environmental assessment
development concept plan
july 1982

SEQUOIA / KINGS CANYON
GIANT FOREST

SEQUOIA / KINGS CANYON NATIONAL PARKS / CALIFORNIA

ENVIRONMENTAL ASSESSMENT

FOR THE

MODIFICATION

OF THE

DEVELOPMENT CONCEPT PLAN

GIANT FOREST

SEQUOIA/KINGS CANYON NATIONAL PARKS

CALIFORNIA

Denver Service Center
National Park Service
U.S. Department of the Interior

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MAPS

PURPOSE OF AND NEED FOR ACTION

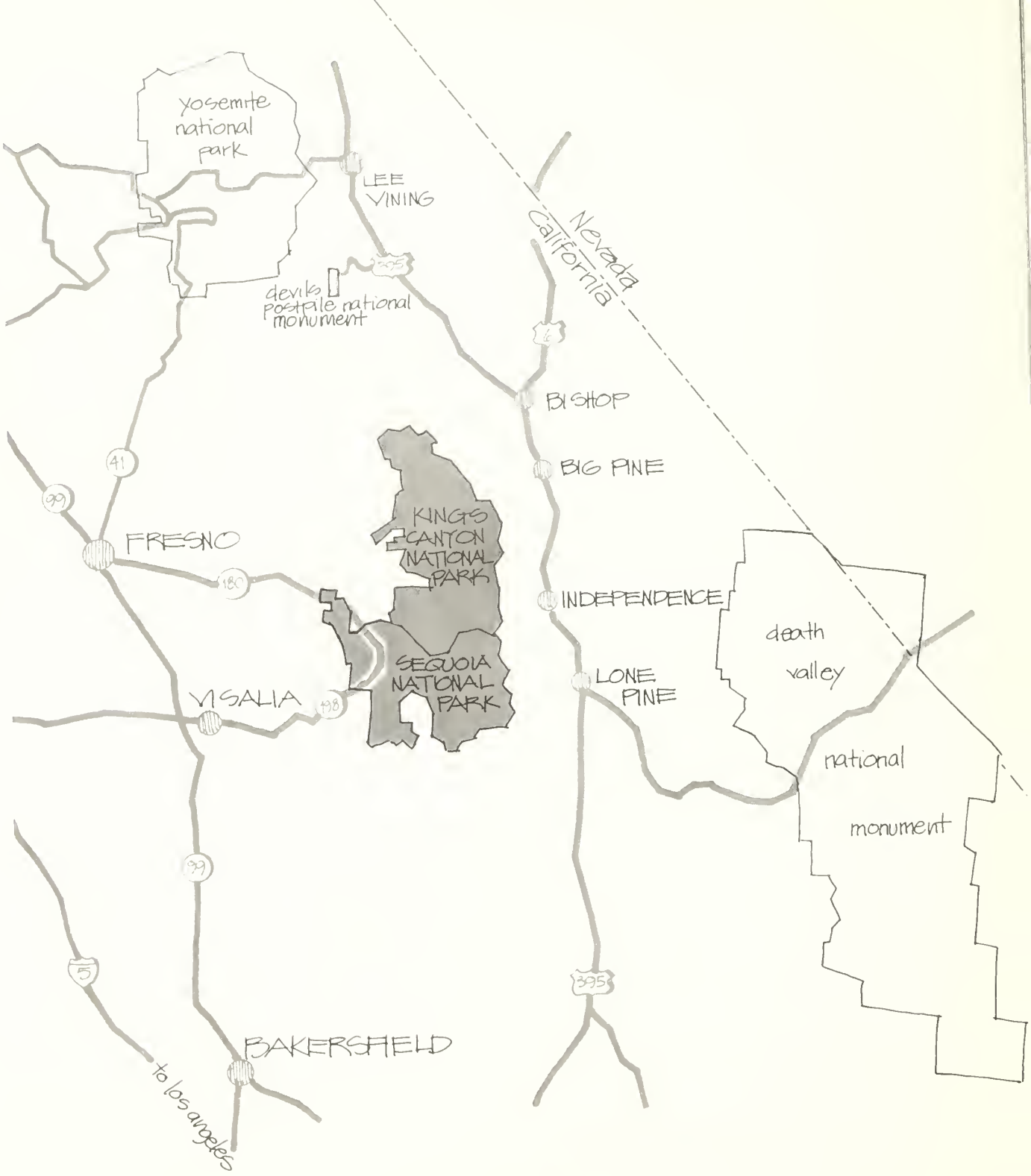
An approved 1979 Final Environmental Statement/Development Concept Plan, Giant Forest/Lodgepole, Sequoia/Kings Canyon National Parks (see Region map), recommended a phased relocation of development from the sensitive sequoia groves in the Giant Forest area to more resilient environments in the Clover Creek area. The plan called for removal of 50 existing historic cabins at Giant Forest as soon as overnight lodging facilities are provided at Clover Creek. However, because funding for the Clover Creek area is not programmed until 1984, it will be at least 1986/87 before overnight lodging facilities can be installed at that location.

In the meantime, the existing historic cabins, which are used for overnight lodging during the summer season, continue to deteriorate. There is little incentive to rehabilitate more of these structures because of the high cost to winterize them and because they will be eventually removed.

Since the 1979 plan, winter activities, particularly cross-country skiing, have increased dramatically in the last three years. Guest Services, Inc., a concessioner in Sequoia/Kings Canyon National Parks, responded to this increased winter use by opening 20 additional cabins at Giant Forest for the 1980/81 winter season and 20 more for the 1981/82 winter season. There are 95 cabins currently available for winter use, but these facilities do not adequately meet the present demand, and interest in winter recreation is expected to increase even more with the completion of a ski lift at the Wolverton ski area before the 1982/83 winter season. Along with the programmed expansion, an increase in the demand for overnight lodging is anticipated.

In order to meet the increased demand for overnight lodging during the winter season, Guest Services, Inc., would install 50 new temporary winterized cabins in the Giant Forest Village/Camp Kaweah historic district area. However, a condition to the installation of these temporary units would be the removal of an equal number of old cabins from the Giant Forest area--39 units from the upper Kaweah area and 11 units from the lower Kaweah area. The concessioner cabins would be eventually removed from Giant Forest and relocated to Clover Creek when funding is available to provide a sewage treatment plant and associated facilities for the cabins.

