alternative 2 is selected, implementation of the proposed treatment would begin within one year of the project’s date of decision. Intensive monitoring would not be required for these treatments. One check at five years post-treatment would be required to monitor regeneration and/or seedling establishment.

A-Basin will notify the Forest Service when the treatment is about to be initiated and completed. A project biologist should be on-site when the treatment begins to explain the procedure, rationale, etc. to the sawyer. A Forest Service representative will survey the treatment area near the treatment’s completion to insure the mitigation has been implemented to the above specifications.

**SUMMARY COMPARISON OF DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

Per direction provided in 40 CFR 1502.14, Table 2-3 provides a comparison of environmental impacts by alternative.
### Table 2-3:
**Summary Comparison of Direct and Indirect Environmental Consequences**

<table>
<thead>
<tr>
<th>Recreational Opportunities</th>
<th>Alternative 1 No Action</th>
<th>Alternative 2 Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issue:</strong> Proposed projects within A-Basin’s SUP area have the potential to affect the recreational experience at the ski area.</td>
<td>No operational or infrastructural changes/additions would occur within the SUP area which would alter the recreational experience. A-Basin’s CCC would remain at 3,210 guests.</td>
<td>The addition of advanced-intermediate and expert terrain in Montezuma Bowl would enhance the recreational experience, by reducing skier congestion at the base area and better aligning A-Basin with its unique advanced skier demographic. Providing lift served skiing in Montezuma Bowl would provide more terrain options than currently available while reducing skier intermingling of differing abilities. Upgrading of the Exhibition lift would reduce congestion and lift lines at A-Basin’s base area. Realignment provides for better mid-mountain circulation in conjunction with implementation of the previously approved Midway Lodge via the 1999 ROD. A-Basin’s CCC would increase to 3,910 guests.</td>
</tr>
<tr>
<td><strong>Issue:</strong> Installation of the proposed Montezuma Bowl lift would entail relocating backcountry access points for NFS lands adjacent to A-Basin’s SUP area. Converting Montezuma Bowl to a lift-served skiing experience would alter the distribution of backcountry acreage immediately accessible from the ski area’s operational boundary.</td>
<td>One backcountry access point atop A-Basin’s southern operational boundary would remain, providing access to backcountry areas adjacent to, and within, A-Basin’s SUP boundary including: Montezuma Bowl, Thurman’s Bowl, The Beavers and The Rock Pile.</td>
<td>With installation of a lift, grooming, avalanche control, the presence of ski patrol staff, and increased use, implementation of the Proposed Action would effectively eliminate the characteristics that define these 347 acres of Montezuma Bowl as a backcountry experience. Acreage accessible from the existing backcountry access point would change from approximately 1,750 acres to 1,275 acres (a 27.1% reduction). With modifications to the existing backcountry access point, Thurman’s Bowl, The Rock Pile and The Beavers would all remain accessible.</td>
</tr>
<tr>
<td><strong>Roadless Areas</strong></td>
<td>No development associated with A-Basin’s operations would occur within the Porcupine Peak IRA.</td>
<td>The Porcupine Peak IRA currently experiences high recreational use and fragmentation. While the majority of Montezuma Bowl and the proposed...</td>
</tr>
</tbody>
</table>
Table 2-3:
Summary Comparison of Direct and Indirect Environmental Consequences

<table>
<thead>
<tr>
<th>Alternative 1</th>
<th>Alternative 2 Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Action</strong></td>
<td><strong>lower two-thirds of the proposed lift are within the Porcupine Peak IRA, Amendment #02 to the 2002 Forest Plan removed all Forest-wide IRA guidelines from Management Areas 7 and 8. Forest-wide IRA guidelines are no longer relevant for the A-Basin SUP area. No inconsistencies between proposed lift-served skiing in Montezuma Bowl and existing Roadless directives were identified.</strong></td>
</tr>
</tbody>
</table>

**TRAFFIC, ACCESS AND PARKING**

**Issue:** Proposed improvements to A-Basin’s parking facilities would increase parking capacity and would affect vehicular circulation in the base area. Furthermore, proposed on-mountain projects may generate measurable increases in daily/seasonal visitation thereby affecting traffic movement and volumes on Highway 6.

Visitation and associated vehicular traffic can be assumed to remain consistent with historic trends, with potential increases commensurate with regional population growth. A-Basin’s current parking lots (1,450 spaces) would continue to accommodate day skier parking needs on average days and would be over-capacity on above average days. However, A-Basin currently has approval to construct 100 additional spaces which, if developed, would alleviate above average day congestion.

Attendance is projected to increase as attributable to local and regional population growth, skier demand increases and improved on-mountain facilities. Winter and summer ADT associated with increased attendance at A-Basin would be projected to increase. An additional 231 proposed parking spaces, combined with the development of approximately 100 previously approved spaces, would ease congestion experienced on above average days.

**SCENIC RESOURCES**

**Issue:** Installation of the Montezuma Bowl lift would entail constructing a top terminal, and associated utility/skier corridor at a high elevation, exposed location. In addition, projects proposed on the front-side of A-Basin’s SUP area (including parking lot improvements and Exhibition lift upgrade) would be visible from Highway 6.

No changes to the scenic environment within A-Basin’s SUP area. Therefore, A-Basin would continue to be consistent with the SIO of “Very Low”.

With incorporation of project design criteria, including adherence to Forest Service Manual direction for scenic resources, all proposed projects were determined consistent with the Forest Plan SIO of “Very Low” for the identified managed viewsheds.
### Table 2-3:
**Summary Comparison of Direct and Indirect Environmental Consequences**

<table>
<thead>
<tr>
<th></th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CULTURAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Issue:</strong></td>
<td>Implementation of proposed projects and associated ground disturbance may affect previously unidentified cultural and heritage resources within the SUP area.</td>
<td>A Class III intensive cultural survey covering approximately 360 acres within Montezuma Bowl was conducted in September 2004. Identified cultural resources have been recommended as not eligible for listing on the NRHP by certified archaeologists, and as a consequence, a recommendation of “no historic properties” was made.</td>
</tr>
<tr>
<td>No Action</td>
<td>No impacts to identified or previously unidentified cultural resources within the A-Basin SUP would occur.</td>
<td>A 1982 cultural survey was reevaluated for the Exhibition lift and parking lots upgrades by the Forest Service and certified archaeologists. The reevaluation of this survey determined that a finding of “no historic properties affected” be made.</td>
</tr>
<tr>
<td><strong>SOCIAL AND ECONOMIC RESOURCES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Issue:</strong></td>
<td>Implementation of the proposed projects could potentially alter certain socioeconomic characteristics of Summit County by improving lift and terrain capacities and increasing annual visitation.</td>
<td>Generation of short-term employment related to construction.</td>
</tr>
<tr>
<td>Provides for no improvements that would directly impact day skier visitation.</td>
<td>No potential to specifically induce new resident population.</td>
<td></td>
</tr>
<tr>
<td>No changes to population, employment, housing or emergency services attributable to A-Basin ski area.</td>
<td>A small increase in seasonal employment is needed to operate new lifts, staff on-mountain guest services and for ski patrol. Does not include additional accommodations for guests or employees.</td>
<td></td>
</tr>
<tr>
<td><strong>NOISE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Issue:</strong></td>
<td>Snow management and avalanche safety through the use of explosives within Montezuma Bowl has the potential to generate noise impacts audible in the Town of Montezuma.</td>
<td>Field testing was conducted in the Town of Montezuma in order to characterize ambient and anticipated noise levels due to avalanche control work. Noise impacts associated with the Proposed Action are no greater than ambient conditions when control work does not occur. Therefore, no additional noise disturbance to residents of the Town of Montezuma would be generated with the Proposed Action.</td>
</tr>
<tr>
<td>The No Action Alternative would not result in any additional acoustic impacts within, or in the vicinity of the Town of Montezuma. Noise levels would not be expected to increase in relationship to existing trends.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 2-3:
Summary Comparison of Direct and Indirect Environmental Consequences

<table>
<thead>
<tr>
<th>Wildlife</th>
<th>Alternative 1 No Action</th>
<th>Alternative 2 Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issue:</strong> Installation of the proposed Montezuma Bowl lift would necessitate vegetation removal and would increase human presence. Increased use of the area and disturbance to habitat could disrupt terrestrial wildlife, including Threatened, Endangered and Sensitive (TES) species and Management Indicator Species (MIS) that may utilize habitat within A-Basin’s SUP area.</td>
<td>No additional direct or indirect impacts or benefits to the animals and their habitats addressed in the analysis area.</td>
<td>There will be no direct or indirect impacts on the Uncompahgre fritillary butterfly, Colorado pikeminnow, bonytail, humpback chub, razorback sucker, and bald eagle.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>There are no meaningful changes to which A-Basin or LAU 26 could support lynx or facilitate lynx movements as a result of Alternative 2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The Proposed Action would be consistent with historic ski area operations, but would extend winter recreational use into a non-developed, lightly impacted area (Montezuma Bowl) within A-Basin’s SUP area.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alternative 2 would not extend the existing hours or seasons of operations at A-Basin.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The moderate-term removal (i.e., until compensatory treatments became effective) of four patches of winter foraging habitat totaling 3.1 acres on both sides of the ski area would have no discernable effect on potential lynx home range viability or dispersal through A-Basin. No effective denning or security habitats would be affected.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The Proposed Action would not impair landscape level movements, impair the ability of lynx to maintain a home range, or increase any lynx risk factors.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• With required Project Design Criteria (PDC), Alternative 2 would be consistent with all applicable, lynx-related provisions of the 2002 Forest Plan and ROD.</td>
</tr>
<tr>
<td>Vegetation</td>
<td>Alternative 1</td>
<td>Alternative 2</td>
</tr>
<tr>
<td>------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Issue:</strong> Plant communities (including TES and regionally important plants) may be altered as a result of the proposed projects.</td>
<td>No additional direct or indirect impacts or benefits to the plants and habitats, including federally listed or R2 sensitive plant species.</td>
<td>Permanent and short- to long-term disturbances (i.e., before reclamation restored areas to pre-disturbance conditions) to 16.63 acres of habitats within A-Basin’s SUP area (including the 3.1 acres of tree thinning associated with the lynx treatment area), including approximately 9.2 acres of tree clearing and thinning (including the 3.1 acres of tree thinning associated with the lynx treatment area) and an additional 7.4 acres of grading non-forested areas. No direct or indirect impacts on any listed or proposed plant species. No portion of the project area has been designated critical plant habitat by the Secretary of the Interior. No R2 sensitive plant species were detected in areas proposed for disturbance: Alternative 2 would have no direct impact on any R2 sensitive plant species.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wetlands and Riparian Areas</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issue:</strong> Identified wetlands and riparian areas throughout the SUP area could be temporarily and/or permanently affected by construction and implementation of proposed projects.</td>
<td>No impacts to jurisdictional and non-jurisdictional waters of the U.S., including wetlands would occur.</td>
<td>Disturbance to wetlands and waters of the U.S. would occur as a result of both temporary and permanent disturbance, including installation of proposed parking lots and stormwater management devices. However, sediment detention ponds to control sheet flow runoff would improve water quality downstream on the North Fork. Permanent wetland impacts would total 0.4 acre on NFS lands. Type conversion impacts from a PFO wetland to a PEM wetland would occur with construction of the Montezuma Bowl lift.</td>
</tr>
<tr>
<td>Alternative 1</td>
<td>Alternative 2</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>No Action</td>
<td>Proposed Action</td>
<td></td>
</tr>
</tbody>
</table>

**WATER RESOURCES**

**Issue:** Implementation of terrain modifications associated with lift terminal construction (vegetation removal, grading, utility installation/burial) has the potential to affect water resources.

- **Arapahoe Basin Watershed:** approximately 0.1 acre of trees would be removed for realignment of the Exhibition lift, occurring outside of the WIZ. Approximately 0.5 acre of grading to create the new top terminal pad for the re-aligned Exhibition lift, with approximately 0.1 acre within the WIZ. PDC would effectively disconnect the graded terrain associated with the top terminal of the re-aligned Exhibition lift from the WIZ, ensuring, along with completed and on-going mitigation projects, that watershed conditions within the Arapahoe Basin watershed would be maintained or improved.

- **Lenawee Watershed:** 0.02 acre of grading associated with the construction of the lower terminal for the Montezuma Bowl lift would be addressed by the incorporated PDC that ensures the graded terrain associated with the terminal pad would be effectively disconnected from the Lenawee stream system, ensuring that stream health would be maintained or improved in this watershed.

- **North Fork Snake River Watershed:** approximately 0.22 acre of ground disturbance would occur around the existing lower terminal of the Exhibition lift to facilitate its retrofit and re-alignment. While this construction would occur within the WIZ of the North Fork, it would not represent a new impact since it would occur in an already disturbed site at the existing lower terminal pad. 3.5 acres of grading associated with the re-development and expansion of the High Noon parking lot would occur within the WIZ and create additional impervious surface, however, the parking lot projects would represent an improvement over existing drainage conditions at the High Noon lot due to ground resurfacing and culvert and sediment detention pond installation.
### Table 2-3:
**Summary Comparison of Direct and Indirect Environmental Consequences**

<table>
<thead>
<tr>
<th></th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AIR QUALITY</strong></td>
<td>No Action</td>
<td>Proposed Action</td>
</tr>
<tr>
<td><strong>Issue:</strong> Proposed increases in vehicular traffic related to proposed improvements may have long- and short-term impacts to air quality.</td>
<td>No new projects would be authorized for NFS lands; and therefore, no short- or long-term impacts to air quality, as a result of actions on public lands, are associated with this alternative.</td>
<td>Incremental increases in the number of vehicles associated with A-Basin would be minor in relation to traffic increases on Interstate 70 and Highway 6 due to population growth. Therefore, no discernable changes to current trends in air quality are anticipated as a direct result of the Proposed Action.</td>
</tr>
</tbody>
</table>
3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

CEQ regulations direct agencies to succinctly describe the environment that may be affected by the alternatives under consideration.\(^{27}\) As such, Chapter 3 describes the existing environment for resources across the human and biological environments that have the potential to be affected by implementing either of the alternatives. Each Existing Condition description is followed by an Environmental Consequences discussion that provides an analysis of the potential effects of implementation of the action alternative.

**ORGANIZATION OF CHAPTER 3**

Chapter 3 is organized by resource area in the following order:

**SCOPE OF THE ANALYSIS**

The Scope of the Analysis briefly describes the geographic and/or regulatory as well as temporal bounds of analysis for each resource. The Scope of the Analysis varies according to resource area and may be different for direct, indirect and cumulative effects.

**AFFECTED ENVIRONMENT**

The Affected Environment section provides a description of the existing condition of the environment potentially affected.

**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 and indicators identified in Chapter 1.

- Direct effects are caused by the action and occur at the same time and place.
- Indirect effects are caused by the action and are later in time or 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 other past, present, and reasonably foreseeable future actions, and can result from individually minor but collectively significant actions taking place over a period of time.

\(^{27}\) 40 CFR 1502.15
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Any irreversible or irretreivable commitments of resources are identified here. An irreversible commitment is a permanent or essentially permanent use or loss of resources; it cannot be reversed, except in the extreme long term. Examples include minerals that have been extracted or soil productivity that has been lost. An irretreivable commitment is a loss of production or use of resources for a lesser period of time. One example is the use of timber land for a logging road. Timber growth on the land is irretreivably lost while the land is a road, but the timber resource is not irreversibly lost because the land could grow trees in the near future.
A. RECREATION

SCOPE OF THE ANALYSIS

The scope of this analysis of recreational opportunities extends to winter uses at A-Basin on NFS lands within the ski area’s 1,872-acre SUP boundary. This analysis defines the existing recreational opportunities within the A-Basin SUP area, and provides an analysis of potential changes in the recreational dynamic anticipated with proposed projects.

AFFECTED ENVIRONMENT

Since its inception in 1946, A-Basin has developed a reputation as a no-frills, inexpensive ski area. Expert-level skiers are drawn to steep terrain in the East Wall area as well as that accessible from the Pallavicini lift. The ski area offers, on average, the longest ski season in Colorado, extending the ski season well into the spring and sometimes summer months. Although it is a day-use area, it serves a broad and diverse market, complementing the larger, destination resorts in Summit and Eagle counties. As with any day-use or destination ski area, A-Basin’s success is affected both by the experience it offers and by various trends that influence skier visitation at all ski areas, including weather, demographic shifts, lifestyle changes, and regional and national economic trends.

Annual Visitation

The majority of skiers that visit A-Basin come from within Colorado, most notably the Front Range and Summit County. Destination skiers make up a smaller portion of A-Basin’s visitation, mostly drawn from people who visit Summit and Eagle counties that want to ski many different areas over their stay. Annual skier visits at A-Basin have been strong over the previous decade, averaging over 250,000 annual visits between the 1994/95 and 2004/05 seasons. Annual visitation is displayed in Table 3A-1. (Note: A-Basin had no snowmaking infrastructure prior to the 2002/03 season.)

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28 Henceroth, 2006
Table 3A-1:
A-Basin Annual Skiers Visits
1994/95 – 2004/05

<table>
<thead>
<tr>
<th>Season</th>
<th>Visits</th>
<th>% change from previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994/95</td>
<td>262,513</td>
<td></td>
</tr>
<tr>
<td>1995/96</td>
<td>241,109</td>
<td>-8.2</td>
</tr>
<tr>
<td>1996/97</td>
<td>235,182</td>
<td>-2.5</td>
</tr>
<tr>
<td>1997/98</td>
<td>215,248</td>
<td>-8.5</td>
</tr>
<tr>
<td>1998/99</td>
<td>262,354</td>
<td>21.9</td>
</tr>
<tr>
<td>1999/00</td>
<td>220,945</td>
<td>-15.8</td>
</tr>
<tr>
<td>2000/01</td>
<td>240,406</td>
<td>8.8</td>
</tr>
<tr>
<td>2001/02</td>
<td>151,678</td>
<td>-36.9</td>
</tr>
<tr>
<td>2002/03a</td>
<td>317,401</td>
<td>109.3</td>
</tr>
<tr>
<td>2003/04</td>
<td>275,428</td>
<td>-13.2</td>
</tr>
<tr>
<td>2004/05</td>
<td>328,251</td>
<td>19.2</td>
</tr>
<tr>
<td>11 Year Average</td>
<td>250,047</td>
<td>6.9</td>
</tr>
</tbody>
</table>

a - The 2002/03 was the first season that A-Basin operated its snowmaking system.
Source: Henceroth, 2006

As demonstrated in Table 3A-1, A-Basin has experienced a 6.9 percent average annual increase in skier visits between the 1994/95 and 2004/05 seasons. This accounts for approximately 6 percent of Summit County's total skier visits.

Nationally, skier visits declined slightly in the 2004/05 season to approximately 56.8 million visits, down approximately 0.3 percent from the 2003/04 season, and approximately 1.3 percent from the record-setting 2002/03 season. Nationally, the top three seasons in terms of skier visits occurred in 2001/02, 2002/03, and 2003/04 seasons. The Rocky Mountain region (composed of ski areas in CO, ID, MT, NM, UT and WY) had the strongest 2004/05 season of any region in the U.S., with 19.6 million visits. 29 This is a gain of 4.1 percent over the 2003/04 season, 4.6 percent over the 2002/03 season and 7.7 percent over the 2001/02 season. In Summit County, skier visits accounted for 31.9 percent of the approximately 11.2 million skier visits in Colorado for the 2003/04 season. Between the 1997/98 and 2003/04 seasons, Summit County skier visits accounted for an average of 33.5 percent of the total Colorado skier market. 30

**Lift Network**

Comfortable Carrying Capacity (CCC) is the optimum number of guests accommodated by a resort at any one time, which affords a high quality recreational experience. A-Basin’s CCC of 3,210 is derived from lift network capacity. A CCC calculation is based on a combination of the uphill hourly capacity of the

29 National Ski Areas Association, 2005
30 Summit County Planning Department, 2005
Chapter 3: Affected Environment and Environmental Consequences

A. Recreation

The Molly Hogan lift and Molly’s Magic Carpet service novice and beginner terrain at the base of the mountain. The Norway double chairlift and Lenawee triple chairlift service all of the trails on the mid- to upper portion of A-Basin’s skiable terrain. Mid- and upper mountain access is gained by riding the Exhibition and Pallavicini lifts.

Historically, the Exhibition lift has had the highest utilization of any lift on the mountain, largely because it serves beginner and intermediate terrain on which guests prefer to start their day. This contributes to Exhibition routinely experiencing long lines in the morning and after lunch. Moreover, the 28-year old Exhibition lift has endured the most use due to its role in early and late season skiing. Due to A-Basin’s atypically long season, which averages approximately 210 days per year, the Exhibition lift has been

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31 Arapahoe Basin, 2006c
utilized approximately 17 percent more than a typical lift of the same age.\textsuperscript{32} Using this rationale, the 28-year old Exhibition lift has experienced the operational equivalent of approximately 33 seasons, necessitating above average maintenance.

**Lift Line Wait Times**

In 2006, A-Basin personnel monitored lift line wait times, conducted surveys and took photographs at the Exhibition and Pallavicini lifts.\textsuperscript{33} The survey methodology included recording the time that elapsed between a specific individual entering the lift maze and loading the chairlift. The surveys were administered on non-holiday periods in order to best reflect a typical day. The surveys took place on the following days: January 14 and 21, February 26, and March 4.\textsuperscript{34} The times of the surveys generally span a three-hour period from 11:00 a.m. to 2:00 p.m., to best represent the busiest time of the day. The results of the lift line wait time survey are listed in Table 3A-3, with representative photos provided in photos 3A-1 and 3A-2.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Wait Time (minutes)</th>
<th>Date</th>
<th>Time</th>
<th>Wait Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/14/06</td>
<td>10:56 a.m.</td>
<td>16</td>
<td>1/14/06</td>
<td>11:26 a.m.</td>
<td>13</td>
</tr>
<tr>
<td>1/21/06</td>
<td>11:40 a.m.</td>
<td>7</td>
<td>1/21/06</td>
<td>11:54 a.m.</td>
<td>4</td>
</tr>
<tr>
<td>1/21/06</td>
<td>12:34 p.m.</td>
<td>18</td>
<td>1/21/06</td>
<td>1:00 p.m.</td>
<td>15</td>
</tr>
<tr>
<td>2/26/06</td>
<td>11:34 a.m.</td>
<td>15</td>
<td>2/26/06</td>
<td>11:50 a.m.</td>
<td>12</td>
</tr>
<tr>
<td>3/04/06</td>
<td>1:45 p.m.</td>
<td>19</td>
<td>3/04/06</td>
<td>2:05 p.m.</td>
<td>13</td>
</tr>
<tr>
<td>Average Wait Time</td>
<td>15</td>
<td></td>
<td>Average Wait Time</td>
<td>11.4</td>
<td></td>
</tr>
</tbody>
</table>

Source: Arapahoe Basin, 2006b

As demonstrated by the above table, lift line wait times on the Exhibition lift averaged approximately 15 minutes with the longest wait surveyed at 19 minutes and the shortest at seven minutes. Average lift line wait time on the Pallavicini lift was 11.4 minutes. The longest wait time was recorded at 15 minutes and shortest was recorded at four minutes.

\textsuperscript{32} A typical operating season for ski areas in Summit County, CO is approximately 180 days.

\textsuperscript{33} Arapahoe Basin, 2006b

\textsuperscript{34} Two surveys were conducted on January 21.
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Photo 3A-1:
16-Minute Wait Time at the Exhibition Lift
January 14, 2006

Source: Arapahoe Basin, 2006b

Photo 3A-2:
15-Minute Wait Time at the Pallavicini Lift
January 21, 2006

Source: Arapahoe Basin, 2006b
Terrain Network

A-Basin’s SUP area encompasses 1,872 acres of NFS lands. This area extends east to 13,050 feet elevation at the summit of the East Wall, south to the approximate 450-acre Montezuma Bowl, west to the approximate 675-acre The Beavers area and north to Highway 6, including their five parking lots. With the Lenawee lift’s upper terminal topping out at approximately 12,600 feet elevation, A-Basin offers some of the highest skiable terrain in North America. A-Basin’s existing terrain network consists of 78 named trails covering a range of skier ability levels from beginner to expert.

Within the 1,872-acre SUP area, approximately 701 acres are within A-Basin’s current operational boundary. A ski area’s operational boundary is defined as the area(s) within its SUP boundary that is actively patrolled and/or maintained (including the base area and parking lots). Therefore, a ski area’s operational boundary is typically smaller than its SUP boundary. A-Basin’s existing operational boundary is limited to its frontside terrain, including approximately 490 acres (including hike-to terrain accessed by hiking the East Wall), and has total vertical elevation change of 2,270 feet. The Beavers and Montezuma Bowl, while within A-Basin’s SUP area, are not patrolled/maintained and are therefore not within its current operational boundary.

The topography of A-Basin varies and is comprised of steeply sloped side walls, large open bowls, basins, glades, chutes, and rolling hills. Characterizing A-Basin are largely north, northeast facing slopes with a large rock wall, known as the East Wall, providing definition to the natural bowl shape of the developed ski area. Trails such as Tree Chutes, Y Chutes, Corner Chutes, Willie’s Wide and North Pole (all advanced and expert terrain) constitute the Upper East Wall with terrain gradients in excess of 45 percent. West of the East Wall on A-Basin’s upper mountain, the topography is moderately steep composed largely of intermediate terrain.

Terrain Distribution by Ability Level

In order to provide guests with a balanced recreational experience, a ski area’s terrain network should balance as closely as possible with the ability level of its guests.

Surveys conducted at A-Basin by the research firm RRC Associates, Inc., along with information provided by A-Basin, indicate that the majority of A-Basin’s skier/rider market is composed of advanced-intermediate and expert level guests. When compared to other ski areas in the Rocky Mountain Region, A-Basin’s skier/rider distribution is decidedly skewed toward the upper ability levels.

Table 3A-4 details the terrain by skier ability level for A-Basin’s current developed trail network as well as the terrain capacity distribution by ability level. Terrain capacity is based on the number of skiers per acre for a given terrain ability level. Compared with A-Basin’s unique skier/rider market, Table 3A-4 shows a deficit of beginner, advanced-intermediate, and expert terrain and a surplus of novice, low

35 Arapahoe Basin, 2006c p. 11
intermediate, and intermediate terrain. Comparing A-Basin’s skier/rider market with the terrain currently provided demonstrates that A-Basin is out of balance with its specific skier/rider market.

### Table 3A-4: Terrain Capacity by Ability Level – Existing Conditions

<table>
<thead>
<tr>
<th>Skier/Rider Ability Level</th>
<th>Trail Area (acres)</th>
<th>Alpine Trail Capacity</th>
<th>Existing Skier/Rider Terrain Capacity Distribution*</th>
<th>Surveyed A-Basin Skier/Rider Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginner</td>
<td>1.5</td>
<td>45.0</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Novice</td>
<td>29.2</td>
<td>526.3</td>
<td>14%</td>
<td>7%</td>
</tr>
<tr>
<td>Low Intermediate</td>
<td>77.3</td>
<td>1,082.7</td>
<td>29%</td>
<td>18%</td>
</tr>
<tr>
<td>Intermediate</td>
<td>88.7</td>
<td>887.1</td>
<td>24%</td>
<td>20%</td>
</tr>
<tr>
<td>Adv. Intermediate</td>
<td>75.2</td>
<td>526.1</td>
<td>14%</td>
<td>30%</td>
</tr>
<tr>
<td>Expert</td>
<td>215.3</td>
<td>646.0</td>
<td>17%</td>
<td>23%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>487.3</strong></td>
<td><strong>3,713</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

* Each row in this column represents the percentage of A-Basin’s total trail capacity that each terrain level can comfortably accommodate. Values are calculated by dividing the capacity attributed to each individual ability level by A-Basin’s total Alpine Trail capacity (3,713).

b - Total alpine trail capacity is higher than the overall CCC for the ski area (3,210) which is constrained by uphill lift capacity.

Source: A-Basin, 2006c

Table 3A-4 indicates that based on surveys conducted at A-Basin, 30 percent of the ski area’s guests fall into the advanced-intermediate category, and 23 percent fall within the expert ability level. However, the current terrain capacities fall short of adequately accommodating these guests (at 14 and 17 percent, respectively) resulting in an imbalance between current terrain and A-Basin’s unique skier/rider market.

### Backcountry Skiing

Terrain that is within and adjacent to A-Basin’s SUP area provides a backcountry experience for those who are experienced and prepared. All backcountry terrain (approximately 1,750 acres) is accessible by riding the Lenawee lift and traversing up a 300-foot path to the ridgeline. Currently one backcountry access point provides access to all areas east, south and west of A-Basin’s operational boundary. Upon exiting through the access point, users are informed that they are leaving the confines of the patrolled/maintained ski area and that numerous natural hazards may be present including avalanche risks. From the access point, skiers can access Thurman’s Bowl to the east, Montezuma Bowl to the south and The Beavers and The Rock Pile to the west. For those accessing Thurman’s Bowl and Montezuma Bowl, this backcountry access point requires users to either hike back to the top and re-enter through the access point or ski all the way out to Montezuma Road. Those accessing The Beavers and The Rock Pile areas ski down to various locations along Highway 6.
Montezuma Bowl

Per the 2002 Forest Plan, Montezuma Bowl was incorporated into A-Basin’s SUP area (the Forest Plan considered Montezuma Bowl a “logical expansion of the ski area” and that it has “excellent potential for skiing and snowboarding”) as it offers above treeline open bowl skiing.\footnote{USDA Forest Service, 2002a} Although it is south facing, the high altitude of Montezuma Bowl generally allows quality snow conditions to be retained throughout the majority of the ski season. The upper portion of Montezuma Bowl is above timberline and possesses quality and diverse terrain characteristics. While Montezuma Bowl is within A-Basin’s SUP area, it is not within the ski area’s current operational boundary. It remains undeveloped, offering a “quasi” backcountry experience.\footnote{Montezuma Bowl terrain is characterized as “quasi” backcountry because it is presently within the A-Basin SUP area and is allocated as “Ski Areas Existing and Potential” (Management Area 8.25) under the 2002 Forest Plan. It is accessible via A-Basin’s lift network, but no avalanche control work is performed there, and ski patrol does not sweep it at the end of each day.} Although the Summit County Rescue Group and Sheriff’s Department are responsible for search and rescue and evacuations within Montezuma Bowl, A-Basin ski patrol typically offers their assistance when warranted, but does not otherwise patrol or maintain Montezuma Bowl.

The Beavers and The Rock Pile

The area known as The Beavers is located on the west side of A-Basin, within A-Basin’s SUP boundary. Although The Beavers was removed from A-Basin’s SUP boundary in 1987 following a fatal avalanche at nearby Breckenridge Ski Resort, it was reinstated via the 2002 Forest Plan to accommodate projected demand for skiing opportunities on the WRNF and in Summit County.

Avalanche risk to the public in The Beavers is considered potentially high. The highest elevation portion of The Beavers, called Beaver Bowl, offers expert level skiers challenging, steep, open bowl terrain, much of it avalanche prone. Terrain lower in The Beavers is steep to moderately steep with forest and glade cover becoming thicker as the skier descends. Challenging features of The Beavers are several prominent avalanche chutes known as “the Alleys.” Immediately west of “the Alleys” are several steep gullies that are also avalanche prone. Skiers accessing The Beavers egress the area down to Highway 6, then typically hitchhike back to A-Basin’s base area. Similar to the Montezuma Bowl terrain, The Beavers area is within A-Basin current SUP area but is not within the operational boundary. The ski area does not patrol or maintain The Beavers area in any way.

The Rock Pile area is located northwest of The Beavers and is well beyond A-Basin’s SUP area. Entrance into The Rock Pile is gained off of Elephant’s Trunk (refer to Figure 4 in Chapter 6). The skiing experience largely consists of tight tree skiing with steep to moderately steep terrain, which funnels down and egresses to Highway 6.
Thurman’s Bowl

Backcountry skiers leaving A-Basin and heading east encounter Thurman's Bowl and Chihuahua Gulch. Thurman’s Bowl is located on the south side of Lenawee Mountain and provides a steep, avalanche prone, above timberline skiing experience. Backcountry skiers are funneled down into one drainage basin called Thurman’s Gulch and may egress down to Montezuma road. Beyond Thurman's Bowl lies Chihuahua Gulch located on the east side of Lenawee Mountain. This area also offers backcountry skiers a steep, avalanche prone ski experience completely above timberline. As the skier descends, a protruding center ridge separates this area between Chihuahua Gulch and Ruby Gulch. The skier then enters tight trees with the option to take either Gulch down to Montezuma Road.

Backcountry Use Surveys

In 2006, A-Basin personnel monitored access to backcountry terrain immediately adjacent to A-Basin’s SUP boundary. The survey methodology consisted of recording the number of people that exited through the access point and their intended backcountry destination. The choices of backcountry destinations were Montezuma Bowl, The Beavers and “Other” areas, which include Thurman’s Bowl and The Rock Pile area. The surveys were administered on non-holiday periods in order to most accurately reflect a typical day. The surveys took place on the following days: January 14; February 4, 18, 25, 26; and March 4. The times of the surveys generally spanned a five-hour period starting at 10:00 a.m. and ending at 3:00 p.m.

Surveys and observations provided by A-Basin indicate that Montezuma Bowl and The Beavers receive the highest level of backcountry use among all areas accessed from the ski area. The surveys indicate that, on average, 18 people per day utilized Montezuma Bowl, with another 18 utilizing The Beavers. Over the duration of the survey, most people accessed Montezuma Bowl in the morning hours between 11:00 a.m. and 12:00 p.m. with an average of 5.5 people per day. The busiest time for those accessing The Beavers took place between 10:00 a.m. and 11:00 a.m. with an average of 5.3 people per day. Skiers accessing “Other” areas of backcountry terrain immediately adjacent to A-Basin’s SUP boundary averaged seven people per day during the survey period with the busiest time occurring between 11:00 a.m. and 12:00 p.m. with approximately 2.6 people.

Guest Services

With the exception of public restrooms at the top of the Lenawee lift located within the Patrol Headquarters building (constructed in summer 2005), all restrooms and guest services are located at A-Basin’s base area in the A-frame.

38 Arapahoe Basin, 2006a
Restaurant services are currently provided at the A-frame, with seating available both inside and on an outside deck. There are a total of 863 seats available to skiers. This restaurant seating at A-Basin will be augmented by approximately 120 seats with completion of the Midway Restaurant.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

**Alternative 1 – No Action**

In relation to the Proposed Action components, selection of the No Action Alternative would result in no operational or infrastructural changes/additions within the A-Basin SUP area. No alteration to the recreational experience would occur, and generally speaking, the quality of wintertime recreation opportunities would resemble the current conditions. However, A-Basin retains the approvals to implement any unimplemented projects authorized via the 1999 ROD (listed in Chapter 1), which would enhance the recreational experience on NFS lands.

**Annual Visitation**

According to the 2002 Forest Plan, skier visits in the State of Colorado are projected to be roughly proportionate to the population growth of the Front Range, and are expected to increase by an additional 800,000 skiers by 2010.\(^{39}\) Annual visitation at A-Basin under both the No Action and Proposed Action alternatives was calculated utilizing the following procedure:

1. Annual visitation and length of season data for the 1993 through 2004 seasons were tabulated.

2. Each season’s annual visitation was divided by the season length in days to derive a value for seasonal skiers per day.

3. A “normalized” annual visitation, factoring out the influence of the length of the ski season on annual visitation, was computed by multiplying each season’s skiers-per-day value by the average length (209 days) of the ski season over the 1993 – 2004 seasons.

4. A linear fit to the normalized annual visitation was computed, and utilized to forecast visitation at A-Basin through the 2014/15 season.

It is important to note that this approach results in a *linear* growth forecast, which differs from the compounded growth assumption typically applied to populations and financial interest. The linear model was utilized to account for the following observations:

- Even the normalized annual visitation fluctuates fairly widely from year-to-year, due to uncertainties in relevant influences such as national economic trends and climatic conditions, and does not follow a compound growth model.

\(^{39}\) USDA Forest Service, 2002a
- Given the pattern of national skier visitation, on-going compound growth in skier visitation is unlikely.

Thus, the visitation projections shown in Table 3A-5 are calculated based on the best-fit line to historic normalized visitation. For the No Action Alternative, projected visitation was forecasted by utilizing a linear equation with one-half of the slope of the Proposed Action line. As indicated in Table 3A-5, compared to the Proposed Action, the slower rate of growth for the No Action Alternative accounts for the influence of declining visitor experience that would be anticipated due to increased crowding with the terrain available under the No Action Alternative.

It is important to note that the 6.9 percent average annual growth rate that A-Basin experienced between the 1994/95 and 2004/05 seasons is not considered sustainable into the future under either the No Action or Proposed Action.

Due to the linear forecasting methodology, the No Action Alternative average growth rate of 1.2 percent over the 10-year forecast period is applicable only over that 10-year period. The 1.2 percent rate does not represent an annualized growth percentage as it would in a compound growth model.

<table>
<thead>
<tr>
<th>Season</th>
<th>Projected Visitation (No Action)</th>
<th>Projected Visitation (Proposed Action)</th>
<th>Projected Increase in Visitation as Result of Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006/07</td>
<td>283,062</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>2007/08</td>
<td>286,385</td>
<td>302,636</td>
<td>16,251</td>
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<tr>
<td>2008/09</td>
<td>289,708</td>
<td>309,210</td>
<td>19,502</td>
</tr>
<tr>
<td>2009/10</td>
<td>293,031</td>
<td>315,783</td>
<td>22,752</td>
</tr>
<tr>
<td>2010/11</td>
<td>296,354</td>
<td>322,356</td>
<td>26,002</td>
</tr>
<tr>
<td>2011/12</td>
<td>299,677</td>
<td>328,929</td>
<td>29,252</td>
</tr>
<tr>
<td>2012/13</td>
<td>303,000</td>
<td>335,503</td>
<td>32,503</td>
</tr>
<tr>
<td>2013/14</td>
<td>306,323</td>
<td>342,076</td>
<td>35,753</td>
</tr>
<tr>
<td>2014/15</td>
<td>309,646</td>
<td>348,649</td>
<td>39,003</td>
</tr>
<tr>
<td>Average Annual Percent Change</td>
<td>1.2%</td>
<td>2.4%</td>
<td>--</td>
</tr>
</tbody>
</table>

Source: SE GROUP, 2006b

**Lift Network**

A-Basin’s combined hourly lift capacity would remain at approximately 7,600 pph. As discussed above, the ski area’s CCC is determined by the lift network capacity; therefore, with no change in the lift network, A-Basin’s CCC would remain at 3,210.

Out-of-base lift capacity would not change, and base area congestion along with long lift line and wait times at Exhibition would be expected to continue and likely exacerbate. Projected increases in
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A. Recreation

Colorado’s population (in particular, the Front Range) over the coming decade, which are projected to be proportionate with the increase in the amount of skier visits expected at A-Basin, would be the catalyst for the increase in visitation and base area congestion.

**Lift Line Wait Times**

Since most guests begin their day on the Exhibition lift, lift line wait times on the Pallavicini lift are not expected to change significantly in the morning or after lunch under the No Action Alternative. However, this analysis anticipates that under the No Action Alternative, daily and annual visitation would increase annually, and lift line wait times in the afternoon would continue to be longer due to increased ridership at this time of day.

However, with installation of the previously-approved Midway Lodge (anticipated in Summer 2006), skiers would no longer be required to descend to the base area for guest services, thus allowing more people to remain on-mountain and thereby reducing, but not eliminating, congestion at A-Basin’s out-of-base lifts (particularly during the busy mid-day period when people typically take a break from skiing).

**Terrain Network**

A-Basin’s operational boundary would remain at approximately 701 acres with skiable terrain also remaining at 490 acres.

**Terrain Distribution by Ability Level**

Under the No Action Alternative, A-Basin’s terrain capacity distribution by ability level would remain out of balance with the ski area’s specific skier/rider demographic. Advanced-intermediate and expert terrain capacity supply would continue to express a deficit with regard to the capacity demand currently desired at A-Basin, and a surplus of novice, low intermediate and intermediate terrain capacity would continue. As indicated previously, surveys conducted at A-Basin indicate that the majority of guests ski/ride at the advanced intermediate and expert ability levels, while the terrain capacity that serves this contingent falls short. The expert terrain serviced by the Pallavicini lift would continue to experience the highest utilization by the advanced skier demographic at A-Basin, and would be exacerbated when the East Wall is closed at times throughout a typical ski season.

**Backcountry Skiing**

Under the No Action Alternative, the current backcountry access point, located above the Lenawee lift would remain in place. Access to Montezuma Bowl, Thurman’s Bowl, The Beavers and The Rock Pile would be unaltered.

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40 Arapahoe Basin, 2006c
Guest Services

Although no additional guest services would be approved under the No Action Alternative, the previously-approved Midway Lodge would likely be constructed near the top terminal of the Exhibition lift in 2006.

Alternative 2 – The Proposed Action

Annual Visitation

Under the Proposed Action, A-Basin’s projected visitation in 2014/15 is anticipated to be approximately 349,000 skier days (refer to Table 3A-5). The 2014/15 projection would include a 2.4 percent average annual increase in skier days and an approximate 40 percent increase over the current normalized annual visitation (250,047 skier days).

The data presented in Table 3A-5 depicts an increase of approximately 39,000 annual skier visits between the No Action Alternative and the Proposed Action by the 2014/15 winter season.

Lift Network

Installation of the Montezuma Bowl lift would bring A-Basin’s total lift network to six aerial lifts and one surface conveyor lift. Additionally, the upgrading of the Exhibition lift with new technology would increase uphill capacity by roughly 44 percent over existing conditions (1,800 to 2,600 pph). Under the Proposed Action, A-Basin’s CCC would continue to be driven by the proposed lift network and would increase by 700, to 3,910 guests (22 percent increase) due to the upgrade of the Exhibition lift and the installation of the Montezuma Bowl lift.

Lift Line Wait Times

As described under the No Action Alternative, installation of the previously-approved Midway Lodge (anticipated in Summer 2006), would have the effect of allowing more skiers to remain on-mountain, thereby relieving congestion at A-Basin’s out-of-base lifts (particularly during the busy mid-day period when people typically take a break from skiing).

Under the Proposed Action, the Montezuma Bowl lift, and its associated terrain, is anticipated to relieve pressure on the Pallavicini and (upgraded) Exhibition lifts. Currently, Pallavicini is used for two primary purposes: 1) lines at Exhibition are exceedingly long; and 2) it services a significant portion of A-Basin’s advanced terrain. With the opportunity to easily access additional advanced-intermediate and expert-level terrain in Montezuma Bowl, a re-distribution of advanced skiers from Pallavicini to the Montezuma Bowl lift is anticipated, thereby decreasing lift wait times at Pallavicini. The Montezuma Bowl lift is also

41 SE GROUP, 2006b
42 “normalized annual visitation” is defined in this section under the description of Alternative 1
expected to have the effect of redistributing guests who currently use the Lenawee and Norway lifts to access advanced intermediate.

Finally, by upgrading the aging Exhibition lift with new technology and to a higher hourly capacity, guests would be distributed to the mid-mountain area faster and more efficiently. Thus, lift lines at Exhibition would be reduced beyond the No Action Alternative.

**Terrain Network**

With the incorporation of Montezuma Bowl into A-Basin’s lift-served skiing, A-Basin’s operational boundary would increase by roughly 395 acres, from approximately 701 acres to 1,096 acres. A-Basin’s lift-served skiable terrain would increase by roughly 347 acres, from the current 490 acres to approximately 837 acres. An additionally 48 acres of terrain would be located below the bottom terminal of the proposed Montezuma Bowl lift, providing an opportunity for skiers to descend an additional 250 vertical feet and hike back up to the lift.

**Terrain Distribution by Ability Level**

Although the ability level of A-Basin’s terrain is weighted more heavily toward more advanced skiers, the current allocation of terrain within these ability levels still does not meet the demand. Adding Montezuma Bowl to A-Basin’s lift-served terrain network would add approximately 347 acres of advanced-intermediate and expert level terrain, in addition to the 48 acres of “hike-back” terrain, and would bring the ability distribution if A-Basin’s terrain into better alignment with the abilities of their unique skier/rider market. This is demonstrated in Table 3A-6 (refer to highlighted cells in the “Adv. Intermediate” and “Expert” rows), which illustrates that by increasing A-Basin’s supply of advanced-intermediate and expert level terrain to 24 and 21 percent, respectively, A-Basin’s terrain would be better aligned with its unique skier/rider demographic as compared with the No Action Alternative.
Chapter 3: Affected Environment and Environmental Consequences

A. Recreation

Table 3A-6:
Proposed Action Terrain Distribution by Ability Level

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginner</td>
<td>1.5</td>
<td>52.5</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Novice</td>
<td>29.2</td>
<td>731.0</td>
<td>14%</td>
<td>14%</td>
<td>7%</td>
</tr>
<tr>
<td>Low Intermediate</td>
<td>77.3</td>
<td>1,237.4</td>
<td>29%</td>
<td>24%</td>
<td>18%</td>
</tr>
<tr>
<td>Intermediate</td>
<td>88.7</td>
<td>887.1</td>
<td>24%</td>
<td>17%</td>
<td>20%</td>
</tr>
<tr>
<td>Adv. Intermediate</td>
<td>250.4</td>
<td>1,251.8</td>
<td>14%</td>
<td>24%</td>
<td>30%</td>
</tr>
<tr>
<td>Expert</td>
<td>364.6</td>
<td>1,093.9</td>
<td>17%</td>
<td>21%</td>
<td>23%</td>
</tr>
<tr>
<td>Total</td>
<td>811.8</td>
<td>5,254</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: A-Basin, 2006c

Adding Montezuma Bowl to A-Basin’s terrain network also responds to the Purpose and Need for the Proposed Action by better distributing the projected increase in skier visits across the mountain. Together with the previously-approved Midway Lodge, this addition would ease base area congestion by keeping more skiers on the mountain, especially during the busy lunch time hours. Furthermore, skiers would be expected to disperse across the mountain more efficiently due to the Exhibition lift upgrade and additional advanced intermediate and expert terrain in Montezuma Bowl. This improved skier distribution is important, as skier visitation in Colorado is projected by the 2002 Forest Plan to increase by 800,000 skiers by 2010. The majority of this growth is anticipated to take place on the WRNF, with Summit County experiencing the largest percentage of that growth due to its proximity to fast-growing Front Range communities. The recent growth in A-Basin’s skier visitation (33 percent over the past three years, from 244,406 skier visits in 2001 to 328,251 in 2005) validates the 2002 Forest Plan FEIS projections that Summit County’s annual skier visitation will increase by roughly 320,000 in 2010.43

**Backcountry Skiing**

Under the Proposed Action, backcountry acreage within, and immediately adjacent to, A-Basin’s SUP area and accessible from the Norway and Lenawee lifts would decrease by approximately 475 acres - from 1,750 acres to 1,275 acres.44 While the entry points to Thurman’s Bowl, The Rock Pile and The Beavers from the top of the Lenawee and Norway lifts would change slightly under the Proposed Action due to the proposed reconfiguration of access points, backcountry skiers would still have complete access to these areas.

43 USDA Forest Service, 2002b p. 3-454
44 Quantification of backcountry skiable terrain adjacent to A-Basin’s SUP area is based on analysis of U.S. Geological Survey maps.
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The Proposed Action would provide lift services in approximately 347 acres of what is currently “quasi” backcountry terrain within Montezuma Bowl. Therefore, with installation of a lift, and associated grooming, avalanche control, the presence of ski patrol staff, and increased public use, the existing backcountry characteristics of Montezuma Bowl would be essentially eliminated. Incorporation of Montezuma Bowl into A-Basin’s operational boundary would also mean that access to the area would be controlled by the A-Basin ski patrol (i.e., it would either be open for public use or closed – there would no longer be an access point that is perpetually open throughout the season). However, a backcountry access point proposed to be located at the southern portion of the A-Basin SUP boundary, approximately 250 vertical feet below the bottom terminal of the Montezuma Bowl lift, would allow guests to exit A-Basin’s operational and SUP boundaries and descend to Montezuma Road. The existing descent from the base of Montezuma Bowl to Montezuma Road is approximately 6,000 linear feet (1.1 miles). It is anticipated that the frequency of skiers egressing to Montezuma Road would decrease markedly as the route out is arduous, densely vegetated and does not present good skiing opportunities. Additionally, once skiers reach Montezuma Road, they must have previously left a vehicle there or arranged for pickup. For these reasons, it is anticipated that most skiers would elect to ride the proposed lift back out of Montezuma Bowl.

Under the Proposed Action, the backcountry skiing experience in Thurman’s Gulch, Chihuahua Gulch, The Beavers and The Rock Pile areas has potential to change from existing conditions in the respect to the number of people skiing these areas. Skiers that once accessed Montezuma Bowl seeking a backcountry experience (roughly 18 per day, as indicated by backcountry surveys conducted in 2006) may be displaced across the adjacent backcountry terrain, thereby slightly increasing use of these adjacent backcountry areas.

Guest Services

As with the No Action Alternative, no additional guest services are included in the Proposed Action. However, the previously approved Midway Lodge would likely be constructed near the top terminal of the proposed realigned Exhibition lift in 2006.

CUMULATIVE EFFECTS

Overall, the Proposed Action, combined with the projects approved in the 1999 ROD, would translate to an improved recreational experience and therefore likely increases in visitation at A-Basin in the future. A-Basin has approval to upgrade the Norway lift by installing a mid-way loading station, construct the mid-mountain Midway Lodge (roughly 4,000 square feet of indoor guest services and approximately 120 indoor/outdoor seats), install additional snowmaking infrastructure, and implement additional recreational opportunities, such as hiking and biking trails and a tubing park, throughout the SUP area.

Recent Forest Service decisions and pending analyses at other ski areas in Summit County, including Keystone, Breckenridge and Copper Mountain, have potential to cumulatively reduce the acreage of hike-
A. Recreation

to terrain that is within a ski area’s SUP area while increasing lift-served and snowcat-accessible terrain to the mainstream skiing public. The 8.25 management prescription in the 2002 Forest Plan is the Forest Service’s strategy to allocate certain recreational uses of the Forest, such as developing ski opportunities, non-motorized and motorized backcountry areas within the WRNF. Past and on-going projects are described below.

In 2003, a Decision Notice was signed on Keystone’s Little Bowl/Erickson Bowl Snowcat Skiing and Sightseeing Proposal Environmental Assessment. This approved a snowcat skiing and sightseeing operation on 311 acres of terrain within Keystone’s SUP area, and enlarged the ski area’s operational boundary to include this terrain. Previously, this terrain was only accessible by an approximate 30 minute hike. With the 2003 approval, an additional 266 acres of undeveloped forested terrain (below Little Bowl and Erickson bowls) also became accessible. Also at Keystone, the Forest Service is currently analyzing a proposal to augment the ski area’s current fee-based snowcat skiing operations in Little Bowl and Erickson Bowls (now called Bergman Bowl) with an additional 278 acres of snowcat skiing on Upper Independence and Bear mountains. The new opportunities would consist of guided and non-guided bowl skiing via snowcat or hiking (within Keystone’s existing SUP boundary). However, due to the historically low utilization of the Upper Independence Mountain area by skiers, this proposal is not anticipated to have significant effects on the backcountry users.

A Record of Decision signed in January 2006 on the Copper Mountain Trails and Facilities Improvements Final EIS authorized construction of a chairlift on Tucker Mountain, within the ski area’s SUP boundary. Tucker Mountain has historically been accessible only via hike-to skiing after traversing from the Mountain Chief lift, as well as by snowcats provided by the ski area on an occasional basis. The Final EIS indicates that construction of the Tucker lift would alter the style and solitude of the skiing experience off of Tucker Mountain because “neither the physical rigor of hiking nor the investment involved in snowcat skiing would be a prerequisite to the skiing experience.” While the Final EIS noted that providing lift service on an additional 240 acres on Tucker Mountain would be an undesirable change for those who enjoy this terrain in its current, undeveloped state, this lift will increase access to NFS lands for a larger segment of the skiing public.

Finally, in April 2005, a Decision Notice was signed on the Peak 8 Summit lift and 6 Chair Replacement Environmental Assessment at Breckenridge. The Decision Notice approved construction of a lift to serve the upper portions of Peak 8, which eliminates the need to hike Peaks 7, 8 and 9 to access a combined 399 acres – all of which are within Breckenridge’s existing operational boundary. In reaching her decision, WRNF Supervisor Maribeth Gustafson considered that the intent of providing a ski area on public land is to provide opportunities for the public to use and enjoy National Forests and that public lands must be managed and made available for all members of the public to enjoy without a tone of exclusivity. She

45 USDA Forest Service, 2006e
further stated that there are “…literally thousands of acres of undeveloped terrain which are available to all of those seeking the more solitary and adventurous experiences that are unique to the backcountry.”

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

Development of additional lift-served terrain in the previously undisturbed Montezuma Bowl portion of A-Basin’s SUP area would represent irretrievable effects to backcountry recreation resources. However, relatively minimal ground and vegetation disturbance would be necessitated to provide lift-served skiing in Montezuma Bowl, and, as such, the area could be reclaimed and revegetated, thus restoring its backcountry characteristics. Therefore, this commitment of the recreation resource is not considered irreversible in nature.

46 USDA Forest Service, 2005f pp. DN-2 and 3
B. ROADLESS AREA

SCOPE OF THE ANALYSIS

Of the 1,872 acres in the A-Basin SUP boundary, approximately 988 acres are overlapped by the Porcupine Peak Inventoried Roadless Area (IRA). Approximately 312 of those acres are in Montezuma Bowl. Figure 4 in Chapter 6 provides information on how A-Basin’s SUP area interacts with the Porcupine Peaks IRA.

This section analyzes potential direct, indirect and cumulative effects of proposed projects within A-Basin’s SUP area on the Porcupine Peak IRA. Per the 2002 Forest Plan, Montezuma Bowl was incorporated into A-Basin’s SUP area because the Forest Plan considered Montezuma Bowl a “logical expansion of the ski area” and that it has “excellent potential for skiing and snowboarding.” While Montezuma Bowl is within A-Basin’s SUP area, it is not within the ski area’s current operational boundary and remains undeveloped, offering an easily accessible, un-patrolled “backcountry” experience.

As detailed below, during a 2004 appeal review of the 2002 Forest Plan, cases of overlapping management direction concerning IRAs and other management prescriptions were reversed. This resulted in an amendment to the 2002 Forest Plan (detailed below) which removed Forest-wide guidelines pertaining to roadless areas from certain Management Areas, including MA 8.25 – Ski Areas, Existing and Potential.

AFFECTED ENVIRONMENT

Inventoried Roadless Areas

In 1972 the Forest Service began identifying roadless areas for Wilderness consideration through the Roadless Area Review and Evaluation (RARE I). In 1979, the agency completed RARE II, a more extensive national inventory of roadless areas. The RARE II study evaluated approximately 62 million acres and recommended 15 million for Wilderness designation, 12 million as potential Wilderness requiring further study, and 36 million for non-Wilderness uses.

Most national forests and grasslands employed RARE II data to develop inventories of roadless areas. Subsequent forest plan revisions and regional assessments have further evaluated inventoried roadless areas. These inventoried roadless areas are identified in a set of inventoried roadless area maps, contained in the 2000 Forest Service Roadless Area Conservation Final Environmental Impact Statement.

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47 Ibid.
48 Roadless is defined as “areas that do not contain facilities for purposes of travel by vehicles greater than 50 inches in width...” Per 36 CFR 212.1 Definitions – Travel Management; Designated Routes and Areas for Motor Vehicle Use, a road is a motor vehicle route over 50 inches wide, unless identified and managed as a trail.
49 USDA Forest Service, 2000a
The term roadless is not a management designation – it is an inventory of a current condition of NFS lands. The direction for providing roadless area inventories is found in several places, including the Code of Federal Regulations (36 CFR 219.17[a]), Forest Service Handbook (FSH 1909.12.7.1), and the Wilderness Act (78 Stat. 890; 16 U.S.C. 1131-1136).

