1983

Final Environmental Impact Statement

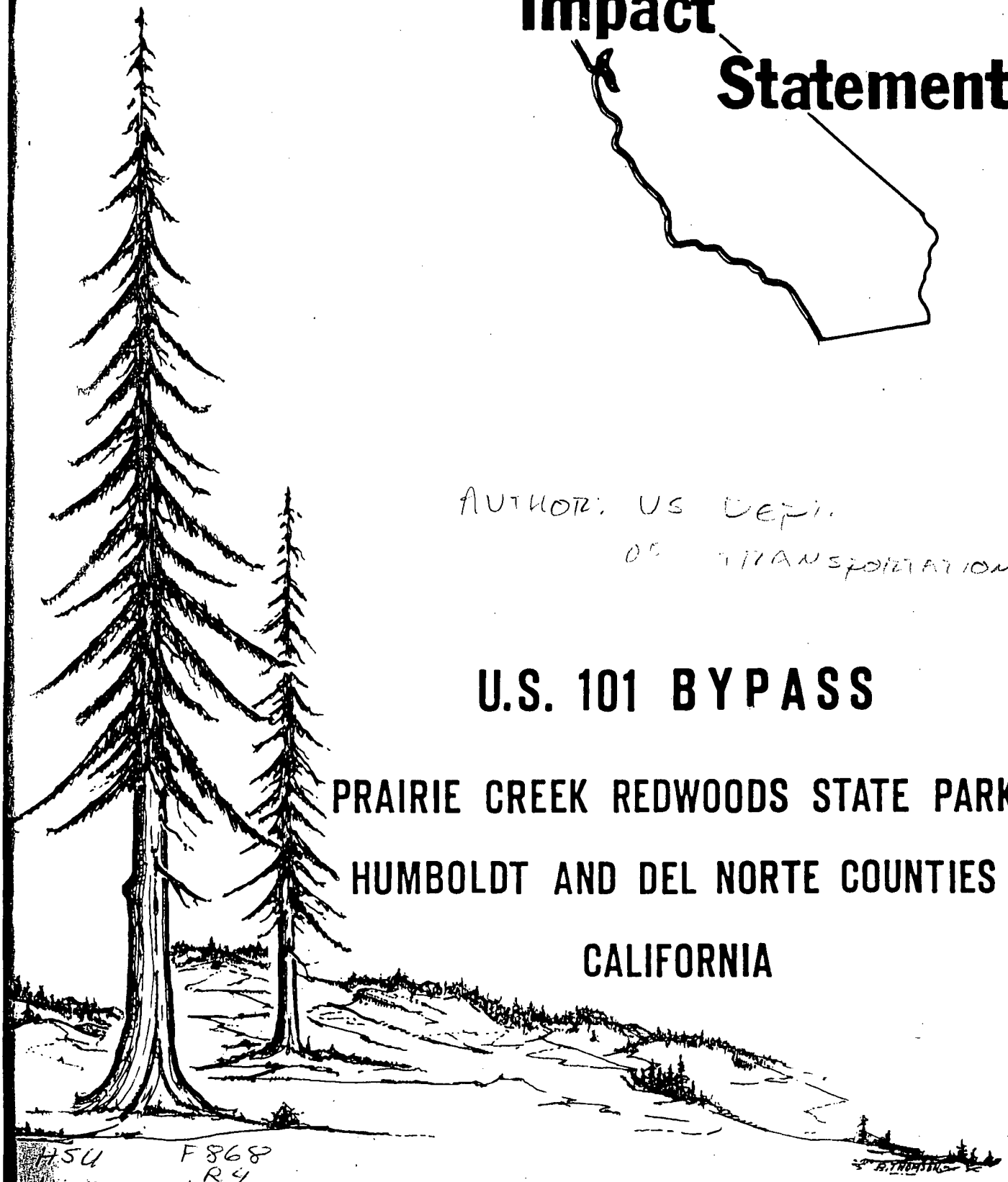
AUTHOR: US DEPT. OF TRANSPORTATION

U.S. 101 BYPASS

PRAIRIE CREEK REDWOODS STATE PARK

HUMBOLDT AND DEL NORTE COUNTIES

CALIFORNIA



SCH Number: 79071315
01-Hum-101-125.6/R135.0
DN-101-C.0/0.5
01101 194401

U.S. 101 Bypass from 0.5 mi. South of May Creek Bridge #4-42, Humboldt County, to 0.5 mi. North of Humboldt/Del Norte County Line, California

FINAL
ENVIRONMENTAL IMPACT STATEMENT/SECTION 4(f) EVALUATION

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration
and
U.S. DEPARTMENT OF THE INTERIOR
National Park Service

and

STATE OF CALIFORNIA
Department of Transportation

Pursuant to: 42 U.S.C. 4332(2)(c), 23 U.S.C. 128(a), 138, 49 U.S.C. 303 and PL 95-250 (Federal)
Division 13 Public Resources Code (State)

Thirteen alternatives are evaluated to solve the problems of conflict and congestion on U.S. 101 in Prairie Creek Redwoods State Park. The preferred alignment would require clearing approximately 440 acres of second-growth redwood forest, .7 acres of wetland, and 4.5 acres of old-growth redwoods. This action complies with Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands.

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July 6, 1983
Date

E. W. Blackmer, Chief
Office of Environmental Analysis
California Department of Transportation

2-6-84
Date

Howard H. Chapman
Regional Director, Western Region
National Park Service

Feb. 5, 1984
Date

Willis Kimmerling Jr.
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SUMMARY

U.S. 101 is the only major north-south highway in the north coast region of California (see Location map). Approximately 60-miles of this highway pass through Redwood National Park and Prairie Creek Redwoods State Park (see Existing Conditions map). A conflict exists between visitors to Redwood National Park and the commercial traffic using this highway. Tourists tend to drive slowly, while the commercial drivers want to drive at the maximum speed limit. During the peak month of August, long lines of cars, recreation vehicles and logging trucks frequently create heavy congestion for park visitors and through traffic alike. During this period 55 to 60 percent of the traffic is tourist vehicles.

A total of thirteen alternatives are evaluated in this document: no action; the preferred alternative; six alternatives with alignments east of Prairie Creek Redwoods State Park; two alternatives on the western side of the state park; and three alternatives along the present alignment of U.S. 101 (see Alternatives map and Alternatives Eliminated After Consideration map). Seven alternatives, including the preferred route east of the state park, are a combination of two-lane highways with truck-passing lanes or four-lane highways that avoid or go through a corner of the state park. The preferred alternate, Alternative B, will provide 4 12-foot lanes, a 6-foot median and 8-foot shoulders. The alignment will go through a corner of the state park.

The three alternatives concerning the existing highway and the two alternative alignments west of the existing highway were eliminated because they would result in the destruction of prime park resources or not achieve the goal of separating park and non-park traffic. Two of the alternatives east of the state park were eliminated because they are inappropriate road widths.

An additional four alternatives east of the state park were rejected during the planning process because they either were less safe or substantially more expensive than the preferred alternative.

The "No action" alternative could possibly result in increases in the frequency and severity of traffic congestion on U.S. 101. However, the increase in vehicles, if it occurs, could be affected by gasoline price and availability and fluctuations in tourism.

Congress directed in Public Law 95-250 that a bypass highway be built east of Prairie Creek Redwoods State Park. That alignment is recommended because it best solves the problems of conflicts between tourists and through-traffic, reduces congestion on the road, and minimizes the destruction of old-growth redwoods and other significant park resources. The preferred alternative is the safest design of all the alternatives along the eastern alignment, except Alternate D, which is comparable.

All easterly bypass routes including the preferred alternative would necessitate the purchase of approximately 1,480 acres of privately owned land - about 600 would be within the right of way and the remainder would be severed lands. The cost of the land acquisition would be approximately $10 million.

Highway construction under any alternative along the preferred eastern alignments would necessitate clearing approximately 425 acres of land, most of which is 20 to 30 year old second-growth redwoods. About 1 acre of wetlands would be obliterated, and 4.5 acres of old-growth redwood forest would be removed.

A major impact of the highway construction would be the moderate to high soil erosion, which could occur during the construction period and for an indeterminate number of years thereafter. This erosion would have the potential to significantly reduce the aquatic productivity of the streams in the project area.

Some negative impacts to local and tourist traffic using the bypass would result from implementation of the preferred alternative. Due to the long, steep grades, vehicles using the bypass would require significantly more fuel than they now use when traveling the existing route. The trucking industry would be the most seriously affected, but energy consumption would also increase for passenger vehicles. The traffic accident rate is expected to decline because of the four-lane width. The statewide average accident rate for a 4-lane divided highway in mountainous terrain is less than the anticipated rate of the existing route. Cross median accidents could become a problem if traffic volumes increase significantly on the bypass. Travel time on the bypass would be greater than on the existing route except during periods of congestion.

The construction cost of the preferred alternative would be approximately $95 million (1983 costs). However, by the end of construction in 1989 inflation expected to increase costs to $115 million.* Congress has appropriated $105 million. ($50 million in the Surface Transportation Assistance Act of 1978 and $55 million in the Federal-Aid Highway Act of 1981). The State of California share would be 10% of the federal appropriation for a total of $115.5 million presently available for the project (including engineering costs) without committing more than the 10% in State funds.

Erosion control measures are being developed with recommendations by a multidisciplinary technical advisory committee concerned with park, wildlife and water resources. Extensive measures to minimize water quality impacts will be implemented through effective design features and construction methods (see page 58 and Appendix G). An on-going water quality monitoring program has been initiated to measure water quality before, during and after construction. Wetlands and riparian habitat taken in construction will be replaced with no net loss of habitat values. Monetary compensation for fishery losses will be provided by Caltrans to aid in development of a habitat rehabilitation and/or fish replacement program mutually acceptable to the National Park Service and the California Department of Fish and Game.

The majority of comments received in response to the circulation of the draft EIS and at a public hearing were concerned with water quality, erosion, flooding, fish and wildlife, habitat loss, and growth inducement during construction, need for a bypass east of the state park, budgetary constraints, and increased transportation and energy costs. There is no clear concensus, local government, environmental groups and citizens are divided in support and opposition.

Environmental issues to be resolved are: 1) final compensation for fisheries should losses exceed preliminary estimates; and 2) the specific limits of 10. acres of wetland/riparian habitat to be developed along Prairie Creek for replacement of lands lost in construction of the bypass.

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* Using current inflation rates.

PROBLEM STATEMENT

U.S. 101 is the primary road system for Redwood National Park, and it is the main artery of the region's highway network (see Existing Conditions map). Because rail lines are nonexistent north of Arcata and air service is minimal, timber industry products and other commercial goods are transported by truck through the region on this two-lane highway. A conflict exists between visitors to Redwood National Park and commercial truck drivers using this highly scenic 10-mile segment of U.S. 101 that passes through Prairie Creek Redwoods State Park, which is within the boundaries of Redwood National Park. Tourists generally want to drive slowly through the redwood groves, occasionally stopping at turnouts or leaving U.S. 101 to drive the side roads, while commercial truck drivers and other through-traffic tend to drive at the maximum speed limit wherever possible.

Widened areas have been developed with minimal grading where space permits between old growth trees. These areas are used as traffic turnouts and for temporary parking, but do little to relieve congestion during heavy use periods. Further expansion of these areas would require removal of park quality vegetation which grows to the limits of the roadway.

The average daily traffic (ADT) on U.S. 101 increases from 4,000 in December to 6,900 in the summer months (Caltrans 1981). August is the peak month, and 55 to 60 percent of all traffic on U.S. 101 at the Del Norte/Humboldt county line is tourist vehicles.

Between 1975 and 1982*, traffic volumes varied as follows:

	ANNUAL ADT	AUGUST ADT
1975	4,300	8,300
1976	4,500	9,300
1977	4,600	9,500
1978	4,750	7,100
1979	4,700	7,500
1980	4,600	7,300
1981	4,350	6,900
1982*	3,700	5,900

These ADT's reflect both reduced tourist and commercial traffic during the nationwide recession.

Long lines of cars, campers, logging and supply trucks, and a variety of recreation vehicles are a common occurrence during the peak summer months, causing the road to have periods of unstable traffic flow with lines of cars going 30-35 mph in areas where the speed limit is 55 mph.

Congestion on the highway may occur during heavy use periods between Memorial Day and Labor Day holidays or approximately 100 days per year, usually 6 to 8

* 1982 volumes are based on preliminary unpublished data.

hours per day. Traffic delay due to congestion may be approximately five minutes. The delay is a result of motorist driving habits and not a function of highway capacity.

In recent years, bicyclists have become more common and are creating special needs and problems. Seasonal variations of bicycle traffic passing through the park range from 80 to 90 in the summer to zero on some winter days.

Bicyclists and tourists who stop at turnouts to view the redwoods are often confronted with loud engine noises and close passing traffic. Although accident rates on this segment of U.S. 101 are below the state average for two-lane highways of this type, the speed and proximity of large logging and service vehicles create an undesirable experience for park visitors from a park management viewpoint.

In 1978, Congress authorized and directed the Secretary of the Interior to acquire and donate to the state of California the right of way for a bypass highway that would follow the drainages of May and Boyes creeks around the eastern boundary of Prairie Creek Redwoods State Park (Public Law 95-250, see Appendix A).

The Surface Transportation Assistance Act of 1978 authorized $50 million for a demonstration project to construct the bypass. An additional $55 million for the project was appropriated in the Federal-Aid-Highway Act of 1981 (see Appendix B).

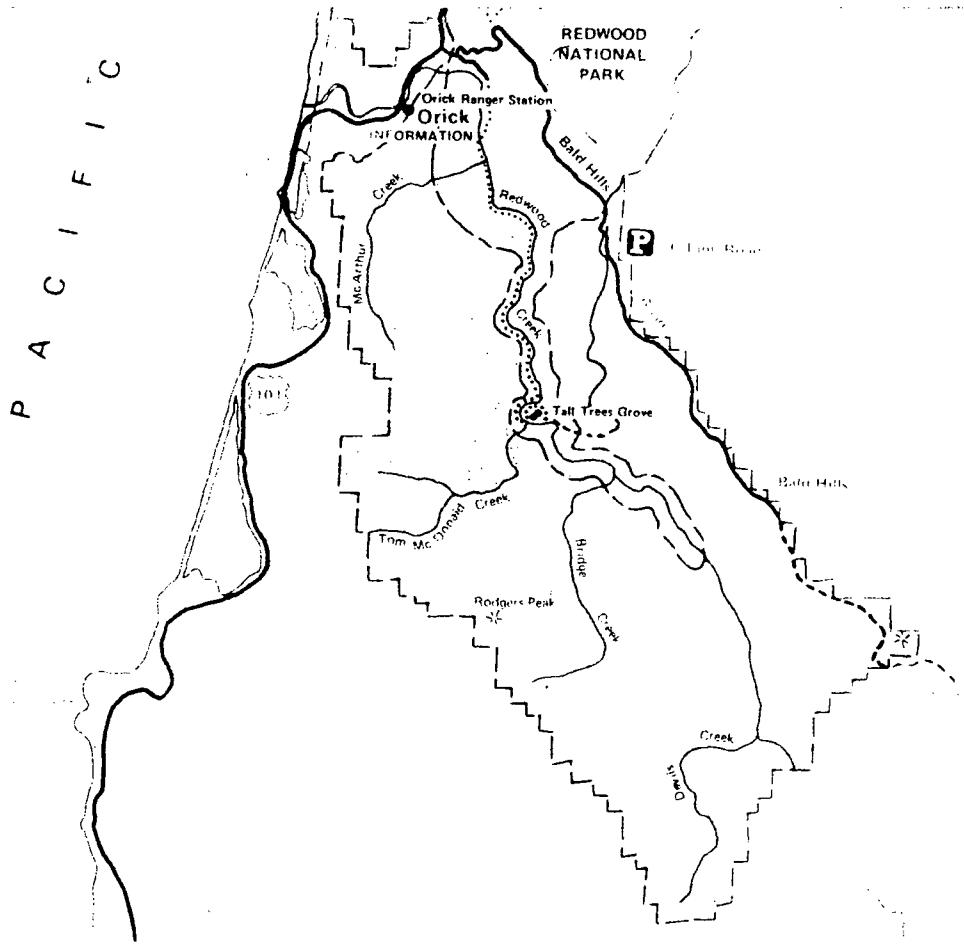
The purpose of the demonstration project is to "determine the extent to which a bypass will divert motor vehicle traffic around the park as to best serve the needs of the traveling pubic while preserving the natural beauty of the park." Under the provisions of 23 USC 152, the Secretary of Transportation, Federal Highway Administration, must report to the Congress the results of the demonstration project. This project is compatible with local transportation plans.

The General Management Plan for Redwood National Park (USDI, NPS 1980) calls for the existing U.S. 101 highway to be used by park visitors as a parkway for low-speed scenic drives once the bypass has been constructed. The bypass is to be used by nonpark traffic. Before land is acquired and a bypass highway is constructed, the natural, cultural, and socioeconomic impacts of various alternatives must be assessed in compliance with the National Environmental Policy Act, the California Environmental Quality Act, and other applicable laws and orders (such as the Endangered Species Act, Executive Order 11990, Protection of Wetlands, and Executive Order 11988, Floodplain Management).

The purpose of the Final Environmental Impact Statement is to document the environmental effects of the proposed action and reasonable alternatives, and identify mitigating measures which will be undertaken to minimize adverse environmental effects.

PROJECT HISTORY

North of Orick, U.S. 101 follows Prairie Creek through a prairie and old-growth redwoods. At the time U.S. 101 was constructed in 1928, an approximate 100-foot wide strip of highway right of way was acquired from logging companies an



EXISTING CONDITIONS

REDWOOD NATIONAL PARK / CALIFORNIA

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

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individual owners. Since then, the California State Park System, with assistance from the Save-the-Redwoods League, has acquired properties adjacent to the U.S. 101 right of way and has added those lands to Prairie Creek Redwoods State Park.

Planning for a bypass around the state park began in the early 1960's. At that time, alignments east and west of the existing highway, and also the existing alignment, were studied. The western alignments followed either Gold Bluffs Beach or the bluffs above the beach, and the eastern alignment followed the eastern boundary of Prairie Creek Redwoods State Park. Upgrading the existing two-lane highway to four-lane status was also considered.

This planning effort came to a halt in the mid-1960's because an acceptable alignment could not be agreed upon. Commercial and local users supported the Gold Bluffs Beach alignment, but conservation groups preferred the eastern alignment.

In 1973, the Save-the-Redwoods League initiated land acquisition negotiations with Simpson Timber Company to gain control and ensure protection of the Prairie Creek drainage. During these negotiations, the league consulted the California Department of Transportation (Caltrans) concerning right of way lines for the eastern alignment in case a bypass should be built. The league preferred an eastern alignment over expansion of the existing route or development of western alignments (see page 127.)

With the passage of Public Law 95-250 and the Surface Transportation Assistance Act of 1978, the bypass highway once again became the focus of more detailed design and analysis.

U.S. 101 is managed by Caltrans, who is designing the bypass alternatives. The Federal Highway Administration is providing 90 percent of the project funding, and the other 10 percent is being provided by the State of California.

Of the original 13 alternatives considered, six alternatives are presented, consisting of a no action alternative and five bypass alternatives with alignments east of Prairie Creek Redwoods State Park. The five bypass alternatives are designed for a 55 mph speed limit, 12-foot lanes, and 8-foot shoulders; they would require the purchase of about 1,513 acres of private timber land. Approximately 631 acres would be for right of way and 882± acres would be severed.

If the bypass was constructed, under current state law and upon mutual agreement, the existing route through the state park could revert to the County. The County could then revert the right of way to California Department of Parks and Recreation. Commercial traffic would not be allowed (by authority of sections 5003 and 5008 of the Public Resources Code of California) to use the existing route through the state park except when road snow, ice, or emergency conditions exist. Two options for separating truck traffic from automobile traffic are being considered. Under the first option, entrance stations to Prairie Creek Redwoods State Park would be built and administered by the state which could disseminate tourist information about the area. Under the second option, highway signs and enforcement personnel would be relied upon to separate through-traffic from tourist traffic. Appropriate records would be kept to monitor the success of this demonstration project in separating traffic and what effect diversion of some traffic onto the bypass would have on the overall environment and character of the park.

Under any alternative, except the no action alternative, additional field surveys for both archeological and historic resources would be conducted. (A survey of the preliminary centerline of the preferred alignment and the materials testing areas has been accomplished). Additional temporary access roads and pads associated with soil tests would also be subjected to reconnaissance. Field checks would be made as clearing progressed.

The National Park Service would continue to work with Caltrans during the design of the project to identify and mitigate specific environmental concerns that could impact park resources.

ALTERNATIVE A - NO ACTION

Under the no action alternative, no bypass around Prairie Creek Redwoods State Park would be constructed. U.S. 101 would remain as a two-lane 24-foot-wide highway with 4-foot shoulders, except where 10- to 12-foot diameter redwoods encroach on the paved shoulders. Paved turnouts are provided in many places throughout the park. When not impeded by slow-moving vehicles, traffic through the park travels at 50 mph except where the highway leaves Prairie Creek and climbs over a divide to the McGarvey Creek drainage. The curvilinear alignment here reduces the driving speed to 35 mph. No build options that would incorporate reduced speed zones and signing turnouts have been considered (see Alternative K).

No lands would be acquired under this alternative. Existing maintenance and minor highway modifications (e.g., shoulder widening) would continue. Maintenance costs would stay at current levels.

ALTERNATIVE B - FOUR-LANE ROAD WITH SEGMENT ACROSS STATE PARK (THE PREFERRED ALTERNATE)

Alternative B is preferred because this alternative would meet the overall objective to separate through and park traffic, and provide the safest facility for the most reasonable cost. See Highway Users discussion, page 74 and comparisons of alternatives in Tables 1 and 6 on pages 21 and 50.

Under the preferred alternative, a four-lane bypass highway would be constructed around Prairie Creek Redwoods State Park, with a portion of the eastern alignment passing through a corner of the state park (see Alternative B map). Approximately 4.5 acres of state park lands would be used for construction of the bypass. The highway would be approximately 12 miles long, bypassing 9.8 miles of the existing route. Bicyclists would be allowed on the bypass; however, most bicyclists would probably prefer the existing highway because of the lower grades, slower traffic, and the option to ride in a park environment. The existing route is designated a Bikecentennial route.

The bypass would start about 0.5 mile south of the May Creek bridge and head in a northeasterly direction, following the north side of the May Creek drainage. The road would turn north and skirt the eastern edge of Prairie Creek Redwoods State Park, following the ridge between the Prairie Creek and Klamath River drainages, then turn to the northwest and follow roughly the irregular park boundary. The bypass would intersect U.S. 101 about 0.5 mile north of the Humboldt/Del Norte County line (see Alternative B map). The initial 4.5 miles of road would climb about 1,400 feet at a sustained grade of 5 to 7 percent. From its high point on the east side of the state park, the road would begin a descent at 4 to 6 percent for about 1.5 miles, then follow a slight upgrade for about 1 mile. The downgrade on the final 4.6 miles would be about 6 percent (see Bypass Profile, page 10).

Alignment

The proposed alignment for the bypass would diverge 2,400 feet south of the May Creek Bridge, parallel U.S. 101 approximately 150 feet to the west then turn east. A diamond interchange east of the bridge (engineering stations 452-480) would provide access to the southern entrance of Prairie Creek Redwoods State Park. At the interchange, the bypass would start a 4.5-mile, 1,400-foot climb at a sustained 5 to 7 percent grade. The route would follow the north side of the May Creek drainage along a low ridge dividing May Creek and Boyes Creek, then turn north along the eastern boundary of the state park at station 570.

The first major excavation would be 1 mile north of May Creek interchange through a low saddle ridge at station 520. A bridge would be constructed over unstable soil areas between station 618 and 631 at the headwaters of Boyes Creek. Between stations 650 and 670, the route would cross five small intermittent drainages.

A long straight through-cut would be excavated between stations 666 and 693. The highway would be approximately 200 feet east of the state park and would follow the ridge between the Prairie Creek and Klamath River drainages. The top of the sustained grade from May Creek is at the northern end of this long-cut section, and a brakes and load check area would be provided for both northbound and southbound traffic in the area of the summit (station 696). North of the summit, the grade would descend at 4 to 7 percent for 1.5 miles to station 775.

A second long-cut area would be planned between stations 720 and 750. The maximum cut would be about 200 feet high at the northern end (station 742).

The highway would turn to the northwest in the vicinity of station 750, and approximately 1,000 feet of the alignment would pass through a corner of the state park, which is forested with old-growth redwoods (stations 751-761). Approximately 4.5 acres would be required for the roadway and side slopes, and approximately 2.3 acres of old-growth redwoods would be isolated by the highway construction. Grading would be minimal in this area. The highway would then follow the irregular park boundary and skirt a low ridge separating intermittent drainages at the headwaters of Ah Pah Creek in the Klamath River basin. From stations 740 to about 900, the alignment would have a series of 1,000-foot radius curves.

North of the state park boundary at station 775, the highway would maintain an upgrade of 3 percent for approximately 1.5 mile to station 848. Embankments crossing ravines would be 150 feet high. Three intermittent streams would be crossed in this area. North of station 848, the grade would descend at a variable rate to a maximum of 6 1/2 percent for the final 4.6 miles of the bypass.

Extensive earthwork would be required between stations 840 and 940. A 200-foot cut would be necessary at station 845. Embankments over 200 feet high would be constructed at stations 870 and 895. A 200-foot excavation would be made at station 925 and 150-foot cuts at stations 962, 1020 and 1030. The north interchange for southbound state park access would be constructed immediately north of the last large excavation at station 1030.

Land Acquisition

The ownership and acreages of land required for the bypass would be as follows:

Ownership	Severed Lands	Acreage Right of Way	Total
Simpson Timber Company*	882	631	1,513
Federal Land**	-0-	484	484
State Land***	-0-	13	13
TOTAL	882	1,128	2,010

* The Simpson Lands include a 33 acre gravel bar on the Klamath River would be acquired to supply aggregates for construction. The remaining severed acreage would become part of Redwood National Park.

** Approximately 15 acres are owned by the Bureau of Land Management, and the balance is owned by the National Park Service.

*** Highway construction would require 4.5 acres of the 13 acres of the right of way.

Approximately 2.3 acres of old-growth forest would be isolated east of the alignment. Sediment retention basins required for erosion control will be located within the right of way or on park land.

Since the publication of the draft EIS for the project, the U.S. Bureau of Land Management has surveyed and reproportioned the rangeline adjacent to the state park easterly boundary. As a result, the state park boundary was moved approximately 500 feet westerly and the boundary is contiguous with the rangeline. In addition, section corners in the area may be reproportioned which could affect land ownership patterns. Therefore, exact acreage by ownership remains unresolved, but the total right of way acreage will be 1,128 acres.

Forty-five percent of the land required for the right of way are lands protected by the 4(f) requirements (see Appendix E).

Land acquisition is anticipated to cost approximately $10 million. This money is not included in the project funding.

Land acquisition segment maps are on file in the NPS Western Regional Office in San Francisco.

Design

The proposed road design would be an all paved roadway consisting of four 12-foot lanes, 8-foot shoulders, and a 6-foot median separating northbound and southbound traffic (see Typical Cross Sections on page 20. Truck escape ramps for southbound traffic would be provided at two locations south of the summit.

Interchanges at each end of the bypass would connect with the existing U.S. 10 at May Creek (post mile 126.1) and 0.5 mile north of the Humboldt/Del Norte County line. Both interchanges would direct traffic onto the bypass. A driver would have to exit the highway to gain access to Prairie Creek Redwoods State Park.

Three road connections with locked gates would be built to provide access for logging traffic and the severed road system of Simpson Timber Company in the Klamath River watershed. One connection would be at the north interchange, a second at station 824 and the other at station 970, connecting Ah Pah Road easterly of the bypass. In addition, a fourth connection would be built in the vicinity of the Holter Ridge and Cal-Barrel Roads at station 666. This intersection could serve as an ex't for state park visitors and provide for a future connection with Holter Ridge Road, if needed. Long range plans include developing Holter Ridge Road to connect the bypass and Bald Hills Road (see Redwood National Park General Management Plan 1980). A Park Service access road connection will be provided at the May Creek interchange.

Foundation Stability. Embankment foundations for the new bypass would require substantial work. Stripping and placement of drainage blankets to intercept groundwater would be necessary under virtually all major fills. Unstable soil conditions warrant bridge construction at the northerly Boyes Creek crossing (618 to 631) where an embankment was originally proposed.

