

CHAPTER 1

PURPOSE AND NEED

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ARIZONA

SNOWBOWL

**Coconino National Forest
Peaks Ranger District**



1. PURPOSE AND NEED

DOCUMENT STRUCTURE

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

Therefore, the Forest Service has prepared this Environmental Impact Statement (EIS) in compliance with the NEPA and other relevant Federal and State laws and regulations. This EIS discloses the direct, indirect, and cumulative environmental impacts anticipated to result from implementation of the Proposed Action or alternatives. The document is organized into four chapters:

- Chapter 1 - Purpose and Need: includes information on the history of the project proposal, the purpose of and need for the project, and the proposal for achieving that purpose and need. Chapter 1 also details how the Forest Service informed the public of the proposal and how the public responded.
- Chapter 2 – Description of Alternatives: provides a detailed description of the Proposed Action as well as alternatives that were formed in response to major issues. This discussion also includes alternatives considered but eliminated from further analysis and mitigation measures. Finally, Chapter 2 provides a summary table of the environmental consequences anticipated with each alternative.
- Chapter 3 - Affected Environment and Environmental Consequences: provides a description of the affected environment (i.e., existing conditions) according to resources area and describes the environmental effects of implementing the Proposed Action and other alternatives. Chapter 3 is organized by resource topic.
- Chapter 4 - Consultation and Coordination: provides a list of preparers and agencies consulted during the development of this EIS.

Additional documentation, including more detailed analyses of project area resources, may be found in the project administrative record located at the Peaks Ranger District of the Coconino National Forest (CNF).

BACKGROUND

The San Francisco Volcanic Field covers approximately 1,800 square miles in northern Arizona. The field lies along the southern perimeter of the Colorado Plateau, defined by the Mogollon Rim to the south of Flagstaff. The most prominent peak within the field is Humphreys Peak, which at 12,633 feet is the highest point in Arizona. Collectively, Humphreys Peak, Agassiz Peak (12,345 feet), and Fremont Peak (11,696 feet) are

identified on USGS maps as the San Francisco Mountain. However the mountain is more commonly referred to as the San Francisco Peaks by the local population and for the purpose of this analysis shall be hereafter referred to as such.

The Arizona Snowbowl (hereinafter referred to as “Snowbowl”) is owned and operated by Arizona Snowbowl Resort Limited Partnership. Snowbowl is located entirely on the CNF on the western flank of the San Francisco Peaks. The ski area is operated under a 777-acre Forest Service-issued Special Use Permit (SUP), which is renewed on a 40-year basis. Snowbowl is approximately 15 miles north of Flagstaff, one of the four largest metropolitan areas in Arizona (refer to Figure 1-1). Snowbowl is surrounded on three sides by the 18,616-acre Kachina Peaks Wilderness Area, which was designated by the U.S. Congress in 1984.

Skiers¹ have been using the Snowbowl since 1938, when the ski area’s original base area was established in Hart Prairie. The foundation of the base lodge (which was destroyed by fire in 1952) can still be seen just above the first tower of the Hart Prairie Chairlift. Originally a dirt road, the Snowbowl Road was constructed by the Civilian Conservation Corps. A rope tow, powered by a car engine, was the only means of uphill transport. In 1954 the road was extended to the site of the Agassiz Lodge and in 1956 the Agassiz Lodge was constructed. A Poma surface lift was installed in 1958 and part of that lift line is now the *Blackjack* (trail #17). The original Agassiz Chairlift was installed by the Riblet Corporation in 1962. Relatively little activity was seen until the 1970's when Summit Properties purchased the area with plans for a base village, however, a land use plan issued in 1971 restricted development to the existing permit area. In 1977 the area was purchased by Northland Recreation and a Master Concept Plan was filed with the Forest Service. This plan was tested in the courts with final approval coming from the US Supreme Court (on appeal). In 1982 the Hart Prairie Chairlift was built. Fairfield Communities purchased the ski area in November of that same year and began an improvement program in 1983, including construction of the Hart Prairie Lodge, Sunset Chairlift and transfer of the rope tow back to Hart Prairie. In 1985 parking lots #5 and #6 were completed along with a new maintenance shop. In 1986 a new CTEC triple chairlift was installed on the site of the original Agassiz Chairlift; the rope tow and the Poma were removed and the Aspen Chairlift was installed in Hart Prairie. A two-year Snowbowl Road improvement and paving project began in 1988.

Arizona Snowbowl Resort Limited Partnership purchased the ski area in December 1992 and proceeded to make immediate improvements to the facilities and ski trails. Hart Prairie Lodge was expanded by constructing a new guest service office, rental shop and children's ski school. *Logjam* (trail #25) was widened and new trails – *Lava* (trail #43c) and *Volcano* (trail #43a) were constructed.

In addition to wintertime skiing and snowboarding, the Snowbowl offers summertime scenic chairlift rides on the (Sky ride program) Agassiz Chairlift. Guided horseback rides, banquets and restaurant facilities are also available.

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.

