environmental assessment comprehensive design

SEQUOIA- KINGS CANYON



NATIONAL PARKS / CALIFORNIA

ENVIRONMENTAL ASSESSMENT

for

DORST CREEK CAMPGROUND

SEQUOIA-KINGS CANYON NATIONAL PARKS
California

June 1987



http://archive.org/details/environmentalass87dorst

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PURPOSE AND NEED

Dorst Creek campground, located in Sequoia-Kings Canyon National Parks, consists of: 222 individual campsites, a group campground, comfort stations, and a RV sanitary dump station. This site is adjacent to the Generals Highway, north of Lodgepole, near the north boundary of the park. The campground was originally planned in the mid 1930s and reflects the type of vehicles used at that time. As a result, the spaces, grades, and turning radii are inadequate for the RV and trailer campers of the 1980s. The campground is a seasonal facility, usually opening during the Memorial Day weekend and closing after Labor Day. During the winter, the site experiences heavy snow, normally starting in late November. Occasionally winters of exceptionally heavy snow have required the campground to be plowed prior to opening, and has infrequently set opening back to mid-June.

In spite of the short season of use, as a result of unregulated/unrestricted vehicle traffic campsites are run down, with many areas void of vegetation due to overuse and soil compaction. This results in reduced root growth, increasing the chance for disease in older trees as well as reducing the chance for seedling survival. The campground is devoid of pine cones, fallen branches and tree needles, which precludes normal decomposition and nutrient cycles. The net result inhibits natural revegetation, contributing to erosion during wet periods, and dust immediately after.

Road pavement is seriously deteriorated and is non-existent for parking at individual sites and the group camping area. Vehicular circulation is poor and confusing. Spaces and turning radii are frequently inadequate. This, combined with road grades in some loops being excessively steep, make it difficult for RVs and trailers to stay on the pavement, and to safely travel through the campground.

Many individual sites have steep access from their vehicle parking. Many are steeply cross sloped, a few are on rock ledges and some are immediately off of the main campground road. When these problems are combined with the other problems of the campground, it suggests consideration of abandoning some sites, and perhaps even some loops. A variety of sign materials, and sign and lettering styles exists. This creates a feeling of disorganization and detracts from the visitors' opportunity for a quality experience.

The purpose of this environmental assessment is to compare and evaluate the environmental consequences of the alternatives that could guide the future maintenance and redesign of the Dorst Creek campground.

AFFECTED ENVIRONMENT

NATURAL RESOURCES

Geology/Topography/Soils

The geologic conditions in the Dorst Creek campground are typical of the Sierra Nevada. This range, composed of metamorphic rock with intrusions of granite, has been uplifted and tilted to the west through time. Much of the older metamorphic rock has eroded away, leaving a largely granitic area exposed. In the study area granitic exposures are less dramatic and other igneous rock predominates.

Elevations in the campground range from 6,500 feet to 7,000 feet.

The soils in the Dorst Creek campground are classified as Toiyabe-Corbett-Granite Rockland association. These soils consist of shallow to moderately deep loamy sands and sandy loams that have developed on granite rock. Corbett soils are 35 to 50 inches deep; weathered granidiorite and Tioyabe soils are less than 22 inches deep. Toiyabe soils are intermingled with granite outcroppings and are generally on steep slopes or within areas of hard bedrock.

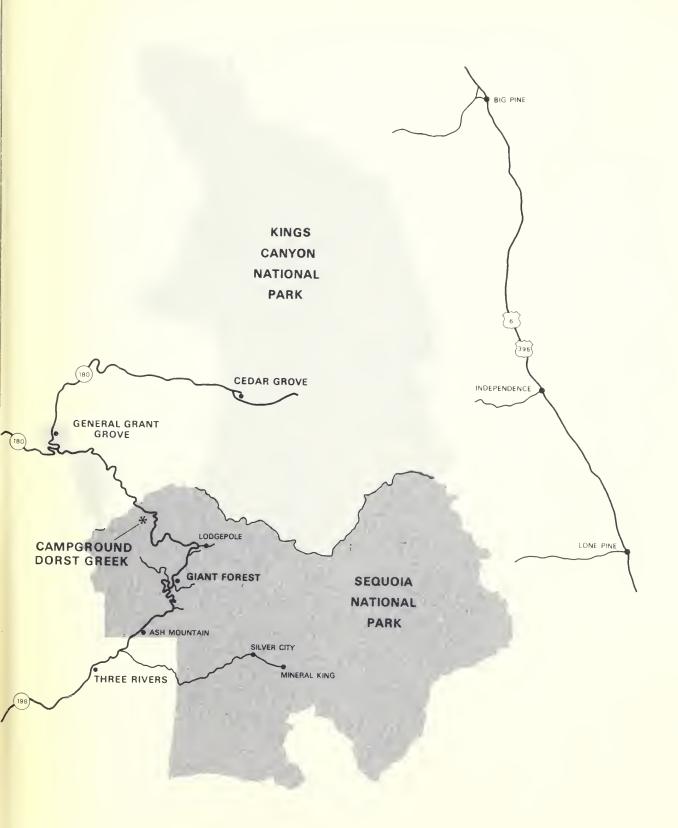
Alluvial meadow soils occur in poorly drained areas. The soil surface is high in organic matter and the subsoil consists of stratified deposits of sandy material of largely granite origin.