In order for an area to be inventoried as Roadless it must first meet the minimum criteria that would allow it to be studied through a forest plan. These criteria include:

1. The area being undeveloped with little or no evidence of human activity.

2. It must be at least 5,000 acres in size. If less than 5,000 acres, the area must be manageable in a natural condition, self-contained ecosystem (such as an island) or contiguous to existing or proposed Wilderness areas, primitive areas, or roadless areas in other Federal ownership, regardless of their size.

3. The area must offer outstanding opportunities either for solitude or for primitive or unconfined types of recreation.\(^{50}\)

Per the 200 Forest Service Roadless Area Conservation Final Environmental Impact Statement, in addition to meeting the above basic criteria for a Wilderness study, inventoried Roadless areas of national forests and grasslands typically exhibit the following social and ecological “values”:\(^{51}\)

- Provide sources of clean drinking water;
- Function as biological strongholds for populations of threatened and endangered species;
- Provide large, relatively undisturbed landscapes important for biological diversity and the long-term survival of many at risk species;
- Present opportunities for primitive, semi-primitive non-motorized, and semi-primitive motorized dispersed recreation;
- Serve as defense against the spread of non-native invasive plant species;
- Offer reference areas for study and research;
- Consist of natural-appearing landscapes with scenic quality; and
- Hold traditional cultural properties and sacred sites.

The State of Colorado currently has approximately 4.4 million acres of IRAs. These IRAs were designated by the Clinton administration in 2001 with the promulgation of the Roadless Area

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\(^{50}\) 16. U.S.C. 1131 - 1136

\(^{51}\) USDA Forest Service, 2000a

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B. Roadless Area

Conservation Rule, which ended all road building, logging, coal, oil, gas and other mineral leasing, and the exploration and development on 58.5 million acres (31 percent) of NFS lands in 39 states.\(^{52}\)

**White River National Forest Plan Amendment Number 02**

On the WRNF, cases of overlapping management direction concerning IRAs and other management prescriptions were identified by the Forest Service during a 2004 appeal review of the 2002 revision of the Forest Plan. It was found that the Forest-wide Guidelines for Alpine and Inventoried Roadless Areas conflicted with the standards and guidelines for certain management prescriptions outlined in the revised Forest Plan, namely in the 5, 7, and 8 management area categories. Category 5 management areas are primarily forested ecosystems which are managed to meet a variety of ecological and human needs, including general forest and rangelands, resource production, forested flora and fauna habitat, deer and elk winter range, bighorn sheep, and elk habitat and forested landscape linkages. Category 7 management areas seek to manage public lands that are intermingled with private lands to such an extent that ecosystem management for NFS lands must be tempered by other landowner’s uses and objectives. Category 8 (which include Management Area 8.25 – Ski Areas, Existing and Potential) manages those ecological conditions and processes that are likely to be permanently altered by human activities beyond the level needed to maintain natural-appearing landscapes and ecological process. The reader is referred to 2002 Forest Plan for additional information.

Since the “intent of the Standards and Guidelines should be clear and non-conflicting with other directions,” the Forest Service amended the 2002 Forest Plan to clarify and/or remove conflicting direction contained therein.\(^ {53}\) In January 2006, Forest Plan Amendment 02 was signed, mandating the removal of the inventoried roadless guideline in the Forest Plan for management areas 7 and 8, while maintaining the same geographic boundaries of all roadless areas. Management of inventoried roadless areas in these prescriptions relies on current rules, laws, and regulations.

**Porcupine Peak IRA**

The WRNF includes approximately 640,000 acres of IRAs, with approximately 59,000 acres located in Summit County. The 8,745-acre Porcupine Peak IRA is located north of the Town of Montezuma and south of A-Basin (refer to Figure 4 in Chapter 6). It is bound to the north by Highway 6, to the east by the Continental Divide, to the south by Forest Development Road (FDR) 260 (Peru Creek), and to the west by Montezuma Road. The IRA is adjacent to the approximately 8,300-acre Mt. Sniktau Roadless area on the Arapahoe/Roosevelt National Forest located across the Continental Divide, which together with Porcupine Peak, create a combined roadless area of over 17,000 acres. The Porcupine Peak IRA was not identified in the RARE II analysis, but instead through subsequent Forest planning. The Porcupine Peak

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\(^{52}\) Ibid.

\(^{53}\) USDA Forest Service, 2006a
Roadless Area was identified in the Forest Plan FEIS as NOT capable or available for recommended Wilderness designation.\(^5^4\)

The Porcupine Peak IRA is fragmented with patented mining claims. Currently there are approximately six claims that are occupied year-round. Permitted motorized access to these mining claims within the Porcupine Peak IRA is provided by FDR 260 (Peru Creek) and 263 (Chihuahua). Montezuma Road and Highway 6 also provide access to the southern and northern portions of the Roadless Area, respectively. Non-motorized access into the area is provided by two trails: Forest Development Trail (FDT) 34 (Lenawee) and 78 (Chihuahua Lake).

The elevation in the Porcupine Peak IRA ranges from approximately 9,400 feet to over 14,000 feet elevation (Grays and Torreys peaks). Other notable mountains include Grizzly Peak (13,427 feet), Ruby Peak (13,277 feet), and Porcupine Peak (11,803 feet). Landform features include fluvial deposits from the Snake River and South Fork of the Williams River with the terrain composed of high relief mountains and uplifted hills with steep to moderately steep slopes.\(^5^5\)

Approximately 30 percent of the Porcupine Peak IRA is above treeline. At lower elevations, dense vegetation cover characterizes the area, with dominant species including lodgepole pine at the lower elevations to Engelmann spruce and sub-alpine fir at higher elevations.

Per the 2002 Forest Plan, the following three Management Areas have been applied to the Porcupine Peak IRA: 8.25 (provides for existing and potential winter sports sites), 1.31 (emphasis is on semi-primitive, non-motorized recreation opportunities year-round), and 5.5 (emphasis on forested landscape linkages). Travel management regulations are varied throughout the area. The area east of Lenawee Mountain is closed to motorized vehicles at all times. The area west of Lenawee Mountain has motorized use restricted by a special order.\(^5^6\)

The Porcupine Peak IRA and adjacent areas offer a wide variety of recreation opportunities due to the accessible diversity of terrain. Popular activities include: hiking, biking, camping, fishing, four-wheel driving, developed and backcountry skiing, snowboarding, and peak climbing. There is a network of non-system roads and trails in this area which access mining claims and Grays and Torreys peaks. From Loveland Pass many hikers travel through this area to climb Mount Sniktau, located to the northeast of the Porcupine Peak IRA in the Mt. Sniktau Roadless Area. Cross country skiing and snowshoeing are popular in Peru Creek. Additionally, there is a rock climbing site southeast of Porcupine Peak. Hunting use is limited and consists primarily of lottery drawn mountain goat permits.\(^5^7\)

\(^5^4\) USDA Forest Service, 2002a p. 3-526
\(^5^5\) USDA Forest Service, 2002a
\(^5^6\) Ibid.
\(^5^7\) Ibid.
This IRA in many locations has limited opportunity for solitude due to the high recreational use associated with Gray and Torreys peaks, as well as Chihuahua Lake. The western portion has moderate solitude opportunities in the summer and low during the winter with ski activity in The Beavers. There is low opportunity for scientific, educational, or historic values in this area, and two-track roads throughout the area provide motorized use. As per the Forest Plan EIS, the high recreational use on Grays and Torreys and multiple private inholdings (patented mining claims) make this area difficult, if not impossible, to manage for Wilderness designation.  

Summary of Policy Related to IRAs

In January 1998, Forest Service Chief Mike Dombeck proposed to temporarily suspend road construction and reconstruction in most inventoried roadless areas and other adjacent unroaded areas, and provided advance notice of revisions to the regulations governing the management of the Forest Transportation System. After analyzing public comments on the proposal, the agency issued an interim rule on February 12, 1999. The Interim Roads Rule suspended road construction and reconstruction in certain inventoried roadless areas for 18 months (March 1, 1999 to August 31, 2000), while a long-term forest road policy was developed.

On October 13, 1999, President Clinton directed the Forest Service to develop, and propose for public comment, regulations that would provide appropriate long-term protection for currently inventoried roadless areas. This ultimately resulted in a 2001 directive which banned road building, mineral leasing and development on 58.5 million acres of public lands.

In May 2005, the Bush administration repealed the 2001 Clinton directive and implemented a new roadless policy. The 2005 rule prohibits new road construction and reconstruction in inventoried roadless areas on NFS lands, but identifies exceptions, including personal or administrative use.

The new policy “establishes a State petitioning process that will allow State-specific consideration of the needs of these areas in an appropriate solution to address the challenges of inventoried roadless area management on NFS lands.” This is achieved by granting State governors the discretion to recommend to the Forest Service a “long-term strategy for conservation and management of IRAs on NFS lands that allows for the recognition of local situations and resolution of unique resource management challenges within a specific state.” These State petitions must be submitted to the Secretary of Agriculture by November 2006.

In response to the new directive, the State of Colorado passed Senate Bill 05-243 in June 2005, which created a bi-partisan, 13-member group called the Colorado Roadless Areas Review Task Force (Task Force). The goal of the Task Force is “to help determine the future of roadless areas in Colorado,

58 USDA Forest Service, 2002a
59 USDA Forest Service, 2005e; 36 CFR Part 294 (as revised in May 2005)
60 Ibid.
including what uses, if any, will be allowed in the applicable forest areas.\footnote{Colorado Roadless Area Review Taskforce, 2006} The Task Force segments public discussion regarding IRAs by individual forest, with plans to discuss IRAs on the WRNF in June 2006. Public comments are to be addressed in July 2006.

Based upon public comments, the Task Force will make recommendations to the Governor regarding how IRAs should be managed in Colorado. The Governor will then submit a petition to the Secretary of Agriculture on behalf of the State of Colorado by November 2006.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

**Alternative 1 - No Action**

Under the No Action Alternative no changes would occur in A-Basin’s SUP area; therefore developed, lift-served skiing would not be offered in Montezuma Bowl. The 312 acres of NFS lands within Montezuma Bowl that are overlapped by the Porcupine Peak IRA would remain unchanged.

**Alternative 2 - The Proposed Action**

With the implementation of the Proposed Action, the 397 acres of A-Basin’s SUP area within Management Prescription 8.25 and constituting Montezuma Bowl would become lift accessible. The lower two-thirds of the lift would be located within approximately 312 acres of the Porcupine Peak IRA, which overlap the Montezuma Bowl portion of the SUP.

The proposed access corridor to the top terminal of the Montezuma Bowl lift is outside of the Porcupine Peak IRA. However, incorporating Montezuma Bowl into A-Basin’s operational boundary and creating a lift-served skiing experience would affect the criteria that were previously identified as required for roadless consideration. Related to criteria #1, human activity would be evident with the visibility and utilization of the Montezuma Bowl lift. Human activity would undoubtedly increase in Montezuma Bowl during A-Basin’s operating season, as the terrain is skied on a regular basis. Approximately 3.8 acres of vegetation removal and grading within the IRA would be required for lift corridor and bottom terminal installation. Related to criteria #3, opportunities for solitude and/or primitive recreation in Montezuma Bowl during the winter would be affected due to increased human activity and the presence of a mechanized lift. With the exception of the period of time in which the lift is constructed, the proposal would not increase human activity in the IRA during the summer.

These impacts are limited to the approximately 312 acres, or 3.5 percent, of the 8,745-acre Porcupine Peak IRA. When combined with the 8,300-acre Mt. Sniktau IRA, the 312 acres in Montezuma Bowl account for 1.8 percent of the combined IRAs’ total area. Although the installation and use of a lift in Montezuma Bowl may be interpreted as being inconsistent with the theme and intent of an IRA, the lift would not affect any of the previously identified ecological and social values to the point of altering the
roadless characteristics of the Porcupine Peak IRA. This is due to the large size of the IRA and the fact that the area is already heavily fragmented due to access to patented mine claims and recreation associated with Grays and Torreys peaks. Furthermore, no roads are proposed to be constructed in the IRA. The analysis determines that the Proposed Action is consistent with Forest Service policy regarding the management of IRAs and that the integrity of the Porcupine Peak IRA would be retained with installation and use of the Montezuma Bowl lift.

CUMULATIVE EFFECTS

No past, present or reasonably-foreseeable future projects have been identified for cumulative analysis of impacts to the Porcupine Peak IRA. While there are Forest Service and community-based projects that will potentially take place in the Peru Creek drainage at some point in the future (e.g., Chihuahua/Homestead land exchange and the Shoe Basin Mine reclamation project), none of these are developed sufficiently to warrant an analysis of effects at this time.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Installation of a lift to service approximately 312 acres of the Porcupine Peak IRA, which overlaps the Montezuma Bowl portion of A-Basin’s SUP area, would represent irretrievable effects to some roadless characteristics that were defined previously. This represents approximately 3.5 percent of the total acreage within the IRA. As discussed, human activity in Montezuma Bowl would increase, and thus associated winter opportunities for solitude and/or primitive recreation in Montezuma Bowl would be irretrievably lost. However, this commitment of public lands within the IRA to lift-served skiing is not considered irreversible because of the small amount (3.8 acres) of proposed vegetation removal and because the lift could be removed, restoring the characteristics that allow Montezuma Bowl to be considered as part of the Porcupine Peak IRA.
C. TRAFFIC, PARKING, AND SKI AREA ACCESS

SCOPE OF THE ANALYSIS

The scope of this analysis is limited to the sections of Highway 6 and I-70 between exit 216 at Loveland Pass and exit 205 at the town of Silverthorne. These sections describe the access routes to A-Basin and the existing state of traffic, parking and pedestrian access at the ski area. The traffic analysis calculates existing and projected traffic volumes on the premise that all A-Basin guests arrive via automobile rather than by bus. Therefore, the traffic analysis presents the most conservative scenario.

AFFECTED ENVIRONMENT

Ski Area Access

A-Basin is accessed via Colorado Highway 6, which travels through and separates A-Basin’s base area facilities and Early Riser parking lot from additional parking areas on the north side of the highway. A-Basin is approximately 1.5 to 2 hours driving time from Denver and the Front Range metropolitan area via I-70 and Highway 6, either through Eisenhower Tunnel or over Loveland Pass, respectively (refer to Figure 1 in Chapter 6). Eastbound access to the ski area occurs via Highway 6 at the Dillon/Silverthorne interchange from I-70 and travels past Keystone to A-Basin. Westbound traffic exits I-70 east of the Eisenhower Tunnel and proceeds over Loveland Pass to A-Basin.

Highway 6 is a year-round, two- and four-lane highway. Although it is a year-round highway, it can be temporarily closed on Loveland Pass, during adverse winter weather conditions. Highway 6 between I-70 and A-Basin is kept open year-round, with the Colorado Department of Transportation (CDOT) taking responsibility for highway snow removal, sanding, and the snow safety/avalanche control programs associated with Loveland Pass. At its intersection with A-Basin, Highway 6 has no auxiliary lanes for access to any of A-Basin’s five parking lots.

A-Basin management estimates that 60 percent of its clientele is composed of skiers from east of the Continental Divide with the remaining 40 percent being west of the Continental Divide based skiers. East of the Continental Divide skiers include guests traveling primarily from the Colorado Front Range communities, but also Clear Creek County, who typically return home at the end of the day rather than spend the night in Summit County. West of the Continental Divide skiers primarily live in Summit and Eagle counties.

62 East of the Continental Divide skiers include guests traveling primarily from the Colorado Front Range communities, but also Clear Creek County, who typically return home at the end of the day rather than spend the night in Summit County. West of the Continental Divide skiers include guest traveling from Summit and Eagle counties.
Traffic

The roads and related locations of traffic count data used in this analysis include:

- Highway 6 – milepost 213.131 (Swan Mountain Road)
- Highway 6 – milepost 215.952 (Gondola Road)
- Highway 6 – milepost 216.340 (East on-ramp from Montezuma Road/Keystone)
- Highway 6 – milepost 257.083 (I-70 Junction East of Eisenhower Tunnel)

Interstate 70 is the only east-west interstate crossing Colorado, and serves as the lifeblood of east-west travel in the state for the movement of people, goods, and services. It is a major corridor for access to many of Colorado’s recreation and tourism destinations. In addition, it is a link in the national interstate highway system, the principal purposes of which are to connect major metropolitan areas and industrial centers by direct routes, and to provide a dependable highway network to serve in national emergencies.

Existing traffic congestion along I-70 is degrading the accessibility of mountain travel. Congestion is also impeding freight-related services and affecting the connectivity of intra- and interstate travel. Travel demand along I-70 is projected to increase over the next 25 years and beyond, and current congestion along I-70 is believed to be impeding economic growth in the I-70 Corridor communities, which are highly reliant on weekend tourism. The need to relieve this congestion is especially acute for extended weekend travelers seeking access between the Denver metropolitan area and US 40 (to Grand County), as well as through the Eisenhower Tunnel to the Western Slope. The need primarily results from the number of travelers bound for corridor destinations from the Denver metropolitan area and from out of state. Motor carriers, which provide freight services necessary to serve mountain residents, businesses, and visitors, as well as interstate commerce, also add to the I-70 traffic.\(^{63}\)

CDOT prohibits the movement of hazardous materials through Eisenhower Tunnel. Therefore, tractor-trailers hauling hazardous materials east or westbound must exit I-70 at Highway 6 and cross the continental divide via Loveland Pass, except when Loveland Pass is closed due to inclement road conditions. In that case, hazardous materials carriers are stopped at the tunnel and allowed to pass through on the hour, with all other vehicular traffic stopped.

Approximately 8 miles of Highway 6 from the I-70 interchange in Silverthorne to Montezuma Road is four-lane highway. Highway 6 between Montezuma Road and the Loveland Ski area interchange is two-lane highway winding at an approximate 6 percent grade, which affects the ability for vehicles to pass in designated passing zones. Steeper portions on the adverse grade include a passing lane.

Proximate to A-Basin’s base area parking lots, Highway 6 does not include auxiliary turning lanes. The mountainous terrain of this area does not allow for highway widening for the addition of these lanes.

\(^{63}\) Colorado Department of Transportation, 2004
Chapter 3: Affected Environment and Environmental Consequences
C. Traffic, Parking and Ski Area Access

Traffic Volumes

CDOT records traffic volumes on state highways and Colorado interstate highway systems. Average Daily Traffic (ADT) is the number of vehicles passing a count location in both directions in a 24-hour period. Raw ADT data is processed and converted to Average Annual Daily Traffic (AADT) volumes, defined as the total volume of traffic on a road segment for one year, divided by 365 days. Both directions of traffic volumes are reported. AADT can be adjusted to compensate for monthly and daily fluctuations in traffic; the basic intent being to provide traffic volumes which best approximate the use of a given highway section for a typical day of the year.

Per CDOT, the hourly design volume for traffic on Highway 6 along the corridor between Montezuma Road and the I-70 interchange east of the Eisenhower Tunnel is 9 percent of the AADT.64

AADT for roads that access A-Basin are displayed in Table 3C-1.

<table>
<thead>
<tr>
<th>Traffic Counter Location</th>
<th>AADT</th>
<th>AADT</th>
<th>AADT</th>
<th>AADT</th>
<th>AADT</th>
<th>AADT</th>
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<td></td>
<td>1999</td>
<td>2000</td>
<td>2001</td>
<td>2002</td>
<td>2003</td>
<td>2004</td>
</tr>
<tr>
<td>Swan Mountain Road</td>
<td>7,672</td>
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<td>7,664</td>
<td>9,876</td>
<td>9,990</td>
<td>9,800</td>
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<td>County Road 67</td>
<td>3,019</td>
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<td>3,018</td>
<td>4,433</td>
<td>4,008</td>
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<tr>
<td>Montezuma Road</td>
<td>4,627</td>
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<td>4,628</td>
<td>5,591</td>
<td>5,403</td>
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<td>I-70 Interchange East of Tunnel</td>
<td>4,640</td>
<td>4,637</td>
<td>4,637</td>
<td>4,637</td>
<td>4,637</td>
<td>4,600</td>
</tr>
</tbody>
</table>

a - projected data
Source: CDOT, 2006

Traffic count data collected at Highway 6 and Montezuma Road for vehicles traveling eastbound and westbound on Highway 6 account for west of the Continental Divide skiers and the small percentage of east of the Continental Divide skiers that travel through the Eisenhower Tunnel to access A-Basin. Front Range skiers typically access A-Basin over Loveland Pass, due to the shorter driving distance and time.65 Of the 60 percent of A-Basin’s skiers who visit A-Basin from points east of the Continental Divide, this analysis assumes that 80 percent travel over Loveland Pass with the remaining 20 percent driving through Eisenhower Tunnel and then through Dillon on Highway 6. The remaining 40 percent of A-Basin’s clientele who arrive from points west of the Continental Divide travel east on Highway 6 from various portions of Summit and Eagle counties.

Estimates of traffic on Highway 6 (and A-Basin’s estimated average daily vehicles) as attributable to A-Basin’s operations were derived from historic resort visitation data.66 Based on this data, Table 3C-2

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64 CDOT, 2006
65 USDA Forest Service, 1999a
66 SE GROUP, 2006a
converts A-Basin’s average daily vehicles to AADT between December 2001 and March 2006. The contribution to AADT was then translated to estimate the number of vehicles traveling from east of the Continental Divide – either over Loveland Pass or through Eisenhower Tunnel – as well as vehicles traveling from west of the Continental Divide – via Highway 6 through Keystone.

Table 3C-2:
Estimates of A-Basin’s Contribution to Highway 6 Traffic - AADT

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Overall AADT</th>
<th>East of the Continental Divide</th>
<th>West of the Continental Divide</th>
<th>Total Highway 6 East</th>
<th>Total Highway 6 West</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(vehicle trips, 2-way traffic)</td>
<td>(vehicle trips)</td>
<td>(vehicle trips)</td>
<td>(vehicle trips)</td>
<td>(vehicle trips)</td>
</tr>
<tr>
<td>Jan. 2002 – Dec. 2002 AADT</td>
<td>822.2</td>
<td>394.7</td>
<td>98.7</td>
<td>328.9</td>
<td>394.7</td>
</tr>
<tr>
<td>Jan. 2003 – Dec. 2003 AADT</td>
<td>879.6</td>
<td>422.2</td>
<td>105.6</td>
<td>351.8</td>
<td>422.2</td>
</tr>
<tr>
<td>Jan. 2004 – Dec. 2004 AADT</td>
<td>928.0</td>
<td>445.4</td>
<td>111.4</td>
<td>371.2</td>
<td>445.4</td>
</tr>
<tr>
<td>Jan. 2005 – Dec. 2005 AADT</td>
<td>1029.6</td>
<td>494.2</td>
<td>123.6</td>
<td>411.9</td>
<td>494.2</td>
</tr>
</tbody>
</table>

a - 60% of A-Basin Total Visitation
b - 40% of A-Basin Total Visitation
c - 80% of Front Range Skiers
d - 20% of Front Range Skiers
e - Contribution to AADT is calculated by multiplying the one-way trip data (“Estimated Average Daily Vehicles”) by two to obtain two-way travel on Highway 6.
Source: CDOT, 2006; SE GROUP, 2006a

Based on data provided in Table 3C-2, and assuming that approximately 60 percent of A-Basin’s visitors travel to and from the ski area on I-70, this analysis indicates that A-Basin traffic contributes an average of approximately 550 vehicle trips per day throughout the ski area’s operating season on I-70. A-Basin historically contributes approximately 2 percent of the traffic volume on I-70 at the Silver Plume interchange throughout its operating season.

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67 An average vehicle occupancy multiplier (2.75 people per vehicle) was applied to obtain a vehicle count directly attributable to A-Basin’s visitation.

68 For this analysis, 60 percent of guests traveling on I-70 would be evaluated at a point on I-70 between Georgetown, CO and the I-70/Highway 6 interchange east of the Eisenhower Tunnel. This point would collect A-Basin guests arriving from the Front Range and communities along the eastern slope of the Continental Divide. The 60 percent does not include guests arriving from Eagle County via I-70.

69 The reader may find detailed analysis for existing traffic volumes on I-70 in the Federal Highway Administration’s I-70 Mountain Corridor Draft Programmatic Environmental Impact Statement, available for review at: http://www.i70mtncorridor.com/default.asp
Comparing data for AADT on Highway 6 (Table 3C-1) with estimates of A-Basin’s contributions to
traffic on Highway 6 (Table 3C-2), it can be derived that A-Basin’s overall contribution to traffic on
Highway 6, both east and west of the ski area, is relatively minor (refer to Table 3C-3).

Table 3C-3:
AADT Data for Highway 6

<table>
<thead>
<tr>
<th>Traffic Counter Location</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montezuma Road</td>
<td>5,591</td>
<td>5,403</td>
<td>5,400</td>
<td>5,000</td>
</tr>
<tr>
<td>Highway 6 West of A-Basin⁴</td>
<td>427.6</td>
<td>457.6</td>
<td>482.6</td>
<td>535.4</td>
</tr>
<tr>
<td>Percent of A-Basin Traffic</td>
<td>9%</td>
<td>8%</td>
<td>9%</td>
<td>11%</td>
</tr>
<tr>
<td>I-70 Interchange East of Tunnel</td>
<td>4,637</td>
<td>4,637</td>
<td>4,600</td>
<td>3,900</td>
</tr>
<tr>
<td>Highway 6 East of A-Basin⁴</td>
<td>394.7</td>
<td>422.2</td>
<td>445.4</td>
<td>494.2</td>
</tr>
<tr>
<td>Percent of A-Basin Traffic</td>
<td>9%</td>
<td>9%</td>
<td>10%</td>
<td>14%</td>
</tr>
</tbody>
</table>

³ - Vehicular traffic attributable to A-Basin operations.
Source: CDOT, 2006; SE GROUP, 2006a

Existing peak day traffic over the previous four seasons is also based on daily visitation data. Peak days
typically occur at A-Basin approximately five times per season on holiday weekends, spring break and
powder days in the spring when other Summit County ski areas are closed for the season.⁷⁰ Based on data
provided by A-Basin, over the previous four seasons, A-Basin’s peak day traffic volumes have exceeded
1,650 vehicles on Highway 6. Vehicular traffic on peak days currently exceeds the hourly design volume
of 450 vehicles per hour adjacent to the base area as vehicles enter and exit parking lots from both east-
and west-bound Highway 6.⁷¹ (This is under the assumption that approximately 75 percent of A-Basin’s
daily visitation arrives within two hours [8:30 a.m. – 10:30 a.m.].) Based on this assumption,
approximately 630 vehicles would be accessing A-Basin each hour within the two-hour span. This
analysis assumes that portions of Highway 6 outside of A-Basin’s immediate base area parking lots do
not exceed the Highway’s hourly volume design.

⁷⁰ Days when visitation exceeds the CCC of the ski area.
⁷¹ Based on 2005 data for AADT and daily visitation data included in Table 3C-4.
Table 3C-4:  
Peak Day Traffic Volume on Highway 6

<table>
<thead>
<tr>
<th>Year</th>
<th>Peak Day Visitation</th>
<th>Total Vehicles a</th>
<th>Highway 6 east of A-Basin (AADT)</th>
<th>Highway 6 west of A-Basin (AADT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>3,054</td>
<td>1,111</td>
<td>533</td>
<td>578</td>
</tr>
<tr>
<td>2003</td>
<td>4,649</td>
<td>1,691</td>
<td>812</td>
<td>879</td>
</tr>
<tr>
<td>2004</td>
<td>3,601</td>
<td>1,310</td>
<td>629</td>
<td>681</td>
</tr>
<tr>
<td>2005</td>
<td>4,611</td>
<td>1,677</td>
<td>805</td>
<td>872</td>
</tr>
</tbody>
</table>

a - A vehicle occupancy multiplier of 2.75 is applied.  
Source: SE GROUP, 2006a

Parking

Parking at A-Basin is currently provided in five free parking lots (Early Riser, High Noon, Last Chance, Upper Overflow and Lower Overflow).72 The Early Riser lot is located adjacent to base area facilities on the south side of Highway 6, and the High Noon, Last Chance, Upper Overflow and Lower Overflow parking lots are located on the north side of Highway 6, requiring guests to cross Highway 6 to access the ski area (refer to Figure 2 in Chapter 6). A-Basin’s current parking capacity totals 1,450 vehicles. The existing Lower Overflow lot consists of pull-off shoulder parking along Highway 6 accommodating approximately 150 vehicles. This situation requires guests to cross the highway to access A-Basin’s base area, creating a potentially dangerous situation with pedestrians and traffic. Moreover, on busy days, most notably during the weekends and in the springtime, guests occasionally park along the shoulder of Highway 6, thereby creating traffic conflicts and safety hazards as slower moving vehicles mix with traffic on Highway 6.

Table 3C-5 details the parking capacities of each lot.

Table 3C-5:  
Existing Parking Capacities

<table>
<thead>
<tr>
<th>Parking Lot</th>
<th>Vehicle Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Riser</td>
<td>650</td>
</tr>
<tr>
<td>High Noon</td>
<td>400</td>
</tr>
<tr>
<td>Last Chance</td>
<td>200</td>
</tr>
<tr>
<td>Upper Overflow</td>
<td>50</td>
</tr>
<tr>
<td>Lower Overflow</td>
<td>150</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,450</strong></td>
</tr>
</tbody>
</table>

72 Fee-based, reserved parking is available for the front row of the Early Riser Lot near the Exhibition lift.
Chapter 3: Affected Environment and Environmental Consequences
C. Traffic, Parking and Ski Area Access

Based on a CCC of 3,210 skiers with an additional 1 percent of non-skiing guests, and 50 employees, a 125 percent peak day translates to 4,053 guests. Assuming an average vehicle occupancy of 2.75, there is currently a slight deficiency of day-skier parking on peak days. Similar to water and sewer, parking is a key infrastructure component for a ski area to operate. Peak days typically occur at A-Basin during the winter holidays and in late spring when other regional ski areas have closed for the season and the ski area receives new snowfall. On these days, once the base area lots are at capacity, guests park along Highway 6 west of the ski area as well as at Keystone Resort and utilize shuttle transportation to and from the ski area.

Based on peak days (125 percent of the current CCC), approximately 96 percent of A-Basin’s guests arrive by car, accounting for 3,891 guests. At an average occupancy rate of 2.75 guests per vehicle, those 3,891 guests would require 1,415 parking spaces. The resultant deficit of 24 parking spaces occurs due to an additional 50 spaces required for employees spaces and nine parking spaces required for buses, for a total of 1,474 required parking spaces.

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

Alternative 1 - No Action

Ski Area Access

Under the No Action Alternative, guests from east of the Continental Divide would continue to access A-Basin via Highway 6 over Loveland Pass or I-70 through Eisenhower Tunnel, and visitors from west of the Continental Divide would access via Highway 6 coming past Keystone. The existing 60/40 ratio of east vs. west of the Continental Divide skiers at A-Basin would be expected to remain similar to existing conditions and visitation increases would continue over the next 10+ years based on anticipated regional, state-wide, and local population growth.

Traffic

The Recreation analysis within this document presents annual visitation projections for A-Basin through the year 2015. This analysis discloses that the projected visitation under the No Action Alternative would be approximately 309,646 skier visits by 2015. Based on an average vehicle occupancy of 2.75 guests per vehicle, projections are that A-Basin would contribute on the order of 1,077 vehicle trips per day on east- and west-bound Highway 6. AADT attributable to A-Basin’s operations would be projected at 517 and 560 vehicles east and west of A-Basin, respectively.

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73 Roughly 2 percent arrive via charter bus and 2 percent arrive via the Summit Stage; 96 percent of 4,053 guests
74 SE GROUP, 2006a
75 \( \frac{309,646 \text{ guests}}{209 \text{ days}} \times 2.75 \text{ guests per vehicle x 2 trips} \)
Table 3C-6: Projected AADT on Highway 6

<table>
<thead>
<tr>
<th>Traffic Counter Location</th>
<th>AADT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Montezuma Road</td>
<td>6,062</td>
</tr>
<tr>
<td>I-70 Interchange East of Tunnel</td>
<td>6,394</td>
</tr>
</tbody>
</table>

Source: CDOT, 2006

Per Table 3C-6, total AADT in 2015 is projected to be 7,889 at Highway 6 and I-70 east of the Eisenhower Tunnel and 6,614 at Montezuma Road. Therefore, A-Basin visitation has been projected to contribute approximately 7 and 8 percent, respectively, to Highway 6 AADT east and west of the ski area.\(^{76}\)

Under the No Action Alternative, A-Basin would contribute less traffic (as a percentage of overall AADT) in 2015 than 2005 data indicates (refer to Table 3C-7). This is due to a lower projected increase in skier visitation as compared to projected regional population and traffic growth. Therefore, the No Action Alternative would have a relatively small effect on traffic volumes on both Highway 6 and I-70.\(^{77}\)

Table 3C-7: AADT Data on Highway 6

<table>
<thead>
<tr>
<th>Traffic Counter Location</th>
<th>AADT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
</tr>
<tr>
<td>Montezuma Road</td>
<td>5,000</td>
</tr>
<tr>
<td>Highway 6 West of A-Basin(^a)</td>
<td>535.4</td>
</tr>
<tr>
<td>Percent of A-Basin Traffic</td>
<td>11%</td>
</tr>
<tr>
<td>I-70 Interchange East of Tunnel</td>
<td>3,900</td>
</tr>
<tr>
<td>Highway 6 East of A-Basin(^a)</td>
<td>494.2</td>
</tr>
<tr>
<td>Percent of A-Basin Traffic</td>
<td>14%</td>
</tr>
</tbody>
</table>

a - Vehicles attributable to A-Basin operations.
Source: CDOT, 2006; SE GROUP, 2006a

Peak day traffic volumes are not anticipated to increase under the No Action Alternative; although, the frequency of peak days may increase.

Parking

Under the No Action Alternative, vehicles would be expected to continue to park along Highway 6 in the Lower Overflow lot on an average day. Traffic conflicts, which are currently attributable to slower

\(^{76}\) East (517/ 7,889 = 7 percent) and West (560/ 6,614 = 8 percent)
\(^{77}\) Vehicle trips on I-70 attributable to A-Basin operations would average approximately 646 trips (1,077 x 60 percent). In 2015, A-Basin would be projected to contribute <2 percent to I-70 traffic at the I-70/Silver Plume interchange (CDOT, 2006).
moving vehicles backing out/pulling out of parking lots onto Highway 6, would not be addressed under Alternative 1.

Additionally, on peak days, which occur six-to-ten days throughout the ski season, the existing parking infrastructure is over capacity by approximately 24 spaces. This occurrence results in guests parking along Highway 6 west of the ski area and creates the potential for pedestrian/vehicle encounters, and/or guests parking in Keystone lots and using shuttles to access the ski area. This combination of safety and convenience issues degrade the quality of the recreation experience on NFS lands.

Additionally, as detailed in the Recreation section, under the No Action Alternative, A-Basin’s projected visitation in 2015 would be 309,646. In association with this increase in visitation is an anticipated annual increase in the frequency of peak days and daily attendance of those peak days. Therefore, vehicles parking at A-Basin are projected to increase on an annual basis.

**Alternative 2 - Proposed Action**

**Ski Area Access**

Under the Proposed Action, ski area annual visitation is projected to increase on average by 2.4 percent each year through 2015. As stated in the Recreation section, A-Basin has averaged approximately 250,000 visits per season over the previous 11 years, and over the previous four years A-Basin has experienced a 33 percent increase in visitation, at least partially attributable to the installation of snowmaking infrastructure prior to the 2002/03 ski season.

Ski area access would be identical to the No Action Alternative.

**Traffic**

The Recreation analysis projected visitation for the Proposed Action through 2015. The projected seasonal visitation for 2015 season has been projected at 348,649 guests. Based on an average vehicle occupancy of 2.75 guests per vehicle, by 2015 A-Basin would be expected to generate on the order of 1,213 vehicle trips per day. AADT attributable to A-Basin operations is estimated at 582 and 631 vehicles east and west of A-Basin, respectively. Total AADT by 2015 is projected to be 6,614 at Montezuma Road and 7,889 at Highway 6 and I-70 east of the Eisenhower Tunnel. A-Basin’s operations would be expected to contribute approximately 7 and 10 percent, respectively, to Highway 6 AADT east and west of the ski area.

Therefore, by 2015, traffic volumes attributable to A-Basin’s operations under the Proposed Action are anticipated to increase slightly as a function of projected increases in visitation. The percentage of

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78 This range is dependent on late season snowfall and skiing conditions.; The Upper Overflow lot was previously-approved for additional parking and is discussed in detail in the cumulative effects analysis below.

79 SE GROUP, 2006a

80 348,649 guests / 209 days / 2.75 guests per vehicle x 2 trips
vehicles attributable to A-Basin’s operations would decrease to the east and west of A-Basin when compared to 2005 AADT data. The percentage would increase slightly to the west of A-Basin and would remain relatively stable to the east of A-Basin when compared to the No Action Alternative. Total traffic attributable to A-Basin’s operations under the Proposed Action on I-70 would average approximately 728 vehicles (approximately 2 percent of projected traffic at the I-70/Silver Plume interchange in 2015). Furthermore, A-Basin currently (and under the No Action) contributes approximately 2 percent; therefore, the Proposed Action would have negligible change to the overall traffic volume of I-70 when compared to existing conditions and the No Action Alternative.

Table 3C-8: AADT Data on Highway 6

<table>
<thead>
<tr>
<th>Traffic Counter Location</th>
<th>2005</th>
<th>No Action 2015</th>
<th>Proposed Action 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montezuma Road</td>
<td>5,000</td>
<td>6,614</td>
<td>6,614</td>
</tr>
<tr>
<td>Highway 6 West of A-Basin</td>
<td>535.4</td>
<td>560</td>
<td>631</td>
</tr>
<tr>
<td>Percent of A-Basin Traffic</td>
<td>11%</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>I-70 Interchange East of Tunnel</td>
<td>3,900</td>
<td>7,889</td>
<td>7,889</td>
</tr>
<tr>
<td>Highway 6 East of A-Basin</td>
<td>494.2</td>
<td>517</td>
<td>582</td>
</tr>
<tr>
<td>Percent of A-Basin Traffic</td>
<td>14%</td>
<td>7%b</td>
<td>7%b</td>
</tr>
</tbody>
</table>

a - Vehicles attributable to A-Basin operations.
b - Similar percentages are due to mathematical rounding.
Source: CDOT, 2006; SE GROUP, 2006a

Under the Proposed Action, peak day traffic on Highway 6 related to A-Basin’s operations has been projected to approach 1,777 vehicles. Peak days at A-Basin currently occur on a handful of days each year. (A-Basin’s projected peak day traffic was derived by taking 125 percent of the ski area’s proposed CCC [3,910] and dividing by 2.75 people per vehicle.) As stated previously, over the previous four seasons, peak day vehicular volumes have exceeded 1,650 vehicles on Highway 6. Based on current traffic data, vehicles are split almost evenly between arriving from Highway 6 east and west; therefore, on peak days, approximately 125 additional vehicle trips may occur in each direction on Highway 6. Additional vehicle trips were calculated by determining the vehicles arriving from Highway 6 east and west under the Proposed Action and comparing that total to the existing peak day vehicle totals addressed in the Existing Conditions above.

Parking

In conjunction with previously-approved additions to the vehicle capacity of the Upper Overflow lot (100 spaces), the Proposed Action would accommodate existing use as well as the anticipated increase in frequency of peak day visitation by including an additional 231 parking spaces in the High Noon and the Lower Overflow lots. The reader is directed to Table 3C-9.

81 CDOT, 2006
Table 3C-9: Proposed Parking Capacities

<table>
<thead>
<tr>
<th>Parking Lot</th>
<th>Parking Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alternative 1</td>
</tr>
<tr>
<td></td>
<td>No Action</td>
</tr>
<tr>
<td>Early Riser</td>
<td>650</td>
</tr>
<tr>
<td>High Noon</td>
<td>400</td>
</tr>
<tr>
<td>Last Chance</td>
<td>200</td>
</tr>
<tr>
<td>Upper Overflow</td>
<td>50</td>
</tr>
<tr>
<td><em>Previously-Approved Upper Overflow Increase</em></td>
<td>100</td>
</tr>
<tr>
<td>Lower Overflow</td>
<td>150</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,550</td>
</tr>
</tbody>
</table>

Source: Arapahoe Basin, 2006c

Accounting only for the currently-proposed upgrades and based on projected peak day visitation (125 percent of the proposed CCC), approximately 95 percent of A-Basin’s guests arrive by car, which would account for 4,690 guests. At an average of 2.75 guests per vehicle, those 4,690 guests would arrive in 1,705 cars; therefore, requiring the equal number of parking spaces. The resultant deficit of 83 parking spaces occurs due to an additional 50 spaces required for employee spaces and 9 parking spaces required for buses, for a total of 1,764 required parking spaces.

Additional parking in the Lower Overflow lot (136 parking spaces) would consist of a switchback connecting it to the High Noon lot. A guard rail is proposed between the parking area and the shoulder of Highway 6 that is designed to restrict vehicles from pulling out directly onto Highway 6, thereby, reducing safety concerns for guests of A-Basin and vehicles traveling Highway 6. While the proposed parking lot improvements are expected to improve parking and circulation in A-Basin’s lots, the Forest Service expects that some guests would inevitably continue to park on the shoulder of Highway 6 in order to park closer to the base area.

Proposed upgrades to the High Noon lot would include an additional 95 parking spaces by increasing the size of the lot and removing the existing second tier of the lot – designing the lot to be one level.

**CUMULATIVE EFFECTS**

In conjunction with the Proposed Action, other past, present and reasonably foreseeable future actions that have potential to affect traffic volumes on Highway 6 include approvals for projects contained in the

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82 2 percent arrive via charter bus and 3 percent arrive via the Summit Stage.; 95 percent of 4,936 guests (4,936 guests is derived from adding 1 percent to the CCC for non-skiing guests and multiplying that total by 125 percent).

83 The Upper Overflow lot was previously-approved for additional parking and is discussed in detail in the cumulative effects analysis below.
Chapter 3: Affected Environment and Environmental Consequences
C. Traffic, Parking and Ski Area Access

1999 ROD and the on-going I-70 Programmatic Environmental Impact Statement (PEIS) being conducted by CDOT and the Federal Highway Administration (FHA).

**Traffic**

**I-70 PEIS**

While this analysis indicates that increased skier visitation generated under Alternative 2 would be insignificant to traffic volumes on Highway 6 and/or I-70, traffic on Colorado’s major east-west corridor is becoming a major issue. CDOT and the FHA began analyzing alternatives for the I-70 Mountain Corridor in January 2000 in order to address the underlying need to reduce congestion and to improve mobility and accessibility on I-70 between Glenwood Springs and C-470. The I-70 Mountain Corridor Draft PEIS was undertaken because existing congestion along I-70 is degrading the accessibility of mountain travel for Colorado residents, tourists, and businesses, with projected increases in travel demand over the next 25 years and beyond. The I-70 Mountain Corridor Draft PEIS was released for public review and comment on December 10, 2004. The Draft PEIS comment period closed on May 24, 2005. In addition to the required No Action Alternative, the PEIS analyzes 12 action alternatives. Comments are currently being addressed, with a Final PEIS and Record of Decision expected in late 2006.

The PEIS identifies that the need to relieve this congestion is especially acute for extended weekend travelers seeking access between the Denver metropolitan area and US 40 (to Grand County), as well as through the Eisenhower Tunnel to the Western Slope. Ultimately, the selected alternative that will be identified in the upcoming ROD is expected to result in greater accessibility to mountain communities along the I-70 corridor, benefiting Summit and Eagle County economies, as well as ski areas. The traffic analysis in the I-70 Mountain Corridor Draft PEIS is available for review at:

**1999 ROD**

With implementation of Phase 2 projects at A-Basin authorized in the 1999 ROD (including additional snowmaking coverage that would extend the ski season), A-Basin’s ski season could conceivably extend to up to 11 months throughout the year. As a result, the FEIS anticipated that traffic volumes on Highway 6 would increase slightly during the extended ski periods (i.e., into the summer), although these increases were not expected to be significant because skier visits during the extended ski period would be less than typical skier visits during peak winter periods. In addition, it was anticipated that many of the additional visits would be from Summit County skiers, recreationists already visiting Summit County, or tourists already traveling along Highway 6 and stopping at A-Basin for the novelty of skiing in the summer. Combined with upgrades to the Exhibition lift, additional snowmaking at A-Basin could increase visitation at the ski area during the early and late spring when other ski areas are shutting down. However, from a cumulative perspective, implementation of projects contained in the 2006 Master Development Plan Amendment, combined with approvals from the 1999 ROD, would not be expected to have
significant effects to traffic volumes on Highway 6, and peak day visitation (and therefore traffic) at A-Basin would not be affected.

**Parking**

A-Basin has approval, via the 1999 ROD, to increase the capacity of the Upper Overflow lot by an additional 100 parking spaces, bringing total vehicle capacity at A-Basin to 1,550 parking spaces under the No Action Alternative.\(^{(84)}\)

Under the No Action Alternative, on peak days, which occur six-to-ten days throughout the ski season, the existing parking infrastructure is over capacity by approximately 24 spaces.\(^{(85)}\) Should additional parking be constructed in the Upper Overflow lot (100 spaces), A-Basin would have a surplus of approximately 76 parking spaces on a peak day (1,474 required parking spaces).

Under the Proposed Action and in conjunction with the addition of the previously-approved Upper Overflow Lot, A-Basin’s parking capacity would increase to 1,781 parking spaces. With the construction of the Upper Overflow Lot, A-Basin would have a surplus of approximately 17 parking spaces on a peak day (1,764 requires parking spaces).

Construction of the pedestrian underpass approved via the 1999 ROD would eliminate identified vehicle/pedestrian conflicts associated with skiers crossing the Highway to travel from the upper parking lots to the base area. Per Phase 1 of the Selected Alternative (E), increased traffic was anticipated during the early (October and November) and late (through July 4) seasons. Increased traffic was not anticipated during the summer season.

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

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

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\(^{(84)}\) USDA Forest Service, 1999b

\(^{(85)}\) This range is dependent on late season snowfall and skiing conditions.
D. SCENERY RESOURCES

SCOPE OF THE ANALYSIS

This section presents information on the existing aesthetic characteristics that define A-Basin’s SUP area. The SUP area represents the project area for scenic resources.

As indicated in Chapter 1, three critical viewpoints were identified by the ID Team as appropriate for assessing the existing, as well as potentially altered, aesthetic quality of the project area. These critical viewpoints include:

- Highway 6 approximately 1 mile north of A-Basin’s base area
- Town of Montezuma, approximately 3 miles south of the Montezuma Bowl side of the SUP area
- Various points along the shoulder of Highway 6 between Keystone Ski Area and the top of Loveland Pass

These critical viewpoints were selected because they represent reasonable locations from which to assess the existing and potentially altered visual characteristics of the project area. No visual simulations were deemed necessary in conjunction with this analysis.

FOREST SERVICE SCENERY MANAGEMENT SYSTEM

In addition to providing recreation experiences and the production of numerous resources, public landscapes provide beauty, which is a valuable resource to many Forest Service constituencies. This resource is explicitly recognized in the law. The National Environmental Policy Act requires equal consideration of aesthetics and science.

Until 1995, the Forest Service utilized the Visual Management System for managing scenery resources on NFS lands. However, an updated landscape management system – the Scenery Management System (SMS) – was introduced and adopted as the primary visual management direction by the Forest Service.

The Forest Service requires application of Scenery Management to all Forest Service land. In brief, the SMS is a systematic approach for assessing visual resources in a project area and then using the assessment findings to help make management decisions on the project. The system is founded on an ecological aesthetic, which recognizes that management which preserves the integrity, stability, and beauty of the biotic community preserves the scenery as well.

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86 USDA Forest Service, 1995a
**Scenic Integrity Objectives and Landscape Character**

People experience the visual environment as an integrated whole, not as a series of separate objects. Scenic Integrity is a measure of the degree to which a landscape is visually perceived to be complete, indicating the degree of intactness and wholeness of the landscape character.

A project can cause visual resource change that can be objectively measured. Viewer response to this change, although subjective, usually displays broad patterns of consensus. Thus, visual impacts comprise both the landscape change and viewer response to that change. By assessing the existing scenic character of an area in terms of pattern elements (form, line, color and texture) and pattern character (dominance, scale diversity and continuity), it is possible to identify the extent to which the scenic character of a facility will exhibit visual contrast with the landscape, or its converse, visual compatibility.

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

SIOs range from “Very High” (unaltered environment) to “Unacceptably Low” (extremely altered environment). As indicated in the 2002 Forest Plan, the SIO for the A-Basin SUP area is “Very Low”. This SIO befittingly refers to landscapes where the valued landscape character “appears heavily altered.” The frame of reference for measuring achievement of SIOs is the valued attributes of the “existing” landscape character “being viewed.” The “Very Low” SIO is defined as:

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

However, the Forest Plan states that all National Forest System lands shall be managed to attain the highest possible visual quality commensurate with other appropriate public uses, costs, and benefits.

**SMS Distance Zones**

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

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87 USDA Forest Service, 2002h
88 USDA Forest Service, 2002a
89 USDA Forest Service, 2002c p.AA-17
Chapter 3: Affected Environment and Environmental Consequences

3D: Scenery Resources

- Immediate Foreground: This zone begins at the viewer and extends to about 300 feet. Individual leaves, flowers, twigs, bark texture, and other details dominate this view.

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

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

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

**Forest Plan Standards and Guidelines**

In addition to the SMS, the 2002 Forest Plan contains forest-wide standards and guidelines which apply to resources across the Forest. While the 2002 Forest Plan contains no standards for scenery management, it offers the following guidelines:

- Management activities should be designed and implemented to achieve, at minimum, the level of scenic integrity shown on the Scenic Integrity Objective Map.

- Plan, design and locate vegetation manipulation on a scale that retains the color and texture of the landscape character, borrowing directional emphasis of form and line from natural features.

- Choose facility and structure design, scale, color of materials, location and orientation to meet the scenic integrity objective on the Scenic Integrity Objective Map.

- Facilities, structures and towers with exteriors consisting of galvanized metal or other reflective surfaces will be treated or painted dark non-reflective colors that blend with the forest background to meet an average neutral value of 4.5 or less as measured on the Munsell neutral scale.

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

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90 A *standard* is a course of action which must be followed; adherence is mandatory. A *guideline* is a preferred course of action designed to achieve a goal, respond to variable site conditions, or respond to an overall condition.

91 USDA Forest Service, 2002a p. 2-34

92 USDA Forest Service, 2002a p. 3-80
Protection of scenic values is emphasized through application of basic landscape aesthetics and design principles, integrated with forest management and development objectives. Reasonable efforts are made to limit the visibility of structures, ski lifts, roads, utilities, buildings, signs, and other man-made facilities by locating them behind landform features or by screening them behind existing vegetation. Facilities are architecturally designed to blend and harmonize with the national forest setting as seen from key viewpoints. Facilities that no longer serve a useful purpose are removed.

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

EXISTING CONDITIONS

Scenic Characteristics of A-Basin’s SUP Area

A-Basin is located on the western slope of the Continental Divide within the White River National Forest. High elevation peaks characterize the Continental Divide, including Grays Peak (14,270 feet) and Torreys Peak (14,267 feet).

With a summit over 13,000 feet amsl, A-Basin has some of the highest skiable terrain in the United States, providing unobstructed views of the Continental Divide and surrounding NFS lands. Due to its high elevation and mostly north to northeast face, A-Basin is able to hold snow well into the spring and summer months. With an average 240-day operating season, A-Basin remains open for skiing much longer than most Summit and Eagle County resorts, which average closer to 180 days.

A-Basin’s SUP area can be segmented into three areas: the developed, lift-served portion of the SUP area; the undeveloped Montezuma Bowl on A-Basin’s south side; and the undeveloped Beavers located on the western edge of the SUP boundary.

The development of trails, lifts, infrastructure, and skier facilities has occurred on NFS lands at A-Basin since the ski area’s inception in 1946, when A-Basin’s base area was established. Since that time, over 490 acres of skiable terrain have been developed on NFS lands within A-Basin’s 1,872-acre SUP area. A-Basin’s skiable terrain is currently serviced by five aerial lifts and one surface conveyor lift. Developed skiing terrain within the A-Basin SUP area is located both above and below timberline with 78 named trails.

93 USDA Forest Service, 2002a p. 1-1
94 Skiable terrain is defined as all terrain within the SUP area that is accessible by lift or foot. Skiable terrain includes developed trails within A-Basin’s named trail network, as well as off-piste, hike-to, above treeline and gladed (natural and created) areas that exist within the SUP area. Note: areas that are accessible through backcountry access points which are not patrolled or avalanche controlled are not within A-Basin’s skiable terrain network.
Located along the Continental Divide, the topography of A-Basin is comprised of steeply sloped side walls, large open bowls, basins, terraces, and rolling hills. Largely north, northeast facing slopes characterize A-Basin with a large rock wall, known as the East Wall, providing definition to the natural bowl shape of the developed ski area. Advanced and expert terrain constitutes the Upper and Lower East Wall area, with terrain gradients in excess of 45 percent. West of the East Wall the topography is moderately steep composed largely of intermediate and beginner ski runs. Further west to the SUP boundary is the steep terrain served by the Pallavicini lift, characterized by steep glades and chutes with various rock outcrops. Composed entirely of advanced and expert terrain, this area serves as the westernmost portion of A-Basin’s current operational boundary.

Vegetation cover throughout the SUP area varies due to the elevation changes, slope aspect and gradient. Because of its high elevation, vegetation cover is limited to those plants that occur above the alpine zones (11,000 to 11,500 feet amsl) and subalpine (9,000 to 11,500 feet amsl) zones of Colorado. Vegetation within A-Basin’s subalpine zone is largely dominated by various types of low-lying grasses and forbs. At the lower elevations, below 11,400 feet amsl, vegetation cover becomes denser with canopy cover varying with elevation. Dominant species include Engelmann spruce, Douglas-fir, and sub-alpine fir. The distinctive vegetation patterns typical of cut ski slopes contribute to the visual character of A-Basin’s current operational boundary area.

All ski area-related lifts, trails, parking and skier service facilities are located on NFS lands within A-Basin’s SUP area. Guest service structures consist of the A-frame day lodge (constructed in 1964) and a new ski rental building (constructed in 2005) at the base and ski patrol headquarters (constructed in 2005) at the top of the Lenawee and Norway lifts. Five parking lots, sufficient for approximately 1,450 vehicles, are located immediately adjacent to Highway 6 within walking distance of the Exhibition, Molly Hogan and Pallavicini lifts. A-Basin’s base area is readily visible to drivers along Highway 6 in the immediate foreground view as they pass by the ski area on their ascent up Loveland Pass, or as they descend the Pass. (The upper terminals of the Exhibition of Pallavicini are not visible from the base area.) The majority of A-Basin’s lift and trail network, as well as parking and guest service facilities, are seen in the foreground and middleground from the final switchback on the descent from Loveland Pass. The Lenawee and Norway lifts, as well as associated trails, are visible from the summit of Loveland Pass in the extreme middleground and background distance zones.

Montezuma Bowl is an undeveloped, 450-acre, south-facing bowl located within the SUP area immediately southwest of the Lenawee and Norway lifts’ top terminals. With a summit elevation of 12,500 feet amsl, Montezuma Bowl is defined by a steep upper ridge and a protruding center ridge beginning at roughly 12,000 feet amsl. The vast majority of the Bowl’s side slopes are steep with grades in excess of 45 percent. The narrow ridge in the center of the Bowl slopes down to the southwest and partially divides the Bowl’s lower regions. There are drainage heads on the ridge’s northwest and southeast sides with small remnants of lateral moraines forming benches at roughly 11,700 feet amsl in
the southeast drainage. Montezuma Bowl narrows down to a single valley and the two drainages eventually converge, flowing southwest to the Snake River.

