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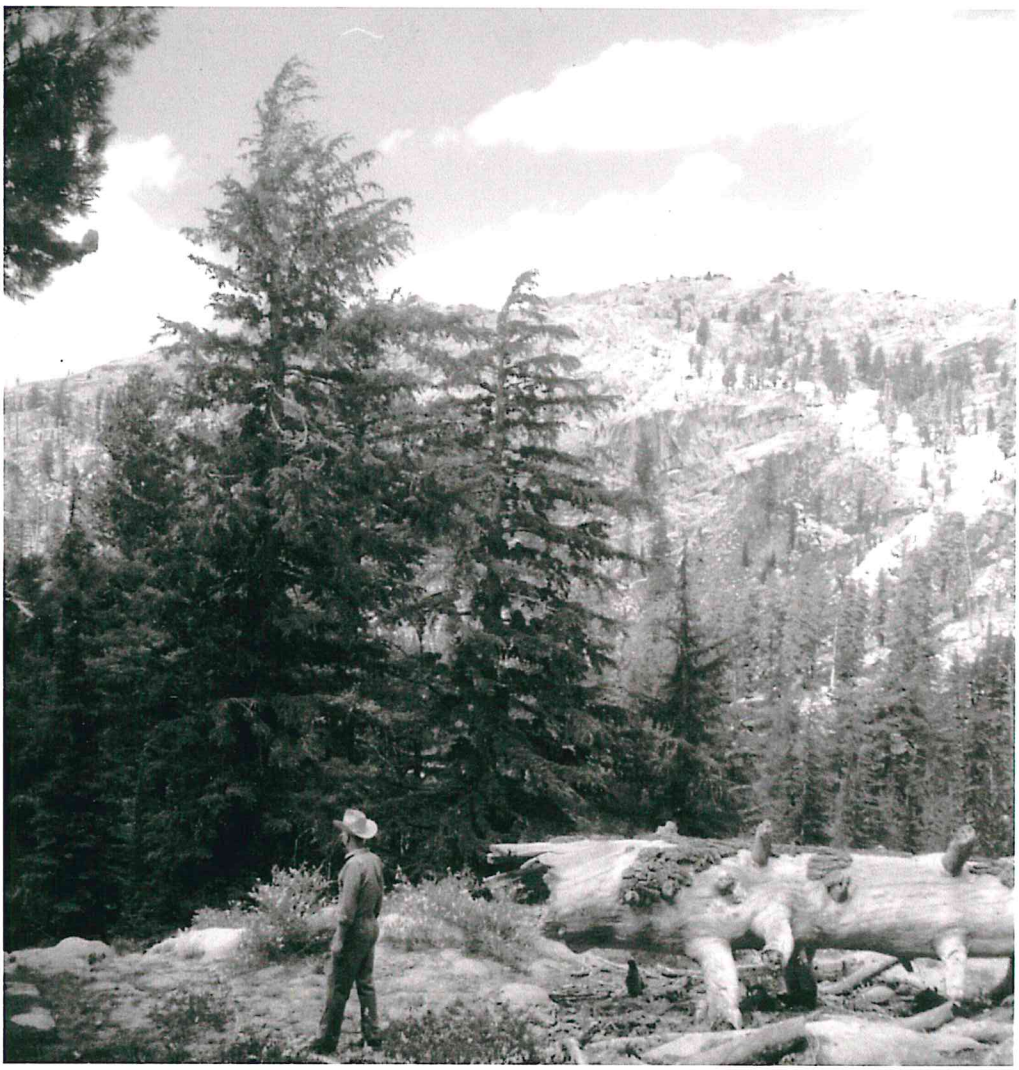
Environmental Assessment

Designation of the Snow Canyon Research Natural Area and Amendment of the Eldorado NF Land & Resource Management Plan

Eldorado National Forest



Western white pine in Snow Canyon, 1984. Photo courtesy of Scully Parker and Bud Veers.

Environmental Assessment

Designation of the Snow Canyon Research Natural Area and Amendment of the Eldorado National Forest Land and Resource Management Plan

USDA Forest Service, Eldorado National Forest, Amador Ranger District
Alpine County, California

Background

Research Natural Areas (RNAs) are discrete land areas large enough to represent specific natural ecosystems. In the West, 300 acres (121.4 hectares) of land is generally considered the minimum size (FSM 4063.1). Each RNA fulfills a part of the Region 5 and PSW goal for establishment of a RNA network representing the diversity of ecosystems found on National Forest System managed lands. Forest Supervisors initially nominate areas, which then receive an ecological assessment. In selection of representative areas, a "pristine" condition is good. However, when areas in a "pristine" condition are unavailable, then areas that reflect the "pristine" condition as closely as possible may be selected (FSM 4063.2).

The prime consideration in managing RNAs is maintenance of unmodified conditions and natural processes. RNAs are managed to maintain the undisturbed conditions and natural processes that characterize those areas. For example, natural areas are not considered as lands suitable for timber management or non-primitive recreation, but prescribed fire could be allowed under a fire management plan for the purpose of sustaining natural processes.

Management Direction

The guiding management direction for RNAs is found in Forest Service Manual 4063. (RNAs are designated in perpetuity unless catastrophic circumstances significantly alter the conditions for which the RNA was originally created. Research natural areas are for non-manipulative research, observation, and study. They also may assist in implementing provisions of special acts, such as the Endangered Species Act and the monitoring provision of the National Forest Management Act. RNA objectives include the following:

- preserve a wide spectrum of pristine representative areas that typify important natural situations that have special or unique characteristics of scientific interest and importance that form a National network of areas for research, education, and maintenance of biological diversity;
- preserve and maintain genetic diversity;
- protect against serious environmental disruptions;

- serve as reference areas for the study of succession;
- provide onsite and extension educational activities;
- serve as baseline areas for measuring long-term ecological changes;
- serve as control areas for resource management techniques and practices;
- monitor effects of resource management techniques and practices; and
- protect habitats of rare and endangered species of plants and animals.

The selection and establishment of RNAs within the National Forest System primarily emerges from continuing land and resource management planning (FSM 1920) and associated environmental analyses (FSM 1950). The process for RNA establishment involves several steps. The Regional Committee identifies needed community types (Keeler-Wolf 1990). Forests nominate potential areas that qualify as a needed community type. The potential areas receive an ecological survey and are evaluated in an interdisciplinary process. Then, areas are established. The Eldorado National Forest (NF) Land and Resource Management Plan (LRMP) contains a section on RNA objectives and standards to protect the values of proposed RNA areas. In general, RNAs tend not to conflict with other uses such as livestock grazing, mining, recreation, or motorized vehicle uses. The low level of past and/or current disturbance is one factor that gives value to the research potential of the proposed RNA.