The soil particle composition and type would have an effect on construction, and a soil compatibility study should accompany this project. Organic soils would be the least desirable for construction as they are highly compressible and tend to decompose when drained. Coarse-textured soils, such as sand and sandy loam, are preferred for most types of developments because support (bearing capacity) and drainage are usually excellent.

Climate/Air Quality

Climatic conditions in the Dorst Creek campground area are typical of the western Sierra Nevada slope. Summers are dominated by warm sunny days, with occasional high-intensity afternoon thunderstorms. Summer temperatures are usually in the low 70s, while winter temperatures average in the low 30s.

Sequoia-Kings Canyon National Parks have been designated class 1 under the Clean Air Act as amended. As such, their air quality related values are important attributes. A class 1 area is subject to the most stringent regulations. Such areas must not exceed the maximum allowable incremental increases over baseline concentrations of sulfur dioxide and particulate matter as specified in section 163 of the act. Air pollutants in the parks, primarily originate from populated areas outside, but vehicular



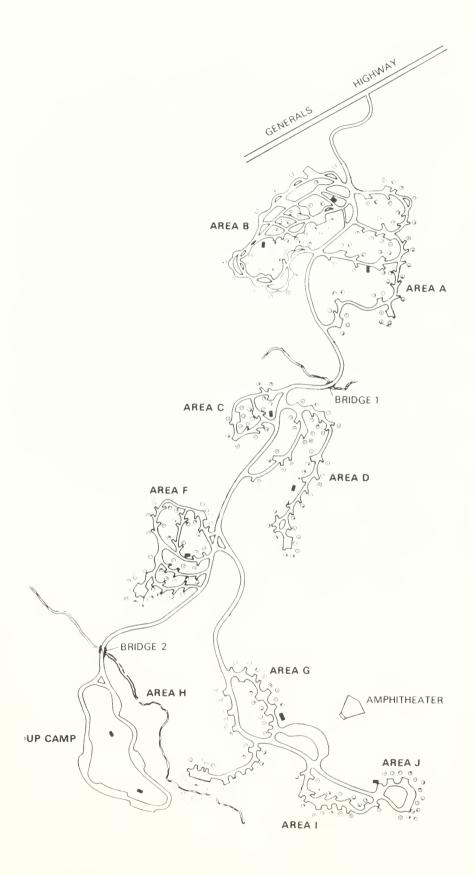
LOCATION MAP

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EXISTING CONDITIONS DORST CREEK CAMPGROUND

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traffic on the Generals Highway and in visitor use areas both contribute a slight amount of hydrocarbons, nitrates, etc. Campfires also add carbon monoxides and particulate matter, which slightly decrease air quality.

Water Resources

The study area does not contain any major watercourses, but two small streams flow through the campground. These are: the Dorst Creek, and Cabin Creek. There are two small wet meadows that exist within or adjacent to the campground. These meadows represent a very small but important percentage of the total acreage of the campground area. Because of the very limited area available and their importance to such a wide variety of wildlife forms, maintaining existing meadow habitat is of critical concern in preserving biotic associations, natural balances, and the integrity of park ecosystems. Meadows are of the most fragile vegetation types in the study area. Considerable ecological changes are often associated with moderate changes in hydrology and soil compaction. (See Appendix A for meadow ecology).