RELATIONSHIP OF THE CURRENT PROPOSAL TO PREVIOUS NEPA ANALYSIS AND APPROVALS

In 1979 a master plan for upgrading Snowbowl was produced, which provided for the installation of new lifts, trails and facilities. These projects were analyzed in the 1979 Arizona Snowbowl Ski Area Proposal Final Environmental Statement (1979 Environmental Statement) and ultimately approved via an associated Record of Decision (ROD). Two of the approved lifts were subsequently installed – Hart Prairie and Sunset. In addition, the Hart Prairie Lodge and new parking were added in accordance with the 1979 Environmental Statement.

Many of the projects analyzed in this current EIS are consistent with the 1979 Master Plan. However, because of the length of time that has passed since the approval of the 1979 Master Plan, the advent of new procedural requirements, and potentially changed conditions, these approvals are no longer valid without additional site specific environmental analysis. Currently proposed projects that were not specifically approved in the 1979 ROD have been designed to remain within the contextual scope of the 1979 approvals. From the selected alternative identified in the 1979 ROD, this analysis carries forward the size of the ski area (777 acres) and the comfortable carrying capacity (CCC)² of 2,825.

In relation to this EIS, the alternative that is ultimately approved via a ROD will provide the framework for a new master development plan (MDP), which will guide the future development of the Snowbowl.

The 1987 CNF Forest Plan³ (hereinafter referred to as “the Forest Plan”) adopted the 1979 Environmental Statement into its standards and guidelines for Management Area 15, which provides direction for developed recreation areas. Throughout the Forest Plan, the Arizona Snowbowl is referred to as the Fairfield Snowbowl.

² CCC is defined as the number of guests that 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 utilized by ski area planners and the Forest Service as a planning tool and *does not constitute a cap on visitation*. Facilities are typically designed to accommodate 125 percent of a ski area’s CCC in order to preserve the guest experience on peak visitation days, which are anticipated periodically throughout the season.

³ USDA Forest Service, 1987 as amended

Figure 1-1: Location Map

PURPOSE AND NEED FOR THE PROPOSED ACTION

The Forest Service and Snowbowl cooperatively determined general categories important for improving the Snowbowl's facilities. From these categories, a list of proposed projects was created, and the Proposed Action ultimately emerged. The Proposed Action responds to the goals and objectives outlined in the Forest Plan,⁴ and helps move the project area towards desired conditions described in it.

The overall Purpose and Need for these projects responds to two broad categories: 1) to provide a consistent/reliable operating season, and; 2) to improve safety, skiing conditions, and recreational opportunities by bringing terrain and infrastructure into balance with existing demand.

PURPOSE #1:

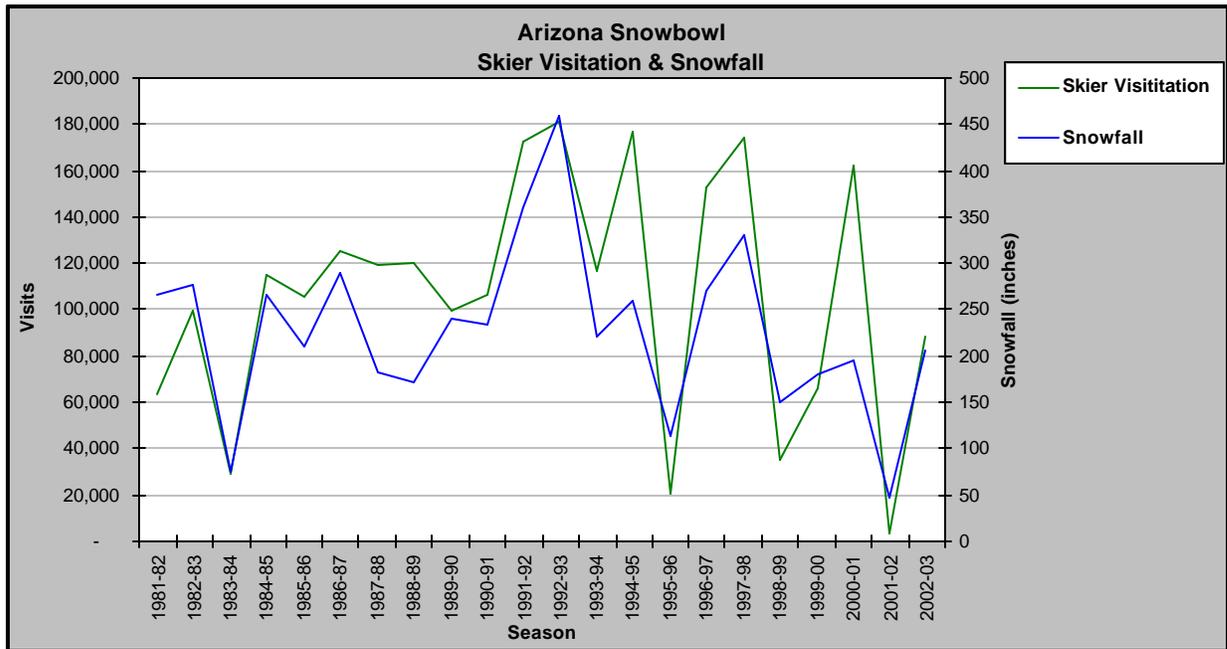
To ensure a consistent and reliable operating season, thereby maintaining the economic viability of the Snowbowl, and stabilizing employment levels and winter tourism within the local community.