Montezuma Bowl cannot be seen from the south at any point within Town of Montezuma or along Montezuma Road. Furthermore, Montezuma Bowl is not visible from any point along Highway 6. Montezuma Bowl is visible from within the Keystone SUP area in the background distance zone.

Vegetation cover in Montezuma Bowl is similar to A-Basin’s “front side” terrain and is typical of an alpine zone and sub-alpine zone environment. The area consists of open bowls, with patchy rock outcrops and is largely devoid of vegetation above approximately 11,800 feet amsl on the west, east and north sides of the bowl. As the elevation decreases, vegetation becomes thicker with a dense stand of Engelmann Spruce and subalpine fir trees running down the center of the Bowl starting around 11,800 feet amsl. The vegetation density on the east and west walls of the Bowl also increases below 11,800 feet amsl.

The area known as The Beavers consists of approximately 475 acres of skiable terrain located within the western edge of the A-Basin SUP area, between the developed ski area and Montezuma Bowl, southeast of Highway 6. This area is readily visible in the foreground and middleground distance zones to motorists as they approach A-Basin from the Keystone area. Predominately made up of advanced and expert chutes, The Beavers is regularly utilized by skiers/riders as backcountry terrain. This area is not patrolled and no avalanche work is performed. Similar to the rest of the SUP boundary, The Beavers is characterized by a bowl shape devoid of vegetation at the higher elevations above 11,800 feet amsl. As the elevation decreases, vegetation cover gradually becomes thicker, with the exception of several avalanche chutes known as “The Alleys”. Dominant species within The Beavers include Engelmann Spruce and subalpine fir.

A-Basin’s existing lift and trail network, as well as related infrastructure, buildings and parking lots are consistent with the “Very Low” SIO.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

**Alternative 1 - No Action**

Under the No Action Alternative, no changes would occur in A-Basin’s SUP area that would affect the scenic environment. Therefore, A-Basin would continue to be consistent with the SIO of “Very Low”. Under the No Action Alternative, however, previously-approved projects on NFS lands may be implemented in the future, which may have the potential to alter the scenic resource at A-Basin. Previously approved, unimplemented projects from the 1999 ROD are listed in Chapter 1.
Alternative 2 - Proposed Action

Exhibition Lift

Although the bottom terminal of the Exhibition lift would remain in its current location, the top terminal would be repositioned approximately 185 feet to the west and 20 feet up-mountain, requiring approximately 0.6 acre of tree removal and grading. Should this lift be upgraded with high-speed technology, the top and bottom terminals would increase in mass, as well.

The change in alignment, requiring additional vegetation removal, as well as potential increases in the mass of the terminals would make the upgraded Exhibition lift slightly more visible than it is presently. The upgraded bottom terminal would be larger than the current bottom terminal, but would remain in compliance with the existing developed ski area SIO of “Very Low”. The top terminal would also remain in compliance as it would not be visible from A-Basin’s base area. These projects would not significantly alter the appearance of A-Basin’s SUP area, and would remain in compliance with the SIO of “Very Low”.

Montezuma Bowl

All areas proposed for ground disturbance including overstory vegetation removal and grading, would result in minimal changes to the scenic environment, especially where overstory vegetation is proposed to be removed. The top-drive terminal, consisting of a bull wheel, its supporting structure and an associated operator building, would be located at approximately 12,465 feet amsl. The top terminal will be strategically placed in a saddle on the southern side of the ridge to minimize its prominence. Installation of the top terminal would require grading for the foundation, an egress route for guests exiting the chairlift as well as a skiway/underground utility corridor between it and the Lenawee lift’s top terminal. Although strategically located on the southern side of this ridge, the top terminal would be slightly visible from various points along southbound Highway 6 between A-Basin’s base area and the summit of Loveland Pass. It would be evident just to the east of the existing Norway and Lenawee top terminals but would be consistent with the SIO of “Very Low” designated for the SUP area.

With a vertical rise of 1,115 feet and a slope length of 4,150 feet, the proposed Montezuma Bowl lift line would run down the middle of the Bowl. Total tree removal associated with terrain in Montezuma Bowl would be approximately 2.9 acres, including strategic tree clearing for “connector” trails in the lower reaches of the Bowl that would be wide enough to accommodate a snowcat for grooming and provide access to the bottom terminal of the Montezuma Bowl lift. Construction of the bottom terminal would require minor grading to level terrain undulations and provide a suitable maze area. Furthermore, approximately 600 feet below the bottom terminal, a 6- to 10-foot wide catchment trail would be defined (with minimal vegetation removal) and roped to allow access for patrollers in the event of an emergency.

Overall, transition of Montezuma Bowl to lift-served skiing can be accomplished with relatively few alterations to the aesthetic environment. From within the SUP area, all modifications to the aesthetic
environment associated with lift installation, grading and vegetation removal are consistent with what guests can expect to encounter at a developed ski area.

Parking

Under the Proposed Action, modifications to the Lower Overflow and High Noon parking lots would necessitate approximately 1.2 acres of tree removal. Visibility of these projects would be limited to the immediate foreground distance zone to travelers on Highway 6 as they pass the base area, as well as in the foreground distance zone from the first switchback on Loveland Pass. In addition, the upgrades to the Lower Overflow and High Noon parking lots would be visible from the foreground view from lifts and trails within the SUP area; however, since these upgrades would be in the context of a developed ski area, this is consistent with A-Basin’s SIO of “Very Low”.

CUMULATIVE EFFECTS

Past, present and reasonably foreseeable actions that could cumulatively affect scenic resources at A-Basin are related to development of public lands dating back to the 1940’s. The ski area and base area have incrementally developed since 1946 as skiing has gained popularity and the state of Colorado’s residential and tourism population has grown.

As noted previously, historic development on NFS lands at A-Basin has involved clearing of trails, grading, and construction of lifts, roads, and buildings. Changes in vegetative patterns and developed facilities are visible from NFS lands within the permit area, and from other various viewpoints along Highway 6.

While the Proposed Action would result in direct or indirect visual effects on NFS land in A-Basin’s SUP area, previously-approved, unimplemented projects within the SUP area would cumulatively contribute to a more developed, built-out theme at A-Basin. While these are cumulative, incremental effects, they are not considered significant in contributing to the overall reduction in visual quality of the SUP area.

Amongst other projects, A-Basin has approval to construct additional parking spaces, the Midway Lodge, and a pedestrian underpass all of which are within the SUP area, as approved via the 1999 ROD (the reader is referred to Chapter 1 for a list of previously-approved projects). A-Basin has indicated that the construction of the Midway Lodge will begin in summer 2006 and the parking lot upgrade will take place in summer 2007.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Additional developed terrain and infrastructure in previously undisturbed portions of the SUP area would represent irretrievable effects to visual resources within Montezuma Bowl and the Porcupine Peak IRA. However, this commitment of the scenic resource is not irreversible because the Montezuma Bowl lift and
associated facilities could be removed and, in time, the area could be reclaimed and revegetated, restoring its natural appearance.
Chapter 3: Affected Environment and Environmental Consequences
E. Cultural and Heritage Resources

E. CULTURAL AND HERITAGE RESOURCES

SCOPE OF THE ANALYSIS

Following state and federal policies and regulations implementing the National Historic Preservation Act (NHPA), the project area was inventoried to identify any cultural resources within the Area of Potential Effect (APE), which was defined as approximately 360 acres within the Montezuma Bowl area, as well as areas proposed for ground disturbance in relation to the proposed upgrade of the Exhibition lift and parking lot improvements. Any discovered cultural resources were to be evaluated for eligibility to the National Register of Historic Places (NRHP) under the Criteria for Eligibility. 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.

Metcalf Archaeological Consultants, Inc. (MAC) conducted a Class III (intensive) cultural resource inventory of the project area on September 2, 3, and 6, 2004. The inventory encompassed a total of 360 acres of mountain cirque-like terrain that lies on the southwestern slope of Lenawee Mountain. (A total of 237 acres were intensively surveyed. Due to slopes in excess of 30 percent, approximately 123 acres were not systematically inventoried. They were, however, visually inspected from the surrounding ridges for obvious cultural properties such as mine adits or structures.) In addition, a files search and subsequent review by a WRNF archaeologist confirmed that a 1982 inventory of the SUP area was adequate to address proposed enlargement of the parking lots as well as upgrading the Exhibition lift. There was no need to conduct any additional inventories for proposed front-side projects.

CULTURAL SURVEY AND LITERATURE REVIEW RESULTS

The cultural resource inventory for Montezuma Bowl disclosed six new sites and five new isolated (finds). Four of the sites are historic and two have both a historic and prehistoric component. The prehistoric components were sparse and contained no temporally diagnostic tools, features or datable material. Both sites are located in heavily eroded locations with shallow deposition and do not appear to have potential for further data important in prehistory. All of the historic sites and historic components are associated with the precious metal mining industry, which occurred between 1860 and 1920. Two of the historic sites are directly associated with prospecting/mining and four are habitation sites (three cabin ruins and one possible tent foundation) most likely occupied by miners. All of the cabin sites were heavily deteriorated and all but one had sparse artifact scatters. Two other historic finds included a whiskey bottle and a scatter of cans. All of the cultural resources have been recommended as not eligible for listing on the NRHP, and as a consequence, a recommendation of “no historic properties” was made.

95 36 CFR Section 60.4
96 Metcalf – Zier, 1982

Arapahoe Basin
2006 Improvement Plan Draft EIS
3-50
In addition, a literature review of the Office of Archaeology and Historic Preservation’s (OAHP) online cultural resource database (COMPASS), was performed by MAC on January, 22, 2003 and August 2, 2004. The returned data indicated that there had been two previous projects conducted near the Montezuma Bowl project area with the result of four sites and seven isolated finds nearby. The larger of the two projects is the Arapahoe Basin Ski Area inventory.97 The other project was a smaller inventory for ski lift construction also at the Arapahoe Basin Ski Area.98 All of the nearby sites had been documented during the 1982 ski area survey, and are located at the top ridge of Montezuma Bowl or The Beavers area. The previously recorded cultural resources nearest to the project area are generally located north of the area of potential effect and include mine tailings, lumber, an adit, and a track. These historic resources were officially determined not eligible by the OAHP in 1983.

An additional files search was performed through the OAHP on-line COMPASS database on March 30, 2006. This search concerned the proposed Exhibition lift and parking lots upgrades. The returned data indicated nine cultural resources, including five sites and four isolated finds. Eight of the nine resources were recorded for the 1982 Metcalf-Zier survey.99 The ninth was recorded for a 1996 inventory of the Continental Divide National Scenic Trail. All of these cultural resources are located outside the project area.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

**Alternative 1 - No Action**

Because no ground disturbance is associated with the No Action Alternative, there is no potential to affect previously unidentified archaeological resources in the study area.

**Alternative 2 - Proposed Action**

- **Exhibition Lift Replacement and Parking Improvements**

The 1982 cultural resources inventory covered 1,360 acres within A-Basin’s SUP area, including the parking areas and the Exhibition lift. The returned data indicated nine cultural resources, including five site(s) and four isolated finds. Because all of these resources are located outside the project area, ground disturbance associated with proposed upgrades does not have potential to impact them. Upon evaluation of the 1982 survey, it was recommended that a finding of “no historic properties affected” be made for the proposed development of additional parking in the Lower Overflow Lot, widening and surface maintenance of the High Noon Lot, and removal and replacement of the existing Exhibition lift with a new lift in an adjacent alignment.”

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97 Black and Metcalf, 1982; Black, 1982
98 Gustafson, 2001
99 Metcalf – Zier, 1982
Montezuma Bowl

With a vertical rise of 1,115 feet and a slope length of approximately 4,150 feet, the proposed Montezuma Bowl lift line would run down the middle of the Bowl. Construction would involve constructing foundations at the upper and lower termini, and installation of lift towers along the lift’s alignment. The lower terminal area, located at 11,350 feet, would require roughly 0.4 acre of surface disturbance, and the upper terminal area, located at 12,465 feet, approximately 0.9 acre of disturbance. However, a majority of the disturbance for the upper terminal would be located on the front side of A-Basin due to the underground installation of a power line from the top of the Lenawee lift in order to provide power to the top-drive Montezuma Bowl lift. From a cultural perspective, none of these elements would affect identified cultural resources as this entire area was surveyed resulting in a determination of “no cultural resources affected.”

CUMULATIVE EFFECTS

Since the ski area’s inception in 1946, three previous archaeological surveys have been conducted within the two sections (12 & 13) of the project area. No unavoidable cultural or heritage resources have been identified within the project area during historic literature investigations. No cumulative effects to cultural or heritage resources are anticipated to result from implementation of either alternative.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

No irreversible and/ or irretrievable commitments of cultural and heritage resources have been identified in association with either alternative analyzed in this document.
F. SOCIAL AND ECONOMIC RESOURCES

SCOPE OF THE ANALYSIS

The scope of this analysis for social and economic resources summarizes current social and economic data specifically relevant to the proposed project, including housing and population, demographic trends, and economic considerations within Summit County, Colorado.

NATIONAL, REGIONAL AND LOCAL SKIER VISITATION TRENDS

As stated in the Section 3A (Recreation), national skier visits were down slightly in the 2004/05 season - to approximately 56.8 million visits. This is an approximate 0.3 percent decrease from the 2003/04 season, and approximately 1.3 percent below the record-setting 2002/03 season of 57.6 million. The 2004/05 season was the fourth busiest season of all time in the United States. All of the top four seasons in terms of skier visits have occurred in the past five years, and five of the top six seasons have also occurred in the past five seasons, suggesting that the ski industry has shifted into a new performance range.100

The 2004/05 season was characterized by a gradually improving national economy and job market, as well as a strengthened travel economy industry and weak dollar which favors international visitation. However, economic and geopolitical factors including high gasoline prices, moderate consumer confidence levels, and the occupation in Iraq and related international tensions may have weighed somewhat on national visitation trends. Nationally, resort initiatives focusing on improving visitor trial, conversion and retention, along with continued use of aggressive pricing techniques (discounted passes, frequent user cards, etc.) and ongoing resort improvements, have aided the ski industry’s performance in recent years.101

The Rocky Mountain region (comprised of ski areas in CO, ID, MT, NM, UT, WY) had the strongest 2004/05 season of any region in the United States, with 19.6 million visits – 1.5 percent higher than the previous record of 19.3 million visits in the 2000/01 season. The Rockies were up 13.3 percent from their long-term average of 17.3 million visits.102

In Summit County, skier visits have been fluctuating each year since the mid 1990s. However, as demonstrated in Table 3F-1, the percentage of total skier days in the County in relationship to the state has been relatively steady, averaging 33.5 percent over the last seven ski seasons.103

100 National Ski Areas Association, 2005
101 Ibid.
102 Ibid.
103 Summit County Planning Department, 2005
Table 3F-1:  
Total Annual Skier Visitation in Summit County  
Compared to the State of Colorado

<table>
<thead>
<tr>
<th>Season</th>
<th>Annual Colorado Skier Visits</th>
<th>Annual Summit County Skier Visits</th>
<th>Percentage of Annual CO Skier Visits Attributed to Summit County</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004/05</td>
<td>11,815,572</td>
<td>3,866,523</td>
<td>32.7</td>
</tr>
<tr>
<td>2003/04</td>
<td>11,200,000</td>
<td>3,557,043</td>
<td>31.9</td>
</tr>
<tr>
<td>2002/03</td>
<td>11,605,588</td>
<td>3,840,424</td>
<td>33.1</td>
</tr>
<tr>
<td>2001/02</td>
<td>11,128,131</td>
<td>3,695,077</td>
<td>33.2</td>
</tr>
<tr>
<td>2000/01</td>
<td>9,708,971</td>
<td>3,871,611</td>
<td>39.9</td>
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<tr>
<td>1999/00</td>
<td>10,891,318</td>
<td>3,660,812</td>
<td>33.6</td>
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<td>1998/99</td>
<td>11,366,365</td>
<td>3,773,900</td>
<td>33.2</td>
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<td>11,979,719</td>
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<td>1996/97</td>
<td>11,844,523</td>
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<td>31.2</td>
</tr>
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<td>1995/96</td>
<td>11,387,058</td>
<td>3,632,867</td>
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<td>1990/91</td>
<td>9,788,487</td>
<td>2,875,043</td>
<td>29.3</td>
</tr>
</tbody>
</table>

Source: Summit County Planning Department, 2005

**HOUSING AND POPULATION**

The local and regional population and housing stock are key considerations in ski resort operations. The population represents the number of potential local users of a resort and the number of people available to work at the resort. The housing stock has an impact on affordability and availability of housing for all citizens in the community, including resort and non-resort employees.

Characteristics of the housing supply in Summit County are shown in Table 3F-2. As of 2005, there were approximately 31,557 housing units in Summit County, reflecting an increase of roughly 30 percent since 2000. More than one-third, or 35.4 percent, of all units were occupied as primary residences. As such, approximately 64.6 percent or 20,371 units are classified as vacant. Of non-vacant units, the majority were occupied by owners at 58.9 percent. The majority of housing units were classified as Multi-Family (21,275), while single family homes accounted for the second largest block (9,683). This information suggests that part-time or seasonal residents dominate the housing market in Summit County, as 64.6 percent of units are vacant. In 2005, there were 2.44 persons per household in Summit County.

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104 Summit County Housing Needs Assessment, 2005
105 Ibid.
Chapter 3: Affected Environment and Environmental Consequences

F. Social and Economic Resources

Table 3F-2:
Housing Units by Household Type in 2005

<table>
<thead>
<tr>
<th>Town</th>
<th>Total Units</th>
<th>%</th>
<th>Number</th>
<th>Owners</th>
<th>Renters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breckenridge</td>
<td>6,154</td>
<td>25</td>
<td>1,572</td>
<td>39.4%</td>
<td>60.6%</td>
</tr>
<tr>
<td>Blue River</td>
<td>635</td>
<td>47</td>
<td>299</td>
<td>74.6%</td>
<td>25.4%</td>
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<tr>
<td>Dillon</td>
<td>1,391</td>
<td>27</td>
<td>377</td>
<td>55.8%</td>
<td>44.2%</td>
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<tr>
<td>Frisco</td>
<td>3,472</td>
<td>34</td>
<td>1,181</td>
<td>56.0%</td>
<td>44.0%</td>
</tr>
<tr>
<td>Montezuma</td>
<td>40</td>
<td>53</td>
<td>21</td>
<td>50.0%</td>
<td>50.0%</td>
</tr>
<tr>
<td>Silverthorne</td>
<td>2,022</td>
<td>68</td>
<td>1,365</td>
<td>57.5%</td>
<td>42.5%</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>17,843</td>
<td>25</td>
<td>4,438</td>
<td>63.3%</td>
<td>36.7%</td>
</tr>
<tr>
<td><strong>Summit County Total</strong></td>
<td><strong>31,557</strong></td>
<td><strong>20</strong></td>
<td><strong>6,364</strong></td>
<td><strong>58.9%</strong></td>
<td><strong>41.1%</strong></td>
</tr>
</tbody>
</table>

Note: Numbers may not add to totals due to rounding.

Between 1990 and 1996, the average selling price of housing increased at an average annual rate of 11.7 percent. The average sales price of all housing types in the County grew at an annual rate of nearly 18 percent from 1990 though 2000. Between 2001 and 2004 the average median sale price of single family homes increased 6.4 percent per year, town homes increased 7.5 percent and condominium prices decreased 5.3 percent, for an average annual increase in all median sale prices of 2.8 percent.

Part-time, seasonal residents and skier visits also have an effect on housing prices. This is due to the proliferation in second home ownership in Summit County. Summit County is a popular second home market due to its proximity to four major ski areas and allure of the mountain lifestyle. This is evident as the vacancy rate of homes in Summit County in 2000 was approximately 64 percent. This demand for second homes drives up the cost of housing because typical second home owners have more disposable income and purchasing power than the local work force and therefore can afford to pay more for housing. The demand for second homes introduces to the community a housing demand that is external of the local economy, which, in non-resort communities, is the primary influence over housing prices. Housing affordability is normally evaluated by comparing the median housing price to the community’s median income. This data is based on Summit County Planning Department reports of 1997 and 2005.

Summit County’s population grew 5.2 percent annually from 1995 to 2005. This rate of growth slightly exceeds that of total housing units in the County, which grew by 5.0 percent annually. During a

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106 Summit County Planning Department, 2001
107 Summit County Planning Department, 2005
108 Ibid. p.44
109 State Demography Office, 2006
110 Colorado Division of Housing, 2006b
comparable period, median household income rose 4.8 percent annually.\textsuperscript{111} While Summit County skier visitation (Breckenridge, Arapahoe Basin, Keystone, and Copper Mountain) grew at approximately 0.8 percent annually, A-Basin visitation increased 3.1 percent annually - slower than the growth in population, housing units, and household income, but exceeding average annual skier visitation in Summit County.

Skier visitation at A-Basin, while a factor in the overall growth of the County, is not a significant influence on economic and social trends in the region. There are other macroeconomic and social factors that affect population and housing trends in Summit County. These factors include availability of affordable housing, number of year-round and season employees, households living in overcrowded conditions as well as the combined future demand for employees.

The local and regional populations are also key considerations in ski resort operations. In January 2005, Summit County had a year-round resident population of approximately 28,259, up from 23,548 in 2000 - reflecting a 20 percent increase.\textsuperscript{112} Approximately 26 percent of Summit County’s 2005 population lives in the areas surrounding Dillon Reservoir (in the incorporated towns of Dillon, Silverthorne, and Frisco). By 2010, Summit County’s population is expected to reach 32,384. Current and projected population data for Summit County, compared to the state, are shown in Table 3F-3.

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2000</th>
<th>2005 (est)</th>
<th>2010 (est)</th>
<th>2025 (est)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summit County</td>
<td>12,881</td>
<td>23,548</td>
<td>28,259</td>
<td>32,384</td>
<td>46,237</td>
</tr>
<tr>
<td>Dillon</td>
<td>553</td>
<td>802</td>
<td>818</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Frisco</td>
<td>1,601</td>
<td>2,443</td>
<td>2,697</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Silverthorne</td>
<td>1,768</td>
<td>3,196</td>
<td>3,934</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Breckenridge</td>
<td>1,285</td>
<td>2,408</td>
<td>3,408</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Montezuma</td>
<td>60</td>
<td>42</td>
<td>46</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Blue River</td>
<td>440</td>
<td>685</td>
<td>762</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Unincorporated Areas</td>
<td>7,174</td>
<td>13,972</td>
<td>16,603</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td><strong>3,294,473</strong></td>
<td><strong>4,338,808</strong></td>
<td><strong>4,720,772</strong></td>
<td><strong>5,196,401</strong></td>
<td><strong>6,787,649</strong></td>
</tr>
</tbody>
</table>

Source: State Demography Office, 2006 (2005 estimate provided by Summit County Planning Department, 2005)

Growth in Summit County between 2000 and 2005 averaged roughly 3.8 percent annually.\textsuperscript{113} The growth rate in this period was slower than the rate from 1990 through 2000, which was 7.2 percent annually. In looking at population projections through the year 2020, Summit County is anticipated to experience a

\textsuperscript{111} Northwest Colorado Council of Governments, 2006
\textsuperscript{112} Ibid.
\textsuperscript{113} State Demography Office, 2006
more modest increase in growth rates ranging between 2 and 4 percent per year. This trend is anticipated to continue to at least 2020.\textsuperscript{114}

The \textit{effective} population of Summit County during peak periods (December and March) dramatically exceeds the resident population.\textsuperscript{115} For example, on popular weekends, there can frequently be as many as 100,000 non-residents in the County, including second-home owners, day visitors, and skiers. At any given time, non-resident individuals out-number Summit County residents by a factor of four-to-one. As stated, Summit County skier visits accounted for an average of 33.5 percent of the total Colorado skier market between the 1997/98 and 2003/04 seasons.\textsuperscript{116} This large percentage illustrates the extent to which Summit County’s infrastructure is used and how the County is affected by tourism and non-resident activity.

\textbf{ECONOMIC CONSIDERATIONS}

The contribution of tourism in the state of Colorado is substantial, generating approximately $7 billion annually. Colorado ski areas contributed more than a quarter of this in 2001/02 by generating approximately $2.5 billion in revenues, which is more than gaming, cultural related events in Denver and commercial river rafting combined.\textsuperscript{117} Roughly $935 million of that came directly from resorts. Lodging, restaurant, retail stores and other businesses that support the ski industry accounted for up to $1.7 billion. In addition to generating revenue, the ski industry also supports the State through infrastructure expenditures, spending an estimated 169 million in expansion projects during the 2000/01 and 2001/02 seasons. Colorado’s ski industry also provides approximately 31,000 jobs or about 14 percent of all jobs related to the state’s tourism industry.

Summit County is home to several of Colorado’s most visited ski resorts, including A-Basin, Copper Mountain, Keystone, and Breckenridge. During the 2004/05 ski season, Summit County resorts accumulated just under 3.8 million skier days, more than any other county in the state, and, as noted previously, approximately one-third of all skier visits within the state of Colorado.

This tourism spending also plays an important role in the County’s employment and income. Summit County’s winter tourism economy directly employed approximately 9,640 people, or 46 percent of

\textsuperscript{114} Summit County Planning Department, 2005

\textsuperscript{115} Effective population does not refer to \textit{legal residents} of the region; it is a measure of the overall activity in a resort region during peak periods. While the resident population of the County may only be 28,259, the heavy tourism activity brings significant numbers of overnight and day visitors to the County, thus creating a burden on county services, the economy, traffic, etc. Therefore, this “impact” is displayed as an \textit{effective} population, rather than the actual population of county residents.

\textsuperscript{116} Summit County Planning Department, 2005

\textsuperscript{117} Walsh, 2004
Summit County’s 20,956 jobs. This figure is higher than in any other county in Colorado. Summit County’s median household income in 2000 was $56,587, compared to the state median of $47,203.

A significant portion of Summit County’s residents are seasonally employed, many of these people work at local ski areas. On average, A-Basin typically employs 34 full-time year-round employees, 83 people on a full-time winter seasonal basis, and 154 people on a part-time winter seasonal basis, reflecting a total year-round Full Time Equivalent (FTE) of approximately 114 jobs.

In 2005, the US Treasury collected approximately $154,423 in fees from the operation of A-Basin. These fees are based upon Forest Service calculations using the Ski Fee Bill. These “Receipt Act” payments are generated from fees paid to National Forests by permittees, such as A-Basin, and are distributed pursuant to the Receipt Act. Such payments have historically varied according to the level of revenues generated by the permittee, which in the case of A-Basin is largely a function of skier visitation.

In 2005, A-Basin’s property tax payments to Summit County were $67,560. Property tax revenue goes directly to Summit County and is partially responsible for funding of schools, road maintenance, fire and police protection, as well as other community services.

Winter tourism is the primary contributor to the economic well being of Summit County. During 2002, Summit County generated approximately $1.6 billion from outside sources, with approximately $632 million generated directly from winter tourism and spending associated with second home ownership generated an additional $517 million. Retail sales in 2005 within the County exceeded $1.1 billion, reflecting a 2.3 percent annual growth from 2000 to 2005. However, retail sales in Summit County are of a seasonal nature. The shoulder (i.e., late Spring and Fall) seasons experience the lowest retail sales tax revenue demonstrating a five-year average of $56 million and $65 million during the months of May and October, respectively. Conversely, the winter and early spring seasons experience the highest retail sales tax revenue demonstrating a five-year average of $130 million and $132 million during months of December and March, respectively.

Year-round sales tax revenue continues to experience strong growth trends, which is indicative of increasingly more diversified recreation and visitor opportunities, as well a larger resident population. Nonetheless, the peak ski season months of December through March continue to generate the highest total levels of retail sales in Summit County. (The reader is referred to the project file for a monthly breakdown of retail sales tax for the past five years.)

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118 Ibid.
119 US Census Bureau, 2000
120 Full Time Equivalent (FTE) is a measurement equal to one staff person working a full-time work schedule for one year. Derivation of FTE assumes the following: Full Time Year-Round (FTYR) = 1.0 FTE, Full Time Seasonal (FTS) = 0.5 FTE, Part Time Seasonal (PTS) = 0.25 FTE
121 Henceroth, 2006
122 Ibid.
123 Marquis, 2004
124 State of Colorado Department of Revenue
125 Ibid.
ECONOMIC VIABILITY OF A-BASIN

Upgrades and improvements are critical to helping resorts remain viable in a competitive business, particularly in light of recent trends in the ski industry. Many resorts that have invested capital in improvements and expansions have improved utilization and revenues. In turn, 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.

The benefits of ski area improvements were demonstrated during the 2002/03 season - the first season A-Basin utilized snowmaking operations and the first time skier visits exceeded 300,000. Before this, A-Basin’s skier visits fluctuated between a low of 151,000 (2001/02) and a high of 262,513 (1994/95) over the past 11 seasons.

Ski resorts in Colorado are also following a national trend toward developing four-season resort recreation opportunities as another means of generating consistent revenue and minimizing the financial risks of seasonal cash flow cycles. Real estate developments, in conjunction with summer recreation programming, have proven to be an economically viable complement to the winter amenities at many destination-oriented resorts. However, A-Basin does not have any real-estate investments and must therefore solely rely on skier visits to remain economically viable within an increasingly competitive market. To do this, adding additional infrastructure as the market demands, helps build visitation and activity at the resort, and all sectors of the operation (restaurant, retail, skiing) benefit.

ENVIRONMENTAL JUSTICE

In 1994, President Clinton issued Executive Order (EO) 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” to ensure such populations are not subject to disproportionately high levels of environmental risk. EO 12898 provides that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” EO 12898 makes it clear that its provisions apply fully to programs involving Native Americans.

Racial diversity has remained limited in Summit County; the largest change has been the growth of the Hispanic community, which increased from 2.5 percent of the 1990 population to 9.8 percent of the 2000 population. A-Basin’s closest residential community of Dillon, approximately 10 miles away, reflects the County pattern of limited racial diversity. For additional details, the reader is referred to the Final EIS and ROD for the Forest Plan on pages 3-628 through 3-631.

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126 59 Federal Register 7629, 1994; Disproportionately is a generic term used to define the adverse effects of environmental actions that burden minority and/or low income populations at a higher rate than the general public.
For this project, it has been demonstrated that the level of environmental risk to humans is too low to measure since no low income or minority populations were identified as potentially being disproportionately affected in terms of Environmental Justice issues. Therefore, no environmental justice issues related to the Proposed Action were identified to be analyzed.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

Table 3F-4 illustrates the Social Economic Impacts by Alternative.

**Table 3F-4:**
Estimated Long-Term Social Economic Impacts by Alternative (Projected for the 2014/15 Season)

<table>
<thead>
<tr>
<th>Source</th>
<th>Category</th>
<th>2004/05</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Day Skier Visitation</em></td>
<td>328,251</td>
<td>309,646</td>
<td>348,649</td>
</tr>
<tr>
<td>2</td>
<td><em>Summit County Demographics</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Population</td>
<td>28,259</td>
<td>36,759</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Housing Units</td>
<td>31,557</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><em>Development Costs</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Spent within impact area</td>
<td>--</td>
<td>--</td>
<td>$1,700,000</td>
</tr>
<tr>
<td>7</td>
<td>Spent outside impact area</td>
<td>--</td>
<td>--</td>
<td>$4,000,000</td>
</tr>
<tr>
<td>8</td>
<td>TOTAL</td>
<td>--</td>
<td>--</td>
<td>$5,700,000</td>
</tr>
<tr>
<td>9</td>
<td><em>Visitor Spending</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Lift Tickets</td>
<td>$4,897,000</td>
<td>$4,799,000</td>
<td>$5,578,000</td>
</tr>
<tr>
<td>11</td>
<td>Ski School</td>
<td>$317,000</td>
<td>$297,000</td>
<td>$335,000</td>
</tr>
<tr>
<td>12</td>
<td>Retail</td>
<td>$448,000</td>
<td>$424,000</td>
<td>$478,000</td>
</tr>
<tr>
<td>13</td>
<td>Food &amp; Beverage</td>
<td>$1,221,000</td>
<td>$1,315,000</td>
<td>$1,656,000</td>
</tr>
<tr>
<td>14</td>
<td>TOTAL</td>
<td>$6,883,000</td>
<td>$6,835,000</td>
<td>$8,047,000</td>
</tr>
<tr>
<td>15</td>
<td><em>Employment</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Direct (on-site)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Full-time, year-round employees</td>
<td>34</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td>18</td>
<td>Full-time, seasonal employees</td>
<td>83</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>19</td>
<td>Part-time, all employees</td>
<td>154</td>
<td>154</td>
<td>154</td>
</tr>
<tr>
<td>20</td>
<td>TOTAL</td>
<td>271</td>
<td>271</td>
<td>289</td>
</tr>
<tr>
<td>21</td>
<td><em>Fiscal Considerations</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Forest Service Fees</td>
<td>$154,423</td>
<td>$145,533</td>
<td>$163,865</td>
</tr>
<tr>
<td>23</td>
<td>Property taxes to Summit County paid by A-Basin</td>
<td>$67,560</td>
<td>Slight increase as A-Basin’s property value increases</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Estimated sales tax revenues</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td><em>Other Economic &amp; Social Effects</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Public Safety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Ticket Pricing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Character of the Area</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3F-4:
Estimated Long-Term Social Economic Impacts by Alternative
(Projected for the 2014/15 Season)

a - For more detailed information regarding information source, refer to Source Notes in the succeeding table.
b - The 328,251 skier visits for the 2004/05 represent a peak year number at A-Basin. This year was used because complete financial data was available and thus serves as the base year for this analysis. Skier visits over the last five seasons have averaged 262,632.

<table>
<thead>
<tr>
<th>Source Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Base skier visitation based on average of 1993/94 through 2004/05 seasons. Increase in visits is based on several growth factors which have been applied, including Forest Service growth estimates, and the impacts of trail development, improved facilities, snowmaking (season length), and lift capacity. Note: The 6.9 percent average annual growth rate that A-Basin experienced between the 1994/95 and 2004/05 seasons is not considered sustainable into the future under either the No Action or Proposed Action. The reader is referred to Section 3A for more information on ski visitation projections.</td>
</tr>
<tr>
<td>3 Base population number is 2005 estimate provided by U.S. Bureau of the Census. The projection of 36,579 reflects the 2015 estimate by the Summit County Planning Department. This projection takes into account the projected continued growth in recreation and tourism industries in the region, thus it takes into consideration the types of development that are discussed in this FEIS. As such, it is not necessary to apply additional population growth factors that would reflect economic impacts from the proposed improvements.</td>
</tr>
<tr>
<td>4 Housing base number provided by Summit Housing Authority. Projections are not available. It is important to note that with an average household size of 2.44 in Summit County (2005), 11,172 households are occupied full-time. The remaining 20,385 households are occupied on a part-time basis by second homeowners or renters. Given the anticipated growth in Summit County population, we can estimate that an additional 3,483 housing units will be occupied by residents in 2015 (36,759 – 28,259 / 2.44) The number of additional vacant housing units in 2015 will be determined by the amount of second-home development over the next decade. Regardless, Summit County should expect an increase in housing units of roughly the same proportion to that of population growth.</td>
</tr>
<tr>
<td>5 Development will likely occur in the first three-to-five years for each alternative. However the costs are shown in the table at build-out (2015).</td>
</tr>
<tr>
<td>6 Development costs within impact area include costs of trail construction, parking lot upgrades, and 20% of lift costs (as lifts are manufactured off-site). Cost estimates provided by SE GROUP.</td>
</tr>
<tr>
<td>7 Development costs outside impact area include 80% of lift costs. Cost estimates provided by SE GROUP.</td>
</tr>
<tr>
<td>9 Visitor spending impacts are based on current spending levels provided by A-Basin during the 2004/05 season.</td>
</tr>
<tr>
<td>10 Lift ticket sales are collected entirely by A-Basin. This is on-site spending only. Alternative 1 visitor spending reflects a modest increase in per visit revenue resulting from implementation of previously approved facilities.</td>
</tr>
<tr>
<td>11 Ski School sales are collected entirely by A-Basin. This is on-site spending only.</td>
</tr>
<tr>
<td>12 Most retail sales occur off-site in local retail establishments, however a small portion occurs at A-Basin.</td>
</tr>
<tr>
<td>13 Food &amp; Beverage figures reflect base area dining facilities. Alternative 1 visitor spending reflects a modest increase in per visit revenue resulting from anticipated implementation of previously approved facilities (i.e., new Midway lodge).</td>
</tr>
<tr>
<td>14 Total visitor spending is the amount of dollars directly spent by A-Basin visitors while at the resort.</td>
</tr>
</tbody>
</table>
### Source Notes:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Employment estimates were provided by A-Basin. One FTE is the equivalent of one person working full-time for one year. As such, FTEs do not necessarily equal job positions, as many jobs will be filled by seasonal or part-time employees. For purposes of this analysis, a full-time year round employee equals one FTE; a full-time seasonal employee equals one-half FTE; and all part-time positions are considered one-quarter FTE.</td>
</tr>
<tr>
<td>16</td>
<td>Represents actual A-Basin employment generated by spending at resort. Includes individuals such as lift attendants, general administration, ski patrollers, mountain operations crew, etc. FTEs were calculated using the FTE formula explained earlier in this chapter.</td>
</tr>
<tr>
<td>17</td>
<td>Represents the actual and projected number of full-time year round employees of A-Basin.</td>
</tr>
<tr>
<td>18</td>
<td>Represents the actual and projected number of full-time seasonal employees of A-Basin.</td>
</tr>
<tr>
<td>19</td>
<td>Represents the actual and projected number of part-time employees of A-Basin.</td>
</tr>
<tr>
<td>20</td>
<td>Represents the total FTEs generated by existence and operation of A-Basin. This number does not include short-term construction employment.</td>
</tr>
<tr>
<td>21</td>
<td>This category includes other fiscal considerations that are not included in the general economic indicators cited above (spending, employment, visitation, etc).</td>
</tr>
<tr>
<td>22</td>
<td>A-Basin makes annual payments to the Forest Service based on visitation. For the past three seasons, the average fee per skier visit has been $0.47 per visit. This analysis assumes that this remains constant.</td>
</tr>
<tr>
<td>23</td>
<td>A-Basin's property tax assessment will increase as capital improvements are completed. The value of new lifts, infrastructure and buildings will be added to A-Basin's current assessment, and A-Basin's property tax liability will increase as the assessment is revised upwards.</td>
</tr>
<tr>
<td>24</td>
<td>Sales taxes are collected on much of the visitor spending created by A-Basin visitors. The tax revenues from these sales will increase in future years proportionate to spending increases.</td>
</tr>
<tr>
<td>25</td>
<td>Other economic and social effects are generally factors that cannot be accurately projected, but are standard secondary effects from typical mountain capital improvements in a mountain resort region.</td>
</tr>
<tr>
<td>26</td>
<td>It is anticipated that there will be no significant change in the manner in which public safety and municipal services are provided in the region.</td>
</tr>
<tr>
<td>27</td>
<td>It is likely that ticket pricing will increase proportionate to the value of the improvements that A-Basin carries out. This is due to an improved product and consumers’ willingness to pay, the costs of capital financing and A-Basin’s improved market positioning.</td>
</tr>
<tr>
<td>28</td>
<td>The character of the area will continually change as ski area changes take place. This trend has been occurring in the region for several decades as tourism and recreation industries have matured and are not expected to change in the foreseeable future.</td>
</tr>
</tbody>
</table>
**Alternative 1 - No Action**

**Economic Impacts**

Under the No Action Alternative, skier visits are anticipated to increase at an average of 1.2 percent annually through the 2014/15 season (the reader is referred to Table 3A-5 in Section 3A [Recreation] of this document for more information on skier visitation projections). This rate of increase represents a decrease from the 6.9 percent average growth rate that A-Basin has experienced over the past 11 seasons (since the 1994/95 season), as this is not considered sustainable into the future under either the No Action or Proposed Action. However, population growth in both Summit County and on Colorado’s Front Range communities, combined with I-70 improvements, will likely influence skier visitation at all Summit County ski areas in the future.

Without continuing capital investment in the resort, it is reasonable to expect there will be slight erosion of market share and a corresponding decrease in annual visitation growth.

**Employment Impacts**

The No Action Alternative would maintain A-Basin’s current operations, and the FTE for A-Basin would remain at approximately 114 jobs.

**Alternative 2 - Proposed Action**

**Economic Impacts**

The average annual growth rate of skier visitation under the Proposed Action is anticipated to increase over the No Action Alternative by approximately 2.4 percent as a direct result of the mountain improvements. (The reader is referred to Table 3A-5 in Section 3A [Recreation] of this document for more information.)

Under Alternative 2, skier visits are anticipated to increase by 6.2 percent over ten years to 348,649 in 2014, equating to about $8,047,000 in annual spending at A-Basin. Implementation of the Proposed Action would include capital expenditures of approximately $5.7 million over the course of the next several years. Approximately $1.7 million of this total would be spent within the direct impact area (Summit County) with the remaining $4 million being spent beyond the impact area for items such as lift equipment.

Annual resort operating costs, such as land use fees, sales taxes, and labor costs, would be expected to increase in accordance with increases in visitation and revenues. Fees paid to the US Treasury for the ski area’s Forest Service SUP would increase in proportion with skier visitation to approximately $163,865 in 2015.
Employment Impacts

As employment is highly correlated with visitation, direct, year-round full-time resort employment would increase by approximately one person and full-time seasonal employment by 17. This increase in employees increases A-Basin’s FTE from a base level of 114 employees to a future level of 124 jobs. Implementation of the Proposed Action would contribute to the creation of additional direct, secondary, and induced jobs within the community.

Alternative 2 construction projects would create the opportunity for additional short-term jobs at A-Basin and in the Summit County area resulting from secondary and induced effects of the direct construction employment at A-Basin. These secondary and induced jobs are not permanent, and would be re-absorbed into the local economy after the construction period ends.

Given the anticipated levels of visitation and spending at A-Basin, and in the region, there would be no measurable increases in the regional economy and labor force as a result of implementing the Proposed Action.

CUMULATIVE IMPACTS

Because proposed projects at A-Basin are too small to measure both directly and indirectly in the economic characteristic of Summit County, the Proposed Action would not be detectable as cumulative affects either. The number of direct and indirect jobs potentially created as a result of implementation of the Proposed Action is considered negligible in regards to other past, present and reasonably foreseeable future actions. Cumulatively, other recreationally-oriented projects that will potentially contribute to growth trends and social and economic changes in the Summit County area include ongoing and proposed developments at Keystone, Copper Mountain, and Breckenridge. Summer recreational development as well as second home construction is expected to continue at the present rate or higher, regardless of whether or not components out of A-Basin’s 2006 MDPA are approved.

The I-70 Mountain Corridor Draft PEIS will potentially lead to expedited access to Summit County and will benefit local businesses through increased tourism and commerce. However, the timeline for implementation of whatever emerges as the selected alternative is unknown, and therefore the cumulative effects of this project on the socioeconomic dynamic of Summit County not quantifiable.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

No irreversible and/ or irretrievable commitments of social and economic resources have been identified in association with either alternative analyzed in this document.
G. NOISE

SCOPE OF THE ANALYSIS

Because avalanche control work (using explosives) would be necessary to ensure safe use of Montezuma Bowl, acoustic monitoring was conducted to assess potential noise effects within the Town of Montezuma. This section briefly discusses noise characteristics pertaining to existing and proposed conditions within the Town of Montezuma.

AFFECTED ENVIRONMENT

Methodology

Field testing was conducted in the Town of Montezuma in order to characterize ambient noise levels. The test was performed on March 9, 2006 starting at approximately 1:30 p.m. and ending at roughly 2:20 p.m. The test avalanche control work within Montezuma Bowl was conducted by A-Basin ski patrol following a nighttime storm that deposited 6 to 8 inches of new snow in Montezuma Bowl. This is typical of conditions during which the ski patrol would need to perform snow safety work in Montezuma Bowl. The control work consisted of the detonation of six explosive charges along the northwest ridge of Montezuma Bowl. The explosives ranged in size from 2.0 to 2.7 pounds. The methods of detonation included hand-thrown charges and “dangle” charges that were strung into areas (such as cornices) of potentially dangerous access.

Ambient monitoring continued for approximately one-half hour, in advance of a second monitoring test that occurred during test avalanche control work. The monitoring location was located in mid-town Montezuma along Main Street. Air temperature during the monitoring was approximately 22 degrees Fahrenheit. Wind speeds averaged approximately 10 to 15 mph, gusting at times to 20 to 30 mph. Sky conditions at the time were partly cloudy. Approximately 6 to 8 inches of new snow was observed in Montezuma Bowl. Ambient sound levels were monitored utilizing a Quest Technologies 2900 Type II recording sound meter, averaging at a one-minute interval.

Findings

Ambient noise levels in the Town of Montezuma, as observed during the test time period, were influenced by several factors:

- Vehicular traffic (including heavy equipment for snow removal)
- Barking dogs
- Wind
- Discharge of firearms
Chapter 3: Affected Environment and Environmental Consequences

G. Noise

Average ambient noise levels during the baseline test were measured to be approximately 43 dBA. This measured average level was influenced by several observed loud noises that occurred during the ambient test, including dogs barking, passing heavy equipment, and weapons fire of unknown source. The peak noise level during the ambient test was observed to be approximately 103 dBA, associated with a passing front-loader that was performing snow removal at the fire station. During quiet periods, ambient levels ranged from 35 to 40 dBA.

For comparison purposes, typical noise levels (in dBA) associated with a variety of common sources are outlined in Table 3G-1:

<table>
<thead>
<tr>
<th>Source/Type</th>
<th>Noise Level (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiet Rural Area</td>
<td>25-30</td>
</tr>
<tr>
<td>Quiet Residential Area</td>
<td>40</td>
</tr>
<tr>
<td>Conversation, busy office</td>
<td>50-60</td>
</tr>
<tr>
<td>Highway Traffic</td>
<td>70</td>
</tr>
<tr>
<td>Heavy traffic</td>
<td>85</td>
</tr>
<tr>
<td>Snowmobile at 25 feet</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on a comparison of measured ambient noise levels in Montezuma to those of common sources, existing conditions are typical of a quiet, rural to residential area.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

**Alternative 1 - No Action**

The No Action alternative would not result in any additional acoustic impacts within, or in the vicinity of the Town of Montezuma. Noise levels would not be expected to increase in relationship to existing trends.

**Alternative 2 - Proposed Action**

As noted, the test avalanche control work within Montezuma Bowl was conducted following a nighttime storm that deposited 6 to 8 inches of new snow in Montezuma Bowl. The peak observed sound level due to avalanche control explosive work in Montezuma Bowl, as measured in the Town of Montezuma, was 74 dBA. This represents an instantaneous peak effect, and is not representative of an impact to average observed noise conditions within the Town of Montezuma. In fact, the loudest noise encountered during the test observations was 98 dBA, caused early in the test by the second passage of the front-loader that was conducting snow removal at the fire station. The average observed ambient noise level during the hour-long avalanche control test was 44 dBA, which is the statistically the same as ambient conditions.

\[ \text{dBA} \] is a measurement of sound level expressed in decibels, filtered or weighted at various frequencies to approximate the response of the human ear. A decibel (dB) is a unit for measuring the intensity of sound. The human hearing range is from 0 dB (the theoretical threshold of audibility) to 130 dB (the average pain threshold).
(when control work does not occur) within the level of uncertainty of readings for the Type II noise meter.

**CUMULATIVE EFFECTS**

The Proposed Action would not contribute to any noise-related cumulative effects.

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

No irreversible and/or irretrievable commitments of resources in relation to noise have been identified in association with either alternative analyzed in this document.
H. VEGETATION

SCOPE OF THE ANALYSIS

To appropriately evaluate potential project effects of varying scale on different species, different analysis areas are considered, depending on the species and issue involved.

The project area considered herein consists of A-Basin’s 1,872-acre SUP area, designated as an 8.25 Management Area (Ski Areas – Existing and Potential), which is intensively managed for downhill skiing opportunities and opportunities for non-motorized recreation.\(^{128}\) The SUP boundary occurs within the subalpine and alpine life zones. In addition, the project area extends to some backcountry areas surrounding the SUP boundary that are, or that may be, accessed through the ski area’s backcountry access points.

A-Basin’s existing, developed ski terrain is located on the north and west slopes of Lenawee Mountain and the west slope of Grizzly Peak – both of which are 13,000-foot peaks. Ski area elevations range between approximately 10,780 feet at the base area and 13,050 feet at the summit. All existing, developed ski area facilities are located on the front, north-facing side of the southwest and northeast trending ridges running off Lenawee Mountain, in the North Fork of the Snake River. Forest cover is composed of mature and late successional Engelmann spruce (\textit{Picea engelmannii}) and subalpine fir (\textit{Abies bifolia}) stands that are anthropogenically fragmented by developed ski terrain and naturally by avalanche chutes and harsh conditions approaching treeline, which occurs approximately one-half to two-thirds of the way up Lenawee Mountain.

That portion of Montezuma Bowl within the SUP area is the upper, undeveloped portion of an 800-acre, southwest-facing drainage in the South Fork of the Snake River. Elevations range from approximately 12,600 feet amsl at the top of the Bowl to approximately 10,875 feet amsl in the drainage bottom. Approximately 40 percent of the Bowl is forested, with spruce-fir stands increasingly interspersed with lodgepole pine (\textit{Pinus contorta}) at lower elevations and on south and west-facing slopes. At the extreme upper elevational limits of the spruce-fir zone, trees become increasingly stunted and fragmented into Krummholz patches. Two drainage bottoms occur within the Bowl, each supporting an intermittent creek flanked by planeleaf willows (\textit{Salix planifolia}). These willow communities extend upslope to above treeline, where they originate in swales and broader hillside seeps. Stands of shortfruit willow (\textit{S. brachycarpa}) are most common on the east side of the drainage below the ridgeline, but also occur elsewhere in more xeric, rocky portions of the Bowl. Remaining upper portions of the bowl support alpine grass-forb communities, boulder fields, scree fields, and rocky ridgelines.

\(^{128}\) USDA Forest Service, 2002a,b
**Disturbance Areas**

Disturbance areas represent the smallest quantitative analysis areas and the immediate areas of physical habitat modifications (i.e., habitat conversion). General characterization of habitats within the existing, developed portion of A-Basin’s SUP area has been recently described in the A-Basin 1999 EIS, to which this document is tiered.\(^{129}\) Those descriptions remain valid, except for those portions of existing ski trails disturbed by snowmaking pipeline installations, which further setback the sparse vegetation communities present on those xeric, rocky, high elevation soils. More specific existing habitat characterizations of proposed disturbance areas (by project) are provided below along with descriptions of habitats that would be disturbed in Montezuma Bowl, which were not addressed in A-Basin’s 1999 EIS.\(^{130}\) Plant associations follow Johnston.\(^{131}\)

**Upgraded Exhibition Lift**

Realignment of Exhibition lift would remove the scalloped edge at five points along the skier’s left edge of two intertrail islands bordering the Exhibition trail, composed of mature, closed canopy (4B), spruce-fir trees. The larger, uphill intertrail island has an average existing width of 70 feet and a maximum width and length of 130 feet and 740 feet, respectively. As such, it is linear and without “interior” habitat value. The smaller, lower island has a similar width as the larger island, but is 190 feet long. It also lacks “interior” habitat characteristics. Understory vegetation is a slight variation of the common plant association found within mature spruce-fir forests at upper elevations on xeric rocky soils and north-facing slopes. Species composition is dominated by myrtleleaf blueberry (*Vaccinium myrtillus ssp. oreophilum*), with local areas co-dominated by heartleaf arnica (*Arnica cordifolia*). Other common understory plants include elk sedge (*Carex geyeri*), parrot’s beak (*Pedicularis parryi*), Richardson’s geranium (*Geranium richardsonii*), leafy cinquefoil (*Potentilla diversifolia*), silvery lupine (*Lupinus argentea*), Jacob’s ladder (*Polemonium viscosum*), and gooseberry (*Ribes inerme*).

A-Basin’s ski trails were developed by grading, which in combination with naturally rocky soils, heavy annual precipitation, and high altitude has resulted in poor growing conditions and sparse herbaceous and graminoid communities.

**Montezuma Bowl Lift**

The proposed Montezuma Bowl lift’s upper terminal location is on the xeric ridgeline between the front and back sides of the ski area. This xeric, southwest-facing site supports False Elk Sedge/ Alpine Clover (*Carex elynoides/Trifolium dasyphyllum*) and Parry’s Clover/Alpine Avens (*T. parryi/Acomastylis rossii*) plant communities.\(^{132}\) Characteristic species associated with the former community included alpine avens (*Acomastylis rossii*), club moss (*Selaginella densa*), Fendler’s sandwort (*Eremogone fendleri*), Greenland

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\(^{129}\) USDA Forest Service, 1999a  
\(^{130}\) Ibid.  
\(^{131}\) Johnston, 1987  
\(^{132}\) Redner, 2004
bluegrass (*Poa glauca*), rock sedge (*Carex rupestris*), and spike trisetum (*Trisetum spicatum*). Characteristic species associated with the latter community included arctic sage (*Artemisia arctica*), American bistort (*Bistort bistortoides*), rock rose clover (*Sibbaldia procumbens*), elk sedge (*Kobresia myosuroides*), tufted hairgrass (*Deschampsia cespitosa*), rocky mountain sedge (*Carex scopulorum*), and arctic fescue (*Festuca brachyphylla*). Cushion plants were not present and this area is not snowfree during winter. No federally listed or WRNF R2 sensitive plants were detected and the site’s characteristics do not support suitable habitat for such species.\(^{133}\)

The proposed Montezuma Bowl lift corridor would extend through the alpine, through a stunted, high elevation spruce-fir stand, and through a meadow west of the of a willow-dominated riparian zone associated with the Bowl’s eastern creek. The July 14, 2004 botanical survey along the corridor followed the staked/flagged alignment, but specific tower locations were not identified. The lift corridor did not support habitat suitable for any federally listed or WRNF R2 sensitive plants.\(^{134}\)

Within several hundred feet of the summit ridge, where the upper lift terminal would be located, soil depth quickly increases and the plant community changes from those communities associated with the rocky ridgeline, described above. The alpine portion of the corridor is almost entirely within the Tufted Hairgrass/Alpine Avens (*Deschampsia cespitosa/Acomastylis rossii*) plant community, with only localized areas within the False Elk Sedge/Alpine Clover and Parry’s Clover/Alpine Avens communities described above under the upper lift terminal. The Tufted Hairgrass/Alpine Avens community occurs in moderate to heavy winter snow accumulation areas, including those in cirque bottoms, alpine meadows, and fellfield turfs with gentle (6 to 29 percent) slopes, moderate to sandy loam and moderate surface gravel soils at 10,600 to 12,900 feet in elevation. Characteristic species included: American bistort, Rocky Mountain sagewort (*Artemisia scopulorum*), simple daisy (*Erigeron simplex*), alpine cinquefoil (*Potentilla diversifolia*), and alpine fescue, (*Festuca brachyphylla*).

The proposed Montezuma Bowl lift corridor approaches, but would probably not enter, a Krummholz community. Local Krummholz is composed of individual trees and patches up to approximately 8 yards wide, ranging from 2 to 7 feet tall, with live branches to ground level, and containing no “interior” habitat. Typical subalpine krummholz understory species included one-sided wintergreen (*Orthillia secunda*), strawberries (*Fragaria virginiana ssp. glauca*), grouse whortleberry, Jacob’s ladder (*Polemonium pulcherrimum*), and tufted hairgrass.