Vegetation and Wildlife

Most of the Dorst Creek area contains mixed coniferous forest. Large conifers, including jeffrey pine, sugar pine, white fir and red fir, are the principal species. These species are found in varying degrees of density and dominance depending on local microclimatic conditions. Red Fir is the dominant species in the area. Ponderosa pine, incense cedar, and black oak are subdominants.

Within the study area, 23 mammal and 15 amphibian and reptile species are closely associated with the mixed conifer forest. The upper canopy pine seeds along with numerous tree-dwelling insects provide food sources for the lodgepole chipmunk, chickaree, gray squirrel, and other small mammals and birds. The forest also provides roosting and nesting habitat for the pygmy owl, spotted owl, and other raptors. Rodent species in the understory provide prey for larger mammals, such as fisher, marten, and long-tailed weasel. Larger mammals, including black bear, cougar, and coyote, range throughout most of the park habitats.

Fomes annosos, a root disease, is infesting some mature white fir, Jeffrey pine, and sugar pine in the campground. This disease attacts and kills the roots of these trees. As the infection progresses, the trees vigor is progressively reduced and death is inevitable. However, before death occurs, a diseased tree is more likely to fall because of a reduction in its root system. Therefore, trees infected with Fomes annosos are considered to be potentially hazardous.

Vegetation maps for the area describe the forest as 0-70 percent cover composed of medium to highly decadant fir. Consequently the removal of hazard trees has been a perpetual activity in Dorst Creek campground. In general, a mature forest provides less desirable habitat for most

forest-dwelling wildlife than a young forest with interspersed open areas, or glades.

Threatened or Endangered Species

According to a U.S. Fish and Wildlife Service memorandum (December 1986) there are no known or reported threatened or endangered plant or animal species in the area.

CULTURAL RESOURCES

Archeology

As part of the advanced planning for this effort, an archeological surface survey and cultural resource inventory was carried out by the archeology office of Yosemite National Park in the fall of 1986. The purpose of the survey was to assess the location, nature, extent and integrity of existing archeological resources in order to offer site-specific management recommendations for project planning and development. The information presented here was taken from the preliminary summary report. Final recommendations must await the completion of data analysis and the final report.

Only two sites, CA-TUL-308 and -1201 are located within the existing campground area. They contain surface features of large milling stones with no surface or subsurface cultural components. The only concern for these sites, relative to development, is to leave the stones in place. Construction and disturbance can occur around them.

National Register Properties

There are no properties on or eligible to the National Register of Historic Places located within the Dorst Creek campground area.

Visitor Use

Visitors to the Dorst Creek campground are primarily attracted by the giant sequoia trees in the park, the mountain environment, and the opportunity to enjoy an overnight stay. Visitation varies significantly depending upon annual and seasonal weather patterns. For example, due to a heavy snowpack in 1983, a late opening was caused resulting in lower visitation. Visitation is also affected by colder, stormy weather during the summer.

Table 1 - Visitation

1980	43,703
1981	50,399
1982	79,261
1983	19,618
1984	89,934
1985	46,818
1986	31,760

ALTERNATIVES

Alternative 1 - Proposed Action

This alternative proposes to improve the condition of the main campground road with minor relocations. The campground loops will be redesigned to provide for better circulation and access off of the main campground road. Density of the campsites will be reduced and individual sites improved.

Little additional clearing and roadway relocation is anticipated. For the most part, existing roadway locations will be used. Where roads are to be relocated, their former locations will often be used for campsites or campsite access.

There will be a similarity in architectural styles and materials used in the renovation of the existing comfort stations, and any new architectural construction will be similar to existing styles. New comfort stations are proposed at Clover Creek and a very serious effort will be made to repeat existing design and use of material. Doing this will achieve visually cohesive design elements, economical construction, and similarity in maintenance solutions.

Main Campground Road - The basic design concept for the main campground road is to create a 20-foot-wide paved surface, curbed where needed. No campsites will front on, or be accessed directly off of, the main road. Parking for some walk-in sites will be at 90 degrees to, and directly off of, the main campground road. The road will be relocated where appropriate.

The front loops (see enclosed site maps), A and B, will no longer be bisected by the main campground road. It will be shifted to the east edge of these loops, reducing the number of intersections from 8 to four "T" intersections, with the leg of the "T" being one-way, either into or out of the loop. The relocation will end at the first existing water crossing of the original road.

No further road relocation is anticipated until the intersection with Area F. Perpendicular parking will be provided for walk-in sites in Areas C and D. This parking will be immediately off of the main campground road.