Existing Condition:

Inconsistent annual snowfall has historically led to a sporadic operating season and therefore broad fluctuations in annual visitation. This has created unstable employment levels and has greatly affected local winter tourism. Snowbowl's ability to maintain or improve its current level of service and endure the business conditions caused by unreliable snowfall is questionable. Figure 1-1 correlates annual snowfall (inches) with annual visitation for the past 22 seasons at Snowbowl:

⁴ USDA Forest Service, 1987

**Figure 1-2
Skier Visitation and Snowfall**



Need:

The installation and operation of snowmaking infrastructure would provide a reliable and consistent operating season helping to stabilize Snowbowl’s investment, increase local employment levels, and boost winter tourism within the community.

PURPOSE #2:

To improve safety, skiing conditions, and recreational opportunities, bringing terrain and infrastructure into balance with current use levels.

Existing Condition:

Currently, areas of intermediate and beginner terrain are inadequately sized to accommodate the public’s demand for terrain of these ability levels on peak days. This lack of terrain often results in significant use of the existing terrain and high skier densities on peak days. This creates safety issues because of overcrowded ski runs. When compared to ski industry norms (and guest expectations), Snowbowl exhibits a deficit of intermediate and beginner level terrain and a surplus of novice level terrain as shown in Table 1.1.

Need:

Improve the quantity and distribution of beginner and intermediate terrain and skier safety by developing additional terrain within the existing SUP area.

**Table 1-1
Existing Terrain Distribution**

Skier/Rider Ability Level	Trail Area (acres)	Skiing Terrain Capacity (guests)	Existing Skier Distribution (percent)	Typical Skier Market (percent)	Difference
Beginner	0.5	15	1%	5%	-4
Novice	44.0	790	44%	15%	+29
Low Intermediate	31.3	438	25%	25%	0
Intermediate	38.1	381	22%	35%	-13
Adv. Intermediate	15.4	108	6%	15%	-9
Expert	9.4	28	2%	5%	-3
Total	138.6	1,760	100%	100%	

Existing Condition:

Public demand at Snowbowl has grown significantly in the past 20 years, increasing from 63,000 annual visits in 1981/82 to 162,175 during the 2000/01 season, an increase of 157 percent. The inadequate size and limited conditions of on-mountain facilities have resulted in a crowded, undesirable guest experience in many areas, such as in the lodges and on the chairlifts. Additionally, Snowbowl frequently experiences peak demand days which significantly exceed the current CCC of the existing facilities and infrastructure.

Need:

To increase the capacities of the day lodges, chairlifts, and other ski area infrastructure, bringing it into proper balance with *current* use levels, while remaining within the ski area’s previously approved CCC of 2,825 skiers.

Existing Condition:

Approximately 30,000 visitors ride the summer Scenic Sky ride annually. Although numerous summer visitors express interest, guests are not allowed to hike down the mountain due to the steep grades and cobbled surface.

Need:

To allow guests to hike from the top back to the base area by providing an established hiking trail from the top of the Agassiz Chairlift. Additionally, this trail would allow Snowbowl lift maintenance personnel to periodically access the top terminal of the Agassiz Chairlift using all terrain vehicles during the summer.

Existing Condition:

In the past, numerous snowplayers illegally parked along the Snowbowl Road and at the ski area to sled, slide, and saucer in existing openings off the edge of the road and at the ski area. This dispersed use often leads to injuries, traffic management issues, garbage, and sanitation problems.

Need:

To develop a managed and professionally designed snowplay/tubing facility at the ski area to fill the demonstrated public demand for snowplay. The facility should provide restrooms, a warming building, ticketing, concessions, parking, and trash receptacles.

SUMMARY OF THE PROPOSED ACTION

In response to the purpose and need, the following Proposed Action was assembled by Snowbowl and the Forest Service. A detailed description of the Proposed Action is provided in Chapter 2.

SNOWMAKING

- Approximately 205 acres of snowmaking coverage throughout the SUP area utilizing Class A reclaimed water as a source
- A 10 million-gallon snowmaking water reservoir near the top terminal of the existing Sunset Chairlift

SNOWPLAY/TUBING FACILITY

- A professionally designed and managed snowplay/tubing facility at the base area

LIFTS/UPHILL CAPACITY

- Replace of the Sunset Chairlift with a high speed, detachable chair
- Relocate the existing Sunset Chairlift as the Humphreys Chairlift, accessing a pod of proposed ski trails
- Upgrade and extension of the Hart Prairie Chairlift with a high-speed, detachable lift
- Upgrade and realignment of the Aspen Chairlift
- Install three surface conveyors in the area north of the Hart Prairie Lodge
- Install a handle tow is proposed to service a halfpipe and terrain park

TERRAIN

- Approximately 74 acres of new trails
- Approximately 47 acres of thinning to created improved glades
- Approximately 87 acres of terrain improvements (grading/stumping and smoothing)
- Create a dedicated teaching area near the Hart Prairie Lodge
- Construct a halfpipe

GUEST SERVICE FACILITIES

- Enlarge the Hart Prairie Lodge by approximately 6,000 square feet to a *total of* 24,900 square feet
- Construct a new 10,000 square foot guest services facility adjacent to the Agassiz Lodge⁵
- Construct a 2,500 square foot Native American cultural and education center constructed in or near the Agassiz Lodge
- Replace existing on-mountain ski team buildings

SUMMER TRAILS

- Construct a hiking trail from the existing Agassiz Chairlift mid-station to the top terminal

⁵ Facilities in both the Hart Prairie and Agassiz lodges would be brought into ADA compliance.