A mid-section of the proposed lift corridor goes through a high elevation (11,600 to 11,850 feet amsl), open canopy (4A) spruce-fir stand. Lower, more protected trees in a more mesic setting show little elevational stunting while higher trees on a more exposed, xeric ridgeline show considerable stunting, but not so much as to be considered Krummholz. A few trees in this area had been historically cleared for

\(^{133}\) Redner, 2004  
\(^{134}\) Ibid.
mining with evidence of tall standing tree stumps, a dilapidated cabin, glory hole, and tailings near the survey zone, legacy trees are present. Three structure class 2-3 snags (dead for several years, with some branches, but no bark) are present in the corridor. No nest cavities were present in those snags. Historic mining effects in and adjacent to Montezuma Bowl have resulted in an uneven-aged stand of spruce and fir, with lodgepole entering stands at lower elevations and on more south and westerly aspects. The native shrub understory common to this area is dominated by russet buffaloberry (*Shepherdia canadensis*) and juniper (*Juniperus communis ssp. alpina*). The forest supports common herbaceous plant species, including: one-sided wintergreen (*Orthilia secunda*), strawberries (*Fragaria virginiana ssp. glauca*), fireweed (*Chamerion douglasii*), myrtleleaf blueberry, and yarrow (*Achillea lanulosa*).

At the proposed lower Montezuma Bowl lift terminal site, tree characteristics are similar to those described above for the upper mid-section of the lift corridor, except some trees occur in dense, multilayered clumps characteristic of open areas at this upper elevation. Spruce-fir and a few lodgepole trees are mature with an open canopy (≤ 25 percent) that does not meet forest criteria for classification as a “forest”. This sparse density of trees represents the scalloped edge of a mature, closed canopy (4B) spruce-fir stand. Ground cover associated with open areas between the trees is an extension of the spruce-fir understory described above. The only Course Woody Debris (CWD) present is a sparse density of historically harvested stumps and well decomposed (structural class 3) logs, none of which are discernable in winter. The lower terminal disturbance area would occur no closer than 38 feet from the willow community flanking the creek.

**Access and Utility Corridor**

The 10- to 12-foot wide, 579-foot long graded access and utility corridor would extend from the existing mountain road adjacent to the top terminal of the Lenawee lift to the top terminal of the proposed Montezuma Bowl lift. The distal 247 feet of the lift access route, the lift terminal disturbance area, and most of the area where the lift towers would be located are in xeric, southwest-facing, False Elk Sedge/Alpine Clover (*Carex elynoides/Trifolium dasyphyllum*) and Parry’s Clover/Alpine Avens (*T. parryi/Acomastylis rossii*) plant communities, described above. The proximal 332-foot section of the lift access route has a northeast aspect and supports a Parry’s Clover/Alpine Avens community, but most of that disturbance area is sparsely vegetated, unstable scree, boulders, and previously disturbed, unvegetated road and road shoulders. The sparsely vegetated areas are due primarily to unstable slopes and the shortened growing season associated with this snow deposition area on the generally leeward side of this alpine ridge. No federally listed or WRNF R2 sensitive plants were detected along this route during the July 14, 2004 botanical survey, however, some sparsely vegetated areas were similar to a nearby area (i.e., several hundred feet southwest along the ridge), where one clawless draba (*Draba*

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135 Parks et al., 1997  
136 USDA Forest Service, 1995a  
137 Parks et al., 1997  
138 Redner, 2004
The proposed skiers’ right collector trail would extend through a 4B spruce-fir stand with a small amount of interspersed lodgepole pines that occurs on a low, rounded ridge between the Bowl’s west and central drainages. This stand, at approximately 11,450 feet amsl, shows little elevational stunting and is similar to the lower, more protected spruce-fir stand along the Montezuma Bowl lift corridor, described above, except legacy trees are not present. The stand supports a moderate density of structural class 2 and 3 snags and a moderate density of structural class 1, 2, and 3 logs.141

The proposed skiers’ left collector trail would occur on the west-facing, northern 0.4 acre of approximately 1 acre, 4B spruce-fir island at 11,550 feet amsl. Trees show some elevational stunting. A few structural class 1 snags are present and there is a low to moderate density structural class 2 and 3 logs.142 Boulders are present on the surface and there is a glory hole below this trail pitch. An intermittent stream channel draining a seep complex flows through that clearance area. The stream is flanked by planeleaf willows, which connect to the riparian corridor extending down the central drainage bottom past the proposed bottom terminal site of the Montezuma Bowl lift.

The proposed “center” collector trail is a natural linear corridor through the same upper elevational (11,600 to 11,850 feet amsl), open canopy (4A) spruce-fir stand that would be bisected by the proposed Montezuma Bowl lift corridor. Tree removal affecting the structural continuum of trees described above would occur along the skier’s right side of opening to widen the trail. No snags are present in the clearance area. A low density of structural class 2 and 3 logs is present.143

The proposed upper and lower, east and west hike-back collector trails, and hike-back skiing areas between, extend through mature, closed- and open canopy (4B, 4A) spruce-fir dominated forest between 11,350 and 11,650 feet amsl. On southern and west-facing slopes, lodgepole pine interspersion is more common and in some areas codominates the spruce-fir. The “Lightning Trees” on the east side of the drainage, is an historic burn primarily supporting sapling to pole stage spruce and fir trees whose density

139 Redner, 2004; USDA Forest Service, 2003a and 2005b; Thompson, 2004
140 All “trails” associated with the Proposed Action would involve tree removal - either via total clearing or incorporating the selective removal of individual trees. Trees would be flush cut and removed over the snow to reduce disturbance to ground vegetation. There would be no subsequent grading of trails.
141 Parks et al., 1997
142 Ibid.
143 Ibid.
and canopy coverage is so low that the area is considered to be a treed meadow, rather than forest.\textsuperscript{144} Standing CWD is low, while structural class 2 and 3 log density is moderate.\textsuperscript{145}

The hike-back track below the proposed Montezuma Bowl lift base terminal follows the drainage bottom and adjacent toe slopes. This route would occur over the intermittent creeks willow dominated riparian corridor and adjacent subalpine meadow supporting scattered seedling to pole stage fir, lodgepole pine, and spruce trees. In winter, only the larger sapling and pole stage trees are visible. One approximately 21-foot tall, multilayered, 15- x 40-foot spruce clump also occurs along the alignment.

**Parking Lots**

The modified Lower Overflow/ High Noon Parking Lot would be in a remnant, stage 5 spruce stand now surrounded and fragmented by Highway 6 and three parking lots. The stand supports a regenerating, multilayered canopy with all structural stages present and a moderate density of live horizontal conifer foliage. Evidence of selective, historic logging is present along with fire scars. The stand contains low to high local densities of down CWD (primarily in structural classes 3 and 2) and a low snag density (primarily in structural class 3).\textsuperscript{146} Some trees have dead tops as the result of lightning strikes. Ring analysis of a 130-foot tall, 65-cm dbh legacy tree indicated it was at least 395 years old. The stand appears to meet old-growth criteria, but the analysis was not conducted because the Forest Plan biodiversity standard for managing late-successional and old-growth forests is not an issue in Late-successional assessment area (LSAA) #11 containing the A-Basin project area.\textsuperscript{147} The stand understory supported 20 to 90 percent ground cover dominated by *Vaccinium myrtillus* and *Arnica cordifolia*, with *Luzula parviflora*, *Ligularia amplectens*, *Polemonium delicatum*, and *Ribes inerme*. A CDOT overflow pipe on the south side of Highway 6 drains spring runoff via a culvert under the Highway to a mid-point of this stand. Despite gravel fill, the seasonally wetted area supports a primarily herbaceous, forested wetland. Characteristic species include bittercress (*Cardamine cordifolia*), triangular-leaf groundsel (*Senecio triangularis*), chiming bells (*Mertensia ciliata*), brook saxifrage (*Micranthes odontoloma*), marsh marigold (*Psychrophila leptosepala*), *Luzula parviflora*, *Poa reflexa*, Carices, with a few scraggly willows and bush honeysuckle (*Lonicera involucrata*).

**AFFECTED ENVIRONMENT**

**Threatened and Endangered Plant Species**

Listed, proposed, and candidate animal and plant species that were initially considered for this project included those identified by the U.S. Fish and Wildlife Service (USFWS) as potentially occurring on the Dillon Ranger District (DRD) or potentially affected by management activities on the DRD (refer to

\textsuperscript{144} USDA Forest Service, 1995a
\textsuperscript{145} Parks et al., 1997
\textsuperscript{146} Ibid.
\textsuperscript{147} Mehl, 1992; USDA Forest Service, 2002b

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Table 3H-1). This list included one plant - Penland alpine fen mustard (Eutrema penlandii, federally threatened) - which is addressed below. A Biological Assessment was prepared for this project and is part of the project file and incorporated herein by reference.

**Penland Alpine Fen Mustard**

Federally threatened Penland alpine fen mustard has only been found in particular alpine limestone formations on the leeward side of the Mosquito Range in Park and Summit counties. There are no records of this plant outside that portion of the Mosquito Range extending from Hoosier Ridge south to Mount Sherman. This mustard is found above 12,000 feet amsl in rocky crevices where there is moisture during the growing season. It occurs in high calcium and high pH soils, which is the composition of the Leadville Limestone geological formation. That formation is generally highly mineralized and mining activities have historically occurred where this limestone is found. The plant is always found down slope from persistent snowfields that provide moisture all summer long. Mining activity appears to be the most significant threat to this plant.

<table>
<thead>
<tr>
<th>Common and Scientific Name</th>
<th>Status</th>
<th>Rationale for Occurrence(^a) (Habitat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penland alpine fen mustard, Eutrema penlandii</td>
<td>T</td>
<td>No habitat. (Rocky alpine crevices in Leadville Limestone &gt;12,000 ft.)</td>
</tr>
<tr>
<td>Uncompahgre fritillary butterfly, Boloria acrocnema</td>
<td>E</td>
<td>No habitat (alpine snow willow stands &gt;12,000 ft. on peaks ≥ 12,600 ft.)</td>
</tr>
<tr>
<td>Humpback chub, Gila cypha</td>
<td>E</td>
<td>No West Slope water depletions (far downstream in Colorado River drainage)</td>
</tr>
<tr>
<td>Bonytail chub, G. elegans</td>
<td>E</td>
<td>No West Slope water depletions (far downstream in Colorado River drainage)</td>
</tr>
<tr>
<td>Colorado pikeminnow, Ptychocheilus lucius</td>
<td>E</td>
<td>No West Slope water depletions (far downstream in Colorado River drainage)</td>
</tr>
<tr>
<td>Razorback sucker, Xyrauchen texanus</td>
<td>E</td>
<td>No West Slope water depletions (far downstream in Colorado River drainage)</td>
</tr>
<tr>
<td>Bald eagle, Haliaeetus leucocephalus</td>
<td>T</td>
<td>No breeding or winter habitat (unfrozen rivers and lakes)</td>
</tr>
<tr>
<td>Canada lynx, Lynx canadensis</td>
<td>T</td>
<td>Occasionally present in AA, potential forage/ travel habitat (montane and subalpine forests)</td>
</tr>
</tbody>
</table>

\(^a\) In Action Area (AA).

Note: Other listed and proposed species are not listed in this table because they have no affinities to action area habitats, the project area is outside of the species' range, and the Proposed Action would have no effect on the species. Species are listed phylogenetically. Federal status, listed after species, is as follows: E = Endangered, T = Threatened. Potential pre-field survey occurrence on the project area and habitat affinity is summarized for each species. Source: USFWS (2005) and Western Ecosystems, Inc.

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148 USFWS, 2005
149 Thompson, 2006a
Region Two Sensitive Plant Species

Region Two (R2) has designated “sensitive species,” representing species 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.\textsuperscript{150} The updated R2 Sensitive Species List was refined by the WRNF to produce a subset of sensitive species, including 19 plants, that may be present or potentially present on the WRNF after an analysis of all sensitive species on the overall updated R2 list (refer to Table 3H-2).\textsuperscript{151} All of these species are considered below. Based on a pre-field analysis of habitats that occur in the project area and species’ habitat affinities, nine R2 sensitive plant species were thought to have had potentially suitable habitat in the project area, elevational distributions overlapping those in the project area, or otherwise warranted a more detailed analysis. Those nine species are discussed individually below.

Information on R2 sensitive species status, distribution, and ecology was derived from Colorado Natural Heritage Program (CNHP) data base maps and reports, Natural Diversity Information System (NDIS) species mapping, personal knowledge from Forest Service botanists and biologists, various scientific studies and reports, field surveys conducted for the Proposed Action, described below, and an extensive compilation of information contained in the Forest Plan.\textsuperscript{152} On July 14, 2004, a botanical survey was conducted for federally listed and WRNF R2 sensitive plants through all project areas associated with Alternative 2 that could potentially support such species. The purpose of the survey was to gain a better understanding of the nature of the action, identify and characterize habitat types, structural stages, and plant communities affected by the Proposed Action, and search for the plant species considered in this document. Additional surveys were conducted through these areas on May 27, 2003, July 7, 2005, and February 10, 2006. Vern Phinney, USFS wildlife biologist, conducted a survey through Montezuma Bowl on September 29, 2005. Plant communities and habitats present in the project area are described above. A Biological Evaluation was prepared for this project and is available for review in the project file at the DRD.

\textsuperscript{150} USDA Forest Service, 2003b
\textsuperscript{151} USDA Forest Service, 2003a,b and 2005b; Giezentanner, 2003
\textsuperscript{152} USDA Forest Service, 2002c
Table 3H-2:
Pre-field Checklist of R2 Sensitive Plant Species that occur on the WRNF and Initial Pre-field Assessment of Potential Effects Resulting from the Proposed Action

<table>
<thead>
<tr>
<th>Common name, Scientific name</th>
<th>Rational for Potential Project Effects (Habitat Affinity)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sea pink, Armeria maritima ssp. sibirica</strong></td>
<td>No habitat (Wet sandy alpine slopes &gt;12,250 ft.)</td>
</tr>
<tr>
<td><strong>Park milkvetch, Astragalus leptaleus</strong></td>
<td>No habitat (Wet meadows/aspen; Gun. Basin, Middle Park)</td>
</tr>
<tr>
<td><strong>Wetherill milkvetch, Astragalus wetherillii</strong></td>
<td>No habitat (Eroding shale bluffs 5,250-7,400 ft.)</td>
</tr>
<tr>
<td><strong>Smooth rockcress, Braya glabella</strong></td>
<td>Pot habitat (Sparse. calcareous alpine gravels &gt;12,000 ft.)</td>
</tr>
<tr>
<td><strong>Lesser panicked sedge, Carex diandra</strong></td>
<td>No habitat (Subalpine swamps, wet meadows, w. carrs)</td>
</tr>
<tr>
<td><strong>Rocky Mountain thistle, Cirsium perplexans</strong></td>
<td>No habitat (Adobe and barren shale slopes 4,500-7,000 ft.)</td>
</tr>
<tr>
<td><strong>Clawless draba, Draba exunguiculata</strong></td>
<td>Pot. habitat (Granitic alpine fellfields 12,000-14,000 ft.)</td>
</tr>
<tr>
<td><strong>Gray’s Peak whitlow-grass, Draba grayana</strong></td>
<td>Pot. habitat (Gravelly alpine slopes 11,500-14,000 ft.)</td>
</tr>
<tr>
<td>Altai cotton-grass, Eriophorum altaicum var. neogaeum</td>
<td>No habitat (Peat wetlands &gt;9,600’, San Juan &amp; Elk Mtns.)</td>
</tr>
<tr>
<td><strong>Russet cotton-grass, Eriophorum chamissonis</strong></td>
<td>No habitat (High elevation peaty wetlands)</td>
</tr>
<tr>
<td><strong>Slender cotton-grass, Eriophorum gracile</strong></td>
<td>No habitat (Peaty wetlands &amp; saturated soils 6,900-8,000 ft.)</td>
</tr>
<tr>
<td><strong>Globe gilia, Ipomopsis globularis</strong></td>
<td>Pot. habitat (Gravelly ridgetops 12,000-14,000 ft.)</td>
</tr>
<tr>
<td><strong>Colorado tansy-aster, Machaeranthera coloradoensis</strong></td>
<td>No habitat (Sparsely vegetated sandy soils 8,100-7,800 ft.)</td>
</tr>
<tr>
<td><strong>Kotzebue’s grass-of-Parnassus, Parnassia kotzebuei</strong></td>
<td>Pot. habitat (Edges of stand. water bodies 10,000-12,400 ft.)</td>
</tr>
<tr>
<td>Harrington penstemon, Penstemon harringtonii</td>
<td>No habitat (Open sagebrush, pinyon-juniper habitats)</td>
</tr>
<tr>
<td><strong>De Beque phacelia, Phacelia scopulina var. submutica</strong></td>
<td>No habitat (Clay barrens)</td>
</tr>
<tr>
<td><strong>Porter feathergrass, Ptilagrostis porteri</strong></td>
<td>No habitat (Peaty soils in willow-tuft. hairgrass &gt;10,000 ft.)</td>
</tr>
<tr>
<td><strong>Ice cold buttercup, Ranunculus karelinii</strong></td>
<td>Pot. habitat (Ridge/Mtn. top rock, scree, &lt;12,700 ft.)</td>
</tr>
<tr>
<td>Sun-loving meadowrue, Thalictrum heliothilum</td>
<td>No habitat (Steep oil shale slopes 6,300-8,800 ft.)</td>
</tr>
</tbody>
</table>

Note: Other R2 plant 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, and Alternative 2 would have no impact on the species. Potential pre-field survey occurrence on the project area and habitat affinity is summarized for each species. Species in **bold** are potentially present and/or are discussed in the text. Plants are listed alphabetically by scientific name after USDA Forest Service (2003a, 2005a).

Source: USDA Forest Service (2003a, 2005a) and Western Ecosystems, Inc.

**Sea Pink**

Sea pink (*Armeria maritima*) is a rare plant that occurs in the vicinity of Hoosier and Webster Passes in Park and Summit counties. Sea pink grows at the base of rocky talus slopes in wet, sandy, or spongy, organic, alpine turf above 11,900 feet. This plant blooms in late June to early July and keeps its pink color for only a few weeks. The plant grows with alpine clovers that resemble this plant.
Sea pink and potential habitat for it was not detected on or adjacent to proposed disturbance areas during any botanical surveys.\textsuperscript{154} Previous rare plant surveys at A-Basin have not detected this species.\textsuperscript{155} This species is considered to be absent in proposed disturbance areas with no potential habitat present.

**Smooth Rockcress**

Smooth rockcress (\textit{Braya glabella}), or arctic braya, may have had a more general distribution in North America before being eliminated from most locations by glacial activity.\textsuperscript{156} It is now found scattered across arctic Canada and Alaska, and southward in the high mountains of British Columbia and Alberta. Smooth rockcress was discovered in Colorado in 1987. Six populations are now known in the high mountains of Gunnison, Chaffee, Park, and Pitkin counties, 1,000 miles south of the main range of this plant. One population of this species is known on the WRNF, at the south end of Pitkin County.\textsuperscript{157} Populations of this \textit{Braya} are small and found in highly calcareous soils derived from Leadville Limestone and Manitou Dolomite between 12,000 and 13,000 feet amsl. It occurs on sparsely vegetated slopes above timberline with fine gravels or on disturbed sites associated with inactive mines. Smooth rockcress flowers in July and produces fruits in late July and August.

Smooth rockcress was not detected during any of the plant surveys of alpine areas conducted specifically to detect this and other rare plants that might occur in the area.\textsuperscript{158} Previous rare plant surveys at A-Basin have not detected this species.\textsuperscript{159} This species is considered to be absent in proposed disturbance areas with no potential habitat present.

**Clawless Draba**

Clawless draba (\textit{Draba exunguiculata}) is a Colorado endemic that grows on rocky, gravelly and talus slopes and fellfields in soils usually of granitic origin. Its elevational range is 12,000 to 14,000 feet amsl on exposed ridges and crests. Clawless draba tolerates exposure to strong winter winds and grows where few alpine plants are found. It blooms (yellow petals) in late June to July and begins to sets fruit early to middle August. It is known from Boulder, Gilpin, Clear Creek, El Paso, Grand, Summit, Park, and Lake counties.

One clawless draba plant was located during the July 14, 2004 botanical survey on the cut slope of the historic jeep trail near the weather instruments site, approximately 496 feet on the opposite side of the upper Lenawee lift terminal from the proposed access and utility corridor and upper Montezuma Bowl lift terminal.\textsuperscript{160} Habitats in the proposed disturbance areas are far more vegetated than the area where this

\textsuperscript{154} Redner, 2004
\textsuperscript{155} Redner, 1996; USDA Forest Service, 1999a
\textsuperscript{156} Colorado Native Plant Society, 1997; Spackman et al., 1997
\textsuperscript{157} USDA Forest Service, 2002c
\textsuperscript{158} Redner, 2004
\textsuperscript{159} Redner, 1996; USDA Forest Service, 1999a
\textsuperscript{160} Thompson, 2004
species was found, although some adjacent, sparsely vegetated areas upslope of the proposed access and utility are potential, but unoccupied habitat. Clawless draba was not detected in or adjacent to any areas proposed for disturbance.\textsuperscript{161} Previous rare plant surveys at A-Basin have not detected this species.\textsuperscript{162} This species is considered to be absent in proposed disturbance areas with no potential habitat present.

**Gray’s Peak Whitlow-grass**

Gray’s Peak whitlow-grass (\textit{Draba grayana}) is another endemic Colorado draba that grows on gravelly alpine slopes and fellfields between 11,500 and 14,000 feet amsl. This plant does not tolerate much exposure to the substantial alpine winds and requires moderate soil moisture. It is found blooming in protected microhabitats, such as a depressed surface area or adjacent to small boulders, and is generally protected by larger plants. It blooms (yellow petals) in late July-August and sets fruit in August-September. It is known from Larimer, Gilpin, Clear Creek, Grand, Summit, Park, and Lake counties.

Gray’s Peak whitlow-grass was not detected during field surveys specifically looking for this and other rare plants that might occur in areas proposed for disturbance.\textsuperscript{163} This species is considered to be absent in proposed disturbance areas with no potential habitat present - previous rare plant surveys at A-Basin have not detected this species.\textsuperscript{164}

**Globe Gilia**

Globe gilia (\textit{Ipomopsis globularis}) is a rare plant found in the Hoosier Pass and Blackpowder Pass areas and in the Mosquito Range in Lake, Park, and Summit counties.\textsuperscript{165} Globe gilia grows along windswept ridge tops, in fellfield habitats, and gravelly calcareous soils from 11,500 to 13,500 feet amsl. This plant generally is found growing near alpine cushion plants on Leadville Limestone or Manitou dolomite. It flowers in July to early August and fruits in August.

No globe gilia was detected during the plant surveys of alpine areas conducted specifically to detect this and other rare plants that might occur in the area.\textsuperscript{166} This species is considered to be absent in proposed disturbance areas with no potential habitat present - previous rare plant surveys at A-Basin have not detected this species.\textsuperscript{167}

\textsuperscript{161} Redner, 2004
\textsuperscript{162} Redner, 1996; USDA Forest Service, 1999a
\textsuperscript{163} Redner, 2004
\textsuperscript{164} Redner, 1996; USDA Forest Service, 1999a
\textsuperscript{165} Colorado Native Plant Society, 1997; Spackman et al., 1997
\textsuperscript{166} Redner, 2004
\textsuperscript{167} Redner, 1996; USDA Forest Service, 1999a
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Colorado Tansy-Aster

Colorado tansy-aster (*Machaeranthera coloradoensis*) grows in gravelly areas in higher mountain parks, slopes, and rock outcrops up to dry alpine tundra.\(^{168}\) Its elevational range is between 8,500 and 12,500 feet amsl where the plant flowers in July to early August. This endemic to south-central Wyoming and Colorado is known to occur in Gunnison, Hinsdale, La Plata, Lake, Mineral, Park, Pitkin, Saquache, and San Juan counties.

Botanical surveys were conducted knowing the habitat affinities and potential occurrence of this species on the ski area. However, suitable habitat for this tansy-aster was not located in any of the areas proposed for disturbance.\(^{169}\) This species is considered to be absent in proposed disturbance areas with no potential habitat present - previous rare plant surveys at A-Basin have not detected this species.\(^{170}\)

Kotzebue's Grass-of-Parnassus

Kotzebue grass-of-parnassus (*Parnassia kotzebuei*) is a forb usually growing in wet, moss-covered sandy soil or in rocky ledges at the edges of ponds, lakes, and pools in streams in the upper subalpine life zone into the alpine.\(^{171}\) Elevational ranges are 10,000 to 12,000 feet amsl and 11,000 to 12,400 feet amsl.\(^{172}\) Small, white solitary flowers atop plants up to 10 centimeters tall open in June-July. The species occurs in approximately 15 populations in four areas of Colorado, however it is only known on the WRNF from two sites west of Hoosier Pass. The total population on the WRNF ranges from 80 to 1,400 individuals. This plant is a WRNF species of viability concern. The concern for this species on the Forest is because habitat is limited, habitat is vulnerable to management activities that may adversely affect it, and because known breeding populations are small and isolated.\(^{173}\)

Botanical surveys were conducted knowing the habitat affinities and potential occurrence of this species on the ski area. None of the proposed disturbance areas supports suitable habitat for this species. Potential, but unoccupied habitat for this species may be present along portions of the intermittent creek in the linear meadow west of the linear forest containing the proposed Skier’s Right Collector trail. This plant was not located in this potential habitat during July 14, 2004 and July 7, 2005 botanical surveys.\(^{174}\) This species is considered to be absent in proposed disturbances areas with no potential habitat present - previous rare plant surveys at A-Basin have not detected this species.\(^{175}\) However, skiing and snow management over the top of this plant would have no adverse effect if it was present in terrain outside of ground disturbance areas.

\(^{168}\) Spackman et al., 1997

\(^{169}\) Redner, 2004

\(^{170}\) Redner, 1996; USDA Forest Service, 1999a

\(^{171}\) Spackman et al., 1997; USDA Forest Service, 2002d

\(^{172}\) Spackman et al., 1997; USDA Forest Service, 2002c

\(^{173}\) Ibid.

\(^{174}\) Redner, 2004

\(^{175}\) Redner, 1996; USDA Forest Service, 1999a
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**Colorado False Needle Grass**

Porter feathergrass (*Ptilagrostis mongholica*, aka Colorado false needle grass) inhabits peat hummocks in willow carrs (high altitude wet areas dominated by willows) or peat hummocks with scattered willows between 9,200 and 12,000 feet amsl, but only where the valley floor is nearly flat, persistently moist, and exposed to the south and east. This grass has been found in El Paso, Lake, Park, and Summit counties where it is also associated with Deschampsia, Carex, Betula glandulosa, and Pentaphylloides. Seeds mature from mid-August to early September.

No Porter feathergrass was detected during any plant surveys of the project area conducted specifically to detect this and other rare plants that might occur in the area. Those surveys not only covered ground disturbance areas associated with the present proposal, but also other potentially suitable habitats within the SUP area. While *Deschampsia* communities and willow stands are present in some alpine areas of Montezuma Bowl, they are located on relatively steep slopes where peat communities have no opportunity to develop. This species is considered to be absent in areas proposed for disturbance with no potential habitat present. Previous rare plant surveys at A-Basin have also not detected this species.

**Ice Cold Buttercup**

Ice cold buttercup (aka tundra buttercup; *Ranunculus karelinii* [*R. gelidus* spp. *grayi*, *R. grayi*]) grows in very cold, exposed sites among small-diameter scree on high alpine ridges, peaks, and slopes, especially in or near late-lying snow banks or associated rivulets. Elevations range from 12,700 to 14,100 feet amsl. This species occurs in three sites on the WRNF, all in Summit County: (1) Peak 10, (2) east of Montezuma, and (3) on Grays Peak. The total known population on the Forest is < 100 plants. The viability concern for this species on the Forest is because there are few populations, populations are small and isolated, and habitat is vulnerable to management activities that may adversely affect it.

No ice cold buttercups were detected during the plant surveys of alpine areas conducted specifically for this and other rare plants that might occur in the area. Although portions of the A-Basin project area occur relatively close to the Grays Peak population, the specific habitat conditions required to support this species are not present. The highest proposed disturbance area, the access and utility corridor proposed between the Lenawee and upper Montezuma Bowl lift terminals, would occur at 12,465 feet amsl, slightly below the lowest known elevational range of this species. Previous rare plant surveys at A-Basin have not

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176 Colorado Native Plant Society, 1997; Spackman et al., 1997; USDA Forest Service, 2002c  
177 Redner, 1996; USDA Forest Service, 1999a  
178 Spackman et al., 1997; USDA Forest Service, 2002c  
179 USDA Forest Service, 2002c  
180 Ibid.  
181 Redner, 2004  
182 Ibid.
detected this species. This species is considered to be absent in proposed disturbance areas with no potential habitat present.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

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

**Alternative 1 - No Action**

The No Action Alternative reflects a continuation of existing operations and management practices at A-Basins without major changes, additions, or upgrades on NFS land (other than those previously approved, yet to be implemented mountain improvements). Effects of previously approved mountain improvements have been considered in prior documents and are considered herein. The current status of plant species and communities and how they have been affected by conditions under this alternative are described above in the Affected Environment section.

The No Action Alternative would have no additional direct or indirect impacts or benefits to the plants and habitats addressed in this document (refer to tables 3H-3 and 3H-4). Furthermore, Alternative 1 would have no direct or indirect impacts on any federally listed or R2 sensitive plant species.

**Alternative 2**

Alternative 2 would result in permanent and short- to long-term disturbances (i.e., before reclamation restored areas to pre-disturbance conditions) to 16.8 acres of habitats within A-Basin’s SUP area (including the 3.1 acres of tree thinning associated with the lynx treatment area). This includes approximately 9.2 acres of tree clearing and thinning (including the 3.1 acres of tree thinning associated with the lynx treatment area) and an additional 7.4 acres of grading non-forested areas. The reader is referred to tables 3H-3 and 3H-5 for a detailed breakdown of disturbance acreage associated with various project components.

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183 Redner, 1996; USDA Forest Service, 1999a
184 Thompson, 2006a and 2006b
### Table 3H-3:
Areas of Tree Removal, Ground Disturbance, and Grooming
Associated with the Proposed Action

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MONTEZUMA BOWL LIFT AND SUMMER ACCESS ROUTE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing without grading (along lift corridor)</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Tree Clearing and Grading (at bottom terminal)</td>
<td>0</td>
<td>0.3</td>
</tr>
<tr>
<td>Grading Non-forested areas (summer access route, adjacent depression, and upper and bottom terminals)</td>
<td>0</td>
<td>1.4</td>
</tr>
<tr>
<td>Total Disturbance</td>
<td>0</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>MONTEZUMA BOWL TRAILS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing without grading</td>
<td>0</td>
<td>1.2</td>
</tr>
<tr>
<td>Tree Thinning without grading</td>
<td>0</td>
<td>1.7</td>
</tr>
<tr>
<td>Total Disturbance</td>
<td>0</td>
<td>2.9</td>
</tr>
<tr>
<td><strong>MONTEZUMA BOWL HIKE-BACK TRACK</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing without grading</td>
<td>0</td>
<td>0.03</td>
</tr>
<tr>
<td>Total Disturbance</td>
<td>0</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>EXHIBITION LIFT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing without grading</td>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td>Grading Non-forested areas</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Total Disturbance</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>PARKING LOT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Clearing and Grading</td>
<td>0</td>
<td>2.3</td>
</tr>
<tr>
<td>Grading Non-forested areas</td>
<td>0</td>
<td>5.5</td>
</tr>
<tr>
<td>Total Disturbance</td>
<td>0</td>
<td>7.8</td>
</tr>
<tr>
<td><strong>GROOMING AREAS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expanded Grooming in Montezuma Bowl</td>
<td>0</td>
<td>36.7</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TREE CLEARING WITHOUT GRADING</strong></td>
<td>0</td>
<td>1.83</td>
</tr>
<tr>
<td><strong>TREE THINNING WITHOUT GRADING</strong></td>
<td>0</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>TREE CLEARING AND GRADING</strong></td>
<td>0</td>
<td>2.6</td>
</tr>
<tr>
<td><strong>TOTAL FOREST AFFECTED</strong></td>
<td>0</td>
<td>6.13</td>
</tr>
<tr>
<td><strong>GRADING NON-FORESTED AREAS</strong></td>
<td>0</td>
<td>7.4</td>
</tr>
<tr>
<td><strong>TOTAL NON-FOREST AFFECTED</strong></td>
<td>0</td>
<td>7.4</td>
</tr>
<tr>
<td><strong>TOTAL FOREST AND NON-FOREST AFFECTED</strong></td>
<td>0</td>
<td>13.7</td>
</tr>
<tr>
<td><strong>GROOMING</strong></td>
<td>0</td>
<td>36.7</td>
</tr>
</tbody>
</table>

a - Tree clearing acreage based on September 2003 aerial photography at 0.5-square foot pixel resolution. Refer to Table 3H-5 for more detailed tree clearing information associated with Alternative 2, including the selective removal of individual trees. Note the numbers in this table do not include the 3.1 acres of tree thinning associated with the lynx treatment area (see Section 2). Source: SE GROUP and Western Ecosystems, Inc.
### Table 3H-4:
**Determination Summary of Effects on R2 Sensitive Plant Species Resulting from the Proposed Action**

<table>
<thead>
<tr>
<th>Common name, Scientific name</th>
<th>Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alt. 1</td>
</tr>
<tr>
<td><strong>PLANTS</strong></td>
<td></td>
</tr>
<tr>
<td>Sea pink, <em>Armeria maritima</em> ssp. sibirica</td>
<td>NI</td>
</tr>
<tr>
<td>Park milkvetch, <em>Astragalus leptaleus</em></td>
<td>NI</td>
</tr>
<tr>
<td>Wetherill milkvetch, <em>Astragalus wetherillii</em></td>
<td>NI</td>
</tr>
<tr>
<td>Smooth rockcress, <em>Braya glabella</em></td>
<td>NI</td>
</tr>
<tr>
<td>Lesser paniced sedge, <em>Carex diandra</em></td>
<td>NI</td>
</tr>
<tr>
<td>Rocky Mountain thistle, <em>Cirsium perplexans</em></td>
<td>NI</td>
</tr>
<tr>
<td>Clawless draba, <em>Draba exunguiculata</em></td>
<td>NI</td>
</tr>
<tr>
<td>Gray’s Peak whitlow-grass, <em>Draba grayana</em></td>
<td>NI</td>
</tr>
<tr>
<td>Altai cotton-grass, <em>Eriophorum altaicum</em> var. neogaeum</td>
<td>NI</td>
</tr>
<tr>
<td>Russet cotton-grass, <em>Eriophorum chamissonis</em></td>
<td>NI</td>
</tr>
<tr>
<td>Slender cotton-grass, <em>Eriophorum gracile</em></td>
<td>NI</td>
</tr>
<tr>
<td>Globe gilia, <em>Ipomopsis globularis</em></td>
<td>NI</td>
</tr>
<tr>
<td><strong>Colorado tansy-aster, <em>Machaeranthera coloradoensis</em></strong></td>
<td>NI</td>
</tr>
<tr>
<td>Kotzebue’s grass-of-Parnassus, <em>Parnassia kotzebuei</em></td>
<td>NI</td>
</tr>
<tr>
<td>Harrington penstemon, <em>Penstemon harringtonii</em></td>
<td>NI</td>
</tr>
<tr>
<td>De Beque phacelia, <em>Phacelia scopulina</em> var. submutica</td>
<td>NI</td>
</tr>
<tr>
<td>Porter feathergrass, <em>Ptilagrostis porteri</em></td>
<td>NI</td>
</tr>
<tr>
<td><strong>Ice cold buttercup, <em>Ranunculus karelinii</em></strong></td>
<td>NI</td>
</tr>
<tr>
<td>Sun-loving meadowrue, <em>Thalictrum heliophilum</em></td>
<td>NI</td>
</tr>
</tbody>
</table>

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 discussed individually in the BE (Thompson, 2006b). 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 or a loss of species viability range-wide.

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.
### Table 3H-5:
Tree Removal Associated with the Proposed Action

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Acres(^a)</th>
<th>Type(^b)</th>
<th>Structural Stage(^b)</th>
<th>Lynx Habitat Classification(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LIFTS AND TERMINALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition lift</td>
<td>0.1</td>
<td>SF</td>
<td>4B</td>
<td>Other</td>
</tr>
<tr>
<td>Montezuma Bowl lift</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lift Line</td>
<td>0.5</td>
<td>SF</td>
<td>4A</td>
<td>Other</td>
</tr>
<tr>
<td>Lower Terminal(^d)</td>
<td>0.3</td>
<td>SF</td>
<td>&lt;4A(^d)</td>
<td>WFH</td>
</tr>
<tr>
<td>Total</td>
<td>0.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MONTEZUMA BOWL COLLECTOR TRAILS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skier’s Center Collector Trail</td>
<td>0.8</td>
<td>SF</td>
<td>4B, 4A</td>
<td>Other (0.1), WFH (0.7)</td>
</tr>
<tr>
<td>Skier’s Left Collector Trail</td>
<td>0.4</td>
<td>SF</td>
<td>4A</td>
<td>WFH</td>
</tr>
<tr>
<td>Skier’s Right Collector Trail</td>
<td>1.7</td>
<td>SF w LP</td>
<td>4B</td>
<td>WFH</td>
</tr>
<tr>
<td>Non-Groomed Collector Trails(^e)</td>
<td>Approx. 40-60 trees(^e)</td>
<td>SF</td>
<td>4B, 4A</td>
<td>WFH</td>
</tr>
<tr>
<td>Total</td>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MONTEZUMA BOWL SNOW GROOMING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hike-back Track(^f)</td>
<td>0.03 plus approx. 20-30 trees(^f, d)</td>
<td>SF</td>
<td>2, 4C(^f, d)</td>
<td>Other</td>
</tr>
<tr>
<td>Total</td>
<td>0.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PARKING LOTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modified Lower Overflow/ High Noon Lot</td>
<td>2.3</td>
<td>SF</td>
<td>5</td>
<td>Other</td>
</tr>
<tr>
<td>Total</td>
<td>2.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL FOREST AREA AFFECTED</strong></td>
<td>6.13 plus approx. 60-90 trees g</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(a\) - Tree clearing acreage based on September 2003 aerial photography at 0.5-square foot pixel resolution and field surveys.

\(b\) - Forest stand characterization was based on field surveys and USFS (USDA Forest Service, 1981, 1993 and 1995). SF = Engelmann spruce (Picea engelmannii) and subalpine fir (Abies bifolia); LP = lodgepole pine (Pinus contorta).

\(c\) - Field verified after USFS (USDA Forest Service, 2002). WFH = winter foraging habitat.

\(d\) - Some tree removal would affect disarticulated tree clumps that do not meet minimum canopy coverage to qualify as forest (USDA Forest Service, 1995). For wildlife considerations, structural stage classification applies to the area below the tree clump’s canopy.

\(e\) - East and west collector trails, totaling 3,600 and 3,400 feet along the top and bottom of the hike back terrain, respectively. These two trails would only be wide enough for a ski patroller with a toboggan to safely return to the bottom terminal. Because the grade of these trails could vary slightly, the alignment could avoid virtually all trees and require minimal tree removal.

\(f\) - Tree removal would affect one, 0.03-acre disarticulated tree clump and individual Stage 2-3 trees along the 1,100-foot long hike-back track.

\(g\) - Approx. 60 to 90 trees along 8,100 feet of track.

Note the numbers in this table do not include the 3.1 acres of tree thinning associated with the lynx treatment area.

Source: SE GROUP and Western Ecosystems, Inc.
**Chapter 3: Affected Environment and Environmental Consequences**

**H. Vegetation**

**Threatened and Endangered Plant Species**

Botanical surveys were conducted through proposed disturbance areas, including the access and utility corridor and Montezuma Bowl lift alignment, on July 19, 2004 when Penland alpine fen mustard and other sensitive alpine plant species would have been most detectable.\(^{185}\) While the proposed disturbance areas extend into the alpine, the project area does not overlap the Leadville Limestone geological formation, the only formation in which Penland alpine fen mustard has been found. Alpine areas that would be directly or indirectly disturbed associated with the Proposed Action would not occur in those specific potential habitats for this species (i.e., in rocky crevices down slope from persistent snowfields that provide moisture all summer long).\(^{186}\) Surveys of a similar adjacent habitat to proposed alpine disturbance areas at the proposed Montezuma Bowl lift’s upper terminal and 10- to 12-foot wide, graded access and utility corridor did not contain potential habitat for this species.\(^{187}\) The Forest Service concluded that facilities and operations associated with the 1999 A-Basin Master Development Plan would have no effect on Penland alpine fen mustard or its habitat.\(^{188}\) Alternative 2 would have no direct or indirect impacts on Penland alpine fen mustard or on any other listed or proposed plant species. No portion of the project area has been designated critical plant habitat by the Secretary of the Interior.\(^{189}\)

**Region Two Sensitive Plant Species**

Because no R2 sensitive plant species were detected in areas proposed for disturbance, Alternative 2 would have no direct impact on any R2 sensitive plant species (refer to Table 3H-3).\(^{190}\) Alternative 2 would be consistent with all applicable Forest Plan standards and guidelines related to plants. Alternative 2 should have no indirect impacts on any R2 sensitive plant species.\(^{191}\)

**CUMULATIVE EFFECTS**

No past, present or reasonably foreseeable future activities have been identified that, on conjunction with proposed projects at A-Basin, have potential to cumulatively affect vegetation resources.

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

Tree removal related to parking lot improvements, and approximately 3.8 acres of tree removal in Montezuma bowl for construction of the proposed lift line and skier collector trails, would represent an irretrievable effect to vegetation resources within the SUP area. However, this is not considered an irreversible commitment because vegetation is a renewable resource.

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\(^{185}\) Redner, 2004  
\(^{186}\) Ibid.  
\(^{187}\) Thompson, 2004  
\(^{188}\) USDA Forest Service, 1999a  
\(^{189}\) PL-93-205, Section 4, 1978  
\(^{190}\) USDA Forest Service, 2003a,b and 2005b  
\(^{191}\) USDA Forest Service, 2002a and 2006a
I. WATERSHED RESOURCES

SCOPE OF THE ANALYSIS

The scope of the analysis of water resources focuses on the Lenawee Creek and North Fork Snake River watersheds on NFS and adjacent lands.

FOREST PLAN DIRECTION

Pursuant to the Forest Plan, as amended, stream health standards and design criteria are mandated by the Region 2 Watershed Conservation Practices Handbook (WCPH). The WCPH contains several management measures of relevance regarding stream health and water resources effects:

**Applicable WCPH Management Measures**

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

3. In the *water influence zone* (WIZ) next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian ecosystem condition.

5. Conduct actions so that stream pattern, geometry, and habitats maintain or improve long-term stream health.

6. Maintain long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function.

The Forest Plan also outlines specific Forest-wide and Management Area 8.25 watershed standards, outlined as follows.

**Forest-Wide Standards**

1. In each stream currently supporting a self-sustaining fish population, ensure that projects maintain sufficient habitat, including flow, for all life history stages of native and desired non-native species.

**Management Area 8.25 (Ski Areas – Existing and Potential)**

3. Snow management, including snow farming, will be conducted in a manner that prevents slope failures and gully erosion, as well as bank erosion and sediment damage in receiving waters.

192 USDA Forest Service, 2002a and 2006g
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I. Watershed Resources

AFFECTED ENVIRONMENT

Climate

For a definitive and complete description of the existing hydrologic characteristics at A-Basin and its vicinity, refer to the affected environment section of the *Arapahoe Basin Master Development Plan Final Environmental Impact Statement*, which is incorporated within this document by reference.\(^{193}\) A-Basin is situated at the headwaters of the Snake River and occupies elevations ranging from 11,000 to 12,400 feet (amsl). Annual precipitation (expressed in inches of water equivalent) totals approximately 31 inches per year.\(^{194}\) The annual mean temperature is approximately 30 degrees Fahrenheit. The maximum mean monthly temperature of 49 degrees Fahrenheit occurs in July, while the minimum mean monthly temperature of 12 degrees Fahrenheit occurs in January.

Stream Health

The north aspect of A-Basin, where all existing lift-served terrain is located, is tributary to the North Fork of the Snake River. Terrain in Montezuma Bowl is tributary to the Snake River mainstem. For evaluation and management purposes, the WRNF measures and analyzes stream health for watersheds that contain at least a third-order or larger channel network. A summary of the watersheds containing third-order or larger streams that reside primarily within the A-Basin SUP area is shown in Table 3I-1.

<table>
<thead>
<tr>
<th>Watershed</th>
<th>Tributary to:</th>
<th>Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arapahoe Basin</td>
<td>North Fork Snake River</td>
<td>830</td>
</tr>
<tr>
<td>Lenawee</td>
<td>Snake River Mainstem</td>
<td>670</td>
</tr>
<tr>
<td>North Fork Snake River</td>
<td>Snake River Mainstem</td>
<td>10,210</td>
</tr>
</tbody>
</table>

The watershed analysis for this document focuses on the Lenawee watershed, the third-order watershed in which most of the proposed project activities would occur. The upgrade of the Exhibition lift and the improvements to the High Noon parking lot facilities would occur within the Arapahoe Basin watershed. Meanwhile, the improvements to the High Noon parking lot facilities would occur within the main North Fork Snake River watershed.

Stream Health Definitions

As described above, the Forest Plan refers to the WCPH for direction on projects that affect water resources. The WCPH mandates several management measures of relevance regarding stream health and

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\(^{193}\) USDA Forest Service, 1999a

\(^{194}\) Ibid.
water resources effects. To facilitate the evaluation of stream health compliance in the context of the WCPH management measures, the WCPH outlines several key definitions relevant to the quantification of stream health.\textsuperscript{195}

*Stream Health*: The condition of a stream is compared to reference conditions for a stream with the same type of geology. Comparisons are made of metrics (physical and biological attributes that are quantifiable via measurement or observation) such as channel geometry, large woody debris, substrate, bank stability, flow regime, water chemistry, and/or aquatic biota.

*Stream Health Class*: A category of stream health. Three classes are recognized in the Rocky Mountain Region: Robust, At-risk and Diminished. These classes are recommended to be used for assessing long-term stream health and impacts from management activities.

*Robust Stream Health*: A stream that exhibits high geomorphic, hydrologic and/or biotic integrity relative to its natural potential condition. For a quantitative analysis, high integrity is indicated by conditions that are 74 to 100 percent of a reference condition… Physical, chemical and/or biologic conditions suggest that State assigned water quality (beneficial designated or classified) uses are supported.

*At-Risk Stream Health*: A stream that exhibits moderate geomorphic, hydrologic and/or biotic integrity relative to its natural potential condition (as represented by a suitable reference condition). For a quantitative analysis, moderate integrity is indicated by conditions that are 59 to 73 percent of a reference condition… Physical, chemical and/or biologic conditions suggest that State assigned water quality (beneficial, designated or classified) uses are at risk and may be threatened.

*Diminished Stream Health*: A stream that exhibits low geomorphic, hydrologic and/or biotic integrity relative to its natural potential condition (as represented by a suitable reference condition). For a quantitative analysis, moderate integrity is indicated by conditions that less than 58 percent of a reference condition… Physical, chemical and/or biologic conditions suggest that State assigned water quality (beneficial, designated or classified) uses may not be supported.

In classifying the status of stream health, the EPA examines a continuum of both biological and habitat conditions as a percentage of reference conditions, in order to evaluate overall attainment of the beneficial use for aquatic life.\textsuperscript{196} The WRNF assigns a stream health classification using habitat criteria. The classifications are assigned based on the observed habitat condition as a percentage of reference, or expected, conditions. Reference conditions are described by the EPA as follows:

\textsuperscript{195} USDA Forest Service, 2006g
\textsuperscript{196} USEPA, 1999
Inasmuch as the reference condition is characterized by a population of available data, for the purposes of evaluating conditions in comparison to WCPH standards, the reference value is defined by the value corresponding to the 85th percentile of the reference population. The following table outlines the Region 2 habitat stream health classifications as a function of observed percentage of reference conditions:

<table>
<thead>
<tr>
<th>Habitat Condition % of Reference</th>
<th>Habitat Condition Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>74 - 100%</td>
<td>Robust</td>
</tr>
<tr>
<td>59 - 73%</td>
<td>At-Risk</td>
</tr>
<tr>
<td>&lt; 59%</td>
<td>Diminished</td>
</tr>
</tbody>
</table>

Source: USDA Forest Service, 2006g

Throughout this document, analysis of stream health is conducted according to the definitions of stream health classes outlined in Table 3I-2. In order to characterize the existing status of stream health, the WRNF engaged in intensive field stream sampling surveys during the 2002-2004 field seasons, utilizing a Forest Service Region 1/Region 4 survey methodology for measuring and quantifying specific stream health metrics. The WRNF collected data for 21 project streams at six ski areas, and 21 reference streams across the Forest. The WRNF utilizes a stream sampling survey methodology for measuring and quantifying specific stream health metrics, including fine sediment, large woody debris frequency, residual pool depth, undercut banks, and unstable banks. Reference stream reaches (exhibiting a lesser degree of human impact, with similar morphometry, geology, aspect and slope) were surveyed to provide an analytical control against which to compare the conditions evident in response reaches. Concurrently, response stream reaches were surveyed in areas (usually within lower elevations of affected watersheds) that were judged to reflect the effects caused by management and project activities. Procedurally, reference and response reaches were sampled at a minimum third-order watershed scale.

**Management Effects to Stream Health**

**Metric:**

Unstable banks: A stream bank showing evidence of the following: breakdown (clumps of bank are broken away and banks are exposed); slumping (banks have slipped down); tension cracking or fracture

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197 Ibid.
198 Overton et al., 1997
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(a crack visible on the bank); or vertical and eroding (the bank is mostly uncovered, less than 50 percent covered by perennial vegetation, roots, rocks of cobble size or larger, logs of 0.1 meter in diameter or larger, and the bank angle is steeper than 80 degrees from the horizontal). Undercut banks are considered stable unless tension fractures show on the ground surface at the back of the undercut. 199

Causal Mechanism(s):

Channel Network Extension: Additional roadside drainages frequently connect directly to the stream channel and result in a net increase in the length of the existing channel network within the watershed. This increases the efficiency of flow routing within the watershed, increasing peak flows and subsequent erosion and sediment transport. 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”. Forest roads are usually a primary source of channelized connection between disturbed soils (the road surface) and the stream channel. Because roadside drainage ditches provide an efficient mechanism for capturing runoff, and frequently drain directly to a stream system, a direct link between the road-generated sediment source and the stream system is easily created. A second potential source of connected disturbance could be sparsely vegetated ski trails with drainage waterbars that connect directly to the stream system.

Connected Graded Terrain: In terms of the effect of proposed management activities upon bank stability conditions in affected stream reaches, ultimately the area of disturbance and/or snowmaking that is directly connected to the stream system is the variable of management concern. As discussed above, the WCPH defines CDA as follows: “High-runoff areas like roads and other disturbed sites that discharge surface runoff into a stream or lake.” Based on field observations of high surface flows emanating from graded ski trails during runoff conditions, where ski trail drainage and waterbars route snowmelt flow directly to the stream, these graded areas meet the WCPH definition of a connected disturbed area.

The WCPH clearly documents the relationship between the connection of disturbed areas and effects to peak flows. Likewise, the effect of channel network extension and the increased efficiency of hydraulic routing upon peak flows and stream health is well documented by Wemple, as well as several other studies referenced in the Zero Code of the WCPH. 200

Metric:

Channel Sedimentation (Percent Fines and Residual Pool Depth): The effect of land disturbances such as roads, roadside drainages, ski trail waterbars, and utilities corridors within forested watersheds tend to cause an increase in exposed and compacted surface soils and therefore increased erosion and sediment transport. Sediment transport within the stream network of the watershed is often indicated by higher

199 USDA Forest Service, 2005b
200 Wemple, 1994; Burroughs and King, 1989; Troendle and Olsen, 1994
percentages of fine-grained particles within the channel substrate. Fine sediment deposition can diminish habitat by aggradation, or filling in, of pool systems. Pools are important components of habitat for many fish species and other aquatic organisms. Filling by fines affects pool habitat by reducing volume, particularly during low flow conditions, and obliterating substrate cover.

**Causal Mechanism:**

*Connected Disturbed Area (CDA):* 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 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. CDA provides a measure of the extent to which a stream reach is influenced by direct, channelized connections between disturbed soils and the stream network itself.  

**Metric:**

*Wood Frequency:* Sustainable woody debris recruitment is recognized as an important riparian function in mountain channels. Coarse woody debris has several important functions:

- Standing dead trees provide habitat for nesting species in the riparian zone and contribute detritus and insects to streams.
- Once in streams, coarse woody debris maintains channel structure by storing sediment and encouraging pool scour. It helps reduce stream energy by interrupting the continuous slope of channel beds and creating turbulence.
- In streams supporting fisheries, coarse woody debris also helps provide stable fish habitat by retaining spawning gravel and by serving as rearing cover.

**Causal Mechanism(s):**

*Vegetation Removal in Water Influence Zone (WIZ):* Recruitment of coarse woody debris is dependent upon maintenance of riparian vegetation structure and function. Removal of vegetation within the WIZ has been demonstrated to have a negative impact upon maintenance of adequate wood frequency. In addition, culverts present an obstacle to woody debris transport within the stream system. Because culverts must be periodically cleared of obstructions caused by large and small woody debris, they constitute sites of net woody debris loss from the stream system.

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201 Ibid.
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Lenawee Watershed

The WRNF has channel survey for a population of several class Aa+ reference streams, which has been supplemented by surveys completed by Colorado State University. Based on the reference values evaluated for this data population, Table 3I-3 outlines the stream health classifications for various metrics for class Aa+ channels:

<table>
<thead>
<tr>
<th>Class</th>
<th>Fine Sediment</th>
<th>Residual Pool Depth</th>
<th>Unstable Banks</th>
<th>Wood Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(%)</td>
<td>(m)</td>
<td>(%)</td>
<td>(pieces/100m)</td>
</tr>
<tr>
<td>Number of reference reaches</td>
<td>(n=10)</td>
<td>(n=6)</td>
<td>(n=20)</td>
<td>(n=6)</td>
</tr>
<tr>
<td>Robust</td>
<td>&lt; 24</td>
<td>&gt; 0.19</td>
<td>&lt; 14.0</td>
<td>&gt; 8</td>
</tr>
<tr>
<td>At Risk</td>
<td>24 - 27</td>
<td>0.15 - 0.19</td>
<td>14.0 – 15.8</td>
<td>6 - 8</td>
</tr>
<tr>
<td>Diminished</td>
<td>&gt; 27</td>
<td>&lt; 0.15</td>
<td>&gt; 15.8</td>
<td>&lt; 6</td>
</tr>
</tbody>
</table>

Source: USDA Forest Service, 2006d

Within the Lenawee Creek watershed, in which the proposed Montezuma Bowl improvements would occur, the WRNF has surveyed stream health data for one reach on Lenawee Creek. The survey field work for this particular reach was completed by Colorado State University. The reach is located near the mouth of Lenawee Creek, extending from immediately above the powerline utility corridor that parallels Montezuma Road approximately 760 feet northeast and upgradient. The stream health survey results for the Lenawee Creek response reach are outlined Table 3I-4:

<table>
<thead>
<tr>
<th>Category</th>
<th>Fine Sediment</th>
<th>Residual Pool Depth</th>
<th>Unstable Banks</th>
<th>Wood Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(%)</td>
<td>(m)</td>
<td>(%)</td>
<td>(pieces/100m)</td>
</tr>
<tr>
<td>Lenawee Creek Measured Values</td>
<td>17</td>
<td>0.17</td>
<td>11.1</td>
<td>30</td>
</tr>
<tr>
<td>Health Class</td>
<td>Robust</td>
<td>At Risk</td>
<td>Robust</td>
<td>Robust</td>
</tr>
</tbody>
</table>

Source: USDA Forest Service, 2006c

As shown in the table above, the data collected for the Lenawee reach indicate Robust stream health with respect to fine sediment, woody debris, and unstable banks. Indeed, because of the minimal level of historic human influence within the watershed, and based on the stream health survey results, Lenawee Creek was identified by the WRNF as a reference reach, a population of minimally-impacted stream that provides an analytical reference point against which to judge the effects of existing and proposed watershed management. The value for residual pool depth is shown to reside within the At-Risk category, however, WRNF analysis has indicated that in general, this metric is not highly responsive to
management activities within the watersheds of high-gradient channel systems, which tend to flush fine sediments downstream, where they are deposited within lower-gradient reaches.