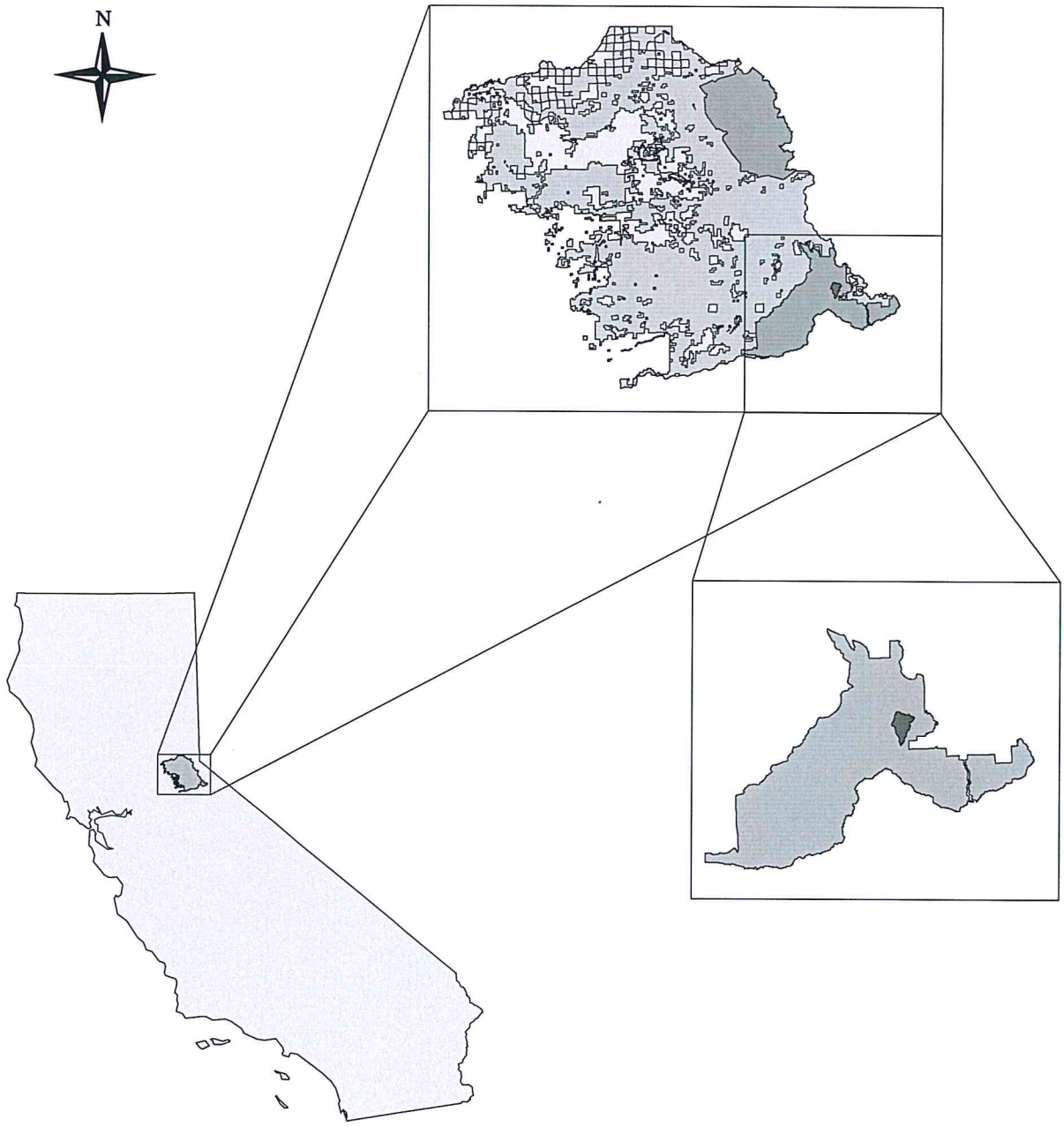
This environmental analysis (EA) tiers to, and is consistent with, the above planning process, therefore, issues of scale, and extent of representation of natural features across the entire Pacific Southwest Region are not reanalyzed, nor repeated here.