This Environmental Assessment examines the interim measure to provide temporary facilities until development can be completed in the Clover Creek area. The initial proposal to remove the historic cabins from Giant Forest remains the same. This assessment evaluates modifications to the original proposal that did not provide for temporary winterized cabins in the Giant Forest area. The analysis of the effects of this action is intended to serve as a supplementary document to the 1979 Final Environmental Statement/Development Concept Plan.



REGION

SEQUOIA/KINGS CANYON NP/CALIFORNIA

UNITED STATES DEPARTMENT OF THE INTERIOR/
NATIONAL PARK SERVICE

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AFFECTED ENVIRONMENT

The proposed site for the temporary winterized cabins in the upper Kaweah area comprises approximately 1 acre within the 2,425-acre Giant Forest sequoia grove, which is located in Sequoia National Park, Tulare County, California. Giant Forest is on the western slope of the Sierra Nevada, adjacent to the Central Valley of California, and is accessible via Generals Highway and either California 180 or 198 (see Vicinity map).

NATURAL ENVIRONMENT

Detailed information on the natural resources of Giant Forest is found in the 1979 Final Environmental Statement/Development Concept Plan. Only material related to modifications of the original proposal for the upper Kaweah area is repeated in this section.

Geology

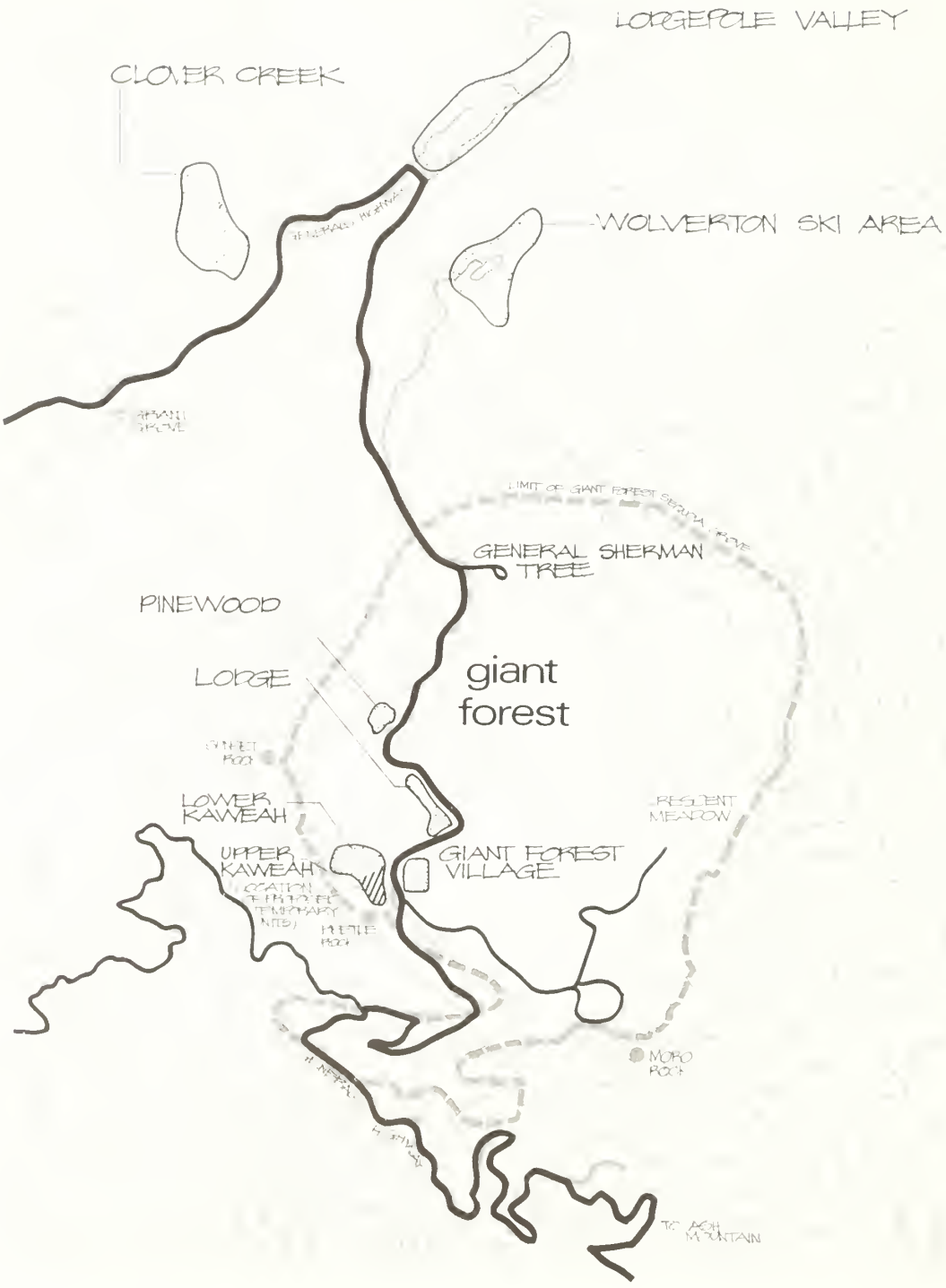
Giant Forest is located on a southeast terrace of granodiorite basement rock above the Marble fork of the Kaweah River system. Elevation is approximately 6,500 feet, and the area is relatively level with local rises and swales. Slopes drop off steeply from the terrace to the east, south, and west while the ridge climbs to the north.

Climate

The climate of Giant Forest is primarily influenced by the elevation and mountain topography of the area. Summers are mostly sunny; however, brief, intense thunderstorms may occasionally develop. The average daily temperature in Giant Forest during July ranges from 38 to 87 degrees Fahrenheit and during January from 0 to 50 degrees Fahrenheit. Over 90 percent of the area's precipitation falls as snow from October through April. A ten-year average of snow measurements for the Giant Forest area is 206.3 inches per year.