Existing Connected Disturbed and Connected Graded Area

Because little to no human-related land surface impacts exist within the Lenawee watershed, it was not included in Forest-wide Connected Disturbed Area and Connected Graded Area surveys conducted in 2004 and 2005.

Arapahoe Basin Watershed

Existing Stream Health Conditions

The WRNF does not have field-surveyed stream data available for the current set of stream health metrics utilized within the WCPH. As noted in the 1999 EIS, the stream channels within this watershed have historically been heavily altered from natural conditions via culverting, re-routing, and excavation/fill. Due to the extent of the alteration from natural conditions, no suitable reaches within the Arapahoe Basin channel system were identified by the WRNF for utilization as a response reach to act as an indicator of management activities within the watershed. Thus, no stream health data using the current adapted R1/R4 channel survey protocol is available for the Arapahoe Basin watershed.

The 1999 EIS was completed before the 2002 Forest Plan integrated stream health practices into the plan as Forest Plan Standards—thus the evaluation of stream health within the 1999 EIS was not conducted according to the current practices that quantify specific metrics and causal mechanisms as outlined above. Nonetheless, a qualitative evaluation of channel morphology within the Arapahoe Basin watershed was conducted pursuant to the 1999 EIS process. The stream reaches that were reviewed in 1999 are shown in Figure 7 in Chapter 6. The results of the channel morphology evaluation are quoted from the 1999 EIS below. Reach number references indicate the corresponding reach shown in Figure 7:

In the course of the development of A[rapahoe] Basin as a ski area, the historic drainage network has been highly altered. These alterations have primarily included the rerouting of runoff to provide for improved ski runs and the covering of channels with logs to improve skier safety. These modifications have caused existing channels to erode and enlarge and, in several locations, have caused the formation of new channels. (InterFluve 1996) A recent field assessment of existing channel morphology indicated the following:

- Reach 7C and lower Reach 8 are currently stable and show no significant signs of degradation.

202 USDA Forest Service, 2006b
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- Channel segments on Reaches 1, 2, 3, and 4 show signs of past degradation, but appear to be well armored and stable at present.

- The remaining reaches (5, 6, 7A, 7B, upper Reach 8, 9, 10, 11) and the Upper Basin show signs of current channel degradation. These signs include one or more of the following: excessive bank erosion; bed elevation degradation (head cuts); and excessive deposition. Four areas (head cuts on reaches 5, 7B, and 11; and the eroded ditch which carries water from the lower end of Dercum’s Gulch to the upper end of Reach 4 displayed more severe erosion and/or the potential to lead to higher levels of disruption...(InterFluve 1996)

The 1999 EIS identified several channel restoration mitigation projects, all of which were required by the Record of Decision. The restoration and re-watering of Dercum’s Gulch was completed by A-Basin in cooperation with the Forest Service during the summer of 2005. Other projects, such as the repair of the ditch between Dercum’s Gulch and Reach 4; re-watering the channel below Reach 7C; and wetlands meadow enhancement in the vicinity of reaches 7C and 8, are still in process.

Stream channel morphology and stream health within the Arapahoe Basin watershed continues to exhibit change and adjustment resulting from the increase in peak flows due to the implementation of portions of the 1999 snowmaking approvals. Currently, A-Basin is making snow on 76 percent of the terrain authorized in Phase 1 of their snowmaking approval in the 1999 ROD, about 95 acres. On approximately 13.4 acres of Phase 1, snowmaking infrastructure has not been installed. A-Basin makes snow in this area by dragging hoses from existing hydrants. Water lines, power and hydrants will be installed in the future as part of the completion of Phase 1.

North Fork Snake River Watershed

There is a lack of quantitative habitat data for the North Fork of the Snake River. However, it is likely that sediment impacts from Colorado Department of Transportation (CDOT) winter traction sanding on Highway 6, as well as sediment derived from erosional sources such as the A-Basin dirt parking lots, as well as the developed ski trail system, represent the primary habitat impact within the North Fork. As described above, fine sediment deposition can diminish habitat by filling in pool systems, which are important components of habitat for many fish species and other aquatic organisms.

A-Basin currently has approval to divert water from the North Fork of the Snake River at the base of A-Basin. In a year with average flows, A-Basin diverts approximately 90 acre feet of water per season. While diverting, A-Basin has committed to maintain a 0.5 cubic feet per second bypass flow. In October the maintained bypass flow is higher, at 1.0 cubic feet per second. In addition to the bypass flow previously described, water withdrawal must be less than or equal to 25 percent of the stream flow. A storage reservoir, with a capacity of 5.5 acre feet is used to provide buffer storage.

The quantitative effects of this diversion activity upon fisheries habitat on the North Fork of the Snake River have not been measured, however there is likely a reduction in over-wintering habitat that results
from reduced flows during snowmaking operations. Associated with the 1999 approval, A-Basin has been monitoring macroinvertebrates on the North Fork and Snake River mainstem, as a potential indicator of effects from snowmaking diversions. Currently, these data are still undergoing in the process of detailed quantitative analysis. Due to the numerous impact mechanisms on the North Fork (highway sanding, hazardous chemical spills, magnesium chloride applications) in addition to the effects of snowmaking, a quantitative conclusion concerning the effects of snowmaking alone may not be possible.

**Chemical Water Quality**

Chemical water quality characteristics within the Snake River watershed are discussed at length in the 1999 EIS, as well as in various third-party reports since that time. A brief summary of chemical water quality characteristics is outlined below. The water chemistry of the Snake River mainstem is affected by inflows of acid drainage from various abandoned mines, especially the Pennsylvania Mine in the Peru Creek watershed. In particular, the weathering process of iron pyrite results in the introduction of hydrogen ions, sulfate, and iron within the water column. In addition, the lower pH of the mine drainage results in the dissolution of other naturally-occurring environmental metals (such as aluminum, copper, cadmium, manganese, and zinc). When acid mine drainage of lower pH mixes with non-polluted waters of higher pH (more basic), the resultant mixed waters increase in pH in comparison to the mine drainage itself. As a result, the iron and other metals that are dissolved within the water column of the undiluted mine drainage, precipitate out of the water column to form metal hydroxides when the acid mine drainage mixes with non-polluted streams. This may be commonly observed in affected streams as a reddish-yellow iron hydroxide precipitate that forms on the stream substrate.

The Snake River mainstem and its Peru Creek and Saints John Creek tributaries are identified by the Colorado Department of Public Health and Environment on the 2004 list of Section 303(d) impaired water bodies due to acidity (pH) and high concentrations of cadmium, copper, lead, and zinc. The 303(d) listing of these streams within the Snake River watershed indicates that metals concentrations exceed aquatic life standards established to protect trout. In addition, the Snake River above Deer Creek frequently exceeds domestic water supply standards for iron and manganese.

The highest metals concentrations in the Snake River immediately below the confluence with Peru Creek decrease substantially downstream as the inflows from clean tributaries, especially the North Fork Snake River (which contains A-Basin’s existing trail network), introduce dilution volume. A-Basin’s snowmaking diversions reduce the volume of higher quality dilution flows from the North Fork during the snowmaking season.

Existing activities associated with the Highway 6 corridor do affect the chemical water quality of the North Fork of the Snake River. Application of magnesium chloride de-icing compound during winter operations increases the salinity of soils near the road corridor, as well as the salinity of receiving water bodies and wetlands. In addition, since the Eisenhower Tunnel is closed to hazardous materials transport,
Highway 6 over Loveland Pass serves as a designated hazardous materials route. As a result, traffic accidents involving hazardous materials cargo periodically result in the release of chemicals to the North Fork of the Snake River.

Because none of the proposed project components analyzed here would affect chemical water quality, it will not be discussed or analyzed further within this document.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

**Alternative 1 - No Action**

Alternative 1 - the No Action Alternative reflects a continuation of existing and previously approved operations and management practices at A-Basin without major changes, additions, or upgrades on NFS land (other than those previously approved, yet to be implemented mountain improvements). Effects of previously-approved mountain improvements have been considered in prior documents. The No Action Alternative would have no additional direct or indirect impacts or benefits to watershed resources or riparian habitats as addressed in this document.

**Arapahoe Basin Watershed**

Because the 1999 snowmaking approval occurred prior to the 2002 Forest Plan Revision and the current accepted version of the WCPH, further NEPA analysis would need to occur for stream health prior to implementation. In general, in order to meet WCPH requirements, only that portion of previously-approved snowmaking that could be implemented while yet meeting WCPH requirements to maintain or improve stream health would take place under Alternative 1.

**Lenawee Watershed**

Under Alternative 1, no activities that differ from existing conditions would occur within the Lenawee watershed, and therefore no stream health changes would occur.

**North Fork Snake River Watershed**

In Phase 2 of the 1999 snowmaking approval, there are several additions approved via the 1999 ROD. Among the additions are the construction of a diversion structure and withdrawal pump station on the North Fork, and the installation of a water pipeline from Porcupine Gulch to the pump station. The diversion would be located on the North Fork Snake River downstream of the Porcupine Gulch confluence and would consist of an infiltration gallery of approximately 100 feet in length. The pump house would be built off-channel and would be approximately 300 square feet in size. Water would be pumped from the North Fork through a 10- to 12-inch pipeline to A-Basin. The final locations of the diversion and pump station would be selected to avoid impacts to cultural resources and to minimize potential impacts to wetlands and wildlife. This implementation would be expected to improve habitat conditions on the North Fork, because flows would be enhanced along the roughly 2 miles of stream
between A-Basin and the anticipated new diversion below the confluence with Porcupine Gulch. However, further NEPA analysis would need to occur before implementation since the 1999 snowmaking plan was approved before the 2002 Forest Plan Revision and the current accepted version of the WCPH.

**Alternative 2 - Proposed Action**

**Stream Health**

**Arapahoe Basin Watershed**

Under the Proposed Action, approximately 0.1 acre of trees would be removed to facilitate the realignment of the Exhibition lift. This tree removal would occur outside of the WIZ, and thus would not affect riparian or watershed resources. Approximately 0.5 acre of grading would occur to create the new top terminal pad for the re-aligned Exhibition lift. While all of this grading would occur outside of wetlands, approximately 0.1 acre would occur within the WIZ.

The fact that a particular piece of graded ski trail is hydrologically connected to the stream network means it has the ability to quickly route water and potentially contribute to increased peak flows and subsequent channel adjustments. Watershed disturbance from urban development and mining have known relationships between total impervious area and stream channel stability. Shawley and Wemple suggest that soil disturbance at ski areas creates impervious surfaces with hydrologic effects similar to those in urban areas. Their research shows that increased overland flow at ski areas can cause an increase in the magnitude and frequency of peak discharges during summer rainstorms. Logically, this phenomenon would be equally applicable to spring snowmelt.

The routing of overland flow to the steam network has been shown to be an important factor controlling the magnitude of floods, stream power, and the physical and biological condition of streams. Wemple describes a mechanism by which road ditches can affect flood peaks by hydrologically connecting areas of overland flow with stream channels. Hydrologic connection also provides a conduit for the transport of sediment and other pollutants into streams. This process has been observed at ski areas that have a dense network of waterbars and ditches on ski trails and roads. Generally, the effect of ditches on flood peaks becomes negligible when they are disconnected by routing flow to permeable soils rather than into stream channels.

Due to the importance of the connectedness of areas of proposed ground disturbance to the stream system, for management purposes, the area of proposed connected grading is the variable of concern in

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203 Touysinhthiphonexay and Gardner, 1984; Booth, 1990
204 Shanley and Wemple, 2002
205 LaMarche and Lettenmaier, 2001; Bledsoe and Watson, 2001; Walsh, 2004; Wang et al., 2001
206 Wemple et al., 1996
207 Markart et al., 1998; Shanley and Wemple, 2002
208 Tague and Band, 2001; LaMarche and Lettenmaier, 2001
relationship to effects to peak flow and subsequent stream health consequences. This is because although new graded terrain increases the peak runoff from the parcel of interest, when not directly connected to the stream system, runoff from graded areas can infiltrate and route through soil and shallow groundwater before being realized as streamflow. This process delays and lags the flows so that the effect to peak flow associated with disconnected areas of grading is not sufficient to result in negative stream health consequences.

Project design criteria, incorporated into the Proposed Action and described in Table 2-2, would effectively disconnect the graded terrain associated with the top terminal of the re-aligned Exhibition lift from the WIZ, ensuring, along with completed and on-going mitigation projects, that watershed conditions within the Arapahoe Basin watershed would be maintained or improved.

**Lenawee Watershed**

Table 3I-5 outlines the Proposed Action disturbances within the Lenawee watershed that would occur inside the WIZ:

<table>
<thead>
<tr>
<th>Disturbance</th>
<th>Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing</td>
<td>0.08</td>
</tr>
<tr>
<td>Clearing/Grading</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Grading</td>
<td>0.02</td>
</tr>
<tr>
<td>Tree Thinning 60%</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Most of the WIZ impacts would be associated with areas of tree removal or thinning to facilitate skier traffic in select areas below tree line. Because Lenawee Creek exhibits Robust stream health with respect to large woody debris frequency, it is improbable that the areas of proposed tree removal within the WIZ would result in a detrimental change in stream health class with respect to this metric. The 0.02 acre of grading would occur associated with the construction of the lower terminal for the Montezuma Bowl lift. This project component would be accompanied by project design criteria, included in Table 2-2, that would ensure that the graded terrain associated with the terminal pad would be effectively disconnected from the Lenawee stream system, ensuring that stream health would be maintained or improved in this watershed.

**North Fork Snake River Watershed**

Within the North Fork Snake River watershed, approximately 0.22 acre of ground disturbance would occur around the existing lower terminal of the Exhibition lift to facilitate its retrofit and re-alignment. While this construction would occur within the WIZ of the North Fork, it would not represent a new impact since it would occur at the existing lower terminal pad.
Also included are 3.5 acres of grading within the North Fork WIZ associated with the re-development and expansion of the High Noon parking lot. Although the improvement and expansion of the parking lot would occur within the WIZ and create additional impervious surface, the parking lot projects would represent an improvement over existing drainage conditions at the High Noon lot. Existing issues here include:

- Erosion from flows captured off of Highway 6
- Entrainment of sediment from the dirt parking lot surface
- Inadequate stormwater detention and drainage

The proposed improvements to the parking lots would include re-contouring the parking lot, re-gravelling, and development of a stormwater drainage routing and detention system with sediment ponds, sized sufficiently to store the increase in runoff between existing and proposed conditions, for the 25-year 24 hour design storm (per Summit County code requirements). By detaining and treating the surface water runoff from these parking lot facilities to a greater extent than currently occurs, stream health conditions in the North Fork would be maintained or improved.

**CUMULATIVE EFFECTS**

The water resources effects associated with A-Basin that are cumulative in nature include:

- Effects to stream health.
- Channel substrate and residual pool volume effects resulting from sediment production caused by changes in land cover and usage.
- Coarse wood debris reduction caused by the tree removal within the WIZ performed to create ski trails.

Each of these potential cumulative effects is discussed in detail below.

The stream health effects of increased peak flows are most evident in the directly affected, on-mountain watersheds: Arapahoe Basin and Lenawee. These watersheds drain into the North Fork Snake River and Snake River mainstem, respectively, where the effects of changes in flow are comparatively small relative to the hydrology of these larger watersheds. Thus, from a stream health perspective, the North Fork Snake River and Snake River mainstem collectively define the downstream spatial boundary for analysis of stream health cumulative effects.

The temporal extent of the analysis commences with conditions extant before the development of A-Basin, extend through the history of A-Basin to the present, and includes the lifespan of current proposed projects as well as those that are current reasonably foreseeable future actions, in general 10 to 20 years into the future from the date of this document.
Stream Health
Past Actions
Summit County, including the Snake River watershed was heavily logged to support mining and related activities in the late nineteenth and early twentieth century mining era, roughly from around 1870 through 1910. Trees were removed for utilization as lumber, and also sometimes burned to create open areas for livestock forage or to expose mineral deposits. Historically, this tree harvest increased water yields and stream peak flows, as the land cover changed, reducing evapotranspiration by trees and increasing solar radiation at the ground surface. Stream channels and watershed systems adjusted and changed their morphologies in response.

Present Actions
During the 20th century, Summit County has undergone extensive land-use changes as the area shifted from historic mountain rural and mining land uses to a semi-urban environment. Residential and municipal development on private lands has increased within the Snake River watershed, increasing impervious surfaces and non-point source pollution associated with stormwater runoff. Meanwhile, on public lands under Forest Service management, forested vegetation density has increased in comparison to late 19th-century conditions.

Within the Arapahoe Basin SUP area, the watersheds are subjected to activities associated with a developed recreation area prescribed under ski area management, including trail construction and snowmaking. As a result, these watersheds tend to exhibit cumulative changes to channel conditions, with differing corresponding dynamic equilibria, as compared to watersheds in undeveloped conditions. These changes are caused by increases in peak flow magnitude and duration due to the effects of both trail clearing and snowmaking. Affected stream reaches typically exhibit long term, continuing adjustments to their dynamic equilibria due to accelerated water inputs caused by both snowmaking and trail construction.

Reasonably Foreseeable Future Actions
Due to historic logging, the forest landscape in Summit County is occupied by dense, relatively even-aged forest between 90 and 130 years of age, dominated by lodgepole pine, a comparatively short-lived, disturbance-dependent species. These widespread single-species forests are nearing a stage of development where they are increasingly at risk for insect infestation, disease, and fire due to size, age, and homogeneity. The Forest Service may in the future undertake forest health treatments within the Snake River watershed to improve biodiversity, wildlife habitat capabilities, and fire resiliency.

The effects of potential forest health treatments such as vegetation thinning or prescribed burns could have short term effects on stream health by increasing water yields in affected watersheds. However in general, such projects would be timed to minimize environmental impacts by spreading the effects over time, and would be accompanied by re-vegetation. The growth of new vegetation and increased species
diversity would be expected to improve forest structural and species diversity, and resistance to disturbance. As a result, long-term stream would be expected to improve as a result of future forest health treatments.

**Conclusion**

Historic land uses within the Snake River watershed have added a great degree of human influence to the natural cycle of watershed disturbance, and have caused stream health conditions to shift away from the reference state. However, by maintaining or improving stream health, it is unlikely that the Proposed Action would, in combination with past, present, and reasonably foreseeable future actions, negatively affect the cumulative state of stream health within the Arapahoe Basin, Lenawee, or North Fork Snake River watersheds.

**Chemical Water Quality**

**Past Actions**

As described above, the water chemistry of the Snake River is affected by inflows of acid drainage from various abandoned mines associated with late 19th century mining activities. The effect to water quality is increased concentrations of metals, some of which are toxic to aquatic life.

**Present Actions**

Chemical water quality in the Snake River watershed is affected by present human activities, including:

- Magnesium chloride applications on US Highway 6
- Release of chemicals via spills associated with the transport of hazardous materials over Loveland Pass
- Snowmaking withdrawals at Arapahoe Basin reduce the volume of high-quality dilution flows available from the North Fork of the Snake River during the snowmaking season
- Snowmaking withdrawals at Keystone Resort introduce metals-impacted Snake River waters into watersheds that are otherwise un-influenced by acid mine drainage.

These actions continue to affect aquatic life with and beneficial use attainment within the Snake River watershed.

**Reasonably Foreseeable Future Actions**

Ongoing study of the water quality within the Snake River watershed system is being conducted as part of the Snake River Watershed Task Force, in cooperation with the CDPHE. Task Force participants include, among others:
Chapter 3: Affected Environment and Environmental Consequences
I. Watershed Resources

- USFS
- United States Geological Survey
- Summit County
- CDPHE
- Northwest Colorado Council of Governments
- Arapahoe Basin
- Keystone Resort
- Trout Unlimited

Pursuant to the TMDL process that accompanies the watershed’s 303(d) listing with the EPA, the Task Force stakeholders, working with CDPHE and the EPA, will continue to study and engage in water quality improvement projects within the watershed, in pursuit of the development of a watershed-wide TMDL for the identified chemical water quality constituents of concern. It is expected that the TMDL process will include reclamation projects that would, in the future, result in improvements to the chemical water quality of the Snake River.

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

No irreversible or irretreivable effects or commitments to watershed resources are anticipated as a result of implementation any of the alternatives.
This section is based on the Waters of the United States, Including Wetlands Delineation Report for the Arapahoe Basin Ski Area Lifts, Terrain and Parking Area Upgrading Plan (delineation report). The delineation report is contained in the project file and includes a more detailed description of individual waters of the United States (WOUS), including wetlands identified through field investigations. The text that follows summarizes the delineation report. The project area that was studied is composed of areas proposed for ground disturbance, including: Montezuma Bowl, the Lower Overflow and High Noon parking lots (including the forested land in between); and the proposed Exhibition lift corridor. Wetland investigations were limited to areas of the resort proposed for development; and therefore, do not represent total wetland acreage within the project area. Rather, wetland areas and resources represent those areas within and/or proximate to areas of proposed disturbance. Studied WOUS, including wetlands, are located within the North Fork Snake River and Snake River watersheds. A discussion of anticipated WOUS, including wetlands impacts resulting from project implementation is presented in the Environmental Consequences portion of this section.

US ARMY CORPS OF ENGINEERS (USACE) DIRECTION

The *USACE Wetlands Delineation Manual*, hereinafter referred to as 1987 Manual, defines wetlands as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands generally include swamps, marshes, bogs, and similar areas. Activities within and near these areas, including tree removal, culvert installation, grading, and changes in runoff regimes may affect the ecological functions of wetland resources. Filling of wetlands is regulated by Section 404 of the Clean Water Act (CWA), and such activities would require issuance of a permit from the USACE. Additional direction regarding wetlands management is provided by Executive Order 11990 – Protection of Wetlands.

According to the 1987 Manual, wetlands that have been disturbed through natural and/or anthropogenic alteration of hydrology, soils, and/or vegetation do not necessarily exist under “normal circumstances.” “Normal circumstances” has been further defined as “the soil and hydrologic conditions that are normally

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209 SE GROUP, 2005
210 Environmental Laboratory, 1987
211 Presidential Executive Order 11990, Protection of Wetlands, 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.
212 Environmental Laboratory, 1987
present, without regard to whether the vegetation has been removed.” Examples of alteration may include: removal of vegetation, removal of soil, placement of fill, construction of dams and levees, conversion of agriculture, channelization, drainage, fires, beaver dams, etc. Areas that do not exist under “normal circumstances” require modified wetland delineation techniques identified as the “Atypical Method for Delineation” in the 1987 Manual. Portions of mixed conifer forest located between the existing High Noon and Lower Overflow lots were delineated using the “Atypical Method for Delineation” due to the sediment (sand) loading created by highway maintenance runoff. It was determined that wetlands delineated within the other two study areas – Montezuma Bowl and Exhibition lift corridor - exist under “normal circumstances” as outlined in the 1987 Manual. Therefore, the wetlands within these study areas were delineated using protocols outlined in the “Routine Method for Delineation” section of the 1987 Manual.

**AFFECTED ENVIRONMENT**

**Methodology**

Wetlands at A-Basin were delineated in 2004 and 2005 in study areas outlined above. Certain locations (where no ground disturbance is proposed) within the Montezuma Bowl and Exhibition lift study areas were delineated using aerial photography, due to the presence of a distinct scrub/shrub vegetation line. The areas within Montezuma Bowl were then field confirmed and soil samples were taken to identify the potential presence of deep (> 8 inches) organic soils. Within the Exhibition lift study area lift engineering can completely avoid all WOUS, including wetlands for tower placement, and the bottom and top terminals would be located in previously-graded upland areas. The delineation report entails WOUS, including delineated wetlands, with desktop assistance from aerial photography, as stated above, and the 1999 FEIS.

To ensure consistency with Federal, State, and local regulations, wetlands within the study area were delineated consistently with the methodology outlined in the 1987 Manual. The methodology found in the 1987 Manual was implemented with the benefit of current regulations and Regulatory Guidance Letters (RGL) and memoranda. The 1987 Manual utilizes the three parameters of vegetation, soils, and hydrology to identify and delineate wetlands and requires that these parameters be determined during the growing season.

Jurisdictional WOUS were also delineated within the study areas. WOUS at A-Basin included perennial and intermittent streams. Jurisdictional WOUS were delineated using the following criteria: 1) distinct bed and bank features must be present, 2) an identifiable Ordinary High Water Mark (OHWM)

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213 RGL 90-7, 1990
214 SE GROUP, 2005; IntraSearch, 2003; USDA Forest Service, 1999a
215 As defined in 33 CFR 328.3 (a)(1-8) and 328.3 (b-c); Environmental Laboratory, 1987
217 33 CFR 328.3 (a)(1-5)
must be present, and 3) the landforms near the stream must exhibit morphology that is indicative of
stream processes (i.e., an identifiable concave watershed, not a planar or convex surface). Several small
rivulets and erosional features were observed but not identified as WOUS, because these features did not
meet the criteria detailed above.

Dominant species in each of four strata (i.e., tree, sapling/shrub, herb, and woody vine) were identified as
the most abundant species that immediately exceed 50 percent of the total measure of plant dominance for
that stratum, plus any additional species that comprise 20 percent or more the total areal cover for that
stratum. For each stratum in the plant community, dominant species are the most abundant plant species
(when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50
percent of the total dominance measure for the stratum, plus any additional species comprising 20 percent
or more of the total dominance measure for the stratum (the 50/20 Rule).

Meeting the hydric soils parameter for wetland determinations requires fulfillment of at least one of the
four technical criteria using published soils information and field indicators. The surveyor used field
indicators to make decisions regarding the hydric soils parameter. Field indicators are intended to
supersede guidance provided in the 1987 Manual. Soil colors were determined in the field using standard
NRCS sampling techniques and Munsell Soil Color Charts. Soil testing during field investigations
generally revealed low chroma colors and mottling within wetland boundaries.

Indicators of wetland hydrology observed at A-Basin included inundation, inferred soil saturation to the
surface, drainage patterns in wetlands, and the Fac-neutral test. Streams, springs, and seeps provide a
constant and reliable source of water for most of the wetlands within the study areas.

**Findings**

Twenty-four jurisdictional WOUS, including wetlands, totaling approximately 30.4 acres were delineated
within the boundaries of the study areas. Seeps, springs, perennial streams, roadside drainage and
groundwater recharge from snowmelt primarily feed these wetlands within two project watersheds (refer
to figures 5 and 6). A preliminary site visit was conducted by the USACE within the parking lot study
area. A final Jurisdictional Determination (JD) has not been issued by the USACE for projects within the
study areas.

Wetland classification is based on the Cowardin classification system. The Cowardin system classifies
wetlands primarily by dominant plant community. Four types of jurisdictional wetlands were identified
within the project area consisting of palustrine emergent, palustrine shrub/scrub, palustrine forested, and
fen. Additionally, as noted above, WOUS were identified. Identified wetland type and acreage and stream
type, acreage and linear feet are presented in Table 3J-1.

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218 USDA Natural Resource Conservation Service, 1998
219 Cowardin et al., 1979
### Table 3J-1: WOUS, Including Wetlands Area/Linear Feet by Type

<table>
<thead>
<tr>
<th>Study Area and Type</th>
<th>Area (acre)*</th>
<th>Linear Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Montezuma Bowl</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palustrine Emergent (PEM)</td>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td>Palustrine Shrub/Scrub (PSS)</td>
<td>19.6</td>
<td>-</td>
</tr>
<tr>
<td>Palustrine Forested (PFO)</td>
<td>0.1</td>
<td>-</td>
</tr>
<tr>
<td>Perennial Channel</td>
<td>0.5</td>
<td>5,626.8</td>
</tr>
<tr>
<td>Intermittent Channel</td>
<td>0.3</td>
<td>4,081.4</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td>21.0</td>
<td>9,708.2</td>
</tr>
<tr>
<td><strong>Exhibition Lift</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palustrine Emergent (PEM)</td>
<td>3.8</td>
<td>-</td>
</tr>
<tr>
<td>Palustrine Shrub/Scrub (PSS)</td>
<td>3.1</td>
<td>-</td>
</tr>
<tr>
<td>Palustrine Forested (PFO)</td>
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<td>-</td>
</tr>
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<td>Perennial Channel</td>
<td>0.3</td>
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<tr>
<td>Intermittent Channel</td>
<td>0.2</td>
<td>2,584.2</td>
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<td><strong>Sub-Total</strong></td>
<td>7.4</td>
<td>5,501.5</td>
</tr>
<tr>
<td><strong>Parking</strong></td>
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<td></td>
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<tr>
<td>Palustrine Emergent (PEM)</td>
<td>0.0</td>
<td>-</td>
</tr>
<tr>
<td>Palustrine Shrub/Scrub (PSS)</td>
<td>0.6</td>
<td>-</td>
</tr>
<tr>
<td>Palustrine Forested (PFO)</td>
<td>1.2</td>
<td>-</td>
</tr>
<tr>
<td>Perennial Channel</td>
<td>0.1</td>
<td>1,212.1</td>
</tr>
<tr>
<td>Intermittent Channel</td>
<td>0.1</td>
<td>1,326.8</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td>2.0</td>
<td>2,538.9</td>
</tr>
<tr>
<td><strong>Total Palustrine Emergent (PEM)</strong></td>
<td>4.3</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Palustrine Shrub/Scrub (PSS)</strong></td>
<td>23.3</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Palustrine Forested (PFO)</strong></td>
<td>1.3</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Perennial Channel</strong></td>
<td>0.9</td>
<td>9,757.5</td>
</tr>
<tr>
<td><strong>Total Intermittent Channel</strong></td>
<td>0.6</td>
<td>7,992.4</td>
</tr>
<tr>
<td><strong>Total WOUS</strong></td>
<td><strong>30.4</strong></td>
<td><strong>17,749.9</strong></td>
</tr>
</tbody>
</table>

*a - Area of stream channel calculated by average width of channel at ordinary high water mark.
Source: SE GROUP, 2005

### Palustrine Emergent Wetlands

Palustrine emergent wetlands occur over a total of 4.3 acres across the Montezuma Bowl and Exhibition lift study areas. No PEM wetlands were identified within the parking study area. This wetland class is characterized by the presence of erect, rooted, usually perennial, herbaceous hydrophytic plants.\(^{220}\) Carex sp., horsetail, beak sedge, and diamond-leaf willow were the dominant plants. Low chroma soil matrices

\(^{220}\) Cowardin et al., 1979
exhibiting 10YR 2/1 at 4 inches were characteristic of these hydric soils. The primary hydrologic input for PEM wetlands throughout all project areas is groundwater (i.e., a high water table).

**Palustrine Shrub/Scrub Wetlands**

Palustrine shrub/scrub (PSS) wetlands represent the majority of wetlands delineated within the study areas, totaling 23.3 acres. Cowardin et al. has defined this type of wetlands as being dominated by a woody vegetation community composed of shrubs and young trees less than 6 feet tall. The dominant species present within these wetlands includes geyer willow, diamond-leaf willow and plain-leaf willow. The majority of the PSS wetlands found within the project areas are classified as slope wetlands, which is a separate classification of wetlands that typically occur on or at the foot of hillslopes.

In the Montezuma Bowl study area, PSS wetlands (19.6 acres) are present primarily within the two first order drainages that are tributary to the Snake River. Soils within these wetlands exhibit low-chroma matrices and redoximorphic features along the peripheries of the wetland. Vegetation within the PSS wetlands in Montezuma Bowl is dominated by geyer willow (*Salix geyerana*) and plain-leaf willow (*Salix planifolia*).

In the parking study area, PSS wetlands (0.6 acre) are present between Highway 6 and the existing High Noon lot. This wetland receives direct runoff from Highway 6 and High Noon lot, as well as the Highway 6 drainage system which routes runoff through the forested stand between Highway 6 and the High Noon lot. This PSS feature’s primary function is water filtration as it is located at the confluence of the North Fork. The North Fork through the A-Basin base area, including parking lots, is heavily culverted. At this location of this PSS wetland, the North Fork flows underneath the High Noon lot via a 60-inch corrugated metal pipe (CMP), is exposed to surface and groundwater inputs for approximately 20 linear feet, then flows under Highway 6 via another 60-inch CMP. The exposed portion of the North Fork includes the adjacent PSS wetlands. Soils identified within this PSS wetland include a 5- to 14-inch layer of accumulated highway sand on top of a 6-inch organic soil with a matrix of 10 YR 2/1. Vegetation within the PSS wetland is dominated by *Salix* sp. A second PSS wetland complex is present on the north side of the parking study area which receives roadway runoff and is connected to upslope wetlands, via 12- and 18-inch CMPs, adjacent to the Upper Overflow lot. The PSS wetlands within the study area are dominated by *Salix* sp. and exhibit low chroma soil matrices, which classify this area as a jurisdictional wetland.

The Exhibition lift study area includes approximately 3.1 acres of PSS wetlands along and adjacent to the existing and proposed lift line. As stated above, this area was identified utilizing aerial photography and previous wetland delineations.

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221 1979
222 Novitzki, 1979
223 Wetlands delineated adjacent to the Upper Overflow lot are identified in the 1999 A-Basin FEIS.
Palustrine Forested Wetlands

Palustrine forested (PFO) wetlands occur over a total of 1.3 acres across the Montezuma Bowl and parking study areas. No PFO wetlands were delineated within the Exhibition lift study area. This is due to perennial stream channels occurring in forest zones with adjacent wetlands occurring along the banks and within small floodplain zones. Within all delineated PFO wetlands, each vegetative stratum is present, but included a dominance of the tree stratum (woody plants $\geq 3.0$ inches dbh, regardless of height). Dominant vegetation included Englemann spruce ($Picea englemannii$) and subalpine fir ($Abies lasiocarpa$).224

PFO wetlands primarily occur within the parking study area as a result of Highway 6 runoff forming a defined channel, which flows seasonal and storm water runoff through the forested area. This stream/wetland complex is of low quality due to excess sedimentation.225 An 18-inch CMP culvert carries water from the opposite (east) side of Highway 6 and is the hydrologic input for this stream/wetland. A bench area where sedimentation has essentially created a wetland area where soils are seasonally saturated was identified utilizing the “Atypical Method of Delineation.” This stream/wetland feature flows through the forested stand into the High Noon parking lot drainage ditch, which is tributary to the North Fork.

Waters of the U.S.

The project area includes intermittent and perennial drainages within each of the project areas (refer to Table 3J-1). The reader is referred to the project file for the wetlands delineation report.226

The channels within Montezuma Bowl result from groundwater springs and seeps and include a surface and/or groundwater connection to the Snake River beyond A-Basin’s SUP boundary. Additionally, the majority of these channels include adjacent wetland (PPS) vegetation; and were therefore classified in Table 3J-1 as wetlands and stream channels. The channels in Montezuma Bowl have an average channel width at the OHWM of 4 feet.

The Exhibition lift project area was delineated for stream channels with the similar methodology as wetlands within this project area. Stream channels were identified through the use of aerial photography and existing delineation reports for this area.

Stream channels within the parking project area include intermittent channels formed from Highway 6 runoff and a perennial channel (North Fork Snake River).

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224 Weber, 1987; Reed, 1988
225 The WOUS feature is mapped and classified as a PFO wetland. This is due to the sedimentation which has created excessive braiding through the forested area (i.e., braided features were identified as a PFO wetland.
226 SE GROUP, 2005
Chapter 3: Affected Environment and Environmental Consequences
J. Wetlands and Riparian Areas

DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES

The following text presents a discussion of potential impacts to the WOUS, including wetlands located with the three study areas. The impacts identified are those which can be expected to occur as a result of the proposed activities and alternatives detailed in Chapter 2 – Description of Alternatives. Table 3J-2 depicts the total approximated WOUS, including wetlands impacted by alternative. Exact WOUS, including wetlands boundaries, would be verified and appropriate permitting would be received prior to construction activities within the specific study area (Montezuma Bowl, Exhibition lift, Parking Area).

Alternative 1 - No Action

Selection of the No Action Alternative would not affect WOUS, including wetlands within the study areas, as no ground disturbance would be approved. Projects previously-approved via the 1999 ROD (refer to Chapter 1 of this document) may be implemented in the future even under the No Action Alternative.\textsuperscript{227}

Alternative 2 - Proposed Action

Under the Proposed Action, WOUS, including wetlands would be permanently impacted for the modification/construction of the proposed Lower Overflow and High Noon lots (refer to Table 3J-2). A 404 Permit would be required by the USACE prior to the development of the Lower Overflow and High Noon lots. Additionally, approximately 0.1 acre of PFO wetlands would by converted from PFO wetlands to PEM wetlands as a result of tree clearing required for the proposed Montezuma Bowl lift corridor.

Table 3J-2:
WOUS, Including Wetlands Proposed Permanent Impacts

<table>
<thead>
<tr>
<th>Total Impacts by Type</th>
<th>Proposed Action</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (acre)\textsuperscript{a}</td>
<td>Linear Feet</td>
</tr>
<tr>
<td>Palustrine Emergent (PEM)</td>
<td>0.0</td>
<td>-</td>
</tr>
<tr>
<td>Palustrine Shrub/Scrub (PSS)</td>
<td>0.2</td>
<td>-</td>
</tr>
<tr>
<td>Palustrine Forested (PFO)</td>
<td>0.2</td>
<td>-</td>
</tr>
<tr>
<td>Perennial Channel</td>
<td>0.0</td>
<td>-</td>
</tr>
<tr>
<td>Intermittent Channel</td>
<td>0.0</td>
<td>-</td>
</tr>
<tr>
<td>Total WOUS</td>
<td>0.4</td>
<td>-</td>
</tr>
</tbody>
</table>

\textsuperscript{a} - Area of stream channel calculated by average width of channel at ordinary high water mark.

A low quality PFO wetland, which receives surface water runoff from Highway 6, is proposed for permanent impact as a result of the construction of additional parking for the Lower Overflow lot. The existing culvert under Highway 6 would be extended for the length of the parking lot disturbance area and runoff would be transported to the existing drainage adjacent to the High Noon lot. As stated above in the

\textsuperscript{227} USDA Forest Service, 1999b
Affected Environment section, the delineation identified approximately 4 to 16 inches of highway sand within a partially defined intermittent stream channel and adjacent PFO wetlands.

A second wetland would be impacted with the modification of the High Noon. Two detention ponds are proposed within PSS wetlands between the High Noon lot and Highway 6. The U.S. Army Corps of Engineers agreed that transferring the existing wetlands to detention ponds would result in improved water quality downstream on the North Fork. The proposed detention ponds would collect sheet flow runoff from the High Noon lot, Lower Overflow lot and Highway 6 runoff.

**CUMULATIVE EFFECTS**

Past, present and reasonably foreseeable future actions at A-Basin include those projects approved via the 1999 ROD. The 1999 FEIS analyzed and disclosed impacts to WOUS, including wetlands throughout the front side of the ski area, including parking areas adjacent to Highway 6. The 1999 FEIS also included wetland mitigation areas to compensate for the loss of WOUS, including wetlands at (at least) a 1:1 compensation to impact ratio. WOUS, including wetlands proposed for impact under Alternative 2 will require necessary mitigation per Section 404 of the Clean Water Act. Therefore, through the requirement of wetland mitigation, there would be no cumulative functional or value loss to wetlands within A-Basin’s SUP boundary.

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

Permanent impacts to approximately 0.4 acre of WOUS, including wetlands, associated with modification/ construction of the proposed Lower Overflow and High Noon lots constitute an irretrievable commitment of resources. Additionally, approximately 0.1 acre of type conversion to wetlands as a result of tree clearing required for the proposed Montezuma Bowl lift corridor would be irretrievable. Neither of these impacts is considered irreversible in nature.

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228 USACE, 2005
K. WILDLIFE

SCOPE OF THE ANALYSIS

The A-Basin project area is located within the Snake River Lynx Analysis Unit (LAU 26), which contains 75,743 total acres, including 64,640 acres (85.3 percent) in federal ownership and 11,103 acres (14.7 percent) in non-federal ownership. LAU 26 encompasses the entire Snake River Watershed, bounded on the east and north by the Continental Divide, by I-70 on the north and west, and by the Snake River-Swan River hydrologic divide on the south.

AFFECTED ENVIRONMENT

Threatened and Endangered Species

A Biological Assessment (BA) was prepared for this project and is part of the project file and incorporated herein by reference. Listed, proposed, and candidate species that were initially considered in the BA included those identified by the US Fish and Wildlife Service (USFWS) as potentially occurring on the Dillon Ranger District or potentially affected by management activities on the District. Those species identified include: Uncompahgre fritillary butterfly (Boloria acrocnema), Colorado pikeminnow (Ptychocheilus lucius), bonytail (Gila elegans), humpback chub (G. cypha), razorback sucker (Xyrauchen texanus), bald eagle (Haliaeetus leucocephalus), and Canada lynx (Lynx canadensis). Candidate species were considered as R2 sensitive species.

Six of the seven animal species initially considered herein were dropped from further detailed consideration because their range distributions do not include the action area, habitats necessary for their life requirements are not found within the project area, and/or there would be no water depletions associated with the alternatives under consideration. The one remaining species warranting additional discussion, Canada lynx, is addressed below.

Canada Lynx Environmental Baseline

The reader is referred to the introduction in the Affected Environment portion of the Vegetation Section for an overview of the project setting and habitats present.

In an attempt to reestablish a viable lynx population, the Colorado Division of Wildlife (CDOW) has released (as of March 2006) 204 lynx in the San Juan Mountains. All releases have been in the San Juan Core Area in southwestern Colorado. Additional releases are planned for 2006, 2007, and 2008. As of March 12, 2006, the CDOW was tracking 93 of the 126 lynx still possibly alive in the Southern Rockies Ecosystem. Reproduction has been documented between 2003 and 2005, throughout the Southern

229 USDA Forest Service, 2002e updated 01/30/06
230 Thompson, 2006a
231 USFWS, 2005
Rockies Ecosystem. Additional animals are present on the landscape as result of reproduction and because some lynx have dead batteries in their collars and/or they are outside of the research area.

Although the CDOW’s lynx releases occurred in the San Juans, far from the project area, a number of radio-collared lynx have already found their way to and through Summit County. In February 2005, the CDOW released a map showing aerial VHF and satellite locations of 43 individual lynx released in the San Juans that were relocated on and adjacent to the WRNF between February 4, 1999 and February 1, 2005. The map (on file at the DRD) shows several hundred relocation points, several dozen of which occurred within approximately 5 miles of A-Basin, on both sides of the Continental Divide. There are accounts of lynx moving through Summit County and some of its ski areas, including one lynx that was observed within developed ski terrain on the north side of A-Basin. Although some lynx released by the CDOW have moved through Summit County, none are known or suspected of taking up residency and lynx appear to be using Summit County during dispersing, exploratory, and mating season movements.

**Snake River Lynx Analysis Unit**

Environmental baseline statistics of lynx habitat in LAU 26 are summarized in Table 3K-1. In the LAU, current mapping shows 6,604 acres of potential lynx denning habitat, 17,580 acres of non-denning lynx winter foraging habitat, 13,790 acres of “other” lynx habitat, and 1,530 acres of currently unsuitable lynx habitat, totaling 39,504 acres of lynx habitat. Roughly 3.0 percent of the lynx habitat in the LAU is currently mapped as unsuitable and 16.7 percent is mapped as denning. Non-habitat totals 25,134 acres. These values are consistent with the management thresholds recommended by Ruediger et al. and required by the 2002 Forest Plan to help preserve lynx within LAUs. LAU 26 contains segments of the Loveland Pass Lynx Linkage, designated and managed as a Forested Landscape Linkage (Management Area 5.5). Potential lynx use of LAU 26 is described in the BA.
Table 3K-1: Environmental Baseline Status of Lynx Habitat in the Snake River Lynx Analysis Unit, LAU 26

<table>
<thead>
<tr>
<th>Habitat Description</th>
<th>Acres of Habitat in LAU</th>
<th>% of all Lynx habitat in LAU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Foraginga</td>
<td>17,580</td>
<td>44.5</td>
</tr>
<tr>
<td>Denning</td>
<td>6,604</td>
<td>16.72</td>
</tr>
<tr>
<td>Other</td>
<td>13,790</td>
<td>34.91</td>
</tr>
<tr>
<td>Unsuitable</td>
<td>1,530</td>
<td>3.87</td>
</tr>
<tr>
<td>Non-habitat</td>
<td>25,134</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Lynx Habitat</strong></td>
<td><strong>39,504</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

a - Excludes winter foraging values associated with denning habitat.
Note: Data are based on USFS (USDA Forest Service, 2002e) habitat mapping and classification criteria.

Lynx Habitat Classification of Proposed Disturbance Areas

WRNF lynx GIS mapping (updated 01/30/06) identifies the two intertrail islands in the path of the proposed realigned Exhibition lift as part of a single 3.9-acre polygon of lynx denning habitat. Based on field validation, that classification is invalid because the island is too small, fragmented, and disturbed by surrounding skiing activity that regularly extends into June (i.e., through the denning period). While this island’s structure meets denning criteria, this linear, 4-acre island contains no interior, it is located within the developed interior of the ski area, and its lower edge occurs 362 meters from the base of the existing Exhibition lift and the ski area’s base area. A 207-acre polygon of “non-habitat” including the ski area’s developed trails below treeline, its base area, parking lots, and areas associated with the nearby section of the Highway 6 corridor surrounding this and other tree islands on the north side of the ski area. Because the tree islands affected by the realigned Exhibition lift and surrounding islands are too small, fragmented, and disturbed by surrounding skiing activity relative to a snowshoe hare’s home range, they are considered to be non-functional as “winter foraging habitat”. The affected polygon is, therefore, considered to be “other habitat”.

WRNF lynx GIS mapping identifies the upper Montezuma Bowl lift terminal site access route to the lift terminal as part of an 8,707-acre polygon of “non-habitat” that includes alpine areas of the A-Basin SUP area and continuous alpine terrain along the Continental Divide. That designation is valid.

WRNF lynx GIS mapping identifies the alpine portion of the Montezuma Bowl lift corridor as part of an 8,707-acre polygon of “non-habitat” that includes alpine areas of the A-Basin SUP area and continuous alpine terrain along the Continental Divide. That designation is valid. Trees associated with the mid-section of the lift corridor are mapped as an 11-acre polygon of “other” habitat that includes the high elevation forest stand and the stand of willows associated with the bowl’s central drainage bottom. That designation is valid. The meadow above the base terminal area, containing a few individual trees, is mapped as a 5-acre polygon of “non-habitat”. That designation is valid.

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237 Ibid.
Chapter 3: Affected Environment and Environmental Consequences

K. Wildlife

WRNF lynx GIS mapping identifies the meadow associated with the base terminal as part of a 5-acre polygon of “non-habitat”. That designation is valid. The forest edge that would be cleared and graded for the terminal is the edge of a peninsula of a 578-acre polygon of denning habitat. The “denning” classification for the proposed impact area is invalid because canopy coverage is not ≥40 percent, no effective down CWD is present, and the site is the edge of a meadow. Furthermore, the “denning” classification for the rest of the peninsula is invalid because while the canopy is adequately closed and while it supports a moderate density of down CWD (see habitat characterization under the skiers’ right collector trail, below) virtually all of the down CWD is in advanced structure classes (2 and 3) that are non-functional for denning. Based on winter surveys, the larger peninsula supports red squirrels and a low density of snowshoe hares that contributes to the overall prey base. As such, this peninsular portion of the polygon represents functional “winter foraging habitat”. While the low tree density along this polygon’s edge that would be affected by the lift terminal represents poor quality habitat for hares and squirrels, it nevertheless contributes to the interior of the stand and better quality habitat therein. As such the 0.3-acre sparsely forested impact area represents “winter foraging habitat”.

WRNF lynx GIS mapping identifies the summer access route as part of an 8,707-acre polygon of “non-habitat” that includes alpine areas of the A-Basin SUP area and continuous alpine terrain along the Continental Divide. That designation is valid.

WRNF lynx GIS mapping identifies the forest stand that would be bisected by the skiers’ right collector trail as a peninsula on a 578-acre polygon of denning habitat. The “denning” classification for this peninsula and the proposed 1.7-acre thinning area is invalid because while it supports a moderate density of down CWD, virtually all of the down CWD is in advanced structure classes (2 and 3) that are non-functional for denning. Based on winter surveys, this peninsula supports red squirrels and a low density of snowshoe hares that contributes to the overall prey base. As such, this peninsular portion of the polygon represents functional “winter foraging habitat”.

WRNF lynx GIS mapping identifies the island that would be affected by the skiers’ left collector trail as the tip of a 186-acre polygon of denning habitat. The “denning” classification for this 1-acre island at treeline is invalid because it is too small and fragmented, it contains no interior, and there is inadequate CWD for denning. However, this stand supports red squirrels and snowshoe hares who may occasionally use it as part of the larger continuous forest block to the south. As such, this affected island composing the tip of the larger polygon should be considered “winter foraging habitat”.

WRNF lynx GIS mapping identifies the 0.8-acre of tree clearing that would be associated with the skiers’ center collector trail as occurring along the interfacing of polygons classified as “other” and denning habitat. The natural, linear meadow that would be widened for the trail is a distinct boundary between

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238 Parks et al., 1997
239 Ibid.
these spruce-fir stands of different canopy closure. The “other” habitat classification is valid. For the reasons described above for the skiers’ right collector, that portion of the denning polygon along the skiers’ right side of the center collector trail should be considered to be “winter foraging habitat”.

Therefore, tree removal along the skiers’ right side of the center collector trail would affect 0.7-acre of “winter foraging habitat” and tree removal along the skiers’ left side of the center collector trail would affect 0.1-acre of “other” habitat.

WRNF lynx GIS mapping identifies the Hike-back Collector Trails as extending through “denning”, “other”, “non-habitat”, and “winter foraging habitat” polygons. For the reasons described above under the Skier’s Right and Skier’s Left Collector Trails, the “denning” classifications for those two polygons should instead be considered to be functional “winter foraging habitat” in these impact areas. Other lynx habitat classifications are valid.

WRNF lynx GIS mapping identifies the hike-back track to occur through polygons classified as “non-habitat”, and “other” habitat. Those designations are valid.

WRNF lynx GIS mapping identifies the forest stand that would be modified by the Lower Overflow/High Noon Parking Lot as lynx denning habitat. In November 2005, the Lynx Biology Team was on-site and specifically evaluated this stand, surrounded by Highway 6 and the High Noon, Lower Overflow, and Last Chance parking lots at the base of the ski area. Although the spruce-fir stand was classified as “denning habitat” and met denning criteria, it was considered by the Team to be too small, fragmented, and disturbed by surrounding highway and parking lots activities to be functional as denning habitat. That stand would then revert to “winter foraging habitat”, but for similar reasons it was considered to be non-functional as winter foraging habitat. It was, therefore, considered to be “other habitat”. The existing High Noon Lot, Lower Overflow parking lots, and southern portion of the Last Chance Lot, along with the adjacent Highway 6 corridor, A-Basin base area, and ski trails up to timberline are all part of a 207-acre polygon of “non-habitat”. That designation is valid.

**Habitat Connectivity Across A-Basin’s SUP Area**

Lynx habitat connectivity across A-Basin’s SUP area is relatively good because of the relatively short distances involved and the juxtaposition of undeveloped, flanking habitat blocks that could function as diurnal security areas facilitating movements. Lynx would likely cross the ski area in two ways: as part of general east-west movements through forested portions of Montezuma Bowl on the back side of the ski area, and as part of general southwest-northeast movements up the forested east side of the North Fork of the Snake River toward Loveland Pass on the front side of the ski area.

Montezuma Bowl is the largest of three, generally south-facing, forested drainages on the north side of Montezuma and Peru Creek roads. A continuous forest band, ranging from 0.57 to 1.43 miles wide, extends east-west across the bottoms of these drainages from Chihuahua Gulch to the Montezuma Road-
Highway 6 junction. The forest band is narrowest on the west side of Chihuahua Gulch and widest near Highway 6. Although forest cover in Montezuma Bowl is fragmented into a scalloped edge of stringers approaching treeline, mostly continuous forest cover that a lynx would be expected to move through in an east-west orientation extends about 1.2 miles above Montezuma Road. Entirely closed forest cover (i.e., forest cover below the drainage bottom meadow extending out of the Montezuma Bowl alpine) is 0.64 mile wide above Montezuma Road and fragmented forest cover (most of which a lynx would be expected to cross through) is 0.79 mile wide above the bottom of the meadow.

At present, there are virtually no anthropogenic restrictions to east-west lynx movements through the continuous forest cover below alpine areas of Montezuma Bowl. As stated in the Recreation analysis (Section 3A), recent surveys conducted by A-Basin indicate that an average of approximately 18 skiers per day access Montezuma Bowl. Some of the adventurous skiers take shorter, quality pitches confined to the alpine, and then hike or skin back up to the top. However, most Montezuma Bowl skiers collect in the central drainage bottom near or above the proposed bottom lift terminal, and then take the incised, forested drainage bottom over a mile to Montezuma Road where they are picked up, have parked their vehicles, or hitchhike out. The egress from the de facto collection point to Montezuma Road is rarely a quality skiing experience and it is not the reason Montezuma Bowl is skied. Drainage incision confines the egress route to the drainage bottom per se. Snow conditions in this south-facing bowl differ considerably from those perceived standing on the ridgeline at 12,465 feet and those at 9,700 feet along Montezuma Road, sometimes making the egress an ordeal that is not repeated, particularly during early and late-season.

On the front side of the ski area, anthropogenically and naturally fragmented forest cover is not a restriction to lynx movements, although the human activity associated with those areas may be during certain seasons. The width of developed ski terrain below treeline that a lynx would have to cross is narrow (2,889 to 3,487 feet; 0.55 to 0.66 mile) compared to most other ski areas. Considering The Beavers and other backcountry areas that are routinely used by a relatively low number of dispersed skiers under suitable snow conditions, the width of skier disturbance areas that a lynx would have to cross if diurnal (i.e., from approximately 9 a.m. to 4 p.m.) movements occurred during the ski season would be up to approximately 1.32 miles. These distances are well within the daily travel and dispersal distances reported for lynx and well within the 3 to 6 miles daily travel distance for resident females that Ruediger et al. indicated should be considered in project planning.

If recreational activity at A-Basin restricts lynx movements across the ski area, restrictions would be greatest when the ski area was open to the public (generally 8:30 a.m. to 4 p.m. [7.5 hours per day] and from late October into June [approximately 7.5 months]), distantly followed by those associated with winter and summer maintenance activities. Winter maintenance activities are concentrated at the base

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240 A-Basin, 2006a
241 Ruediger et al., 2000
area, but extend across most of the developed, front side of the mountain involving grooming and snowmaking. Those activities on the mountain are largely nocturnal and crepuscular. Summer maintenance activities are conducted by a handful of people during daylight hours.

At A-Basin, suitable security habitat occurs on both sides of Montezuma Bowl and the front side of the mountain. Security habitat may be less effective on the north side of the ski area, leading up to Loveland Pass, where a 1.53-mile long patch of forest contiguous with the ski area is fragmented by avalanche paths into four patches totaling 181 acres. These patches are no further than 0.41 mile from Highway 6.

**Region Two Sensitive Animal Species**

Region Two (R2) has designated “sensitive species,” representing species 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. The updated R2 Sensitive Species List was refined by the WRNF to produce a subset of sensitive species, including two insects, five fish, two amphibians, 17 birds, and seven mammals, that may be present or potentially present on the WRNF after an analysis of all sensitive animal species on the overall updated R2 list (refer to Table 3K-2). These species are considered below in phylogenetically ordered taxa (insects, fish, amphibians, birds, and mammals) and discussed individually where appropriate.

Information on R2 sensitive species status, distribution, and ecology was derived from CNHP data base maps and reports, CDOW habitat mapping, personal knowledge from Forest Service wildlife biologists, various scientific studies and reports, field surveys, and an extensive compilation of information contained in the 2002 Forest Plan.

