

Resources Management
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NATURAL RESOURCES MANAGEMENT STATEMENT

MARCH 1982

DEVILS POSTPILE NATIONAL MONUMENT

SEQUOIA AND KINGS CANYON NATIONAL PARKS
CALIFORNIA

NATURAL RESOURCES MANAGEMENT STATEMENT
FOR
DEVILS POSTPILE NATIONAL MONUMENT

Sequoia and Kings Canyon National Parks
California

March 1982

Prepared by
Sequoia and Kings Canyon National Parks
and
Devils Postpile National Monument
National Park Service
Department of the Interior

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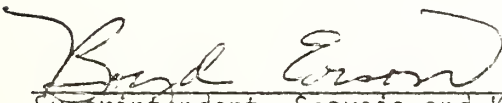
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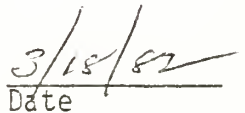
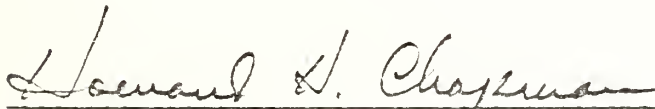
SUMMARY

Devils Postpile National Monument is a natural area that is easily accessible by roadway and trail. This Monument is an important high-use (relative to size) natural area for metropolitan Southern California and other areas. While the geologic features of the postpiles and Rainbow Falls are clearly the key features that attract public visitation, the Monument has much more to offer the visitor.

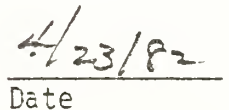
The on-going management activities and proposed actions are designed to preserve the natural resources of the Monument and to comply with various legal mandates and policy. NEPA documentation will be prepared in conjunction with the Developmental Concept Plan and Fire Management Plan. On-going routine management and proposed monitoring and research are categorically excluded from the NEPA process in 516 DM 2 Appendix 1.6 and 1.7 and 516 DM 6 Appendix 7.4A(4); neither are these programs excepted from exclusion under 516 DM 2.3A(3); and, except as noted above, further NEPA documentation will not be prepared.



Superintendent, Sequoia and Kings Canyon National Parks


Date

Regional Director, Western Region


Date

NATURAL RESOURCES MANAGEMENT STATEMENT

I. INTRODUCTION

Devils Postpile National Monument was placed in federal protection (National Park Service, U.S. Department of Interior) by Presidential Proclamation No. 1166, on July 6, 1911. This geologically significant area was once administered by Yosemite National Park (1890). In 1905, more than 500 square miles were withdrawn from Yosemite National Park in the Minaret Range and the Devils Postpile area and returned to public domain. Only 800 acres were returned to protected status as Devils Postpile National Monument in 1911.

The Monument is reached by traveling SR 203, a dead-end road from Mammoth Lakes, Mono County, California. During the last decade, the Monument's annual visitation has fluctuated between 81,323 (1979) to 108,415 (1977).

II. NATURAL HISTORY

A. Physiography

The Monument is located on the western slope of the Sierra Nevada in Madera County, California. The boundaries are two and one-half miles long and one-half mile wide. Elevations within the Monument range from about 7,200 to 8,200 feet.

While huge areas of exposed granite (of the Sierra batholith) are present, there are also older metamorphics (of the Ritter Range) and more recent volcanics contributing to the area's physiography. This region is geographically near the eastern escarpment of the Sierra Nevada and yet establishes the divide of drainage for the eastern and western watersheds. The Ritter Range (to the Monument's west) is clearly higher in elevation but the San Joaquin River was forced west here (due probably to volcanic

"plugging" or "damming"). Hence, the vegetation in the Monument area has both east-slope and west-slope affinities.

The Monument occupies an area within a Pleistocene glacial trough that was created by huge ice-flows originating in the Mt. Ritter area. The main glacier moved southward and was fed by numerous smaller glaciers that also created present alpine watersheds. Glacier-polish, glacial straitions, and glacial grooves are found throughout the Monument. Glacial erratics are also commonly found.