Bridge construction at this location will reduce the amount of earthwork required by the elimination of excessive stripping quantities and the disposal of large amounts of unsuitable material.

Fill construction with conventional 1 1/2:1 slopes in the unstable areas encountered could require stripping up to 75 feet below the existing ground surface. Fills with flatter slopes will be utilized where possible to provide the stability required, maintain earthwork balance and reduce disposal needs.

Bedrock at the sites of the new interchanges is mostly concealed by heavy overburden and dense brush. No major problems are anticipated at these sites. Structure foundations have been explored and analyzed by the Caltrans Engineering Geology and Technical Services Branch, and recommendations concerning bridge sites have been made.

All bridges for the bypass would be designed to comply with the seismic design criteria, which are approximately 2.5 times greater than that used for bridges prior to the San Fernando earthquake of 1971. The seismicity of the site and the dynamic characteristic of the bridges would also be considered. These structures would be able to withstand strong seismic excitations from a major earthquake without collapsing, even though heavy damage might occur.

Cut Slopes. The proposed cut slopes for the bypass would have the same basic soil conditions - poorly consolidated sands, gravels and clays over fractured shale bedrock. The only truly major difference in the cuts would be the elevation of the interface between the bedrock and the gravel.

The newly excavated slopes would be constructed at 1:1 to 2:1 ratios and would contain multiple, 20-foot benches at 30- to 60-foot intervals. Benches would be sloped inward (toward the upper cutface) and drained by paved or gabion ditches to reduce the erosion of accumulated surface runoff.

Horizontal drains will be required in some cut slopes to pick up groundwater to alleviate saturation and hydrostatic pressure.

All newly constructed slopes would be revegetated to control sheet erosion. Extensive measures are planned to maintain slope stability, minimize erosion and prevent excessive degradation of water systems. (See Mitigation Measures, page 58 and Appendix G.)

Construction and Maintenance

Preliminary estimates indicate that the area to be cleared would be approximately 460 acres, excluding disposal areas. The size of the cleared area, the new slope area, and the amount of earthwork that would be required, would be governed primarily by soil stability and design criteria. The number of lanes would have only a minimal effect on these parameters. In the clearing phase of construction, raw wood materials such as logs and stumps from the right of way will be donated to Redwoods United Incorporated, a local community service organization (see page 72).

Material removed for cuts would be used for fills; required earthwork for cuts and fills would amount to approximately 10 million cubic yards. Approximately 3/4 million cubic yards of aggregate material would be needed for surfacing and for base and embankment stabilization. Aggregate material would be obtained primarily from the Klamath River, and if necessary, small quantities from Redwood Creek. The Klamath is the nearest source with material of sufficient quantity and quality. Approximately 1/4 million yards of material from the excavation might be of a quality that would permit its use for sub base material.

A 33± acre gravel source of sufficient size to supply the aggregate needs has been identified on the Klamath River. The source consists of a gravel bar located eight miles upstream from U.S. 101 on the southerly side of the river

in Humboldt County. The property is owned by Simpson Timber Company. This bar has been used to supply material for logging roads. (See discussion page 52.)

Construction would be scheduled in three separate stages: clearing, spring 1984; grading and structures, spring 1985; and surfacing, spring 1988. The bypass project would be scheduled to be completed by the end of 1989.

Total cost of construction under the selected alternative would be $95 million at 1983 prices. Escalated total cost at time of construction is estimated to be $115 million, using current inflation rates. Maintenance costs would be high for the first few years, but would drop as new slopes became stabilized.

ALTERNATIVE C - TWO-LANE ROAD, UPHILL TRUCK-PASSING LANES, WITH SEGMENT ACROSS STATE PARK

Alignment

The alignment under alternative C would be the same as under alternative B.

Land Acquisition

Although the actual road width would differ from alternative B, land acquisition would be the same as under alternative B because the right of way is the same.

Design

Under alternative C, the highway would consist of two 12-foot lanes with shoulders and truck-passing lanes on uphill portions of the road (see Typical Cross Sections graph). Of the 12-mile bypass, 1.8 miles would be two lanes, 9.8 miles would be three lanes, and 0.4 mile would be four lanes. Passing lanes would be constructed in four areas: (1) 0.5 to 4.5 miles north of the proposed May Creek interchange for northbound traffic (stations 480-720), (2) from Ah Pah Creek to 0.8 mile north of Ah Pah Creek for northbound traffic (stations 800-846), (3) a 1.6-mile segment for southbound traffic (stations 680-765), and (4) a 4.2-mile segment at the northern end of the bypass for southbound traffic (stations 850-1070); see Bypass profile for Alternatives C & E.

Construction and Maintenance

Approximately 415 acres would be cleared under this alternative. Required earthwork would be approximately 9.1 million cubic yards, and 600,000 cubic yards of aggregate material would be needed. The construction schedule would be generally the same as under alternative B. Total construction costs would be approximately $85 million at 1983 prices and as much as $103 million by the end of construction (1989). Maintenance costs would be approximately the same as under alternative B (see Alternatives map).

ALTERNATIVE D - FOUR-LANE ROAD AVOIDING STATE PARK

Alignment

The alignment under alternative D would be the same as under alternatives B and C, except the corner of Prairie Creek Redwoods State Park would be avoided, and no state park lands would be affected. A bridge over Ah Pah Creek would be constructed. The alignment would be about 1,700 feet shorter than under alternative B.

Land Acquisition

Under this alternative, an additional 170 acres of land from Simpson Timber Company would be required for the highway right of way, for a total of 1,683 acres of private land. Federal lands used for the bypass would amount to 404 acres.

Design

The design would be a four-lane highway as described under alternative B. A bridge at Ah Pah Creek would be constructed over the 400-foot-deep gorge cutting at right angles (east-west) to the highway alignment. The bridge would be approximately 2100 feet long, with a roadway section of four 12-foot lanes and a 6-foot median and 8-foot shoulders (see Typical Cross Sections, page 20).

Construction and Maintenance

The total area to be cleared under alternative D would be 440 acres. Total earthwork would be around 10 million cubic yards, and approximately 750,000 cubic yards of aggregate material would be required. The cost of constructing the bridge is estimated at $51 million (1983). The total project construction costs would be $141 million in 1983 or $170 million in 1989 under alternative D. Maintenance costs might be slightly higher than under alternative B or C.

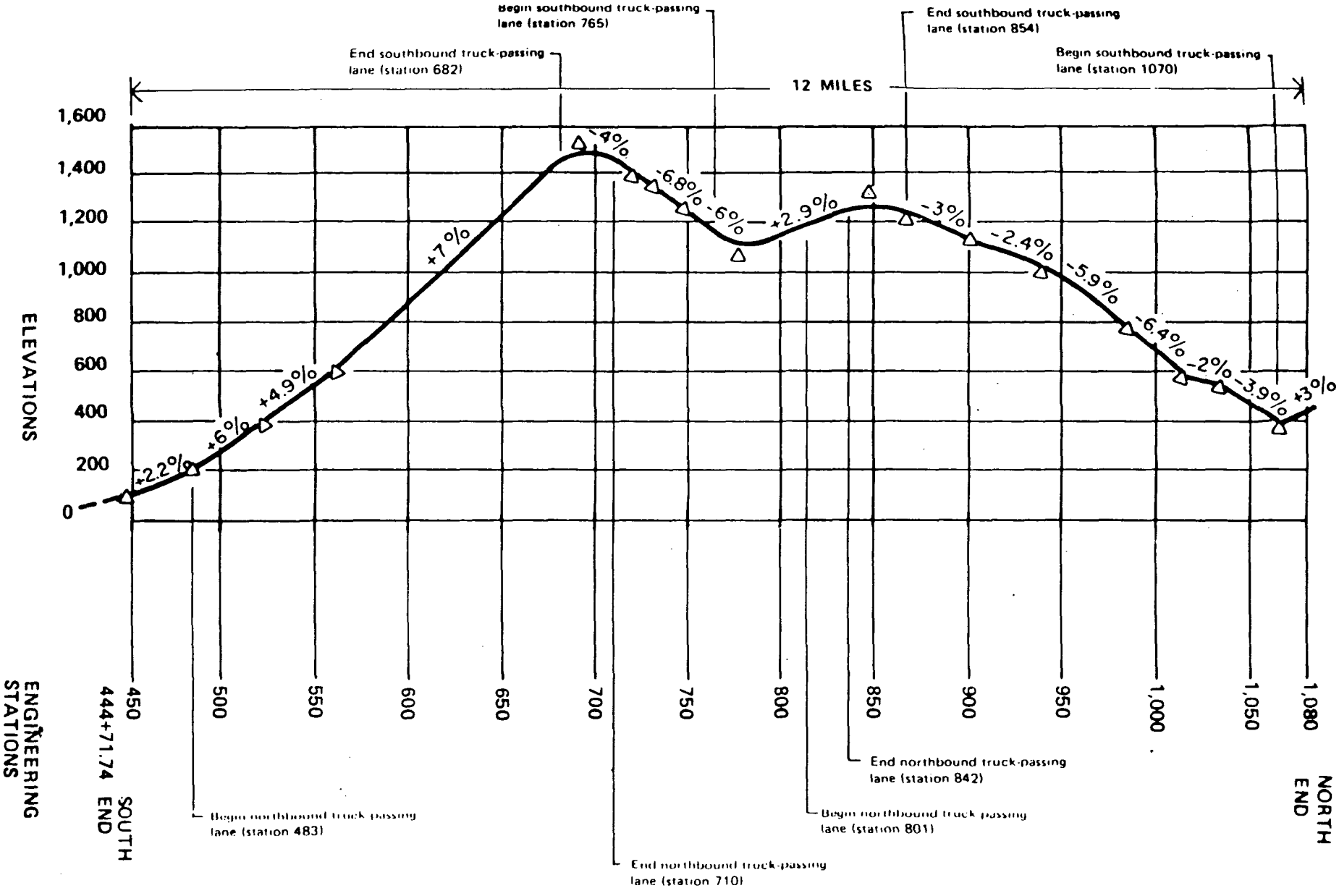
ALTERNATIVE E - TWO-LANE ROAD, UPHILL TRUCK-PASSING LANES, AVOIDING STATE PARK

Alignment

The alignment for alternative E would be the same as that for alternative D, which would avoid state park lands (see Alternatives map).

Land Acquisition

Land acquisition would be the same as under alternative D.


Begin southbound truck-passing lane (station 765)
End southbound truck-passing lane (station 854)
End southbound truck-passing lane (station 682)
Begin southbound truck-passing lane (station 1070)
12 MILES
1,600
1,400
1,200
1,000
800
600
400
200
0
ELEVATIONS
+2.2%
+6%
+4.9%
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ENGINEERING STATIONS
SOUTH END
444+71.74
NORTH END
Begin northbound truck passing lane (station 483)
End northbound truck-passing lane (station 710)
Begin northbound truck passing lane (station 801)
End northbound truck-passing lane (station 842)

sign

e design of the bypass would be the same as under alternative C, with two 12-
ot lanes and uphill truck-passing lanes in the locations indicated under
ternative C. As under alternative D, a bridge over Ah Pah Creek would be
nstructed.

nstruction and Maintenance

proximately 395 acres would be cleared of vegetation for this right of way.
proximately 9 million cubic yards of earthwork would be developed, and
),000 cubic yards of aggregate material would be required. Total costs for
nstruction would be $131 million (1983) or $157 million (1989). Maintenance
sts would be comparable to those under alternative D.

TERNATIVE F - TWO-LANE ROAD, UPHILL AND DOWNHILL TRUCK-PASSING LANES, WITH GMENT ACROSS STATE PARK

gnment

e alignment under alternative F would be the same as under alternative B (see
ernative B map).

d Acquisition

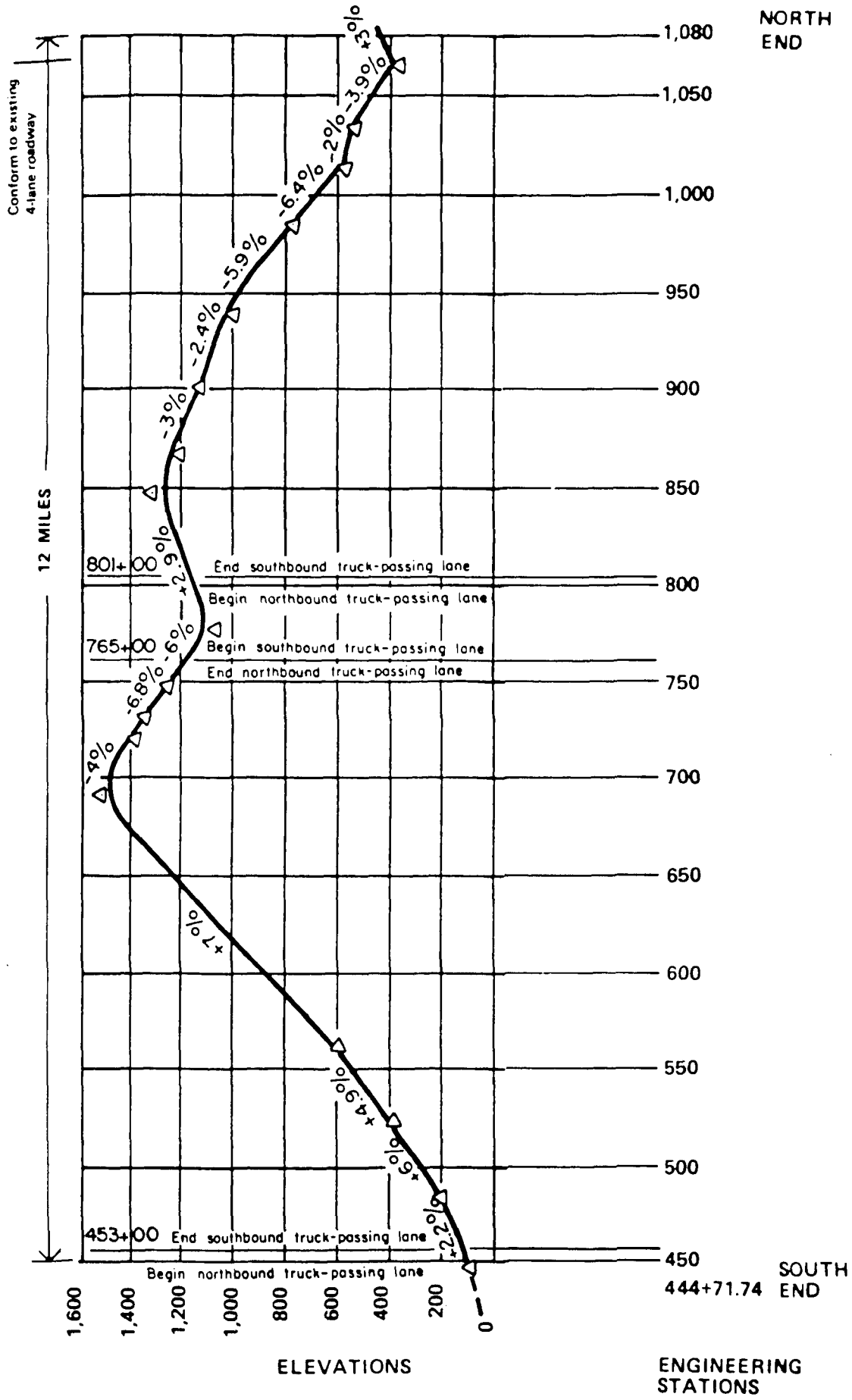
eages would be the same as under alternative B.

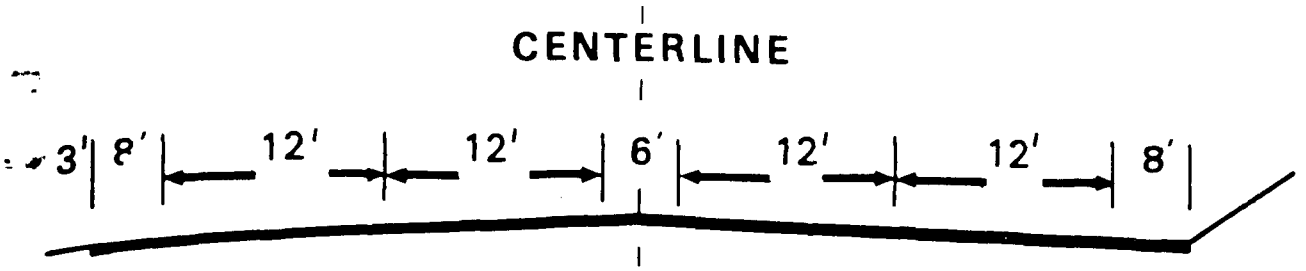
ign

bypass would consist of two 12-foot lanes, shoulders, and truck-passing
es on uphill and downhill portions of the road. A 6-foot paved median would
arate northbound and southbound traffic on the four-lane segments (see Typi-
Cross Sections). Because of the steep grades and transition segments
uired for merging traffic, the design would be the same as under alternative
xcept for a 0.7-mile segment (including transitions) of the two-lane road-
. The two-lane portion between stations 765 and 801 would be immediately
th of the segment passing through state park lands (see Bypass Profile for
ernative F).

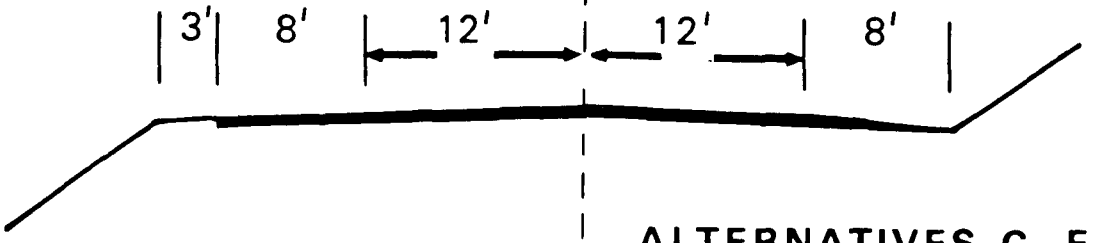
struction and Maintenance

roximately 459 acres would be cleared under this alternative. Required
thwork would be approximately 10.2 million cubic yards, and 750,000 cubic
ds of aggregate material would be needed. The construction schedule would
generally the same as under alternative B. Total construction costs would
approximately $93 million at 1983 prices and as much as $113 million by the
of construction in 1989. Maintenance costs would be approximately the same
nder alternative B.

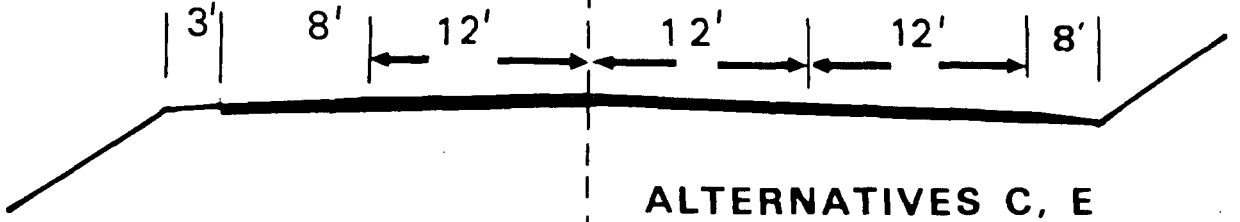




ALTERNATIVES B, D, F
Four Lane Sections



ALTERNATIVES C, E, F
Two Lane Sections
Without Truck-Passing Lane



ALTERNATIVES C, E
Sections With Uphill
Truck-Passing Lane

TYPICAL CROSS SECTIONS

(ALTERNATIVES B, C, D, E, F,)

Table 1: Comparison of Alternative, Design, and Construction Features

	Alternatives					
	A	B	C	D	E	F
Number of Lanes	2	4	2-4	4	2-4	2-4
Area Cleared (in acres)	0	460	415	440	395	459
Earthwork (in millions of cubic yards)	0	10.3	9.1	10.0	9.0	10.2
Aggregate Material (in cubic yards)	0	785,000	600,000	750,000	550,000	750,000
1983 Construction Costs (in millions)	0	95	85	141	131	93
1989 Construction Costs (in millions)	0	115	103	170	157	113

ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Many alternative alignments and lane and shoulder combinations have been considered and evaluated since the 1960's when an improved highway around or through the Prairie Creek Redwoods State Park area was first thought to be necessary and desirable (see Alternatives Eliminated After Consideration map).

Earlier suggested alternatives included a Gold Bluffs Beach route, a Gold Bluffs route, a widening of U.S. 101, and truck-passing lanes on U.S. 101. They were eliminated from further consideration mainly because of potential environmental degradation of prime cultural and natural features now included within the national park boundaries. These alternatives were mentioned briefly in the Draft Environmental Statement for the General Management Plan (USDI, NPS, 1979) and are discussed below (alternatives G-J).

A nonstructural alternative (alternative K), whereby the speed limit on the existing alignment would be reduced, was also considered and eliminated from further consideration.

Different widths and variations of the alignments east of Prairie Creek Redwoods State Park have subsequently been considered (alternatives L and M). However, the topography would allow for little variation, and cost differences would be relatively small.

Alternative G - Gold Bluffs Beach

This alignment would eliminate the need for the prolonged steep grade encountered east of the state park, but would be almost entirely within park lands that are protected under the Department of Transportation Act of 1966 (Section 4(f)). The act states that park land should not be used for highway construction unless no prudent and feasible alternative is available (see Discussion of 4(f) Involvement). Two routes to gain access to the coast were considered: along Davison Road (11.7 miles) or Squashon Creek (12.4 miles). Right of way requirements would be 450 acres on the Davison Road alignment or 515 acres along the Squashon Creek.

The Davison Road alignment would provide 6.4 miles of truck passing lanes while 3.2 miles would be provided on the Squashon Creek route. The cost of either would be approximately $47 million in 1983. With the exception of the 2.1 mile segment along the existing route between Davison Road and May Creek, all of the bypass would be built on prime park lands and resources (approximately 490 acres). A major highway to and along Gold Bluffs Beach would significantly alter the visitor experience at this relatively undisturbed prime state park resource, and a significant portion of the beach would be eliminated.

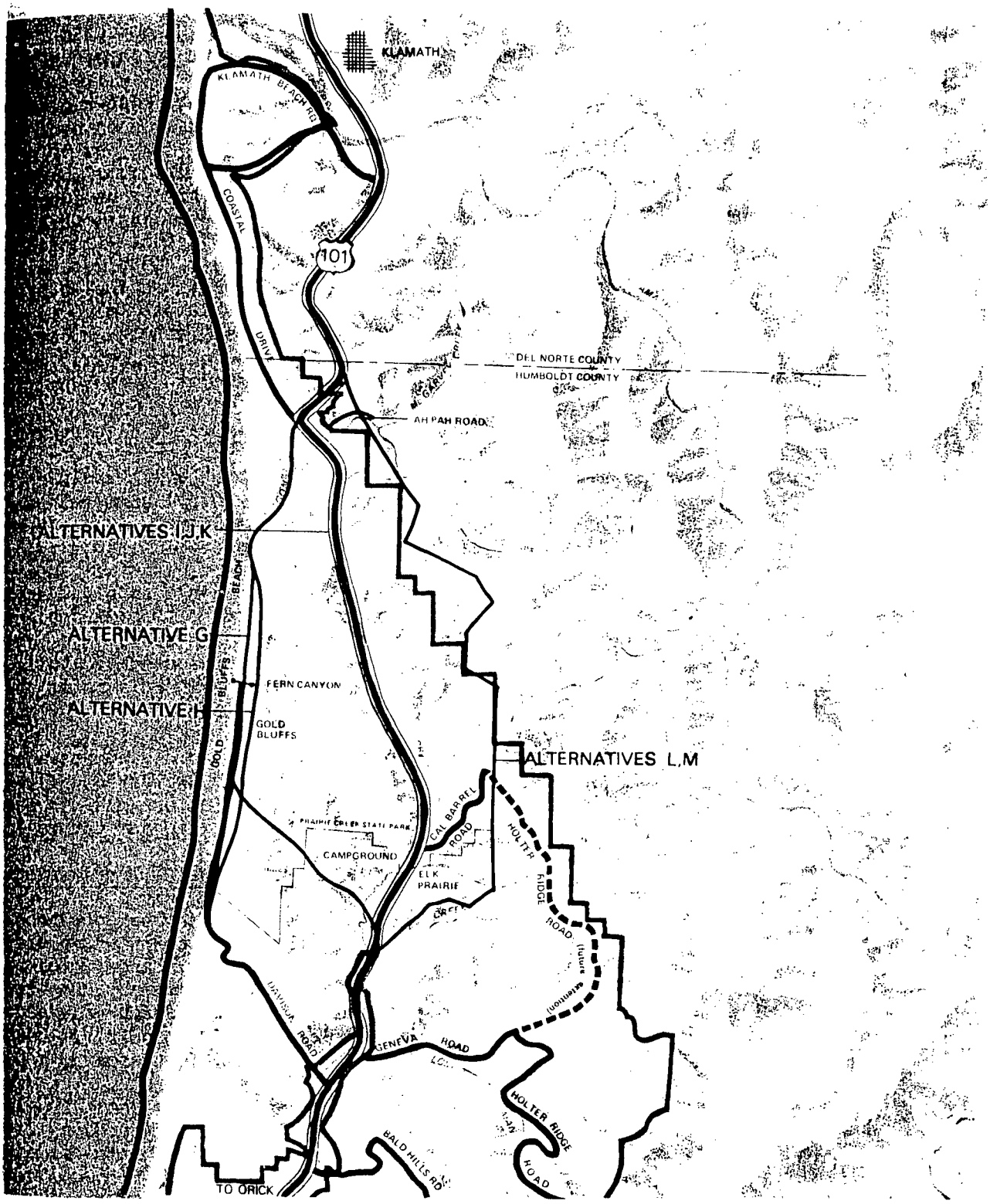
Because the Gold Bluffs Beach area also supports a herd of Roosevelt elk, a highway would eliminate a significant portion of their habitat and impede their access to the beach area. Increased noise and activity resulting from the bypass could cause the elk to migrate into another elk herd's territory and could create habitat competition throughout Prairie Creek Redwoods State Park.

Alternative H - Gold Bluffs Alignment

The implementation of this alternative would create impacts similar to those described for a Gold Bluffs Beach alignment, but to a larger degree because of adverse terrain. A bluffs alignment would increase right of way needs approximately 25%. Park lands required on the Squashon Creek alignment would be about 610 acres, and 570± acres on the Davison Road option. Current costs would be $83 to $90 million. It would also be necessary to either bridge or fill a portion of Fern Canyon. This action would destroy the pristine beauty of the canyon and entirely eliminate a significant portion of its vegetative and aquatic resources (see USDI, NPS, 1979 for a further discussion of these resources). Ten old-growth redwood groves along the bluff that have been dedicated to individuals would also be destroyed.

Alternative I - Expansion of U.S. 101 to Four Lanes

Expanding U.S. 101 into a four-lane highway was considered, but this option would be contrary to separating through-traffic from tourist traffic. From an engineering viewpoint, the relatively low annual average traffic would not justify a four-lane facility on the level terrain of the southerly seven mile portion on the existing route through the state park. The bypass and northerly four miles of the existing route are on steep terrain, necessitating a four-lane facility. The visitor would be deprived of a leisurely scenic drive or bicycle ride through these towering redwood groves of the state park. Through traffic may tend to drive faster which would increase traffic conflicts and reduce safety.