Soils

Most of the soils in Giant Forest are a deep variant of the Shaver series, which are forest soils that have developed as residual from granitic rocks in moist portions of the region. This variant ranges in depth from 54 inches to well over 6 feet in some areas and receives moisture from groundwater sources. The soils have a surface litter 2 to 3 inches deep, with a sandy loam soil texture throughout the mineral portion. The bottom of the soil profile shows gleyed colors indicative of a fluctuating water table. Characteristically, the Shaver series have moderately thick surface soils, 13 to 15 inches, with a coarse sandy loam texture that is slightly acidic and high in organic matter content. Subsoils have similar textures and are slightly to moderately acid in reaction. The high moisture content, high nutrient composition, and ease of root penetration make these soils suitable for giant sequoias.



VICINITY

giant forest

SEQUOIA/KINGS CANYON NATIONAL PARKS

(UNITED STATES DEPARTMENT OF THE INTERIOR/NATIONAL PARK SERVICE)

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Air Quality

Air quality in Giant Forest is generally good and has been designated a class I area under the 1977 Clean Air Act amendments. Air pollutants originate from highly populated areas outside the park, mainly from vehicular traffic on Generals Highway and to the visitor use areas. The pollutants are carried by air currents, and the immediate concentrations depend on the meteorological conditions. Ozone levels in the Giant Forest area sometimes exceed standards that are considered safe for urban areas.

Because of the high altitude of the park, it receives a large amount of ultraviolet light. The wave length of this light induces photochemical reactions to yield the more harmful pollutant compounds, nitrates and ozone. The giant sequoias are considered to have good tolerance from high levels of ozone and other oxidants that are the primary pollutants damaging to vegetation, but the impacts of those pollutants on other components of the ecosystem, of which the giant sequoias are an integral part, are not known (U.S. Department of Agriculture, Forest Service 1972).

Water Resources

Surface Water. The drainage creeks of the Giant Forest area are Sherman Creek, Little Deer Creek, Crescent Creek, and an unnamed creek to the southwest. All of these creeks, except Crescent Creek, flow northwesterly into Marble fork. Crescent Creek flows south into Moro Creek and then into the middle fork.

The water quality of Marble fork was reported to be of pristine quality in 1971, with no minerals, chemicals, or other substances that would need to be removed by water treatment. The water quality characteristics are reported to be within the U.S. Public Health Service drinking water standards.

Groundwater. Although groundwater flows in Giant Forest are not fully understood, the conditions are important to giant sequoias. It is possible that groundwater flows may be essential to the perpetuation of some sequoias, but there is limited documented evidence to support this statement.

Hydrologic Influences on Giant Sequoias. A study of hydrologic influences on the Giant Forest sequoia grove was conducted during the summer of 1968, a year of unusually dry conditions (Rundel 1972). Both soil moisture stress (indication of water in soil) and plant water stress (indication of water in plant xylem) were determined. The results showed that throughout the summer the soil moisture levels in all parts of the soil profile inside the groves remained well above those outside the grove. The plants outside the grove exhibited a greater water stress (higher stress with less water) that extended to a later date. The conclusion of the study indicated that moisture is a critical factor in the ecology of the giant sequoia ecosystem.

The increased soil moisture during the summer of 1968 can best be explained by an input of moisture by subsurface percolation of groundwater from higher elevations. Precipitation in Giant Forest was too little and scattered to account for the sharp increase in soil moisture. The drainage areas above the study transects were too small for runoff to greatly affect soil moisture. However, hydrologic information on the source and consistency of these hypothesized groundwater supplies does not exist.

It is of ecological importance to the giant sequoia that soil moisture be replenished by groundwater during late summer. More than any other single ecological factor, soil moisture availability determines the physiological limits of giant sequoia survival and maintains present grove boundaries. During drought stress of late summer, sequoia seedlings that have germinated in spring along margins of groves may die, and crown foilage of mature trees may brown. High mortality rates of first-year seedlings can be attributed to dessication during summer months, even in sequoia groves. Outside grove margins, surface soil moisture levels are too low to allow the survival of seedlings.

Floodplains/Wetlands

The floodplains of the drainage creeks have not been mapped, but because of the small size of the watersheds, overflows would be rare and not threaten structures or visitors in the area. No wetlands occur in the area of the proposed site.

Vegetation

The Giant Forest area contains mixed conifer with giant sequoias. The dominant tree species on the proposed site for the temporary lodging facilities is white fir. The understory consists of young white fir, heavy plant litter accumulations, and highly trampled areas. Manzanita shrubs occur in this area, but they are sparsely distributed.

Threatened or Endangered Plant Species. There are no threatened or endangered plant species on the acreage of concern in Giant Forest (Federal Register 1980). However, the giant sequoias (Sequoiadendron giganteum) are of international significance because of their limited range, large size, and life span of over 2,000 years (Harvey et al. 1980).

Giant Sequoia Ecology

The giant sequoia is restricted to about 75 disjunct groves along the western slope of the central and southern Sierra Nevada. Although at one time more extensively distributed, the giant sequoia's range has been largely reduced by changing climatic conditions. Although present grove boundaries seem stable, a majority of areas are undergoing a gradual decrease in density of giant sequoias because of low levels of regeneration. This decline in density began long before the influence of man on the groves. However, at this time Giant Forest seems to be a mature, steady-state grove.

An interaction of factors within the ecosystem controls giant sequoia grove boundaries. Availability of soil moisture at the seedling stage is the single most critical factor for maintenance of groves (Rundel 1972). Other environmental conditions, such as temperature and physiographic factors are of secondary importance. Giant sequoias are associated with conifers, such as white fir, sugar pine, and incense cedar. The white fir is especially tolerant of shade, and unless white fir reproduction is controlled by fire, there is a tendency for it to eliminate reproduction while mature sequoias linger as successional relicts.

Fire is an important component of the giant sequoia ecosystem. In addition to controlling ground cover and understory to provide room for germination of sequoia seeds, hot fires cause the serotinous sequoia cones to open and release their seeds in tremendous numbers (Harvey et al. 1980). Larger sequoias are insulated from the effects of fires by their thick, relatively fire-resistant bark. Lower branches are sloughed off early in the life cycle, reducing the probability of crown fires. As a result, the giant sequoias are well adapted to withstand fire, and in fact they require it for long-term survival (Harvey et al. 1980).

Reproduction of giant sequoias is not restricted to conditions produced by fire, although an altered substrate and open forest floor enable more seedlings to survive. Root pits of fallen trees, sandbars of rivers, small streams and creeks, and other minor disturbances provide a receptive seedbed for sequoias. Seeds for these intermittent and randomly occurring seedbeds come mainly from the activities of two animals, a minute beetle and the chickaree. The most significant seed release is due to the cone-mining activity of the beetle, which mainly attacks green cones five to eight years old. The chickaree feeds on two- to five-year-old cones, and the fleshy green cone scales appear to be its major food source in sequoia groves.