B. Geophysical Features

The Monument was established because of two important geophysical features, the postpiles themselves and Rainbow Falls. Much has been written about the postpiles is a geological feature, and an in-depth treatment of the Monument's geological history is provided in the guidebook "Devils Postpile National Monument", edited by Wymond Eckhardt. The most recent geological treatment is by N. King Huber of the U.S. Geological Survey, Menlo Park, California.

Interest continues in postpile formation and decay. New research techniques estimate the lava flows from which the postpiles were formed to be approximately 600,000 years B.P. The postpiles formed from cracks as the lava cooled. Later (about 40,000 B.P.), glaciers quarried away part of the formation exposing the postpiles. Today the formation can be seen as a sheer wall of polygonal basalt columns up to 60 feet high, and glacial polish is evident on top of many of the columns.

Earthquake activity in the winter of 1980 and the spring and summer of 1981 dislodged numerous postpiles. These fallen columns have been photographically recorded. Numerous other columns lean towards the talus-pile at angles considered dangerous to the public. Because of this, public access to the talus-pile has been denied. Previously the talus-pile was accessible and enjoyed by thousands each season.

The second major geophysical feature in the Monument is Rainbow Falls. This spectacular waterfall exists near the southern end of the Monument on the San Joaquin River. Here the river falls freely 101 feet into a shallow pool.

The geology at Rainbow Falls is different from that of the postpile formation. The area is overlain by a shallow surface layer of pumice and underlain by "platy andesite", a term given to the extrusive rock found here. This andesite, while about the same age as the postpile basalt, is unique in composition and general structure. It forms cracks both vertically and horizontally. The horizontal cracks create its flattened and plate-like character. When these rocks strike each other, they tinkle like china plates, adding to their "platy" character.

The formation of Rainbow Falls has been an item of interest and speculation. Certainly, the area was influenced by local glaciation. The platy andesite must have crumbled easily under the weight of Pleistocene glaciers. Perhaps the original precipice was formed by localized glacial "plucking".

It is thought by some that the river has moved from its earlier course and now falls over banks that it cut at an earlier date.

C. Soils and Surface Materials

Soil formation in high-Sierra regions depends upon many important factors. Parent materials, slope, exposure, hydrology, organic matter content, and surface vegetation are only a few of such factors. Extensive soil formation in any Sierran ecosystem depends upon the right combination of these factors. Soils in the Monument are either poorly-developed or entirely absent.

It is difficult to locate an area within the 800 acres of the Monument that is not covered by pumice. The pumice within the Monument indicates post-glacial volcanic activity in the Mono Lake - Mono Basin area, and it plays an important role in the area's phytogeography and vegetation development. Most of the pumice found in the Monument is less than one centimeter (1 cm) in diameter suggesting that it traveled some distance before falling. The Mono Craters are considered a possible source.

Little soil formation probably occurred before the present pumice cover appeared. This is because: (1) glaciated volcanic rock-surfaces are very slow to decompose, (2) slopes did not allow particle accumulation, (3) montane and sub-alpine climates do not foster rapid development of pioneer plant communities, and (4) snowpack and rainfall contribute to rapid soil erosion.

Enough post-glacial pumice has fallen to create a dominant upper mantle of this siliceous rock. In most areas of the Monument, it is less than 20 cm in depth. In flatter areas (meadow areas and "tables") the pumice accumulation is much deeper (25-50 cm).

On slopes underlain by basalt and andesite, where the water table is low and percolation is high, a sparse conifer forest normally exists. Here, pines and firs contribute little organic matter towards extensive soil formation. The soils remain barren with a paucity of litter and insufficient moisture to enhance soil-formation. It is common, on steeper slopes, to see bare rock and few plants. The plants often creep downhill with the soil, further inhibiting soil development.

Thundershowers often occur within the Monument and create surface disturbances of pumice "washouts". These occurrences may lay an area bare until a later event carries "new" pumice in.

The instability of such surface materials inhibits soil formation and thus the vegetation or plant cover. Little "understory" or underbrush develops within these "unstable" areas.