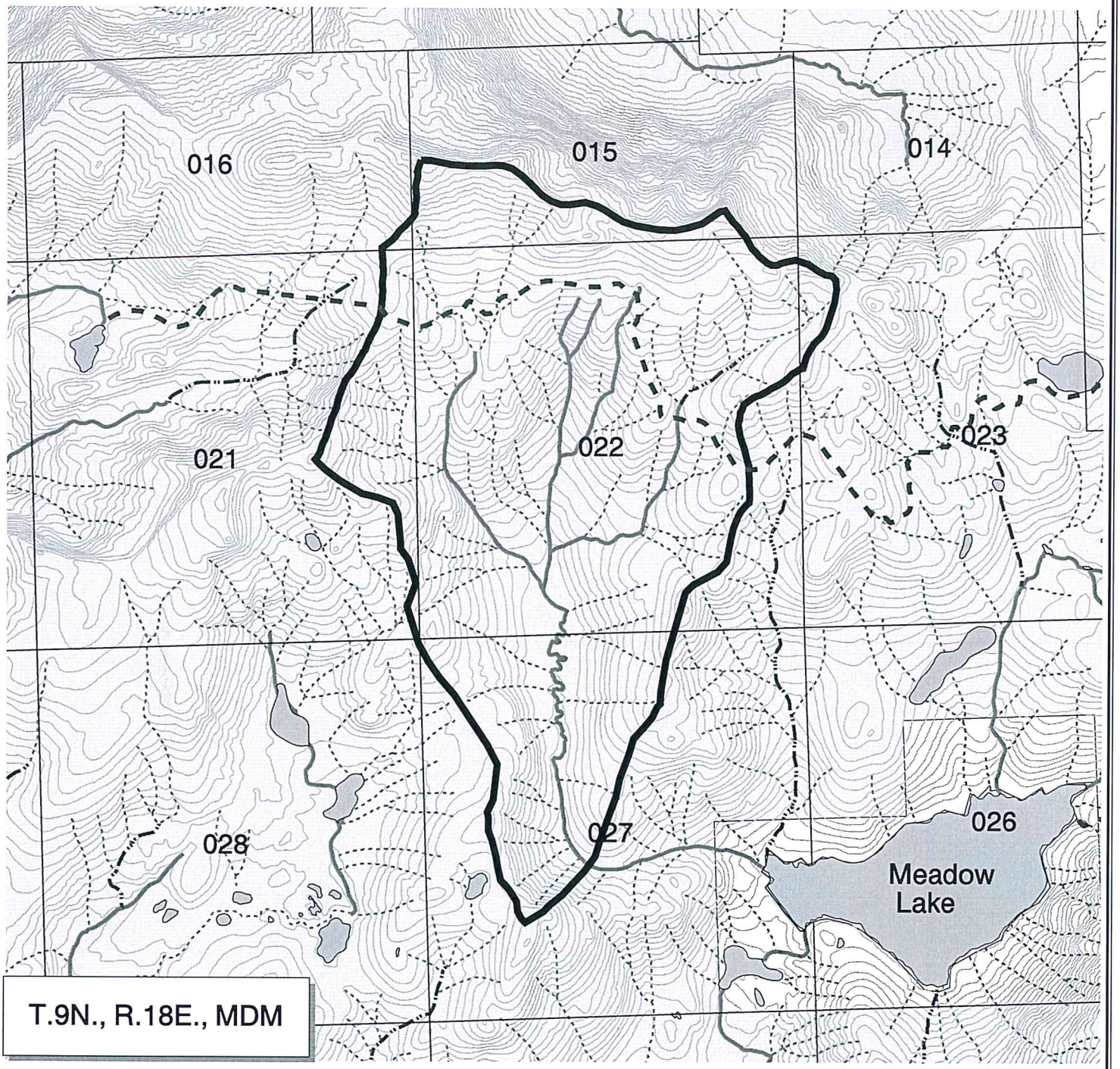
Description of the candidate RNA

The Snow Canyon candidate RNA is located in Alpine County, Eldorado National Forest, on the Amador Ranger District, and lies completely within Mokelumne Wilderness [Map 1 on the following page]. The total acreage of Snow Canyon RNA as described above is 888.6 acres (359.6 ha). Elevations in Snow Canyon RNA range from 9,846 feet (3001 m) at Deadwood Peak, the northwest edge of Snow Canyon RNA, to 8,180 feet (2493 m) at the mouth of the watershed. This represents an elevation range of 1,666 feet (508 m) [Map 2].

Snow Canyon contains a relatively small area of central Sierra subalpine landscape, yet included within it are diverse topographic features, extraordinary geology, and several vegetation types. The RNA encompasses the whole watershed of the creek draining Snow Canyon, which drains generally from north to south through the RNA.

Snow Canyon RNA Locality
Map 1





Snow Canyon Research Natural Area (RNA)

Eldorado National Forest
Map 2

N

RNA Boundary
- 888.6 acres
- Section
- Lakes & Ponds

Streams
- Ephemerial
- Perennial
- Seasonal

Trail
- Non-motorized

Ownership
- Eldorado National Forest
- Private Land

The primary perennial stream is Snow Canyon, formed in the northern half of the RNA where three perennial streams flow southward and gradually merge into one stream. Confluences of these streams concentrate in the central part of RNA where the canyon abruptly flattens at the relatively large alluvial-filled valley floor to form a large meadow at 8,250 feet (2514 meters). The meadow is surrounded by subalpine western white pine forest (Photo 1).

Photo 1: A view south of the southern portion of Snow Canyon. The target element, subalpine western white pine forest, forms a band of vegetation from about 8250 to 8800 ft (2514-2682 m) in elevation that surrounds a large subalpine meadow. The meadow lies in a flat in Snow Canyon at about 8250 ft (2514 m) with the drainage meandering down its eastern half.

The main stream then meanders through the entire southern half of the RNA. It turns eastwardly at the mouth of the watershed and drains into Meadow Lake, which is about half-mile (0.8 km) to the east of Snow Canyon RNA. Meadows and riparian plant communities thrive along the perennial water courses. Surface run-off characteristics are dominated by snowmelt from late March through early June, which results in high stream flow during that time period. Low stream flow occurs from summer through winter, although thunderstorms in the summer can result in elevated stream flow for a brief period.

The ecological types of the Snow Canyon candidate RNA are Western White Pine and Montane Meadows (Photo 2), with other unique and un-represented natural community types.

Photo 2: A view north of the northern portion of Snow Canyon showing 1600 ft (488 m) of vertical relief. The upper dark band of rock is a volcanic ridgeline that defines the RNA's northern boundary. The middle light band of rock is subalpine barrens on granitic bedrock with sparse herbaceous and tree cover. The lower band of continuous tree cover is subalpine western white pine forest, which surrounds the subalpine meadow in the foreground.

Western white pine forest, the target element, occurs in the lower two-thirds of the RNA covering slopes above meadows and riparian corridors. The forest cover is open with some very large trees (one measured 66 inches [168 cm] dbh). The western white pine forest at Snow Canyon RNA is a good example of this forest type for the central Sierran region (Photo 3). Although western white pine is commonly present throughout the upper montane and subalpine zones in the Sierra, subalpine conifer stands dominated by western white pine are uncommon. The subalpine western white pine forest type is found at middle elevations, 8,250 to 8,800 ft (2525 to 2682 m), in Snow Canyon RNA on granitic substrates. Slopes may be east-, southeast-, south-, southwest-, and west-facing with gentle to steep inclinations. This subalpine forest type covers about 213 acres (86 ha) in the Snow Canyon RNA. The forest is dominated by western white pine *(Pinus monticola)*; though pure stands are not present. In some areas, mountain hemlock *(Tsuga mertensiana)* is common – generally on slightly moist sites with west-facing exposures. Other tree species occurring in low numbers are red fir *(Abies magnifica)*, Sierra Nevada juniper *(Juniperus occidentalis* ssp. *Australis)*, whitebark pine *(Pinus albicaulis)*, lodgepole pine *(P. contorta* var. *murrayana)*, and Jeffery Pine*(P. jeffery)i.*

Photo 3: At about 8800 ft (2682 m) in elevation, tree cover becomes dense enough to be classified within the subalpine western white pine forest community. At its upper limit, this forest develops an open canopy and has a sparse understory of associated perennials, such as *Arctostaphylos nevadensis, Eriogonum marifolium,* and *Monardella odoratissima* ssp. *glauca.*

The flora of the Snow Canyon RNA is moderately rich for the alpine and subalpine elevations represented in the RNA with 223 species observed (Nachlinger 1992). It is a mixture of circumpolar, western North America, Sierra Nevada, and Great Basin species. One CNPS-listed 1B plant, *Silene invisa*, occurs in this forest type. (Appendix B of the Establishment Record, found in the Planning Record, and incorporated here by reference, lists taxa of vascular plants found on the RNA sorted by vegetation type.)

Two rock types are found in the RNA, volcanic rock on the ridge (Photo 4) defining the northern boundary and granitic rock in remaining areas. Mesozoic granodiorite is exposed in approximately 86 percent of the watershed. This granodiorite forms the core of Sierra Nevada Mountains. Pliocene volcanic rocks cover approximately 14 percent of the watershed. These rocks are found above 9,200 feet (2804 meters). Springs and seeps originate at the contact between volcanic rock and the granitic batholith at an elevation of about 9,200 feet (2804 meters). The landscape was scoured by several episodes of glaciation in the Pleisocene, resulting in outstanding examples of glacial polish.