ALTERNATIVES ELIMINATED AFTER CONSIDERATION

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he area of state parkland that would exceed the Federal Noise Standard (an Leq f 57 dBA) for any build alternatives on the existing alignment would be imilar to noise impacts associated with alternative A (see Table 7 page 69).

f a four-lane facility would be built, no additional right of way would equired to construct two additional lanes along the southern seven mile portion of the existing highway because of the existing 100-foot right of way. owever, approximately 20 acres of 4(f) land for additional right of way would e required to widen the northern segment. The trees and shrubs within the xisting right of way are high quality park resources. The construction of two dditional lanes would destroy a number of old-growth redwoods, which the park as established to preserve. Approximately 1,300 trees (675 old-growth trees) ould be cut down, and a number of additional trees would be expected to blow own. Over half of the land used under this alternative is dedicated redwood roves in Prairie Creek Redwoods State Park. About 1 acre of prairie and 0.7 cres of wetland would also be affected. The cost would be approximately $28 illion at 1980 prices and would escalate to about $34.5 million by 1989.

lternative J - Truck-Passing Lanes on Route 101

nder alternative J, minor improvements would be made to the existing route. hese features include: Passing lanes over the 1 1/2 mile segment at the northrn end of Prairie Creek Redwoods State Park where U.S. 101 climbs Ah Pah idge; a 0.8 mile segment of four-lane with 8-foot shoulders would be built hrough Elk Prairie; and the segment between Elk Prairie and the base of Ah Pah idge would be widened to 40 feet to provide 12-foot lanes with 8-foot shoulers and graded to improve sight distance where restricted by vertical alignent. The trees and understory vegetation within the right of way are high uality park resources. Alternative J would result to a lesser degree in the ame impacts as Alternative I and would require removal of resources which the ark was established to protect.

mprovements proposed under this alternative would be cost effective from a raffic operations viewpoint, but like Alternative I, would do nothing to sepaate traffic and relieve use conflicts of visitors and through traffic during he summer months.

lternative K - Reduce Speed Limit on U.S. 101

nonstructured alternative would reduce the speed limit along U.S. 101 through rairie Creek Redwoods State Park, and implement minor improvements in signing nd turn lanes. The present speed limit is 55, which has been established by ear-round driving patterns. The speed limit could be reduced to 40 or 45 mph, specially during the peak tourist season (July and August). To reduce the peed limit below that established by existing driving patterns either yearound or seasonally, special legislation would be necessary.

his alternative would reduce the noise approximately 2 dBA and could make riving through Prairie Creek Redwoods State Park more pleasant for tourists. ecause commercial and through-traffic would have no alternative route, this raffic would be forced to reduce its speed. It may be, however, that estalishing a 40 mph speed limit might not slow traffic compared to the existing low. Even if it did, it would not meet the objective of separating uses - the ourists would still sense the pressure of commercial vehicles that wanted to aintain the maximum speed. Both tourists and commercial vehicle drivers might

be frustrated under this alternative. Enforcement of a lower speed limit might be difficult and would result in the need for additional personnel.

In addition to the lower speed limit, minor improvements along the existing route through additional signing, turn-outs and turn lanes would be implemented under this low or minimal cost alternative. Existing turnouts are small in size, difficult to recognize and enter and exit safely. These areas are also used as temporary parking for trailheads and memorial groves, restricting their use as turnouts. Any significant expansion would require removal of old-growth redwood trees which grow immediately adjacent to the pavement. These actions would not separate traffic or reduce conflicts.

Alternative L - Two-Lane Road Along Preferred Alignment, No Passing Lanes

Under this alternative, a two-lane highway with 8-foot shoulders would be built along the preferred alignment. Alternative L would cost $80 million (1982); escalated cost would be $97 million (1989). Land acquisition would be the same as under alternative B.

This alternative would combine steep sustained grades, as under alternative B, but with few passing opportunities, making the accident potential very high.

Alternative M - Four-Lane Road with Uphill Truck-Passing Lanes

Under this alternative, a four-lane highway would be built along the preferred eastern alignment, and uphill truck-passing lanes would be provided. The cost would be $103 million (1982), with an escalated cost of $125 million (1989). Such a roadway would have a much higher capacity than would be reasonably required.

EXISTING CONDITIONS

U.S. 101 and the proposed bypass alignment are in a remote, relatively undeveloped area of northern Humboldt and southern Del Norte Counties in northern California. U.S. 101 forms the transportation backbone for the region. It is the only north-south link between the two counties for commercial traffic, local residents, and visitors traveling through the redwood region (see Location map).

The existing highway, from Orick north through Prairie Creek Redwoods State Park is a two-lane paved road with numerous turnouts. The highway follows the existing gentle grade of Prairie Creek north, passing through pasturelands, rural residential areas and old growth redwoods in the park before climbing steeply over Ah Pah Ridge at the north end of the state park. Just past the northern end of the state park, the highway widens to a four-lane (12-foot lanes, 4-foot shoulders) configuration and remains four lanes for approximately 4 miles until just before crossing the Klamath River.

Klamath (6 miles north of the proposed bypass) and Orick (5 miles south) are the nearest towns. The nearest cities are Eureka (population 25,000), which is 50 miles to the south; Arcata (population 12,007), which is 43 miles to the south; and Crescent City (population 3,053), which is 26 miles to the north (see Existing Conditions map).

Commercial buses running between San Francisco and Portland, Oregon stop regularly in Orick and can be flagged down near the state park campground and the Klamath townsite. Other scheduled bus transportation is limited in the region. County bus service to the south from Crescent City ends at Klamath, and currently there is bus service from Eureka to Orick.

Developments along the segment to be bypassed are limited to state park visitor and administrative facilities. Prairie Creek Redwoods State Park is noted for a herd of Roosevelt elk that can often be seen in Elk (Boyes) Prairie adjacent to the highway. Roadside turnouts allow tourists to stop and view the scenery, and they provide access to redwood groves and trailheads. The Ah Pah Road in the northern end of the area and the Cal-Barrel Road in the southern end are short scenic drives.

A Redwood National Park environmental education center used by the Humboldt County schools is southwest of Elk Prairie where the Wolf Creek logging camp was located. Near Elk Prairie, a Prairie Creek Redwoods State Park campground complex contains 75 developed campsites, information, maintenance services, and employee housing.

The Ah Pah Road is the only commercial access to U.S. 101 and is used primarily by logging trucks for access to Simpson Timber Company lands in the Klamath River watershed.

Gold Bluffs Beach is a wild, remote stretch of coast in Prairie Creek Redwoods State Park and can be reached by the one-lane Davison Road, a 5-mile dirt road which leaves U.S. 101 2 miles south of the project. Eight picnic sites and 25 campsites are available on the beach. Housing for state park employees is at the south end of Gold Bluffs Beach. Davison Road continues north along the beach and leads to Fern Canyon. Fern Canyon and Gold Bluffs Beach can also be reached by a trail that leads south from the Coastal Drive, and by two trails from the Elk Prairie area, all part of the state park's 70-mile network of maintained trails.

No developments are located or planned in the May Creek and upper Boyes Creek watersheds or along the eastern boundary of Prairie Creek Redwoods State Park.

NATURAL ENVIRONMENT

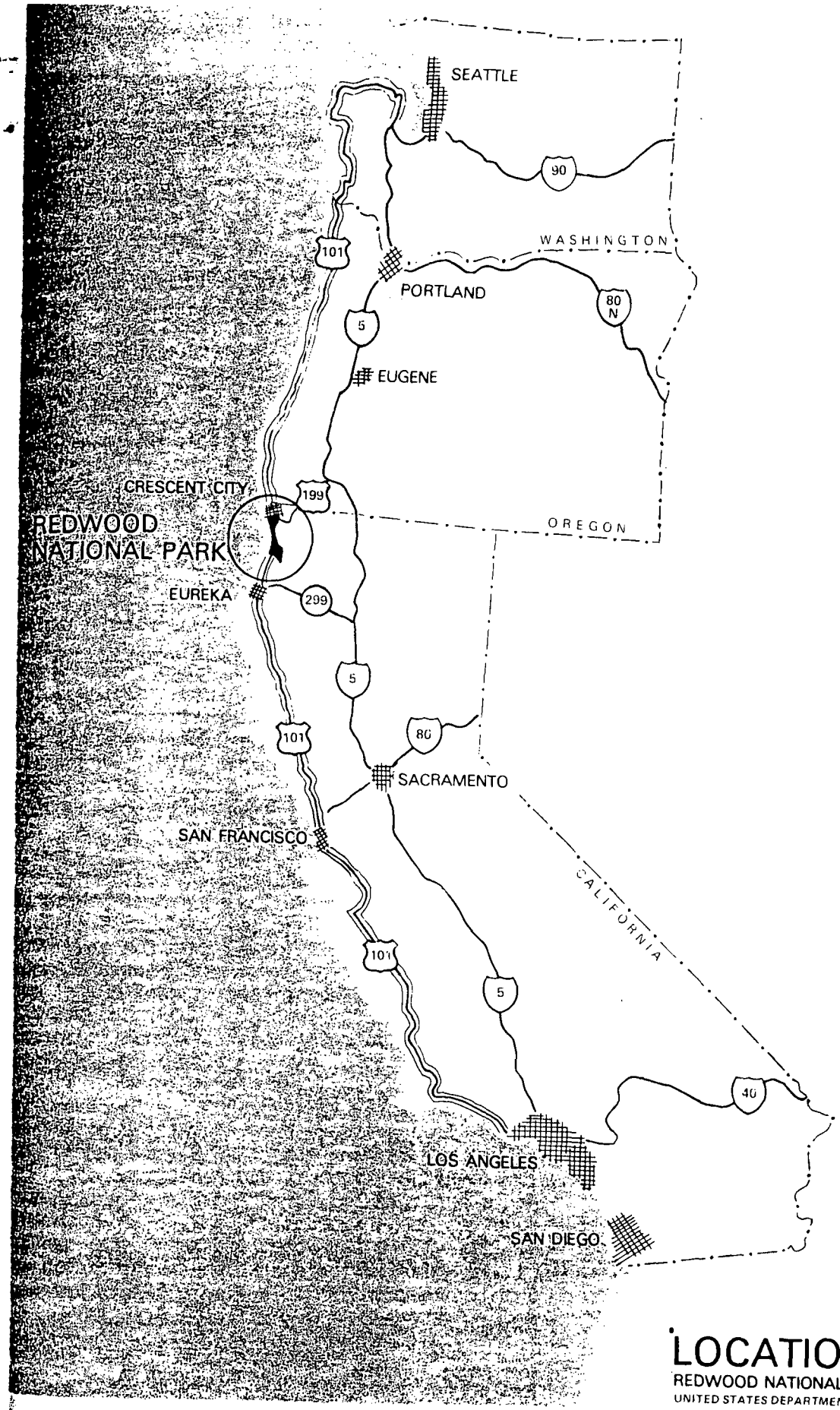
Climate

The regional climate is cool and moist, and rainfall is seasonally abundant. The area has nearly constant average temperatures year-round, particularly at lower elevations. Higher elevations east of Redwood National Park, where the proposed bypass would be located, have slightly wider temperature variations and average approximately 5-10 inches more annual precipitation. Low to moderate snowfall occurs annually.

Records indicate precipitation falls primarily between October and June and averages 70 inches per year at Elk Prairie in Prairie Creek Redwoods State Park (United States Department of Commerce, National Weather Service 1977-79). The heaviest rainfall occurs in January, and less than 5 percent of the yearly total occurs during the summer months. On a highway with elevation and climatic conditions comparable to the proposed alignment, ice and/or snow make driving hazardous approximately five days per year. Generally, average temperatures vary about 15 degrees during the year, between 45° and 60° F.

Air Quality

Prairie Creek Redwoods State Park lies within the north coast air basin, established under the mandates and regulations of the Clean Air Act of 1970. The basin includes the four northwest California counties of Del Norte, Humboldt, Mendocino, and Trinity and the northern half of Sonoma County. Maintaining and enforcing the national ambient air quality standards in the state is the joint responsibility of the California Air Resources Board and the counties. Particulate matter found in the air basin can be dust, solid particles from wood-processing activities, and organic debris from local vegetative cover. This type of pollution is not generated by vehicle emissions. Major sources of particulate emissions are centered in urban areas. The Humboldt County Air Pollution Control District reported that suspended particulates between 1976 and 1980 in the Eureka-Arcata area were slightly below federal secondary standard of 60 micrograms per cubic meter based on an annual geometric mean. (Humboldt County Air Pollution Control District). Ambient levels for other pollutants are below the national standards. Vehicle emissions and photochemical air pollutants are not a serious problem, and air quality is well within state and federal standards. Reductions in automobile-generated pollutants will result from ongoing state and federal automobile emission control programs.



LOCATION

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The portion of Redwood National Park that was created in 1968 has a mandatory class I status under the Clean Air Act amendments of 1977. Prairie Creek Redwoods State Park lands and the lands added to Redwood National Park in 1978 have mandatory class II status under the Clean Air Act amendments of 1977.

Water Resources

Surface Water. The preferred bypass alignment would cross the Prairie Creek and Klamath River watersheds. Prairie Creek empties into Redwood Creek approximately 1 mile upstream from the U.S. 101 bridge in Orick. Within the Prairie Creek watershed, the proposed highway would affect Prairie Creek, May Creek, Boyes Creek, Brown Creek, and several unnamed creeks. Within the Klamath River watershed, the proposed highway would cross several forks of Ah Pah Creek and McGarvey Creek.

A water quality evaluation and monitoring program for surface water to establish baseline conditions from which a reasonable determination of impacts can be made of the project was begun in March 1980. Data are being collected on all the intersected streams except Brown Creek and the unnamed creeks.

Drainage Areas, Floodplains and Conditions - Data collected in recent years show that this area is comprised of some of the most actively eroding terrain in North America (Janda and Nolan 1979a).

The watersheds for all the streams except Prairie Creek have been directly impacted by logging activities, resulting in excess sediment and woody debris in the stream channels. Habitat degradation and restriction from prior logging has suppressed fishery productivity. Streams that would be affected by the bypass have recovered to approximately 60% of the potential fishery value. The most important species of the fishery are: steelhead trout (Salmo gairdnerii gairdnerii), which predominate, Coho salmon (Oncorhynchus kisutch), Chinook salmon (O. tshawytscha), and limited numbers of coastal cutthroat trout (S. clarkii clarkii).

Streamflows of the major watercourses where crossed or diverted by the proposed bypass have been calculated by the Caltrans District hydrologist for a 100-year storm condition. Peak flow during a 100-year storm condition for Ah Pah Creek would be 208 cubic feet per second (cfs); May Creek, 740 cfs; Prairie Creek, 3,100 cfs; McGarvey Creek, 280 cfs; and Boyes Creek, 230 cfs. (A 100-year storm is a momentary peak flow that has a statistical probability of occurring once in 100 years. See floodplain discussion and findings, pages 60 and 173.)

Conditions for May, Boyes, Prairie, Ah Pah and McGarvey creeks are described below.

May Creek: The 1,200-acre May Creek drainage was extensively logged during the 1940's and 1950's, and there is still excess sediment and woody debris in the stream. May Creek's low gradient and fairly small watershed do not allow debris to be flushed out rapidly. Streambanks have been heavily revegetated, primarily with alder, providing shade and a source of organic debris to the stream. Some of the streambanks erode and supply sediment to the stream. In general, May Creek has recovered fairly well from logging. Pools and riffles are developing where debris accumulation will allow. May Creek serves as good spawning area for salmonids during periods of high streamflow because of its

suitable gravels and low gradients. Approximately 0.8 mile of steelhead and salmon habitat is available.

The present gross fishery value is $7,900 per stream mile per year. (See Appendix H.)

Water quality sampling and gauging stations established in May Creek represent the upper, middle, and lower watershed conditions. Generally, water quality appears to be good.

The aquatic invertebrate community is sufficiently diverse and represented in such numbers that it will support a fairly large population of fish.

Boyes Creek: Boyes Creek watershed includes 950 acres and has not been as heavily impacted by logging as May Creek because logging was confined to upstream portions. Although significant sediment and instream debris remain upstream, the lower portions of the creek are relatively undisturbed and in good condition. In the mid-1970's, however, logging again occurred near the headwaters, and the effects have been seen far downstream in the terms of increased turbidity after even fairly small amounts of rainfall (personal communication, Bill Allison, former area manager, Prairie Creek Redwoods State Park).

The lower portion of the creek flows through the northern end of Elk Prairie. There is some bank instability evident, perhaps because of the soil type found in the prairie and in this portion of the stream and because of the heavy use of the area by the elk herd. Except for the logged-over areas, the remainder of the creek flows through old-growth timber stands and is characterized by fairly stable, well-vegetated banks. Approximately 1.4 miles of stream habitat are available. Debris blocks migration 0.3 mile upstream from the confluence of the north and south forks.

Aquatic resource sampling data indicate a healthy stream environment. No water quality parameters approach levels that would significantly limit use of the stream by aquatic organisms. The aquatic invertebrate community is diverse and capable of supporting a relatively large fish population. Boyes Creek is a fairly low gradient stream. In spite of the stream environment, spawning fish population is low and only 1/4 of potential. Gross fishery value is $900 per stream mile per year (see Appendix H). Low streamflows in summer reduce pool and nursery areas, reducing numbers of fish present as compared to earlier in the year. Boyes Creek does, however, retain some pool areas in its lower portions that could provide summer nursery areas.

Prairie Creek: Prairie Creek is the major watershed in Prairie Creek Redwoods State Park. The 25,000-acre watershed is relatively undisturbed, although the stream has been impacted by sediment from logged areas within some of its tributary watersheds and by existing U.S. 101.

Most of the organic debris found in Prairie Creek is what may be expected naturally and provides stream features such as pools and riffle areas. Gravels are present and are suitable spawning areas for coho salmon, steelhead and native trout.

Prairie Creek is an extremely productive stream with a diverse invertebrate community, large numbers of fish, and generally good water quality. No parameters limit aquatic productivity. Coliform levels have exceeded water quality standards at times, probably a result of runoff from Elk Prairie and an adjacent campground and visitor facilities. The aquatic invertebrate fauna is diverse, and the numbers of represented species will support a relatively large fishery resource. Fishery sampling indicates that Prairie Creek does contribute significantly to the fishery resources of the Redwood Creek drainage.

As previously discussed, May and Boyes creeks provide spawning habitat but lack summer nursery areas during low streamflow periods. Prairie Creek provides significant summer nursery areas and is therefore extremely important to the success of the fish spawned in tributary waters.

The relative importance of the Prairie Creek watershed to the propagation and rearing of commercially important fish species should be emphasized. A recent survey of Redwood Creek and its tributaries above the confluence of Prairie Creek indicated only two areas where juvenile coho salmon were found (Anderson and Brown 1980). Chinook salmon may similarly be restricted throughout the area surveyed.

By contrast, surveys conducted within Prairie Creek specific to the proposed bypass alignment indicate coho salmon present at almost every sampling site. High quality spawning gravels for both coho and Chinook are available within almost the entire upper two-thirds of the watershed. The portion of Prairie Creek that would be most affected by the bypass is the 2.2 mile segment below the confluence of Boyes Creek. The gross fishery value of this segment is estimated to be $53,400 per year per mile (see Appendix H). The differences in productivity between the Redwood Creek and Prairie Creek watersheds can be attributed to severe habitat degradation within Redwood Creek and its tributaries as a result of erosion and sedimentation.

Also contributing to the higher productivity of Prairie Creek is the Prairie Creek fish hatchery. The hatchery is operated by Humboldt County and plays a key role in contributing to the fisheries of the county. A substantial portion of the fish reared at the hatchery actually originate from the drainage area itself, and while there has been some use of eggs from other drainages, the hatchery has helped to preserve native stock.

Ah Pah Creek: Unlike the Prairie Creek drainage, recent fisheries information concerning Ah Pah and McGarvey creeks is available (USDI, FWS 1979a; Calif. Dept. of Fish and Game 1979). Water quality and invertebrate sampling sites were established specifically to gather data for the proposed highway bypass.

The 8,500-acre Ah Pah Creek watershed has been heavily affected by past logging. Fish habitat has been degraded by increased sediment and large amounts of organic debris. Approximately 2 1/2 stream miles of salmon/steelhead habitat are now available on the main stem. Although bank revegetation has occurred, the aquatic resources have not fully recovered. Significant efforts have been made by the California Department of Fish and Game, the U.S. Fish and Wildlife Service, and the Bureau of Indian Affairs to restore the creek to a more productive condition by removing barriers to fish migration. Recent barrier removal efforts have increased total habitat available from 2 1/4 to 7 stream miles. The gross fishery value of Ah Pah Creek is approximately $25,900 per

mile per year. Data indicate relatively good water quality, although some instream water temperatures may be elevated as a result of denuded streambanks in some reaches. The importance of Ah Pah Creek is the fishery resource it could provide when fully recovered. Currently, it may be considered a reasonably good steelhead stream. The creek, however, probably will not recover for many years (USDI, FWS 1979a).

McGarvey Creek: The 3,100-acre McGarvey Creek watershed also has been heavily impacted by past logging practices. Large quantities of sediment and slash occur in the creek. Data indicate water quality is good.

The U.S. Fish and Wildlife Service recommends (USDI, FWS, 1979a) that before McGarvey Creek can again become a significantly productive stream, considerable stream clearance work needs to be done. Three stream miles are available as salmon and steelhead habitat. Scheduled barrier removal will increase the habitat an additional 1 1/4 miles. The gross fishery value of McGarvey Creek is $6,000 per mile per year, (see Appendix H). McGarvey Creek is considered to have fair to good value as a steelhead stream, but fair to poor value as a salmon stream.

The California Department of Fish and Game has surveyed the streams that would be affected. Existing and potential populations were estimated by assessment of spawning areas.

Table 2: Fish Population Estimate

Drainage	Species	Present	Potential	Percent of Potential
McGarvey Cr.	Coho Salmon	159	297	58%
	Steelhead	306	506	
Ah Pah Cr.	Coho Salmon	677	938	72%
	Steelhead	714	1001	
May Cr.	Coho Salmon	54	86	
	Steelhead	86	135	64%
	Cutthroat Trout	41	61	
Boyes Cr.	Chinook Salmon	2	15	
	Coho Salmon	9	36	24%
	Steelhead	13	56	
	Cutthroat Trout	6	16	
Prairie Cr.	Chinook Salmon	369	608	
	Coho Salmon	770	1248	61%
	Steelhead	816	1379	
	Cutthroat Trout	3	4	

Water Quality Standards: Standards for the quality of surface water have been set for various uses, and the most stringent standards are for drinking water. Interim federal regulations for primary drinking water apply to groundwater and surface water systems that supply public consumption needs. Secondary drinking water standards (standards for water potability) are established by the state of California.

Water quality objectives for major streams in the north coast region were established in the 1975 Water Quality Control Plan, Klamath River Basin 1-A (California Water Quality Control Board). The objectives apply to actions affecting the degradation of surface waters. In general, they permit no alteration of natural conditions, and they specify maximum contaminant levels for both point and nonpoint sources.

Some of the surface waters within the project limits fall short of the quality objectives of the California Water Quality Control Board for the following constituents: total dissolved solids, dissolved oxygen, pH, and bottom deposits (California Water Quality Control Board 1974).

The overall chemical quality appears to be good, with most levels of contaminants in surface water meeting the primary and secondary stndards. An exception to this is the consistent excess of iron.

Surface waters and bottom sediments of the Klamath River and Redwood Creek have been analyzed for levels of insecticides and herbicides. Detectable concentrations were below primary drinking water standards.

Groundwater. Groundwater is generally of good mineral quality and suitable for domestic purposes and irrigation use. The iron and manganese contents exceed the concentrations recommended by the U.S. Public Health Service drinking water standards. Chemical analysis does not indicate any impairment of groundwater as a result of man's development, primarily because of adequate annual rainfall and favorable drainage of aquifers (USDI, NPS, 1979).

Public (park system) and individual domestic requirements and small irrigation demands are currently the primary uses of groundwater. The groundwater within the project area lies within the lower Klamath River valley and the Prairie Creek basins. In the Redwood Creek vicinity, the water supply is adequate to meet projected requirements though the year 2000.

The overall chemical quality appears to be good, with most levels of contaminants meeting the primary and secondary standards. An exception to this is the consistent excess of iron in some wells.

Data collected in the Prairie Creek area indicate that a significant increase in both fecal coliform and fecal streptococci have occurred. In addition to biological contamination of Prairie Creek by elk, there is reason to suspect that the Prairie Creek campground may also be a source of bacterial pollution of Prairie Creek. The water supply for the state park is now chlorinated, with additional treatment methods used for removal of hydrogen sulfide, iron, and manganese (USDI, NPS, 1979).

Geology

The bedrock in the area consists of the Cretaceous Franciscan formation, which contains interbedded graywacke, shales, minor conglomerates, and thin-bedded chert. Overlying the formation is a variable thickness of Plio-Pleistocene nonmarine sedimentary rocks. These consist of poorly to nonindurated sands and gravels of the undifferentiated Gold Bluffs formation (Irwin 1960 and DeMonthe 1972). This unit acts as a mammoth reservoir to feed underground water into individual beds of the underlying Franciscan formation (see Geology map).

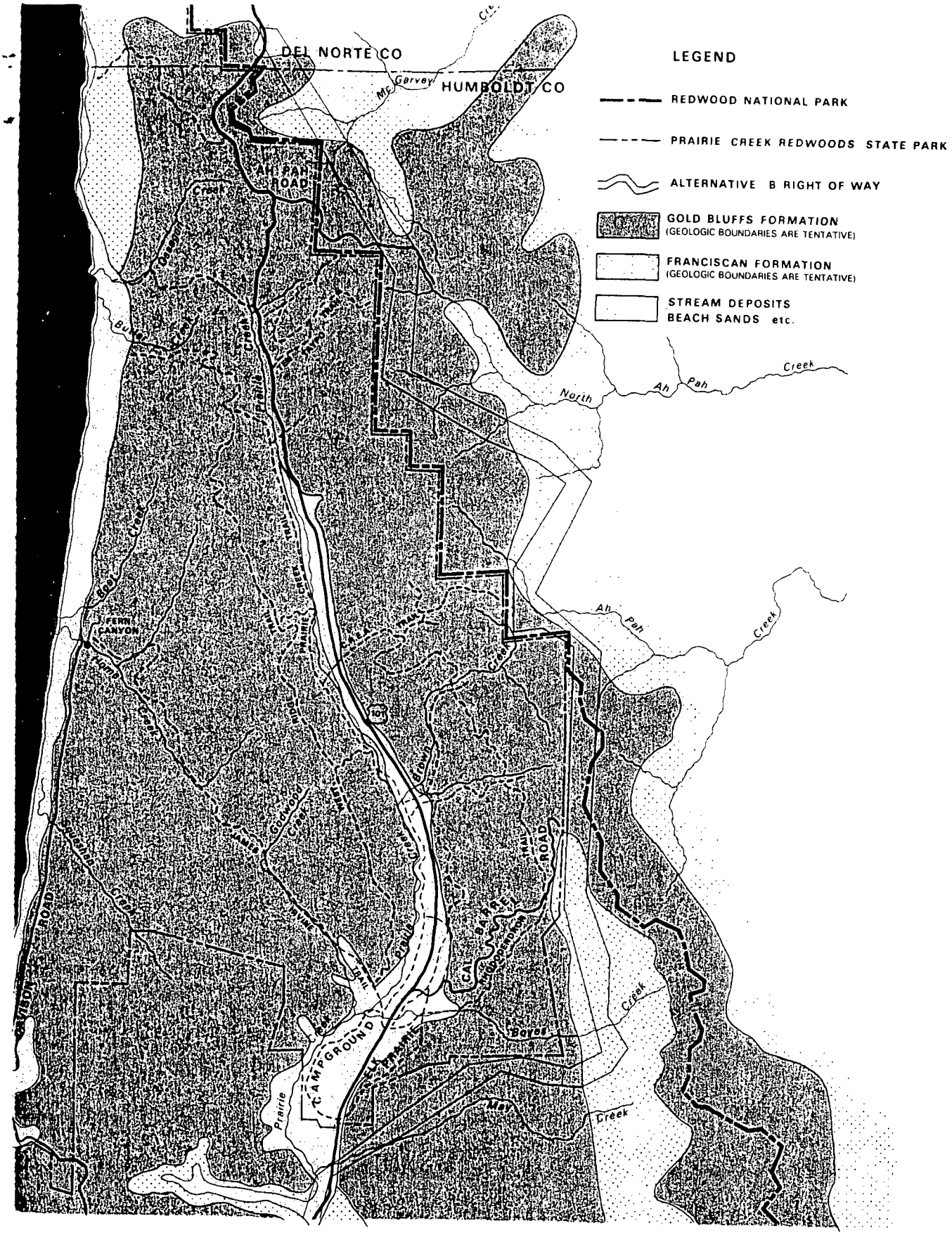
On the natural slopes, exposures are very scarce. Bedrock is covered by heavy alluvium and very dense vegetation. Little or no blasting should be required in the excavation of any of these materials.

Data collected in recent years have shown that the coastal ranges of northern California are among the most rapidly eroding areas in North America (Janda and Nolan 1979a). Of particular interest here is the work done in the Redwood Creek watershed south of the project area. Extensive USGS research in that area has documented a set of geologic, climatic, and land management conditions that have combined to cause Redwood Creek to be perhaps the most highly erosive of all the north coast rivers, and the high sedimentation rates there have resulted in the serious and long-lasting degradation of many of the area's most valuable natural resources (USDI, USGS 1978c). Subsequent work has shown that most of the region's major sediment-producing hillslopes tend to be located in or along the major stream channels, and that they occupy a surprisingly small portion of total drainage basin area, perhaps as little as 50 percent (Kelsey et al. 1981). It has also been pointed out that the effects of a localized source of sediment production may also cause accelerated erosion in areas well downstream of the initial disturbance (USDI, USGS 1978c).