No further road relocation is anticipated until the intersection with Area F. Perpendicular parking will be provided for walk-in sites in Areas C and D. This parking will be immediately off of the main campground road.

The main campground road will no longer traverse Area G but will be relocated near the edge of a large meadow and follow the east bank of a watercourse. At this point, access to the Group Camp will be provided. The existing one-lane timber bridge to the Group Camp is in good condition and except for the foundation, can be relocated to this point. This will eliminate groups driving through a portion of Area F. The old road bed will be obliterated.

The main road will continue along the east bank of the watercourse following a campground road which will no longer be used. The main road turns left, toward the northeast, and terminates in a loop passing through the amphitheater parking area.

<u>Individual Campsites</u> - One approach to reducing campsite density is to use existing two-vehicle parking areas that serve two campsites, and use the parking for one vehicle with trailer (tent, boat) or extra vehicle. The adjacent existing site would be abandoned.

Many other sites are entirely too steep, or their access road is too steep, or access from the road parking to the site is too steep, or combinations of all of these. Construction to alleviate these problems will be expensive, visually obstrusive, and in some situations detrimental to the environment. Therefore it is proposed to eliminate approximately 48 of the original 222 sites.

Expanding the campground has been studied on the ground and appears to be economically and environmentally unfeasible. In areas of possible expansion, the terrain is either steep or a meadow. The only exception to this is Area E, originally proposed as the Boy Scout Camp Area, and now to be used for individual campsites.

Combining the sites lost, with the potential gain at Area E, results in a total of 176 sites.

Campground Loops - Areas A and B, approximately 76 sites, will be designed specifically for RVs and trailer sites. It has been proposed by the park to eliminate RVs and camping trailers from the balance of the campground areas. It has also been proposed to develop Area C, and the rear portions of Areas E and H, for walk-in sites, with a maximum of 400 yards, hike to the site, typically, 50 to 200 yards will be the normal walk from car to site.

Areas D-H will be made of simple loops using existing roadways as much as possible. The group camp layout appears to be satisfactory. However, the parking needs to be reorganized and better defined.

Vehicular Areas - All roads and parking areas will be paved with asphaltic concrete and, where necessary, curbing will be installed to confine vehicles to paved areas. A chip-seal coat may be applied to campsite parking areas. This would better define such areas and make them more rustic in character.

<u>Comfort Stations</u> - The 12 comfort stations are in good condition, adequately designed, and not in need of replacement.

A new comfort station is required at Area E, with septic tank and water source.

Utilities

Minor utility work is anticipated except for a new, larger waterline to Areas A and B, and new service to Area E.

Revegetation

A major revegetation effort is needed and gene pool considerations will be a factor in this work. Planting plans will be prepared to create visual screening between campsites, confine noise, reduce headlight glare, and prevent erosion (refer to Mitigating Measures section for more complete description).

Trails

A trail will be laid out on the ground for construction by park forces. Its location will be coordinated with park staff for use either as a guided, or self-guided, interpretive trail. The trail will connect both ends of the campground, with connections to it at appropriate intermediate points.

Signs

A sign plan will be prepared locating each sign by number, with sketches of sign layout and text. Vehicular signing will conform to MUTCD requirements, and other signing will be in accordance with NPS sign system specifications.

Mitigating Measures

Revegetation. A major revegetation effort will be needed and gene pool considerations will be a factor in this work. Chipping and clearing debris will be combined with topsoil and spread in preparation for revegetation. It is recommended that a starch polymer be incorporated into the soils which will extend the moisture availability for plants used to revegetate the area. Following the placement of the topsoil, it is

recommended that a two-inch layer of chippped/mulched tree limb material (salvaged from the vegetation removal areas) be spread over the surface to reduce erosion and to aid in the maintaining of lower soil temperatures. Following the placement of the chipped/mulched material it is recommended that the disturbed area be hydroseeded with a sterile grass hybrid (wheat x wheatgrass). This grass will not produce, but the purposes of stabilizing the surface soils and providing an additional layer of mulch material on the surface would be accomplished. Through these procedures the soils would be protected and the success of long-term revegetation efforts can be maximized. Prior to implementation, a planting plan will be prepared to create visual screening between campsites, confine noise, reduce headlight glare, and prevent erosion.

Wet Meadows

Where construction occurs near either wet meadow, extensive measures will be undertaken to protect and mitigate any possible effects to these areas.