Pumice also creates numerous management problems within the Monument. Whenever human disturbances occur to such soils, recovery is slow and "visual aesthetics" are degraded. Such disturbances include "spur path" development, off-road encroachment by vehicles and over-use by visitation. Once a "spur path" is cut, it is easily identified and used by others and degradation is rapid.

Soil development is best seen in the meadows of the Monument. While some meadow bases are fluvial in origin, others are found to have bases formed from simple mechanical weathering. Meadow formations will be discussed in another section.

D. Water Resources

The San Joaquin River travels the entire length of the Monument. Within the Monument, the river is not stocked or planted with hatchery fish. Its "wild" fish fauna is enjoyed by hundreds of anglers each season.

The river changes in character many times throughout its journey through the Monument, changing along its course from a series of broad low-gradient meanders to scattered pools and fast-flowing rapids, cascades, and falls. At one point the river enters the narrow "funnel" of a volcanic obstruction. Three small creeks enter the river within or near the Monument; these are King Creek, Boundary Creek, and an unnamed creek from Red's Meadow.

Below the Monument, the river continues on to race through a narrow granite gorge south of "Lost Camp" and towards Mammoth Pool, the first man-made obstruction on the San Joaquin River. This portion of the river is being considered for National Wild River status and the whole area for inclusion into the National Wilderness Area system as a portion of the proposed San Joaquin Wilderness Area. This would bridge a large gap between the Minaret and John Muir Wilderness Areas.

The large meadow near the Ranger Station is Soda Springs Meadow. The soda spring for which this meadow is named is at the southern edge of the meadow. Totally submerged in the June snow-melt, the soda spring gradually becomes more accessible by July. In August and September it is normally separated by a few meters from the river and easily spotted. Iron in the water oxidizes to reddish-brown and clearly marks the spring's

location. The spring provides a continuous flow of carbonated water throughout the year.

E. Vegetation

The vegetation of the Monument is a montane forest dominated by red fir and lodgepole pine. Numerous other species occur making the area an interesting mosaic of conifers and deciduous trees.

The most common conifer near the ranger station and along the Monument's trails is the lodgepole pine. This opportunistic tree can be found in most areas where at least some soil is present (even if only pumice). The lodgepole pine is dominant on the near-horizontal surfaces of the Monument. Seedlings and young trees of this species are also found at the meadows' edge.

Where slope increases or soils are shallower, the lodgepole gives way to red fir and, in some cases, white fir. A large white fir grove exists around the postpiles and numerous mature specimens can be viewed along the trail that leads to the top of the postpile formation.

Other conifers include western white pine, Jeffrey pine, mountain hemlock, and western juniper.

The forest floor under the dominant conifer cover of the Monument is sparsely covered with a few perennials and numerous annual species. Most of these plants must be able to tolerate the relatively low water-holding capacity of local soils. Bottlebrush, squirreltail grass, and Duran's lupine are very common in open forest situations. Later in the blooming season, Parry's rabbitbrush and Chaenactis can be found. In a few

areas within the Monument, manzanita, bush-chinquapin and similar shrubs develop a woody understory.

Along the San Joaquin River and the few creeks that flow into it within the boundaries, typical montane riparian vegetation can be found; this includes quaking aspen, black cottonwood, creek alder and willows.

A number of meadows of various subtypes can be located within the Monument. "Dry Meadows" where seeps or intermittent drainages occur form shallow meadows occupied by sedges and grasses. In dry years these may not even "green up" after the snow melt.

A few larger meadows occur in the southern Monument region that are regularly wet and occupied by sedges, mannagrass, wildryes and other grasses. Some of these southern meadows are bordered with robust specimens of quaking aspen.

Soda Springs Meadow is the largest meadow within the Monument. This open and spacious meadow is filled with perennial sedges, grasses and wildflowers. It is quite wet in June and early-July and becomes quite dry by late-August and early-September. The large meadow is divided by the San Joaquin River and appears to be, at least in part, formed by classic fluvial events. Numerous test-holes dug throughout the meadow revealed shallow river rocks of considerable size overlain with smaller alluvial deposits and finally pumice.