The studies cited above have traditionally viewed the Prairie Creek drainage basin as a sediment-producing area of relatively minor importance. There have been two major justifications for this reasoning. The first is that in general it has experienced less logging-related disturbance than the rest of the Redwood Creek watershed. The second and perhaps more important reason is that much of the Prairie Creek drainage is underlain by the topographically subdued sands and gravels of the Gold Bluffs formation. Erosion of these hillslopes is much less severe than that which occurs on the steep, highly erosive slopes developed on the more widespread Franciscan formation. This latter group of rocks underlies much of northwestern California, including the Redwood Creek watershed, and is widely known for its high erosional potential (Janda 1979).

Soils

The proposed bypass route would go through an area of clay and gravelly loam soils that are moderately to strongly acidic. The soil series encountered along the proposed bypass alignment are Empire, Josephine, Melbourne, Hugo, Mendocino, and Hely. These soils, with depths of 4 feet or more, are found throughout the area. All soils affected have a moderate to high potential for erosion damage. The area's slopes are hilly to very steep (30 to 70 percent), thereby increasing the possibility of erosion damage. All of these soils are moderately to rapidly permeable, and drainage ranges from imperfect (Melbourne) to good. The most common soil series present are the Mendocino, a reddish-brown clay loam that is moderately to highly acidic, and the Melbourne, a brown clay loam that is moderately to strongly acidic.



2000 0 2000 4000 6000 8000 FEET

600 0 600 1200 1800 2400 METERS

600 Meter=1968.48 Feet

GEOLOGY

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lists areas of high potential for surface erosion. These areas are erized by soils with a high erosion hazard located on slopes of 30 to 70 in areas of extensive grading (USDA, FS 1961).

Table 3: Areas of High Potential Surface Erosion

ring s*	Soil Series	Erosion Hazard	Slope
30	Empire	High	30-50%
70	Mendocino Conglomerate and Melbourne	Moderate to High	40-70%
10	Hely Conglomerate	High	50-70%
330	Hugo and Melbourne	Moderate to High	50-70%
350	Melbourne	Moderate	50-70%
905	Melbourne	Moderate	50-70%

ternative B map.

city. The project area for the proposed bypass lies approximately between two potentially active fault zones. The Crescent City fault pproximately 25 miles to the northwest, and the Freshwater fault is imately 35 miles to the south. Both of these potentially active faults aximum expected earthquake magnitudes of 7.3. The San Andreas fault approximately 85 miles southwest of the project area and has a maximum ed earthquake magnitude of 8.25. The California Earthquake Epicenter map 54 earthquakes with epicenters within a 60-mile radius of the project These range from a magnitude of 4.0 to 6.9. The number of occurrences n 1900 and 1974 at each magnitude are as follows (Real et al. 1978): 4.0 51 occurrences; 5.0 - 5.9, 9 occurrences; and 6.0-6.9, 4 occurrences. earthquakes of between 7.0 and 7.9 magnitude have occurred 71 miles and es to the southwest of the project area. Active faults that would prob- ave the greatest effect on the project area are shown in Table 4 sfelder 1978).

active fault complexes are located in the general project area; South ountain fault, five miles east of the bypass and Grogan fault in the d Creek drainage. These faults have not shown evidence of movement in st two million years.

Table 4: Seismic Information

Fault	Distance From Project (Miles*)	Potential Magnitude	Maximum Expected Bedrock Acceleration**	Predominant Period (Secs)**	Duration of Strong Motion (Secs)
San Andreas	85	8.25	.06 g	0.50	35
Crescent City	25	7.3	.23 g	0.35	27
Freshwater	35	7.3	.13 g	0.35	27

*Measured from fault to center of project area.

**Bedrock acceleration and predominant period are at the proposed site.

The seismic hazard appears to be moderate. However, no significantly adverse effects from seismic shaking are anticipated because of design considerations (see page 13).

Mineral Resources

No mines or valuable mineral resources are known to occur within the proposed bypass area or upon the additional right of way that may be required.

Wildlife

Prairie Creek Redwoods State Park, Redwood National Park, and private timberland to the east contain a variety of wildlife habitats. Representative species associated with each habitat are listed in Appendix C.

Birds. Common birds along U.S. 101 and the project area include ravens, varied thrushes, chickadees, and Steller's jays. Less familiar birds include red-tailed hawks and common flickers. Birds dependent on old-growth forests, such as pileated woodpeckers and marbeled murrlets, may reside or nest in the area.

Fish. Steelhead trout, cutthroat trout, rainbow trout, silver salmon, Chinook salmon, lamprey, sculpin, and stickleback have been identified in the area's streams.

Mammals. Roosevelt elk is the most commonly seen mammal in the May Creek and Boyes Creek watersheds. Elk or elk signs are observed along U.S. 101 at Elk Prairie and along the lower portion of May Creek. The elk cross U.S. 101 at several points at Elk Prairie; however, no major trails or movement patterns have been observed in the lower May Creek watershed. The elk extensively use the cutover timberlands that provide forage and cover. With the maturing of second-growth forests and the absence of major natural disturbances (such as fire), the quality of elk habitat would decrease and the number of elk would be reduced.

Other mammals found in the area are black bear, black-tailed deer, coyote, and various small mammals.

ed and Threatened Species. There are no known species tha
inhabit or breed in the project area (letter, FWS, Area O
CA. March 5, 1981).

rd species on the federal list occasionally occur in
gles (endangered) occur only as winter visitors in t
n peregrine falcon, Aleutian Canada goose, and Cal
ered in their entire range) do not permanently in
n they may make occasional flyovers.

al species occurring in the project area are listed as
the California Department of Fish and Game (1978). Howev
nia Department of Fish and Game has designated protected furb
the red fox, the pine marten, the fisher, and the river otter.
ed status has been designated for the ring-tailed cat, the golden e
white-tailed kite. Although no observances have been made, these spe
y occur in the project area.

ion

ew. A number of vegetation types are present near U.S. 101 through
ate park and along the eastern bypass routes (see Vegetation map). These
are fully described in the Redwood National Park Draft Environmental
ent (USDI, NPS, 1979).

owth redwood forest is found along U.S. 101 in Prairie Creek Redwoods
Park. Many large old-growth trees grow adjacent to the existing highway.
gh they are within the Caltrans right of way, these trees and associated
tory shrubs are of park-like quality and of equal value to forests
ed within the state and national parks. Old-growth forests cover the
l range mountains from the coast to several miles inland up coastal val-
Best development is on lower hill slopes within a few miles of the ocean
streamside alluvial terraces. Redwood forests are typically dense
of redwood, often exceeding 300 feet in height, with an understory of
r forest trees, evergreen shrubs, ferns, and native herbs. Old-growth
s average approximately 30 trees per acre (range 25 to 50) for trees 12
or larger in diameter at breast height. Other trees associated with
ds are Douglas fir, western hemlock, grand fir, and tan oak. Farther
l and at higher elevations, Douglas fir becomes an increasingly abundant
ent of redwood forest vegetation. The evergreen shrub understory con-
of rhododendron, salal, evergreen huckleberry, and Oregon grape. The
herbaceous plants are sword fern, deer fern, redwood sorrel, trillium,
dwood violet.

precipitation, slope, and aspect collectively contribute to the overall
tial productivity of forestlands. Potential productivity of an area is
by site classes, which are based on attained height of dominant trees at
ears of age. Site classes are designated from I to V, with class I for
with trees 180 feet tall or more and class V for sites with trees less
105 feet tall. The forest productivity of the lands to be affected by the
s is relatively high, and they are designated as class II, which include
ant trees 155 to 179 feet tall (USDA, USFS 1959-61).

lands along the proposed routes east of the state park were logged in the
s and early 1960's and are now second-growth coniferous forests. Douglas
s the primary overstory species, and there are scattered clusters of red-

wood sprouts. The second-growth stands are generally extremely dense (several hundred stems per acre), and individual trees range up to approximately 50 feet in height and up to 12 inches in diameter. Other forest associates are western hemlock, tan oak, and madrone. Shrubs and herbaceous vegetation are often absent beneath the crowded forest trees. However, native shrubs, including rhododendron, evergreen huckleberry, salal, Oregon grape, and ferns, become common as time passes. Stumps, woody debris, and other signs of logging are abundant beneath second-growth stands.

Riparian vegetation is found adjacent to small streams, in gullies near U.S. 101, and along the bypass routes east of the state park. Red alder is the common overstory species; sword fern and sedges are found in the understory.

Newly cutover land is limited to a former Save-the-Redwoods League tract (now within Redwood National Park) in the upper portion of the Boyes Creek watershed. The tract was partially tractor logged in the mid-1970's. A few of the remaining old-growth trees have blown down since logging. Exposed soils are widespread, and logging slash is abundant. Early successional plants are common, such as pearly everlasting, Australian fire weed, and California blackberry. Forest tree reproduction is seen in the form of stump sprouts beside cut stumps of redwood and tan oak, along with seedlings of redwood, Douglas fir, and other native species.

Elk Prairie is a 160-acre grassland along U.S. 101 at the southern end of Prairie Creek Redwoods State Park. The prairie has been heavily impacted by man's activities and overgrazing, and introduced species dominate.

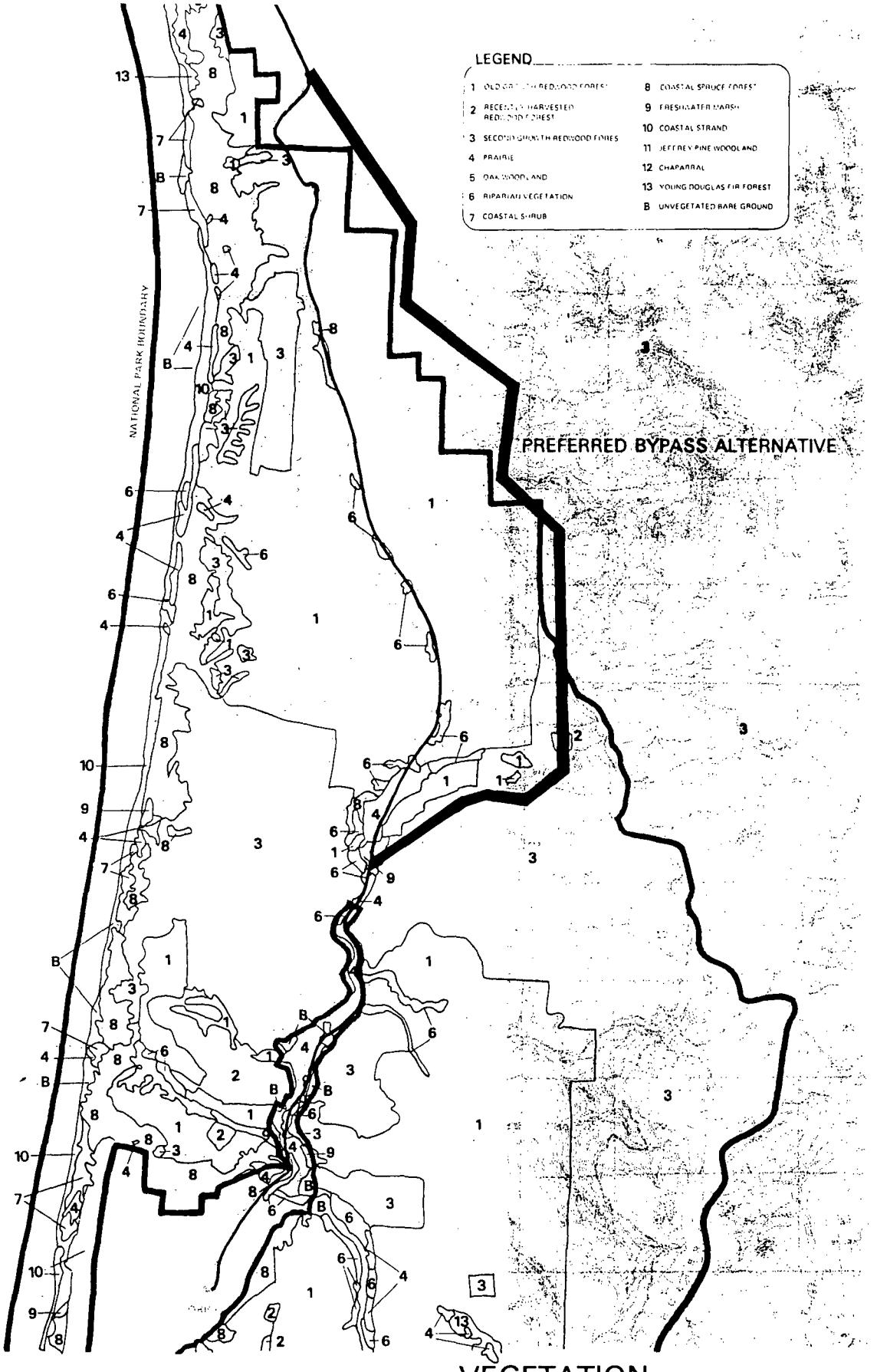
The preferred material source on the Klamath River (see discussion page 52) is a gravel bar essentially devoid of vegetation.

Wetlands. Pursuant to Executive Order 11990, Protection of Wetlands, and NPS Floodplain Management and Wetland Protection Guidelines (Federal Register, vol. 45, no. 104), the National Park Service surveyed the project area and identified wetlands in the vicinity of May and Prairie creeks (see Southern Interchange map). A statement of findings is included (see page 181).

The largest wetland areas were identified at the south end of the proposed interchange adjacent to Prairie Creek and southeast of the May Creek Bridge.

These wetland areas generally lie within the slightly elevated riparian zone dominated by vine maple, (Acer Circinatum), elderberry (Sambucus callicarpa), bigleaf maple (A. macropyllum), and red alder (Alnus oregona).

The lower (depressed) portion of this wetland area is dominated by bullrushes (Scirpus microcarpus), and associated species that include sedges (Carex obnupta), water parsley (Oenanthe sarmentosa), and buttercup (Ranunculus repens), all common to wet, seasonally saturated habitats. A population of heavily browsed (by elk) skunk cabbage (Lysichiton americanum) was idenified in this area. The aggregate total of these wetland areas encompass approximately 0.7 acres (measured early Spring 1983). Areas of standing water can be expected to fluctuate after winter rains begin. This wetland is in the Palustrine system and is classified as forest and wetlands temporarily flooded (USDI, FWS, 1979b).



VEGETATION

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reamside areas along Prairie Creek and May Creek are included in the riverine tland system and classified as unconsolidated shore (USDI, FWS 1979b). Most this area is unvegetated sand and gravel bars with scattered rushes uncus effusus and J. bolanderi), thistles (Cirsium vulgare), foxglove igitalis purpurea), and red alder seedlings.

e stream and edges provide wildlife habitat for Roosevelt elk and a variety small mammals and birds. Although the land surrounding Prairie Creek has en somewhat modified by human activities (campgrounds, housing, log decks, d livestock grazing), the stream retains much of its integrity.

wetlands are found north of May Creek on the proposed alignment or proposed terial source location on the Klamath River.

dangered and Threatened Species. The proposed bypass corridor was surveyed in the spring and summer of 1980 for federal and state listed threatened endangered plant species that might occur along the alignment. The following three species are known to occur in old-growth redwood forests:

> Pityopus californicus (Eastw.) Copel F. California pityopus
> Federal status: none
> State of California status: "plants rare but not endangered" (list III, 1980 inventory)
>
> Monotropa uniflora L. indian pipe
> Federal status: none
> State of California status: "plants rare in California, common elsewhere" (list IV, 1980 inventory)
>
> Pleuropogon refractus (Gray) Beuth. ex. Vassey nodding semaphore grass
> Federal status: none
> State of California status: "plants rare in California, common elsewhere" (list IV, 1980 inventory)

ne of the species were found along the proposed alignment. Monotropa iflora was found in the corner of Prairie Creek Redwoods State Park above the ght of way limits.

e wetland areas were surveyed for presence of threatened or endangered ants. No federally listed species are found in or near Redwood National rk, but one candidate species, Thurber's reedgrass (Calamgrostis assiglumis), is known to exist in similar habitats. However, none was und in this area.

lmagrostis crassiglumis is listed as rare and endangered by the California tive Plant Society. One other species, nodding semaphore grass leuropagon refractus), listed by the California Native Plant Society as re in California but common elsewhere was also looked for in the wet areas t was not found.

Noise

Present improvements at the state park consist of campgrounds, residences, and park buildings. Visitors within these developments are not now subjected to traffic noise from U.S. 101 that exceeds federal noise standards. These improvements are outside areas with Leq* 57 dBA,** which are recommended by the Federal Highway Administration for land use category A, land tracts where serenity and quiet are of extraordinary significance, (Leedy 1975).

There are no noise generators or proposed park developments within the proposed bypass corridor.

On U.S. 101 through the state park, traffic-generated noise contours have been calculated based on the Leq 57 dBA federal standard.*** The Leq in the area between the center of the existing highway and 400+ feet on each side (approximately 750 acres) now exceeds the 57 dBA federal standard.

Aesthetic Qualities

Scenic resources contribute much to the visitors' enjoyment of a park. Beautiful scenery and vistas are as important to Redwood National Park as other resources. Visitors can enjoy views of old-growth redwood forests, wildlife, and prairies while traveling on U.S 101 in Prairie Creek Redwoods State Park. Numerous turnouts and side roads provide closer access to these scenic resources. Long-distance vistas east toward the hills and mountains are rare along U.S. 101 in Humboldt and Del Norte counties. Generally, travelers have views of the coast or forests.

SOCIOECONOMIC ENVIRONMENT

Regional Characteristics

The proposed bypass alignment will be located primarily in Humboldt County, with a small segment in Del Norte County. Past data indicates a population decline in both counties between 1960 and 1970 but a slight increase since 1970. Del Norte County's population was 18,200 in the 1980 census, up from 14,600 in 1970, a 2.5 percent growth rate.

Humboldt County's population increased to 108,500 people in 1980, a growth rate of 8.8 percent from the previous census.

The following population projections for Humboldt County have been prepared by the California Department of Finance.

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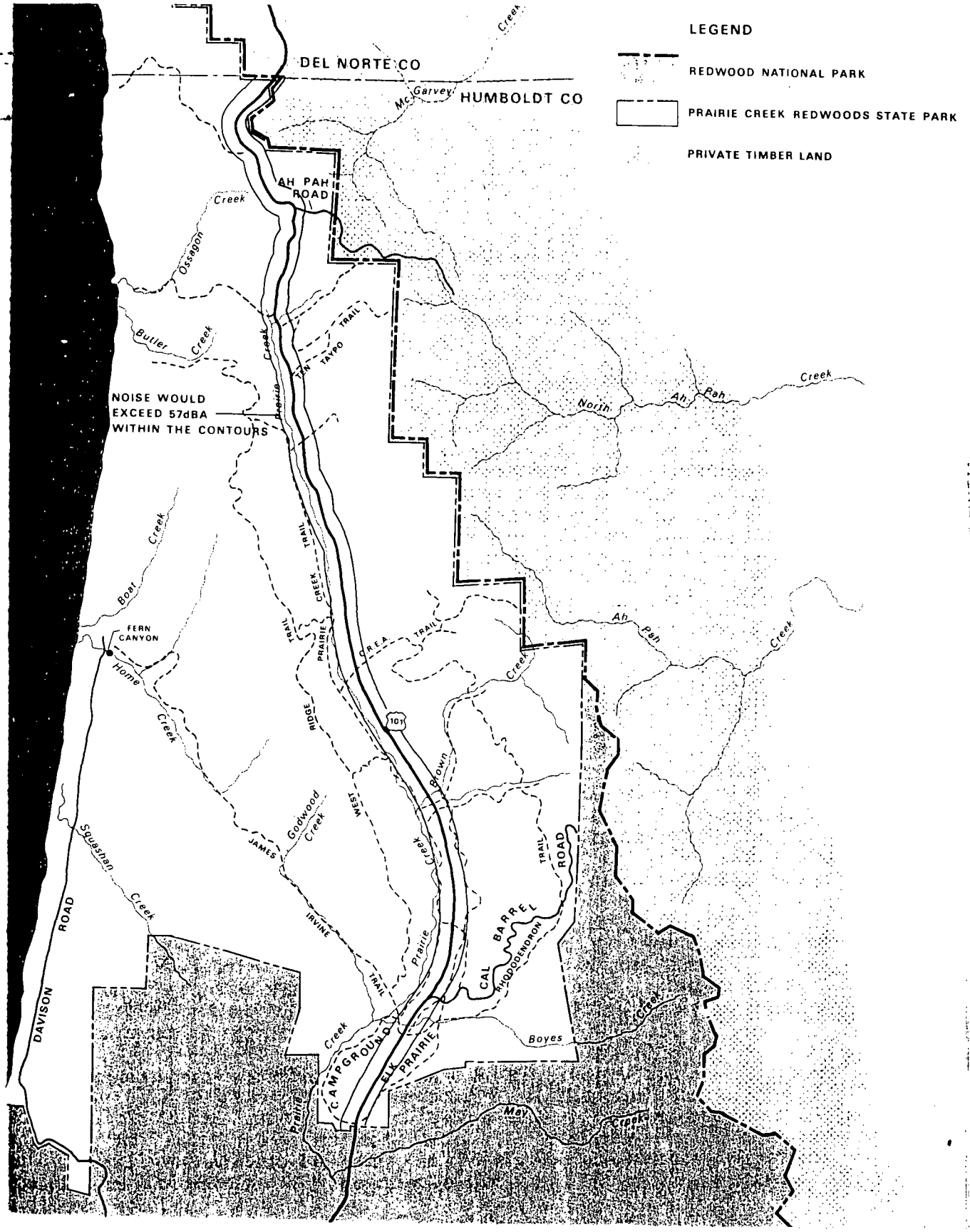
* Leq is the equivalent steady state sound level that, in a stated period of time, would contain the same acoustical evergy as a time-varying sound level during the same period. This level is the value of an acoustical quantity in decibels.

** 57 dBA is a noise level comparable to that of a large business office.

*** The FHWA Highway Traffic Noise Prediction Model (FHWA RD-77-108) for the prediction of Leq noise was used and compared to recommended "design levels" in the Federal Highway Administration Procedural Manual 7-7-3 for Land Use Category "A" (57 dBA).



NOISE CONTOURS YEAR 2000

ALTERNATIVE A

REDWOOD NATIONAL PARK/CALIFORNIA

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2000 0 2000 4000 6000 8000 FEET

600 0 600 1200 1800 2400 METERS

600 Meter=1968.48 Feet

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Table 5: Humboldt County Population Projections

Year	Most Probable	Lowest Probable
980	108,500	
990	121,900	110,800
000	134,500	116,500
010	148,900	117,200
020	162,900	115,500

ocal residents and commercial businesses of Crescent City, Orick, Klamath, rinidad, Arcata, and Eureka are most likely to be affected by the proposed pass. These towns provide many of the services required by park visitors and ark employees.

early 84 percent of the land in the region is forested, 9.5 percent is range- and, and 3.7 percent is cropland and pastureland. The timber industry has een the dominant feature of the region's economy for more than a century, with ne timber output reaching an all-time peak of 1.9 billion board feet in 1959. ouisiana Pacific, Simpson Timber, and Arcata Redwood are the three major tim- er companies in the region. Recent employment in recreation and tourism, agri- ulture, fishing, and government have expanded while employment in the timber ndustry has declined. For additional socioeconomic information and tourism haracteristics, see the Redwood National Park Draft Environmental Statement JSDI, NPS 1979), Second Annual Report to Congress (USDI, NPS 1980c), and the atershed Rehabilitation Plan, Environmental Assessment (USDI, NPS 1980).

raffic Characteristics

.S. 101 is the only north-south route from Arcata to Crescent City. There are o secondary roads that go significant distances or provide alternative routes or local and through-traffic.

he Average Daily Traffic (ADT) count for U.S. 101 through Prairie Creek Red- oods State Park is currently 3,700 vehicles and is expected to increase to ,800 vehicles by the year 2010. Although recent ADTs are reduced because of he recession, projected ADT's are based on statewide population and traffic se predictions. Approximately 15 percent of this traffic volume on an average ay is truck traffic. Tourist traffic accounts for 15 percent of this volume, ith the remainder being local traffic.

n 1982 during the peak month of August, the ADT count averages 5,900 vehicles er day and is expected to increase to 15,700 per day by the year 2010. The istribution of vehicles shifts to 55 to 60 percent tourist vehicles during his month, with truck traffic making up 11 percent of the volume and local raffic constituting approximately 30 to 35 percent of the daily volume.

n spite of apparent traffic conflicts on U.S. 101, records indicate that park egments of U.S. 101 have not had a particularly high accident rate. Statis- ics show that in the last three years (1980-82) there has been a total of 62 ccidents, 4 of which had one fatality each. The frequency rate is 1.39 acci- lents per million vehicle miles (MVM), as compared to the statewide expected ate of 2.55 accidents per MVM for this type of road. No bicycle accidents ave been reported.

Traffic flow varies depending primarily upon park visitation. Under unrestricted road and traffic conditions (generally between September and June), traffic usually flows at 50 to 55 mph. During the peak tourist month of August, traffic flow is unstable with frequent backups, momentary stoppages, and speeds decreasing to 30 mph at times.

Visitor Characteristics

Most visitors to the north coastal region are on a long trip away from home (USDI, NPS 1977). Visitors want to see the redwoods, but the area is not the primary destination of their trip. Although most visitors travel more than 200 miles to reach the redwoods, almost 75 percent have been to the park before. Day visitors, who spend less than eight hours in the region, account for 40 percent of all visitors. Day visitors can be classified into three types: (1) drive-through visitors who see the redwoods only from U.S. 101, (2) scenic-driving visitors who in addition to traveling on U.S. 101 drive the low-speed roads like Cal-Barrel Road, and (3) outdoor recreationists who participate in some nonvehicle-related activity, such as walking, swimming, or picknicking.

Visitation to the region is expected to increase, although no statistical projections are available at this time. The seasonal distribution of visitors is projected to shift, with larger proportions of a year's visits occurring during the off-season period (Grobey et al. 1979).

CULTURAL RESOURCES

Archeology/Ethnography

The specific area of the proposed bypass was part of the ethnographic Yurok territory. Early studies of the Yurok recorded major settlements along the coast, rivers, and streams, although references to upland areas were included (Waterman 1920). An archeological survey by Moratto within Redwood National Park also focused on coastal and riverine locations (USDI, NPS 1973). Bickel's (1979) inventory of the 1978 Redwood National Park extension concentrated on an inland area outside the Yurok territory. Bickel discussed the need for augmenting the ethnographic and previous archeological data on coastal and riverine settlements, with data on the utilization of upland resources.

Reports on file at Redwood National Park, Arcata, show that the route of the proposed U.S. 101 bypass was not included in any previous archeological studies. These reports were prepared in conformance with the cultural resources clearance requirement for the Redwood National Park General Management Plan. Research for these reports included a record search of available information from the State Regional Archeological Clearinghouse located at the Northwest Regional Center of the California Archeological Survey Anthropology Laboratory, Sonoma State University, Rohnert Park, California.