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242 USDA Forest Service, 2003b
244 USDA Forest Service, 2003b
Table 3K-2:
Pre-field Checklist of R2 Sensitive Animal Species that Occur on the WRNF and Initial Assessment of Potential Effects Resulting from the Proposed Action (Alt. 2)

<table>
<thead>
<tr>
<th>Common name, Scientific name</th>
<th>Rationale for Potential Project Effects (Habitat Affinity)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INSECTS</strong></td>
<td></td>
</tr>
<tr>
<td>Great Basin silverspot, <em>Speyeria nokomis nokomis</em></td>
<td>No habitat (Wetlands supporting violet populations)</td>
</tr>
<tr>
<td>Hudsonian emerald, <em>Somatochlora hudsonica</em></td>
<td>No habitat (Wooded ponds; not found to date on WRNF)</td>
</tr>
<tr>
<td><strong>FISH</strong></td>
<td></td>
</tr>
<tr>
<td>Roundtail chub, <em>Gila robusta</em></td>
<td>No habitat or hydrologic effects (Far downstream in CO River)</td>
</tr>
<tr>
<td>Mountain sucker, <em>Catostomus platyrhynchus</em></td>
<td>No habitat or hydrologic effects (Far downstream in CO River)</td>
</tr>
<tr>
<td>Bluehead sucker, <em>Catostomus discobolus</em></td>
<td>No habitat or hydrologic effects (Far downstream in CO River)</td>
</tr>
<tr>
<td>Flannelmouth sucker, <em>Catostomus latipinnis</em></td>
<td>No habitat or hydrologic effects (Far downstream in CO River)</td>
</tr>
<tr>
<td>Colorado River cutthroat trout, <em>Oncorhynchus clarki pleuriticus</em></td>
<td>No habitat or hydrologic effects (Isolated highounai. streams)</td>
</tr>
<tr>
<td><strong>AMPHIBIANS</strong></td>
<td></td>
</tr>
<tr>
<td>Boreal western toad, <em>Bufo boreas boreas</em></td>
<td>No habitat (Montane/ subalpine ponds with willow wetlands)</td>
</tr>
<tr>
<td>Northern leopard frog, <em>Rana pipiens</em></td>
<td>No habitat or hydrology effects (Permanent wetlands)</td>
</tr>
<tr>
<td><strong>BIRDS</strong></td>
<td></td>
</tr>
<tr>
<td>Northern goshawk, <em>Accipiter gentilis</em></td>
<td>Pot. habitat (Closed montane forests &gt; 7,500’)</td>
</tr>
<tr>
<td>Northern harrier, <em>Circus cyaneus</em></td>
<td>Pot. habitat (Grasslands, agricultural lands, marshes, &amp; alpine)</td>
</tr>
<tr>
<td>Ferruginous hawk, <em>Buteo regalis</em></td>
<td>No habitat (Plains, grasslands)</td>
</tr>
<tr>
<td>American peregrine falcon, <em>Falco peregrinus anatum</em></td>
<td>No habitat (Cliffs, open habitats concentrating vulnerable prey)</td>
</tr>
<tr>
<td>White-tailed ptarmigan, <em>Lagopus leucurus</em></td>
<td>Present (Alpine habitat and upper elevation willow stands)</td>
</tr>
<tr>
<td>Greater sage grouse, <em>Centrocercus urophasianus</em></td>
<td>No habitat (Sagebrush)</td>
</tr>
<tr>
<td>Columbian sharp-tailed grouse, <em>Tympanuchus phasianellus columbianus</em></td>
<td>No habitat (Sagebrush and mountain shrub)</td>
</tr>
<tr>
<td>Flammulated owl, <em>Otus flammeolus</em></td>
<td>No habitat (Old-growth ponderosa pine and aspen)</td>
</tr>
<tr>
<td>Boreal owl, <em>Aegolius funereus</em></td>
<td>Pot. habitat (Mature spruce-fir &amp; mixed conifer)</td>
</tr>
<tr>
<td>Black swift, <em>Cypseloides niger</em></td>
<td>No habitat (Waterfalls, cliffs)</td>
</tr>
<tr>
<td>Lewis’ woodpecker, <em>Melanerpes lewis</em></td>
<td>No habitat (Riparian forests)</td>
</tr>
<tr>
<td>Three-toed woodpecker, <em>Picoides tridactylus</em></td>
<td>Pot. habitat (Mature-decadent conifer forests)</td>
</tr>
<tr>
<td>Olive-sided flycatcher, <em>Contopus cooperi</em></td>
<td>Pot. habitat (Open, upper elev. conifer forests)</td>
</tr>
<tr>
<td>Loggerhead shrike, <em>Lanius ludovicianus</em></td>
<td>No habitat (Plains, low valleys, shrublands)</td>
</tr>
<tr>
<td>Purple martin, <em>Progne subis</em></td>
<td>No habitat (Old-growth aspen)</td>
</tr>
<tr>
<td>Brewer’s sparrow, <em>Spizella breweri</em></td>
<td>No habitat (Sagebrush and other structurally similar shrublands)</td>
</tr>
<tr>
<td>Sage sparrow, <em>Amphispiza belli</em></td>
<td>No habitat (Low elevation big sagebrush and sage/greasewood)</td>
</tr>
<tr>
<td><strong>MAMMALS</strong></td>
<td></td>
</tr>
<tr>
<td>Pygmy shrew, <em>Microsorex hoyi montanus</em></td>
<td>Pot. habitat (Variety of subalpine habitats)</td>
</tr>
<tr>
<td>Fringed myotis, <em>Myotis thysanodes</em></td>
<td>No habitat (Forests/woodlands to 7,500 ft.; unknown on WRNF)</td>
</tr>
</tbody>
</table>
### Table 3K-2:

**Pre-field Checklist of R2 Sensitive Animal Species that Occur on the WRNF and Initial Assessment of Potential Effects Resulting from the Proposed Action (Alt. 2)**

<table>
<thead>
<tr>
<th>Common name, Scientific name</th>
<th>Rationale for Potential Project Effects (Habitat Affinity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spotted bat, <em>Euderma maculatum</em></td>
<td>No habitat (Cliffs, arid terrain)</td>
</tr>
<tr>
<td>Townsend's big-eared bat, <em>Corynorhinus townsendii townsendii</em></td>
<td>No habitat (Structures, tree cavities &lt;9,500 ft.)</td>
</tr>
<tr>
<td>American marten, <em>Martes americana</em></td>
<td>Present (Conifer forests)</td>
</tr>
<tr>
<td>North American wolverine, <em>Gulo gulo luscus</em></td>
<td>Pot. travel habitat (Mountains)</td>
</tr>
<tr>
<td>River otter, <em>Lutra canadensis</em></td>
<td>No habitat (Year-round open water and streamflows of ≥ 10 cfs)</td>
</tr>
</tbody>
</table>

a - PA = Project area containing upgraded facilities at A-Basin.

Note: 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, and Alternative 2 would have no impact on those species or their habitats. Potential pre-field survey occurrence on the project area, potential for project effects, and habitat affinity is summarized for each species. Species in **bold** are potentially present and/or are discussed in the text. Animals are listed phylogenetically.

Source: USDA Forest Service, 2003a and 2005b and Western Ecosystems, Inc.

### Insects

Two species of R2 sensitive insects, Hudsonian emerald (*Somatochlora hudsonica*) and Great Basin silverspot (*Speyeria nokomis nokomis*), are potentially present on the WRNF (refer to Table 3K-2).

Neither of these species has potential habitat within the area of influence of the project area nor have known distributions overlapping the WRNF.

### Fish

Five species of sensitive fish, roundtail chub (*Gila robusta*), mountain sucker (*Catostomus platyrhynchos*), bluehead sucker (*Catostomus discobolus*), flannelmouth sucker (*Catostomus latipinnis*), and Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), occur on the WRNF (refer to Table 3K-2). None of these species occur within the hydrologic influences of the project area.

### Amphibians/Reptiles

Two species of sensitive amphibians and no species of sensitive reptiles occur or are expected to occur on the WRNF (refer to Table 3K-2). Both amphibians occupy ponds and wetland habitats. No suitable breeding habitat for the northern leopard frog (*Rana pipiens*) is present on the project area and the project area is well beyond the dispersal range of the nearest extant population. The one remaining amphibian, boreal western toad (*Bufo boreas boreas*), is addressed below.

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247 USDA Forest Service, 2003a and 2005b
Boreal Western Toad

The boreal western toad inhabits marshes, wet meadows, and the margins of streams, beaver ponds, lakes, and glacial kettle ponds between 7,000 and 11,860 feet in Colorado. They may be active both day and night, hiding beneath rocks, logs, or in rodent burrows when inactive. These toads emerge from winter chambers during May and begin moving back to the hibernaculum in late August and early September. By October, most toads have entered hibernation. Breeding begins in late spring as the winter snow pack recedes. Strings of eggs are usually deposited in shallow pools or along pond margins in late May to early June. Tadpoles metamorphose their first or second summer depending on elevation and water temperature. Post-breeding dispersal of adult toads may extend considerable distances into upland habitats from breeding sites. While males appear to have home ranges within an approximate 300-meter radius of breeding sites, females generally disperse farther (up to 2.5 miles) and into drier habitats than males. Although this toad was once widespread in Colorado’s mountains, and while suitable habitat is still widespread, this species has declined in recent years, with Chytrid fungus thought to be a primary agent.

No suitable breeding habitat for the boreal toad is present on or adjacent to the project area. Several extant boreal toad populations are present within surrounding drainages, hydrologically upstream and downstream of the project area. Those populations are at or beyond maximum known dispersal distances.

Birds

Sixteen species of sensitive birds are known or expected to occur on the WRNF (refer to Table 3K-2).248

Ten of these species, including ferruginous hawk (Buteo regalis), American peregrine falcon (Falco peregrinus anatum), greater sage grouse (Centrocercus urophasianus), Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus), flammulated owl (Otus flammeolus), black swift (Cypseloides niger), loggerhead shrike (Lanius ludovicianus), purple martin (Progne subis), Brewer’s sparrow (Spizella breweri), and sage sparrow (Amphispiza belli), are associated with habitats that are not found in the project area. Those habitats include plains, and semi-arid shrublands, cliffs, riparian complexes and other montane and subalpine habitats supporting moderate to high density bird populations, sagebrush and mountain shrub habitats, late-successional aspen forest, and waterfalls. The remaining six species are addressed individually, below.

Northern Goshawk

Goshawks (Accipiter gentilis) are a forest-interior species generally associated with aspen and conifer forests between 7,500 and 11,300 feet. Goshawks nest in mature to old-growth aspen, mixed aspen and coniferous forests with a depauperate understory on gently sloping north or east aspects near the bottom of stream courses. Nests may be reused in subsequent years. Goshawk territory size averages 640 to 2,560 acres with a diameter of 1 to 3 miles in the western United States. In Colorado, Towry estimated that a

248 Ibid.
Chapter 3: Affected Environment and Environmental Consequences

K. Wildlife

Nest territory required 3,264 to 6,784 acres (5.1 to 10.6 square miles). Hoover and Wills estimated mean territory size for a pair at 3,300 to 6,800 acres. Within the territory, goshawks require at least 30 acres of unbroken forest for a nest site, with desired forest conditions providing three suitable and three replacement nest sites, totaling 180 acres. Colorado goshawks forage in the forest understory and forest openings for rabbits, hares, squirrels, and blue grouse.

No evidence of nesting goshawks has been detected within or adjacent to proposed disturbance areas or within or adjacent to the A-Basin SUP area. Goshawks have been detected occasionally hunting developed portions of Breckenridge, Vail, Ski Cooper, and Powderhorn Ski Areas. Based on the distribution of habitats around the project area it is possible that goshawks could utilize portions of A-Basin as part of a local pair’s large foraging range.

**Northern Harrier**

In Colorado, northern harriers (*Circus cyaneus*) are considered residents, most numerous in migration and least numerous in summer. They are relatively rare breeders that nest in a variety of habitats, including native and non-native grasslands, agricultural lands, emergent wetlands, and tall desert shrublands, with the only requirement being abundant cover, such as that provided by tall reeds, cattails, and grasses. They have not been documented in Summit County and their primary breeding areas in Colorado include extensive wetlands on the eastern plains and the San Luis Valley. In the vicinity of the project area (and higher mountains), harriers are considered rare to locally uncommon. During late summer and fall migration, harriers may wander or range (i.e., considered accidental and rare, with one record in the state) above treeline.

This species was not detected on the project area. The A-Basin SUP area and surrounding area are unsuitable as breeding habitat. It is possible, though extremely unlikely, that during late summer and fall migration, harriers could wander through the project area and opportunistically hunt the alpine grasslands in Montezuma Bowl.

**White-tailed Ptarmigan**

White-tailed ptarmigan (*Lagopus leucurus*) are residents of the alpine, although they (esp. females) may vertically migrate to winter in subalpine basin and water courses containing willow stands. They inhabit all alpine regions of Colorado except the Wet Mountains and Spanish Peaks. Males generally winter above treeline in areas of exposed grasslands and short willow thickets, while females often winter below treeline in taller, denser willow thickets. Pair formation begins in late April when females return to breeding grounds. Areas mostly snow free early in spring are used for breeding. Females select nest sites among rock fields or alpine grasses adjacent to sheltering and concealing rocks. Egg-laying begins in early June. Young hatch in early to mid-July and leave the nest shortly after, but remain in a brood with

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the hen through September. Many of the State’s alpine areas are protected by wilderness designations and most summer ptarmigan habitat is inaccessible to substantive human impacts. Impacts to this species have largely come from winter habitat losses, attributable to high-altitude reservoir development, livestock grazing, an expanded elk population, road construction along stream courses, ski area development, and snowmobiling.

Ptarmigan are present in alpine areas of the A-Basin SUP area as part of a broad band of their overall range that extends along the Continental Divide and its spur ridges. Ptarmigan were not detected during 2004-2006 surveys associated with the Proposed Action, but they were detected during prior wildlife surveys and they are occasionally detected in Montezuma Bowl by ski patrol. Alpine areas are used as summer habitat, breeding range, and as winter range (primarily by a lower number of males). Virtually all willow stands in Montezuma Bowl are covered by snow early in most winters and are unavailable to wintering ptarmigan. However, birds are occasionally present in windswept areas of Montezuma Bowl’s headwall and eastern ridgeline.

**Boreal Owl**

Boreal owls (*Aegolius funereus*) are rare to locally uncommon residents of Colorado’s mountains, mainly above 9,000 feet. They inhabit mature and late-successional spruce-fir and spruce-fir/lodgepole pine forests interspersed with small meadows, streams, and wetlands. The forest structure provides nest cavities and the more mesic communities generally support higher small rodent populations. Red-backed voles are their principal prey species and owl populations may fluctuate considerably in response to prey availability. Nests are occupied as early as April 21 and nests with eggs or young are known to extend from May 22 to July 9. Summer home ranges of three adults near Cameron Pass ranged from 593 to 869 acres (May 18 to July 31) and winter ranges ranged from 1,961 to 3,631 acres (August 1 to January 12). Year-round home ranges for two males varied from 3,447 to 3,894 acres and overlapped each other by > 90 percent. Recent surveys in Colorado have shown that the species is widely distributed in suitable habitats, with records from most of the higher mountain ranges in the state. The recent increase in records has been due to intensive and more knowledgeable searching. Boreal owls are tolerant of human and machine noise. In Colorado, these owls have nested within 30 meters of a major highway. Except during egg-laying, these owls tolerate frequent (every four to five days) direct nest inspections and will deliver prey to the nest while humans observe from several meters away. There is no evidence that human disturbance is an important factor in boreal owl nest loss or movements.

There have been no surveys conducted on the ski area that were adequate to detect boreal owls. However, based on structural characteristics of some conifer stands in the project area, these owls are potentially present. Snags with large openings to cavities were detected in some proposed disturbance areas during field surveys such that the project area could support several nesting pairs of these owls.
Three-Toed Woodpecker

Three-toed woodpeckers (Picoides tridactylus) are rare or locally uncommon residents of higher mountains. This species is most common in years and areas where trees have high insect populations due to disease or fire. Elsewhere, they occur at low densities, even in old-growth stands. Reported densities range from one pair per 35 to 106 acres. The highest densities occur in areas with forest insect infestations, often following fires. This primary cavity nester is generally associated with spruce-fir forests, but they may also occur in ponderosa pine, Douglas-fir, and lodgepole pine forests supporting high insect populations. Kingery et al. speculated that fire suppression has led to forest conditions favorable to wood-boring insect infestations that this species feeds on.251 This suggests that the Colorado population is fairly near historic high densities in unburned forests, but does not support an abundance of high-density populations that occur after fires, although the recent pine beetle infestation in Summit County has extended suitable habitat patches for this species.

Three-toed woodpeckers have not been detected on A-Basin. However, structurally suitable habitat is present, despite forest loss and fragmentation due to ski area development and the currently low levels of local insect infestations and foraging habitat provided by blow downs and stands affected by fires. Three-toed woodpeckers have been detected using suitably mature and senescent spruce-fir and lodgepole forests on developed portions of Breckenridge, Vail, Monarch, Beaver Creek, Copper Mountain, Wolf Creek, and Durango Mountain Ski Areas. While habitat fragmentation may affect this species on ski areas it does not exclude them.

Olive-Sided Flycatcher

Olive-sided flycatchers (Contopus cooperi) are uncommon summer residents of Colorado’s higher mountains and migrants through lower elevations. This flycatcher preys almost exclusively on flying insects, particularly bees, flies, moths, grasshoppers, and dragonflies, which they spot from snag perches. Requisite habitat components for this species are snags and conifers. In Colorado, they breed from 7,000 to 11,000 feet, primarily in dense, mature spruce-fir and Douglas-fir forests, especially on steep slopes or near cliffs, and less often in other coniferous forests, montane and foothill riparian forests, and aspen forests. An analysis of summer (boreal forests) and winter (tropical rain forests) habitat suggests that this flycatcher depends more on forest structure than on tree species composition. Within these habitats they are often associated with forest openings and forest edge habitat where they sally for flying insects from the tops of uncommonly tall snags and trees. They may occupy early successional forests (i.e., those resulting from fires and logging), provided snags and/or residual tall trees are available for foraging and singing perches. This flycatcher's affinity to such forest structure may limit its local abundance or distribution.

251 1998
Olive-sided flycatchers have not been detected on A-Basin. Forest stands associated with the parking lots and intertrail islands on the north side of the ski area and those in lower Montezuma Bowl are structurally similar to those where this flycatcher was detected on developed and undeveloped portions of Breckenridge, Vail, Copper Mountain, Wolf Creek, and Durango Mountain Ski Areas. Forest stands that would be affected on the north side of the ski area represent unsuitable habitat for this species, while those in Montezuma Bowl represent suitable, but apparently unoccupied habitat.

**Mammals**

Seven species of sensitive mammals occur or are expected to occur on the WRNF (refer to Table 3K-2). Three of those species are present or have habitat affinities similar to those present within the project area and may be present. Those three species are addressed below. The remaining four species, spotted bat (*Euderma maculatum*), Townsend's big-eared bat (*Corynorhinus townsendii townsendii*), fringed myotis (*Myotis thysanodes*), and river otter (*Lutra canadensis*), have not been detected on or near the project area, do not have affinities to project area habitats, and have elevation and/or distributional ranges that do not overlap the project area.

**Pygmy Shrew**

Pygmy shrews are a species associated with the northern boreal forests of Canada and the northern United States. Until 1961 this shrew was unknown from the Rocky Mountains south of Montana. In that year the first Colorado specimens were collected around the edge of a small sphagnum bog, at around 9,700 feet in the Cache la Poudre drainage, about 40 miles west of Fort Collins. Since then, additional specimens have been collected in the same general area, in Wyoming's Medicine Bow Mountains, in spruce-fir forest near Rabbit Ears Pass in Grand County, and in Gunnison County. In Colorado this shrew has been captured in a variety of habitats including spruce-fir and lodgepole pine forests, clearcuts and selectively logged forests, forest-meadow edges, boggy meadows, willow thickets, aspen-fir forests, and subalpine parkland. However, they are thought to occur primarily in spruce-fir and lodgepole pine forests, where they are most abundant in mature and old-growth structural stages. This species is apparently only present in the central mountains of Colorado as discontinuous, relic populations.

No suitable trapping surveys have been conducted within the project area to detect this rare species. Pygmy shrews have not been detected in Summit County (NDIS data) or anywhere else on the WRNF. Based on the species' broad habitat affinities, the forested habitats that would be affected by the Proposed Action could represent potential, but in all probability, unoccupied habitat. The probability that this species would be present in the 9.23 acres (including the 3.1 acres lynx treatment area) of affected forest when it has never been located on the WRNF is unlikely.

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252 USDA Forest Service, 2003a and 2005b
American Marten

Martens are boreal weasels closely associated with dense, late-successional, spruce-fir forests in Colorado, although their seasonal distribution also extends upward into the alpine and down into lodgepole pine forests and coniferous riparian corridors. Complex physical habitat structure, particularly on the forest floor, provides three important microhabitat functions: access to subnivian space for foraging and resting, escape cover, and thermal protection. Such structure might be in the form of logs, rock piles/outcrops, stumps, windthrown trees, slash, boulder fields, and squirrel middens. Martens generally avoid habitats lacking overhead cover, including large clearcuts, burns, and meadows. Excluding marten use of talus and alpine boulder fields, openings in the range of 100 to 300 meters wide are the largest that martens are known to cross.

Marten primarily eat red-backed voles, other voles, pine and ground squirrels, and other small mammals, but will opportunistically eat insects, birds, fruits, and nuts. Martens are mainly crepuscular and nocturnal, are active year-round, and may forage on the ground or in trees, except during periods of severe winter weather. Their movements respond to prey availability, but they do not exhibit seasonal or altitudinal migrations.

Home range size varies widely among reported studies, due to sex, geographic area, prey abundance, and habitat characteristics, including type and degree of forest fragmentation. Home ranges are larger for males, larger in areas of reduced prey availability or abundance, and larger in more fragmented landscapes. In Wyoming, the closest study area to Colorado in which marten home ranges were measured, males averaged 494 to 791 acres and females 198 acres.

Marten are present in the A-Basin project area. Forests on both sides of the ski area are part of one or more individuals’ home range.

North American Wolverine

Wolverines are a circumpolar species, which reach their southern, North American distributional limits in Colorado. They are scarce in other parts of the south-central Rocky Mountains and were, apparently, never common in Colorado. Historic wolverine range in Colorado extends the length of the Rocky Mountains and the West Slope.

Wolverines occur at low densities throughout their distribution. Animals may travel over 20 miles per day and range over large territories. Male territories are as large as 772 square miles, while those of females may be 150 to 190 square miles. Wolverines are opportunistic feeders and will eat a wide variety of food items depending on their availability. They have been described as scavenging predators. Much of the literature documents large animals in their diets. Although wolverines are capable of killing large animals, especially in deep, hindering snow, the large proportion of large animals in their diet is probably more
reflective of the importance of carrion. They are also successful predators on a variety of small mammals and birds and are known to cache surplus food items.

The CDOW initiated a wolverine project in 1978 to summarize wolverine history in Colorado and to accumulate information about their current status. Although the study provided circumstantial evidence that wolverine were present in Colorado, it did not identify the presence of viable populations. Researchers associated with the project believed the species still existed in the state. Circumstantial evidence accumulated during the wolverine study suggested that during May through October, wolverine primarily occur at higher elevations from the upper montane to the alpine. Beginning around November, some wolverine may start an elevational migration to the lower limits of treeline or into the oak brush-sagebrush zone, apparently in relation to migrating ungulate herds.

Although the project area is located within the wolverine's historic range, only one, positive identification of a wild wolverine has been documented in Colorado in the last 30 years, the CDOW has been unable to verify that a viable population persists, and most researchers now consider Colorado and the southern Rockies to be outside of the extant wolverine distribution. Since 1993, the CDOW has offered a $500 reward for any positive information on wolverine presence, but has not received any. There have been no road kills or accidental shooting or trapping of wolverines reported. The CDOW has concluded that if any wolverine remain in Colorado, their numbers are so small that they do not represent a viable population and are not detectable by known census methods. The CDOW has speculated that it is quite possible that wolverine have been extirpated from Colorado.

At best, wolverines were apparently uncommon in Colorado's mountains even before the arrival of white man and, if present, they are undoubtedly less common today. If wolverines remain in the southern Rockies, they could occur in the vicinity of the project area. If wolverines follow migratory ungulate herds, they may occasionally occur in the vicinity of the project area, although they would rarely be present. Elk winter range outside the project area could possibly represent a concentrated carrion or forage source. In summer, habitats in and adjacent to the project area support small elk nursery groups that might attract wolverines. As such, habitats in Montezuma Bowl would only provide serendipitous foraging opportunities for the rare animal that might be moving through the area.

Management Indicator Species

The Forest Service identified MIS to provide a means to monitor selected issues on the Forest as required by regulation. 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. Strategies and objectives found in Chapter I of the 2002 Forest Plan direct the Forest to provide ecological conditions that sustain viable populations of MIS and to demonstrate positive trends in habitat availability, quality, or other factors affecting the species. The 2002 Forest Plan has one objective and one
strategy (referred to hereinafter as Forest Direction, to differentiate it from the specific MIS management objective or question) that is specific to all MIS on the Forest:

**Forest-wide Goals and Objectives for MIS:**

*Objective 1b.* Provide ecological conditions to sustain viable populations of native and desired nonnative species and to achieve objectives for [MIS] and focal species.\(^{253}\)

*Strategy 1b.4.* Within 15 years, demonstrate positive trends in habitat availability, habitat quality, or other factors affecting sensitive species and [MIS].

Since the establishment of the original 16 MIS in the 2002 Forest Plan, there have been advancements in MIS knowledge and application, including a Region 2 clarification of the selection criteria found in the 1982 National Forest Management Act planning regulations.\(^{254}\) Based on that clarification, the WRNF conducted a MIS data review involving the 16 original MIS.\(^{255}\) The goal of the review was to determine the usefulness of each species as a MIS and the practicality of monitoring population trend for each based on species biology, available methodologies, and effectiveness. The 2005 MIS review found that several species on the 2002 MIS list do not serve strong roles as indicators of major management activities’ effects or of ecosystem change. Several of these species do not respond to the criteria for selecting MIS and do not indicate a well defined range of habitat. For some species the effects of management activities are difficult to determine because of the infeasibility and ineffectiveness of collecting monitoring data at appropriate scales. Populations of several MIS are strongly influenced by factors in addition to direct habitat change. For those MIS, population changes are difficult to interpret in relation to management actions. As a result of the 2005 MIS review, the WRNF MIS list was updated.\(^{256}\)

Monitoring protocols (on file at the WRNF Supervisor’s Office in Glenwood Springs) have been developed for each MIS on the Forest to obtain the data elements necessary to meet the intent of the regulations defining MIS. The Forest Service is implementing these protocols for each MIS Forest-wide within the constraints of the budget and workforce. Protocols will guide the Forest in determining where and how to spend scarce resources in order answer the MIS questions raised during the development of the 2002 Forest Plan. Results of the annual monitoring program are included in the Forest-wide Monitoring Report as a portion of the 2002 Forest Plan. Population and habitat trends for all MIS will be reflected in this report and will guide future Forest management programs.

MIS are meant to be a Forest-wide issue. Project-level activities are evaluated in relation to how they affect Forest-wide population and habitat trends.

\(^{253}\) USDA Forest Service, 2002a p. 1-3  
\(^{254}\) Hayward et al., 2004; 36 CFR 219.19(a)(1)  
\(^{255}\) USDA Forest Service, 2005g  
\(^{256}\) USDA Forest Service, 2006f
MIS Evaluated for Alternative 2

From the revised list of Forest-wide MIS, effective March 1, 2006, American elk (*Cervus elaphus*), American pipit (*Anthus rubescens*), aquatic macroinvertebrates, and all trout were identified as project MIS, based on 2002 Forest Plan selection criteria and the presence or potential occurrence of these organisms and their habitats on NFS lands within or adjacent to the A-Basin project area. These species 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 any proposed activities. MIS not selected as project MIS include cave bats (no caves present or affected), Brewer’s sparrow (*Spizella breweri*, no sagebrush present or affected), and Virginia’s warbler (*Vermivora virginiae*, no mountain shrubland habitat present or affected). Table 3K-3 summarizes the analysis and rationale of the MIS evaluation for the Proposed Action.
# Chapter 3: Affected Environment and Environmental Consequences

## K. Wildlife

<table>
<thead>
<tr>
<th>MIS Species</th>
<th>Monitoring Question Identified in 2002 Forest Plan Revision</th>
<th>Habitat Occupied by Species? Are species and habitat present in the analysis area?</th>
<th>Will Proposed Action affect (direct, indirect, or cumulative) the species, its habitat, or its management question?</th>
<th>Will Proposed Action affect Forest-wide Population or Habitat Trends?</th>
<th>Is species addressed in other project documents?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elk</strong></td>
<td>Does Forest motorized and non-motorized travel and recreation management result in effective use of habitat by large ungulates?”</td>
<td>Wide range of forest and non-forest habitats; Species Presence - Yes Habitat Presence - Yes</td>
<td>Species - No Habitat - Yes Is monitoring question applicable to project? – No. Habitat by large ungulates would not be affected.</td>
<td>Population trends: No Habitat trends: No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Cave Bats</strong></td>
<td>Are caves being managed so that bat species will continue to use the caves, and maintain populations in the areas adjacent to the caves?”</td>
<td>Caves, abandoned mines; Species Presence - No Habitat Presence - No</td>
<td>Species - No Habitat - No Is monitoring question Applicable to Project? - No. Project will not affect any cave resources.</td>
<td>Population trends: No Habitat trends: No</td>
<td>Yes, fringed myotis, spotted bat, and Townsend’s big-eared bat are considered in the BE.</td>
</tr>
<tr>
<td><strong>American Pipit</strong></td>
<td>“Is the alpine grassland habitat being managed to provide habitat for those species dependent or strongly associated with alpine grassland habitat?”</td>
<td>Alpine Grassland; Species Presence - Yes Habitat Presence - Yes</td>
<td>Species - Yes Habitat - Yes Is monitoring question applicable to project? - Yes. Alpine grassland would be affected.</td>
<td>Population trends: No Habitat trends: No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Brewer’s Sparrow</strong></td>
<td>“Is sagebrush habitat being managed adequately to provide the quality and quantity of habitat for species dependent or strongly associated with sagebrush?”</td>
<td>Sagebrush; Species Presence - No Habitat Presence - No</td>
<td>Species - No Habitat - No Is monitoring question applicable to project? – No. Sagebrush habitats would not be affected.</td>
<td>Population trends: No Habitat trends: No</td>
<td>Yes, this species is considered in the BE.</td>
</tr>
<tr>
<td><strong>Virginia’s Warbler</strong></td>
<td>“Does forest management maintain populations of species dependent on dense shrub habitat dispersed throughout the shrub cover types?”</td>
<td>Dense Shrub Habitats; Species Presence - No Habitat Presence - No</td>
<td>Species - No Habitat - No Is monitoring question applicable to project? – No. Shrub habitat types would not be affected.</td>
<td>Population trends: No Habitat trends: No</td>
<td>No</td>
</tr>
</tbody>
</table>
## Table 3K-3:
White River National Forest Management Indicator Species and their 
Potential to Occur in the A-Basin Project Area

<table>
<thead>
<tr>
<th>MIS Species</th>
<th>Monitoring Question Identified in 2002 Forest Plan Revision</th>
<th>Habitat Occupied by Species? Are species and habitat present in the analysis area?</th>
<th>Will Proposed Action affect (direct, indirect, or cumulative) the species, its habitat, or its management question?</th>
<th>Will Proposed Action affect Forest-wide Population or Habitat Trends?</th>
<th>Is species addressed in other project documents?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Macro-invertebrates</td>
<td>“Does forest management maintain or improve water quality (including chemical aspects as well as sediment) such that aquatic faunal communities are similar between managed and reference sites?”</td>
<td>Perennial streams, intermittent streams, lakes and reservoirs; Species Presence - Yes Habitat Presence - Yes</td>
<td>Species - No Habitat - No Is monitoring question applicable to project? – No. Water quality would not be affected.</td>
<td>Population trends: No Habitat trends: No</td>
<td>Yes, the Hudsonian emerald, has an aquatic larval phase and is addressed in the BE. Otherwise, No</td>
</tr>
<tr>
<td>All Trout (brook, brown, rainbow, Colorado River cutthroat)</td>
<td>1. “Does forest management maintain or improve the physical habitat quality for salmonids in mountain streams?” 2. “Do winter water depletions associated with Forest special uses impact spawning success of fall spawning fish?”</td>
<td>Perennial streams and lakes; Species Presence - Yes Habitat Presence - Yes</td>
<td>Species - No Habitat - No Is monitoring question #1 applicable to project? – No. Habitat quality for salmonids in mountain streams would not be affected. Is monitoring question #2 applicable to project? – No. Spawning success of fall spawning fish would not be affected.</td>
<td>Population trends: No Habitat trends: No</td>
<td>Colorado River cutthroat trout are considered in the BE. None of the other species are considered.</td>
</tr>
</tbody>
</table>

Species in **bold** are project MIS.
Because Alternative 1 is a true No Action Alternative, Alternative 1 would contribute no direct, indirect, or cumulative effects on any WRNF MIS.
Source: USDA Forest Service, 2002b, 2005g and 2006f and Western Ecosystems, Inc.

### 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?” Forest-wide, the elk population is increasing, but the population is decreasing in some areas as a result of intentional management (e.g., DAU E-13). Per the 2002 Forest Plan, 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 the Proposed Action because elk are seasonally present on A-Basin. The Forest Service is implementing the elk monitoring protocol (on file at the WRNF Supervisor’s Office in Glenwood Springs), in cooperation with the CDOW, 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 2002 Forest Plan, and viability of this MIS will not be addressed further in this document. Elk life history information is contained in the project file.

Forest and District Level Information

Elk habitat on the WRNF includes all of the dominant vegetation types, and most of the other types found in the Southern Rocky Mountains. The WRNF provides most of the summer range for the herds in the general area. Certain areas in the extreme lower elevations of the Forest are used as winter or transitional range, but the vast majority of the winter range occurs off the Forest. Winter range is considered the most limiting seasonal range for most elk populations on the Forest. Approximately 10 percent of the winter range is found on NFS lands for the populations of elk that spend the summer on the WRNF. The remaining 90 percent is located on either Bureau of Land Management lands or private lands surrounding the Forest.

The State of Colorado has responsibility for the management of wildlife populations. The CDOW 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. Periodically these plans are updated to cover land management changes, new social perspectives, and changes in elk populations. The CDOW estimates population numbers of elk and sets management objectives for elk in units referred to as Data Analysis Units (DAUs). The CDOW publishes a disclaimer with its population estimates noting “estimating population numbers of wild animals over large geographic areas is an inexact science.”

The WRNF contains portions of the following elk DAUs: E6, E12, E13, E14, E15, and E16. These DAUs are located in the northwestern part of Colorado, and cover 10,873 square miles. Approximately 3,853 square miles (2,465,920 acres; 35 percent) of these DAUs are found within the proclaimed boundary of the WRNF.

Project-Level Information

The A-Basin project area is in DAU E-13, which comprises all of Summit County and the southern part of Grand County. DAU E-13 contains 1369.2 square miles (876,288 acres), with 35 percent (479.1 square miles [306,624 acres]) of this DAU within the WRNF. A-Basin’s SUP area (1,872 acres) represents a small portion (0.21 percent) of the home ranges of herds within DAU E-13. The current elk population objective for DAU E-13 is 3,000 elk post-hunting season. From 1994 to 2004, the post-hunt elk
population averaged about 5,187 elk with a 2004 post-hunt estimate of about 3,800 elk (refer to Table 3K-4). From 1995 to 2004 the post-hunt population of elk declined from 5,969 to 3,800 as the State increased hunting pressure in an attempt to bring the herd in balance with the population management objective. Based upon the most recent data available, the DAU E-13 herd remains slightly above the population objective.

Table 3K-4:
Post-hunt Elk Population Estimates for Data Analysis Unit E-13 Containing the A-Basin Project Area

<table>
<thead>
<tr>
<th>Year</th>
<th>Post-Hunt (Spring) Elk Population Estimate</th>
<th>Year</th>
<th>Post-Hunt (Spring) Elk Population Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>4060</td>
<td>1993</td>
<td>5224</td>
</tr>
<tr>
<td>1981</td>
<td>4560</td>
<td>1994</td>
<td>5627</td>
</tr>
<tr>
<td>1982</td>
<td>5100</td>
<td>1995</td>
<td>5969</td>
</tr>
<tr>
<td>1983</td>
<td>5900</td>
<td>1996</td>
<td>5572</td>
</tr>
<tr>
<td>1984</td>
<td>4570</td>
<td>1997</td>
<td>5835</td>
</tr>
<tr>
<td>1985</td>
<td>5380</td>
<td>1998</td>
<td>5504</td>
</tr>
<tr>
<td>1986</td>
<td>4746</td>
<td>1999</td>
<td>5593</td>
</tr>
<tr>
<td>1987</td>
<td>5423</td>
<td>2000</td>
<td>5020</td>
</tr>
<tr>
<td>1988</td>
<td>5594</td>
<td>2001</td>
<td>5080</td>
</tr>
<tr>
<td>1989</td>
<td>5822</td>
<td>2002</td>
<td>4554</td>
</tr>
<tr>
<td>1990</td>
<td>5772</td>
<td>2003</td>
<td>4501</td>
</tr>
<tr>
<td>1991</td>
<td>5916</td>
<td>2004</td>
<td>3800</td>
</tr>
<tr>
<td>1992</td>
<td>6084</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: the CDOW publishes a disclaimer with the information stating “estimating numbers of wild animals over large geographic areas is an inexact science”. 2001-2004 data provided April 25, 2005 (A. Holland, CDOW, pers. comm.). Source: Unpublished CDOW data obtained from Andy Holland, CDOW Biologist, Hot Sulfur Springs and Joe Doerr, Wildlife Biologist, Eagle Ranger District, and available in Upper Blue Project record).

NDIS mapping classifies the entire A-Basin SUP area as part of a block of elk summer range and summer concentration area that extends over most mid- and upper elevations of the entire southern half of Summit County. This summer concentration area excludes developed portions of the Snake River valley bottom (from the eastern end of Ski Tip to Dillon Reservoir), developed portions of the upper Blue River valley bottom and Highway 9 corridor north to Dillon Reservoir, Dillon Reservoir, and the bottom of the Blue River valley north of the reservoir. Summer concentration areas are defined as those areas where elk concentrate from mid-June through mid-August. High quality forage, security, and lack of disturbance are characteristics of these areas to meet the high energy demands of lactation, calf rearing, antler growth, and general preparation for the rigors of fall and winter. Developed portions of A-Basin do not meet the summer concentration area criteria, but do meet summer range criteria. Summer range is defined, in part,

257 Doerr, 2002; Holland, 2005

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as that part of the range of elk where 90 percent of the individuals are located between spring green-up and the first heavy snowfall or during a site-specific period of summer. The closest block of winter range to A-Basin begins on the south-facing slopes, north of Highway 6 across from the entrance to the Gondola Road, and extends west down valley. Therefore, no elk winter range or any other elk seasonal range is delineated on NDIS maps within the A-Basin SUP area. A few elk have begun wintering in the Snake River on south-facing slopes to the east of the Keystone Ski Tip base area in milder winters, however, that use does not extend uphill into or near the Montezuma Bowl project area. No other elk seasonal ranges are designated in the vicinity of the project area on NDIS maps.

Elk use of A-Basin’s south side extends from June through October, generally for movements between larger, higher quality habitat blocks. Skiing generally extends into June and fall snows become restrictive in October. These factors coupled with the poor forage development on ski trails, high degree of natural and ski area-related forest fragmentation, and limited diurnal summer maintenance activity results in little residency time of the ski area’s north side.

Elk use of A-Basin’s south side extends from May into November and is virtually unaffected by habitat modifications or human activities. This use period includes summer range and spring and fall transitional range. Southwest-facing Montezuma Bowl becomes snow-free relatively early for the elevation and supports high quality habitat (e.g., large foraging areas with optimal forage:cover ratios in an isolated setting that melt out over an extended period and support localized mesic foraging areas into fall). Calving per se has not been detected within the Bowl; however, cow-calf groups use the area during summer. Based on extensive elk calving surveys around Keystone Ski Area, it is likely that calving occurs at lower elevations in the Snake River valley and cows move their calves to higher elevation summer ranges, including Montezuma Bowl, thereafter. Even at the lower elevations associated with Keystone SUP area, habitat quality, snowmelt patterns (with or without the influence of snowmaking), and plant phenology preclude all but low levels of calving.

**American Pipit**

American pipit 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”? 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 2002 Forest Plan, and viability of this MIS will not be addressed further in this document.
American Pipit Life History Information

As a migrating species, American pipits arrive in Colorado in late April to early May. The winter range of the species includes Mexico and the southwestern United States. One brood is raised per season with nest building beginning in early to late June, shortly after pair formation and when suitable nest sites become free of snow. The average territory size is 1.4 acres (0.56 hectare) and average clutch size is three to five eggs. According to Colorado Breeding Bird Atlas workers, courtship begins around 19 June and the last fledgling was recorded on 22 August. American pipits forage in sparsely vegetated, moist habitats associated with snow accumulation and they feed on insects on snowfields, at streamsides, and along pond margins. Researchers have noted that severe summer weather can lead to low reproduction success or even the absence of small, isolated alpine populations in some years and that weather and predation can take a heavy toll, primarily on nestlings. The nest is constructed on the ground in wet and dry meadows, tussocks, or erosion banks; usually protected by overhanging vegetation, sod, or rock. Alpine grassland is the primary habitat for American pipits. Typically, no more than five bird species regularly complete their breeding and nesting activities above tree line. Of these five species, the American pipit is the most conspicuous and common breeding bird in many alpine areas. The Colorado Breeding Bird Atlas project indicated that pipits compose three-quarters of the breeding birds above timberline and that they adapt readily to both wet and dry conditions.

Forest-level Information

Alpine grasslands are the primary habitat for American pipits on the WRNF. The primary risk factors affecting alpine grassland communities on the Forest have been identified as recreation and livestock management in alpine areas. These areas are sensitive to disturbances that alter vegetation cover, since the soils can be unstable and have low fertility, and the vegetation is slow growing. Approximately 131,980 acres (206 square miles) of alpine habitat on the WRNF supports grassland communities that may be suitable habitat for American pipits. The American pipit protocol, on file at the WRNF Supervisor’s Office, requires the acreage of this community to be updated every five years via GIS analysis. The next update will be conducted in 2007. Approximately 75 percent of the alpine grasslands on the Forest occur within management areas that include primarily wilderness, recommended wilderness, Research Natural Areas, and other special management areas that provide protection from many of the management activities that might affect those habitats. Management effects from a variety of recreation uses on the remaining 25 percent of the alpine grassland will be tracked by monitoring American pipits. Approximately 13 percent of the alpine grassland is located within domestic livestock allotments currently open to grazing and an additional 5 percent is located on allotments that are currently vacant, but could be restocked. Over 82 percent of the alpine grassland is located on allotments that are closed to grazing and will not be impacted by domestic livestock. This information was developed from the Riparian-non-forest GIS coverage at the Forest level and represents the baseline habitat area for this MIS on the Forest as of 2002.
The WRNF does not yet have population numbers and habitat trends for American pipits on the Forest because this species is a new MIS in the 2002 Forest Plan. In 2002, the WRNF began Forest-wide monitoring of this species to collect the required data and address the management question.

American pipit conservation information for the Southern Rockies suggests the breeding population trend is presently stable, that insufficient data are available for further trend interpretation, but that the breeding priority score indicates this is not a species of conservation concern in the physiographic area (refer to Table 3K-5). These data have been derived from BBS data associated with the Southern Rocky Mountains Physiographic Area (Area 62) and information based on the Colorado Partners In Flight (CPIF) prioritization process, which assigns scores to species in categories pertaining to their biology and conservation needs. The principle objectives of the prioritization process are to establish an unbiased means of identifying bird species in greatest need of conservation attention, and to identify areas where conservation efforts for those species are likely to be most effective.

PIF data in Table 3K-5 indicate that the American pipit has a moderate relative abundance throughout its range. In the Southern Rocky Mountains, the American pipit occurs in high abundance relative to other parts of its range. The expected future conditions for breeding and non-breeding populations are expected to remain stable. Currently there are no known threats to the population. A slight to moderate decline in the future suitability of habitat conditions for non-breeding populations is expected while the breeding populations are expected to remain stable. However, the local population trend is uncertain due to inadequate sample size.

Table 3K-5:
Population Trend and Conservation Information for American pipit from the Southern Rocky Mountains Physiographic Area

<table>
<thead>
<tr>
<th>MIS</th>
<th>G_RA</th>
<th>AI_B</th>
<th>TN_L</th>
<th>TB_L</th>
<th>PT_B</th>
<th>% Pop</th>
<th>Trend_INT</th>
<th>B_Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.m.PI</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>No Data</td>
<td>16</td>
</tr>
</tbody>
</table>

G_RA = Relative abundance (global score); 1 = highest relative abundance, 5 = lowest.
AI_B = Breeding area importance score (local); 1 = lowest importance (relative abundance), 5 = highest.
TB_L = Threats to breeding (local); 1 = lowest threats, 5 = highest.
TN_L = Threats to non-breeding (local for non-migratory populations such as BRCR); 1 = lowest threats, 5 = highest.
PT_B = Breeding population trend (local); 1 = largest population increase (≥ 50%), 5 = largest population decrease (≥ 50%).
% Pop = Percent of species’ population in physiographic area.
Trend_INT = Trend interpretation. B_Total Score = total breeding priority score; (scores of 19 to 21 indicate species of conservation concern in the physiographic area).
The WRNF is included in the Southern Rockies analysis area.
Source: Colorado Partners In Flight, 2004

Table 3K-6 provides monitoring transect results established for the Monitoring Colorado’s Birds (MCB) program that quantify American pipits on the WRNF. Information was provided by Jason Beason of the Rocky Mountain Bird Observatory in April 2004. These are some of the first data collected on the Forest that will be used to establish the environmental baseline and population trend once more years of sampling are available. At present, these data cannot be used to suggest trends.
Table 3K-6: Monitoring Colorado’s Birds Monitoring Transect Results that quantify American pipits on the WRNF

<table>
<thead>
<tr>
<th>Transect</th>
<th>American Pipit</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2002</td>
<td>2003</td>
<td>Avg/yr</td>
<td></td>
</tr>
<tr>
<td>AT02</td>
<td>38</td>
<td>22</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>AT07</td>
<td>30</td>
<td>37</td>
<td>33.5</td>
<td></td>
</tr>
<tr>
<td>AT08</td>
<td>36</td>
<td>28</td>
<td>32.0</td>
<td></td>
</tr>
<tr>
<td>AT10</td>
<td>23</td>
<td>9</td>
<td>16.0</td>
<td></td>
</tr>
<tr>
<td>AT13</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>AT15</td>
<td>NR</td>
<td>22</td>
<td>22.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total Birds</strong></td>
<td>127</td>
<td>118</td>
<td>122.5</td>
<td></td>
</tr>
<tr>
<td><strong>Total Transects</strong></td>
<td>4</td>
<td>5</td>
<td>4.5</td>
<td></td>
</tr>
</tbody>
</table>

NR = Transect not conducted.
Source: Beason, 2004

Project Level Information

American pipits are present in the alpine headwalls of Montezuma Bowl and in some alpine areas of the north side of the ski area. American pipits are also present during summer in ski terrain on Breckenridge, Copper Mountain, Ski Cooper, Vail, and Monarch Ski Areas, and probably also present on other Colorado ski areas extending sufficiently into the alpine. Skiing and ski area management of alpine areas generally result in very limited ground disturbance or measurable effects of alpine vegetation communities and are mutually exclusive with summer pipit habitat use.

Aquatic Macroinvertebrates

Aquatic macroinvertebrates were selected as a MIS of water quality, specifically to answer the question: “Does Forest management maintain or improve water quality (including chemical aspects as well as sediment) such that aquatic faunal communities are similar between managed and reference sites”? On the WRNF, aquatic macroinvertebrates were selected to address trend and condition of flowing waters only and, therefore, macroinvertebrates in still water habitats will not be discussed further in this document. 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.
Aquatic Macroinvertebrate Life History Information

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. Although sensitive species occur in most insect families, three families are comprised primarily of species that are more sensitive to disturbance. These are Ephemeroptera (mayflies), Plecoptera (stoneflies), and Tricoptera (caddisflies). In this document, “EPT taxa richness” refers to the number of taxa in these three sensitive families, while “taxa richness” refers to the number of taxa of all aquatic macroinvertebrates.

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.

Forest-Level Information

The WRNF has 3,400 miles of perennial streams, 4,200 miles of intermittent streams, and 13,900 acres of lakes and reservoirs. Macroinvertebrate communities occur in all water bodies on the WRNF, including ponds, lakes, reservoirs, wetlands, rivers, perennial streams, and intermittent streams. Even degraded systems usually contain aquatic macroinvertebrates, however such communities differ considerably from those in pristine systems. Aquatic macroinvertebrates are sensitive to their physical and chemical environment and respond quickly to changes therein. Little information is available on current population characteristics on the Forest because of the recent selection of this group as a MIS that was not monitored in the past. It is assumed that macroinvertebrate community characteristics (species composition and density) are aligned with existing aquatic condition. Polluted waters should contain fewer individuals and the loss of sensitive taxa, streams with increased sediment loads should show a shift to more sediment tolerant taxa, and streams with healthy, clean waters should contain higher numbers of species and taxa. Forest-wide, habitat quantity for macroinvertebrates was expected to remain stable, while habitat quality was expected to increase as more streams moved to reference conditions due to improved habitat protection and enhancement measures. The Forest Plan concern for aquatic macroinvertebrates relates to how populations in stream reaches, where management activities occur, compare with similar stream reaches without management activities.

A macroinvertebrate monitoring protocol was drafted in early 2003 and data collection began during the 2003 field season. The Forest was divided into 10 different management combinations based on Forest Plan land allocation and livestock grazing. One site from each management combination was randomly selected for monitoring each year for five years (50 sites total). The randomly selected sites will be resampled every five years to determine Forest-wide trends. Forest-wide trend information is limited
because limited repeat sampling has occurred. Nine sites were sampled by the Forest in 2003; 10 sites were sampled in 2004, and 11 sites were sampled in 2005. Table 3K-7 displays the streams sampled and the taxa richness and EPT taxa richness of the sites where data are available. None of the Forest-wide macroinvertebrate monitoring sites sampled to date are within the A-Basin project area, but sampled sites are present in North Barton Gulch (north and hydrologically uninfluenced by Breckenridge Ski Area), Crystal Creek (south and hydrologically uninfluenced by Breckenridge Ski Area) and Two Elk Creek (within the influence of Vail Ski Area) that function, in part, as 8.25 Management Area treatment and control sites.

Table 3K-7: Aquatic MIS Sites on the WRNF Sampled for Macroinvertebrates and Trout during 2003, 2004,* and 2005

<table>
<thead>
<tr>
<th>Year Sampled and Stream Name</th>
<th>Taxa richness</th>
<th>EPT taxa richness</th>
<th>Ranger District</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 Avalanche Creek</td>
<td>41</td>
<td>18</td>
<td>Sopris</td>
<td>Wilderness/no Grazing</td>
</tr>
<tr>
<td>03 Bennett Gulch</td>
<td>43</td>
<td>20</td>
<td>Holy Cross</td>
<td>Timber/no Grazing</td>
</tr>
<tr>
<td>03 Big Fish Creek</td>
<td>37</td>
<td>23</td>
<td>Blanco</td>
<td>Wilderness/Cattle</td>
</tr>
<tr>
<td>03 Buck Creek</td>
<td>30</td>
<td>16</td>
<td>Eagle</td>
<td>Recreation/Sheep</td>
</tr>
<tr>
<td>03 East Canyon Creek</td>
<td>36</td>
<td>15</td>
<td>Rifle</td>
<td>Timber/Sheep</td>
</tr>
<tr>
<td>03 Cottonwood Creek</td>
<td>35</td>
<td>17</td>
<td>Eagle</td>
<td>Recreation/Cattle</td>
</tr>
<tr>
<td>03 Crystal Creek</td>
<td>40</td>
<td>21</td>
<td>Dillon</td>
<td>Recreation/no Grazing</td>
</tr>
<tr>
<td>03 East Miller Creek</td>
<td>31</td>
<td>10</td>
<td>Blanco</td>
<td>Timber/Cattle</td>
</tr>
<tr>
<td>03 Piney River</td>
<td>36</td>
<td>21</td>
<td>Holy Cross</td>
<td>Wilderness/Sheep</td>
</tr>
<tr>
<td>04 North Barton Gulch</td>
<td>41</td>
<td>16</td>
<td>Dillon</td>
<td>Timber/no Grazing</td>
</tr>
<tr>
<td>04 Beaver Creek</td>
<td>27</td>
<td>7</td>
<td>Rifle</td>
<td>Recreation/Cattle</td>
</tr>
<tr>
<td>04 Deep Creek</td>
<td>40</td>
<td>12</td>
<td>Rifle</td>
<td>Timber/Sheep</td>
</tr>
<tr>
<td>04 East Fk Crystal River</td>
<td>36</td>
<td>18</td>
<td>Sopris</td>
<td>Wilderness/Sheep</td>
</tr>
<tr>
<td>04 Express Creek</td>
<td>30</td>
<td>9</td>
<td>Aspen</td>
<td>Recreation/no Grazing</td>
</tr>
<tr>
<td>04 Fourmille Creek</td>
<td>no collection</td>
<td>no collection</td>
<td>Sopris</td>
<td>Timber/Cattle</td>
</tr>
<tr>
<td>04 Morapos Creek</td>
<td>56</td>
<td>20</td>
<td>Blanco</td>
<td>Recreation/Sheep</td>
</tr>
<tr>
<td>04 Ripple Creek</td>
<td>40</td>
<td>21</td>
<td>Blanco</td>
<td>Wilderness/Cattle</td>
</tr>
<tr>
<td>04 Snowmass Creek</td>
<td>31</td>
<td>17</td>
<td>Aspen</td>
<td>Wilderness/no Grazing</td>
</tr>
<tr>
<td>04 Two Elk Creek</td>
<td>30</td>
<td>17</td>
<td>Holy Cross</td>
<td>High Development</td>
</tr>
<tr>
<td>05 Meadow Creek</td>
<td>37</td>
<td>24</td>
<td>Holy Cross</td>
<td>Wilderness/sheep</td>
</tr>
<tr>
<td>05 West Tenmile Creek</td>
<td>41</td>
<td>15</td>
<td>Dillon</td>
<td>High Development</td>
</tr>
<tr>
<td>05 South Fork Swan</td>
<td>39</td>
<td>21</td>
<td>Dillon</td>
<td>Timber/no Grazing</td>
</tr>
<tr>
<td>05 East Brush Creek</td>
<td>37</td>
<td>20</td>
<td>Eagle</td>
<td>Recreation/cattle</td>
</tr>
<tr>
<td>05 Derby Creek</td>
<td>38</td>
<td>19</td>
<td>Eagle</td>
<td>Timber/Cattle</td>
</tr>
<tr>
<td>05 Campbell Creek</td>
<td>37</td>
<td>14</td>
<td>Eagle</td>
<td>Recreation/cattle</td>
</tr>
<tr>
<td>05 Turkey Creek</td>
<td>32</td>
<td>22</td>
<td>Holy Cross</td>
<td>Timber/Sheep</td>
</tr>
<tr>
<td>05 Upper Fryingpan</td>
<td>42</td>
<td>19</td>
<td>Sopris</td>
<td>Wilderness/No grazing</td>
</tr>
<tr>
<td>05 South Fork Fryingpan</td>
<td>28</td>
<td>11</td>
<td>Sopris</td>
<td>Recreation/no grazing</td>
</tr>
<tr>
<td>05 Milk Creek</td>
<td>26</td>
<td>11</td>
<td>Blanco</td>
<td>Recreation/Sheep</td>
</tr>
</tbody>
</table>
Table 3K-7:
Aquatic MIS Sites on the WRNF Sampled for Macroinvertebrates and Trout during 2003, 2004, a and 2005

<table>
<thead>
<tr>
<th>Year Sampled and Stream Name</th>
<th>Taxa richness</th>
<th>EPT taxa richness</th>
<th>Ranger District</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 East Elk Creek</td>
<td>37</td>
<td>19</td>
<td>Blanco</td>
<td>Timber/Cattle</td>
</tr>
</tbody>
</table>

a - Flows were too low in Fourmile Creek to collect macroinvertebrates. A new site was selected in 2005 to replace that site.
b - Piney River was originally sampled in 2003. Macroinvertebrates were resampled in 2004.