- Construct an Americans with Disabilities Act (ADA) compliant summer access trail into Hart Prairie from the parking lot near Agassiz Lodge

INFRASTRUCTURE AND UTILITIES

- Construct a 14.8-mile pipeline to transport reclaimed water from Flagstaff to Snowbowl
- Install snowmaking pipelines buried within existing and proposed trails
- Redesign the entrance circle, which would have signs directing guests to parking lots, day lodges, and snowplay parking
- Construct a 400-space parking area to service the proposed tubing facility
- Combine parking lots #1 and #2 by re-grading and leveling them
- Develop approximately 1,110 feet of additional on-mountain access road
- Reconstruct approximately 3,650 feet of existing two-track mountain access road
- Decommission approximately 3,050 feet of existing two-track mountain access road

DECISION FRAMEWORK

This EIS is not a decision document. Its primary purpose is to disclose the environmental consequences that are anticipated to occur through implementation of the alternatives under consideration.

The decision on this EIS will be documented in a ROD signed by the Decision Maker – the Forest Supervisor for the CNF. The Decision Maker may select the No Action Alternative, the Proposed Action, or Alternative 3. The Decision Maker may also make adjustments to the selected alternative as long as the effects are within those described in this analysis. The alternative that is ultimately approved via the ROD will provide the framework for a new MDP that will guide development of the Snowbowl for the subsequent five to eight years.

In addition to determining which alternative to select, the Forest Supervisor will also determine which mitigation measures to require. The Forest Supervisor may also require additional mitigation measures not discussed within this document.

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

PUBLIC INVOLVEMENT

PUBLIC SCOPING

On September 23, 2002, a scoping notice was mailed to approximately 350 community residents, interested individuals, public agencies, and other organizations. This notice was designed to elicit comments, concerns, and issues pertaining to the Proposed Action. A press release and legal notice were distributed to key local and regional media. On October 7, 2002, the Forest Service published a Notice of Intent (NOI) to prepare an EIS in the Federal Register. In addition, two public open houses were held at the Flagstaff High School on October 10, and 26, 2002. Forest Service representatives and members of the consultant team were present to answer questions and collect comments.

TRIBAL SCOPING

Additionally, the Forest Service initiated tribal consultation in June 2002 with 13 Native American tribes which hold the San Francisco Peaks sacred. Tribal consultation concerning the Proposed Action was initiated in June 2002 with a formal letter from the Forest Supervisor to 13 tribal leaders. Also in June 2002, the District Ranger contacted tribal representatives from Cultural Preservation Offices of 13 affiliated tribes to discuss the Snowbowl proposal and suggest pre-proposal meetings. Phone contacts between the District Archaeologist and several tribal Cultural Preservation Officers (Hopi, Navajo, Hualapai, San Carlos Apache, Yavapai-Apache) were made during the months of June-December 2002. In addition, follow-up phone calls to interested tribes were made by the District Archaeologist to ensure receipt of letters. Overall, numerous phone calls and letters have been sent to tribes and the tribal public requesting input.

Two formal public meetings were held on the Hopi and Navajo Indian Reservations (Tuba City and Kykotsmovi) on Monday, December 9, 2002. The emphasis of these two public meetings was to explain the Proposed Action to tribal members and to elicit comment/concerns on behalf of individuals and the tribe.

Additional tribal contacts included:

- August 6, 2002: Forest Service, Shereen Lerner, and representatives from Yavapai-Apache (all Apache tribes invited; only Camp Verde attended)
- August 18, 2002: Heather Cooper and Mae Franklin (Navajo liaison) set up information booth at Tuba City Flea Market as part of the Western Navajo Fair
- August 21, 2002: Forest Service, Shereen Lerner, and Hopi Land Team
- September 19, 2002: Forest Service, Shereen Lerner and Hopi Cultural Resource Advisory Team
- October 8, 2002: Mae Franklin attended Gap/Bodaway Chapter House meeting on Navajo Reservation and collects comments regarding Snowbowl proposal
- October 13, 2002: Mae Franklin attended Cameron Chapter House meeting and collects comments regarding Snowbowl proposal
- October 23, 2002: Shereen Lerner, Forest Service and representatives from the Hopi Tribe
- November 23, 2002: Mae Franklin and Heather Cooper attended Leupp Chapter House meeting and collect comments regarding Snowbowl proposal
- November 26, 2002: Heather Cooper presents "Collaborative Management of the San Francisco Peaks" to the Hopi Cultural Resources Advisory Team