Ethnographic reports, consultations with local Yuroks, and the location and environmental context of the proposed bypass indicate that interrelated prehistoric uses of the area for temporary camps or trails probably occurred. Ridgelines were used as trail routes prehistorically. As Waterman noted, upland areas were also utilized for the vegetable and wildlife resources. He described both "acorn-places" and "snaring-places." If camps were repeatedly occupied, archeologists might expect to find substantial archeological sites containing midden and a range of chipped and ground stone implements. Trail use or temporary camps might imply that light evidence, such as lithic scatter

long a ridgeline or an isolated grinding tool, might be present. Heavy logging and the difficulties of surveying dense second-growth stands make the inding of such resources difficult. Finally, it should be noted that use of pecific upland areas as power-seeking places was also possible. Such use ight not have left any material evidence.

ative American Consultations

onsultations were conducted in 1978 and 1979 with local Native Americans egarding places of importance within Redwood National Park; however, specific nformation about the area included in the proposed bypass was not obtained ecause most of the route lies outside Redwood National Park.

n August 1979, a meeting was held between Caltrans, the Northwest Indian Cemetery Protective Association, and local Yuroks with regard to possible impacts s a result of the bypass to areas or sites of particular concern to American ndians. No objections were raised.

ocal Yuroks knew of six trails in the vicinity of the proposed alignment, four f which were to the south of the alignment. The other two trails connected oints on the Klamath River to the ridgeline of the proposed bypass and then ontinued to Elk Prairie and crossed the southern portion of the project area. chert quarry was thought to have existed near the headwaters of Boyes Creek. t was recommended to discourage off the road travelers along the route and to ry to locate the chert quarry.

n compliance with the Native American Religious Freedoms Act, additional consultation has been initiated regarding gravel extraction from the Klamath River.

urveys. Pursuant to Executive Order 11593, archeological surveys for the roposed bypass were conducted in May 1980 by park archeologists. Dense secondrowth vegetation and steep slopes made survey conditions quite difficult. The urveys included approximately 12 miles of brushed centerline (P-line), or cenerline trail; all mechanically cleared, tractor cuts and pads associated with oil tests, as of August 13, 1980; the recently logged area on the southern porion of the bypass; and logging roads throughout that were either not gravelled r overgrown.

o surface evidence of prehistoric cultural resources or trails was encountered uring the course of the archeological survey. It appeared that the quarry menioned above was used as a source of road rock by Simpson Timber Company. No vidence of prehistoric trails was found. At the point where the proposed ypass centerline lies along the ridgeline (stations 674 to 683), a puncheon ogging road was noted (USDI, NPS 1980).

istory

verview. Homesteaders settled lands bordering Prairie Creek, northeast of rick, during the 1800's under the provisions of the Homestead Act of 1862 and he Timber and Stone Act of 1878. Ultimately, land not ranched in the area round Redwood and Prairie creeks was staked for mining and timber claims.

n the early 1880's, the California Redwood Company moved into northern umboldt County to buy up all the redwood forestland and all the mills in the umboldt Bay region, and the company eventually combined several large timber

holdings. Fraudulent practices led to litigation and indictments and eventual dissolution of the company.

Following the demise of the California Redwood Company, three other major timber concerns began to surface by the late 1890's around the Orick area: James E.Henry, the American Lumber Company, and the Charles A. Smith Timber Company. Charles A. Smith was a millionaire lumberman from Minneapolis, Minnesota, who bought up 30,000 acres of land on which claims had been cancelled and relocated by Humboldt County citizens after the scandal. These lands became the Simpson holdings near Orick. An 1898 map shows the American Lumber Company owning most of the land east of Prairie Creek, with a few private owners, such as Willis Ward, dispersed throughout the area. The American Lumber Company holdings were operated jointly by the Hill-Davis Company and the Hammond Lumber Company.

A 1911 map shows several landowners in the area east of Prairie Creek around Little Lost Man and Ah Pah creeks: the Hammond Company, the Hill-Davis Company, Willis C. Ward, and the C. A. Smith Timber Company.

In 1924 the property that was owned jointly by Hammond and Hill-Davis was partitioned, the forests north of Redwood Creek going to the Hill-Davis Company and those to the south going to Hammond. The entire Hammond operation was sold to the Georgia-Pacific Corporation in 1956 for $80 million. In 1945 land east of Prairie Creek was owned by the Sage Land and Lumber Company and by Hill-Davis Company, Ltd. The Arcata Redwood Company holdings in the Orick area began with the purchase of Skunk Cabbage Creek from the Hammond Lumber Company in 1947 and the large Hill-Davis holdings in 1958.

Historical Survey. In accordance with Executive Order 11593, a short survey of historical documents and a field inspection of the proposed bypass route were conducted by an NPS historian in June 1980 to determine if historic resources are located in the project area. A field check was made where feasible along the proposed bypass route, mainly along cutbanks, logging roads, and wherever a cleared area could be found. The entire alignment was not surveyed because of time limitations and the difficulties imposed by the dense overgrowth. The line was walked by the park archeologist, and sites of possible historical significance were noted. These were subsequently examined by the NPS historian for evaluation. The results of the evaluation are as follows:

> California Barrel Company Camp: The proposed bypass alignment passes just west of the ruins of the California Barrel Company camp in section 31, T12N, R2E. This company was organized in San Francisco no later than 1888, and possibly as early as 1883, by John L. Koster of San Francisco in association with other prominent California businessmen. The company first concentrated on manufacturing and selling sugar and syrup barrels, half barrels, and kegs for the Spreckels Western Sugar Refining Company. Business was begun on a small scale, with elm stock from which the barrels were made imported from the middle west and eastern states around Cape Horn. Eventually the Koster family took over the business in its entirety and began to expand its operations by manufacturing barrels for a variety of products. As most firms began to patronize the company, imported wood became too expensive, and a search was initiated along the coast to find a substitute for elm. It was soon discovered that abundant timber existed in Humboldt County, which was much closer to the San Francisco assembly plant. In 1902 the company began to acquire timber lands in Humboldt County, and in June 1903 it began construction of a small stave and heading factory at Arcata. Full operations began in November 1903 with the

intention of ultimately supplying all raw material requirements from Humboldt County except for the oak stock that was still needed for the wine and liquor cooperage.

Over the next several years, the company's prosperity contributed much to the growth of Humboldt County. By 1937 Cal-Barrel's personnel averaged 750 people, with about 600 employed in the Humboldt County operations alone. Around 1946 it employed over 1,000 workers at its 30-acre plant and at its extensive logging operations on Redwood Creek and the Klamath River. It remained a mainstay of the Arcata economy for over 50 years, finally closing in 1956. The collapsed structures of the California Barrel Company camp in the redwood forest lie just east of the Prairie Creek Redwoods State Park boundary.

Puncheon Road: One frequent engineering problem associated with building logging or stage roads through the redwood forest was occasioned by the often marshy nature of the ground. A puncheon road was sometimes necessary to keep vehicles from sinking into the mud and was formed by first grading a roadbed and then paving it with redwood slabs. One short stretch of such a road was found along the proposed bypass route. It appears to be covering only one stretch of low ground. While it might have continued farther, the density of the surrounding brush made it impossible to discern other vestiges.

Ah Pah Trail: The Ah Pah Trail is known to have been located in the path of the bypass route. The Ah Pah Trail was a branch of the Trinidad-Klamath Trail that was opened about 1882 and trended northeast from Prairie Creek toward the Klamath River.

The criteria for evaluation for the National Register of Historic Places were applied to the three properties, and a determination was made that they do not qualify for inclusion on the register. The State Historic Preservation Officer has been consulted regarding archaeological and historical resources in compliance with Section 106 (see Appendix E page 148).

Limited historical research has not suggested the presence of any significant historical remains in the proposed bypass area. Only signs of early lumbering activity, such as logging roads, springboard marks, and artifactual material in the form of old saws or cables, may be expected as brush-clearing progresses. The Ah Pah Trail route is undoubtedly overgrown and possibly significantly altered by later lumbering operations. However, it is possible that remnants of the trail are still recognizable.

The environmental consequences for the no action alternative and the bypass alternatives are presented in this section. Table 6 shows a comparison of impacts for all the alternatives.

Table 6: Comparison of Impacts

	Impacts of Alternatives					
	A	B	C	D	E	F
Acres of vegetation cleared						
second-growth coniferous forest	-	441	409	425	393	436
old-growth redwood forest	-	4.5	4.5	0	0	4.5
riparian	-	13.6	13	13.6	13	13.6
wetland	-	0.7	0.7	0.7	0.7	0.7
Total	0	460	415	440	395	459
Wildlife	Low to moderate under alternatives A-F					
Water resources	None	Significant loss of aquatic resources and habitat under alternatives B-F				
Air quality & noise	Moderate	Not significant under alternatives B-F				
Erosion potential	Slight	Moderate-high under alternatives B-F				
Land acquisition (in acres)	0	1,977	1,977	2,147	2,147	1,977
Energy (relative to the no action alternative)						
total energy requirements[1]	-	+73%	+68%	+93%	+84%	+73%
individual energy consumption[2]	-	+35%	+35%	+35%	+35%	+35%
Accidents Expected Accident Rate (Acc/MVM)	2.55[3]	.95	2.03	.95	2.00	1.08
Cultural resources	No impacts under all alternatives.					

[1]Includes construction of the bypass.
[2]Average energy consumption increase for a vehicle using the bypass.
[3]Current actual accident rate is 1.39 (Acc/MVM).

EFFECTS ON THE NATURAL ENVIRONMENT

Soils

Surface soils encountered along the bypass alignment are derived from loosely consolidated nonmarine terrace deposits. Textures of these soils range from a

silty gravel loam to clay loam. Slope gradients of 50 to 70 percent are common, particularly at higher elevations. The erosion potential of these soils is moderate to high. The major contributing factors are texture, slope, rainfall, and vegetation cover. As shown on the Geology map, portions of the proposed alignment would cross areas underlain by Franciscan bedrock. It is in these areas that the impacts of construction-related erosion would be the most serious. Controlling this erosion would be difficult and expensive, and would require careful use of state-of-the-art knowledge of erosion control techniques during all phases of construction and for many years thereafter.

The area to be cleared for the bypass alignment would be approximately 460 acres. The maximum differences between the bypass alternatives would be approximately 14 percent, with the actual acreages ranging from 460 acres under alternative B to 395 acres under alternative E.

It is expected that some slides would occur during the construction of the bypass and for several years after completion. Even with the extensive subsurface investigations that have been done, it is impossible to predict where isolated "pop-outs" may occur. This is particularly true in steeply inclined, fractured, wet strata so typical of the Franciscan formation encountered. With the mitigation features that will be incorporated, concerns associated with cut slope failures should be reduced to disposal, rather than erosion problems. Fills, though absolute safety may not be achievable, pose no major problems. Stable embankments can be designed with a relatively high level of confidence.

In an effort to assess potential impacts on fisheries, a best guess estimate[1] has been made to quantify erosion materials (sediment yield) that would be generated. Standard erosion control techniques should contain 95% of the gross predicted unmitigated sediment yield during construction and 99% of the long-term yield. The goal of additional measures to be implemented is to further reduce sediments generated during construction by 75% and post-construction sediments an additional 85%. Based on the estimate, the erosion products that would escape containment during construction, provided mitigation goals are met, would be 3,500+ tons per year. Long term erosion would be 425+ tons per year, approximately half of which could wash through the drainage system as suspended sediments during high flows.

Mitigation Measures. Disposal sites would be planned in order to have a place to put excess and unsuitable material without creating adverse environmental impacts. Candidate areas have been identified as potential disposal sites along the alignment of the bypass.

Erosion on new slopes would be controlled to the degree possible, primarily by selection of proper slope gradients and reestablishment of vegetation by adequate seed and fertilizer. Slope movement would be minimized by cut bench heights, toe support structures, and horizontal drains. (Additional mitigation measures are addressed in the "Water Resources" section.) However, should substantial failures occur, erosion could continue to be a major impact throughout construction and for many years thereafter.

(1) The estimate is based on the Universal Soil Loss Equation as detailed in the National Cooperative Highway Research Progress Report 221.

Material Source

Approximately 3/4 million cubic yards of aggregate material will be needed for surfacing and permeable material. The subbase material (1/4 million cubic yards) is expected to be generated within the project. The Klamath River is the only source close enough with the capability to supply this quantity. Four large gravel bars have been studied and coordinated with California Department of Fish and Game. Three of these bars have developed wildlife habitat or would have risks of hydraulic problems after removal of the gravel.

The fourth bar is an excellent source. It is located on the south bank of the river 8 miles upstream from Route 101 immediately south of the Humboldt-Del Norte County boundary. This source is approximately 2,500 feet long, up to 900 feet wide, and extends over 33 acres. The California Department of Fish and Game has been consulted regarding the selection of this site. The bar is presently owned by the Simpson Timber Company and has been previously used to provide aggregates for logging roads. Short term impacts of construction will exceed prior use. These impacts will be greatest in the last two years during the surfacing phase of the work, when approximately 300,000 cubic yards of material each year would be required. Aggregate requirements during the grading phase would be 50 to 60 thousand yards per year. Because of resistant banks immediately downstream, high gravel replenishment rates are expected.

This segment of the Klamath River has been designated "Recreational" under both California and Federal Wild and Scenic River Systems. The Klamath River is included in the national system because of its anadromous fishery. However, scenic and recreation features primarily related to boating are important secondary values. In that there is no irrevocable scenic easement on the bar to be used, the provisions of Section 4(f) do not apply to the use of this site. No master plan has been prepared for the Klamath River. Gravel processing involves excavating, crushing, washing, and removal of rock from the bar. Permits for the use of this aggregate source will be obtained from the California Department of Fish and Game, Regional Water Quality Control Board, and the U.S. Army Corps of Engineers. Conditions of use will be complied with including applicable sections of the State's "Standard Specifications". Mitigating measures listed on pages 58-60 will be implemented. A reclamation plan to insure the area will be left in as natural a condition as possible will be prepared. The Contractor will be responsible for conformance with the plan.

Short-term, minor impacts are anticipated as a result of the fabrication of aggregate products.

Noise and dust would be the primary impacts of the excavating, crushing, and removal operations and would be noticeable by river users. Dust abatement techniques would minimize dust problems. Crushing and washing would create fine sediments which initially would be held on the bar in settling basins. No runoff is expected during the normally dry summer months. During the first winter storms after the seasonal cessation of gravel operations, runoff and overwash would carry these fines into the river. Due to the relative downstream location of the bar and small size of the operation, no significant adverse effects are expected on the fishery and recreation resources. Since all operations will occur above the live stream channel, no effect on fish passage or boating will occur. Risk of affect on river flow characteristics is minimal (see page 62).

asphalt plants are located on the bar during the last two summers of construction, there would be an additional risk of petroleum spills and runoff. rough the use of ditches and settling ponds, there will be no discharge of ch material into the river. Odors from the plant would be noticeable by ver users.

cess to the site would be by an existing logging road system that would allow f-highway hauling directly to the project area (Ah Pah Road area), a distance approximately 8 miles.

Resources

ɔe Water. Implementation of alternative A (no action) would result in
w impacts on aquatic resources. Runoff from U.S. 101 would continue to
ibute small amounts of petroleum-based contaminants to Prairie Creek.

ɔnstruction of any of the bypass alternatives would not significantly
the major existing drainage patterns in the project area. Drainage from
101 already flows into watercourses within the project limits. Runoff
the proposed bypass would be discharged into natural streams. Runoff from
upstream from the project area would be channeled under the new facility
nto the natural watercourses at approximately their present locations.

crease in pavement runoff pollutants, particularly petroleum-based contam-
s, could be expected as a result of construction and use of the bypass.
mpact of these pollutants should have little, if any, effect on the biotic
on of the aquatic environment. Caltrans is currently conducting a water
ty investigation for this project according to section 208 of Public Law
0 (Water Pollution Control Act, as amended). The investigation would con-
throughout the construction phase and would address background levels, in
ion to other parameters, of deleterious constituents found in roadway run-
This information would allow a more accurate evaluation of potential high-
avement runoff impacts on the local aquatic environment. Comparative data
ghway runoff has been assessed, and very minimal impacts to local water
ty are expected.

any highway, it is possible that chemical spills could occur along the
ss. These chemicals would find their way into natural streams and could
ıtially result in significant but unavoidable impacts. However, the
ams crossed by the proposed alignment are not used for domestic purposes.

ɔidable adverse impacts would occur to all streams crossed by any bypass.
e impacts include short-term and long-term losses in stream productivity
delays in the long-term recovery from previous logging activities. Despite
erences in numbers of lanes and alignments in alternatives B, C, D, E, and
neir impacts on aquatic resources would be similar. Construction of any of
alternative routes could result in significant changes in the aquatic inver-
ate community, in loss of fish spawning and nursery areas, and in loss of
amside riparian vegetation.

loss of aquatic resources and habitat would be an indirect result of clear-
land necessary for the bypass highway. Portions of the land would be
sed for up to four winter seasons during the clearing, stabilization, drain-
and grading phases of construction. Although mitigation measures should
mize erosion, heavy winter rains could cause surface soil erosion (rilling,
ying) throughout the project area and would contribute to slope failures
slides where slope stabilization work was incomplete. Soil erosion and
e failures would result in increased turbidity and sediment in the streams,
ıcting aquatic resources and habitat. These impacts would be most severe
ng the construction phase of the highway. After revegetation and stabiliza-
of cut-and-fill slopes, streams should begin to recover. However, the
nt of recovery would be directly dependent on the long-term stability of
e graded areas. If chronic slope failures developed, stream productivity
ld be permanently depressed. Should such a failure occur, the damage to
neries could offset National Park Service's watershed improvement program in
Redwood Creek drainage. However, mitigation proposed will minimize these
ts.

Damage from worst case situations would vary from stream to stream depending on the proximity of the highway to the stream. May Creek would be severely affected. The watershed would contain an interchange, a stream rechannelization, and 2 miles of highway paralleling this creek (see Southern Interchange map). Approximately 1.7 stream miles would be affected, and the lower 1.2 miles that includes all of the 0.8 anadromous habitat on the stream would be severely impacted, should erosion control fail (pronounced sediment input and damage to riparian vegetation).

Prairie Creek would be impacted directly through stream channelization (about 400 feet in length) in the southernmost portion of all bypass alignments. In addition, about 6.8 stream miles of Prairie Creek would be impacted indirectly through sediment and turbidity contributions from May, Boyes, and Brown creeks.

Upper portions of the Boyes and the Brown watersheds would be crossed by 3 miles of highway. The bridge planned for the northerly branch of Boyes Creek and the comparatively minimal exposure of Brown creek could result in less impacts than to other drainage systems that may be affected. A major failure of erosion control measures could result in sedimentation problems in both streams. About 1.8 miles of Boyes creek and 1.4 of Brown creek could be affected.

Ah Pah and McGarvey creeks would also be crossed near their headwaters, and downstream aquatic resources would be damaged by turbidity and sedimentation. Both creeks have steep gradients in the upper portions of their watersheds and both flatten as they appproach the Klamath River. About 11.1 stream miles of Ah Pah Creek (the north and main forks) and about 4.2 stream miles of McGarvey Creek would be affected. Severe damage would be expected in the lower 2.3 miles of Ah Pah Creek and the lower 1 mile of McGarvey Creek (see Appendix H for fishery loss estimates). Impacts of highway construction on Ah Pah and McGarvey creeks could indirectly affect the wild and scenic values of the Klamath River by temporarily depressing fish runs in these tributaries.

Gravel extraction operations on the Klamath River would result in minor, short term, localized turbidity when the river rises in early winter storms. This will contribute an insignificant amount to the total sediment transport of the river per year. Impacts on the Klamath River fishery would be negligible.

The accelerated sedimentation and fish barriers that are the result of prior logging activities over the past 20 to 30 years are the principal causative factors responsible for the low productivity of commercially important fish species in the Redwood Creek drainage. Prairie Creek and its tributaries, now at half to two-thirds its potential, is the most productive component of the Redwood Creek fishery.

The streams in the project area affected by prior logging are slowly improving. Even with on-going rehabilitation programs, it has taken 20+ years to regain half the potential productivity. The present amount of sediment in streambeds in many areas is near or above critical levels for juvenile salmonoids. Sediment added as a result of the project, particularly during construction, will have a substantial effect no matter how efficient the erosion control efforts are. The potential exists for a significant reduction in fish productivity. Based on the anticipated sediment yields, barring any major failures, the greatest deposits of sediment would be expected on Ah Pah, McGarvey, and May creeks.

ies Mitigation. Estimates of existing and potential fishery values on an evaluation of spawning areas have been made by the California ment of Fish & Game. Anticipated short-term fishery losses that will during construction are based on the degree of sedimentation expected as ed from the Universal Soil Loss Equation, (barring serious erosion control es) and existing conditions. Long-term post construction losses have estimated which consider long-term erosion control goals. Equitable mone- compensation will be made by Caltrans to fund replacement of these fishery s upon agreement among Caltrans, Department of Fish and Game, and National Service.

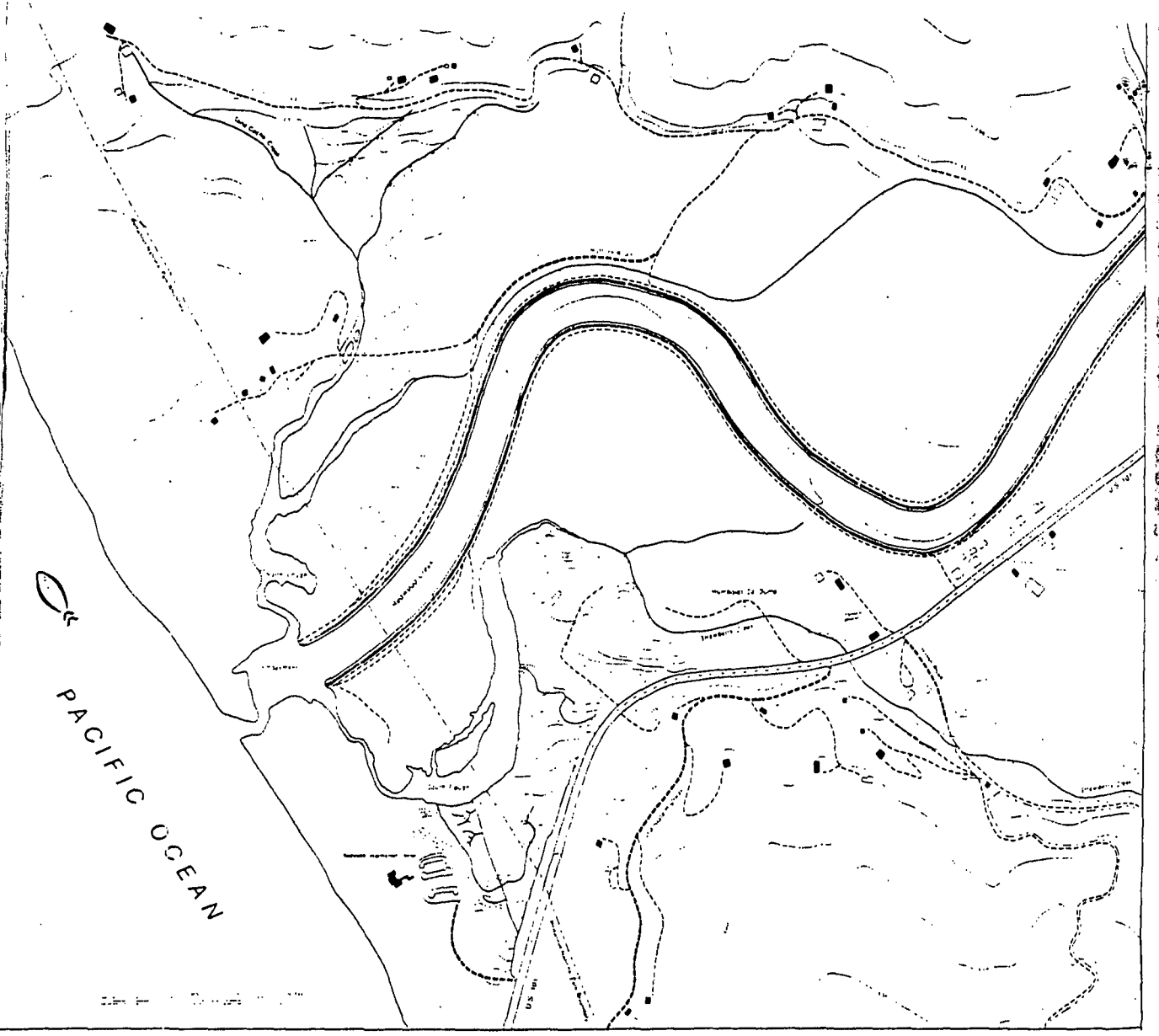
unds would be utilized for fish replacem in the Klamath Drainage and at rehabilitation in the Prairie Creek Drainage. Anticipated fish losses isted in Appendix H. Humboldt County Prairie Creek Hatchery would receive ng for the fish replacement. Preliminary estimates of hatchery costs on present production goals and budget are $134,000. Costs for short- losses associated with clearing and grading phases of construction during irst 4 years would be approximately $92,000, or $23,000 per year.

l-purpose monitoring program will be implemented to: 1) determine the t of sediment reaching the streams; and 2) assess the actual effects on populations. The program would provide a means to measure the relative ss of the erosion control efforts.

easure sediment and effects on spawning areas, a series of sample plots be established on Prairie Creek and Ah Pah Creek. These plots would be ed before construction and annually following clearing until five years grading. Stream surveys will be conducted to assess spawning areas mate populations. The surveys will correlate preliminary population and estimates. At least four surveys will be conducted: following clearing, he midpoint of the grading phase and at the second and fifth year following ing.

tat improvement at the mouth of Redwood Creek would be most beneficial to salmonid fishery of the drainage. Poor water quality within portions of estuary caused by accumlated organic debris restricted access for juvenile and the need to control timely release of fish to the ocean augment a lem that has seriously restricted the use of this waterbody by salmonids.

gnificant improvement of water quality and access would increase the hold- capacity of this waterbody and provide suitable habitat for smolts. This d result in a greater survival rate of young fish and thus increase the ne and spawning resource base. The National Park Service, with hydraulics ineering assistance from the Army Corps of Engineers, will administer a con- uction project to modify the Redwood Creek levee configuration at the mouth he creek. Caltrans and the National Park Service will fund the project. project will result in the flushing out of organic matter during high win- flows and allow for water circulation and smolt access during the summer. National Park Service will be responsible for the construction, operation, maintenance of the facility. Construction of this project will satisfy the igation needs for the park bypass impacts on fisheries in the Prairie Creek inage.



The alternatives under consideration are:

A. Remove levees along lower one-quarter to one-half mile of Redwood Creek;

B. Remove lower one-quarter mile of south levee and construct new levee along bank of south slough;

C. Insta.. flood control gates in south levee to allow water circulation in south slough; and

D. Install a permanent drainage structure from south slough to Pacific Ocean.

Alternative C is currently preferred because it would require no land acquisition. Alternative D would not mitigate fisheries losses resulting from the project. Alternative B would require acquisition of private lands. Alternative A would probably result in significant additional sediment deposition at the mouth of Redwood Creek, eliminating existing salmonid habitat.

ating Measures. Mitigating measures would be designed to increase the of vegetative stabilization of soils, alleviating soil erosion and associ- increased surface water turbidity and sediment loading.

.on control measures are being developed with the assistance of a multi- .plinary technical advisory committee. Members of the team are representa- ; of the concerned agencies: Caltrans, National Park Service, Prairie Creek ›ods State Park, North Coast Regional Water Quality Control Board and the ·ornia Department of Fish & Game.

·ans District 01 design staff, with the assistance of Caltrans Transporta- Laboratory erosion control and earthwork stability specialists, have asses- :he proposed work area, adjacent drainages, order of work and basic design ach area to be graded. With evaluation and input from the technical advi- committee reflecting concerns of all appropriate disciplines, each area be engineered to provide a measure of protection consistent with standards by the technical advisory committee and best management practices.

ific erosion control measures will be incorporated into the contract plans specifications to be implemented during the clearing, grading and the inter- ng periods between these operations. Procedures to control erosion would mplemented by maintenance forces after the project is built. General ero- control concepts are shown in Appendix G. The contractor would be ired to conform to section 7-1.01L of the Caltrans standard specifications ilable at Caltrans District 01 Office, 1656 Union Street, Eureka, .fornia) and the mitigation methods set up for the project. The following .gating measures would be included in the construction contract if the ıss was bui :

An acceptable program for effective control of water pollution would be submitted to the National Park Service for review.

Sanitary facilities that would not contaminate the groundwater or surface water would be provided at the job site as required by the federal Occupational Safety and Health Act.

Every reasonable precaution would be exercised to protect streams from pollution by fuels, oils, and other harmful materials. The operation would be scheduled and conducted so as to avoid or minimize increasing turbidity and silting of the streams.

Stream relocations and channelization would reproduce natural stream conditions as closely as possible.

Removal of material from beneath a flowing stream would not be commenced until adequate means, such as a bypass channel, were provided to ensure the stream would be free from mud or silt resulting from aggregate removal.

Banks of stream alteration areas and stream relocation areas would be stabilized.

Ephemeral stream relocation areas would be flared at each downstream end to conform to existing stream patterns.

Culverts would be designed to prevent scour.

Where there is possible migration of anadromous fish in streams that would be affected by construction of the bypass, the contractor would conduct the operations so as to allow passage of such migratory fish.

Washwater, from aggregate washing or other operations, containing mud or silt would be treated by filtration or retention in settling ponds to prevent turbid water from entering live streams.

During construction, all loose piles of soil, silt, clay, sand, debris, or other earthen materials would be protected to minimize any discharge to waters.