Portions of the meadow are dominated by early wildflowers - especially shooting stars, cinquefoils and bistorts. Later, many other wildflower

species such as asters, monkey-flowers, yampahs and yarrows are found. Willows border the river's edge on the meadow and under these shrubs may lie paintbrushes, lupines and columbines.

Closure of a central meadow trail has enabled natural revegetation to occur. This previous "eyesore" has nearly vanished and visitors are encouraged to enjoy the meadows by seeking random, less damaging pathways.

F. Fauna

The fauna which are most frequently observed are birds, small diurnal mammals, and invertebrates. The most frequently seen birds include the Steller's jay, the western tanager, dark-eyed juncos, and hairy woodpeckers. The more adept "birder" may find an interesting variety of additional birds. Goshawks and great horned owls are often observed in late-summer.

Common mammals within the Monument include the golden-mantled ground squirrel, the lodgepole chipmunk, chickaree, and Belding ground squirrels. Porcupines, coyotes, long-tailed weasels, martins, and marmots are occasionally sighted.

Large colonies of Belding ground squirrels are common in Soda Springs Meadow during the spring and summer months. This species is present with numerous young early in June. Foraging continues through July and early August. Often by late August and September, few Beldings can be located.

Mule deer and black bear are the large mammals present in the Monument. Mule deer visit Soda Springs Meadow in the evening and early-morning hours.

Black bears are occasionally seen within the Monument boundaries. They were more common before 1980; however, the use of bear-proof garbage receptacles since that time has reduced the availability of human food, reducing their incentive to forage in the campground. Bears are observed more frequently in the surrounding National Forest campgrounds (without bear-proof garbage containers). It is not known if any black bears den or reside within the Monument.

Because of the cold climate, there are few known species of reptiles and amphibians within the Monument. Those present include the pacific treefrog, northern alligator lizard, western terrestrial garter snake, and two unconfirmed reports of western rattlesnakes. Other species may be present.

Fish caught within the Monument are considered "wild" and include rainbow, brown, and brook trout. Brown trout as long as 27 inches have been taken from deeper pools in the river. The California Department of Fish and Game plants fish (normally rainbow trout) at numerous sites upstream the Monument, but few of these "plants" appear to make it downstream to the Monument.

III. MANAGEMENT OBJECTIVES

In accordance with the enabling legislation for National Parks and Monuments, Devils Postpile National Monument is to be managed as a natural area. It is to be managed to remain as unchanged as possible by man for the enjoyment of future generations.

Management objectives pertinent to natural resources are as follows:

Maintain and/or restore the natural ecosystems of the Monument so they may operate essentially unimpaired by human interference, with special attention to the outstanding geological phenomenon.

...Encourage and support research designed to provide management with decision assistance in all aspects of planning, development and management.

...Restore meadows damaged by past visitor use and protect them from future abuse.

...Encourage institutions of higher learning to use the resource in geologic education, research and field studies.

...Protect wildlife populations from human abuse.

Provide the highest quality opportunities for visitor understanding, compatible use, and enjoyment of the Monument's resources.

...Maintain an up to date inventory of Monument resources.

Cooperate with other agencies and outside interests in the development of plans and major management programs.

...Work closely with Inyo National Forest, Mono County, and Madera County officials, particularly in efforts to suppress fire and to improve water quality in the Middle Fork San Joaquin River.

Limit development to that necessary and appropriate for public use and enjoyment and protection of the area.

- ...Manage the Monument primarily for day use, with eventual elimination of overnight camping.
- ...Maintain the final approach to the Postpile and Rainbow Falls as a walk-in experience that is out of sight and sound of motor vehicles or structures.
- ...Consider relocating employee housing outside the Monument.
- ...Hold at current level the backpacker parking in the Monument, while attempting to arrange with the Inyo National Forest for additional space for parking outside the Monument.
- ...Build and maintain a trail system in the Monument, providing safety around Rainbow Falls, adequate maintenance, and reduction of impact on vegetation and other natural resources.