- December 9, 2002: Tribal meeting held at Tuba City High School. Representatives include: Forest Service personnel (including Forest Supervisor Jim Golden and Peaks District Range Gene Waldrip); SE GROUP; Shereen Lerner; and members of the Hopi Tribe and Navajo Nation
- December 9, 2002: Tribal meeting held at Kykotsmovi Community Center. Representatives include: Forest Service personnel (including Forest Supervisor Jim Golden and Peaks District Range Gene Waldrip); SE GROUP; Shereen Lerner; and members of the Hopi Tribe
- December 14, 2002: Mae Franklin, Gene Waldrip, and Heather Cooper attend Western Navajo Agency Council meeting, requesting comments on Snowbowl proposal

In response to public and tribal scoping, including the open houses, approximately 1,200 comment letters were received. Based upon the responses received during scoping, the Forest Service Interdisciplinary Team (ID Team) prepared a list of issues to be analyzed within this document.⁶ The issues and concerns are detailed in the following section and are examined individually by alternative in Chapter 3 - Environmental Consequences.

ISSUES AND INDICATORS

Based on the results of internal and public scoping, the Forest Service identified specific areas (resources) of concern and classified them as being either: 1) *significant issues* that drive alternatives, require mitigation, or generally require in-depth analysis/disclosure; 2) *tracking issues* that do not necessarily drive alternatives or mitigation, but are tracked throughout the analysis with their effects disclosed; and 3) *non-issues*. This EIS focuses on analysis of significant and tracking issues. Each issue (major and tracking) includes a list of indicators that were determined 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

Heritage Resources

The San Francisco Peaks are central to the cultures and religious practices of many Native American tribes. In 2000, the Peaks were determined eligible for nomination to the National Register of Historic Places (the Register) for their traditional cultural values. In analyzing alternatives, 36 CFR 800 requires that the potential effect of a proposed undertaking be evaluated against the qualities that make a cultural property eligible for the Register. Consequently, in discussions to date with representatives from various tribes, it is evident that the Proposed Action will adversely affect cultural values.

⁶ The scoping comment disposition analysis is available in the project file.

Significant issues raised in response to identified (potential) cultural impacts include the following.

Issue #1: The installation and operation of snowmaking infrastructure as described in the Proposed Action, and the use of reclaimed wastewater as a water source, will impact cultural and spiritual values associated with the San Francisco Peaks (Significant).

Background:

The region’s Indian Tribes are opposed to the concept of creating snow by an artificial means, particularly through the use of reclaimed water. Although the reclaimed water proposed for use in making snow meets both the EPA and ADEQ water quality standards, the tribes believe the water to be impure which would negatively affect the spiritual values of the Peaks. Any negative effects that occur to the Peaks will be reflected by the plants, animals, water, and soil of the entire mountain. Additionally, the tribes are opposed to snowmaking because it is a disruption of natural processes.

Study Area:

- Direct: SUP area
- Indirect: San Francisco Peaks

Indicator:

- Qualitative discussion of the spiritual values of the San Francisco Peaks and the potential for incremental change as a result of implementation of the Proposed Action

Issue #2: Proposed ground disturbances and vegetation removal may result in permanently evident, visible alterations (i.e., “scarring”) of the San Francisco Peaks’ landscape (Significant).

Background:

Ground disturbances associated with grading, vegetation clearing, and snowmaking pipeline installation, could alter the landscape of the San Francisco Peaks – both permanently and temporarily. From the Native American perspective, ground disturbing activities within the SUP could “scar” the sacred landscape/mountain which is believed to be a living entity. The more extensive the disturbance, the greater the adverse effect to cultural values.

Study Area:

- Direct: SUP area
- Indirect: San Francisco Peaks

Indicators:

- Narrative description of existing and historic vegetation and ground disturbance within the SUP area

- Quantification of existing and additional proposed temporarily and permanently evident vegetation disturbances/removals
- Quantification of existing and additional proposed temporary and permanently evident ground disturbances
- Qualitative discussion of the cultural significance of proposed ground and vegetative disturbances and removal within the SUP area

Issue #3: Some people feel the effects of the Proposed Action cannot be adequately described until the significant qualities of the San Francisco Peaks are identified as part of the National Register nomination process (Tracking).

Background:

The Coconino National Forest has committed to completing the National Register nomination of the Peaks for its traditional cultural values. Analysis and potential approval of the Proposed Action is considered to be independent of the National Register nomination and potential designation processes. Additionally, completion of the nomination/designation processes is not considered to be prerequisite for the analysis or potential approval of the Proposed Action. Since the Peaks have already been determined eligible for National Register nomination for its traditional cultural values, various alternatives may be evaluated according to how they affect traditional values, even if the nomination process has not been completed.

Study Area:

- San Francisco Peaks

Indicators:

- Narrative discussion why the Proposed Action is not dependent upon completion of the National Register nomination/designation processes
- Narrative discussion of the ability for the proposed projects to coexist with a National Register designation if nomination is approved

Noise

Issue #4: The proposed snowmaking system would increase noise levels potentially disturbing residents, recreationists, and/or wildlife (Tracking).