Giant sequoia seeds will germinate in almost any natural medium in the forest if there is sufficient moisture. However, the primary survival factor of seedlings depends on whether or not the rooting medium remains moist and allows for rapid root penetration. Nearly 90 percent of the mortality rate reported was attributed to lack of soil moisture. Seedlings that form deep root systems early in the year, before the decline of soil moisture levels, and seedlings adjacent to rocks, limbs, and other objects that help retain soil moisture show a high survival rate (Rundel 1972). Few insects attack young seedlings, but heat canker may kill exposed seedlings, and pathogens and falling debris also take their toll on the seeds (Harvey et al. 1980).

Although relatively brief in the life cycle, the seedling stage of giant sequoias is critical, and the mortality of seedlings in their first year of growth is high. Harvey and others (1980) found a mortality rate of nearly 75 percent between July 15 and October 30, 1966, in a study of over 2,000 seedlings in fire-manipulated plots in the Redwood Mountain Grove.

Once seedlings have a majority of their roots located in a zone of relatively permanent soil moisture, growth is extremely rapid. They may reach over 10 feet in height in ten years, and a few may grow 2 feet

vertically per year. This rapid growth, including development of bark and quick loss of lower branches, enables the sequoia to better withstand fire.

Giant sequoia seedlings are better adapted to full sunlight and moderate shade than white fir seedlings. Sequoia seedlings grow best with a litter cover that reduces heat damage to the stem and lowers soil temperatures; they also survive or endure in areas of dense shade but grow poorly. Sequoia seedlings are better able to endure drought than white fir, apparently because of their extensive root system. The presence of dry, dense litter layers adjacent to groves may inhibit seed germination and establishment in many areas.

In large mature groves, such as Giant Forest, the mortality rate remains high until the trees are about 4 feet in diameter, which generally means they are about 400 years old. Beyond this age, there are only slight distinctions in mortality rates between age classes. Factors seemingly involved in the deaths of older trees include toppling of trees from fungus-weakened roots, undercutting by streams, excessive strain due to snow or wind, and waterlogged soils. However, many trees live to be over 2,000 years old (Harvey et al. 1980).

Mature sequoia trees have extensive root systems that may extend outward from the trunk up to 200 feet. The system consists of large roots up to 3 feet in diameter and tiny threadlike feeders that spread out from larger roots near the base of the tree. The entire root system is within 4 to 5 feet of the soil surface (Engbeck 1976).

In groves where there is heavy visitation, both direct effects and alteration of key environmental conditions appear to affect the vigor of mature trees and regeneration of the species. Giant sequoias are subject to direct injury from construction and use of existing facilities. Buildings, parking areas, and compacted soils alter the soil moisture regime. Fire suppression maintained in developed areas increases competition against the giant sequoia and reduces reproduction.

With development sites located in a sequoia grove, management techniques for the best protection of the prime resource are not possible, and the ability of the grove to perpetuate itself is hampered.

Wildlife

Some of the more common wildlife species in the area include black bear, raccoon, Douglas squirrel, chickaree, deer mouse, Steller's jay, and mountain chickadee.

Rare or Endangered Wildlife Species. No wildlife species listed by the U.S. Fish and Wildlife Service as rare or endangered are known to currently inhabit the Giant Forest area (U.S. Department of the Interior, Fish and Wildlife Service 1980).

Aesthetic Quality

Giant Forest contains the largest sequoia grove in Sequoia National Park. The dark enclosed forest of monumental sequoias contrasts with moist Sierran meadows that are interspersed throughout the grove. Rock outcrops, including Moro rock, Sunset rock, and Beetle rock, line the edge of the forest and offer views of the high country and the San Joaquin Valley. Development at the Giant Forest Village and lodge is visually intrusive to the natural setting of the giant sequoia grove. Buildings, parking areas, roads, and signs disrupt the serene atmosphere and compete with the prime resource.

VISITOR USE

Visitation

The number of visitors to Sequoia/Kings Canyon National Parks totaled 1,877,500 in 1981. Generally, visitation increased until 1978, when the total declined; however, since that time visitation has again started to increase (see table 1). Over 70 percent of the visits occur from June through September.

Table 1: Annual Visitation

Year	Sequoia	Kings Canyon	Total
1981	1,095,064	782,472	1,877,500
1980	862,800	823,800	1,686,600
1979	799,600	804,200	1,603,800
1978	973,400	869,900	1,843,300
1977	978,600	1,046,600	2,025,200
1976	1,040,575	1,127,902	2,168,477
1975	957,386	1,035,294	1,992,680
1974	686,940	1,224,400	1,911,340
1973	846,280	906,770	1,753,050
1972	869,600	1,058,040	1,927,640
1971	882,000	896,690	1,778,690
1970	875,670	1,018,990	1,894,660

Visitor Experience

Giant sequoias, sentinels in the upper Kaweah area of Giant Forest, await visitors driving from Ash Mountain. There are 2,425 acres of giant sequoia groves in the Giant Forest area, some sequoias displaying limbs larger than most trees. One of the main attractions in the area is the General Sherman tree, which is estimated to be 2,500 to 3,000 years old. From its base, the sequoia extends 274.9 feet towards the sky, and the circumference on the ground is 102.6 feet.

Various trails in the groves provide the opportunity for visitors to experience the majestic pristine sequoia environment. An excellent map of the trails is available from the visitor center and ranger station. In addition, there is an NPS visitor information booth near the Giant Forest market.

Winter recreation in Sequoia/Kings Canyon National Parks has increased dramatically in recent years. Alpine skiing, cross-country skiing, snow shoeing, snow play, photography, and other winter activities are popular in the Giant Forest area. However, overnight lodging facilities are inadequate to meet the increased visitation.

CULTURAL RESOURCES

Prehistory

Prior to historic times, the Sequoia/Kings Canyon region was inhabited by the Western Mono, Yokut, and Owens Valley Paiute Indians (Steward 1935). Subsistence was based primarily on hunting and gathering, which entailed seasonal migrations from permanent base camps to temporary camps at higher elevations. The park area was also used as a trade route by the Western Mono and the Owens Valley Paiute.