Presently, the campground road crosses the meadow near the group camp with a bridge. The design calls for relocating the road away from the meadow which will reduce impacts occurring due to the existing road and bridge. The relocated road will have numerous culverts so as to not restrict the flow of water into the meadow. These culverts will be placed so as to not flow directly into the meadow reducing the chance of siltation. A low-head pipe will be used which dissipates water, reduces the velocity of the outflow which in turn reduces the chance of erosion. In addition, relocating the existing road will help the meadow return to a more natural condition.

The new location of the main road near the second meadow will reduce the current impact of visitors camping in this meadow by discouraging the use of this area. The new road will act as a barrier.

In addition, there will be a buffer strip of existing trees and other vegetation between the toe of the fill slope and the meadow. Silt fences will be placed at the toe of the slope wherever the road parallels a meadow until revegetation is complete and wooden barricades and snow fences will be installed to protect existing trees prior to construction.

Summary of Design Criteria and Goals

DESIGN CRITERIA

A. Main Road

- 1. Paved with Asphaltic Concrete
- 2. Curbed where necessary
- 3. Two-way traffic

- 4. 20' width
- 5. No campsites accessed directly from this road
- 6. 90 degree parking for some walk-in sites, directly off of this road.

B. Campground Area Roads

- 1. Paved with Asphaltic Concrete
- 2. Curbed where necessary
- 3. Intersect main campgrund road at 90 degree angle
- 4. One-way traffic
- 5. 10' width
- 6. No "deadend loops"
- 7. No "loops within loops"
- 8. All tent, RV, and trailer sites accessed off of these roads

C. Individual Sites

- 1. Walk-in and tent sites will have tent areas clearly defined with log or stone construction and levelled with screened fill
- 2. Paved back-in parking will be provided for all tent and RV sites and most trailer sites
- 3. Areas where RVs and trailers will be parked will be pitched at 2% minimum, (1/4 inch per foot), not to exceed 4% maximum (1/2 inch per foot)
- 4. Where topography precludes back-in parking, pull-through sites will be constructed for towed rigs, i.e., house trailers, RVs towning small cars.

D. <u>Subtle Separation of Camper "Styles"</u>

- 1. Walk-in sites will be clustered and not immediately adjacent to RV or trailer sites.
- 2. RV and trailer sites will be clustered
 - a. Problems of site development regarding vehicle size and turning radii will be isolated.
 - b. High levels of evening light and noise will also be more isolated.
- 3. Access Group Camp directly without going through another campground.

GOALS

- A. Reduce density of campsites
- B. Relocate campgrund host's site and utility buildings
- C. Develop new campground loop east of sites 90-144 (Area D)
- D. Improve/simplify, entrance/exits to sites 125-157 (Area F)
- E. Eliminate campsites 78-88
 - 1. Inadequate turning radius at cul-de-sac
 - 2. 8 sites are on ledgerock
- F. Simplify access to Group Camp, eliminate combined use of entrance/exit with Area F.

- G. Simplify road layout, Area I/J
- H. Amphitheater
 - 1. Increase parking
 - 2. Make handicap accessible

The cost for this project is estimated at \$3,638,000 with funding coming from both FHWA and NPS. The tenative phasing and estimated costs are as follows:

Category A - FHWA

Stage 1 - Main Campground Road Stage 2 - Areas A, B, C, D, and E Stage 3 - Areas F, G, H	\$ 600,000 1,100,000
Amphitheater and Group Camp	1,000,000
Total	\$2,700,000
Category B - National Park Service Stage 1 - Areas A, B, C, D, E\$ Stage 2 - Areas F, G, H	469,000
Amphitheater and Group Camp	469,000
Total	\$ 938,000

Alternative 2 - No Action

This no-action alternative would not change the campground density, alignment, width or surface of the campgrounds main or loop roads. Normal maintenance activities would continue.