Background:

There were concerns that noise emissions from single or multiple snowmaking guns and operation of the pumping stations may be audible from Hart Prairie, Thorpe Park, Mars Hill, Observatory Mesa, Fort Valley, or the Kachina Wilderness, potentially disturbing residents, recreationists, and/or wildlife.

Study Area:

- Audible area

Indicators:

- Modeled analysis of snowmaking-related noise emissions above ambient background levels (decibels)
- Modeled analysis of noise dispersion to define audible areas

Traffic and Access

Issue #5: The Proposed Action could affect traffic volumes and/or congestion on U.S. Highway 180 and/or the Snowbowl Road (Tracking).

Background:

Although daily skier visitation is not proposed to increase as a result of the Proposed Action, the proposed snow tubing facility has potential to increase daily traffic volumes and/or the frequency of congested periods on U.S. Highway 180 and the Snowbowl Road.

Study Area:

- U.S. Highway 180 between Flagstaff and Snowbowl Road, Snowbowl Road

Indicators:

- Historic and projected traffic counts for U. S. Highway 180
- Comparison of anticipated winter traffic volumes with existing winter traffic volumes and the design capacities of U.S. Highway 180 and the Snowbowl Road
- Relative comparison of existing and anticipated winter traffic with current summer traffic volumes

Aesthetic Impacts

Issue #6: Proposed ground disturbance and vegetation removal within the SUP may incrementally affect the aesthetic quality of the west face of the San Francisco Peaks (Tracking).

Background:

Removal of forested vegetation and ground disturbing activities within the SUP area associated with the proposed projects would be evident in the foreground, middle ground, and background views from various locations. Additionally, there was concern that construction of the proposed water transmission line could result in removal of trees for a new utility corridor affecting aesthetic qualities of the area.

Study Area:

- Foreground, middle ground, and background views⁷ of Snowbowl’s SUP area.

⁷ Foreground, middle ground and background, as defined by the Forest Service, are detailed in Chapter 3, Section D.

Indicators:

- The incremental aesthetic effects of the proposed projects compared to historic landscape alterations within the SUP area
- Visual simulations, from identified representative viewpoints, of the proposed landscape alterations as compared to the existing condition. Viewpoints modeled are:
 - Hart Prairie (151 Rd) – Summer
 - U. S. Highway 180 at the Nordic Center– Summer
 - Humphreys Trail (Wilderness area) - Summer
 - Interstate 40 East of Williams - Winter

Socio-Economics

Issue #7: Implementation of the Proposed Action may have social and economic effects on Flagstaff and Coconino County (Tracking).

Background:

A correlation exists between the consistent operation of the ski area and the Flagstaff/Coconino County economy. This correlation encompasses: seasonal tourism; employment and income levels; and tax revenues. The strength of this correlation needs to be assessed and disclosed.

Socially, Snowbowl provides a source of wintertime recreation for a large number of people in northern and central Arizona. The relative importance of this local source of wintertime recreation needs to be assessed.

Study Area:

- City of Flagstaff/Coconino County

Indicators:

- Discussion of the potential for the Proposed Action to affect a change in key local economic indicators (population; long- and short-term employment, housing, and tax revenues, etc.)
- Analysis of the correlation between Snowbowl annual skier visitation and annual retail and Bed, Board and Booze (BBB) and tax revenues
- Narrative description of the recreational/social function which Snowbowl serves
- The effects of dry roads/fair weather on tourism in Flagstaff and the BBB
- Presentation of historical data analyzing the relationship between winter tourism levels for the City of Flagstaff, with annual snowfall, and annual skier visitation at Snowbowl
- The percentage of the total economy represented by winter tourism
- Financial viability of the ski area under all alternatives

Recreational Opportunities and Experiences

Issue #8: The effects of the Proposed Action on the quality, distribution, and opportunity for winter and summer recreational experiences within the SUP area (Tracking).

Background:

Snowbowl has provided a source of winter and summer recreational activities since 1938, when the ski area's original base area was established in Hart Prairie. Since that time, an expanding population in the state of Arizona has led to increased pressure on Snowbowl. Inconsistent snowfall in northern Arizona and coupled with increased demand has reduced the ski area's ability to provide a consistent skiing/riding product. As a result, local and regional skiers have expressed a desire for a more reliable and consistent snowpack at Snowbowl.

The Proposed Action would increase skiable terrain and allow the area to meet the CCC specified in the 1979 of 2,825, and would improve recreational opportunities. By increasing the consistency of the snow pack even through dry winters, the Proposed Action is intended provide more opportunities for skiers in an environment of increasing recreational demand. Summertime hiking opportunities would also be added.

Study Area:

- San Francisco Peaks and SUP area

Indicators:

- Comparison of historic winter and summer recreation visitation versus that anticipated under the Proposed Action
- Narrative description of the quality of winter and summer recreational opportunities under all alternatives.

Wilderness Values

Issue #9: Implementation of the Proposed Action may affect the experience of wilderness users within the surrounding Kachina Peaks Wilderness (Tracking).

Background:

The Proposed Action would increase use and noise levels within the SUP area during the winter operating season. This could affect the experience of the public recreating within the Kachina Peaks Wilderness.