After construction, all surplus soil, silt, clay, sand, or other earthen materials would be removed from the site and deposited in a protected location to prevent discharge of sediment.

Any dewatering would be done in a manner so as to eliminate the discharge of soil, silt, clay, sand, or other waste earthen materials.

Portland cement, or fresh cement, would not be allowed to enter streams.

When construction was completed, the streamflows would be returned as nearly as possible to a meandering thread to avoid creating a possible future bank erosion problem.

All cut-and-fill slopes except predominately rock areas would be reseeded and/or revegetated with resident plant species.

In areas of potentially high erosion, mitigation measures such as fiberglass roving netting, ditch lining, berms at top and/or toe of slopes, check dams, sediment ponds, placement of straw in embankment slopes, or other erosion control practices will be used.

Construction will be in conformance with all provisions of section 7-1.01L, "Water Pollution", of Caltrans standard specifications, applicable statutes of the California Department of Fish & Game code, and conditions established by the California Water Quality Control Board.

Other measures which will be used will include:

Application of chips prepared from vegetation chipped in the clearing of the work area could be used to protect disturbed ground.

An accelerated planting program would be implemented. During construction, vegetation on new slopes will be established before winter rains.

Added compactive efforts and scarification of embankment slopes should be used to aid in plant establishment and help prevent sloughing.

The order of work should be phased to reduce the need for reliance on temporary control measures as much as possible.

In the period between grading and surfacing phases of work, measures should be taken to protect the roadbed by shaping to form a ditch and coating with erosion resistant material.

prehensive and flexible erosion control plan with contingency courses of n will be necessary to deal with erosion problems that may become evident g construction. The plan would include effective winterization procedures incorporate adequate temporary drainage systems to protect the work and nvironment, along with special crews to patrol the project during winter to keep erosion control devices operating properly.

nnel working directly under the Resident Engineer will be assigned the nsibility of enforcing the contractor's compliance with erosion control ires prescribed in the construction contract.

ldition, Caltrans maintenance personnel have received training on the ing of chemical spills. Procedures have been developed to correct, as lily as possible, hazardous spills that interfere with the orderly flow of ic, or that may have a detrimental effect upon the environment. Caltrans in agreement with three contractors to handle the cleanup of hazardous s.

ngoing water quality sampling program and maintenance recommendations are conducted according to the best management practices formulated under sec- 208 of Public Law 92-500 (Water Pollution Control Act, as amended).

structing the southern interchange as proposed will require channel changes rairie Creek and May Creek. The channel change at Prairie Creek would be oximately 400 feet long, 40 feet wide, and graded similar to the existing am. Rock slope protection and gabion structures would be placed as needed revent bank erosion and degradation.

channel change at May Creek would incorporate a large culvert structure, 250+ feet long under the eastern portion of the interchange. A minor nel change may be required at each end of the culvert. The existing bridge be replaced on the road leading to the southern state park entrance. e structures would have natural bottoms.

ific design of the channel changes has not been made. Features suggested he FHWA publication "Restoration of Fish Habitat" (FHWA-IP-79-3) would be emented in the design of these channel changes. Impacts on wildlife and ands have been reviewed in the field with Caltrans, state park, NPS, and fornia Department of Fish & Game personnel; mitigation measures as cribed in pages 58 and 150 will be implemented.

ndwater. The impact of the proposed bypass alignment on groundwater is ected to be very minor.

odplains. A hydraulic study of the project area has been conducted by District 01 Caltrans hydraulics engineer to identify potential floodplain acts pursuant to Executive Order 11988. Twenty encroachments are identi- d, two of which are significant (see Floodplain Findings & Summary, page). Flood Insurance Rate Maps (FIRM) indicate headwater areas are located in e C (acres of minimal flooding) and that May and Prairie creeks encroach- ts are located in Zone A (areas subject to 100-year flooding). All build ernatives would have similar floodplain impacts.

No significant flooding impacts on any floodplains affected by the project have been identified. Special mitigation is proposed to prevent losses caused by erosion and habitat loss. See pages 150 and 170. The "Location Hydraulics Study" and "Klamath River Gravel Extraction Analysis" are on file in the Caltrans District 01 Office.

Prairie Creek

At the south end of the project, the highway will be shifted westerly to facilitate placement of an interchange that will provide access to the south entrance to Prairie Creek Redwoods State Park (see southern interchange map page 41). The new alignment will require a minor channel change and longitudinal encroachment of the Prairie Creek floodplain.

The encroachment will not raise the 100 year water surface outside the immediate area of construction to a level that would change the creek. The channel change at Prairie Creek would not support incompatible Base Floodplain Development by narrowing the width of the floodway in the immediate area. This channel change has flood proofed the roadway. The potential risks of bank erosion and scour will be mitigated by the placement of rock slope protection through the area of the channel change. The channel change has been designed to minimize potential damage. Everything upstream of the proposed channel change area is on park property, and no incompatible floodplain development should occur. If park facilities were built within this floodplain, the water would be no higher than it has been historically.

There are minimal risks to property, traffic or improvements that would result from the proposed encroachment of Prairie Creek. Impacts to natural and beneficial floodplain values of Prairie Creek as well as all other drainages affected by the project will be dependent on the effectiveness of erosion control measures. Estimates of losses should a major failure occur are discussed in the previous section. Mitigation to control these damages is addressed on page 150 and in Appendix G. Wetland and riparian values lost in construction will be replaced (see Wetlands, page 64).

May Creek

The interchange planned for the south end of the project will cross the floodplain of May Creek. An interchange at this location will result in a substantial alteration of the stream and its environment from the condition as it now exists. Approximately 3.5 acres of riparian habitat will be removed along with the loss of salmonid nursery habitat. These losses will be mitigated.

Backwater created at May Creek would occur only on infrequent intervals (i.e., once in 100 years), but would cause no damage when it does. During a 100-year storm, water would be ponded over approximately 1/2 acre upstream of the planned culvert structure. Nearly all of this area is within the proposed highway right of way. A 30-foot by 200-foot strip of park land could be ponded 1-foot deep outside the right of way. There is no likelihood of any facilities being constructed in that area.

The height of the highway fill in this area is more than adequate to provide sufficient head for a 500-year storm. The backwater for a 500-year storm is 1.6 feet higher than the 100-year storm and would not cause any more measurable damage. The impacts from 100-year storms should be only the silt deposited

no serious effects on vegetation. A riser would be incorporated into the of the culvert to prevent damage to the highway fill in the event the is plugged by debris during high flows. No significant risks would be lated with the proposed construction in Prairie Creek and May Creek. At me of final design, if the outlet conditions (higher than normal water ity) warrant, channel lining will be placed to mitigate any adverse effect might cause erosion or scour.

stream flooding will not occur as a result of vegetation loss or through land conversion because of the small area impacted by construction compared the drainage storage area. Downstream bank degradation will be controlled ppropriate channel change design to reduce stream velocity. The southern nterchange alignment has been designed to retain the greatest practical width etland-riparian habitat to accommodate elk movement along Prairie Creek.

topography of May Creek and Prairie Creek drainages limit practical alignent alternatives to avoid construction in floodplains and wetlands (see Wetlands discussion page 64). Bridge options could not totally avoid floodplains and would not be satisfactory because remaining habitat and vegetation values under the structures would not warrant the $10 to $15 million increase in construction costs.

Headwater Areas

In regard to the transverse crossings of Boyes Creek, Ah Pah Creek and McGarvey Creek, location hydraulic studies have been conducted and the findings are: 1) the areas subject to 100-year flooding are only in restricted and steep sided canyons; 2) downstream erosion will be mitigated by designing energy dissipators which reduce the water velocities to acceptable levels; 3) there is no potential damage to the roadway due to overtopping; and 4) the pos-sibility of damage to the roadway, traffic, upstream or downstream properties is extremely remote due to application of high design standards which will be applied to this project. All potential damage will be mitigated as previously described. The risks associated with the implementation of this project are insignificant. The proposed action is not a significant encroachment since: 1) the possibility of disruption of the highway facility is extremely remote; 2) there is no significant risk; and 3) there is no significant impact on natural or beneficial floodplain values.

Klamath River

Development of the gravel bar on the Klamath River to be used as an aggregate source for the project (described on page 52) has been reviewed by Caltrans Hydraulics Department and found to present minimal floodplain risk regarding river flow alteration and has excellent potential for replenishment.

Vegetation

The primary impact on vegetation would result from complete removal of all overstory and understory vegetation during the clearing phase of construction. All vegetation would be removed between the limits of construction (see Alternative Map). The land used for the highway pavement and road shoulders would remain revegetated while cut-and-fill slopes would be reseeded.

number of secondary impacts would also occur as a result of clearing and grading the land necessary for highway construction. Damage to root systems or branches of trees adjacent to the limits of construction might occur. Root damage could reduce growth rates or weaken old-growth trees so that they may fall prematurely. Meinecke (1929) traced roots from 4-5 foot diameter trees 55 feet away from the trunks. Increased waterflows or sedimentation from open slopes could damage or destroy downstream riparian vegetation. Slides or failures in cutbanks, or fill areas, could damage or destroy adjacent vegetation or newly replanted vegetation. Opening up dense stands of second- or old-growth trees might change the character of adjacent forests, causing open understory areas to become brush-covered. Exposing these trees might also create the potential for many trees to be blown down, especially during severe storms. Secondary impacts on vegetation cannot be quantified but are discussed in general terms under each alternative.

Redwood National Park was created and expanded to protect diminishing old-growth redwood forests. However, the vast majority of NPS land that the proposed alignment would traverse is second-growth redwood forest. Among this forest there are a few old-growth redwoods. The surrounding private forestlands are also predominately second-growth coniferous or recently cutover lands. There would be a loss of 440± acres of second-growth redwood and cutover forest vegetation.

Vegetation Mitigation. Under each of the bypass alternatives cut-and-fill slopes would be revegetated with native shrubs and conifers. Specific prescriptions are being developed now as part of Redwood National Park's watershed rehabilitation program. The prescriptions would include recommendations for use of mulches as soil amendments and use of grasses, shrubs, conifers, and fertilization to help revegetate cut slopes.

Alternative A (no action) would have no new direct or secondary effects on vegetation.

Alternative B, the preferred alternative (four-lane road with segment across state park) would result in direct removal of approximately 431 acres of second-growth coniferous forest, 13.6 acres of riparian vegetation, 10 acres of recently cutover forest, 4.5 acres of old-growth forest (approximately 125 old-growth trees, 40% of which are redwoods plus blow-downs would be lost), and 0.7 acres of wetland. The second-growth and recently cutover forests contain occasional residual old-growth trees. The most notable are found at the May Creek interchange area, the upper end of Boyes Creek, and at the Ah Pah Road intersection.

Of the approximately 460-acre total, about 125 acres would be devoted to traffic lanes, median strip, shoulders, truck escape ramps and interchanges. The remaining area would be available for revegetation. Approximately 440 acres would be within grading slope limits and an estimated 20 acres would be needed to construct settling basins for erosion control. The success of revegetation efforts could be reduced by grazing deer and elk, resulting in minor long-term erosion.

Secondary impacts on vegetation resulting from implementation of alternative B would include probable damage to downstream riparian vegetation in Prairie Creek, May Creek, Boyes Creek, Ah Pah Creek, and McGarvey Creek. In addition to aquatic resources, streamside riparian vegetation would be impacted in these areas. Slope failures in cuts and fills are impossible to predict but could

throughout the project area. The proposed material source on the Klamath is a gravel bar essentially devoid of vegetation.

Another secondary impact would be damage to adjacent trees (roots and branches) all along the bypass highway. This damage would probably be more significant at the corner of Prairie Creek Redwoods State Park. An additional 2 acres of old-growth redwoods might be damaged. Also, the state park corner would probably change from an open swordfern understory to a dense salal, huckleberry, and conifer saplings understory, as the stand was opened up by highway construc-

Alternative C (two-lane road, uphill truck-passing lanes, with segment across state park) would result in direct removal of approximately 388 acres of second-growth coniferous forest, 13 acres of riparian vegetation, 9 acres of recently cutover forest, 4.5 acres of old-growth forest, and 0.7 acres of wetland. Of the approximately 415 acres total, about 100 acres would be devoted to lanes, shoulders, truck escape ramps, and interchanges; the remainder could be revegetated. Secondary impacts of alternative C would be similar to those under alternative B; however, the impacts wuld be slightly less due to the reduction in total acres disturbed.

Alternative D (four-lane road, truck-passing lanes, avoiding state park) would result in similar impacts as to those under alternative B. A total of about 440 acres of vegetation would be disturbed, including 416 acres of second-growth coniferous forest, 13.6 acres of riparian vegetation, 10 acres of recently cutover forest, and 0.7 acres of wetland. No old-growth trees in Prairie Creek Redwoods State Park would be cut. Secondary impacts of alternative D would be similar to those under alternative B except that no secondary impacts would occur within the state park.

Alternative E (two-lane road, uphill truck passing lanes, avoiding state park) would result in similar impacts to those under alternative D. About 395 acres of vegetation would be removed within the limits of construction, including 372 acres of second-growth coniferous forest, 9 acres of recently cutover forest, 13 acres of riparian vegetation, and 0.7 acres of wetland. No old-growth trees in Prairie Creek Redwoods State Park would be cut. Secondary impacts of alternative E would be similar to those under alternative D; however, the reduction in total acres to be disturbed would also result in a slight reduction of secondary impacts.

Vegetation loss for alternate F would be nearly identical to alternate B.

No federal or state listed threatened or endangered plant species would be affected by any of the bypass alternatives.

Wetlands

The extent of the wetlands that would be affected by the proposed southern bypass interchange would be approximately 0.7 acres dominated by plant species common to wet, seasonally saturated habitats.

An alignment on the south side of the May Creek drainage in lieu of the proposed alignment would minimize effects to wetlands on the lower reaches of May Creek and eliminate encroachment on wetlands at Prairie Creek. This alignment, however, would require a 100+ foot high cut that would take 3+ acres of prime redwood forest opposite the state park entrance. In addition, a 100+ foot high

fill across May Creek would be necessary 1/2 mile upstream of the planned crossing. A 100 foot high fill in this area would require approximately 2 acres of riparian habitat.

An alignment north of the May Creek drainage would be within the boundaries of Prairie Creek Redwoods State Park and would result in severe impacts to park resources. Such a proposal would require 200+ foot cuts through old-growth redwood stands east of Elk Prairie. The wetlands that would be impacted by the U.S. 101 bypass include the same characteristics as streamside areas found all along Prairie Creek and other creeks in this area.

Mitigation. Wetland and riparian habitat lost as a result of construction would be mitigated in accordance with the U.S. Fish and Wildlife Service Mitigation Policy (46FR 7644). Compensation for riparian and wetland losses as defined for resource category 2 in the policy would occur; that is, no net loss of in-kind habitat value.

The U.S. Fish and Wildlife Service has requested 1 for 1 replacement in kind to mitigate riparian and wetland habitat losses. The total land to be replaced would be approximately 14.3 acres.

The area along Prairie Creek from the south end of the bypass to Bald Hills Road (see Alternatives Map) has been identified to replace wetlands and riparian habitat lost. Other locations considered as possible candidate areas for mitigation are the Strawberry Creek area near the mouth of Redwood Creek and McDonald Creek, five miles south of Orick. A project on Prairie Creek that includes establishment of riparian habitat on private property (the Davison Ranch) has been initiated by the State of California Coastal Conservancy. Caltrans will reimburse the Conservancy for that part of the project that applies to riparian habitat, and receive credit for approximately 4 acres. The area will be protected by mutual agreement between the property owner the Conservancy, and the Calfornia Department of Fish and Game.

The remaining acreage (10 acres ±) along Prairie Creek will be developed immediately south of Davison Ranch on a 40-acre ± parcel to be purchased from Arcata Redwood Company. Approximately 10 acres can be established for riparian and wetland habitats. All costs for purchase of land and development of new habitats will be funded by Caltrans (See Wetlands Findings, page 171.)

A Memorandum of Understanding is being developed between Caltrans, the National Park Service and the Department of Fish and Game (with the concurrence of the Fish and Wildlife Service and Federal Highway Administration).

Wildlife

Direct and indirect impacts on wildlife in the vicinity of the proposed bypass alignment would result from construction and operation of the bypass. Wildlife impacts are difficult to quantify because of the lack of detailed knowledge about species that occupy the area. However, some general observations can be made about effects of the alternatives.

No new wildlife impacts would occur as a result of implementation of alternative A (no action).

The implementation of alternatives B, C, D, E, and F would result in similar effects on wildlife. Although alteration of vegetation and wildlife habitat

be the single, largest direct impact on wildlife, numerous other effects be evident. Wildlife displacement, attraction to roadside vegetation, ment pattern changes, increased road kills, and continued habitat damage occur.

at alteration would result from clearing about 460 acres of land within limits of construction and converting this land either to roadbed or to and fills. Although cut-and-fill slopes would be revegetated, much of the within the construction limits would be unavailable for wildlife. None of land to be cleared represents critical habitat for any wildlife species. tate or federally listed threatened or endangered species would be affected ny of the alternative alignments.

ildlife currently occupying the land within the limits of construction would displaced to lands surrounding the bypass, resulting in increased mortality a net loss in wildlife because of habitat overcrowding.

erbivores might be attracted to new vegetation planted on cut-and-fill slopes. this, in turn, could result in increased road kills of animals browsing along the roadside. Total road kills might also increase because the deer and elk interaction with vehicles would be spread over two highways. Four deer were killed by vehicles from 1975 to 1980 in a 2-mile portion of U.S. 101 near Elk Prairie and May Creek.

Movement patterns of wildlife, most notably large mammals, would change. The bypass highway could be a barrier to movement unless the animals because accustomed to the road, vehicles, and noise.

Roosevelt elk is the most well-known mammal in the vicinity of the bypass. The Elk Prairie herd numbers about 70 individuals (Mandel 1979) and is commonly seen near U.S. 101 at the southern end of Prairie Creek Redwoods State Park. Elk from this herd may range into the May Creek watershed. Elk have been sighted in the lower May Creek drainage and are common in both May Creek and Boyes Creek basins. Redwood National Park contracted for a short-term study of elk along the bypass to help understand the extent and type of use (Kitchen and Klitz 1981). The results of this study indicate that the elk would probably be affected by the proposed bypass particularly in the area of the southern interchange because road kills may increase, habitat would be lost and movement patterns would be restricted.

The Elk Prairie herd use Prairie Creek as a corridor to the southern part of their range to gain seclusion from public exposure in the prairie. Construction of the interchange, particularly in the channel change area, will augment a narrow condition that presently exists along this corridor. To mitigate possible substantial range restriction of this herd, the alignment of the interchange will be designed to maintain minimum corridor width (140+ feet) for elk movement. Slopes between the roadway and the channel change will be planted with conifers to provide adequate cover to shield the elk from view. Local California Department of Fish & Game representatives have concurred in this approach as a workable solution.

Black bear are also common inhabitants of the project area, particularly in remote locations, and would be similarly affected.

Air Quality

The principal contaminants in the exhaust from gasoline powered vehicles are hydrocarbons, nitrogen oxide, and carbon monoxide. Other pollutants with the exception of lead are normally not considered to be important atmospheric contaminants. Because of its relative inertness in the photochemical process, carbon monoxide is most suitable as a trace pollutant to define dispersion. Hydrocarbons and nitrogen oxide are more reactive. The carbon monoxide concentration levels that would occur as a result of vehicles on the bypass highway were estimated. Worst-case meteorological conditions were assumed to occur concurrent with peak-hour traffic volumes. A computer program (EMFAC6/ENV28A) was employed to establish mobile source emissions, and a mathematical model (Caline 3-A) was used for the microscale air quality analysis.

Calculations indicate that carbon monoxide concentrations can be expected to decrease in future years as a result of more effective emission controls. The highest estimated carbon monoxide concentration using these worst-case conditions was 10.8 ppm under alternatives B and D in cut conditions at 50 feet, which is far below the California one-hour standard of 40 ppm and the national one-hour standard of 35 ppm (see Appendix D).

The highest one-hour average ambient CO concentration recorded was 4.1 ppm at the park employees' housing at Elk Prairie in June 1979.

Calculations indicate that no long-term degradation of the existing air quality is expected as the result of a proposed construction. A localized, short-term increase in particulates (construction dust) would occur during the construction period. Insofar as can be determined by this study, construction of the proposed bypass is consistent with California's implementation plan for achieving and maintaining the national ambient air quality standards.

Air pollution during construction would be controlled in accordance with the standard specifications of section 7-1.01K, "Air Pollution Control", Caltrans, standard specifications.

Noise

Under the no action alternative, noise levels could increase along U.S. 101 if traffic volume increased. By the year 2000, noise levels would exceed the Leq 57 dBA standard within 500 feet on each side of the highway. Prairie Creek Redwoods State Park visitors who stop along the highway, bicyclists, hikers on trails close to the road, and state park employees in park housing at Elk Prairie would experience noise levels greater than what is considered acceptable for park environments.

Under alternatives B through F, construction of a bypass would reduce noise levels on the existing route so that the Leq 57 dBA standard would be exceeded only within 60 feet of the roadway. Along the bypass corridor, wherever the road was within or immediately adjacent to national or state park boundaries, the Leq 57 dBA standard would be exceeded only within a maximum of 850 feet of each side of the road in the year 2000 (see Noise Contours Year 2000 - Alternatives B-F). Table 7 below shows the comparison of the areas of Park lands that would be in excess of the 57 dBA standard for each of the alternatives.

Some of the area within Prairie Creek Redwoods State Park might receive peak noise levels from construction equipment working on this project in excess of Leq 57 dBA. Noise levels during construction would be controlled in accordance with the specification standards of Caltrans.

Table 7: Noise Levels

Alternative	State Park Acres		National Park Acres	
	1980	2000	1980	2000
A	753	941	---	---
B	152	267	657	860
C	152	267	657	860
D	131	217	657	860
E	131	217	657	860
F	152	267	657	860

Energy Consumption

An energy analysis has been made that utilizes a computer program developed by the Caltrans Transportation Laboratory. Factors considered in the program are traffic, roadway characteristics, and costs. Information derived from the program includes direct and indirect consumption of energy by cars and trucks and as a result of maintenance and construction activities over a specified study period. Although based on empirical and theoretical data that provide only best guess estimates, the program does provide a relative comparison of energy requirements of the alternatives.

In this analysis, the four-lane alternatives, two-lane with truck-passing lanes alternatives, and the bypass alternative were compared using projected traffic data for the 1980-99 period (20-year design life). Fuels required would result in a substantial commitment of irretrievable resources. Alternatives D and E (because of the bridge requirement) would have the greatest effect as compared to alternative A.

The comparisons, equated in barrels of crude oil, are as follows for the 20-year period. Operation and maintenance of the existing roadway (no bypass) would require 986,175 barrels of crude oil (135 barrels/day). Alternative B, the preferred four-lane alternative, and alternative F would increase the consumption by 723,200 barrels over alterntive A, for a total of 234 barrels/day. Alternative C would require 67,060 barrels more than alternative A, for a total of 227 barrels/day. Only minor differences in consumption between these alternatives would occur because of extensive grading. Total energy requirements for the bypass would be 73 percent greater under alternatives B and F than under alternative A because of construction, sustained adverse grades, and the additional 2.5-mile length.

Alternatives D and E, because of additional bridge construction, would increase total energy requirements to 93 percent and 84 percent respectively over alternative A. Table 8 illustrates the comparative energy requirements of the alternatives.

Energy consumption directly affecting motorists on the bypass would increase approximately 35 percent overall because of sustained grades and increased length. Consumption for automobiles would increase 26 percent, and for trucks,

43 percent over that used on the existing route. The fuel required to operat vehicles under any of the build alternatives would be essentially the same. Added fuel costs and haul time could have a proportionate effect on the cost transportation of goods.

Table 8: Energy Requirements
1980-1999

Alternative	Alt. A	Alt. B & F	Alt. C	Alt. D	Alt. E
Direct energy* consumed by cars	1.59×10^{12}	2.01×10^{12}	2.01×10^{12}	1.96×10^{12}	1.96×10^{12}
Indirect energy** consumed by cars	1.32×10^{12}	1.44×10^{12}	1.44×10^{12}	1.40×10^{12}	1.40×10^{12}
Direct energy consumed by trucks	1.97×10^{12}	2.80×10^{12}	2.80×10^{12}	2.73×10^{12}	2.73×10^{12}
Indirect energy consumed by trucks	7.71×10^{11}	8.44×10^{11}	8.44×10^{11}	8.21×10^{11}	8.21×10^{11}
Energy consumed by construction	---------	2.66×10^{12}	2.43×10^{12}	3.96×10^{12}	3.48×10^{12}
Energy consumed by maintenance	5.79×10^{10}	1.35×10^{11}	1.00×10^{11}	1.32×10^{11}	9.73×10^{10}
Total (BTU)	5.71×10^{12}	9.89×10^{12}	9.63×10^{12}	1.10×10^{13}	1.05×10^{13}
Barrels of crude oil/day euivalent	135	234	227	260	248

*Direct energy is required for propulsion.

**Indirect energy is used to denote all energy outputs for construction, operation, and maintenance of a system exclusive of propulsion energy and parasitic loads within the vehicle.

Aesthetic Qualities

Under alternative A, there would be no effect on the aesthetic quality.

The bypass alignments east of the state park would offer bypass users entirely different views than those seen along the existing route. Long-distance vistas of Elk Prairie, Klamath River, and the mountains to the east would be possible from the bypass in contrast with the secluded feeling of driving through old-growth redwood groves on the current route.

The bypass highway would be seen from the cutover lands to the east of the proposed highway, but because of the old-growth redwoods and ridge top to the west, the highway would not be visible from the higher use areas of the park for any significant distance. Those who did see it might find it offensive. Graded areas will be seeded with resident species and woody plants planted on benches for erosion control. The vegetated fill slopes will blend into the natural landscape and provide an aesthetic benefit to the motorists.

The routes under alternatives B and C, which go through the state park, would obviously alter the views from within the state park because the 4.5 acres of old-growth redwoods would be cut. However, very few state park visitors currently use that land. Increased visual, noise and dust impacts associated with gravel processing on the Klamath River would have a short-term aesthetic effect on the recreational use on this portion of the river.

EFFECTS ON THE SOCIOECONOMIC ENVIRONMENT

Simpson Timber Company

Under alternatives B through F, Simpson Timber Company would lose a small portion of its land. According to information provided to Representative Phil Burton, Simpson Timber Company owned 60,000 acres in Del Norte County and 225,000 acres in Humboldt County prior to the Redwood National Park expansion (Greenacres Consulting Corporation 1977). In 1978, approximately 9,000 acres of Simpson lands were taken through congressional action (Public Law 95-250) in order to protect existing park resources. Approximately 0.5 percent of Simpson's present acreage would be acquired for the U.S. 101 bypass under any of the alternatives except the no action alternative.

The acreage that would be acquired for the highway bypass supports a relatively small number of old-growth redwood and Douglas fir. Approximately 95 percent of the land to be acquired under any of the alternatives was cutover 15 to 30 years ago and now supports prime second-growth timber. Preliminary estimates of the amount of timber that would be lost to Simpson Timber Company as a result of the U.S. 101 bypass are around 8.5 million board feet. This reduction in timber harvest would occur over a 10- to 20-year period.

The impacts of land acquisition and timber reduction would be mitigated by federal payments at fair market value for the amount of land and timber purchased. The Simpson Timber Company road system would be severed by the acquisition. Compensation for acquisition of the land and timber would also include payment for any severance damages to the road system resulting from this acquisition. (Provisions for acquisition are given on page 12.)

Region

Land acquisition and timber harvest reduction resulting from implementation of any of the alternatives are expected to have an insignificant impact on the regional economy. The total forestland in Humboldt County would be reduced by 0.05 to 0.1 percent. The annual timber harvest level in Humboldt County would also be reduced by 0.05 to 0.1 percent depending on whether the timber would be harvested over a 10-, 15-, or 20-year period. The projected range of economic effects associated with the reduction in timber volumes is shown in table 9.

Table 9: Timber Harvest Reduction Impacts
(Alternatives B-F)

	QRC[1]	QRC[1]	Greenacres[2]
Volume of timber harvest reduction (millions of board feet)	8.5	8.5	8.5
Time period	10 Years	15 Years	20 Years
Reduction in annual timber cut (millions of board feet)	.85	.57	.42
Forest products jobs (per million board feet)	8.3	8.3	9.2
Associated Annual Effects In:			
Forest products employment loss (jobs)	7	5	4
Forest products earnings loss ($)	61,502	43,930	35,144
Residentiary employment loss (jobs)	3	2	3
Residentiary earnings loss ($)	29,536	18,932	29,536
Total job loss	10	7	7
Total wage loss	91,038	62,862	64,670
Employment multiplier[3]	1.44	1.44	1.91

[1]Adapted from QRC Research Corp. 1977.