The subalpine barrens and bedrock type (Photo 5) is found at high elevations, between about 8,600 and 9,200 ft (2621-2804 m), on granitic substrates between the alpine community on volcanic substrates upslope and the continuous forest below. It occurs on southwest-, south-, and southeast-facing slopes of moderate inclinations. This vegetation type covers about 442 acres (179 ha) within the boundary of Snow Canyon – the most extensive plant community in the RNA.

Photo 4: The uppermost elevations of Snow Canyon are defined by a volcanic ridgeline covered with an alpine barrens and scree community. This view, at about 9250 ft (2819 m) in elevation, shows low-growing perennials, such as *Polygonum davisiae*, *Eriogonum incanum*, and *Phlox diffusa*, dominating gentle slopes with cobbly surfaces.

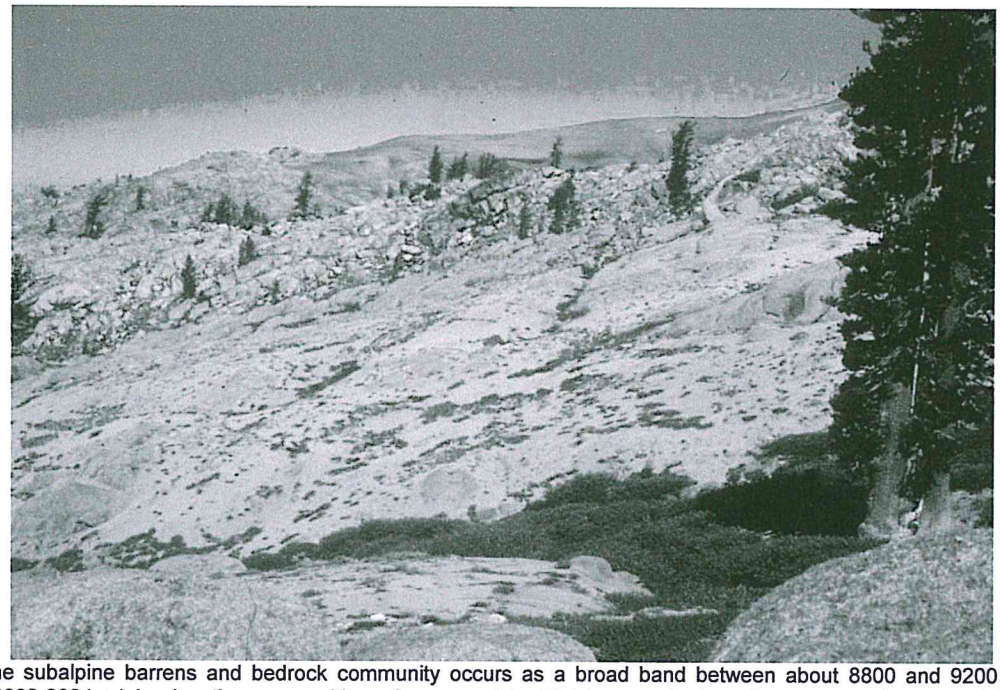


Photo 5: The subalpine barrens and bedrock community occurs as a broad band between about 8800 and 9200 ft (2682-2804 m) in elevation on granitic rocks scoured by Pleistocene glaciers. Sparse cover by perennials, such as *Holodiscus microphyllus,* and scattered trees of *Pinus monticola* occur in a landscape dominated by rock.

The subalpine riparian scrub vegetation type lines major drainages from elevations of 8,250 feet to 9,100 feet (2515-2774 m). It occurs within the subalpine barrens and bedrock type and subalpine western white pine forest. Riparian scrub is also found in close association with subalpine meadows. It forms narrow corridors of streamside vegetation along perennial streams.

The subalpine meadow type occurs at elevations from 8200 to 9200 ft (2499-2804 m), on flat to gently sloping terrain. At its higher elevational limits, this vegetation type tends to cover small areas at seeps, especially at the interface between volcanic and granitic substrates. Throughout its elevational range, it may be found along gentle drainages within the subalpine barrens and bedrock type and subalpine western white pine forest, and is often associated with the riparian scrub vegetation type.

In the southern half of the RNA, an extensive meadow occurs in the bottom of the drainage with the main creek meandering along its eastern half. This type covers about 70 acres (28 ha) in the RNA. The subalpine meadow is dominated by herbaceous plant species that are from one to two feet tall (0.3-0.6 m). The subalpine meadow vegetation type can often be very diverse in species. Both moist and wet phases may have up to 100 percent plant cover, but in the wet phase most of the cover may be from just one to a few species. Wet, moist, and dry phases of this type occur along a moisture gradient defined by the depth of the water table and distance to flowing water. Drier phases tend to occur at the outer margins of meadow, where soils are well-drained and soil texture is coarse. The dry phase has the least total plant cover for the subalpine meadow type. The moist phase meadows are very common in the RNA, while wet phase meadows occur in close association with flowing water – soils are saturated throughout the growing season – and may have high organic matter content.

Snow Canyon RNA provides terresterial habitats for two Federally-listed endangered birds, the bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus anatum*). In addition, it provides habitats for a State-listed endangered bird, the great gray owl (*Strix nebulosa*), and a State-listed rare animal, the wolverine (*Gulo gulo*). Wolverine and peregrine falcon sightings have been made about 4 miles (6.4 km) west and 5 miles (8 km) northwest of Snow Canyon RNA, respectively. Sensitive species listed by the U.S. Forest Service that may occur in the Snow Canyon RNA include 3 birds and 2 mammals: northern goshawk (*Accipiter gentilis*), great gray owl (*Strix Nebulosa*), willow flycatcher (*Empidonax traillii*), fisher (*Martes pennanti*), and Sierra Nevada red fox (*Vulpes vulpes necator*).

Aquatic Species surveys indicate that two sightings of only one amphibian species, the toad, have been observed within the Snow Canyon RNA. These individuals have not been positively identified to species, and are either western toad (*Bufo boreas*) or Yosemite toad (*Bufo canorus*) or intercrosses (hybrids) between the two. A genetics sample was taken in 2003 and will be analyzed in the near future to determine species. Habitat suitable for the mountain yellow-legged frog (*Rana muscosa*) exists in the streams of Snow Canyon although there have been no known sightings. A healthy mountain yellow-legged frog population exists in the neighboring watershed, Deadwood Canyon.