Study Area:

- San Francisco Peaks and SUP area

Indicators:

- Quantification of seasonal Wilderness utilization and visitation
- Narrative discussion of the anticipated effects of the Proposed Action to Wilderness users

Ski Area Infrastructure and Utilities

Issue #10: Effects of the Proposed Action on ski area infrastructure and supporting utilities within and beyond the SUP area (Tracking).

Background:

The Proposed Action necessitates additions to Snowbowl's existing infrastructure, including parking, buildings, power, water and sanitation, as well as installation of a 14 mile pipeline connecting the ski area to the City of Flagstaff's reclaimed water system.

Study Area:

- SUP area and proposed reclaimed water pipeline corridor

Indicators:

- Disclosure of current versus anticipated requirements for: guest seating, power, domestic water supply and wastewater treatment.

THE PHYSICAL AND BIOLOGICAL ENVIRONMENT

Watershed Resources

Issue #11: The application of Class A reclaimed water for snowmaking within the SUP area may affect water quality within the receiving subwatersheds (Tracking).

Background:

Snowbowl's proposed snowmaking operations would utilize reclaimed water from the City of Flagstaff's Rio de Flag Water Reclamation facility, which would differ in water quality characteristics than sources currently present within the receiving watershed area. Although the reclaimed water proposed for use meets both EPA and ADEQ water quality standards and has been approved by the ADEQ for snowmaking use, concerns were raised that the water may contain low levels of unregulated and unmeasured residual constituents (e.g. pathogens, pharmaceuticals, or hormones) which may cause health problems in humans and wildlife.

Study Area:

- Primary watersheds: Hart Prairie Watershed and Agassiz Subwatershed
- Snowbowl Sub-area (consisting of four subwatersheds - Snowbowl, Sunset, Hart Prairie, and Humphreys) each includes snowmaking coverage

Indicators:

- Description of the certification process for allowing Class A water to be used for snowmaking
- Literature search on use of reclaimed water for various recreational and municipal purposes uses
- Literature search and narrative description of the potential presence of pharmaceuticals, pathogens, and hormones in Class A reclaimed water

- Documentation of compliance with State and Federal water quality standards regarding Class A wastewater and its purposes
- Analysis of potential water quality effects of using reclaimed water in the snowmaking system to down gradient users

Issue #12: Use of reclaimed water for snowmaking purposes between November and February of each year could affect aquifer recharge (Tracking).

Background:

Concerns were raised regarding the appropriateness of using reclaimed water for snowmaking purposes. The use of reclaimed water for snowmaking could potentially affect recharge to the regional aquifer due to reduced discharges into the Rio de Flag. Additionally, concern was expressed that the use of the reclaimed water for snowmaking would limit its availability to other users in the community.

Study Area:

- Primary watersheds: Hart Prairie Watershed and Agassiz Subwatershed
- Snowbowl Sub-area (consisting of four subwatersheds - Snowbowl, Sunset, Hart Prairie, and Humphreys) each includes snowmaking coverage

Indicators:

- Quantification of anticipated snowmaking water use in average dry, median, and wet years
- Description and quantification of the Rio de Flag Reclamation facility’s historic seasonal discharges
- Description and quantification of current uses of reclaimed water within the City of Flagstaff by season
- Discussion of existing water rights and the ability to implement the proposed snowmaking with or without procuring additional water rights
- Narrative description of both the City of Flagstaff’s well field and reclaimed water uses and their hydrologic relationship to the regional aquifer
- Discussion of the applicability of the Rio de Flag Water Treatment Plant NPDES permit to the proposed snowmaking application
- Quantification of anticipated total consumptive water losses (i.e., evaporation, evapotranspiration, sublimation) resulting from proposed snowmaking

Soils and Geology

Issue #13: The Proposed Action has potential to change soil chemistry and moisture due to the application of machine produced snow (Tracking).

Background:

The proposed application of machine-produced snow may have the effect of increasing total water availability, potentially leading to an increase in the duration, intensity, and/or quantity of total annual snowmelt.

Study Area:

- Eight sub-watersheds in the vicinity of the SUP area having potential to change under the Proposed Action⁸

Indicators:

- Anticipated volume of machine-produced snow applied under various scenarios: dry year, average year, and wet year
- Modeled anticipated changes in the duration and intensity of annual snowmelt compared to historic natural variation
- Modeled (WEPP) anticipated changes in erosion/sedimentation due to predicted changes in total snowpack
- WEPP modeling to include all proposed areas of ground disturbance
- Analysis of potential changes to soil chemistry due to anticipated increases in soil moisture consistency and nutrient loading

Vegetation

Issue #14: Plant communities (including T, E and S plant species, and regionally important plants) within the SUP area may be altered as a result of the proposed projects (Tracking).

Background:

The Proposed Action would necessitate impacts to vegetation communities within the SUP area. Mixed conifer forests occupy a small percent of the State, and are rare in the higher elevations of northern Arizona. Snowbowl includes the upper reaches of the largest contiguous patch of montane grassland on the San Francisco Peaks. Additionally, the San Francisco groundsel (*Senecio franciscanus*) is found on the San Francisco Peaks. In addition, the construction and operation of the proposed projects may cause disturbance to federally threatened and endangered as well as regionally sensitive plants (T, E and S plants) and/or their habitats.