Although many streams across several different ski areas have been sampled in 2003 and 2005, analysis has not yet been conducted to determine trends at these sites. Preliminary results derived from these data suggest that where watersheds are heavily managed for recreation (e.g., access roads, clearing for ski runs, etc.), macroinvertebrate communities deviate from reference streams. Analysis has been completed with data collected from Two Elk Creek, located within a watershed partly developed for Vail Ski Area, which provides an example of trend data for an 8.25 Management Area. Macroinvertebrate data were collected in 1993 and 2004. In addition, data from the two macroinvertebrate surveys were also compared to appropriate reference sites in Polk Creek. Caution must be used when comparing data collected using different methods, or at different times of the year. Examining the 1993 and 2004 Two Elk Creek data, it appeared that diversity declined, and percent Ephemeroptera and percent Dominant Taxon scores increased in 2004 (refer to spreadsheets in the project file). These three metrics are related because the cause for these metric score changes was due to an increase (and domination of the sample) by *Baetis tricaudatus*, an Ephemeroptera taxon that is tolerant of sediment and disturbance. This species has been found to be extremely abundant in sites impacted by sediment. This species was not present in the three Two Elk Creek sites sampled in May and October, 1993. The 1993 study found *Rhithrogena robusta*, a sensitive Ephemeropteran (mayfly) to be the dominant taxon in that sample. The increase in Dominant Taxon scores could be due to seasonal or methodological differences in sampling protocols.

When comparing 2004 Two Elk Creek (i.e., a stream within the influence of 8.25 Area Management that is part of the Forest-wide aquatic macroinvertebrate monitoring protocol) samples to reference streams, it appeared the stream habitat was in relatively poor condition. Diversity, number of taxa, number of EPT, number of Plecoptera, number of intolerant taxa, percent dominant taxon, percent clingers, percent Dipterans, and percent Chironomid metric scores all indicated degraded conditions.

With only two years of sampling conducted to date on and downstream of ski areas, and until paired samples comparing treatment reaches with control reaches can be collected, any conclusions regarding the management question at 8.25 Management Areas using macroinvertebrates should be tempered.

As a new MIS, at this time it is not possible to determine which direction the Forest, on average, is trending with respect to aquatic macroinvertebrates. Protocols are in place and monitoring has begun to determine current status and population trend. Recent Forest management and current direction should
create a positive trend in macroinvertebrate communities, with better protections in place and proactive projects to improve damaged areas. Growth outside the Forest boundary and other aspects over which the Forest has little control, like water development and natural gas development, are contributing to a negative trend in localized areas.

**Project-Level Information**

Aquatic macroinvertebrates are found in streams on and below the A-Basin project area. Macroinvertebrate communities in stream reaches hydrologically above developed ski terrain probably support species compositions and densities comparable to baseline conditions, while those in lower reaches on and below the ski area have probably been altered, to some extent, by increased runoff resulting from tree removal for ski trails, snowmaking, and parking lot and Highway 6 runoff. Macroinvertebrate diversity in the North Fork of the Snake River was high, with 55 benthic taxa distributed throughout the reach during 1995 sampling. However, sampling conducted in September, 2005 on the North Fork Snake downstream of Arapahoe Basin resulted in only 31 taxa collected. The reduction in taxa may be partly due to chemical spills that have occurred in the North Fork Snake/Highway 6 corridor in recent years. Nevertheless, when comparing 2005 data to reference streams, the macroinvertebrate community in the North Fork Snake reflects relatively high biotic integrity. Aquatic macroinvertebrate sampling has not been conducted in the two intermittent streams draining Montezuma Bowl, however those streams probably support species compositions and densities comparable to baseline conditions for intermittent or ephemerally flowing streams. Macroinvertebrate monitoring is not being conducted at A-Basin. Such MIS sampling is not required at the project level.

**All Trout**

All trout, including brook (*Salvelinus fontinalis*), brown (*Salmo trutta*), rainbow (*Oncorhynchus mykiss*), and Colorado River cutthroat trout (hereinafter MIS trout, or trout), were selected as a MIS to address issues related to salmonid habitat management and winter water depletions/spawning success. All trout were selected to answer two management questions: (1) “Does Forest management maintain or improve the physical habitat quality for salmonids in mountain streams?” and (2) Do winter water depletions associated with Forest special uses impact spawning success of fall spawning fish?” Decreased habitat quality can result from changes in channel morphology and increased sedimentation. 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 species on the WRNF, viability is not expected to become a concern through implementation of this project or continued implementation of the 2002 Forest Plan, and viability of this MIS will not be addressed further in this document.
Trout Life History Information

Trout occur in most of the perennial water bodies on the WRNF, including streams, rivers, lakes, and reservoirs. Trout may be excluded from some areas due to chemical contamination below mines or by natural or human-caused barriers. At high elevations, trout may be absent due to water temperature. On the Forest, trend and condition are considered in streams and rivers only. Therefore, trout in still water habitats will not be discussed further in this document. The timing of flows, water quality, and availability of various habitat features such as deep pools, cover, and spawning gravels influence trout abundance. Geology, elevation, temperature, gradient, and substrate distribution are other factors that commonly influence trout abundance. As habitats are degraded, either by chemical pollutants, increased sediment, or unfavorable changes in flow (especially severe reductions), trout typically respond with lower abundance and uneven year class distribution.

Forest-Level Information

The WRNF has 3,400 miles of perennial streams, 4,200 miles of intermittent streams, and 13,900 acres of lakes and reservoirs. The 2002 Forest Plan EIS estimated no change in total trout habitat quantity, stable Forest-wide populations of trout as a whole, and improving habitat quality due to improved streamside protection measures. For brook and brown trout in ski areas (where winter water depletions were expected to increase), the 2002 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.

The 2002 Forest Plan concern with respect to trout concerns how populations in stream reaches where management activities occur compare with similar stream reaches without management activities (i.e., reference conditions). Because the Forest Plan revision was completed in 2002 with newly selected aquatic MIS, the Forest does not yet have trout population numbers and trends for reference and affected stream reaches Forest-wide. In 2003, the WRNF began its Forest-wide aquatic MIS monitoring. Nine randomly selected sites were completed for trout monitoring in 2003. Ten and 11 additional randomly selected sites were completed in 2004 and 2005 surveys, respectively. Additional sites will be sampled each year through 2007. To determine MIS trends, the Forest will resurvey the 2003 sites in 2008, resurvey the 2004 sites in 2009, etc. None of the monitoring sites sampled to date are within the A-Basin project area, but sampled monitoring sites are present in North Barton Gulch (north of and hydrologically uninfluenced by Breckenridge Ski Area) and Two Elk Creek (within the influence of Vail Ski Area) that function, in part, as 8.25 Management Area treatment and control sites. Forest-wide fish data from the 2003, 2004, and 2005 samples are shown in Table 3K-8.
### Table 3K-8:
WRNF MIS Trout Monitoring Data

<table>
<thead>
<tr>
<th>Year Sampled and Stream Name</th>
<th>Trout per 100 m</th>
<th>Species present</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 Avalanche Creek</td>
<td>24</td>
<td>Brook, brown, rainbow, &amp; cutthroat trout, sculpin</td>
<td>Wilderness/no Grazing</td>
</tr>
<tr>
<td>03 Bennett Gulch</td>
<td>24</td>
<td>Brown trout</td>
<td>Timber/no Grazing</td>
</tr>
<tr>
<td>03 Big Fish Creek</td>
<td>66</td>
<td>Brook &amp; rainbow trout, sculpin</td>
<td>Wilderness/Cattle</td>
</tr>
<tr>
<td>03 Buck Creek</td>
<td>91</td>
<td>Brook trout</td>
<td>Recreation/Sheep</td>
</tr>
<tr>
<td>03 East Canyon Creek</td>
<td>13</td>
<td>Cutthroat trout</td>
<td>Timber/Sheep</td>
</tr>
<tr>
<td>03 Cottonwood Creek</td>
<td>3</td>
<td>Brook trout</td>
<td>Recreation/Cattle</td>
</tr>
<tr>
<td>03 Crystal Creek</td>
<td>5</td>
<td>Cutthroat trout</td>
<td>Recreation/no Grazing</td>
</tr>
<tr>
<td>03 East Miller Creek</td>
<td>140</td>
<td>Brown, brook, &amp; hybrid cutthroat trout, sculpin</td>
<td>Timber/Cattle</td>
</tr>
<tr>
<td>03 Piney River</td>
<td>24</td>
<td>Cutthroat &amp; hybrid cutthroat</td>
<td>Wilderness/Cattle</td>
</tr>
<tr>
<td>04 North Barton Gulch</td>
<td>2</td>
<td>Brook trout</td>
<td>Timber/no Grazing</td>
</tr>
<tr>
<td>04 Beaver Creek</td>
<td>9</td>
<td>Cutthroat trout</td>
<td>Recreation/Cattle</td>
</tr>
<tr>
<td>04 Deep Creek</td>
<td>59</td>
<td>Cutthroat &amp; brook trout</td>
<td>Timber/Sheep</td>
</tr>
<tr>
<td>04 East Fork Crystal River</td>
<td>1</td>
<td>Cutthroat trout</td>
<td>Wilderness/Sheep</td>
</tr>
<tr>
<td>04 Express Creek</td>
<td>4</td>
<td>Brook trout</td>
<td>Recreation/no Grazing</td>
</tr>
<tr>
<td>04 Fourmile Creek</td>
<td>0</td>
<td>Sculpin</td>
<td>Timber/Cattle</td>
</tr>
<tr>
<td>04 Morapos Creek</td>
<td>35</td>
<td>Cutthroat trout, sculpin, dace</td>
<td>Recreation/Sheep</td>
</tr>
<tr>
<td>04 Ripple Creek</td>
<td>59</td>
<td>Cutthroat trout</td>
<td>Wilderness/Cattle</td>
</tr>
<tr>
<td>04 Snowmass Creek</td>
<td>78</td>
<td>Rainbow &amp; brook trout</td>
<td>Wilderness/no Grazing</td>
</tr>
<tr>
<td>04 a Two Elk Creek</td>
<td>24</td>
<td>Brook &amp; cutthroat trout</td>
<td>High Development</td>
</tr>
<tr>
<td>05 Meadow Creek</td>
<td>65</td>
<td>Brook, cutthroat, brown trout, sculpin</td>
<td>Wilderness/sheep</td>
</tr>
<tr>
<td>05 West Tenmile Creek</td>
<td>92</td>
<td>Brown, brook trout, sculpin</td>
<td>High Development</td>
</tr>
<tr>
<td>05 South Fork Swan River</td>
<td>23</td>
<td>Brook trout</td>
<td>Timber/no Grazing</td>
</tr>
<tr>
<td>05 East Brush Creek</td>
<td>35</td>
<td>Brown and Brook trout</td>
<td>Recreation/cattle</td>
</tr>
<tr>
<td>05 Derby Creek</td>
<td>41</td>
<td>Rainbow, cutthroat, hybrid rainbow x cutthroat trout</td>
<td>Timber/Cattle</td>
</tr>
<tr>
<td>05 Campbell Creek</td>
<td>0</td>
<td>No fish sampled</td>
<td>Recreation/cattle</td>
</tr>
<tr>
<td>05 Turkey Creek</td>
<td>25</td>
<td>Brook and cutthroat trout</td>
<td>Timber/Sheep</td>
</tr>
<tr>
<td>05 Upper Fryingpan River</td>
<td>NA</td>
<td>NA</td>
<td>Wilderness/No grazing</td>
</tr>
<tr>
<td>05 South Fork Fryingpan R.</td>
<td>NA</td>
<td>NA</td>
<td>Recreation/no grazing</td>
</tr>
<tr>
<td>05 Milk Creek</td>
<td>3</td>
<td>Colorado River cutthroat</td>
<td>Recreation/Sheep</td>
</tr>
<tr>
<td>05 East Elk Creek</td>
<td>26</td>
<td>Brook and brown trout</td>
<td>Timber/Sheep</td>
</tr>
</tbody>
</table>

a - Fish in Two Elk Creek were sampled in 2003 as part of the Upper Eagle Watershed Assessment. Additional MIS data were collected in 2004.

NA – data are not available at this time.
While additional years of monitoring data are required to determine Forest-wide trout trends, information is available to discuss status and trends associated with Forest management and human interaction that could affect trout. The 2002 Forest Plan EIS estimated no change in total trout habitat quantity, stable Forest-wide populations of trout as a whole, and improving habitat quality due to improved streamside protection measures. For brook and brown trout in ski areas (where winter water depletions were expected to increase), the 2002 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. Current Forest management should create a positive trend in trout populations, with better protections in place and proactive projects to improve damaged areas. Growth outside the Forest boundary and other aspects over which the Forest has little control, like water development, are contributing to a negative trend in localized areas.

**Project Level Information**

The north side of A-Basin occurs near the headwaters of the North Fork of the Snake River, which flows southwest approximately 5 miles to its confluence with the Snake River in the Keystone base area. There is a waterfall complex approximately 0.5 mile below A-Basin that forms a barrier to upstream fish movements. No fish occur above the falls. Below the falls, the North Fork is a self-sustaining fishery dominated by brook trout. There was limited historic mining in the North Fork drainage and no acid rock drainage (ARD) from mines. Water quality in the drainage is characteristic of high-basin snowmelt sources. A-Basin has funded North Fork channel modifications to mitigate ski area effects on the fishery and is maintaining state water quality standards in effect as of the date of the ROD for the 1999 EIS. Implementation of the A-Basin Master Plan anticipated reductions in spawning habitat, but sufficient water depth for egg survival.

The south side of A-Basin is drained by intermittent streams that converge and join the main stem of the Snake River just below the portal to the Robert’s Tunnel. Because of intermittent flows, lack of overwintering habitat, high stream gradient, and isolation, no trout are present in this tributary. This reach of the Snake River above the confluence with the North Fork is biologically dead (i.e., there are no aquatic macroinvertebrates or fish) due to ARD out of historic mines in Peru Creek. The North Fork provides dilution to the ARD-impacted Snake River and some trout and aquatic macroinvertebrates are able to survive in the Snake River below the North Fork confluence.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

**Alternative 1 - No Action**

The No Action Alternative is a true no action alternative and reflects a continuation of existing operations and management practices at A-Basin, as described above. Effects of previously approved mountain improvements have been considered in prior documents and are considered herein as part of the...
environmental baseline. The current status of animal species and groups and how they have been affected by conditions under this alternative are described above in the Affected Environment section.

The No Action Alternative would have no additional direct or indirect impacts or benefits to the animals and their habitats addressed in this document, and A-Basin would continue operating as currently. Resort activities associated with winter and summer use and maintenance would continue, having minimal additional effects on the present wildlife community that has adjusted to this long-term land use. Plant communities would continue succession: ski trails toward more diverse, native meadows and forests toward more mature and senescent structural stages. Alternative 1 would have no impact on any listed or proposed animal species or designated critical habitat, no impact on any R2 sensitive animal species, and would be consistent with all applicable WRNF standards and guidelines, as amended, the management objective, and Forest direction for project MIS.258

**Alternative 2**

**Forest Plan Consistency**

A Forest Plan Consistency Analysis was conducted for the Proposed Action and is contained in the Administrative Record at the DRD. Regarding wildlife, Alternative 2 would be consistent with all applicable Forest Plan standards and guidelines, management objectives, and Forest direction.259

**Threatened and Endangered Animal Species**

The Proposed Action would have no direct or indirect impacts on the Uncompahgre fritillary butterfly, Colorado pikeminnow, bonytail, humpback chub, razorback sucker, and bald eagle. The one remaining species warranting additional discussion, Canada lynx, is addressed below.

**Canada Lynx**

Evaluation of potential project effects on lynx is assessed with respect to relevant conservation measures recommended in the Canada Lynx Conservation Strategy and Assessment (LCAS) and 2002 Forest Plan, including maintaining suitable foraging and denning habitat, maintaining diurnal security areas, and maintaining habitat connectivity within and between LAUs.260 Alternative 2 components constituting the Proposed Action at A-Basin would be contained within the existing SUP area. Montezuma Bowl components would occur outside the current development area boundary. All other Alternative 2 components would occur within the existing development area boundary where lynx habitat is already highly dissected, developed, and heavily used by winter recreationists.

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258 USDA Forest Service, 2002a, 2005a and 2006a,b,f
259 USDA Forest Service, 2002a,b and 2006a
260 Ruediger et al., 2000; USDA Forest Service, 2002a,d
Direct Effects

Potential Effects of Alternative 2 Project Components on Lynx

The upgraded Exhibition lift, replacing the existing lift along the same virtual alignment, might only potentially affect lynx during the short summer construction period if a lynx, traveling through the lift corridor or across mountain roads during the day, encountered and was deflected by construction activities. Lynx movements would most likely occur during nocturnal and crepuscular hours when animals are most active. That period would be largely outside of the diurnal construction traffic and activity interval. However, lynx can be active at any time of the day, such as the lynx that crossed through developed A-Basin ski terrain in October 1999, within several hundred yards of the top of the Exhibition lift. A lynx encountering a lift construction area would most likely result in the lynx avoiding the activity and going around it. A lynx encountering construction traffic might wait in forest cover to cross the road until the vehicle passed, increase its gait across the road before the vehicle arrived, or, stand and watch the vehicle that would likely stop to observe the lynx, similar to what happened on Keystone Ski Area on October 3, 2000. Another less likely option would be for the lynx to retrace its route. Road-kill of a healthy lynx would likely not occur because of the slow vehicle speeds along the mountain roads. In any event, it is unlikely that any such encounter would occur, and if it occurred, would meaningfully affect lynx habitat use or survival probabilities. The 0.1-acre of “other habitat” that would be removed at five points along the scalloped edge of two intertrail islands within the developed interior of the ski area to accommodate the lift corridor would have minimal effects on potential forage and cover values for travel.

Installation of the upper Montezuma Bowl lift terminal, the access and utility corridor to the top terminal, and the upper portion of the lift corridor would affect alpine habitat and subalpine meadow classified as “non-habitat”. Installation of the lower lift terminal would remove 0.3-acre of “winter foraging habitat” along a forest/meadow edge. Tree clearing for lift clearance along the mid-section of the lift corridor would remove 0.5-acre of “other” habitat at treeline. These lift components would locally remove and fragment habitat representing a portion of the individual territories of primary lynx prey species. Such habitat modifications may or may not be manifested in a lower abundance of prey because of the large area of surrounding forest that would be retained. This small loss of forest cover in habitats naturally fragmented near treeline would not adversely affect local habitat connectivity, because of the configuration and extent of surrounding forest. The structures imposed by the lift terminals and towers would represent inanimate objects that a lynx encountering them would simply walk around during approximately 17.5 hours a day (from 3:30 p.m. to 9 a.m. during the 7.5 month ski season) when the lifts are not operating and no humans are present. Construction activity effects would be diurnal, short-term, localized along the lift corridor, and otherwise similar to those described above for the upgraded Exhibition lift, although there would be no road constructed and used for construction and maintenance of the Montezuma Bowl lift.
Montezuma Bowl trails including skiers’ right, left, and center collector trails, would convert 2.8 acres of field verified lynx “winter foraging habitat” and 0.1 acre of “other” habitat into 1.7 acres of “other” habitat (associated with the skiers’ right collector trail selective tree thinning) and 1.1 acres of “non-habitat”. These trails would have the same minor effects on potential lynx forage and local habitat connectivity as described above for the lift components. Habitat loss associated with these trails and other Alternative 2 project components resulting in the loss or appreciable degradation of “winter foraging habitat” would be minimized by the required implementation of a lynx conservation measure that would enhance an equal or greater area of habitat. The removal of approximately 60 to 90 trees and a 0.03-acre tree clump along 8,100 feet of the four hike-back collector trails and the hike-back track would have no discernable effect on lynx forage or local travel values. Habitat connectivity would be virtually unaffected in Montezuma Bowl because only 3.73 acres (in five patches) of the 1,120 acres of forest cover in the Montezuma Bowl side of the SUP area would be removed under Alternative 2. Three of the five patches of tree removal (i.e., those associated with the lift corridor [0.5 acre] and the skiers’ center [0.8 acre] and left [0.4 acre] collector trails) proposed in Montezuma Bowl would occur above the continuous forest cover likely to be used by a lynx, although lynx could follow those stringers all the way up to treeline. The lowest patch of tree removal (i.e., the 0.3 acre associated with the bottom lift terminal) proposed in Montezuma Bowl would occur approximately 4,981 feet (0.94 mile) above Montezuma Road. The bottom of the hike-back terrain (at 11,350 feet) would occur 0.85 mile above Montezuma Road. All five patches of tree removal (totaling 3.73 acres) in Montezuma Bowl and all skiing (i.e., to the central collection point at the bottom of the hike-back terrain) would occur in the upper 29 percent of the mostly continuous forested cover that a lynx would be expected to move through above Montezuma Road. The bottom of all winter activity areas in Montezuma Bowl would be approximately 996 feet (0.19 mile) above the 0.64 mile wide band of entirely closed forest cover above Montezuma Road.

Skiing forested areas of Montezuma Bowl would have the largest potential effect on lynx habitat use of ski terrain of any Alternative 2 project component. While the 35.8 acres of tree skiing in the hike-back terrain is an explicit component of Alternative 2, it is likely that the entire 121.7 acres of forest above the bottom of the hike back terrain would be skied to some extent. The effects of such tree skiing on lynx and their prey base has not been rigorously examined. Winter tracking surveys conducted at other existing ski areas indicate that both primary prey species remain in developed ski terrain. Some developed and skied terrain supports greater densities of both prey species than undeveloped terrain outside the ski area. However, the combination of skier disturbances, skier pruning, physical snow compaction, and the compaction facilitating competitor (e.g., coyotes and red fox that also eat hares and squirrels) access (although both species may also be present in non-skied islands) likely reduces snowshoe hare abundance within retained intertrail islands. However, the effect can vary considerably with factors including, but not limited to, stand size, configuration, aspect, slope, and proximity to other large habitat patches, forest type, structural stage, and level of regeneration, down CWD density and class, live conifer foliage availability, and the intensity and frequency that it is skied. Red squirrels, largely arboreal and subnivian
during winter, may be largely unaffected by tree skiing. Tree skiing would also be expected to greatly reduce the effectiveness of the habitat for lynx daybed use, displacing them from the area for approximately 6.5 hours each day during the ski season. It is not likely that a lynx would cross through the active ski terrain during the day. However, lynx are seen in active ski terrain on some ski areas (e.g., Vail [1973], Telluride, and Durango Mountain Resort). Active ski terrain in Montezuma Bowl would be broadest (0.75 mile across) at treeline and narrowest (0.56 mile across) at the bottom of the hike-back terrain. Lynx could also completely avoid active ski terrain by traveling through the 1.2-mile wide band of continuous forest cover below the hike-back terrain and above Montezuma Road.

The 36.7 acres of grooming in Montezuma Bowl would be largely in alpine areas and open meadows classified as “non-habitat”, the latter of which might only be used by lynx for travel between adjacent forest patches. Grooming could have a greater effect in the few acres of forest that would be thinned or cut for trails. In the unlikely event that a lynx would be foraging or traveling through a particular trail during the few minutes each night that the trail might be groomed, the lynx may be affected in the same way as a lynx encountering construction vehicles along mountain roads, as described above in the upgraded Exhibition lift section.

The area to be affected by parking lot upgrades is “non-habitat” and “other” habitat that is unlikely to be encountered by a traveling lynx because the lots are surrounded on three sides by Highway 6. Snowshoe hares have not been detected in the forest that would be further fragmented, suggesting that the present forest patch is too small and isolated to be used as even a part of a hare’s home range.

Buried utilities would affect “non-habitat” that has little or no value to lynx other than as open habitat (e.g., ski trails) that might be crossed. Utilities installation effects would be diurnal, short-term, localized along the utility corridor, and otherwise similar to those described above for construction associated with the upgraded Exhibition lift.

In summary, there would be no meaningful changes in the extent to which A-Basin or LAU 26 could support lynx or facilitate lynx movements as a result of Alternative 2. The Proposed Action would be consistent with historic ski area operations, but would extend winter recreational use into a non-developed, lightly impacted area (i.e., Montezuma Bowl) within A-Basin’s SUP area. Alternative 2 would not extend the existing hours or seasons of operations at A-Basin. The moderate-term removal (i.e., until compensatory treatment effect became effective) of four patches of winter foraging habitat totaling 3.1 acres on both sides of the ski area would have no discernable effect on potential lynx home range viability or dispersal through A-Basin. Skier disturbances associated with tree skiing in Montezuma Bowl may or may not affect snowshoe hare abundance. Lynx displaced from forested ski terrain for approximately 6.5 hours each day during the ski season would be able to forage in the area for the remaining 17.5 hours of each day. No effective denning or security habitats would be affected. Effective security habitat would be available surrounding the forested portion of lower Montezuma Bowl to accommodate any lynx that
might be displaced from ski terrain during the ski season. Other potential short-term (i.e., diurnal construction) effects would be minor. The Proposed Action would not impair landscape level movements, impair the ability of lynx to maintain a home range, or increase any lynx risk factors.

*Alternative 2 Effects on LAU 26 Habitat Parameters*

Implementation of Alternative 2 would convert 3.1 acres of field verified lynx “winter foraging habitat” into 1.7 acres of “other” habitat (associated with selective tree thinning on the proposed skiers’ right collector trail) and 1.4 acres of “non-habitat”. Alternative 2 would also convert 3.03 acres of field verified lynx “other” habitat into an equal acreage of “non-habitat”. In total, 6.13 acres of lynx habitat would be degraded. Additional habitat modifications associated with the removal of up to 60 to 90 trees along 8,100 feet of narrow collector trails would affect field verified polygons of “winter foraging habitat”, “other” habitat, and “non-habitat”, but that sparse tree removal would not meaningfully degrade local habitat values for lynx or primary prey species. The net change in lynx habitat would be: winter foraging habitat” -3.1 acres; “other” habitat -1.33 acres; and “non-habitat” +2.74 acres. These numbers do not consider the required implementation of a lynx conservation measure to minimize loss of winter foraging habitat.

Alternative 2 habitat modifications and resulting changes to LAU 26 lynx habitat statistics are shown in Table 3K-9. Under Alternative 2, total lynx habitat in the LAU would decrease by 3 acres. With the required implementation of a lynx conservation measure to minimize loss of winter foraging habitat, Alternative 2 would be consistent with all applicable, lynx-related provisions of the LCAS, 2002 Forest Plan, Record of Decision, and with Section 7(d) of the ESA (50 CFR §402.01) to help conserve lynx within LAUs.261 None of the resulting changes to LAU 26 lynx habitat are discernable at 0.01 percent of the habitat available in the LAU.

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**Table 3K-9:**
Changes to field verified lynx habitat in the Snake River Lynx Analysis Unit, LAU 26, as a result of the Proposed Action

<table>
<thead>
<tr>
<th>Habitat Classification</th>
<th>Net Acres Affected&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Change in % of Habitat in LAU</th>
<th>Updated acreage of lynx habitat in LAU&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Updated % of lynx habitat in LAU&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Foraging</td>
<td>-3&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.017</td>
<td>17,577</td>
<td>44.5&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Denning</td>
<td>0</td>
<td>0</td>
<td>6,604</td>
<td>16.72</td>
</tr>
<tr>
<td>Other</td>
<td>-1&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.007</td>
<td>13,789</td>
<td>34.91&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Unsuitable</td>
<td>0</td>
<td>0</td>
<td>1,530</td>
<td>3.87</td>
</tr>
<tr>
<td>Non-habitat</td>
<td>+3&lt;sup&gt;f&lt;/sup&gt;</td>
<td>0.012</td>
<td>25,137</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Lynx Habitat</strong></td>
<td>-3&lt;sup&gt;g&lt;/sup&gt;</td>
<td>0.008</td>
<td>39,501</td>
<td>100</td>
</tr>
</tbody>
</table>

<sup>a</sup> - Rounded to nearest integer.
<sup>b</sup> - Includes implementation of Alternative 2.
<sup>c</sup> - Lost (rounded to -3.0 acres from 3.1 acres of actual impact).
<sup>d</sup> - No change from environmental baseline value at 0.1% resolution.
<sup>e</sup> - Lost (rounded to -1.0 acres from 1.33 acres of net habitat loss, including the 1.7 acres of winter foraging habitat converted to other habitat that would be associated with the Skier’s Right Collector Trail selective tree thinning).
<sup>f</sup> - Created (rounded to +3.0 acres from 3.03 acres of permanent habitat loss).
<sup>g</sup> - Lost (rounded to +3.0 acres from 3.03 acres of permanent habitat loss).

Baseline data are based on USFS (USDA Forest Service, 2002e, updated 01/30/06) habitat mapping and classification criteria, as shown in Table 3K-1. Table contents do not consider the required implementation of a lynx conservation measure to minimize loss of winter foraging habitat.

**Alternative 2 Consistency with the LCAS, Forest Plan, and ROD**

In collaboration with the USFWS, most standards and guidelines in the LCAS, and all those relevant to the present Proposed Action, have been incorporated into lynx standards and guidelines in the 2002 Forest Plan and Record of Decision (ROD), as amended. The lynx consistency analysis with the 2002 Forest Plan and ROD is part of the project’s administrative record on file at the Dillon Ranger District. With the implementation of Project Design Criteria that would be a required part of this alternative, Alternative 2 would be consistent with all applicable, lynx-related provisions of the 2002 Forest Plan and ROD.

**Indirect Effects**

Increased skier visits to A-Basin resulting from new and upgraded facilities under Alternative 2 would make small incremental contributions to traffic volumes along I-70, Highway 6, and other regional highways as skiers commute to and from the ski area over the life of the project. Higher quality lynx habitat along I-70, where lynx crossings would be most concentrated and road-kills more likely, extends from Silver Plume to Minturn. Eleven of the 204 lynx released to date in Colorado have been killed attempting to cross highways, including at least four on I-70.

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<sup>262</sup> Ruediger et al., 2000; USDA Forest Service, 2002a,d, 2005a, and 2006a
Based on historic daily and annual visitation data, the traffic analysis conducted in conjunction with the EIS projects traffic through the 2014/15 ski season (i.e., ten years into the future from the most recent data set). The analysis was based on the following assumptions. Approximately 60 percent of A-Basin’s clientele are from the Front Range. Average ski season length is 209 days. Average occupancy is 2.75 people per vehicle. No data are available for what percentage of Front Range traffic goes over Loveland Pass versus through the Eisenhower Tunnel to get to A-Basin, although it is assumed that most goes over the pass. In the 2004/05 season (the most recent full season available), A-Basin had 328,251 skier visits and ski area-related traffic averaged 528 vehicles per day (one-way traffic), with 316 vehicles (60 percent) traveling back and forth to the Front Range along Highway 6 and I-70 and 212 vehicles (40 percent) traveling back and forth locally. (The reader is referred to the project file for a more detailed analysis of traffic data under existing conditions.)

Under the Proposed Action, total skier visits for the 2014/15 ski season would increase by 39,003 over the No Action Alternative. This equates to a total of 596 vehicles per day (an increase of 68 vehicles per day), with 358 vehicles (60 percent, with an additional 42 vehicles per day) traveling back and forth to the Front Range along Highway 6 and I-70 and 238 vehicles (40 percent, with an additional 26 vehicles per day) traveling back and forth locally. While these increased traffic volumes might theoretically increase lynx highway mortality probabilities, these contributions from the Proposed Action at A-Basin would represent a small fraction of total traffic volumes, would be unlikely to occur, and would not rise to a level where incidental take of an individual lynx from a vehicle strike would be expected. Average traffic volume on I-70 at the Eisenhower Tunnel and Highway 6 at the Keystone Gondola Road is approximately 29,000 and 1,200 vehicles per day. Using the above numbers (i.e., without considering future [2014/15] traffic projections on regional highways), assumptions, and no carpooling (i.e., all additional skiers drove separately), the additional A-Basin traffic resulting from the Proposed Action would represent 0.14 percent and 2.2 percent of the average daily traffic volume on I-70 and Highway 6. Similarly, increased Alternative 2 related traffic volumes through adjacent and distant landscape linkages would have unlikely and minimal effects on harassment, habitat permeability, habitat fragmentation, and landscape connectivity.

Additional employees (ski patrollers, lift operators, lift mechanics, and snowcat drivers) are expected to exploit existing vacancies in the local housing market (as opposed to building new homes or contributing meaningful demand for additional subdivision development). Therefore, there would be no habitat loss attributable to these additional employees that would affect lynx, particularly on NFS lands, although new employees could make insignificant contributions to collective dispersed recreational effects on the Forest.

Habitat loss associated with secondary development is almost entirely confined to impacts that occur off the Forest in non-designated and non-lynx habitat. A small portion (14.7 percent) of the LAU is

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\(^{263}\) The reader is referred to Section 3C.
composed of non-federal lands that are subject to potential, development. The vast majority of this habitat loss has not affected the lynx habitat addressed in this document, which generally occurs at higher elevations. Considerable dispersed recreation occurs on the Forest resulting from local and regional human populations. These activities may influence habitat effectiveness. Both commercial and residential development is continuing in Summit County, a small part as a result of A-Basin, and will continue to expand in the short-term with, or without, the proposed mountain upgrading. The principal result of secondary development has been habitat loss, both direct, through habitat conversion, and indirect, through wildlife displacement from human activity areas, almost entirely at lower elevations. Dispersed recreational use, resulting from increased numbers of residents and tourists, may have had minor, short-term, displacing effects on those species inhabiting upper elevation forests in the landscape and regional analysis areas.

Overall indirect Alternative 2 effects would not result in incidental take of individual lynx, either by “harm” or “harassment”, because no habitat loss, modification, or degradation would occur and the relatively small increases in traffic volumes on regional highways running through distant lynx habitat are not anticipated to result in death or injury to lynx, or significantly impair behavioral patterns such as denning, foraging, or travel in those distant habitats.

**Alternative 2 Lynx Effects Summary**

Alternative 2 would be consistent with all applicable, lynx-related provisions of the 2002 Forest Plan, as amended, Record of Decision and with Section 7(d) of the ESA. While the existing environmental baseline has degraded potential lynx habitats and impaired lynx movements in the action area, Alternative 2 would result in insignificant (6.13 acres) habitat modifications and add ski season disturbances to approximately 122 acres of forest near treeline that could affect the habitat effectiveness of potential lynx foraging, daybed, and travel habitats. However, these impacts would be alleviated with the treatment of 3.1 acres of lynx habitat through strategic forest thinning. Indirect effects would make no discernable or meaningful contributions to the existing environmental baseline. These collective effects associated with Alternative 2 would not reach an intensity or extent that would result in incidental take, either by “harm” or “harassment”. This is because the habitat loss would not significantly modify or degrade current habitat availability resulting in death or injury to lynx by significantly impairing behavioral patterns such as denning, foraging, or travel, or impair the ability of lynx to maintain a home range overlapping the project area.

**Region Two Sensitive Animal Species**

Determination of risks to populations of sensitive animals (including insects, fish, amphibians, reptiles, birds, and mammals) considers population size and density, occurrence, suitable habitat, location of the

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population, and consequence of adverse effect on the species as a whole within its range and within the WRNF. The reader should also note that every acre of potential habitat is not necessarily occupied by a particular species, and that every acre of suitable habitat is not of equal importance, nor must it be maintained to maintain effective, well-distributed habitat for any particular species across the Forest. The Forest Service concludes that some habitat loss or impact may affect individuals so long as sufficient habitat components exist which maintain population viability across the Forest. In addition, "impacts" and "adverse effects" on individuals considered herein do not necessarily equate to the death of those individuals. In most cases, adverse effects on NFS lands simply refer to the displacement of individuals from a small portion of their former territory or potential habitat. Furthermore, as a document evaluating worst case scenarios, many of the predicted adverse effects may be unrealized, for example, where unoccupied, but potential habitat that would be lost to an action is actually uninhabited by a particular species.

Based on the habitat to be affected and the habitat affinities of the R2 sensitive species (refer to Table 3K-2), the Proposed Action considered herein would have “no impact” on any R2 sensitive species, with the possible exception of boreal toad, northern goshawk, northern harrier, white-tailed ptarmigan, boreal owl, three-toed woodpecker, olive-sided flycatcher, pygmy shrew and American marten (refer to Table 3K-10).265 These excepted species are addressed below. Evaluated species information and the environmental baseline for the species evaluated are contained above in the Affected Environment and in the BE within the A-Basin project file, which is incorporated herein by reference.266

Table 3K-10:
Determination Summary of Effects on R2 Sensitive Animal Species Resulting from the Proposed Action

<table>
<thead>
<tr>
<th>Common name, Scientific name</th>
<th>Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alt. 1</td>
</tr>
<tr>
<td>INSECTS</td>
<td></td>
</tr>
<tr>
<td>Great Basin silverspot, <em>Speyeria nokomis nokomis</em></td>
<td>NI</td>
</tr>
<tr>
<td>Hudsonian emerald, <em>Somatochlora hudsonica</em></td>
<td>NI</td>
</tr>
<tr>
<td>FISH</td>
<td></td>
</tr>
<tr>
<td>Roundtail chub, <em>Gila robusta</em></td>
<td>NI</td>
</tr>
<tr>
<td>Mountain sucker, <em>Catostomus platyrhynchos</em></td>
<td>NI</td>
</tr>
<tr>
<td>Bluehead sucker, <em>Catostomus discobolus</em></td>
<td>NI</td>
</tr>
<tr>
<td>Flannelmouth sucker, <em>Catostomus latipinnis</em></td>
<td>NI</td>
</tr>
<tr>
<td>Colorado River cutthroat trout, <em>Oncorhynchus clarki pleuriticus</em></td>
<td>NI</td>
</tr>
<tr>
<td>AMPHIBIANS</td>
<td></td>
</tr>
<tr>
<td>Boreal western toad, <em>Bufo boreas boreas</em></td>
<td>NI</td>
</tr>
<tr>
<td>Northern leopard frog, <em>Rana pipiens</em></td>
<td>NI</td>
</tr>
</tbody>
</table>

265 USDA Forest Service, 2003a,b and 2005b
266 Thompson, 2006f
### Table 3K-10:
**Determination Summary of Effects on R2 Sensitive Animal Species Resulting from the Proposed Action**

<table>
<thead>
<tr>
<th>Common name, Scientific name</th>
<th>Determination</th>
<th>Alt. 1</th>
<th>Alt. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIRDS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern goshawk, Accipiter gentilis</td>
<td>NI</td>
<td>MAII</td>
<td></td>
</tr>
<tr>
<td>Northern harrier, Circus cyaneus</td>
<td>NI</td>
<td>MAII</td>
<td></td>
</tr>
<tr>
<td>Ferruginous hawk, Buteo regalis</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>American peregrine falcon, Falco peregrinus anatum</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>White-tailed ptarmigan, Lagopus leucurus</td>
<td>NI</td>
<td>MAII</td>
<td></td>
</tr>
<tr>
<td>Greater sage grouse, Centrocercus urophasianus</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>Columbian sharp-tailed grouse, Tympanuchus phasianellus columbianus</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>Flammulated owl, Otus flammeolus</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>Boreal owl, Aegolius funereus</td>
<td>NI</td>
<td>MAII</td>
<td></td>
</tr>
<tr>
<td>Black swift, Cypseloides niger</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>Three-toed woodpecker, Picoides tridactylus</td>
<td>NI</td>
<td>MAII</td>
<td></td>
</tr>
<tr>
<td>Olive-sided flycatcher, Contopus cooperi</td>
<td>NI</td>
<td>MAII</td>
<td></td>
</tr>
<tr>
<td>Loggerhead shrike, Lanius ludovicianus</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>Purple martin, Progne subis</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>Brewer’s sparrow, Spizella breweri</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>Sage sparrow, Amphispiza belli</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td><strong>MAMMALS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pygmy shrew, Microsorex hoyi montanus</td>
<td>NI</td>
<td>MAII</td>
<td></td>
</tr>
<tr>
<td>Fringed myotis, Myotis thysanodes</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>Spotted bat, Euderma maculatum</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>Townsend's big-eared bat, Corynorhinus townsendii townsendii</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>American marten, Martes americana</td>
<td>NI</td>
<td>MAII</td>
<td></td>
</tr>
<tr>
<td>North American wolverine, Gulo gulo luscus</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
<tr>
<td>River otter, Lutra canadensis</td>
<td>NI</td>
<td>NI</td>
<td></td>
</tr>
</tbody>
</table>

Other R2 sensitive animals 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 Alternative 2 would have no impact on those species. Species in bold are potentially present and/or are discussed in the text. Animals are listed phylogenetically.

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 or a loss of species viability rangewide.

Determinations in this table only consider NFS lands that may be directly or indirectly affected by Alternative 2, which R2 species determinations are based on.

**Boreal Toad**

No suitable breeding habitat for the boreal toad is present on or adjacent to the project area. Several extant boreal toad populations are present within surrounding drainages, hydrologically upstream and downstream of the project area. Those populations are at or beyond maximum known dispersal distances.
from the project area. The only potential hydrologic effect that the Proposed Action would contribute to the North Fork of the Snake River would be a slight improvement to water quality. However, even considering the sensitivity of amphibians to degraded water quality, because of dilution effects, the magnitude of any water quality improvement would not likely be measurable or discernable to the downstream population.

It is also unlikely that any post-breeding dispersal of adult toads would extend the several miles and approximately 1,000 vertical feet to the closest proposed disturbance area in Montezuma Bowl. Therefore, it is unlikely that any such toads would be killed by wandering into an active construction area or have their habitat connectivity between adjacent forest patches impaired by the limited and localized areas of tree removal. Indirect effects associated with this project (described above) would have no impacts on boreal toads. Regarding boreal toads, because potential boreal toad post-breeding dispersal habitat could be affected, the Proposed Action may adversely impact individuals, but is not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide.

**Northern Goshawk**

The Proposed Action would affect goshawks by removing or thinning approximately 7.5 acres (including the 3.1 acres lynx treatment area) of forest cover that supports potential prey species (e.g., snowshoe hare and/or red squirrel). Densities of some prey species may decline in an area larger than the area of tree removal as a result of 4.8 acres (including the 3.1 acres lynx treatment area) of tree thinning, fragmentation effects, and tree skiing. No nests or nesting habitat associated with a potential nesting block would be affected. Indirect effects associated with this project (described above) would have no impacts on goshawks. Regarding goshawks, direct and indirect effects of Alternative 2 may impact individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide.

**Northern Harrier**

This species was not detected on the project area. The A-Basin SUP area and surrounding area are unsuitable as breeding habitat. It is possible, though extremely unlikely, that during late summer and fall migration, harriers could wander through the project area and opportunistically hunt the alpine grasslands in Montezuma Bowl. Alternative 2 would result in insignificant and discountable adverse direct effects to potential migratory harrier foraging habitat as a result of alpine grassland lost to lift terminals, the summer access route, and lift towers. Indirect effects associated with this project (described above) would have no impacts on northern harriers. Regarding northern harriers, direct and indirect effects of Alternative 2 may impact individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide.
White-tailed Ptarmigan

Ptarmigan use of the ski area and adjacent habitats for summer and breeding uses would be virtually unaffected by the Proposed Action. Construction activities in alpine areas could result in short-term, localized displacement of birds. Some new facilities (the upper Montezuma Bowl lift terminal, summer access route, and lift towers) would result in the loss of approximately 1.0 acre of potential year-round habitat. Increased skiing in Montezuma Bowl could also result in more frequent displacement of the few birds that occasionally forage in windswept areas over winter. Most skiable terrain within Montezuma Bowl is now being used to some extent. The Proposed Action would result in more frequent skiing and an expanded area of skiing, as a much larger number of skiers seek untracked terrain within the bowl. However, most ski terrain is mutually exclusive with ptarmigan winter range because of the poor skiing conditions associated with rocky, wind scoured grasslands that ptarmigan use selectively during winter. Indirect effects associated with this project (described above) would have very limited impacts on white-tailed ptarmigan. Regarding white-tailed ptarmigan, direct and indirect effects of Alternative 2 may impact individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide.

Boreal Owl

The Proposed Action would affect boreal owls by removing or thinning approximately 9.23 acres (including the 3.1 acres lynx treatment area) of forest that represents potential foraging habitat, 4.0 acres of which also represents potential nesting habitat (i.e., the Skier’s Right Collector Trail and the expanded parking lots). Disturbances to potential nest sites would be avoided where the selective removal of trees from Skier’s Right Collector Trail would avoid snags and all trees with cavities. However, trees that might contain nest cavities would be removed from the 2.3 acres of clearing associated with the expanded parking lots. Calling surveys to determine if nesting owls are present near the parking lots and/or delaying tree removal until after any nesting birds present have fledged their young (after approximately July 15) would avoid construction season recruitment loss. Densities of some prey species may decline in an area larger than the area of tree removal as a result of tree thinning, fragmentation effects, and tree skiing. Indirect effects associated with this project (described above) would have virtually no impacts on boreal owls. Regarding boreal owls, direct and indirect effects of Alternative 2 may impact individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide.

Three-toed Woodpecker

Alternative 2 would result in modifications (complete tree removal and thinning) to 9.23 acres (including the 3.1 acres lynx treatment area) of potential, but apparently unoccupied, three-toed woodpecker foraging and nesting habitat. Habitat fragmentation effects would extend slightly beyond impact areas. There would be no indirect effects associated with this project (described above) on three-toed woodpeckers. Regarding three-toed woodpeckers, direct and indirect effects of Alternative 2 may impact
individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide.

**Olive-sided Flycatcher**

Alternative 2 would result in the loss or modification of up to 6.0 acres (including the 3.1 acres lynx treatment area) of potential, but likely unoccupied, olive-sided flycatcher foraging and nesting habitat as a result of tree removal and thinning. Habitat fragmentation effects would extend slightly beyond impact areas. There would be no indirect effects associated with this project (described above) on olive-side flycatchers. Regarding olive-side flycatchers, direct and indirect effects of Alternative 2 may impact individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide.

**Pygmy Shrew**

Based on the species' broad habitat affinities, the forested habitats that would be affected by the Proposed Action could represent potential, but in all probability, unoccupied habitat. The probability that this species would be present in the 9.23 acres (including the 3.1 acres lynx treatment area) of affected forest when it has never been located on the WRNF is discountable. Tree clearing and thinning would not result in a 100 percent year-round habitat loss because this species inhabits forest openings and low-density forest ecologically similar to ski trails. In the unlikely event that this shrew was present within disturbance areas during construction, those individuals may be killed. While there would also be some short-term construction impacts, all of the proposed tree thinning areas would likely remain suitable habitat for this species, though perhaps at a lower density as a result of reduced CWD and prey density. Increased predation pressures on adjacent, fragmented, but otherwise undisturbed forest, may adversely affect surviving individuals in those areas. There would be no indirect effects associated with this project on pygmy shrews. Regarding pygmy shrews, because potential pygmy shrew habitat would be directly affected, direct and indirect effects of Alternative 2 may impact individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide.

**American Marten**

Tree removal (9.23 acres including the 3.1 acres lynx treatment area) associated with Alternative 2 would locally reduce marten prey availability, foraging habitat, and denning opportunities. This species is mainly crepuscular and nocturnal and would be unaffected by skiing activities, although tree skiing could affect potential prey availability (i.e., snowshoe hares [see discussion under lynx]). Brief, nightly exposure to snowcats in forested areas of Montezuma Bowl would have temporary (i.e., amounting to minutes), disruptive and displacing effects on foraging. Densities of some prey species may decline in an area larger than the area of tree removal as a result of habitat fragmentation effects, ski trail management, and high levels of winter recreation. Conversely, potential prey base declines may be somewhat less than
the area of tree removal because thinned areas and other forest converted to ski terrain still provide some habitat for potential prey species, particularly outside the snow season. Tree removal would not result in meaningful changes to vegetation structure and patterns that would individually or collectively impair marten life history functions or the ability of marten to maintain a home range. There would be no indirect effects associated with this project (described above) on marten. Regarding marten, the Proposed Action may adversely impact individuals, but is not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability rangewide.

Management Indicator Species

Indirect Effects Analysis Summary for Identified MIS

While direct effects are addressed below, indirect effects of implementation of Alternative 2 on elk, American Pipits, aquatic macroinvertebrates, and trout are similar in nature and would be those associated with the effects of any secondary or subsequent development connected to the analysis area. With the possible exception of indirect effects resulting from approximately 17, full-time, local employees (i.e., ski patrollers, lift operators, lift mechanics, snowcat drivers, and parking lot attendants) that would be retained to operate and maintain the upgraded facilities, there would be no additional indirect effects resulting from Alternative 2. Additional employees are expected to exploit existing vacancies in the local housing market (as opposed to building new homes or contributing meaningful demand for additional subdivision development). Therefore, there would be no habitat loss or degradation attributable to these additional employees that would affect these MIS, particularly on NFS lands. The only conceivable adverse indirect effects to these MIS would result from the incremental contributions of those few additional employees to dispersed recreational effects in the alpine during summer. There would be no meaningful loss of habitat attributable to these additional employees at the local or Forest level.

Elk

Direct Effects Analysis

Direct impacts to elk resulting from the Proposed Action include (1) temporary displacement of elk from Montezuma Bowl construction zones, (2) habitat modifications, primarily in Montezuma Bowl, (3) and temporary displacement from maintenance areas, routes. The temporary, short- to moderate-term displacement of elk from Montezuma Bowl lift components and tree clearing/ thinning construction areas would extend over the construction period and for several years thereafter. Most elk within and adjacent to impact areas at the time of construction would be displaced from the area and its zone of influence. Displacement duration could be influenced by construction duration, time (season) of construction, subsequent human activity, and type of elk use. It is likely that Montezuma Bowl lift installation and trail construction would be entirely diurnal, occur from July through September, and be completed in a single season. This would reduce displacement of summering elk. Some elk would return to Montezuma Bowl habitats near construction zones at night during the construction period and a large number of elk would return to the bowl after construction is completed. Based on elk response to ski lift installation and a large
area of tree clearing associated with more sensitive calving habitats at Vail Ski Area, elk use of Montezuma Bowl could return close (75 percent) to existing levels one to four years after construction, with full recovery likely thereafter, assuming a stable elk population.

Adverse effects from habitat modifications in Montezuma Bowl would be associated with the 1.7 acres of grading. Most of this acreage would be reclaimed. Forage values on reclaimed areas and the increased forage in forest thinned and cleared of trees without grading would likely result in a net increase of forage that would be available to elk. This increase may be offset by forage losses associated with the lift terminals and towers, such that there may be no net change in foraging values. If any net change in forage availability were to occur, it would be insignificant relative to the amount available in Montezuma Bowl.

Elk would also be displaced from the Montezuma Bowl lift corridor for lift maintenance activities following construction. The top drive lift would minimize maintenance activities in Montezuma Bowl that could displace elk, if present at the time of the periodic maintenance (amounting to days per summer). Elk habitat effectiveness in Montezuma Bowl would also be maintained by not constructing a road into the bowl, not only as a result of avoiding vehicle use for periodic maintenance, but also as a result of the unintended attractive nuisance that a road would represent for mountain bikers making a loop through the ski area.

Alternative 2 project components on the north side of the ski area would have no measurable effect on elk use because there is such limited elk use that now occurs and because project components are so small (i.e., Exhibition lift realignment) or are not elk habitat (e.g., parking lot expansion).

Implementation of the compensatory lynx conservation measure that would selectively thin approximately 3.1 acres of mixed conifer forest adjacent to Montezuma Bowl, would result in the short-term, construction period displacement of elk from those treatment patches, but a net, short- to moderate-term gain in forage availability with canopy opening.

Assuming a stable elk population (dependent on CDOW management and other independent variables), the collective, long-term direct effects of Alternative 2 should not result in discernibly different numbers of elk summering on or around Montezuma Bowl. There would be no measurable reduction to elk habitat effectiveness, no impaired ability for elk to disperse across the local landscape, no effect on the WRNF elk population, and no effect on Forest-wide habitat quality or quantity. The Forest-wide implementation of more conservative standards and guidelines associated with the 2002 Forest Plan, other habitat protection measures, and ongoing monitoring and management, is expected to maintain or improve overall Forest-wide habitat quality for elk.

**Indirect Effects Analysis**

Increased skier visits to A-Basin resulting from new and upgraded facilities under Alternative 2 would make incremental contributions to traffic volumes along I-70, Highway 6, and other regional highways as
skiers commute to and from the ski area over the life of the project. A few elk are annually killed by vehicles between the ski area and Denver along the I-70 corridor (between Morrison and Idaho Springs), with additional road-kill potential along other regional highways that are used to access the ski area. Increased traffic would incrementally increase road-kill probabilities.

Based on historic daily and annual visitation data at A-Basin, a traffic analysis through the 2014/15 ski season (i.e., ten years into the future from the most recent data set) was conducted to quantify changes attributable to the Proposed Action. Results are presented under indirect effects to lynx, above. While increased traffic volumes might theoretically increase elk highway mortality probabilities, contributions from the Proposed Action at A-Basin would represent a small fraction of total traffic volumes, would be insignificant and discountable, and if all or most elk highway mortality would occur between the ski area and Denver, it would not affect the WRNF elk population.

Alternative 2 is not anticipated to make any discernable contribution to the present Summit County population. Any habitat loss associated with secondary development is almost entirely confined to impacts that occur off the National Forest. The vast majority of habitat modifications that have occurred on NFS lands in DAU E-13 have not appreciably altered overall elk habitat use patterns. Considerable dispersed recreation occurs on the Forest resulting from local and regional human populations. These activities may influence local habitat effectiveness via short-term displacement. The principal result of secondary development has been habitat loss, both direct, through habitat modification and conversion, and indirect, through wildlife displacement from human activity areas, almost entirely at lower elevations outside of elk habitat.

**Elk Summary**

Implementation of Alternative 2 at A-Basin would not result in or contribute any discernable direct (6.5 acres of habitat modifications in occupied elk habitat) or indirect effects to elk, elk habitat quality, quantity, or effectiveness, or the ability of elk to disperse at the Forest level. Alternative 2 would result in insignificant (the 579-foot long construction and access route) additional contributions to motorized and/or non-motorized travel and recreation management that would adversely influence effective ungulate habitat use and movements on the project area. Alternative 2 would be consistent with all applicable WRNF standards and guidelines, the management objective, and Forest direction for this MIS. Alternative 2 would not measurably contribute to any negative trend in the DAU or Forest-wide population or trend of this MIS that would affect achieving Forest Plan MIS objectives. The Forest-wide implementation of more conservative standards and guidelines associated with the 2002 Forest Plan, other habitat protection measures, and ongoing monitoring and management, is expected to maintain or improve overall Forest-wide habitat quality for elk. The CDOW will continue managing the elk population. The Forest Service will continue implementing the elk monitoring protocol, in cooperation

\[267\] USDA Forest Service, 2002a,b and 2006a

\[268\] USDA Forest Service, 2002a,b
with the CDOW, to monitor population and habitat trends across the WRNF. Table 3K-3 summarizes the analysis for this MIS as a result of the Proposed Action.