Snow Canyon was within the Deadwood Allotment between 1920 and 1956, which grazed approximately 1,600 head of sheep during a usual season from July 1 to September 30. In 1956 the permit for sheep was waived, and the allotment was rested until about 1965, at which time the Deadwood and Indian Valley allotments were combined. Cattle were grazed on this combined allotment from 1965 until the allotment received a non-use rest from 1988 through 1991, and the permit was waived in 1992 (Eldorado NF Grazing Permit files). Snow Canyon RNA is now within the Indian Valley vacant grazing allotment. Currently there is no allotment management plan, term grazing permit, or annual operating plan. Since the allotment has been vacant since 1992, the impact of RNA establishment on the grazing resource is very low. If a new grazing permit were issued, the RNA would be required to be protected from grazing, and the appropriate method to insure that grazing does not occur within the RNA would be addressed in the preparation of an Allotment Management Plan.

There are no roads within the candidate RNA. Snow Canyon RNA is within the Mokelumne Wilderness Area, which prohibits motorized travel within the RNA. A hiking trail (Forest Trail 18E08) to Grouse Lake cuts across the upper elevation slopes of the RNA. Judging by the lack of trail tread wear, traffic appears light; in some areas the trail is obscure from lack of use. Recreational use, such as camping, is light and poses no conflicts with RNA status. The relatively isolated location of Snow Canyon restricts most impacts and conflicts by humans. Establishment of the RNA will have no impact on the recreational values of the area.

The area surrounding Snow Canyon has experienced frequent small (less than 10 acres) fires, which appear to be mostly lightning caused. There are two moderately sized fires shown in the Eldorado GIS fire history coverage that also occurred in the surrounding area. The Meadow Lake fire (186 acres) in 1929 and an unnamed fire (193 acres) in 1939 are both outside the recommended RNA boundary. There is one small (less than 10 acres) fire shown in the GIS coverages for fire history on the southwest ridge boundary of Canyon RNA. Fire history GIS coverages include years from 1910 to the present, although early fire history is somewhat spotty for the Forest. Currently, most forested lands within Mokelumne Wilderness and within the Snow Canyon candidate RNA are in Fuels Condition Class 1 with pockets of Condition Class 2 occurring at lower elevations.

Table 1 – Summary of resources within Snow Canyon candidate RNA

Resource	Summary
Fuels/Wildfire	Shows only one small fire occurrence on the RNA boundary in the known history of the area. The area is in Fire Management Area 2.
Mining/Minerals	No active mining claims. Low potential for valuable mineral deposits.
Grazing	Part of the vacant Indian Valley grazing allotment.
Aquatic Animals	No known occurrence of any TES species; habitat exists for mountain yellow-legged frog
Terrestrial Animals	Contains habitat for bald eagle, peregrine falcon, willow flycatcher great gray owl, wolverine, fisher, Sierra Nevada red fox, and northern goshawk.
Roads	No roads in the candidate RNA.
Cultural Resources	Contains no known cultural resource sites.

Decision Framework

The decisions to be made are:

1. Whether or not to establish Snow Canyon as a Research Natural Area;
2. What changes or amendments, if any, are required to be made to the Eldorado National Forest LRMP;
3. If amendments are determined necessary, whether or not they are significant.

The Regional Forester could decide to establish the RNA, or not.

Purpose and Need

During the original LRMP processes, the Eldorado National Forest (NF) identified and recommended RNAs in their LRMPs. Since original LRMP efforts, new information has been collected and analysis conducted, which has identified an improved boundary to meet the criteria for contributing to a National Research Natural Areas system. There is a need to formally establish this area per LRMP direction and direction contained in FSM 4063.

The purpose of establishing RNAs is to provide for long-term protection and recognition of natural resources, and to contribute to the National network of areas of important forest, shrubland, and grassland types, as well as other plant communities, that have special or unique characteristics of scientific interest and importance.

Candidate RNAs were identified for designation through Regional-, Forest- and District-level planning based on their representative and/or unique natural and ecological features. They were identified to become part of a designated system of areas with a management goal of maintaining their natural condition and features for use in non-manipulative research, as well as for baseline comparison and observation (FSM 4063).

RNA needs were evaluated by the Pacific Southwest/R5 RNA Committee, pursuant to direction in Forest Service Manual 4063.04b, resulting in the identification of these types of areas as suitable and desirable for inclusion in the National network. Snow Canyon was identified in the Eldorado NF LRMP, and was recommended in the selected alternative for the forest plan, pending completion of an Establishment Record and a final boundary definition for this RNA recommendation.

The plant community types found in the candidate RNA are currently not represented or under-represented in the National RNA system. The candidate area would contribute to the Regional and National network of natural community types, and once established, is expected to receive monitoring and research use. Table 2 lists the target types this RNA would contribute to the National network.

Table 2 – General Natural Features of Snow Canyon Candidate RNA

Area Size (Acres)	Target Type	Type
888.9	Western White Pine	SAF 215
	Montane Meadow	SRM 216

Public Involvement

Formal scoping and issue identification involved contacting individuals, organizations, and agencies known to be interested in Research Natural Areas on the Eldorado NF and in Region 5. Individuals who had expressed interest in RNA's were contacted by mail. "Public scoping" was initiated on March 23, 2005 with a scoping letter that included the proposed action, purpose and need, decisions to be made, and a map. A total of 43 scoping packages were mailed. In addition, legal ads were published in the Sacramento Bee (March 25, 2005), and the Mountain Democrat (March 28, 2005) newspapers inviting comments on the proposed action.

Site-specific Comments

One e-mail and two telephone calls of interest were received in response to this request for comments. Responses were all in support of RNA designation for Snow Canyon. No significant issues were raised during scoping.

Alternatives

Alternative 1 – Proposed Action

The USDA Forest Service, Pacific Southwest Region, proposes to establish a Research Natural Area (RNA), which represents two natural ecosystems, Western White Pine (SAF 215), and Montane Meadow (SRM 216). This candidate RNA area occurs on the Amador Ranger District of the Eldorado National Forest, in Alpine County of California. Refer to Map 1 on page 3.

Establishment of this candidate area generates the proposed action of amending the Eldorado National Forest Land and Resource Management Plan (LRMP). The status of this RNAs would be changed from candidate to "established" and boundaries would be designated. Establishment records would be implemented as the guiding direction for the Snow Canyon RNA.

Snow Canyon was identified in the Eldorado NF LRMP, and was recommended in the selected alternative for the forest plan at such time as an Establishment Record was completed and final boundaries for this RNA were defined. This environmental assessment proposes adding this candidate RNA to the system, with boundary modifications and the recently completed Establishment Record. Snow Canyon is suitable and desirable for inclusion in the national network as representative of the Western White Pine and Montane Meadow target ecosystem types.

This candidate RNA would be administratively designated by authority delegated to the Regional Forester by the Chief of the Forest Service (FSM 4063 Amendment, May 4, 1994).