IV. MANAGEMENT ACTIONS - Overview of Problems and Needs

A. High-use Areas

The postpiles formation and Rainbow Falls areas receive high visitor use. These areas must be constantly monitored and managed to avoid environmental degradation. Litter, "spur path" formation, soil surface disturbance, excessive noise and large crowds can all contribute to such degradation. Measures should be taken to "steer" crowds of people and horses in appropriate directions to avoid negative environmental impacts. This could be a combination of signs, revegetation of "spur paths," and imaginative use of trail construction materials (e.g. logs, rocks, etc.). However, care must be taken to avoid the visitor's impression of being "herded".

There is concern about heavy visitor use in the area between the bus turn-around and the postpile. Rerouting foot traffic could restore impacted vegetation in this area. Also, the area needs vegetation restored where the effects of past construction are evident. Some of this work may require the guidance of a landscape architect.

Care must be taken to avoid more human encroachment into the natural environment within the Monument. Roads, buildings, campgrounds, picnic areas, bridges, and similar man-made structures should be kept to a minimum. Attempts must constantly be made to encourage visitors to "walk away" from the parking lots. They need to be invited, in every way possible, to seek out and enjoy the natural aspects of the Monument, where human influence is negligible. A visitor may get the impression that Devils Postpile National Monument is virtually all "front country". The Monument staff needs to devise methods to insure that visitors have the opportunity to see beyond this. While this is easily done for visitors who attend interpretive walks and campfires, such visitors represent a small percentage of annual visitation.

Though the campgrounds within the Monument are to eventually be phased out, they are in need of some redesigning and upgrading for the interim period. They are clearly better than in earlier days, where twice the number of campsites existed in the same area and proper sanitation facilities were absent. Current bear-proof garbage cans have helped greatly. Because the soil within the campgrounds area is also pumice, it is difficult to maintain visual aesthetics. Rehabilitation should include:

- 1) Pave a one-way loop road in Section A to clearly mark the appropriate path upon which vehicles may travel.
- 2) Mechanically disturb areas where old trails and roads existed and seed with appropriate (local) native species.
- 3) Develop clear and obvious sites or pads where campers may pitch their tent and park their vehicle. Too many choices are left up to the visitor without such devices.
- 4) Develop a few "walk in" sites for campers preferring a primitive camp.
- 5) Establish a clearer trail system in Section B to discourage bank degradation along the river.

The main picnic area at the Monument is spacious and functional. It is obviously serving its purpose. However, this is an area of frequent visitor violations of restrictions against wild animal feeding. A signing program might reduce such violations.

B. Interpretation - Resource Basic Inventory

Interpretation is a high priority at the Monument. Techniques and approaches are continuously reviewed. New ideas are routinely employed in order to "keep up" with the changing types of Monument visitors. One of the assets of the interpretive program is accurate information about the Monument's natural resources. Efforts to update and expand this information should include:

- 1) Add to, delete from, or otherwise update and maintain the Monument's species lists.
- 2) Live-trap and inventory small mammals.
- 3) Make or maintain working collections (voucher specimens only) of plants, small mammals, common birds, and common rock-types. Much thought should be given to such a collection with close attention being paid to sensitive species.
- 4) Continue photographic slide collection of representative fauna, flora, geomorphology, geological items (glacier polish, erratics, etc.) and images that illustrate local geophysical processes or events.
- 5) Continue to inventory all areas within the Monument boundaries to add to a more complete understanding of the area.
- 6) Maintain liaison with researchers in and near the Monument and acquire copies of their reports and publications for the Monument's library.

C. Fire Management

Another area of concern is fire management. Training should be provided at the Monument for employees to guarantee a good initial attack in the event of fire.