Alternatives Considered but Rejected

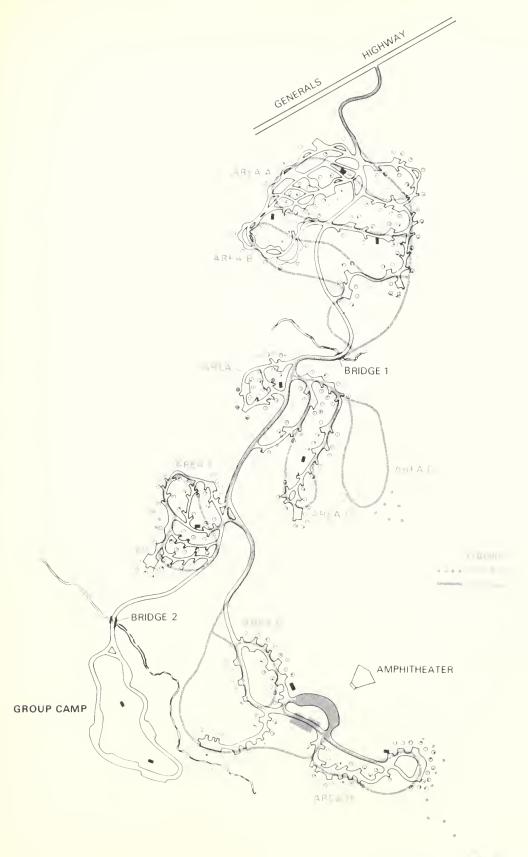
Several alternatives were considered in the design process but rejected because of previous policy decisions, unacceptable environmental or visitor use impacts, or funding considerations. These alternatives included the following:

Closing the campground to another location

Closing the campground was discarded because the master plan set a capacity for camping that includes the Dorst campground. In addition the DCP for Giant Forest calls for the relocation of facilities, including campgrounds, which necessitates the shift of this activity to other areas such as Dorst.

Moving the campground to another location is not considered feasible due to there are no other suitable sites.