[2]Adapted from Greenacres Consulting Corp. 1977.

[3]Total job loss=employment multiplier X forest products job loss.

These small associated reductions in employment and earnings resulting from the highway alignments would be mitigated temporarily by the effects of salary payments and materials and services expenditures for the construction of the highway (see table 10). However, these positive impacts would only occur during the six-year construction period.

Raw wood materials from the right of way will be utilized to some extent by Redwoods United Incorporated, a non-profit corporation which provides community services and employment opportunities for Humboldt County. The Redwood National Park Expansion Act (PL 95-250) provides assistance to this organization through the donation of wood materials from Redwood National Park. This assistance is to help compensate job loss and indirect economic impacts of the park expansion. It is the intent of the bypass funding legislation (PL 97-134)

that these raw wood materials in the bypass right of way be made available as a potential source of supply to maintain the operation of Redwoods United Incorporated at current levels of employment as stipulated in Section 107 of PL 95-250*.

Table 10: Highway Construction Estimates

	Total Cost[1]	Salaries[2]	Person/Years of Labor[3]	Materials and Services
Alternative A	0	0	0	0
Alternative B	$115 Million	$40.6 Million	1,014	$ 74.4 Million
Alternative C	103 Million	36.2 Million	906	66.8 Million
Alternative D	170 Million	59.8 Million	1,496	110.2 Million
Alternative E	157 Million	55.3 Million	1,382	101.7 Million
Alternative F	113 Million	39.8 million	994	73.2 Million

[1]These are 1989 construction costs.

[2]Based upon $40,000/year wages.

[3]Based on 8.8 person/years per million dollars project cost.

The tax loss to Humboldt County resulting from acquisition of Simpson Timber Company land would be insignificant. The Humboldt County total tax budget from 1979-80 was approximately $57,700,000; property tax revenues were $7,116,400. Federal acquisition of approximately 1,500 acres of this land, which is restricted to use for growing and harvesting timber, would reduce the county's annual property tax revenues by around 0.02 percent and the total tax budget by approximately 0.002 percent. Because the land has been zoned for timber production at the landowners' request, and because there is no public access to these lands, no new developments would be expected along the bypass corridor.

Normally, sixty percent of all federal highway funds received by California are allocated to the southern portion of the state and the remaining 40 percent are spent in the northern counties. Local governments initially were concerned that funding the bypass would be at the expense of other projects scheduled to be built in Humboldt and Del Norte counties because Bypass funds would be counted against minimums to be spent in these counties. The California Transportation Commission is not currently including this project in the county minimums and legislation has been introduced to exempt these funds from the 60-40 allocation.

During the construction period, Humboldt and Del Norte counties would receive an increase in transient families and individuals involved in the construction project. Local communities might experience some added crowding during the summer months, more traffic congestion, housing shortages, and an increase in trailer court communities. Manpower needs for this project would not be equally distributed throughout the six-year construction period. Under alternatives B, C, and F, jobs required each year would range from about 30 during the first year of clearing to 400± during the grading phase (third and fourth years). The surfacing during the last year will provide about 120 jobs. At least 90% of this work force would work on the project site. There would be a

*Congressional Record, December 15, 1981 H9553.

large increase for housing needs. The local area (Orick and Klamath) would n
be able to accommodate this increase, especially during the third and fourth
years, and many workers would have to commute from Trinidad, Arcata, Crescen
City, or Eureka. Under alternatives D and E, the housing demand would be ev
greater, forcing the Arcata/Eureka community to absorb more of these workers
Some of the lifestyles of the temporary residents might clash with local val
and attitudes.

Prairie Creek Redwoods State Park

Since the alternative bypass alignments are, for the most part, no more than
one-quarter mile from the state park boundaries, some new problems concerning
the management and protection of park resources in this area might result. C
struction contracts, including subcontracts, would be among the largest let b
Caltrans to date. The influx of temporary residents would undoubtedly inclu
many people who are not familiar with the north coast region, and some of the
people might not be concerned with the resources of the old-growth redwoods a
their environment. Resource protection and enforcement problems, specificall
elk poaching, greens cutting, illegal use of 4-wheel-drive vehicles, and
cleanup tasks, are expected to increase. Infringement on the state park land
by construction employees and equipment would be likely.

To prevent losses of old-growth trees, adjacent memorial groves, and other pa
resources, additional patrol and enforcement efforts would be required. Addi
tional state park ranger time and vehicles would be necessary during the con-
struction period. Special state park access restrictions would be developed
consultation with state park personnel.

Highway Users

The no action alternative would result in more frequent and severe traffic co
gestion along the existing U.S. 101 highway. By the year 2000, if no bypass
was constructed, traffic flow might possibly be unstable, with speeds general
ranging from 30 to 55 mph. This condition would inhibit the movement of both
visitors and local residents, particularly during the summer months..

Visitors' experiences at Redwood National Park would be enhanced by the imple
mentation of any of the bypass alternatives. Visitors account for approxi-
mately 15 percent of the traffic on U.S. 101 on a year-round basis. During t
tourist season, however, they make up about 55-60 percent of all traffic.

No measurable increase in visitation or overnight use of park facilities is
anticipated that would be a result of the proposed bypass.

If any of the bypass alternatives (B, C, D, E, or F) were implemented, local
and truck through-traffic would be diverted to the bypass, and park visitors
could drive through this portion of the park at a safer and more leisurely pa
without pressure from high-speed, destination-oriented traffic.

An estimated 90% or more of the bicyclists would prefer to use the existing
route because of the steep, sustained grades and faster traffic that would be
encountered on the easterly bypass alignment.

The reduction in traffic noise along the existing highway would also improve the park experience for visitors stopping along the highway and for bicyclists. However, during the construction period, noise levels, particularly near the intersections of the bypass and the existing highway, would temporarily detract from the visitors' experiences. Also, visitors viewing the bypass from within the state and national parks might find it an unpleasant intrusion upon the natural scene.

The accident assessment in the Draft EIS was based on rural expressway comparisons. These estimates have been revised to reflect rates expected on a limited access facility. There would be a decrease in the accidents from the current actual accident rate of 1.39 accidents per million vehicle miles (Acc/MVM) on the existing route to 0.95 Acc/MVM expected on the preferred alternative. Under the no action alternative (alternative A), a slight increase in collisions would be expected if traffic volumes and congestion increased. However, a substantial increase in severe accidents would probably occur along the bypass under alternatives C and E, the two-lane roadways with uphill truck-passing lanes. Alternative F would probably result in a slightly greater accident rate than alternative B or D because of maneuvering required to merge into the 0.7-mile section of two-lane roadway. Runaway truck accidents become a problem when sustained grades are 6 percent or more. Although emergency escape ramps are planned, runaway trucks need an extra lane for maneuvering to reach the ramps. Two lanes in either direction would be provided along the entire bypass route either under alternative B or D and along all but 0.7 mile under alternative F. Cross median type accidents have been a problem on some highways with similar geometrics. Generally these problems occur with heavy truck traffic and higher volumes than expected on the bypass. No serious problems of this nature are anticipated because of the traffic volume expected. Should a problem develop, the proposed 6-foot median would be sufficient for barrier construction.

The higher elevation (1,500 feet) and aspect of the bypass alignments are also expected to increase the frequency of snow and ice driving conditions. This potential safety impact would be mitigated by allowing all traffic to use the existing highway at these times.

The bypass would be 2.3 miles longer than the existing route and would take longer to travel than the existing route except during the peak tourist season. Although some automobiles would be able to negotiate the new alignment at or near the maximum speed limit, the heavier vehicles and small-engine cars would be restricted by the steep grades. In the steeper sections, some vehicles might be moving at speeds of 10 mph. However, during the peak tourist season, the bypass route would save through-traffic approximately five minutes.

Because of increased distance and grades on the bypass, fuel consumption for trucks would increase by 43 percent, and car gasoline consumption would increase by 26 percent. Automobile gas consumption increase per trip would be about 0.15 gallon, assuming average speeds of 45 mph on the existing two-lane route and 55 mph on the bypass.

EFFECTS ON CULTURAL RESOURCES

No significant cultural resources have been found in the portions of the proposed bypass surveyed so far. Survey work would continue as land was cleared, and any significant cultural resource identified would be protected under the NPS cultural resources management policies.

SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE OF LONG-TERM PRODUCTIVITY, IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES AND UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Each of the five alternatives with routes east of Prairie Creek Redwoods State Park (alternatives B-F) would have similar unavoidable adverse impacts, irreversible and irretrievable commitments, and both short- and long-term impacts. Numerical differences between the alternatives are detailed in the text and in Table 6 (page 50).

Unavoidable adverse impacts from all five eastern alternatives would include removal of approximately 460 acres of vegetation and wildlife habitat, short-term increases in erosion (assuming effective erosion-control techniques), short-term losses of wetland and riparian habitat (until mitigation sites can achieve similar productivity), short-term aesthetic impact from gravel operations on Klamath River, short-term fisheries loss as a result of increased erosion, loss of 4.5 acres of old-growth in Prairie Creek Redwoods State Park (alternatives B, C, F), increased noise along the eastern edge of Prairie Creek Redwoods State Park, greater energy consumption, and removal of approximately 1,500 acres of commercial timberland from production. Under a worst case situation, if erosion control measures fail, large, chronic slope failures could develop in the major cuts and could result in significant sediment input into watercourses. Aside from continued damage to downstream riparian vegetation, the sediment would result in a long-term depression of fishery resources. Appendix G discusses the risk of chronic slope failures developing. Alternative A's unavoidable adverse impacts include continued conflicts between park and non-park users, continued adverse noise levels, and reduction in the experience of visitors to Prairie Creek Redwoods State Park.

Irreversible and irretrievable commitments of resources as a result of implementing alternatives B-F would be the loss of approximately 1,500 acres of commercial timberland and the loss of 4.5 acres of old-growth trees in Prairie Creek Redwoods State Park (alternatives B, C, F), loss of approximately 460 acres of vegetation and wildlife habitat, increased energy consumption, use of 750,000 cubic yards of gravel from the Klamath River, and increased noise along the eastern boundary of Prairie Creek Redwoods State Park. Under alternative A, noise and traffic congestion would increase with projected traffic volumes. Correspondingly, accident rates in the park would be expected to increase.

Short-term adverse impacts (listed above) as a result of implementing alternatives B through F would be offset by long-term improvements in travel patterns and visitor experience in Prairie Creek Redwoods State Park. However, a long-term loss of approximately 1,500 acres of commercial timberland would occur. A short-term demand for housing for construction workers may conflict with other seasonal and recreational use and create short-term demands for municipal services. However, no long-term effects on growth are expected. Under alternative A, a short-term savings in construction costs and environmental impacts would be offset by long-term continued conflicts in use along the existing ro

LIST OF PREPARERS

NANCY ADAMS, Planner, National Park Service, Denver
Responsible for writing the socioeconomic sections and coordinating all other sections

LINDA GREENE, Historian, National Park Service, Denver
Responsible for the historical survey

LESLIE HART, Cultural Resources Management Specialist, National Park Service, Denver
Responsible for coordinating cultural resources sections

MARY HEKTNER, Plant Ecologist, Redwood National Park
Responsible for the endangered species survey

TERRY HOFSTRA, Aquatic Ecologist, Redwood National Park
Responsible for aquatic resources and wildlife sections

BETTY JANES, Sociologist, National Park Service, Denver
Responsible for coordinating preparation of the document

ANN SMITH (KING), Archeologist, Redwood National Park
Responsible for the archeology survey

BRUCE MINER, Associate Environmental Planner, California Department of Transportation, Eureka, California
Responsible for the alternatives, geology, soils, air quality, energy, and noise sections of the draft document, preparation of the final EIS

JOHN SACKLIN, Environmental Specialist, Redwood National Park
Responsible for the vegetation section, preparation of the final EIS

JOE THORNE, Senior Environmental Planner, California Department of Transportation
Responsible for reviewing Caltrans' sections of the draft and final EIS

LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE DRAFT ENVIRONMENTAL STATEMENT WERE SENT

Review comments were requested from the following:

Federal Emergency Management Agency
U.S. Advisory Council on Historic Preservation
U.S. Department of Agriculture
Forest Service, Six Rivers National Forest
Soil Conservation Service
U.S. Department of Commerce
National Oceanic and Atmospheric Administration,
National Marine Fisheries Service

U.S. Department of Defense
Air Force
Army Corps of Engineers
U.S. Department of Energy
U.S. Department of Housing & Urban Development
U.S. Department of the Interior
Bureau of Indian Affairs
Bureau of Land Management
Fish and Wildlife Service
Geological Survey
Water and Power Resources Service
U.S. Department of Transportation
U.S. Environmental Protection Agency
California State Clearinghouse
California Department of Fish and Game
California Air Resources Board
California Coastal Commission (North Coast Region)
California Water Quality Control Board (North Coast Region)
California State Historic Preservation Officer
California Native American Heritage Commission

Information copies of the draft statement were sent and comments solicited f
the following State and local government agencies and organizations:

Del Norte County Board of Supervisors
Del Norte County Planning Department
Humboldt County Board of Supervisors
Humboldt County Planning Department
Humboldt County Public Works Department
Humboldt County Environmental Education Program
Tri-Agency Economic Development Authority
Redwood Region Economic Development Commission
American Forestry Association
Arcata Redwood Company
Associated California Loggers
Audubon Society
California Native Plant Society
California Redwood Association
California Wilderness Coalition
California Natural Areas Coordinating Council
California Transportation Commission
California Highway Patrol
Del Norte County Chamber of Commerce
Del Norte County Department of Pubic Works
Del Norte County Regional Transportation Commission
Eureka City Council
Eureka Chamber of Commerce
Greyhound Lines, Inc.
Humboldt County Air Pollution Control Board
Humboldt County Association of Governments
Museum of Vertebrate Zoology (Berkeley)
Operating Engineers
Physical Planning & Development Trustees of the
California University and Colleges
Scenic Highway Advisory Committee

University of California

Honorable Don Clausen
U.S. Congressman 2nd Cong. District

Douglas H. Bosco
Assemblyman, 2nd Assembly District

Barry Keene
State Senator, 2nd Senatorial District

Eric Hedlund
Humboldt County Supervisor, 5th District

Conservation Training Network
Del Norte Trails Association
Emerald Creek Committee
Endangered Species Committee of California
Environmental Defense Fund
Friends of the Earth
League of Women Voters
Louisiana-Pacific Corporation
National Parks and Conservation Association
National Recreation and Parks Association
National Wildlife Federation
Native American Heritage Advisory Committees
Natural Resources Defense Council
Northcoast Environmental Center
Northcoast Friends of the River
Redwood Empire Association
Redwood Region Conservation Council
Save-the-Redwoods League
Sierra Club
Simpson Timber Company
Straight Arrow Coalition
The Nature Conservancy
Wilderness Society
Wildlife Society

Copies of the final statement will be sent to the above agencies, organizations and persons in addition to all those who commented on the draft statement.

CONSULTATION

A project development team was organized in August 1979 to enlist multidisciplinary expertise in the project planning process. Membership of the team is comprised of representatives from Caltrans, National Park Service, Federal Highway Administration, California Department of Parks and Recreation, California Department of Fish and Game, the Sierra Club, the local trucking industry, and a citizen advisor. Meetings of the team were initiated on September 26, 1979, and additional meetings were held January 31, 1980 and May 17, 1983 during the planning process. Numerous meetings have been held with NPS, Caltrans, and FHWA personnel regarding the preparation of this document. The Draft and Final Environmental Impact Statements were reviewed by the Caltrans District Environmental Reviewer to solicit comments regarding objectivity of the document.

Two informational meetings to obtain public views concerning the proposal were held June 2, 1980, in Orick and June 3, 1980, in Eureka. Public notices and news articles regarding these meetings appeared in newspapers in Eureka, Arcata, and Crescent City between May 24 and May 29, 1980. A total of 23 people other than Caltrans and NPS personnel attended the two meetings. Participants were generally concerned about snow and ice conditions, truck escape ramps, and energy consumption on the preferred alignment.

Circulation of the draft EIS was advertised in local newspapers and the Federal Register.

The majority of comments received from other agencies in response to the circulation of the draft EIS were concerned with water quality, erosion, flooding, fish and wildlife, habitat loss, and growth inducement during construction. Agencies included: Environmental Protection Agency, Army Corps of Engineers and Department of Interior Bureau of Mines. State agencies included: Department of Fish and Game, Parks and Recreation, Water Quality Control Board and the Coastal Commission. Comments were received from Del Norte and Humboldt counties as well. Organizational and individual comments reflected the same general concerns: erosion, habitat loss, need for a bypass east of the state park, budgetary constraints, increased transportation and energy costs. There is no clear concensus; local government, environmental groups and citizens are divided in support and opposition.

On November 18, 1981, a public hearing was held at the Grange Hall in Orick to solicit additional public input for the proposed project. Approximately 59 persons attended the meeting. Included in this total were about 20 public employees from Caltrans, FHWA, State Parks and Redwood National Park. Generally, people representing environmental groups such as the Sierra Club and the Wildlife Society favored no-build alternatives. Most of the other people expressed the thought that the only remaining option was to build the project as discussed. This group included a former Humboldt County Supervisor and the owner of a local trucking firm. State Parks and Recreation representatives did not make a statement, but a biologist from the Prairie Creek Fish Hatchery, speaking for himself, opposed the bypass. Concerns expressed in the public hearing were cost-benefit oriented. The reduction in noise and congestion to improve park experience benefits would be outweighed by monetary and environmental costs.

Fishery loss and habitat degradation that could result from potential erosion damage were the main environmental concerns. Economic concerns were the high costs of construction, loss of State financial resources for other projects in the area, and the increased costs of freight transportation in an economically depressed area. There were concerns that an easterly bypass is the last option for the significant improvement of this segment of this segment of Route 101 and that congestion trends will continue in the future. Postponing construction will result in even higher costs.

If a bypass is built, a memorandum of agreement will be developed between Redwood National Park and Caltrans and possibly Prairie Creek Redwoods State Park to establish the working relationship between these agencies during the design and implementation phases of the proposed bypass so as to minimize the impacts on park resources and visitors to the area.

The U.S. Fish and Wildlife Service has been contacted regarding the potential impacts on habitat and any endangered plant and wildlife species.

Caltrans and the National Park Service met with the California Department of Fish and Game following release of the draft statement to identify and resolve areas of concern. The following meetings were held:

February 23, 1982: National Park Service, California Department of Fish and Game, Caltrans

Clarify, discuss response to the draft Environmental Impact Statement and mitigating measures for wildlife, wetlands, May Creek, channel changes, and gravel extraction.

March 17, 1982: National Park Service, California Department of Fish and Game, Caltrans

Field trip follow-up to 2/23/82 meeting.

March 22, 1982: National Park Service, California Department of Fish and Game, Caltrans, California Department of Parks & Recreation

Identify Resources Agency's objections to bypass project.

June 16, 1982: National Park Service, California Department of Fish and Game, Caltrans

Wetland mitigation at mouth of Redwood Creek.

December 7, 1982: Caltrans, California Department of Fish and Game, U.S. Fish and Wildlife Service

Wetland and riparian impacts.

June 15 and 23, 1983: Caltrans, California Department of Fish & Game

Field trips to coonfirm riparian acreage.

October 26, 1983: Caltrans, California Department of Fish & Game, National Park Service

Mitigation for wetland, riparian, and fisheries losses tentatively agreed upon.

December 2, 1983: National Park Service, Caltrans, California Department of Fish and Game, U.S. Army Corps of Engineers

Field trip to discuss modifications of Redwood Creek levees to mitigate for fisheries loss.

December 15, 1983: National Park Service, Caltrans, California Department of Fish and Game

Mitigation for wetland and fisheries losses discussed.

The California Department of Fish and Game has been involved in the design and review of the mitigation concepts and details and are in general agreement with the proposed mitigation.

COMMENTS RECEIVED AND RESPONSES

Mathews Machinery Company

The Wildlife Society - Humboldt Chapter

Robert E. Morgan

Sierra Club - Redwood Chapter North Group

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

In Reply Refer To:
(ER-81/2096)

MAR 10 1982

Mr. Bruce E. Cannon
Division Administrator
Federal Highway Administrration
P.O. Box 1915
Sacramento, California 95809

Dear Mr. Cannon:

This responds to a request for the Department of the Interior's comments on the draft environmental statement/Section 4(f) involvement for US-101 Bypass, Humboldt and Del Norte Counties, California.

The Giant Redwoods of Northern California have long been recognized as one of this Nation's great treasures. The preservation of the majesty and beauty of the Redwood forests for future generations of Americans is of paramount importance to the Department of the Interior.

In furtherance of preservation goals, the Redwood National Park Expansion Act of 1978 (P.L. 95-250) was enacted. One of the factors taken into account at that time was a project to construct a bypass highway around Redwood National Park. The project reflected recognition of the need both to mitigate the loss of economic activity resulting from Park expansion and to preserve the natural beauty of the Park while still serving the needs of the traveling public.

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More specifically, the bypass highway project was intended to provide mobility and safety for the traveling public, provide access to the park, preserve its environmental values, and provide both economic stimulus and infrastructure improvement to help offset, at least partially, the loss of employment and economic activity associated with expansion of the Park.

This is a unique project. The Expansion Act directed the Secretary of the Interior to acquire the lands for the bypass highway and to donate the right-of-way to the State of California. Subsequently, the *Surface Transportation Assistance Act of 1978 (Public Law* 95-599) directed the Secretary of Transportation to carry out a demonstration project for the construction of the bypass highway and provided $50 million in contract authority to do so.

Later, in the Federal-aid Highway Act of 1981 (Public Law 97-134), an additional $55 million in contract authority was provided for the project, bringing the total funding available to $105 million. That Act also amended the 1978 Surface Transportation Assistance Act to effectively exempt the funding for the project from provisions of California statutes which require suballocation of funds for use within the State of California.

We are aware, therefore, of the identification of this project and we look forward to working with the Department of Transportation in moving forward with it.

In furtherance of this, we offer the following comments on the draft environmental/Section 4(f) document.

We find that a fuller discussion, in accordance with the requirements of DOT Order 5610.1C, is needed of the comparative costs and impacts associated with the various alternatives that have been studied, or with reasonable modifications thereto. Such a discussion is needed for the selection of a preferred alternative under Section 4(f).

We recommend that your final statement provide such a comparative discussion for the following alternatives:

No Action. This should provide the base line for other alternative comparisons. The major impacts of the No Action alternative appear to be on traffic congestion/park visitor experience. Related secondary impacts, such as noise and air pollution adjacent to the roadway, are not sufficiently discussed and need to be more fully evaluated. It is very important that the major problems with existing conditions be clearly defined here and that the yearly distribution of traffic conditions be presented.

Non-Structural Options. These include various traffic system management options to reduce congestion when needed, ranging from simple speed limit enforcement, and signalized or officer control of the separation of through and visitor traffic at turnouts, etc., to the provision of fringe parking and visitor buses during peak seasons.

Minor Reconstruction of Existing US-101. This includes such minor construction work as access improvements to visitor turnouts, minor widening and shoulder improvement, the provision of limited passing lanes, etc.

Major Reconstruction of Existing US-101. In this regard we call your attention to the I-93 solution in Franconia Notch State Park in New Hampshire, and suggest that the present Section 4(f) document carefully evaluate why a similar solution cannot be used for US-101 in Prairie Creek Redwood State Park and Redwood National Park. We acknowledge that special problems may exist in the case of US-101, such as old-growth redwoods in the existing right-of-way, but the Section 4(f) document should explain why careful design and location could not avoid or minimize such problems.

A

Response to Comments by
United States Department of the Interior

A. The alternative discussion has been revised as suggested. See pages 183-185.

The fact that the above alternatives are not in accord with the statutory language, the accompanying legislative history, and National Park Service's (NPS) planning goal to separate visitor and through traffic in the park should be included in the discussion of alternatives.

East Corridor Alternatives. The discussion of these alternatives is, for the most part, adequate, but the anticipated impacts to Section 4(f) lands, and other aspects of the environment, should be clearly compared to those resulting from other alternatives. Although it appears that the East Corridor alternatives would use considerably more Section 4(f) land than the above alternatives, and would result in other adverse impacts, it may be that secondary impacts (e.g., impacts to old-growth vs. second-growth redwoods, etc.) could be a major factor in reaching a decision. This point, should be more clearly made in the present document. It should also make and support the point that other alternatives could compromise NPS's planning goals.

West Corridor Alternatives. Again, the Section 4(f) document should present the impacts of these alternatives in an objective manner, and compare them to the impacts of other alternatives. Here, also, the fact that the West Corridor alternatives are not in accord with NPS's planning goals should be presented as one item in the analysis, but should not be emphasized in the discussion to the exclusion of all other impacts.

A

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None of the alternatives would avoid the use of Section 4(f) lands, except the No Action alternative, and possibly the Non-Structural alternative. Thus, the basic problem is to find a feasible and prudent solution that would minimize the adverse use of parkland, and/or would enhance park/visitor values without causing other community impacts of extraordinary magnitude, and which would comply with P.L. 95-250. More information is needed to reach a decision on this issue, in accordance with the second proviso of Section 4(f).

In addition, we believe that a full discussion is needed of all possible measures to minimize harm, even for the preferred East Corridor alternatives. At a minimum, we recommend inclusion of measures to reduce blow down of old-growth trees where they may be exposed in new clearings, and measures to control erosion and vegetation disturbance, especially in the Prairie Creek, Boyes Creek, and May Creek drainages. Since these areas have some of the most unstable soils in the world, "standard" erosion control techniques would not appear to be adequate - - special erosion control techniques should be identified and adopted as part of the Section 4(f) mitigation.

B

Response to Comments by
United States Department of the Interior

B. Mitigation measures are discussed on pages 51, 56, 58, 65, 66, 188 and 189.

ENVIRONMENTAL STATEMENT COMMENTS

All of the US-101 Bypass alternatives would result in significant adverse impacts to riparian, wetland, and anadromous fish resources. Due to the location of the project, mitigation measures to offset these impacts will be difficult and costly to attain. We recommend that a full mitigation plan be developed by the Department of Transportation in cooperation with the U.S. Fish and Wildlife Service (FWS), the Corps of Engineers, the California Resources Agency, and other interested parties, so that the costs of such mitigation may be considered in the final selection of an alternative. This would be consistent with efforts by FHWA to use expedited procedures on the project. 1

We have the following specific comments:

Page 41. May Creek. Important fish species present should be specified; i.e., steelhead trout, coho salmon, and cutthroat trout; and it should be mentioned that the creek supports a popular sport fishery for these species. Also, the lack of summer nursery area in this creek should be noted. 2

Boyes Creek. Again, fish species present should be specified (steelhead trout, cutthroat trout, and coho salmon). This creek also supports a popular sport fishery. 2

Page 42. The importance of Prairie Creek for anadromous fish production should be stated more clearly. The species present should be listed (steelhead and cutthroat trout; coho and chinook salmon). Prairie Creek is likely the major producer of anadromous fishes in the Redwood Creek drainage. It should be emphasized that the reason for its relatively high productivity as compared to the rest of the Redwood Creek drainage is that it has been less disturbed by man's activities. 3

Page 50. Endangered and Threatened Species. The referenced letter of March 5, 1981, from FWS should be included in the appendix to document Endangered Species Act consultation. 4

Page 51. Some estimate of the area of riparian vegetation in the project area should be given. A map delineating the distribution of riparian vegetation in the project area would be helpful. 5

Wetlands: There is no mention of wetlands in the more northern portions of the project area, even though it is stated that at least four intermittent streams would be crossed in the Northern Ah Pah Creek area (see page 15, paragraph 4). If these intermittent streams do not meet wetland definition guidelines, it should be so stated in this section. 6

It should be noted that the NPS has recently initiated an intensive rehabilitation program in the Redwood Creek drainage. This program includes revegetation and instream rehabilitation efforts on several streams in the same drainage as the project area. The bypass project has the potential to negate or delay realization of many of the anticipated benefits, and this should be addressed in the final statement. 7

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Response to Comments by
United States Department of the Interior

1. Caltrans and the National Park Service are working closely with the U.S. Fish and Wildlife Service and California Department of Fish and Game regarding mitigation of potential impacts to fisheries, wetland, riparian, and wildlife resources. See pages 58, 79, 80, 95, 96, 171, and Appendices G and H. Application for an Army Corps of Engineer's Section 404 permit has been made.