In general, the Monument has little fuel to carry a fire, and fires known to have occurred in the canyon are virtually nil. However, under exceptionally severe fire weather conditions, some fires will not be stopped

unless they are fortuitously controlled on initial attack. Where fuels exist, they tend to be very patchy. Small scale prescribed burning could be done, but the role of fire in this fuel type needs to be better understood before such management is implemented. A research study on this question is needed. A Fire Management Plan needs to be developed as required in NPS-18, Fire Management Guidelines.

D. Water Quality

A water quality monitoring program is needed on the Middle Fork of the San Joaquin River. Due to high visitation to the Monument and nearby Forest Service campsites (particularly those upstream), water quality in the river may be affected by litter, human waste, and increased runoff where vegetation is absent. The extent and seriousness of the problem is not known. This should be done in conjunction with United States Forest Service monitoring, if possible.

V. MANAGEMENT PROGRAMS

A. On-going Projects

1. Monitor Postpiles formation and Rainbow Falls for environmental degradation.
2. Use signs, trail materials, and vegetation rehabilitation to direct people and horses in appropriate directions and to help enforce regulations.
3. Maintain and update resource inventory of flora, fauna, and natural features; make or maintain working collection (voucher specimens only) of plants, small mammals, common birds, and common rock types.

4. Provide employees fire suppression training.

5. Maintain liaison with scientists working in or near the Monument.

B. New Projects

Priority

1. Project Name: Developmental Concept Plan for Monument facilities and access to postpile and Rainbow Falls.

1

Description of Project: Prepare DCP for high-use areas of the Monument. Facilities will be reevaluated with regard to management objectives, present and future management needs, and the fragility of the vegetation and soil. This will include plans for site hardening and upgrading, as appropriate, within the campground; rehabilitation and relandscaping areas denuded by trampling and/or construction; improving problem with parking, congestion, and access; reevaluation of the location of existing facilities and future needs; and improving visitor contact, distribution of visitor activity, and protection of both visitors and the fragile natural resources. This work will require inter-agency planning and NEPA evaluation.

Alternatives: To continue to manage with existing facilities would be inconsistent with management objectives and would continue to perpetuate existing resource impacts such as denuded vegetation and soil erosion.

Priority

Comments: 10-238 for preparation of plans to be prepared.

2. Project Name: Fire Management Plan

2

Description of Project: Prepare Fire Management Plan as required in NPS-18, Fire Management Guidelines.

Alternative: None

Comments: To be prepared cooperatively by staff at DEPO and SEKI. The planning will entail NEPA compliance.

3. Project Name: Water Quality Monitoring

3

Description of Project: Develop and implement a program to monitor water quality on the San Joaquin River. The program should be capable of documenting compliance (or non-compliance) with State water quality standards, identifying potential health hazards, identifying sources of pollution either originating in or entering the Monument; and characterizing long-term changes in the Monument's water quality. If possible, this work should be done either in conjunction with monitoring in the Inyo National Forest, by USGS, or by some other local agency with monitoring capabilities.

Alternatives: Though the intensity of the monitoring program may vary, the basic monitoring is needed to

Priority

enable Federal land managers to comply with Executive Order 11752 for prevention, control, and abatement of environmental pollution at Federal facilities; the Federal Water Pollution Control Act Amendments of 1972 (PL92-500) and interagency Memorandum of Understanding that precipitated from PL92-500; and the Clean Water Act of 1977 (PL95-217).

Comments: 10-237 to be prepared.

4. Project Name: Role of Fire in Lodgepole Pine

4

Description of Project: Study the natural role of fire in lodgepole pine. This research should be done in conjunction with the study that will be done in Sequoia and Kings Canyon National Parks (SEKI Project No. N-8).

Alternatives: This research could be done exclusively within the Monument, providing data that is site specific. However, the Monument is probably much too small to provide adequate information on the topic. This could probably be resolved by expanding the study into the Inyo National Forest with their permission.

The other alternative would be to not gather this information at all. Adequate fire management information

might be gained from the literature, though such information may not be applicable to the Monument. Though there are few areas in the Monument with sufficient fuel for prescribed burning, without information on the role of fire in the Monument, fire could be misused in those areas as a management tool.

Comments: This project should be programmed through SEKI, N-8.