An archeological survey was conducted in Giant Forest during the fall of 1975 by the National Park Service, Western Archeological Center, in Tuscon, Arizona. No archeological resources were discovered in the immediate project area. The proposed site was again surveyed in the spring of 1982 and again, no resources were identified.

History

Discovery of Giant Forest by non-Indians occurred in 1858. A group of Yokuts living in the vicinity of what is now Three Rivers invited Hale Tharp to join them in a visit to their summer camps in the mountains. Tharp was eventually led to the Giant Forest Plateau.

By the 1880s, the indiscriminate harvest of sequoias caused preservation efforts to focus on withdrawing sequoia groves from the public domain. Those efforts culminated in congressional action in 1890 establishing Sequoia National Park.

The opening of the Generals Highway through the Giant Forest portion of Sequoia in 1926 led to the development of Giant Forest Village and the Camp Kaweah housekeeping cabin complex to accommodate the resultant increase in tourism. During 1927 and 1928, construction of wooden rustic cabins began, some of which were weather-sealed for winter use. By 1933 upper Kaweah was essentially complete, although some conversions of earlier tent-frames to rustic cabins continued until the late 1930s.

In compliance with Executive Order 11593, a thorough historic resources study completed in 1975 resulted in the nomination of several structures in the Giant Forest area to the National Register of Historic Places (U.S.

Department of the Interior, National Park Service 1975). The 39 cabin units in the Giant Forest Village/Camp Kaweah historic district were nominated to the national register for their regional significance in the field of recreation and their local significance in the fields of architecture, landscape architecture, and literature.

The approved 1979 Development Concept Plan called for the demolition of the overnight lodging facilities in the Giant Forest area of the park, including the 39 cabin units in the Giant Forest Village/Camp Kaweah historic district. The removal of the cabins adversely affects the historic district. Accordingly, pursuant to section 106 of the National Historic Preservation Act, the National Park Service requested the comments of the Advisory Council on Historic Preservation on the Development Concept Plan. The council's comments were received in the form of a memorandum of agreement ratified by the chairman on August 21, 1978. Generally speaking, the council and the California state historic preservation officer agreed with the National Park Service to accept the loss of the historic cabins in the interest of preserving the giant sequoias.

ALTERNATIVES

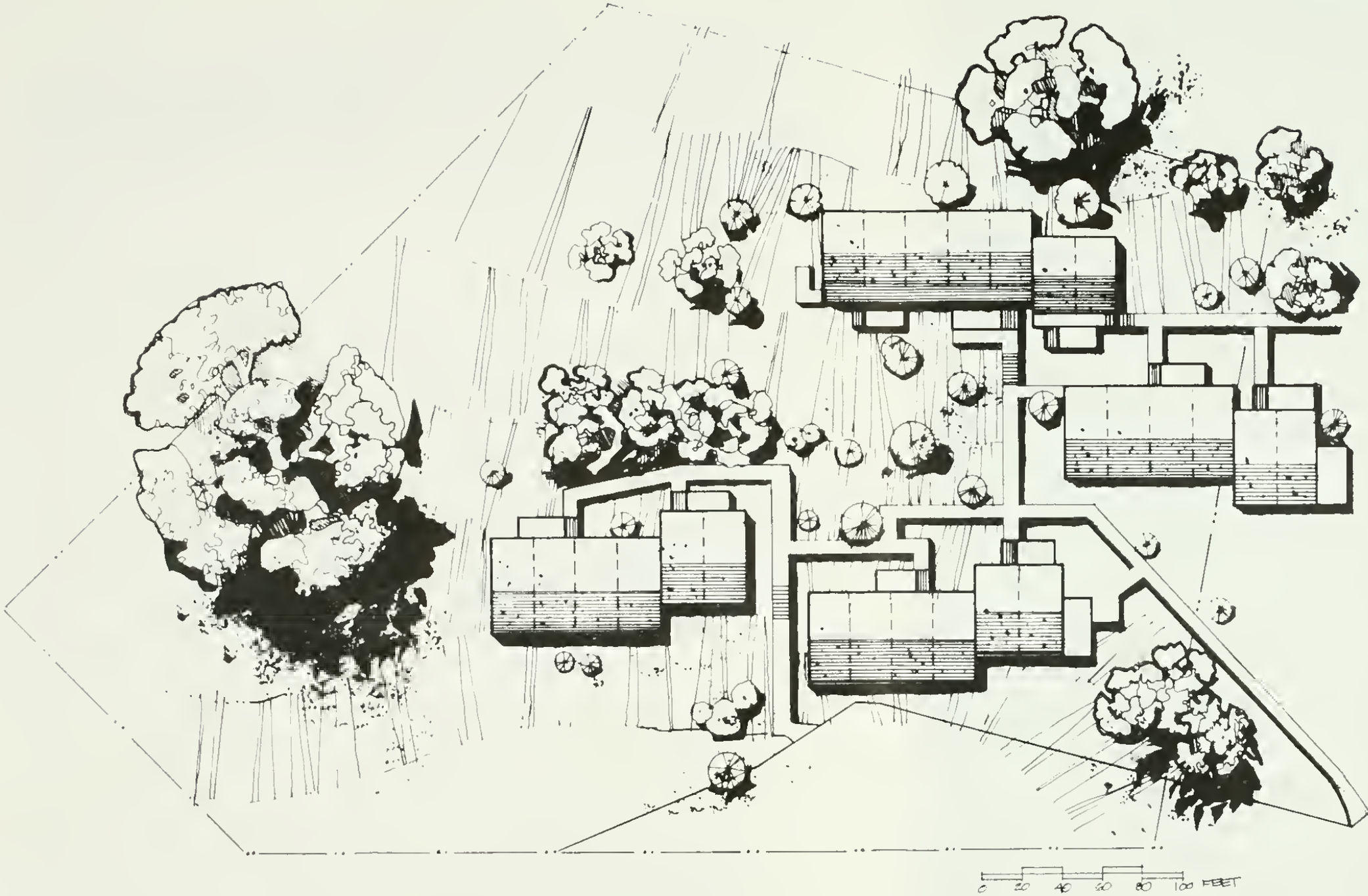
For the purposes of this Environmental Assessment, only two alternatives are presented for consideration and review. Alternative A describes the proposed interim action of installing 50 temporary movable winterized cabins in the Giant Forest Village/Camp Kaweah historic district, after removal of 39 cabin units from the upper Kaweah area and 11 units from the lower Kaweah area. These temporary cabins will be placed on the proposed site as an interim measure to provide adequate winter lodging. Although this proposal modifies the strategy of the proposed action outlined in the 1979 Final Environmental Statement/Development Concept Plan, the intention of removing all concession functions from the Giant Forest area has not changed. Alternative B represents the no interim action alternative (or the proposed action in the 1979 document) and constitutes the approved management direction.