Study Area:

- Area of potential effects from proposed construction activities

Indicators:

- Acres of mixed conifer forest on the San Francisco Peaks, within the SUP, and potentially effected by the Proposed Action
- Potential impacts to montane grasslands within the SUP as a proportion of total grasslands on the San Francisco Peaks
- Disclosure of effects to potentially occurring T, E, and/or S plant species or potential habitat

⁸ Defined in Chapter 3, Section I

Issue #15: The Proposed Action has potential to change vegetation composition within the SUP area due to the application of machine-produced snow (Tracking).

Background:

The application of machine-produced snow may artificially increase total annual snowpack depth. Machine-produced snow typically has a higher moisture content on a percentage basis. These factors may lead to a slower melting of the snowpack and a corresponding acceleration or delay in the greening of vegetation on the ski trails.

In addition, reclaimed water may contain elevated levels of nitrogen, which could raise pH levels, making soil more acidic and less productive for vegetation. Nitrogen is mobile and with coarser textured soils, has the ability to move fairly deep into the soil profile.

Study Area:

- SUP area

Indicators:

- Description of likely snowmaking scenarios for dry, wet and average snow years
- Analysis of potential changes to botanical composition due to anticipated increases in soil moisture consistency and/or delayed snowpack desiccation
- Description of the certification process for allowing Class A water to be used for snowmaking
- Literature search on use of reclaimed water for various recreational and municipal purposes uses
- Documentation of compliance with State and Federal water quality standards regarding Class A wastewater and its uses
- Description of nitrogen constituents of Class A wastewater

Wildlife

Issue #16: The Proposed Action may result in the alteration and/or removal of habitat for terrestrial wildlife species within the SUP (Tracking).

Background:

Modification or removal of habitat may impact terrestrial and/or T, E, and S wildlife species.

Study Area:

- SUP area (varies by species)

Indicators:

- Identification of any T, E, and S; MIS⁹; and other wildlife species and habitats present within the SUP area and along the pipeline corridor

⁹ MIS, or “management indicator species” are defined in the Forest Plan in accordance with National Forest Management Act (NFMA) – 36 CFR 219.19,

- Disclosure/quantification of anticipated effects to those species and habitats present within the SUP area and along the pipeline corridor

Issue #17: Proposed snowmaking activities may result in a longer-duration snowpack and additional water storage for wildlife in the SUP area (Tracking).

Background:

Snowmaking and the proposed water impoundment may create improved spring foraging habitat for grazing ungulates. Although this may be beneficial to certain wildlife species, wildlife may congregate in the area due to the increased presence of moisture, particularly during drought conditions.

Study Area:

- SUP area

Indicators:

- Acreage of proposed snowmaking coverage
- Comparison of natural snowpack duration with the extended snowpack due to snowmaking
- Effects of both longer-duration snowpack and water storage (impoundment) on wildlife in the analysis area

Geotechnical Analysis

Issue #18: Geotechnical feasibility and associated hazards associated with construction of the proposed snowmaking impoundment on the ridge above the Sunset Chairlift must be analyzed (Tracking).

Background:

Ten million gallons of capacity in the proposed impoundment equates to approximately 30 acre feet of water, which could classify it as a Forest Service Class D dam. The ultimate design of the impoundment and its orientation on the ridge will dictate the hazard rating according to Forest Service standards. For example, it would be classified as a high hazard if analysis shows that a breach would result in draining towards the Hart Prairie Lodge and Snowbowl Road and, most likely a moderate hazard if it were to drain to the south away from the Hart Prairie Lodge.

Potential geologic hazards that need to be considered in this analysis include landslide, debris flow, avalanche, rockfall, subsidence, expansive soils, and earthquake.

Study Area:

- Potential flow path under multiple dam breach scenarios

Indicators:

- Hazard classification
- Failure Risk
- Dam breach and downstream inundation analysis

Air Resources

Issue #19: Snowplay activities at Snowbowl could increase vehicular traffic and may negatively impact air quality in the region (Tracking).

Background:

The Environmental Protection Agency has promulgated primary and secondary National Ambient Air Quality Standards (NAAQS) for six criteria pollutants (carbon monoxide, nitrogen dioxide, particulate matter, ozone, sulfur dioxide, and lead). Primary and secondary standards are adopted to protect public health and welfare, respectively. States are required to adopt ambient air quality standards which are at least as stringent as the federal NAAQS, however, the state standards may be more stringent. Arizona has adopted the federal NAAQS.

Study Area:

- The Snowbowl SUP area and the proximate Class 1 airshed ¹⁰

Indicator:

- Compliance with local, state and federal regulations regarding air quality

IDENTIFICATION OF THE PREFERRED ALTERNATIVE

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 Forest Supervisor prefers Alternative 2. Following review of public and agency comments on this EIS, the Forest Supervisor will make a final determination as to which alternative best serves the public interest on National Forest System lands. Modification of the preferred alternative may occur.

¹⁰ The nearest Class I airshed is Sycamore Canyon Wilderness. The Kachina Peaks Wilderness is not classified as a Class I airshed, though it is treated as if it were.