Standards and Guidelines

The following list of management standards applies to the establishment of Snow Canyon candidate RNA. Existing RNA management direction and policies, and monitoring measures are found in the Eldorado LRMP, FSM 4063.3-.37, Establishment Record, and this Environmental Assessment. Applicable FSM policies and Forest Plans measures include, but are not limited to:

Mining & minerals

- Formally established RNAs would be withdrawn from mineral entry. Because Snow Canyon is wholly within the Mokelumne Wilderness. This direction is already in effect.

Firewood cutting

- Woodcutting or removal of firewood and other forest products, such as Christmas trees, would be prohibited within RNAs. Permits would not be issued for gathering

special forest products within RNAs. Because Snow Canyon is wholly within the Mokelumne Wilderness, this direction is already in effect.

Recreation

- All permanent outfitter camps would be located outside of RNAs. Outfitter pack and saddle stock would not be grazed within RNAs without specific permit authorization.
- Motorized use (ATV, motorcycles, and snowmobiles) would not be permitted within RNAs, and Forest travel plans would be updated with area closures for designated RNAs. Because Snow Canyon is wholly within the Mokelumne Wilderness, this direction is already in effect.
- Major reconstruction, or heavy maintenance, would generally not be permitted on trails within RNAs. Exceptions to this would be when maintenance is needed to eliminate resource problems such as erosion or public safety. Because Snow Canyon is wholly within the Mokelumne Wilderness, this direction is already in effect, requiring any maintenance to be done with hand tools.
- New roads would not be built in designated RNAs. Because Snow Canyon is wholly within the Mokelumne Wilderness, this direction is already in effect.
- Recreation uses such as hiking, hunting, or cross-country skiing, would continue.
- The Forest would implement a Forest Order to prohibit campfires, collection of firewood or other forest products, and camping within the RNA. This order is needed to mitigate the risk of wildfire, the removal of potential scientific samples, soil compaction impacts, and concentrated trampling of the vegetation within the montane meadow. Hiking on the established trail within the RNA does not impact vegetation or soil, and is not prohibited.

Fire Management

- Fire management guidelines would be established for the RNA based on the "distinguishing natural features" and "values present" within the area. The FSM 4063 policy requires that a "Prescribed Burning Plan" be approved before prescribed burning with either planned or unplanned ignitions.
- Wildfire suppression activities would be restricted to those resulting in least ground disturbance.
- Seeding following wildfires would utilize only local native, weed-free seed.

General LRMP wilderness fire management direction that would apply:

- Prevent significant adverse effects of air pollutants and atmospheric deposition on wilderness resources, including visibility, while allowing natural resources, such as fire, to assume their natural resource ecological role. ...achieve the air quality goals established in the Clean Air Act, meet Federal and State air quality standards for a Class 1 airshed, and protect wilderness resources from adverse air pollution effects.

Fire management plan objectives specific to the Mokelumne Wilderness area that would also apply to Snow Canyon RNA:

- Allow lightning fires to assume their natural ecological role in the wilderness, while reducing, to an acceptable level, the risks and consequences of wildfire fire within wilderness or escaping from wilderness (FSM 2324.2).

- Suppression activities will protect the integrity of the wilderness and RNA resources. Control methods will be compatible with wilderness and RNA management objectives.

- Suppress all wildland fires that are not within management prescriptions using confine, contain, or control strategies, in accordance with FSM 5130 and FSM 2320.

- Surveillance can be an appropriate suppression action when a wildland fire is expected to be self-contained within a defined area.

- It is the responsibility of the assigned line officer, or designated incident commander to ensure that each wildland fire is out before it is abandoned.

- No human caused ignitions would be managed for resource benefit.

Wildland fire use

- Wildland fire use refers to the management of naturally ignited wildland fires to accomplish resource management objectives. A wildland fire implementation plan (WFIP) must be prepared and approved for wildland fire use (FSM 5143.2). Snow Canyon RNA is not included in a wildland fire use area. Any planned use of fire would only occur as part of research objectives approved by the Pacific Southwest Research Station.

Planning

- The Eldorado LRMP would be amended to establish Snow Canyon as a Research Natural Area, with the proposed boundary change. RNA management objectives and

direction would apply to the Snow Canyon RNA, as recommended in the Eldorado LRMP.

Noxious Weed Control

- Acceptable procedures are described in FSM 4063 for control of noxious weeds and use of herbicides. Generally, broad application of herbicides within RNAs would not be allowed. Actions would be taken to prevent introduction of noxious weeds into RNAs.

Riparian Conservation Objectives (RCOs)

- Establishment of RNAs does not involve ground disturbance. Best management practices (BMPs) are not necessary since there are no ground disturbing or water quality degrading impacts being proposed. Cumulative Watershed Effects (CWE) would not occur.

Aquatic and Terrestrial plants and animals

- Direction and policies for threatened, endangered, candidate, and sensitive plants and animals would be followed.

Alternative 2 – No Action

The No Action alternative would not take administrative action to complete the designation of the Snow Canyon candidate RNA or to amend the Eldorado LRMP to establish the recommended Snow Canyon RNA allocation. The LRMP direction that proposed Snow Canyon as a RNA would not be implemented in this planning cycle. Implementation and formal establishment of the Snow Canyon RNA as envisioned in forest planning would not occur.

The area identified in the LRMP would, however, continue to be managed *status quo* and preserve the RNA option. Action on any new information or opportunities, and changes to address any proposed RNA management conflicts, would be deferred until the next planning cycle. Unique habitats, rare plants, potential baseline study areas, and other such natural features, would continue to be protected under Wilderness designation as required by Forest Service policies, regulations, law, and existing LRMP direction. An amendment to the LRMP would not occur under the No Action Alternative.

Comparison of Alternatives

Table 3 – Comparison of alternatives

Attribute	Alternative 1 *Proposed Action*	Alternative 2 *No Action*
Establish Snow Canyon as a RNA	Achieves the objective	Does not achieve the objective
Amend the RNA boundary to include the watershed	Achieves the objective	Does not achieve the objective
Implement the Forest Plan recommendation	Achieves the objective	Does not achieve the objective
Provide an example of western white pine for the national RNA system	Achieves the objective	Does not achieve the objective
Provide an example of upper montane meadow for the national RNA system	Achieves the objective	Does not achieve the objective
Reduces wildfire risk from campfires	Achieves the objective	Does not achieve the objective
Prevents trampling damage to the RNA from camping	Achieves the objective	Does not achieve the objective
Provides a baseline area for research	Achieves the objective	Does not achieve the objective

Environmental Consequences

Effects common to establishment of RNAs

Establishment of RNAs proposes no ground-disturbing activities. Best Management Practices (BMPs) are not necessary when establishing RNAs because no ground disturbing or water quality degrading impacts are proposed. There are no direct or indirect effects to watershed and hydrologic resources. Establishment of the candidate RNAs would not incur a cumulative watershed effect (CWE) response. No water quality laws, rules, or regulations would be violated. Existing compaction and/or erosion potential would not be altered. The physical and/or chemical properties and the quality of soils would not change.