Wolverton, Wolverton Corrals, and Lodgepole were considered as possible sites for the temporary cabins. Although all three sites could accommodate 50 temporary cabins, they were rejected for a variety of reasons. Wolverton and Wolverton Corrals would need new utility systems prior to installation of the temporary units. The cost of constructing an interim utility system would be high and the expected environmental effects would be great. Additionally, the Wolverton area is a day use area and establishing overnight facilities has never been a management intention in this location. Lodgepole is a principal center for camping and some concern was expressed about changing the character of the area by providing overnight lodging.

ALTERNATIVE A - PROPOSED INTERIM ACTION

Under the proposed interim action alternative, 39 nonwinterized cabins from upper Kaweah and 11 from lower Kaweah will be replaced with 50 temporary winterized cabins at upper Kaweah (see Proposed Interim Action map). The new cabins will be installed only as an interim measure. The temporary movable cabins will include baths, which the existing historic cabins do not have. The cabins will be movable and placed in the Giant Forest area only temporarily until the permanent Clover Creek site is prepared for their relocation. The new cabins will be located and designed to minimize impacts on the natural environment. Special construction techniques will also be used to mitigate potentially adverse environmental effects. These techniques will include raised wood walkways with utilities attached underneath and treated wood foundations that will only require 6- to 12-inch-deep trenches. The units will be prefabricated and transported to Giant Forest to minimize construction activity on the site.

The National Park Service is committed to the removal of the temporary structures and accordingly will take all necessary steps to ensure that the temporary cabins located in upper Kaweah be removed no later than the end of fiscal year 1987.



PROPOSED INTERIM ACTION TEMPORARY WINTERIZED LODGING FACILITIES

giant forest

NORTH

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ALTERNATIVE A - PROPOSED INTERIM ACTION

Impacts on Natural Environment

Implementation of the proposed interim action in the Giant Forest Village/Camp Kaweah historic district will result in various environmental effects.

The preparation of the proposed site will require the removal of 16 white fir trees, with an 8- to 42-inch diameter, for access to the area.

The proposed prefab wood box beam, pressure-treated foundations will require the digging of trenches with a maximum width and depth of 12 inches. These foundations will be placed on a gravel base in the trenches. A total of 2,100 linear feet will be trenched and result in some root pruning of 13 sequoias. The root pruning will increase susceptibility of the sequoia trees to fungal infections by Fomes annosus, but the shallow depth of the trenches will limit the extent of the effect on sequoias because of their deeper, primary-lateral root system.

Elevated walkways are proposed for all foot access from the parking lots to and between the cabin units, along with aboveground utility fixtures. The walkways will be supported by surface pylons, and no trenches will be dug to install utility systems. The utilities will be enclosed below the elevated walkways but above the ground level. A pathway system is also proposed in the sequoia grove. This pathway will be surfaced with asphalt for a total distance of 1,000 feet and a width of 5 feet. Approximately 0.25 acre of surface area will be covered.

Following site preparation, the temporary movable cabins will be transported to the proposed locations via trailers, with a combined weight of 7 tons. A crane, weighing approximately 35 tons, will transfer each cabin to its prepared site. Each site will accommodate two cabins, near existing roadways, in a two-story configuration.

The soil requirement of 2,500 pounds per square foot may not be a limiting factor to cabin placement; however, the Shaver series soils have high compaction hazards and moderate bearing capacity (Thompson Architectural Group, Inc. 1982). The compaction hazard indicates that portions of the root systems of 13 giant sequoias will be affected by compaction related to construction activities. Less than 10 percent of any 1 tree's root system will be affected. Extensive soil compaction will decrease the quality of the moisture regime because less total water may be contained in a heavily compacted area. Compaction may also damage root systems and increase susceptibility to fungal infections as a result of Fomes annosus.

The area of potential intense soil compaction includes the three crane transfer sites, 150 square feet each, and the pathways, totaling 3,000 square feet, off the existing paved access routes. The crane transfer sites will be required to bear at least 25 tons for short periods of time

during installation. The trailer load with one portable unit will result in soil compaction due to the 1-ton-per-square-foot pressure on the surface. The combined effects of the additional weight on the soils and their compactibility has not been precisely evaluated, but some degree of additional soil compaction could be expected. The added stress on the sequoias because of soil compaction has not been thoroughly investigated in order to determine their limits of tolerance.

Site preparation, minor surface grading, and activities associated with installing the cabins will result in a slight, temporary increase in soil erosion hazards. Runoff, sedimentation, and turbidity in the immediate drainage creeks will slightly increase. The operation of heavy equipment in the area will result in a slight, temporary deterioration in air quality due to increases in dust and emissions. Additionally, increased winter use of the cabins will add a slight amount of vehicular emissions during that period.

Removal of some competitors and drainage from the installed cabins will result in an improved moisture regime for mature sequoias (Harvey et al. 1980). The improved moisture regime may be negated by the additional soil compaction in the area. The continuation of overnight lodging in the Giant Forest area precludes the use of fire as a management tool for improving sequoia habitat until all concession facilities are moved to alternate locations.

Some wildlife will be disturbed or displaced as a result of implementing the proposed interm action, but some species will be enhanced by the establishment of new habitats in and around the unnatural structures. The wildlife habitat that may be affected amounts to less than 1 acre, and at the same time, removal of the dispersed historic cabins will return more than 2.5 acres to near-natural conditions. These cabins will be removed manually in order to restrict the effects of demolition equipment onsite.