American Pipit

Direct Effects Analysis

Ground disturbance associated with the upper Montezuma Bowl lift terminal, most portions of the access and utility corridor and adjacent fill area, and some of the higher lift tower sites would result in a net loss of American pipit nesting and/or foraging habitat. The total disturbance area of approximately 0.9 acre is slightly smaller than this species’ mean territory size. It is unknown, but unlikely, if any pipits would be nesting in or immediately adjacent to proposed disturbance areas during the lift construction season. Pipit density in upper Montezuma Bowl is far lower than what would be associated with full occupancy at one pair per 1.4 acres. Based on displaying male density, most of the habitat is vacant. Therefore, it is most likely that adults would be displaced from foraging habitat to adjacent, unoccupied habitat, if an established territory overlapped an impact area. 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 renest and fledge the same number of young they would have otherwise (unlikely, as second clutches are generally smaller). Regardless, Alternative 2 would result in a small net loss of habitat used by American pipits and other species associated with alpine grasslands. There would be no discernable potential direct effect on this species’ Forest-wide population and habitat trends. Under the Proposed Action, continued management of A-Basin would continue to provide habitat in upper Montezuma Bowl for those species dependent or strongly associated with alpine grasslands.

American Pipit Summary

The Proposed Action at A-Basin would result in a small (0.9 acre) net loss of alpine grassland habitat and the potential loss of one year of recruitment by a single pair of pipits. Alternative 2 would not result in, or contribute to, any discernable direct or indirect effects to American pipits or other species dependent or strongly associated with alpine grassland habitat at the Forest level. The Proposed Action would not create negative Forest-wide trends for populations or habitats of this species. Alternative 2 would be consistent with all applicable WRNF standards and guidelines related to American pipits and other species dependent or strongly associated with alpine grassland habitat. Direct and indirect effects of the Proposed Action would be consistent with the management objective, and with Forest direction for American pipits. The limited alpine grassland habitat modifications and the mutually exclusive winter activities associated with the Proposed Action versus summer pipit use, indicate that with the Proposed
Action, management would continue to provide habitat in upper Montezuma Bowl for those species dependent or strongly associated with alpine grasslands. There would be no meaningful loss of alpine grassland habitat attributable to indirect effects associated with reasonably foreseeable future actions at the local or Forest level. The Forest Service will continue implementing the protocol to monitor American pipit populations and habitat trend across the WRNF. Table 3K-3 summarizes the analysis for this MIS as a result of the Proposed Action.

**Aquatic Macroinvertebrates**

**Direct Effects Analysis**

With limited macroinvertebrate sampling and analysis conducted on the Forest to date and until an adequate sample size can be collected of paired samples comparing treatment reaches on and downstream of ski areas with control reaches, any conclusions regarding the management question at ski areas using macroinvertebrates should be tempered. Nevertheless, as a result of potential seasonal water quality and local stream habitat changes, existing aquatic macroinvertebrates may differ (based on the Forest Service monitoring protocol) between managed (A-Basin) and reference (natural baseline) sites. That issue will continue to be evaluated via project-level and Forest-wide monitoring, currently underway, after adequate data have been collected over several years.

While past management may have resulted in a trend possibly degrading water quality on and below A-Basin, Alternative 2 would contribute no additional impacts on local water quality, aquatic macroinvertebrates, or their populations and habitat trend Forest-wide. Alternative 2 proposes no additional snowmaking or water use, little (6.13 acres) tree removal, limited (10.0 acres), generally localized grading, no creek crossings or project components extending into the Water Influence Zone (WIZ). Implementation of project design criteria (refer to Table 2-2) to prevent runoff from entering the WIZ and any creek, stabilization of soils, other effective measures to maintain water quality, and upgrading parking lot sediment ponds would slightly improve water quality in the North Fork of the Snake River on and below the ski area. To the extent that the MIS question can be addressed for the Proposed Action based on available data, Alternative 2 would maintain or improve water quality (including chemical aspects as well as sediment) from current conditions.\(^{271}\)

**Aquatic Macroinvertebrates Summary**

Alternative 2 would contribute no additional impacts on local water quality, aquatic macroinvertebrates, or their populations and habitat trend at the project or Forest level. Alternative 2 would be consistent with all applicable Water and Riparian Resources standards and guidelines, Watershed Conservation Practices Handbook (FSH 2509.25), the management objective, and Forest direction applicable to aquatic macroinvertebrates.\(^ {272}\) Alternative 2 would maintain or improve water quality (including chemical aspects

\(^{271}\) USDA Forest Service, 2002b, 2005a and 2006f
\(^{272}\) Id.
as well as sediment) from current conditions. There would be no degradation of aquatic habitat or meaningful impact on aquatic macroinvertebrates at the local or Forest level attributable to indirect effects associated with reasonably foreseeable future actions. The Forest Service will continue monitoring this MIS to establish and track its population and trend across the Forest. Table 3K-3 summarizes the analysis for this MIS as a result of the Proposed Action. 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. Alternative 2 would not contribute towards Forest-wide MIS objectives for macroinvertebrate communities, either negatively or positively.

**All Trout**

**Direct Effects Analysis**

While past management (up to the date of the ROD for the A-Basin Master Development Plan) may have degraded the physical habitat quality for salmonids in mountain streams on and below A-Basin, Alternative 2 would contribute no additional impacts on local water quality or quantity, the North Fork trout population, or trout populations and habitat trend Forest-wide. Alternative 2 proposes no additional snowmaking or water use, 6.13 acres of tree removal, localized grading, no creek crossings or project components extending into the WIZ. Implementation of BMPs to prevent runoff from entering the WIZ and any creek, stabilization of soils, and other effective measures to maintain water quality, and upgrading parking lot sediment ponds would slightly improve water quality in the North Fork of the Snake River on and below the ski area. For similar reasons, while past management (up to the date of the ROD for the A-Basin Master Development Plan) may have adversely affected the spawning success of fall spawning fish, Alternative 2 would contribute no additional impacts on local water quality or quantity, the spawning success of fall spawning fish in the North Fork, or the success of fall spawning trout populations and spawning habitat Forest-wide.

**Trout Summary**

Alternative 2 would contribute no additional impacts on local water quality or quantity, the North Fork trout population, trout populations and habitat trend Forest-wide, the spawning success of fall spawning fish in the North Fork, or the success of fall spawning trout populations and spawning habitat Forest-wide. Alternative 2 would be consistent with all applicable water-related standards and guidelines, Watershed Conservation Practices Handbook (FSH 2509.25), the management objective, and Forest direction applicable to trout. The Forest Service will continue monitoring this MIS to establish and track its population and trend across the Forest. Stream conditions on the WRNF as a whole are generally

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273 USDA Forest Service, 2002a,b,d
274 USDA Forest Service, 1999b
275 Ibid.
276 Id.
in good (i.e., somewhat near reference) condition and Forest-wide aquatic systems are expected to move toward reference (i.e., better) conditions as more conservative habitat protection measures are implemented and as habitat improves.\footnote{USDA Forest Service, 2002a,b,d and 2006a} Table 3K-3 summarizes the analysis for this MIS as a result of the Proposed Action. The reader is also referred to the water resources analysis (Section 3I) for more comprehensive background data.

**Other Species of Interest**

Mountain goat (*Oreamnos americanus*) is not a species that is routinely evaluated on the WRNF.\footnote{USDA Forest Service, 2002a} However, this species is present on the project area and was identified during scoping. As such, it is addressed herein.

In Colorado, mountain goats are primarily an alpine species associated with meadows, fellfields, and other grass/forb/willow communities in close proximity to escape terrain (cliffs and boulder fields). Alpine terrain on the A-Basin project area is part of a large goat summer range concentration area that extends along the Continental Divide and its major spur ridges south of I-70 to east of Montezuma.\footnote{NDIS mapping, 2006} Small bands of goats are frequently present on the ski area during summer.\footnote{Parsons Engineering Science, 1996; USDA Forest Service, 1999a} In winter, goat habitat is mutually exclusive with deep, compacted snows generally associated with ski terrain. During portions of most winters, windswept areas along the eastern ridgeline of Montezuma Bowl may allow limited foraging. Because the goats occasionally present on A-Basin are the same animals that are exposed to high levels of mostly summer recreational activities extending from Loveland Pass to Grays and Torreys Peaks, they are well habituated to year-round human activities.

The Proposed Action would result in the temporary, short-term (construction season) displacement of goats from the upper Montezuma Bowl lift terminal and ancillary facilities (summer access route, filled depression, and upper lift towers) and approximately 1.0 acre of permanent habitat loss. Goats that may occasionally forage along Montezuma Bowl’s windswept eastern ridgeline may be diurnally displaced by adjacent skiing activity, but could return to forage outside of skiing hours. Goats on the project area are habituated to summer ski area maintenance activities and would adjust to construction activities and new facilities without discernable adverse effects.

**CUMULATIVE EFFECTS**

Past and present actions within southern Summit County are described in the Affected Environment section, above. Past actions that have occurred within A-Basin’s SUP area include lift construction, trail and vegetation clearing, grading, snowmaking and utility line installation, road construction, and restaurant and building construction. Present actions include those that are currently under way or which...
are considered to be part of ongoing resort operations or recently approved current projects (e.g., annual summer construction projects. Approved/unimplemented actions include construction of a pedestrian underpass to link parking lots on the north side of Highway 6 with the base area, upgrades to the High Noon parking lot, and construction of the Midway Lodge.

**Alternative 1 – No Action**

Alternative 1 would have no cumulative impact on any listed or proposed animal species or designated critical habitat, no impact on any R2 sensitive animal species, and would be consistent with all applicable WRNF standards and guidelines, as amended, the management objective, and Forest direction for project MIS.  

**Alternative 2 – The Proposed Action**

**Threatened and Endangered Animal Species**

Additional cumulative effects from reasonably foreseeable future actions that might affect lynx or lynx habitat include those associated with (1) the proposed Independence Bowl snowcat skiing proposal at Keystone Ski Area, (2) the Chihuahua/Homestead Land Exchange, and (3) continued build out of the Keystone base area, town, and adjacent subdivisions. These three future actions are summarized below. Otherwise, impact zones of cumulative effects associated with reasonably foreseeable future actions do not extend into lynx habitat and would not affect lynx affected by the Proposed Action.

**Independence Bowl Snowcat Skiing at Keystone Ski Area**

The Independence Bowl snowcat skiing proposal at Keystone Ski Area (KSA) is an unapproved Federal action currently in the Section 7 consultation process. KSA proposes to provide guided and non-guided bowl skiing via snowcat or hiking on approximately 278 acres of mostly alpine terrain in Independence Bowl. The proposed Independence Bowl snowcat tours would result in no infrastructure development, no ground disturbing activities, no modifications to lynx habitat, no short- or long-term construction effects, and would not extend the existing hours or seasons of operations at KSA. The KSA Proposed Action would be consistent with historic ski area operations, but would extend winter recreational use into a non-developed, lightly impacted, largely alpine area (i.e., Independence Bowl) within Keystone’s SUP area. Snow safety management would increase as a potential disturbance, but not a threat, to potential lynx habitat use in Jones Gulch. Unauthorized skiing is occurring as part of the environmental baseline and will likely continue under the KSA Proposed Action, despite implementation of a comprehensive backcountry management plan seeking to discourage use and avoid disturbances to lynx. The effects on lynx habitat use of unauthorized egress out Jones Gulch would be additive, but otherwise similar to the existing unauthorized egress.

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281 USDA Forest Service, 2002a,b, 2005a and 2006a,f
282 Council on Environmental Quality, 1997; USEPA, 1999
The Keystone Proposed Action would be consistent with all applicable, lynx-related provisions of the 2002 Forest Plan, as amended, Record of Decision and with Section 7(d) of the ESA. Indirect and cumulative effects would make no discernable or meaningful contributions to the existing environmental baseline. The collective effects associated with the KSA Proposed Action would not reach an intensity or extent that would result in incidental take, either by “harm” or “harassment”, because no habitat modifications would occur and diurnal, ski season disturbances would not significantly degrade current habitat effectiveness resulting in death or injury to lynx by significantly impairing behavioral patterns such as denning, foraging, or travel, impair the ability of lynx to maintain a home range overlapping the project area, or increase any lynx risk factors. For the unlikely and minimal collective effects associated with the KSA Proposed Action, the BA determined that it “is not likely to adversely affect” Canada lynx.

Chihuahua / Homestead Land Exchange

The Chihuahua / Homestead Land Exchange involves the exchange of the non-federal 42.97-acre Chihuahua Gulch parcel for a 21.36-acre parcel of NFS land (Keystone parcel). The Federal Keystone parcel is located immediately south of the Snake River between the existing Keystone Resort gondola and the Ski Tip base area. Habitat on the parcel is dominated by mixed conifer stands composed of Stage 4B lodgepole pine succeeding to Stages 4B and 5 spruce-fir. Individual and low-density Stage 3 aspen (Populus tremuloides) are scattered in the eastern one-half of the parcel. The northwest corner of the parcel overlaps a corner of the Snake River riparian corridor consisting of a forested riverine slope wetland, willows, and a portion of a pond. Two perennial creek channels flow through the center of the parcel, but go underground before reaching the northern side of the parcel. Geyer willow (Salix geyeri) and alder (Alnus tenuifolia) dominate these channels. The parcel was historically logged and supports only a low density of course woody debris, consisting primarily of stumps. Development on the parcel is limited to several dirt tracks at lower elevations. Parcel elevations range from approximately 9,350 to 9,570 feet.

The non-Federal Chihuahua Gulch Parcel is located up Peru Creek at the confluence of Chihuahua Creek. The parcel is composed of mesic meadows interspersed with high elevation clumps of mixed conifer forest, primarily 4A-4B spruce-fir. Stands are locally interspersed with Stage 4 lodgepole pine. Two small 3C aspen clones and some 4C spruce clumps are also present. The parcel encompasses the historic mining town of Chihuahua, but virtually no historic structures are discernable and the habitat has recovered well. The parcel supports the teepee and several outbuildings of a resident/caretaker. A reach of Peru Creek, orange with toxic mine wastes, bisects the parcel and isolates Chihuahua Creek from other aquatic reaches of the Snake River system.

Each exchange parcel represents potential lynx foraging and travel habitat. Denning habitat is not present on either parcel. It is unlikely that the Chihuahua Gulch Parcel would be used as diurnal security habitat

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because of small forest patch size and habitat fragmentation. It is possible that the Keystone Parcel, in conjunction with surrounding undeveloped forested habitats, could be used as a patch of diurnal security habitat. It is unknown what the minimum habitat patch size is that would be effective as security habitat. However, this forest block contains a well-buffered interior that receives relatively little human use. Such security habitat adjacent to Keystone Ski Area could be important to lynx home range use and dispersal during the ski season. Both parcels occur within or adjacent to landscape-level movement corridors, so both could receive greater than expected lynx use on or adjacent to them.

The land exchange may benefit lynx, not so much by exchanging nearly equal value habitats, but by the Forest Service acquiring the more isolated Chihuahua Gulch Parcel and, most importantly, by precluding development on that parcel that would not only eliminate potential lynx habitat values on that parcel, but that would also degrade and introduce additional risk factors on NFS lands within a designated landscape linkage surrounding the parcel.

**Continued Keystone Buildout**

The Keystone base area, town, and associated subdivisions, extending along the Highway 6 and Montezuma Road corridors from Summit Cove on the west to Ski Tip on the east, will continue to build out. There is little potential lynx use of these partly developed, private parcels along the valley bottom.

Regarding the land exchange and continued build out of the Keystone base area, town, and adjacent subdivisions, those actions could affect lynx via dispersed recreational effects resulting from new residents and guests that extend into lynx habitat. At worst, these actions might collectively result in disturbances and short-term displacement of individual lynx.

**Region Two Sensitive Animal Species**

Other reasonably foreseeable projects considered in this analysis (described above) would contribute no additional cumulative effects to boreal toad, northern goshawk, northern harrier, white-tailed ptarmigan, boreal owl, three-toed woodpecker, olive-sided flycatcher and pygmy shrew because impact zones associated with those projects do not extend to potential habitat for these species directly and indirectly affected by the Proposed Action on NFS land.

**American Marten**

Other reasonably foreseeable projects considered in this analysis (described above) would result in a small net gain in the area of martens habitat on the Forest as a result of the proposed land exchange. Otherwise, impact zones of cumulative effects associated with other reasonably foreseeable future actions do not extend into martens habitat and would not affect resources affected by the Proposed Action on NFS land.
Management Indicator Species

Elk

Reasonably foreseeable future actions considered in the elk cumulative effects analysis include: (1) the proposed Independence Bowl snowcat skiing proposal at Keystone Ski Area, (2) the Chihuahua/Homestead Land Exchange, and (3) continued build out of the Keystone base area, town, and adjacent subdivisions. These three future actions are summarized in the Cumulative Effects Section for lynx, above. The incremental effects of the Proposed Action on elk (i.e., there would be none) include consideration of the collective effects of past and current actions (as described above under direct and indirect effects), and these reasonably foreseeable actions. These future actions mostly involve private lands. Their effects on elk include short-term displacement from summer range, long-term loss of a relatively small area of winter range, restricted movement corridors, increased probabilities of road-kill, harassment from dogs on winter range, and a net gain of a small area of summer range in an isolated setting. These future actions would have local effects on elk habitat effectiveness, but no discernable effect on habitat effectiveness within the DAU. Human population growth and land development would continue to be two of the largest influences on elk management.

Implementation of Alternative 2 at A-Basin would not result in or contribute any discernable cumulative effects to elk, elk habitat quality, quantity, or effectiveness, or the ability of elk to disperse at the Forest level.

American Pipit

Cumulative effects and reasonably foreseeable future actions considered in this analysis are defined and described above. Additional cumulative effects associated with two future actions could affect alpine grasslands and pipits. The first involves the proposed Independence Bowl snowcat tours at KSA, as described above. However, there would be no ground disturbance resulting from that action at KSA that would adversely affect American pipits or other species associated with alpine grassland habitat. Pipits are Neotropical migrants that are absent in Independence Bowl and its access routes during the ski season when snowcat tours would operate. Therefore, that project would have no direct effects on American pipits or their alpine grassland habitat and would have no adverse effects on this species’ Forest-wide population and habitat trends. The second future action is the dispersed recreational effects, in the alpine, during summer, by new residents and guests of the Keystone base area, town, and associated subdivisions, including those residences that might be developed on the Federal exchange parcel acquired through the Chihuahua/Homestead Land Exchange. Both future actions would result in no meaningful loss of alpine grassland habitat attributable at the local or Forest level. Otherwise, impact zones of cumulative effects associated with reasonably foreseeable future actions do not extend into the alpine and would not affect resources affected by the Proposed Action. Other, general cumulative effects considerations follow the discussion provided for elk and lynx, above.
Chapter 3: Affected Environment and Environmental Consequences
K. Wildlife

Alternative 2 would not result in, or contribute to, any discernable cumulative effects to American pipits or other species dependent or strongly associated with alpine grassland habitat at the Forest level. Cumulative effects of the Proposed Action would be consistent with the management objective, and with Forest direction for American pipits. There would be no meaningful loss of alpine grassland habitat attributable to cumulative effects associated with reasonably foreseeable future actions at the local or Forest level.

Aquatic Macroinvertebrates

Cumulative effects and reasonably foreseeable future actions considered in this analysis are defined and described above. Additional cumulative effects associated with two future actions could affect aquatic macroinvertebrates. The first involves the proposed Independence Bowl snowcat tours at KSA, as described above. However, there would be no ground disturbance, tree removal, or snowmaking resulting from that action at KSA that would adversely affect aquatic macroinvertebrates or their aquatic habitat. Therefore, that project would have no direct effects on this MIS or their habitat and would have no adverse effects on this species’ Forest-wide population and habitat trends. The second future action is the dispersed recreational effects (i.e., fishing) by new residents and guests of the Keystone base area, town, and associated subdivisions, including those residences that might be developed on the Federal exchange parcel acquired through the Chihuahua/ Homestead Land Exchange. Neither future action would result in any loss or degradation of aquatic habitat or meaningful impact on aquatic macroinvertebrates at the local or Forest level. Otherwise, impact zones of cumulative effects associated with reasonably foreseeable future actions would not affect the aquatic resources potentially affected by the Proposed Action. Other, general cumulative effects considerations follow the discussions provided above. 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.

There would be no degradation of aquatic habitat or meaningful impact on aquatic macroinvertebrates at the local or Forest level attributable to cumulative effects associated with reasonably foreseeable future actions.

All Trout

Cumulative effects and reasonably foreseeable future actions considered in this analysis are defined and described above. Additional cumulative effects associated with one category of future actions could affect trout. Additional dispersed recreational effects (i.e., fishing, campground use, off-road vehicle use, etc., all leading to increased sedimentation) will result from new residents and guests of the Keystone base area, town, and associated subdivisions, including those residences that might be developed on the

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284 USDA Forest Service, 2002a,b
285 USDA Forest Service, 2002a,b,d
Federal exchange parcel acquired through the Chihuahua/ Homestead Land Exchange. While these additional incremental effects could have localized, minor degrading effects on water quality, they would not meaningfully contribute any adverse effects to Forest-wide water quality or quantity that would affect local or Forest-wide trout populations or habitat trend. Otherwise, impact zones of cumulative effects associated with other reasonably foreseeable future actions would not affect the aquatic resources potentially affected by the Proposed Action. Other, general cumulative effects considerations follow the discussions provided above. Stream conditions on the WRNF as a whole are generally in good (i.e., somewhat near reference) condition and Forest-wide aquatic systems are expected to move toward reference (i.e., better) conditions as more conservative habitat protection measures and Watershed Conservation Practices are implemented and as habitat improves.286

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

Based on the commitment the Forest Service has made regarding the development and operation of the A-Basin SUP area as an 8.25 Management Area, the previously approved and proposed components that would be installed within the SUP area under Alternative 2 would be difficult to reverse, but would not represent irretrievable commitments of resources. In particular, new parking lots would result in permanent habitat modifications resulting in a small (in proportion to the sum of developed habitats within the A-Basin SUP area), but irretrievable commitment of plant and wildlife resources. The minimal amount of habitat modifications, as well as disturbances during the ski season, related to the Exhibition lift replacement and Montezuma Bowl lift installation would irretrievably affect some individual members of various wildlife species (as discussed previously under the direct, indirect and cumulative effects analyses), but are not considered irreversible.

286 USDA Forest Service, 2002a,b,d and 2006a
L. AIR QUALITY

SCOPE OF THE ANALYSIS

The air quality analysis for the EIS focuses on the Arapahoe Basin SUP area (NFS lands), and the adjacent base area. The only geographically proximate Class I airsheds are the Eagle’s Nest Wilderness area (approximately 15 miles to the west) and Rocky Mountain National Park (approximately 40 miles to the north).

REGULATORY DIRECTION

The goal for air quality on NFS lands in Colorado is to manage emissions generated in or near Federal land management areas such that air quality will meet the National Clean Air Act and Colorado State air quality requirements. Specific requirements can be found in the Forest Service Air Quality Program, Colorado Smoke Management Program Memorandum of Understanding (SMP MOU), and Colorado Air Quality Control Commission Regulation No. 9. In addition, National Ambient Air Quality Standards (NAAQS) for particulate matter (PM10) and the Prevention of Significant Deterioration (PSD) Total Suspended Particulate (TSP) increment for Class 1 and 2 areas must be met.

Forest Service direction regarding air resources is found in the Forest Plan for the WRNF. No specific air quality related standards or guidelines have been promulgated for the 8.25 Management Area; however, forest-wide standards require that activities “[c]omply with local, state, and federal air quality regulations and maintain conformity with the State Implementation Plan.”

Air Quality Regulations

Federal

The Clean Air Act (CAA), was amended numerous times from 1963 through 1990 to address reductions in vehicular and stationary source emissions and to establish national air pollution concentration limits. It also established several programs, including: NAAQS, which limited air concentrations to protect public health and welfare; the New Source Performance Standards, which set emission standards for major sources; and the State Implementation Plan (SIP) procedures, which were designed to bring areas that exceeded NAAQS levels (non-attainment areas) to within the standards. In addition, the PSD program was established to help protect attainment areas of the country (Class I & II areas). The PSD program established allowable concentration increases from all major sources that could potentially exceed the NAAQS. The PSD program also included protection of National Parks, and Wilderness areas greater than 10,000 acres (Class I areas). Finally, the PSD program established visibility impairment restrictions on major sources impacting the Class I areas.

287 USDA Forest Service, 2000c
288 USDA Forest Service, 2002a
Air quality effects of greatest concern as related to A-Basin’s historic and future operations are smoke and particulate matter emissions. The CAA promulgated NAAQS for particulate matter less than 10 microns and 2.5 microns (PM$_{10}$ and PM$_{2.5}$), and a PSD TSP increment for Class I and II areas. Table 3L-1 lists the NAAQS and Class II PSD increment values for particulate matter.

### Table 3L-1: National Ambient Air Quality Standards and PSD Increments

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Period</th>
<th>NAAQS (microgram/m$^3$)</th>
<th>Class II PSD Increments (microgram/m$^3$)</th>
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</thead>
<tbody>
<tr>
<td>PM$_{10}$</td>
<td>24-Hour</td>
<td>150</td>
<td>30</td>
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<tr>
<td></td>
<td>Annual</td>
<td>50</td>
<td>17</td>
</tr>
<tr>
<td>PM$_{2.5}$</td>
<td>24-hour</td>
<td>65</td>
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</tr>
<tr>
<td></td>
<td>Annual</td>
<td>15</td>
<td>---</td>
</tr>
</tbody>
</table>

Source: 40 CFR 50

The CAA designates two different air quality areas that receive different levels of protection. Class I areas generally include national parks, federally-designated wilderness areas that are in excess of 5,000 acres and that were created prior to 1977, national monuments, national seashores, and other areas of special national or regional value. Class I designation warrants the highest level of protection afforded to an area. Class II designation typically applies to non-Class I areas.

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

In addition to the NAAQS discussed above, the EPA has promulgated regulations to protect and enhance air quality. The PSD regulations are intended to help maintain good air quality in areas that attain the national standards and to provide special protections for national parks, federally designated wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historical value. These regulations stipulate that new sources must not cause a decline in ambient air quality and must use best available control technology to limit emissions. PSD permits are required for, “major emitting facilities” which emit, or have the potential to emit, 100 tons or more per year of any air pollutant. EPA regulations specifically list the sources that are considered “major emitting facilities” – this list does not include ski areas. However, the regulations note that the term “major emitting facilities” also includes “any other source with the potential to emit 250 tons per

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289 42 USC 7470-7479
290 42 USC 7475[a] and 7479[1]
291 42 USC 7479[1]
year or more of any air pollutant. A PSD permit is not required for Arapahoe Basin because ski areas are not classified as stationary sources and Arapahoe Basin does not have the potential to emit over 250 tons of any regulated air pollutant.

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

**State**

The EPA retains oversight authority but has delegated enforcement of the CAA to the states. In Colorado, the Air Pollution Control Division of the Department of Public Health and Environment acts as the lead agency. The state is required to develop and administer air pollution prevention and control programs; state standards must be either the same as, or more stringent than, Federal CAA standards. In Colorado, the state has adopted all federal ambient air quality standards as reflected in the CAA with an additional particulate standard; the standard for total suspended particulate emissions is 75 micrograms/cubic meter over 24 hours and 260 micrograms/cubic meter annually.

**AFFECTED ENVIRONMENT**

**Climate**

Summit County experiences a typical mid-continental, high-elevation climate with cool summers and cold winters. Humidity is low and diurnal temperature fluctuations are high. Prevailing winds are generally from the northwest, and the region receives the majority of its precipitation from Pacific storms. Precipitation is generally higher in the winter than in the summer. Winter precipitation occurs as abundant snowfall, while summer precipitation often occurs as localized thunderstorms. Arapahoe Basin’s average annual snowfall totals approximately 370 inches. However, snow accumulation varies within the ski area due to wind loading, scouring, the shadowing effect of peaks and ridges, as well as differences in elevation. Wind speeds on the mountain are generally higher than winds experienced within lower elevations of the Snake River Valley. Within the Valley, lower wind speeds can reduce dispersion, which could potentially increase the likelihood of temperature inversions in the area. Average wind direction as measured at Arapahoe Basin is predominantly from the west and it is unlikely that any emissions generated directly or indirectly by Arapahoe Basin’s operations currently affect the Eagle’s Nest or Rocky Mountain National Park Class I Areas.293

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292 42 USC 7479[1]
293 USDA Forest Service, 1999a
**Air Quality Monitoring**

Summit County has not monitored and is not currently monitoring SO₂, CO, O₃, Pb, NO₂, or PM₂.₅. It is believed that the probability of these pollutants becoming an impediment to attainment is unlikely.²⁹⁴ This, combined with the expense of monitoring, has made it impracticable to oversee these pollutants.

Particulate matter has been monitored as PM₁₀ in the towns of Breckenridge, Frisco, and Silverthorne. Continuous PM₁₀ monitoring commenced in June of 1992 atop the Summit County Justice Center, in Breckenridge. PM₁₀ emissions were measured between October 1993 through 2000 atop the Colorado Mountain College in Silverthorne, and during 2000-2001 in Frisco at the Summit County Commons. A review of the recent monitoring data indicates that neither monitoring site registered emissions above the annual standard, (50 μg/m³). However, monitoring does indicate that exceedance of the 24-hour standard of 150 μg/m³ did occur in 2000 and 2005 at the Breckenridge monitoring site. Despite these single-day exceedances, because the annual mean standard continues to be met, Summit County continues to be classified as an attainment area for PM₁₀. The nearest non-attainment area for PM₁₀ is the Denver metropolitan area.

**Air Pollution Control Measures in Summit County**

Air pollution control measures have been enacted for Summit County. Control measures are not extensive, due to the absence of current violations and the low likelihood of future violations of federal air quality standards. The county requires that only EPA Phase II or III certified wood stoves or solid fuel burning devices be installed in newly constructed buildings, and that only one device be permitted per residential dwelling unit. Solid fuel burning devices are not permitted in newly constructed apartments, condominiums, or commercial properties. Similarly, modification, replacement, or relocation of an existing wood stove requires upgrading to a certified unit.

Other air quality control measures in effect for Summit County include: the County Engineering Department’s routine application of magnesium chloride to gravel roads, which is applied as needed to reduce dust, and the incorporated communities within Summit County routinely sweep the streets to reduce the amount of dust re-entering the atmosphere.

**DIRECT AND INDIRECT ENVIRONMENTAL CONSEQUENCES**

**Alternative 1 – No Action**

Under the No Action Alternative, no changes would occur to the current trends in air quality. Ongoing commercial and residential growth within Summit County would continue independently of activities at Arapahoe Basin. However, due to existing regulations, climate, and topography, future exceedances of NAAQS would be unlikely. It is probable that Summit County would continue to be classified as an attainment area for all monitored criteria pollutants and no additional air quality issues would be

²⁹⁴ Heavner, 1997; Pocius, 1997
Chapter 3: Affected Environment and Environmental Consequences
L. Air Quality

anticipated. Incremental increases in emissions would be unlikely to violate PSD regulations for criteria pollutants.

Any change in emissions would be extremely unlikely to adversely affect air quality in the Eagle’s Nest or Ptarmigan Peak Wilderness areas. Upper level winds are predominantly from the north, and Arapahoe Basin is downwind from both the Eagle’s Nest and Ptarmigan Peak Wilderness Areas and their associated Class I airsheds.

**Alternative 2 – Proposed Action**

No emissions permits would be required for implementation of the Proposed Action. Slash generated by areas proposed for tree removal would be disposed of via lop-and-scatter; burning of slash would not occur. No long-term air quality impacts are expected at Arapahoe Basin or adjacent NFS or Summit County lands as a result of the Proposed Action. Best Management Practices (BMPs) would be utilized as part of the construction process for the top and bottom terminals of the proposed Montezuma Bowl lift, in order to reduce fugitive emissions of dust. In the short-term, dust generated from construction would be dispersed by typical diurnal wind currents. In the long-term, no changes to current trends in air quality/climate are anticipated.

Under the Proposed Action, visitation at Arapahoe Basin is projected to increase at an average rate of approximately 2.4 percent per year through 2015. This increase would be accompanied by a corresponding increase in vehicular traffic on Highway 6. The incremental increase in the number of vehicles on this route associated with Arapahoe Basin skier visitation would be minor in comparison to the general rate of traffic increase along the I-70 corridor and Highway 6 due to population growth. Thus, the impacts of vehicular traffic due to the Proposed Action are not expected to have an appreciable effect on air quality.

**Cumulative Effects**

Past actions that have impacted air quality in the area include: resort development, mining, forest management, population changes within Summit County, and construction of the Highway 6 and later the Interstate 70 (I-70) corridor. Residential and commercial growth within the Snake River Valley of Summit County, and the increased visitation associated with such development is more likely to impact air quality than impacts associated with improvements to the ski area. County building codes include requirements to reduce air quality impacts. As such, with the required mitigation measures applied, no significant cumulative impacts are anticipated to result from implementation of the Proposed Action.

**IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

No irreversible and/or irretrievable commitments of resources in relation to air quality have been identified in association with either alternative analyzed in this document.
4. CONSULTATION AND COORDINATION

LIST OF PREPARERS

FOREST SERVICE TEAM

The following Forest Service and BLM personnel participated in the initial scoping, were members of the Interdisciplinary Team, and/or provided direction and assistance during the preparation of this EIS.

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Peech Keller  Team Leader and NEPA Coordinator
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US Environmental Protection Agency
US Fish and Wildlife Service

TRIBAL GOVERNMENT

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LOCAL MEDIA

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———. 2006b. Personal Communication between Greg Laurie, Dillon Ranger District Hydrologist, and SE Group staff.

———. 2006c. Electronic transmittal from Greg Laurie, Dillon Ranger District Hydrologist, to SE Group staff.

———. 2006d. Electronic transmittal from Mark Weinhold, WRNF Forest Hydrologist, to SE Group staff.


6. FIGURES

FIGURE 1: LOCATION MAP
FIGURE 2: EXISTING CONDITIONS
FIGURE 3A: FRONTSIDE PROPOSED ACTION
FIGURE 3B: MONTEZUMA BOWL PROPOSED ACTION
FIGURE 4: ROADLESS AREA
FIGURE 5: FRONTSIDE WETLANDS
FIGURE 6: MONTEZUMA BOWL WETLANDS
FIGURE 7: CHANNEL NETWORK SURVEY FOR 1999 A-BASIN EIS
F I G U R E - 2
Existing Conditions

LEGEND

Contour Interval: 50 Ft.
Date: 2.15.06
Created By: GH
Produced By: S E G R O U P

Resort Facilities

A Early Riser Lot
B High Noon Lot
C Lower Overflow Lot
D Last Chance Lot
E Previously Approved Upper Overflow Lot
F Previously Approved Midway Lodge
G Snow Plume Refuge

ARAPAHOE BASIN SKI AREA
2006 Improvement Plan EIS
Figure 3B
Proposed Action

Legend:
- Proposed Lift
- Existing Lift
- Proposed Backcountry Access Points
- Proposed Tree Clearing
- Proposed Selective Tree Thining
- Proposed Hike Back Terrain
- Proposed Skier Catchments
- Proposed Avalauncher Site
- Proposed Access and Utility Corridor
- Existing Roads
- Existing Building
- Montezuma Bowl Boundary
- Proposed Operational Boundary
- Special Use Permit Boundary

Resort Facilities:
- Snow Plume Refuge
- Norway Top Terminal
- Lenewee Top Terminal
- Montezuma Lift Top Terminal
  Elevation 12,465 Ft
- Montezuma Lift Bottom Terminal
  Elevation 11,350 Ft

Contour Interval: 50 Ft.
Date: 11.18.05
Created By: GH
Produced By: SE Group
7. **GLOSSARY**

**303(d)** - The section of the 1972 Clean Water Act that requires states, territories, and authorized tribes to develop lists of impaired waters - those that do not meet water quality standards that states, territories, and authorized tribes have set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that jurisdictions establish priority rankings for waters on the lists and develop TMDLs for these waters.

**Acre-foot** - The amount of water necessary to cover one acre to a depth of one foot; equals 43,560 cubic feet or 325,851 gallons.

**Action alternatives** - Any alternative that includes upgrading and/or expansion of existing winter and summer recreational development within the area.

**Affected environment** - The physical, biological, social, and economic environment that would or may be changed by actions proposed and the relationship of people to that environment.

**Agriculture** - A State of Colorado water quality standard (defined as …waters …suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.)

**Airshed** - A geographical area that, because of topography, meteorology, and climate, shares the same air. The Clean Air Act establishes three air quality classes (I, II, and III), each with defined air quality standards.

- **Class I airsheds** are areas designated for the most stringent degree for protection from future degradation of air quality.
- **Class II airsheds** are areas where a moderate amount of development could occur.
- **Class III airsheds** are areas where significant development could occur as long as National Ambient Air Quality Standards are not exceeded.

**Alpine tundra** - A vegetation type that occurs above treeline characterized by extreme environmental conditions, including high winds, cold temperatures, and often seasonally dry moisture regimes.

**Alternative** - One of several conceptual development plans described and evaluated in the EIS.

**Army Corps of Engineers (COE)** - The federal agency charged with enforcing the Clean Water Act by regulation of dredge and fill activities in wetlands.
Artifact - A simple object (such as a tool or ornament) showing early human workmanship or modifications.

Assessment area - The geographical area and/or physical, biological, and social environments which are analyzed for specific resources in the EIS.

Aquatic Life Cold 1 - A State of Colorado water quality standard (defined as …waters that (1) currently are capable of sustaining a wide variety of cold water biota, including sensitive species, or (2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species.)

Aquatic Life Cold 2 - A State of Colorado water quality standard (defined as …waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.)

Backcountry - An undeveloped area where dispersed, off-road recreation such as hiking and trail bike riding may occur. Generally describes semi-private motorized and semi-primitive non-motorized recreation opportunities.

Background - A landscape viewing area visible to a viewer from approximately three to five miles to infinity. Also, in economics, naturally occurring; uninduced.

Baseline condition - The existing dynamic conditions prior to development, against which potential effects are judged.

Best Management Practices (BMPs) - Forest management actions and mitigation prescriptions, which are designed to maintain resource values through preventative rather than corrective measures.

Big game - Those species defined by law which are managed as a sport hunting resource, such as mule deer, turkey, elk, bear, and mountain lion.

Biodiversity - The variety of biotic communities, species, and genes and their interaction with ecological processes and functions, within ecosystems and across landscapes. The number of species present is the basic unit of measurement. More complex measurements also exist.

Biological Evaluation - An evaluation conducted to determine whether a proposed action is likely to affect any species which are listed as sensitive (USFS), candidate (USFS), or other special designations.
**Candidate species** - Those plant and animal species that, in the opinion of the U.S. Fish and Wildlife Service, may become threatened or endangered. Not protected under the Endangered Species Act.

**Canopy** - The more-or-less continuous cover of leaves, needles and/or branches collectively formed by the crowns of adjacent trees in a stand or forest.

**Capability** - The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices such as silviculture or protection from fire, insects, and disease.

**CDPHE** - Colorado Department of Public Health and Environment. The State of Colorado Department responsible for overseeing water quality regulation within Colorado.

**Cubic Feet per Second (CFS)** - A rate of flow in which one cubic foot of substance is delivered each second.

**Clean Water Act** - An act that was enacted by the U.S. Congress in 1977 to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. This act was formerly known as the Federal Water Pollution Control Act (33 U.S.C. 1344).

**Comfortable carrying capacity (CCC)** - Comfortable Carrying Capacity (CCC) is a planning tool used to determine the optimum level of utilization that facilitates a pleasant recreational experience. This is a planning figure only and does not represent a regulatory cap on visitation. CCC is used to ensure that different aspects of a resort’s facilities are designed to work in harmony, that capacities are equivalent across facilities, and sufficient to meet anticipated demand. CCC is based on factors such as vertical transport and trail capacities.

**Consumptive use** - Use of a resource that reduces the supply.

**Cooperating agency** - A federal agency, other than a lead agency, which has jurisdiction by law or special expertise with respect to any environmental impact associated with the proposed action or one of the alternatives. A state or local agency or an Indian tribe may be a cooperating agency with agreement from the lead agency.

**Corridor** - A linear strip of land identified for the present or future location of transportation or utility rights-of-way within its boundaries. Also, a contiguous strip of habitat suitable to facilitate animal dispersal or migration.
Council on Environmental Quality (CEQ) - An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

Cover - Vegetation used by wildlife for protection from predators and weather conditions, or in which to reproduce.

Cover Density - Forest cover density is an index which theoretically ranges from zero to less than one. It references the capability of the stand or cover to integrate and utilize the energy input to transpire water. Cover density represents the efficiency of the three-dimensional canopy system to respond to the energy input. It varies according to crown closure, vertical foliage distribution, species, season, and stocking.

Critical habitat - A formal designation pursuant to the Endangered Species Act which may be applied to a particular habitat that is essential to the life cycle of a given species, and if lost, would adversely affect that species. Critical habitat can have a less formal meaning when used outside the context of the Endangered Species Act.

Cubic feet per second (cfs) - Unit measure of streamflow or discharge, equivalent to 449 gallons per minute or about two acre-feet per day.

Cultural resource - Cultural resources are the tangible and intangible aspects of cultural systems, living and dead, that are valued by a given culture or contain information about the culture. Cultural resources include, but are not limited to sites, structures, buildings, districts, and objects associated with or representative of people, cultures, and human activities and events.

Cumulative impact - The impact on the environment which results from the incremental impact of the action when added to other past, present and reasonable foreseeable future actions regardless of what agency or person undertakes such other actions. Each increment from each project may not be noticeable but cumulative impacts may be noticeable when all increments are considered together.

Demand - The quantity of goods or services called for, given a price of other combinations of factors.

Developed recreation site - An area with characteristics that enable to accommodate, or be used for intense recreation. Such sites are often enhanced to augment the recreational value. Improvements range from those designed to provide great comfort and convenience to the user to rudimentary improvements in isolated areas.

Direct impact - An effect which occurs as a result of an action associated with implementing the proposal or one of the alternatives, including construction, operation, and maintenance.
**Dispersed recreation** - Recreation that occurs outside of a developed recreation site and includes such activities as scenic driving, hunting, backpacking, and recreation activities in primitive environments.

**Distance zone** - One of three categories used in the visual management system to divide a view into near and far components. The three categories are (1) foreground, (2) middleground, and (3) background. See individual entries.

**District Ranger** - The official responsible for administering the National Forest System lands on a Ranger District.

**Diversity** - The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

**Dry Ravel** - A sloughing of sediment due to loss of cohesion in surface materials.

**Ecosystem** - The system formed by the interaction of a group of organisms and their environment, for example, marsh, watershed, or lake.

**Effects** - Results expected to be achieved from implementation of the alternatives relative to physical, biological, economic, and social factors. Effects can be direct, indirect, or cumulative and may be either beneficial or detrimental.

**Endangered species** - An official designation for any species of plant or animal that is in danger of extinction throughout all or a significant portion of its range. An endangered species must be designated in the Federal Register by the appropriate Federal Agency Secretary.

**Environmental analysis** - An analysis of alternative actions and their predictable short and long-term environmental effects, which include physical, biological, economic, social and environmental design factors and their interactions.

**Environmental Assessment (EA)** - A concise public document required by the regulations implementing the National Environmental Policy Act which briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

**Environmental Impact Statement (EIS)** - A disclosure document required by the National Environmental Policy Act (NEPA) that documents the anticipated environmental effects of a proposed action that may significantly affect the quality of the human environment.

**Environmental Protection Agency (EPA)** - The federal agency charged with lead enforcement of multiple environmental laws, including review of Environmental Impact Statements.

**Erosion** - The detachment and movement of soil from the land surface by wind, water, ice, or gravity.
Erosion control - Materials, structure, and techniques designed to reduce erosion. Erosion control may include rapid revegetation, avoiding steep or highly erosive sites, and installation of cross-slope drainage structures.

Erosion hazard - Soil ratings to predict the erosion hazard or potential to be eroded.

Finding of No Significant Impact (FONSI) - A document that is prepared if the agency finds, in an environmental assessment, that the proposed action will not significantly affect the human environment. It must set forth the reasons for such a decision.

Forage - All browse and non-woody plants used for grazing or harvested for feeding livestock or game animals.

Forb - Any non-grass-like plant having little or no woody material on it. A palatable, broadleaved, flowering herb whose stem, above ground, does not become woody and persistent.

Foreground - The landscape area visible to an observer from the immediate area to .5 miles.

Forest Plan - A comprehensive management plan prepared under the National Forest Management Act of 1976 that provides standards and guidelines for management activities specific to each National Forest. The WRNF Forest Plan was approved in 1984.

Forest Service - The agency of the United States Department of Agriculture responsible for managing National Forests and Grasslands.

Forest Supervisor - The official responsible for administering the National Forest System lands in a Forest Service administrative unit who reports to the Regional Forester.

Game species - Any species of wildlife or fish for which seasons and bag limits have been prescribed and which are normally harvested by hunters, trappers, and fisherman under State or Federal laws, codes, and regulations.

GIS - geographic information system, a computer mapping system composed of hardware and software

GPS - Global Positioning System, a satellite-based surveying system

Gradient - The vertical distance divided by the horizontal distance, usually measured as percent. Gradient is used to describe streams and ski slopes.

Grazing - Consumption of herbage or artificial pasture forage by animals.

Groundwater - Subsurface water in the part of the ground that is wholly saturated.
Guideline - An indication or outline of policy or conduct that is not a mandatory requirement (as opposed to a standard, which is mandatory).

Habitat - The sum of environmental conditions of a specific place that is occupied by an organism, a population, or a community.

Habitat type - A classification of the vegetation resource based on dominant growth forms. The forested areas are more specifically classified by the dominant tree species.

Hydric soils - Soils characterized by, or requiring an abundance of moisture, used in the identification of wetlands.

Impacts - See effects

IMPLAN - An economic impact assessment modeling system.

Indicator species - An animal species used to represent a group of species that utilize the same habitat. For monitoring purposes, the well being of the indicator species is assumed to reflect the general health of the community.

Indirect impact - Secondary consequences to the environment resulting from a direct impact. An example of an indirect impact is the deposition of sediment in a wetland resulting from surface disturbance in the upland.

Instream flow - The volume of surface water in a stream system passing a given point at a given time.

Interdisciplinary Team (ID Team) - A group of individuals each representing specialty resource areas assembled to solve a problem or perform a task through frequent interaction so that different disciplines can combine to provide new solutions.

Management direction - A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them.

Management emphasis - Long-term management direction for a specific area or type of land.

Management indicator species (MIS) - A representative group of species that are dependant of a specific habitat type. The health of an indicator species is used to gauge function of the habitat on which it depends.

Management practice - A specific activity, measure, course of action, or treatment.
**Master Development Plan (MDP)** - A document that is required as a condition of the ski area term special use permit, designed to guide resort planning and development and avoid piecemeal decision making.

**Middleground** - The landscape area visible to a viewer from .5 miles to about three to five miles.

**Mitigation** - Actions taken to avoid, minimize, reduce, eliminate, or rectify the adverse environmental impacts associated with the implementation of an alternative or a portion thereof.

**Modification** - See visual quality objectives.

**National Ambient Air Quality Standards (NAAQS)** - Established under the Clean Air Act of 1963, there are primary standards, designed to protect public health, and secondary standards, designed to protect public welfare from known or anticipated air pollutants.

**National Environmental Policy Act (NEPA)** - A law enacted by Congress in 1969 that requires federal agencies to analyze the environmental effects of all major federal activities that may have a significant impact on the quality of the human environment.

**National Forest Management Act (NFMA)** - A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of regulations to guide that development.

**National Forest System (NFS) lands** - National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.

**National Historic Preservation Act (NHPA)** - An act that was enacted by the U.S. Congress in 1966 to protect historic sites and artifacts (16 U.S.C. 470). Section 106 of the Act requires consultation with members and representatives of Indian tribes.

**National Register of Historic Places** - A listing maintained by the National Park Service of areas which have been designated as historically significant. The register includes places of local and state significance, as well as those of value to the nation in general.

**No action alternative** - The management direction, activities, outputs, and effects that are likely to exist in the future if the current trends and management would continue unchanged. Under NEPA, it means following the current approved Forest Plan management direction and guidance.

**Objective** - A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.
**Old growth** - A stand that is past full maturity and showing signs of decadence; the last stage in forest succession. Although the tree age, size, height, or density will vary by timber type, trees are usually 21" or larger dbh and 150 years or older.

**Partial retention** - See visual quality objectives.

**Particulates** - Small particles suspended in the air and generally considered pollutants.

**Permit area** - See Special Use Permit Area.

**pH** - A numeric value used to represent the acidity or alkalinity of an aqueous solution. The Ph scale ranges from 0 (acidic) to 14.0 (basic); 7.0 is a neutral solution.

**Pod** - The area comprising a lift and associated trails.

**Preferred alternative** - The alternative selected from the range of alternatives which is favored by the lead agency.

**Prehistoric** - The period prior to a written record, and may include emigrant exploration, trappers, miners, etc., but generally refers to the previous Native American (aboriginal) occupants of the area, who kept no written records.

**Project area** - The area encompassed by the development proposal including base area and the permit area.

**Proponent** - The individual or business who is proposing the development. In this case, the proponent is Anthony Lakes Mountain Resort, Inc.

**Record of Decision (ROD)** - A document prepared within 30 days after the final EIS is issued which states the agency's decision and why one alternative was favored over another, what factors entered into the agency's decision, and whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why not.

**Q=CIA** - The formula for the Soil Conservation Service’s Rational Method of peak stormflow estimation.

**R2CROSS** - A computer model utilized by the State of Colorado Water Conservation Board to analyze fisheries habitat and minimum streamflow characteristics. The model and measurement process focuses on riffle habitats as the most limiting to fisheries during low-flow conditions. Riffles are shallow areas that are critical to a healthy aquatic environment, but also tend to be the first part of the stream that dries up as flows decrease. The model utilizes physical measurements of channel characteristics as input, and generates a table of hydraulic characteristics for the stream under different scenarios ranging from almost no flow to high-flow conditions when the stream would be full to its banks. These characteristics include
water depth, velocity, stream top width and wetted perimeter (which is the bottom and outside edges of the streambed that remain wet). Instream flow recommendations are generated by analyzing the amount of water needed to retain certain hydraulic characteristics in these riffle habitats to protect the fish and other aquatic life.

**Rational Method** - The stormflow estimation method that uses a runoff coefficient, uniform rainfall intensity and drainage area to estimate peak stormflow from a small watershed.

**Recreation** - A State of Colorado water quality standard (defined as …surface waters … suitable or intended to become suitable for recreational activities in or on the water when the ingestion of small quantities of water is likely to occur. Such waters include but are not limited to those used for swimming, rafting, kayaking, tubing, windsurfing and water-skiing.)

**Recreation visitor day (RVD)** - Twelve hours of recreation use in any combination of persons and hours (i.e. one person for 12 hours, three persons for four hours, etc.).

**Revegetation** - The re-establishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as seedbed preparation, reseeding, and mulching.

**Revegetation potential** - The ability or capacity of a site to be revegetated after a disturbance, which often depends on the quantity and quality of topsoil remaining in place

**Rilling** - Erosion by concentrated overland flow.

**Riparian habitat** - Land situated along the bank of a stream or other body of water and directly influenced by the presence of water (e.g. streamsides, lake shores, etc).

**Roadless area** - A National Forest area which satisfies the following criteria -a) larger than 5,000 acres or, if smaller than 5,000 acres, contiguous to a designated wilderness or primitive area, b) contains no roads and, c) has been inventoried by the Forest Service for possible inclusion in the Wilderness Preservation System.

**Scoping process** - A process that determines the issues, concerns, and opportunities which should be considered in analyzing the impacts of a proposal by receiving input from the public and affected agencies. The depths of analysis for these issues identified are determined during scoping.

**Sediment** - Solid material, both organic and mineral, that has been transported from its site of origin by air, water, or ice.

**Sensitive species** - Species which have appeared in the Federal Register as proposed additions to the endangered or threatened species list; those which are on an official State list or are recognized by the
Regional Forester to need special management in order to prevent them from becoming endangered or threatened.

**Sheetwash** - Erosion by un-concentrated overland flow.

**Significant impact** - A somewhat subjective judgement based on the context and intensity of the impact. Generally, a significant impact is one that exceeds a standard, guideline, law, or regulation.

**Siltstone** - A sedimentary rock composed of silt-size particles

**Sites** - Any place of past human activity.

**Skiers-at-one time (SAOT)** - A term used to measure recreation capacity which means the number of skiers that can use a facility at one time. See also Comfortable Carrying Capacity.

**Skier visit** - Skier visitor day. One visitor day equals one lift ticket sold.

**Soil** - A dynamic natural body on the surface of the earth in which plants grow, composed of mineral and organic materials and living forms.

**Soil productivity** - The capacity of a soil for producing plant biomass under a specific system of management. It is expressed in terms of volume or weight/unit area/year.

**Special Use Permit (SUP)** - A legal document, similar to a lease, issued by the U.S. Forest Service. These permits are issued to private individuals or corporations to conduct commercial operations on National Forest System lands. They specify the terms and conditions under which the permitted activity may be conducted.

**Special-use permit area** - That area of National Forest lands encompassed within the permit boundary held by Anthony Lakes Mountain Resort and designated for recreational use, in particular downhill skiing. Excludes private land.

**Special-use permit boundary** - The extent of the special use permit area, within which Anthony Lakes Mountain Resort is permitted to provide operational facilities and guest services.

**Stand** - A community of trees or other vegetation, which is sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities and to thus, form a management entity.

**Study area** - The geographical area that was analyzed to predict the possible effect that may be associated with proposed alternatives. This area varies depending on the resource, but often coincides with the special use permit boundary.
**Threatened species** - Any species which is likely to become an endangered species within the foreseeable future and which has been designated in the Federal Register as a threatened species.

**Total Maximum Daily Load (TMDL)** - A calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant’s sources.

**Understory** - Low-growing vegetation (herbaceous, brush or reproduction) growing under a stand of trees. Also, that portion of trees in a forest stand below the overstory.

**U.S. Fish and Wildlife Service (USFWS)** - The agency of the Department of the Interior responsible for managing wildlife, including non-ocean going species protected by the Endangered Species Act.

**Visual quality** - Describes the degree of variety in the landscape, created by the basic vegetative patterns, landform, and water forms. Landscapes with the greatest variety or diversity have the greatest potential for high scenic value or visual quality.

**Visual resource** - The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

**Water Rights** - The legal right to use water.

**Water Supply** - A State of Colorado water quality standard (defined as …waters …suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.)

**Watershed** - The entire area that contributes water to a drainage system or stream.


**WQCC** - Water Quality Control Commission. A public commission within the State of Colorado, that holds primacy in administering the mandates of the Clean Water Act on behalf of the EPA for waters of the United States within the State of Colorado.

**WEPP** - Water Erosion Prediction Project. A computer erosion model developed by the USDA Agricultural Research service (ARS) in cooperation with the Forest Service to model the physical processes involved in soil erosion mechanics, to produce erosion estimates.
**Wilderness** - Under the 1964 Wilderness Act, wilderness is undeveloped federal land retaining its primeval character and influence without permanent improvements of human habitation. It is protected and managed so to preserve its natural conditions.

**Winter Range** - That part of the home range of a species where 90 percent of the individuals are located during the winter at least five out of ten winters.

**WIZ (Water Influence Zone)** – The land next to water bodies where vegetation plays a major role in sustaining long-term integrity of aquatic systems. It includes the geomorphic floodplain (valley bottom), riparian ecosystem, and inner gorge. Its minimum horizontal width (from top of each bank) is 100 feet or the mean height of mature dominant late-seral vegetation, whichever is most.

**WRENSS** - The Environmental Protection Agency’s Handbook *An Approach to Water Resources Evaluation of Non-Point Silvicultural Sources* (WRENSS).
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