Effects of implementing the No Action Alternative

Under the No Action Alternative (Alternative 2) the Snow Canyon candidate RNA would not be formally designated and the area would continue to be managed in *status quo* to retain the option

for future designation through to the next planning cycle. New RNA proposals would not be afforded any status with this decision. Protection of identified unique and representative natural features, and sensitive plant and animal species, would continue to be accomplished in project or activity planning on a case-by-case basis. Use restrictions and requirements to protect those features would still apply, but potential for lack of continuity of management and for the gradual loss of representative and unique natural features over time, may increase. Opportunities for future research, monitoring, education, and biological diversity conservation could be lost. Natural process within the candidate RNA could be altered directly by human influences. The Western white pine within the candidate Snow Canyon RNA would not receive additional protection of a site-specific prescribed fire management plan. Ecological processes could be modified indirectly.

Effects of implementing the Proposed Action

Snow Canyon RNA would be established with a total of 888.6 acres. Management of this RNA would offer long-term protection for research, monitoring, education, and biological diversity conservation. Establishment of the proposed RNA would contribute to the national network of research areas. Opportunities for future and current research and monitoring of natural processes and conditions would be available.

Natural processes within the RNA would continue unaltered by direct human influences. The designated RNA would be managed to protect against activities that directly or indirectly modify ecological processes. Activities would be prohibited that affect natural successional changes and/or threaten/interfere with the objectives or purposes for which the RNA was established. Uses would be controlled so as not to detract from the objectives or the protection of the area. Consumptive uses would not be allowed.

Vegetation Management: Snow Canyon is located within the Mokelumne Wilderness and is, therefore, already removed from the timber base. Implementation of the Proposed Action Alternative would not directly, indirectly, or cumulatively impact the ability of the Eldorado NF to remove trees or contribute to available timber products.

Transportation Management: The location of Snow Canyon inside the Mokelumne Wilderness eliminates the possibility of roads being built into the area, thereby providing additional protection for downstream riparian zones in the Snow Canyon drainage into Meadow Lake.

Pest Management: FSM 4063.3 provides direction for pest management activities within RNAs. It states that the pest management activities must be as specific as possible against target organisms and induce minimal impact to other components of the ecosystem. FSM 4063.32 states that no action against endemic insects, disease, plants or animals should be taken in RNAs unless

approximately 14,600-acre Indian Valley Allotment. Implementation of Alternative 1 would not directly, indirectly, or cumulatively significantly impact opportunities for livestock grazing in the Indian Valley allotment, if the decision made at the time of environmental analysis for the Indian Valley allotment is to reactivate this currently vacant allotment, and it would have even less significance for livestock grazing on the Eldorado NF as a whole in the reasonably foreseeable future. If the decision made at the time of environmental analysis for the Indian Valley allotment is not to reactivate this currently vacant allotment, there would be no direct, indirect, or cumulative effects from designating Snow Canyon as a RNA.

Mineral Extraction: As part of the Mokelumne Wilderness, the candidate RNA has been withdrawn from mineral entry. There are currently no active mining claims, nor oil and gas leases, within the candidate RNA. Forest Service geologists have rated the mineral potential for the candidate areas as low. Therefore, implementation of Alternative 1 will not directly, indirectly, or cumulatively impact mineral extraction in the Snow Canyon candidate RNA.

Soils: Implementation of Alternative 1 will not alter the physical or chemical properties or the quality of soils in the candidate RNA directly, indirectly, or cumulatively.

Hydrology and Watershed Resources: Neither alternative has any substantive impact to aquatic features, water quality, or overall watershed condition. This is because neither alternative involves ground-disturbing activities, removal or alteration of living vegetation, or installation of man-made structures or features. However, there is one minor difference. The proposed action - which prohibits camping and the collection of dead wood - may over time result in streams and their adjacent riparian areas that appear slightly more pristine in appearance. This change may or may not be evident because camping and recreational use is currently light and may not increase even if Snow Canyon is not designated as a RNA.

As a result, there are no negative impacts to the hydrology, aquatic features, aquatic habitat, water quality, and overall watershed condition within and downstream of the RNA. There are no connected or reasonably foreseeable activities in the area of the proposed RNA that would contribute to any cumulative effects. Therefore, from the standpoint of hydrological effects, there are no direct, indirect, or cumulative effects from the proposed action.

Existing Trail Use and Maintenance: The candidate RNA has one non-motorized trail within it (see Map 2). The non-motorized trail will continue to be used, but no heavy maintenance or relocation, within the RNAs will normally take place. Exceptions to this would be actions needed to prevent resource damage (e.g. erosion) or to provide for public safety. Implementation of Alternative 1 will not directly, indirectly, or cumulatively impact existing non-motorized trail use or maintenance since trails will be maintained via hand work, and heavy maintenance/trail

relocation can be used if public safety and/or resource concerns arise. The system trail will remain open for public use.

Motorized Use: Motorized use is not allowed within established Wilderness or RNAs. These areas are shown as closed to motorized travel in Forest travel plans. Implementation of Alternative 1 will not directly, indirectly, or cumulatively impact motorized trail use since motorized trails do not exist in the candidate RNA area. No new roads or motorized trails will be constructed. There will be no significant impacts to any roads serving trailhead facilities as a result of RNA establishment.

Recreational Use: Outfitter base camps will not be allowed within the candidate RNA. Cross-country hiking, skiing, hunting, and other low-impact dispersed recreation uses will continue unchanged. There is no evidence of regular dispersed camping use within the Snow Canyon candidate RNA area, and no camping will be allowed within the established RNA. Implementation of Alternative 1 will not significantly impact recreation use directly, indirectly, or cumulatively since this area currently receives little visitation.

Wildlife and Fisheries: The candidate RNA area supports one or more sensitive plant occurrences, and contains habitat for a sensitive amphibian, the mountain yellow-legged frog. Designation of the candidate RNAs will be compatible and/or beneficial to the protection of these plants, animals, and their habitats. Fisheries management in RNAs will continue under direction of the California Department of Fish and Game (CDFG). There is no history of chemical treatments associated with fish stocking in aquatic habitats, and if it were proposed, it would be discouraged. Establishment of the candidate RNAs will not change management for terrestrial or aquatic animal species; therefore, Alternative 1 will not negatively impact wildlife and fisheries resources directly, indirectly, or cumulatively.