The use of the winterized cabins will require a net increase over present use volumes of approximately 4,000 gallons of water per day during the summer season and 7,000 gallons per day during the winter season. The water source for the area is Wolverton Creek, and the additional demands will add further stress to the aquatic environment. This impact will be especially pronounced during low flow periods in the late summer and early fall. The additional stress is not expected to be significant since the firm yield of Wolverton Creek has been measured at 130,000 gallons per day. The increased draw on Wolverton Creek may result in decreased groundwater available to the Giant Forest area.

The increased water consumption will place additional demands on the Imhoff tank and sewage sprayfield. The soils under the tank and sprayfield locations are of similar characteristics as those of the Tollhouse series. The slopes are too steep and the soils are shallow and contain too high a volume of rock fragments to be effective for percolation and containment of sewage effluent. However, the system has since been improved, and the California Water Resources Board representative checked the treatment facility in April 1982. The representative determined that the wastewater system could handle the additional flows

resulting from the proposed cabins. This approval was granted under the same interim basis (until 1988) as was agreed in 1978 for the existing facilities.

The overall effect of implementing this proposal will not result in a net gain or loss of covered surface area. The gain of 1,500 square feet by removing the historic cabins is almost exactly offset by the surface covered for the movable cabins and the walkways. There is a slight gain of less building to land contact resulting from the action. The net effect of implementing the proposed interim action will be a smaller "footprint" because of a 2.0-acre smaller area occupied by the structures. This area, which the old cabins will be removed from, will be restored to as natural a condition as possible.

The ultimate removal of these interim cabins and the existing concession facilities from Giant Forest is the primary park objective. Their removal will not eliminate the soil compaction problem, and this condition will be left to natural processes. The duration of soil compaction has not been investigated, but this condition does impede root penetration (Heilman 1981). In the long-term, the area will be returned to as natural a state as possible.

Impacts on Visitor Use

Implementation of alternative A will not alter the visitation patterns at Giant Forest during the summer season. However, during the winter season, more visitors will be expected in the area if 50 additional winterized cabins are installed. Traffic congestion at the Giant Forest visitor center or orientation to the area will not be alleviated under the proposed interim measure. In fact, the availability of additional winterized cabins will result in an increase in traffic during the winter months.

Use of the temporary cabins will expand the opportunity for overnight visitor stays in Giant Forest during the winter season. Visitation will be in conjunction with the increased interest in winter activities at Giant Forest. These cabins will accommodate 200 additional visitors per night during the winter. Although higher quality accommodations will be provided at a higher price during the entire year, some visitors will be disappointed that the rustic cabins have been removed from the area.

The clustered two-story movable units may be more aesthetically intrusive on the environmental setting than the existing dispersed cabins. Although the proposed cabins may be more imposing to visitors arriving in the area, the situation is temporary because these units would be relocated to the Clover Creek area.

Impacts on Cultural Resources

Implementation of alternative A will not create any new impacts to the Giant Forest Village/Camp Kaweah historic district, because the removal of the cabins from that district was proposed and approved as part of the

1979 Development Concept Plan. The memorandum of agreement for that plan has been amended to reflect the current proposal (see "Consultation and Coordination" section).

This alternative would have no impact on archeological resources. The project area has been surveyed, and a clearance has been issued by the Western Archeological Center (038-83-SEKI, June 24, 1982).

ALTERNATIVE B - NO INTERIM ACTION

Impacts on Natural Environment

Maintaining the original proposed no action alternative in the 1979 Final Environmental Statement/Development Concept Plan would lead to identical impacts as described in that document. The adverse impacts outlined as a result of implementing alternative A would be avoided under this proposal, but the positive effect of removing the 50 cabins would be delayed. The existing cabins are in a deteriorated state, and they would not be rehabilitated because of their poor condition. These cabins would continue to intrude on the natural setting. More land to structure contact would result from keeping the existing cabins, but no significant difference in land surface covering would be expected. Pathways and casual pedestrian routes would continue to have direct impacts on soils and vegetation. Implementation of this alternative would lead to continued intrusion on the 2.5 acres occupied by the dispersed cabin units.

The anticipated increase in water consumption as a result of the implementation of alternative A would not occur under this proposal. Current water rates would not be altered, and the additional potential impacts due to low flow stress on the aquatic life of Wolverton Creek would not result.

Impacts on Visitor Use

Visitation patterns at Giant Forest would not be altered under alternative B. Traffic congestion or visitor orientation problems would not be alleviated under the no interim action alternative.

Because more winterized overnight lodging facilities would not be provided for under this alternative, increasing winter visitation demands in Giant Forest would not be met. Ultimately, sufficient winter accommodations would not be provided until concession facilities are moved to Clover Creek.

Impacts on Cultural Resources

Implementation of alternative B would not create any new impacts on the cultural resources of the area.

CONSULTATION AND COORDINATION

Throughout the process of the original planning effort for the 1979 document, an extensive public involvement program was conducted. Discussions relevant to Giant Forest indicated general support for relocating concession facilities from Giant Forest to Clover Creek to protect the giant sequoias. Some concern was expressed regarding changing the traditional uses in the Giant Forest area, along with reservations about expectations for increased future visitation to the park and potential impacts.

Planning involved several knowledgeable and interested people. These preliminary contacts were made to gather information and input relative to the proposal before it was developed formally. Those contacted included the following:

- Knox Mellon and others
- Paul Pritchard, Destry Jarvis, Russell Butcher
- Joe Fontaine, Carl Pope
- Dan Taylor, Glen Olsen
- Bern Shanks
- State Historical Preservation Office
- National Parks and Conservation Association
- Sierra Club
- Audubon Society
- California Department of Natural Resources

In addition to the above informal contacts, a field trip to the proposed temporary site at upper Kaweah was made with the state historic preservation officer and personnel from the Department of Natural Resources.

Although the implementation of alternative A would not delay the demolition and removal of the historic cabins that comprise the Giant Forest Village/Camp Kaweah historic district, as identified as the proposal in the 1979 Development Concept Plan, the concessioner's proposal does call for the replacement of some of the cabins on a temporary basis in the historic district. Therefore, further consultation with the state historic preservation officer and the Advisory Council on Historic Preservation was required.

Accordingly, on April 8, 1982, consultations were held with the historic preservation officer and members of his staff. On April 22, 1982, additional consultations were held with the staff of the Advisory Council, and on April 26 and 27 representatives of the Advisory Council, the National Park Service, and the California state historic preservation officer participated in the onsite inspection to further discuss the concessioner's proposal.