PROPOSED RE ESIGN

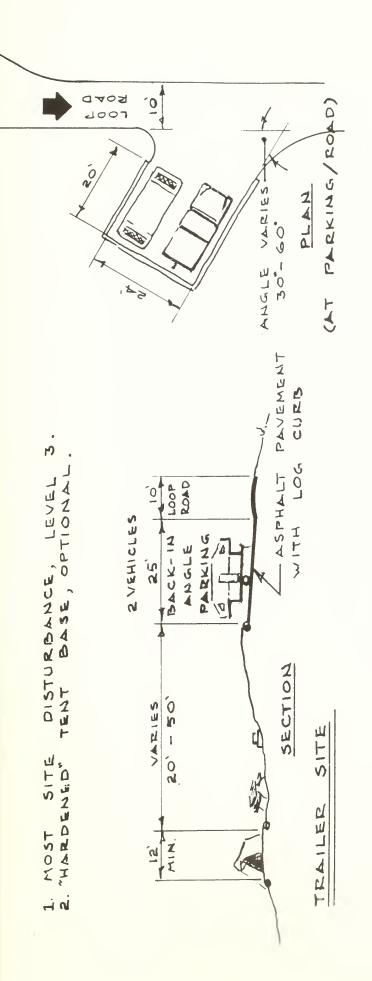
DORST CREEK CAMPGROUND

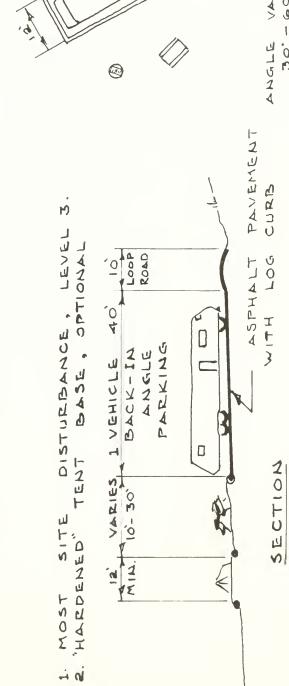
SEQUOIA-KINGS CANYON NATIONAL PARKS

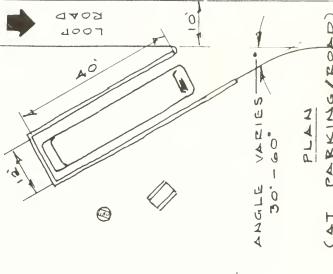
UNITED STATES DEPARTMENT OF THE INTERIOR/NATIONAL PARK SERVICE



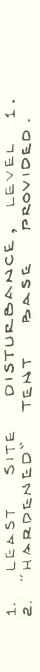


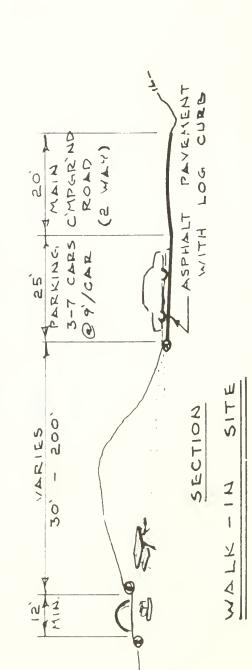


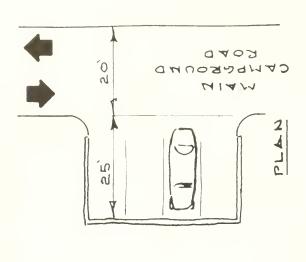


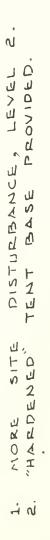


RV SITE





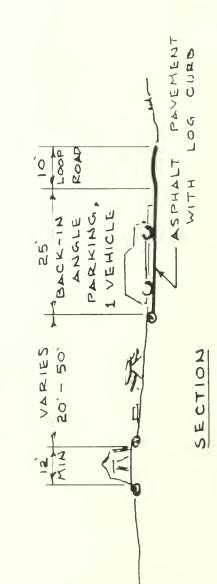




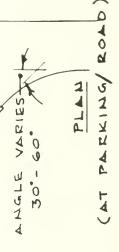
ROAD

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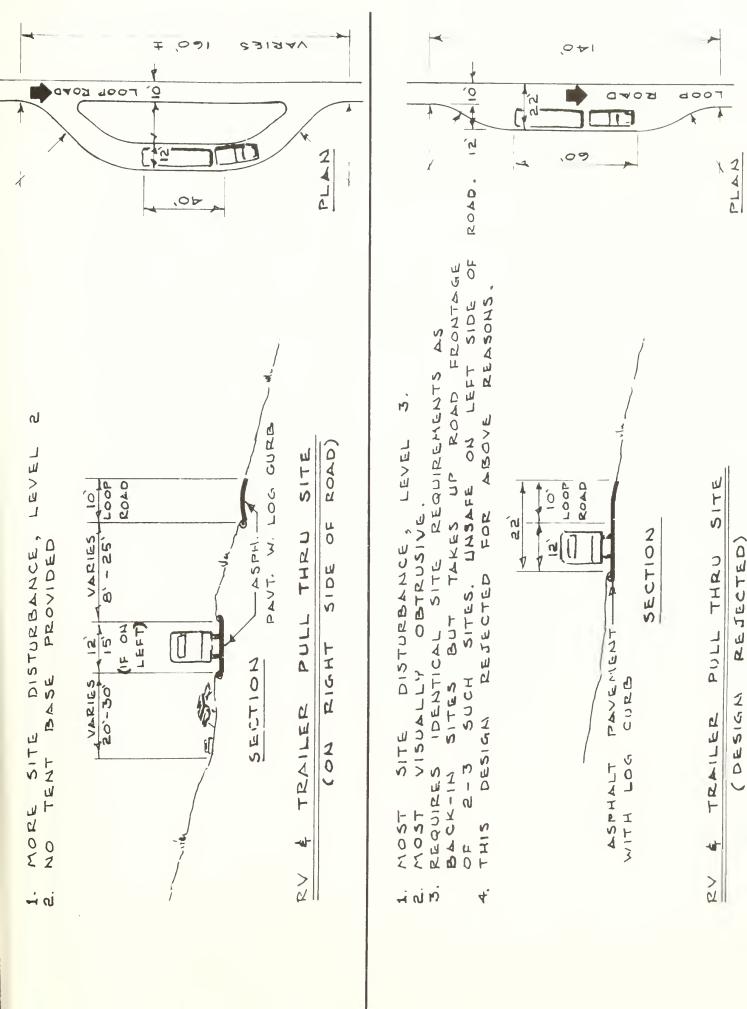
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(AT PARKING/ ROAD)



SITE トスリト



TENT BASE

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 1 - PROPOSED ACTION

Impacts on Natural Resources

Approximately 1,650 linear feet of the main road within the campground would be realigned. This would disturb approximately .75 acres of previously disturbed area. Additionally, approximately 650 linear feet of existing access road would be resurfaced and widened 2 feet for an additional disturbance of .029 acres. The realignment and reorganization of the campground loops would result in disturbance of the following acreages:

Area A	.16 acres	Area F	.11 acres
Area B	.18 acres	Area G	.068 acres
Area D	.16 acres	Area H	.11 acres
Area E	.14 acres		

In addition, this work would result in 1,700 cubic yards of top soil stripping 750 cubic yards of rock removal and 5,675 cubic yards of cut and fill. All of these areas with the exception of the proposed new area E would occur on previously disturbed areas. Impacts will be minimized due to the implementation of the revegetation plan plus erosion control measures as outlined in the mitigating measures section. In addition impacts to the wet meadows will be minimal due to the measures also outlined in the mitigating measure section. There would be no impact on any threatened animal or plant species as a result of this alternative. In addition, there would be no significant impacts to natural resources as a result of this alternative.