Current Planning Efforts: Implementation of Alternative 1 would implement direction contained in the existing Eldorado LRMP, and would not negatively impact any current planning efforts for the Snow Canyon candidate area directly, indirectly, or cumulatively.

Effects relative to significant issues

The comments received from the public were entirely in support of the Proposed Action, with no issues identified. Therefore, there are no effects relative to significant issues, because there were no significant issues raised.

Effects relative to Finding of No Significance (FONSI) elements

In 1978, the Council on Environmental Quality published regulations for implementing the National Environmental Policy Act (NEPA). These regulations (40 CFR Parts 1500-1508)

include a definition of "significant" as used in NEPA. The ten elements of this definition are critical to reducing paperwork through use of a finding of no significant impact (FONSI) when an action would not have a significant effect on the human environment, and is therefore exempt from requirements to prepare an environmental impact statement (EIS). Significance as used in NEPA requires consideration of the following ten intensity factors in the appropriate context for that factor.

(1) Beneficial and adverse impacts:

Management of this RNA would be for long-term protection for research, monitoring, education, and biological diversity conservation. Establishment of the proposed RNA would contribute to the national network of research areas. Opportunities for future and current research and monitoring of natural processes and conditions would be available.

In general terms, natural processes within the RNA would continue unaltered by direct human influences. The designated RNA would be managed to protect against activities that directly or indirectly modify ecological processes. Activities would be prohibited that affect natural successional changes that threaten or interfere with the objectives or purposes for which the RNA was established. Uses would be controlled so as not to detract from the objectives or the protection of the area. Consumptive uses would not be allowed.

The effects of establishment of Snow Canyon as a RNA have been considered in the context of past, present, and reasonably foreseeable future actions in the analysis area. Beneficial effects were not used to offset adverse effects. In the absence of beneficial effects no adverse effects would be significant, whether considered collectively or individually.

(2) The degree to which the proposed action affects public health or safety.

No significant effects to public health and safety are anticipated to result from implementation of the proposed action. No effects to public health and safety were identified during analysis for this proposal, directly, indirectly, or cumulatively.

(3) Unique characteristics of the geographic area.

Forest Service Research Natural Areas (RNAs) are part of a national network of public lands permanently protected to maintain biological diversity, provide ecological baseline information, and for education and research purposes. Snow Canyon contains about 889 acres of undisturbed Western white pine, along with an excellent representative of upper montane meadow. Designating this area will strengthen protection of these values. No significant effects on the unique characteristics of the geographic area are anticipated as a result of implementing the proposed action.

(4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The nature of potential effects on the human environment from implementation of the proposed action is well established and not likely to be highly controversial. Research Natural Areas have not shown controversial effects throughout the National Forest System, and there is no basis to expect scientific controversy for the Snow Canyon RNA.

(5) Degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

Because the purpose for RNA establishment is to protect examples of ecosystem types from human disturbance, the effects on the human environment from the proposed action are not uncertain and do not involve unique or unknown risks. Instead, the existing natural system is maintained, which produces no negative environmental effects to the human environment.

(6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

Designation of Snow Canyon as a RNA will not establish a precedent for future actions with significant effects, nor will it represent a decision in principle about a future consideration. This action implements an ongoing national program to establish a network of RNAs and implements the recommendation for Snow Canyon made in the Eldorado LRMP; therefore this action does not establish precedent, nor is it a decision in principle.

(7) Whether this action is related to other actions with individually insignificant but cumulatively significant impacts

There are no known, or anticipated, cumulative or secondary impacts resulting from this action. Because there are no direct negative environmental effects, there are also no cumulative effects.

(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

The proposed action will not have an effect on significant scientific, cultural or historic resources. No ground disturbing activities are proposed or authorized by this decision.

(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

The formal establishment of Snow Canyon RNA will not affect any federally listed, proposed or Forest Service sensitive plant or animal species. Biological Evaluations for Plants and Animals

are incorporated into this EA by reference, and are available on file at the Eldorado National Forest Supervisor's Office.

(10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The proposed action would amend the Eldorado NF Land and Resource Management Plan, is consistent with Agency direction, and does not violate any Federal, State, or local laws. The establishment of the candidate RNA and amendment of the LRMP does not conflict with any other agency plans, policies or jurisdictions. The Snow Canyon RNA is completely within the federally owned lands of the Eldorado National Forest.

Agencies and Others Consulted

State Historic Preservation Office: There are no potential effects to cultural resources that require coordination or consultation because establishment of the candidate RNA, and amending the LRMP, does not involve any ground disturbing activities. Establishment of the RNA and amending the LRMP is an undertaking that will not affect historic properties and is within compliance with Section 106 of the National Historic Preservation Act.

State Water Quality Bureau: The candidate RNA is not located within a municipal watershed.

State of California Natural Areas Act: The proposals are consistent with the State of California Laws regarding establishment of a statewide system of natural areas.

United States Department of Interior (USDI) Fish and Wildlife Service (USFWS) and State Natural Heritage Program: Bald eagle and peregrine falcon may occasionally be present in the candidate RNA areas. Sensitive plant and animal and amphibian species habitat are known to occur in the candidate RNA. Establishment of candidate RNA will not impact Forest Service sensitive plants and animals. Determinations were made that establishment of this RNA will not adversely affect on any federally listed candidate, threatened, or endangered species, or any State "sensitive" species.

United States Army Corps of Engineers: The establishment of the candidate RNA protects examples of wetlands, including the montane meadow and other riparian areas along Snow Canyon creek. There are no planned "discharges" into wetlands or waters of the United States associated with establishment of the candidate RNA.

Consultations

Pacific Southwest Research Station, Albany, CA

Documents Incorporated by Reference and Available upon Request

Establishment Record for Snow Canyon Research Natural Area, USDA Forest Service, Pacific Southwest Research Station. 2003

Aquatic Wildlife Biological Evaluation and Management Indicator Species Analysis of The Designation of Snow Canyon Research Natural Area. Jann Williams. 2005

Eldorado National Forest Land and Resource Management Plan. USDA. Forest Service. 1989

Mokelumne Wilderness Management Guidelines – LRMP Amendment. USDA Forest Service. 2000

References Cited

Keeler-Wolf, Todd. 1990. The Pacific Southwest Regions Research Natural area target system.

Forest Service Manual (FSM) 1920. Land and Resource management Planning. USDA Forest Service. 1996. http://www.fs.fed.us/im/directives/fsm/4000/4060.txt)

FSM. 1950. Environmental Policy and Procedures. USDA Forest Service. 1992.

FSM 2300. Recreation, Wilderness, and Related Resource Management. USDA Forest Service. 1990.

FSM 4063. Research Natural Areas. USDA Forest Service. 1994.

FSM 5100. Fire Management. USDA Forest Service. 2000