As a result of those consultations and the onsite inspection, it was agreed to amend the 1978 memorandum of agreement with a stipulation that would ensure removal of the temporary facilities no later than the end of fiscal year 1987. A copy of the executed amendment is included in appendix A.

Copies of this Environmental Assessment will be sent to interested parties for their review and comment.

Advisory Council
Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

MEMORANDUM OF AGREEMENT

WHEREAS, the National Park Service proposes to remove overnight facilities in Sequoia National Park, California, that adversely affect internationally significant natural values for the preservation of which Congress established the park; and,

WHEREAS, the National Park Service, in consultation with the California State Historic Preservation Officer, has determined that this undertaking as proposed would have an adverse effect upon the Giant Forest Lodge Historic District, the Giant Forest Village, and the Camp Kaweah Historic District, properties included in the National Register of Historic Places; and,

WHEREAS, pursuant to Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f, as amended, 90 Stat. 1320) and Section 2(b) of Executive Order 11593, the National Park Service has requested the comments of the Advisory Council on Historic Preservation; and,

WHEREAS, pursuant to the procedures of the Advisory Council on Historic Preservation (36 CFR Part 800), representatives of the Advisory Council on Historic Preservation, the National Park Service, and the California State Historic Preservation Officer have consulted and reviewed the undertaking to consider feasible and prudent alternatives to avoid or satisfactorily mitigate the adverse effect; now,

THEREFORE:

It is mutually agreed that implementation of the undertaking, in accordance with the following stipulations, will satisfactorily mitigate any adverse effect on the above-mentioned properties:

Stipulations

1. Prior to demolition, the National Park Service will consult with the Historic American Buildings Survey (HABS), Heritage Conservation and Recreation Service, and the California State Historic Preservation Officer to develop and implement a program to record the Giant Forest Village, and Camp Kaweah Historic District to standards established by the Historic American Buildings Survey. The recordation program may include, but not necessarily limited to, a written history, record photographs, and measured drawings.

Copies of the documentation resulting from the recordation program will be filed with HABS, the Archives of the State of California, and with the California State Historic Preservation Officer;

2. Suitable architectural features and hardware from the cafeteria will be salvaged for reuse in restoration of the Giant Forest Market;

3. The Giant Forest Market will remain *in situ* and will be adaptively restored as a visitor contact station. The comfort station and the District Ranger's Residence will remain *in situ* and continue to be used for those purposes;

4. Beetle Rock, an element of the significance of the Camp Kaweah Historic District, will not be altered by the proposed undertaking; and,

5. Upon completion of demolition in each historic district, the National Park Service will notify the Keeper of the National Register, in writing, in order that it can be removed from the National Register.

(date) 7/12/78
Deputy Executive Director
Advisory Council on Historic Preservation

(date) 7/25/78
National Park Service

(date) 8/1/78
California State Historic Preservation Officer

(date) 8/21/78
Chairman
Advisory Council on Historic Preservation

Advisory
Council On
Historic
Preservation

1522 K Street, NW
Washington, DC 20005

MAY 2 [illegible] 1982

Mr. Howard H. Chapman
Regional Director
Western Region
National Park Service
450 Golden Gate Avenue
Box 36063
San Francisco, CA 94102

Dear Mr. Chapman:

The Council has received your signed proposal including the written concurrence of the California State Historic Preservation Officer for amendment to the Memorandum of Agreement for the Giant Forest/Lodgepole Development Concept Plan, Sequoia - Kings Canyon National Parks, and the Giant Forest Village/Camp Kaweah Historic Districts ratified August 21, 1978.

We have reviewed the proposal and have determined that it represents the agreement reached by the consulting parties. Therefore, pursuant to Section 800.6(c) of the Council's regulations (36 CFR Part 800), an amendment to the Memorandum of Agreement has been prepared and forwarded to the Chairman of the Council for ratification. It will become final after 30 days or earlier if ratified by the Chairman. A copy of the ratified Agreement will be provided for your records.

Thank you for your cooperation.

Sincerely,

Thomas F. King
Director, Office of Cultural
Resource Preservation

Advisory
Council On
Historic
Preservation

1522 K Street, NW
Washington, DC 20005

AMENDMENT
TO
MEMORANDUM OF AGREEMENT

WHEREAS, the National Park Service (NPS), Department of the Interior, the California State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (Council) executed a Memorandum of Agreement on August 21, 1978, for the removal of overnight facilities in Sequoia National Park, California; and,

WHEREAS, NPS proposes to amend the Development Concept Plan for the Giant Forest/Lodgepole Area of Sequoia National Park to permit the Park Concessioner temporarily to replace existing historic lodging facilities with modern facilities within the Giant Forest Village/Camp Kaweah Historic Districts; and,

WHEREAS, pursuant to 36 CFR Sec. 800.6(c)(4) of the Council regulations, NPS has now requested an amendment to the Memorandum of Agreement; and,

WHEREAS, pursuant to Section 800.6 of the Council's regulations, representatives of the Council, NPS, and the California SHPO have consulted and reviewed the proposed amendment to consider alternatives to avoid or satisfactorily mitigate the adverse effect;

NOW, THEREFORE, it is mutually agreed that the undertaking will be implemented in accordance with the Memorandum of Agreement ratified on August 21, 1978, as amended by the attached proposal.

Robert R. Garvey May 19, 1982
Executive Director (date)
Advisory Council on Historic Preservation

Alexander Aldrich 5/24/82
Chairman (date)
Advisory Council on Historic Preservation

PROPOSAL TO AMEND THE MEMORANDUM OF AGREEMENT FOR THE GIANT FOREST/ LODGEPOLE DEVELOPMENT CONCEPT PLAN, SEQUOIA-KINGS CANYON NATIONAL PARKS, CALIFORNIA, RATIFIED AUGUST 21, 1978.

STIPULATION:

The National Park Service will take all steps necessary to ensure that the temporary structures to be located in the Giant Forest Village/Camp Kaweah Historic Districts will be removed no later than the end of fiscal year 1987.

SIGNED: Lawrence C. Chapman DATE: 4/29/82

Regional Director
Western Region
National Park Service

SIGNED: R. Malch DATE: 5/6/82

California State Historic
Preservation Officer

REFERENCES

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As the nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, and parks and recreation areas, and to ensure the wise use of all these resources. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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