Impacts on Cultural Resources

Under this alternative, care would have to be taken to avoid disturbing two identified archeological sites within the campground. As stated in the affected environment section the only concern for these sites is to leave the stones in place. Construction and disturbance can occur around them. Therefore the final design will reflect this concern.

No properties on or eligible for the National Register of Historic Places would be affected by this alternative.

Impacts of Visitor Use and Park Operations

Visitor experience would be improved as a result of this alternative. The campground road and loops would be less confusing and create less traffic

problems. The sites would be more clearly delineated, and there would be a subtle separation of camper styles (i.e., RV and trailer sites would be clustered together and walk-in sites together). Overall the campground would be easier for park maintenance to maintain as a result of this alternative. The reduced density of the campground would enhance the visitor experience.

During construction activities, the campground would be closed causing inconvience and overcrowding in other park campgrounds. Local community benefits could be expected from construction labor hired and from services provided to construction employees.

ALTERNATIVE 2 - NO-ACTION

Impacts on Natural Resources

Impacts on natural resources under this no-action alternative would be limited to those associated with routine maintenance, minor repairs and continued over-use. Within the campground loop, the soil compaction and fomess annosus which are slowly killing off the forest overstory would be expected to continue. In addition the soil compaction, camper traffic and firewood collection which have prevented formation of a suitable environment for seed germination and seedling development would continue.

Impacts on Cultural Resources

There would be no effects on cultural resources as a result of this no-action alternative.

Impacts of Visitor Use and Park Operations

The campground density would remain high, reducing the quality of camping experience. The steep access roads as well as steep access to individual sites would continue to be an inconvenience to visitors. The unpaved and seriously deteriorated parking areas would continue to deteriorate and detract from the camping experience. The turning and traffic problems as a result of the confusing loop layout would continue.

SUMMARY OF ENVIRONMENTAL IMPACTS

	Alternative 1	Alternative 2
Geology/topography/ soils	A total of .97 acres of soil disturbance; increased soil compac- tion due to construction vehicle and foot traffic	No additional disturbance; continued effects from visitor use
Climate/air quality	No additional impact	No additional impact
Water resources	No additional impact	No additional impact
Vegetation/wildlife	A total of .97 acres of vegetation would be disturbed	No additional disturbance; continued effects from visitor use
Threatened or endangered species	No impacts (there are no known threatened or endangered species in the study area)	Same as Alternative 1

APPENDIX A: MEADOW ECOLOGY

Meadows are found throughout the southern Sierra Nevada, and they result from a unique combination of ecological conditions; a high water table, adequate soil moisture, and a short growing season. Soil moisture, the most important factor, results from a shallow water table that rarely exceeds 2 feet in depth in midsummer, and fine-textured, richly organic surface soil horizons. High soil moisture levels sustain the meadow in two ways: by supporting moisture-dependent sedge and grass species and by maintaining conditions too wet for conifer seedling survival. The high soil moisture levels and open summy sites make for favorable growing conditions; however, relatively thin surface soil horizons and a short growing season limit plant growth.

Meadow plants have adapted to these conditions with specialized root systems and growth habits. The root system, concentrated in the upper few inches of topsoil, is a dense mass of fine filamentous roots with a large root area per unit volume of soil.

The water table depth in a meadow controls the transition zone between meadow and forest because a high water table prohibits encroachment of trees. Some trees can tolerate several weeks of flooding during the growing season, but if soils do not drain in late spring or early summer, tree growth is inhibited (Wood 1975).

CONSULTATION AND COORDINATION

- U.S. Department of the Interior Fish and Wildlife Service
- U.S. Department of Transportation Federal Highway Administration

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 - 1986 <u>Draft Environmental Impact Statement, Development Concept Plan Grant Grove/Redwood Mountain, Sequoia/Kings Canyon National Parks.</u>
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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, 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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