2. The species have been noted. See page 29.

3. The importance of Prairie Creek is noted. See page 35.

4. The letter is included. See page 95.

5. Approximately 13.6 acres of riparian vegetation are in the project area. The majority are along Prairie and May Creeks in the vicinity of the southern interchange (7.4 acres). The balance of the areas (6.2 acres) are confined to narrow, streamside corridors in the upper Boyes, Ah Pah, and McGarvey Creek watersheds (0.6, 2.2 and 3.4 acres, respectively) where the alignment crosses these drainages.

6. No wetlands are found north of the southern interchange. The streams which are crossed are in steep, narrow ravines and contain riparian, but no wetland, habitat. See page 42.

7. Watershed rehabilitation work by the National Park Service is concentrated in the lower Redwood Creek drainage, above the confluence of Prairie Creek. Other work may be accomplished in tributaries of Prairie Creek, including the Skunk Cabbage and Lost Man Creek watersheds. The program has a goal of reducing elevated sediment yields and erosion levels from lands disturbed by road construction and logging. It is expected that, in the long term, fisheries resources would recover as erosion diminishes. Since the rehabilitation projects are not being carried out in Prairie, May or Boyes Creeks below the bypass, no direct impacts are expected. With the implementation of the extraordinary erosion control measures to be used (see page 58 and Appendix G) it is the goal to contain over 98% of the unmitigated sediment yield during construction and 99.8% in the long-term (see page 51). However, the immediate goal of the National Park Service program, reduction of erosion, could be indirectly offset by erosion from a major failure along the bypass. In addition, Prairie Creek and its tributaries contribute significantly to the fishery resources of the Redwood Creek watershed. Degradation of habitat in Prairie Creek if major failures occurred could offset potential improvements in habitat which may be realized as a result of the watershed rehabilitation program. Design features and erosion control measures will reduce the risk of a failure.

The areal extent of wetlands as determined by surveys should be included in this section. 8

Page 65. Environmental Consequences: There appears to be a discrepancy in the data provided in Table 5 (respecting riparian losses with Alternative B) and the statement in paragraph 3 on page 75. Table 5 indicates that seven acres will be lost, whereas it is stated on page 75 that 10 acres would be lost. 9

Page 66. Water Resources: The degradation anticipated may be understated. Pavement runoff pollution, chemical spills, increased sediment, turbidity, slides, and other impacts may negate any completed or ongoing efforts to improve the water quality and fishery in project area streams. 10

Page 69. Mitigation Measures: Although most of the standard measures to mitigate for adverse project impacts have been proposed, many of these mitigation efforts may not prevent degradation of aquatic resources, particularly salmon and steelhead. As stated in the impacts section, soil instability, along with increased sedimentation and turbidity, may be prolonged for several years after initial construction. 11

Because specific proposals for mitigating the loss of wetlands have not been included in the document, we cannot comment on their appropriateness. We anticipate that a U.S. Army Corps of Engineers' permit will be required for the project. When application is made for such permit, the FWS will review it from the standpoint of impacts on riparian vegetation, wetlands, and fishery resources using the guidelines contained in the "U.S. Fish and Wildlife Service Mitigation Policy" and make specific recommendations to the Corps of Engineers. As a minimum requirement, the FWS would recommend that the Corps include conditions in the permit similar to the following:

The applicant should implement measures to:

1. Minimize soil erosion and introduction of sediments into streams during and following project construction.

2. Minimize removal of vegetation, particularly riparian vegetation, and provide appropriate compensation for riparian losses as defined for resource category 2 (no net loss of in-kind habitat value) in the "U.S. Fish and Wildlife Service Mitigation Policy." 12

3. Minimize degradation of wetlands and provide appropriate compensation for losses as defined for resource category 2 in the aforementioned policy.

4. Minimize degradation of instream aquatic resources and provide appropriate compensation for losses as defined for resource category 2 in the aforementioned policy.

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Response to Comments by
United States Department of the Interior

8. 0.7 acres of wetland would be removed. See pages 39, 64 and 171.

9. The discrepancy has been corrected.

10. Quantification of potential impacts on water resources and fisheries has been made. See pages 54 and 56 and Appendices G and H.

11. We concur that if major, chronic failures occur, impacts may be prolonged after construction is complete.

12. Mitigation measures to minimize soil loss are in Appendix G. Candidate areas for restoration of wetland and riparian habitat have been identified along Prairie Creek below the project and near the mouth of Redwod Creek (see page 65). Replacement values for fisheries loss has been estimated between $130,000 and $148,000. The funds would be utilized for fish replacement or habitat restoration (see pages 56, 65, 80 and Appendix H). A Section 404 permit has been applied for. The U.S. Fish and Wildlife Service has been consulted, see page 80. Please refer to Wetlands Findings, pages 171 and 172.

As with the Section 4(f) comments, we feel that a fuller discussion of alternatives is needed in the draft environmental statement. 13

Page 104. Appendix F. The cost for constructing 15 miles of truck-passing lanes on the existing route — Alternate J — is shown as $49 million. Likewise, $49 million is cited as the cost of constructing 12 miles of 2-lane road with no truck-passing lanes on the preferred alignment — Alternate L. It seems incongruous that these two alternates should cost the same. This should be clarified in the text. Furthermore, the statement should explain why it would cost $62 million to implement Alternate K — Reduce Speed Limit on Existing Route. 14

SUMMARY COMMENTS

We look forward to working with the Department of Transportation on this highway project so as to best serve the needs of the traveling public while preserving the natural beauty of the park. Since we feel that more information is needed in the Section 4(f) document, we do not want to take a position on any particular alternative at this time. We would prefer to continue working with the Department to identify the most appropriate alternative for carrying out the requirements of Public Law 95-250, Public Law 95-599, and other applicable statutes.

Further coordination in developing a mitigation plan for adverse impacts to riparian, wetland, and anadromous fish resources, should be undertaken with the Area Manager, U.S. Fish and Wildlife Service, 2800 Cottage Way, Room E-2740, Sacramento, California 95825 (phone: FTS 468-4664).

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Thank you for the opportunity to provide these comments.

Sincerely,

Bruce Blanchard, Director
Environmental Project Review

cc: John Vostrez
District Engineer
Caltrans, District 01
P.O. Box 3700
Eureka, California 95501

Response to Comments by
United States Department of the Interior

13. The alternatives discussion of 4(f) involvement has been revised and incorporated.

14. Appendix F has been revised.

GENERAL COUNSEL OF THE
UNITED STATES DEPARTMENT OF COMMERCE
Washington, D.C. 20230

December 4, 1981

Mr. John Vostrez
District Director
Caltrans, District 01
Post Office Box 3700
Eureka, California 95501

Dear Mr. Vostrez:

88

This is in reference to your draft environmental impact statement entitled, "U. S. 101 Demonstration Project, Redwood National Park, California." The enclosed comment from the National Oceanic and Atmospheric Administration is forwarded for your consideration.

Thank you for giving us an opportunity to provide this comment, which we hope will be of assistance to you. We would appreciate receiving four copies of the final environmental impact statement.

Sincerely,

William T. Mikl Jr.

Robert T. Miki
Director of Regulatory Policy

Enclosure: Memo from: Mr. Robert B. Rollins
National Oceanic and Atmospheric Administration/National Ocean Survey

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md 20852

OCT 16 1981

OA/C52x6:JVZ

TO: PP/EC - Joyce M. Wood

FROM: OA/C5 - Robert B. Rollins

SUBJECT: DEIS #8109.31 - U. S. 101 Demonstration Project, Redwood National Park, Prairie Creek Redwoods State Park in Humboldt and Del Norte Counties, California

The subject statement has been reviewed within the areas of the National Ocean Survey's (NOS) responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

Geodetic control survey monuments may be located in the proposed project area. If there is any planned activity which will disturb or destroy these monuments, NOS requires not less than 90 days' notification in advance of such activity in order to plan for their relocation. NOS recommends that funding for this project includes the cost of any relocation required for NOS monuments. For further information about these monuments, please contact Mr. John Spencer, Director, National Geodetic Information Center (OA/C18), or Mr. Charles Novak, Chief, Network Maintenance Branch (OA/C172), at 6001 Executive Boulevard, Rockville, Maryland 20852. 1

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Response to Comments by
U.S. Dept. of Commerce

1. There are no NGS horizontal control monuments within the limits of the project. One vertical control monument near the beginning of the project may require resetting. This work is routine and will be done, if necessary, by the District Surveys Department.

   There will be no cost to the NGS for the relocation of any monuments for this project and no funds need be included for this type of work.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

Project #D-FHW-K40078-CA

DEC 1 1981

Mr. John Sacklin
Redwood National Park
P.O. SS
Arcata, CA 95521

Dear Mr. Sacklin:

The Environmental Protection Agency (EPA) has received and reviewed the Draft Environmental Impact Statement (DEIS) titled U.S. 101 DEMONSTRATION PROJECT, REDWOOD NATIONAL PARK, HUMBOLDT AND DEL NORTE COUNTIES, CALIFORNIA.

The EPA's comments on the DEIS have been classified as Category LO-2. Definitions of the categories are provided by the enclosure. The classification and the date of the EPA's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal Actions under Section 309 of the Clean Air Act. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and the adequacy of the environmental statement.

The EPA appreciates the opportunity to comment on this DEIS and requests five copies of the Final Environmental Impact Statement when available.

If you have any questions regarding our comments, please contact Susan Sakaki, EIS Review Coordinator, at (415) 974-8137 or FTS 454-8137.

Cordially yours,

SONIA F. CROW
Regional Administrator

Enclosure

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Water Quality Comments

1. The DEIS does not adequately discuss the potential impacts on water quality resulting from construction of the proposed project. Best Management Practices (BMPs) to control erosion and sedimentation should be presented in the Final Environmental Impact Statement (FEIS) and implemented when the project has begun. 1

2. The North Coast Region Water Quality Control Board should be contacted to ensure that measures are implemented to protect water quality standards and beneficial uses of surface waters within the vicinity of the proposed project. 2

3. A discussion of the growth-inducing impacts resulting from the proposed project should be presented. Specifically, if increased camping and tourism are predicted, the impacts on water quality with respect to increased demand for drinking water and wastewater treatment should be addressed. 3

404 Permit Comments

In the event that a Section 404 permit is required by the U.S. Army Corps of Engineers, the Environmental Protection Agency will comment on the project's compliance with the Federal Guidelines developed for discharges of dredged or fill material, promulgated by the EPA pursuant to Section 404 (b)(1) of the Clean Water Act.

The preferred alignment would eliminate 10 acres of riparian vegetation and 4 acres of wetlands. Although the DEIS proposes measures to minimize construction impacts, the document is less specific with respect to wildlife and wetland mitigation. Specific measures, developed in consultation with those agencies with responsibilities within these areas of concern, should be presented in the FEIS. 4

The resource impacts resulting from the location of the southern intersection in wetlands may be more significant if portions of the wetlands become isolated or if the use of the wetlands by Roosevelt Elk is significantly disrupted. The possibility of increased flooding downstream as a result of wetland loss should be addressed. 5 6

The southern intersection proposed under alignment B should be chosen only if there is no practicable alternative location for the intersection. The FEIS should address the possibility of either upgrading Cal Barrel Road for use as a connection between the bypass the U.S. 101, or locating the southern intersection in the vicinity of Geneva Road. 7

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Response to Comments by
Environmental Protection Agency

1. Potential impacts to water quality resulting from construction will result from sedimentation. Implementation of a monitoring program during construction is a condition of the report of waste discharge requirements that will be administered by the California Regional Water Quality Control Board. Discharge requirements usually limit contractors' operations not to exceed 10 turbidity units above the background level. Spring and summer turbidity in streams within the project area range from 1 to 6 turbidity units depending on location. Winter measurements have been as high as 100 in the upper Boyes Creek drainage. Effects of construction are described in the Environmental Consequences Section of the Draft EIS. Provisions for prevention through design features and practices generally used are stated in the mitigation measures. (See page 58).

Special features to be developed in areas of high erosion potential not previously listed in the mitigation portion of the Environmental Consequences Section and which would be incorporated in the contract plans and specifications have been added. (See page 150). These represent best management practices for controlling erosion.

As noted in the EIS, an interagency technical advisory committee has been formed. Representatives from the California Department of Fish and Game and the Regional Water Quality Control Board are participating. The committee will provide expertise in the identification and recommendation of special features for treatment of problem areas. It is inevitable some slides will occur, however, mitigation measures judiciously applied should keep sedimentation within acceptable limits when the contract is completed.

2. Coordination with the North Coast Regional Water Quality Control Board will occur as stated above and in the permit process as stated in the Compliance Section (Appendix E).

3. No measurable increase in visitation or overnight use of park facilities is expected which would be directly related to the construction of a bypass highway.

4. Mitigation of adverse impacts to wetland and riparian habitat would result in no net loss of in kind habitat values. See page 65.

5. We agree that Roosevelt elk use of the area would be restricted. This loss of habitat and other impacts will be minimized by prudent design measures. Consultation with the California Department of Fish and Game regarding specific design options to minimize these effects is underway.

6. No downstream flooding will occur. See text page 54.

7. The Cal-Barrel Road is a narrow, steep, one lane gravel road which passes through magnificent stands of old-growth redwood trees within Prairie Creek Redwoods State Park. Upgrading is unacceptable to the National Park Service or California Department of Parks and Recreation.

Locating the southern intersection at the Geneva Road would result in destruction of riparian and wetland habitat on Lost Man Creek, possible adverse effect on a Humboldt County Fish Hatchery and at least three cuts and fills exceeding 200 feet.

200 feet.

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
211 MAIN STREET
SAN FRANCISCO, CALIFORNIA 94105

SPNED-E

7 December 1981

Mr. John Sacklin
Redwood National Park
P. O. Box SS
Arcata, California 95521

Dear Mr. Sacklin:

We are writing in response to your request for comments on the Draft Environmental Impact Statement (DEIS) for the U. S. 101 Demonstration Project, Redwood National Park, Prairie Creek Redwoods State Park in Humboldt and Del Norte Counties, California.

The construction of any of the proposed bypass alternatives (Alternatives B - F) will require Department of the Army authorization under Section 404 of the Clean Water Act, as amended. A copy of our pamphlet, "U. S. Army Corps of Engineers Permit Program, A Guide for Applicants" was inclosed with our 30 April 1980 letter to the California Department of Transportation. For additional information regarding permit requirements please contact our Regulatory Functions Branch at 415-556-5966. 1

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The need for a Corps EIS cannot be determined until we have received a complete permit application for the proposed work. It is therefore desirable that an application be submitted as soon as possible so that, if necessary, the Corps can "adopt" your Final EIS before it is circulated. Adoption of the Final EIS would require that the EIS cover and cover sheet identify the document as also being a Corps EIS and that the document contain a summary prepared by the Corps. Questions regarding the Corps' environmental document requirements should be directed to Mr. Scott Miner of our Environmental Branch at 415-556-0325. 2

The proposed project would not affect any Corps of Engineers project or study. Although the proposed project has the potential for significant hydrological impacts, the hydrological impacts of the preferred alternative appear to be adequately discussed in the DEIS.

Thank you for including us in your review process.

Sincerely,

JAY K. SOPER
Chief, Engineering Division

Copy furnished:
Mr. John Vastrez, Dist. Dir., CALTRANS, Dist 01, P.O. Box 3700, Eureka, CA 95501

Response to Comments by
U.S. Army Corps of Engineers

1. Application for a 404 permit authorizing work within the Corps jurisdiction has been made.

2. We understand and acknowledge the general conditions of the Corps of Engineers acceptance of the Final EIS and project as per conversation with Mr. Ken Maynard - Regulatory Functions Branch.

United States Department of the Interior

BUREAU OF MINES

WESTERN FIELD OPERATIONS CENTER
360 EAST 3RD AVENUE
SPOKANE, WASHINGTON 99202

November 10, 1981

Mr. John Vostrez
District Director
Caltrans District 01
P.O. Box 3700
Eureka, California 95502-3700

Subject: Route 101 Prairie Creek State Park
Bypass Project

Dear Mr. Vostrez:

93 Our Mineral Industry Location System (MILS) indicates an underground gold prospect (sec. 2, T. 12 N., R. 1 E.), a gold placer prospect (sec. 5, T. 11 N., R. 2 E.), and an underground chrome prospect (sec. 18, T. 12 N., R. 2 E.) exist in the area near this project. 1

A field check of these deposits and other mineral occurrences, and an evaluation of the possible effects of the project on the development of these deposits must be conducted and the results reported in the environmental statement.

Sincerely,

R. N. Appling, Jr., Chief

Response to Comments by
Dept. of the Interior Bureau of Mines

1. The gold placer prospect (Sec. S T 11W R2E) and the underground chrome prospect (Sec 18 T 12N R2E) mentioned are not located in sections affected by the bypass.

The proposed bypass alignment would pass through the west 1/2 of Sec. 2 T 12N R1E. The mineral resources file of U.S.G.S. indicated this location is incorrect but listed mining at Gold Bluff in Sec. 9 two miles west of the project. One reference source, California Division of Mines & Geology Bulletin 179, listed gold and platinum deposits approximately two miles east of the bypass.

United States Department of the Interior

1797 (GOV)
(C-911.4.5)

BUREAU OF LAND MANAGEMENT
STATE OFFICE
Federal Office Building
2800 Cottage Way
Sacramento, California 95825

October 26, 1981

Mr. John Vostrez
District Manager
Caltrans, District 01
P. O. Box 3700
Eureka, CA 95501

Dear Mr. Vostrez:

No public lands or programs administered by this agency will be affected by the U.S. 101 Demonstration Project in Humboldt and Del Norte Counties, California. Accordingly, we have no comments.

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Sincerely,

Deane Swickard

Deane Swickard
Acting Chief,
Planning and Environmental
Coordination Staff

cc: Director (202-B)
District Manager, Ukiah

United States Department of the Interior

FISH AND WILDLIFE SERVICE

AREA OFFICE
2800 Cottage Way, Room E-2740
Sacramento, California 95825-1880

Memorandum

OCT 15 1981

To: Associate Regional Director, Resources Management,
National Park Service, 450 Golden Gate Avenue,
P.O. Box 36063, San Francisco, CA 94102

From: Area Manager, Sacramento, CA (SESO)

Subject: Request for Formal Endangered Species Consultation-DEIS,
U.S. 101 Demonstration Project, Humbolt and Del Norte Counties,
California (1-1-82-I-2) (1-1-80-F-6)

We have reviewed your request of September 29, 1981, regarding the subject project. Under terms of the Endangered Species Act 1973 and our implementing regulations (50 CFR 402), consultation is required only when a Federal action may affect a listed endangered or threatened species. Since the subject project does not affect any listed species (DEIS pages 50, 77, and our letter of March 5, 1981), formal consultation with our Service is not warranted.

Thank you for your concern for endangered species. If you have questions please call Mr. Swanson at FTS 448-2791.

cc: Field Supervisor, Ecological Services, Sacramento, CA (ES-LN)

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Save Energy and You Serve America!

United States Department of the Interior

FISH AND WILDLIFE SERVICE

AREA OFFICE
2800 Cottage Way, Room E-2740
Sacramento, CA 95825

MAR 05 1981

In reply refer to: SESO

Ms. Betty Janes
National Park Service
Denver Service Center
755 Parfet Street
P.O. Box 25287
Denver, CO 80225

Subject: US 101 Bypass EIS in Redwood National Park (#1-1-80-F-6)

This is in response to your letter of February 9, 1981, concerning clarification of potential impacts related to the subject project. We have reviewed our Biological Opinion of February 14, 1980, and additional information in our office files and have determined that there will be no impact to listed or candidate endangered or threatened species from the proposed Highway 101 bypass. Thus, the subject project is in conformance with our February 14, 1980, Biological Opinion.

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If the proposal is significantly modified or new information becomes available on listed species or impacts to listed species, formal consultation should be reinitiated. Thank you for your concern for endangered species.

Sincerely yours,

Area Manager

State of California
GOVERNOR'S OFFICE
OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO 95814

EDMUND G. BROWN JR.
GOVERNOR

Mr. J.E. Thorne
State Department of Transportation
P.O. Box 3700
Eureka, CA 95501

December 11, 1981

SUBJECT: REDWOOD NATIONAL PARK BYPASS (PRARIE CREEK UNIT), SCH# 79071315

Dear Mr Thorne:

State agencies have commented on your draft EIR/EIS (see comments attached). If you would like to discuss their concerns and recommendations, please contact the staff from the appropriate agencies.

When preparing the final EIR, you must include all comments and responses (CEQA Guidelines, Section 15146). The certified EIR must be considered in the decision-making process for the project. In addition, we urge you to respond directly to the agencies' comments by writing to them, including the State Clearinghouse number on all correspondence.

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A recent Appellate Court decision in Cleary v. County of Stanislaus clarified requirements for responding to review comments. Specifically, the court indicated that comments must be addressed in detail, giving reasons why the specific comments and suggestions were not accepted and factors of overriding importance warranting an override of the suggestion. Responses to comments must not be conclusory statements but must be supported by empirical or experimental data, scientific authority or explanatory information of any kind. The court further said that the responses must be a good faith, reasoned analysis.

Section 15002(f) of the CEQA Guidelines requires that a governmental agency take certain actions if an EIR shows substantial adverse environmental impacts could result from a project. These actions include changing the project, imposing conditions on the project, adopting plans or ordinances to avoid the problem, selecting an alternative to the project, or disapproving the project. In the event that the project is approved without adequate mitigation of significant effects, the lead agency must make written findings for each significant effect (Section 15082) and it must support its actions with a written statement of overriding considerations for each unmitigated significant effect (Section 15089).

If the project requires discretionary approval from any state agency, the Notice of Determination must be filed with the Secretary for Resources, as well as with the County Clerk.

Please contact Daniel Conaty at (916) 445-0613 if you have any questions.

Sincerely,

Judy Roberts

Memorandum

12/7/81

Memorandum

To : Deni Greene
Office of Planning and Research

Attn: Steve Williamson
State Clearinghouse

From : Office of the Secretary
James W. Burns

Date : 12/7/81

File No.:

Subject : SCH 79071315--Prairie Creek Redwoods State Park -- Draft EIS

We have the following comments to offer on the subject document.

Department of Fish and Game

The Department (DFG) comments that the report does not adequately assess and quantify the project's significant adverse impacts on fish and wildlife, nor does it provide mitigation for avoidable impacts. Therefore, the report does not provide the information required in Section 15143, subsections a, b, c, e, and f of the CEQA guidelines. Until these adverse impacts are properly quantified and mitigated to the extent possible, DFG opposes any of the "build" alternatives, favoring the "no project" alternative instead. 1

Among the project's adverse impacts on fish and wildlife would be the obliteration of four acres of wetland with no compensation proposed. This conflicts with the Resources Agency's Basic Wetlands Protection Policy, copy attached. 2

86

DFG also has the following detailed comments:

Page 49-50 - Mammals. The riparian areas along Prairie Creek and lower May Creek as far south as 1.5 miles from the Prairie Creek State Park boundary are an essential part of the Boyes Prairie Elk Herd (Logsdon, 1956; Franklin, 1968). The riparian area provides feeding, loafing, calving habitat, as well as escape cover and protection from adverse weather. Approximately 45 percent of the elk use occurs in the area along Prairie and May Creeks (Franklin, 1968). 3

Page 65 - Comparison of Impacts. Wildlife impacts listed as low to moderate under Alternatives B through F are incorrect. Major impacts to the Boyes Prairie Elk Herd could be expected. In addition, the loss of riparian and wetland habitat would result in significant impacts on other obligate wildlife species. 4

Page 66 - Soils. The report identifies the Franciscan bedrock as the most significant area for erosion problems during the construction and long-term maintenance phases of the project. However, the mitigation measures suggested to reduce these significant impacts to an acceptable level are inadequate. Road construction on slopes of 30 to 70 percent, coupled with high erosion hazard ratings, mandate a great deal more specifics than simply mentioning that the "state-of-the-art" knowledge will be used. The potential for short- and long-term adverse impacts upon the aquatic environments, specifically a 50 percent loss of ana- 5

Response to Comments by the State Clearinghouse

1. Quantification of the adverse impacts is based on studies accomplished by the National Park Service, California Department of Fish and Game and U.S. Fish and Wildlife Service. The methods and results of these studies are detailed in Wood 1982. Additional mitigation measures are described in response to Environmental Protection Agency comments number one and four.

2. See response to Environmental Protection Agency comment number four.

3. We concur. Aside from habitat loss, the interchange could restrict elk movement south of Elk Prairie. See page 66.

4. The overall impact to wildlife across the entire project would be low to moderate; however, most impacts (loss of habitat) would occur near the southern interchange.

5. See response to EPA Water Quality Paragraph 1.

dromous fisheries, spawning, and nursery areas is critical in the project area. Further, the project proposes 200-foot cuts and fills in the headwaters of Ah Pah and McGarvey Creeks where the State has restored these streams for anadromous fish. This one project could negate the State's efforts if the highway construction on unstable soils causes soil erosion. | 6

Page 67 - Fourth Paragraph. Reductions of 50 percent in the anadromous fish production of Prairie, Boyes, and May Creeks is unacceptable. Page 68 indicates that there will be substantial damage to Ah Pah and McGarvey Creeks as well. These losses must be quantified and compensation provided. | 7

Page 68 - Floodplain. Culverting May Creek at the interchange for access to the southern end of Prairie Creek is unacceptable. The culverts appear to be inadequately sized for the project, because they will back up water for about 600 feet during the 100-year high intensity storm. A bridge should be constructed instead. | 8

Page 69 - Mitigating Measures. The fourth measure is not practical or obtainable as suitable habitat for fisheries in the stream. Artificial streams have not proven effective for maintaining a viable fishery. Therefore, relocating or channelizing anadromous fisheries streams should not be allowed. | 9

66

Page 71 - Third Paragraph. The report does not address the mitigation needed for the loss of four acres of wetland habitat or the substantial reductions in anadromous fish habitat. Until satisfactory mitigation is included in the EIS, DFG believes that the project EIS fails to meet the intent of the National Environmental Policy Act of 1969. | 10

Page 77 - Wildlife. DFG disagrees with the conclusion that the elk would probably not be affected by the proposed bypass because road kills would increase and movement patterns would change. If road kills increase, the elk definitely would be affected (by the reduction in numbers of elk). Secondly, the key habitat for the Boyes Prairie herd includes the riparian wetlands and timbered corridor from the state park boundary south for at least 1.5 miles, as mentioned above. Elk use this habitat for a number of essential purposes, and it is also the main travel route to reach habitat in the Sheelow Creek area and other use areas in the southern portion of their range. Freeway construction would pass directly through this key elk-use area, causing substantial loss of habitat, disruption of travel patterns, and a high road kill situation. | 11

Questions regarding DFG's comments should be directed to A.E. Naylor, Regional Manager, Box 1480, Redding 96099 or (916) 246-6511.

6. We concur.

7. Detailed studies of the existing and potential anadromous fishery habitat of Prairie, Boyes, May, Ah Pah, and McGarvey creeks were undertaken. The habitat analysis has been compared with probable sediment deposition in each stream to determine fishery loss. The results are summarized on page 54 and in Appendix H.

Measures to mitigate the losses are being developed with the California Department of Fish and Game. They could include replacement of fish or restoration of aquatic habitat.

8. The culverts proposed for the May Creek interchange are adequate. The design meets the criteria recommended in Research Report No. 629110 Passage of Anadromous Fish Through Highway Structures. This report was developed through the cooperative efforts of Caltrans and the Department of Fish and Game. Culvert alternatives in the May Creek interchange have been considered. Wetlands and riparian habitat lost will be replaced and design will be coordinated with Department of Fish and Game.

9. Newly excavated channel changes obviously lack features of good fish habitat. At best short term losses will result and it will take several years to regain a balanced condition even with effective practices. Channel change design will include reestablishment of bankside vegetation and the placement of gravel, rocks and/or other features within the channel.

Channel changes properly constructed have retained fish spawning capabilities and allow continued fish passage. Channel changes may support acceptable productivity.

10. See response to Environmental Protection Agency comment one and four.

11. We concur. The sentence has been changed.

Response to Comments by
the State Clearinghouse

Department of Parks and Recreation

The Department supports the concept of reducing traffic congestion in Prairie Creek Redwoods State Park. The present traffic situation adversely impacts a number of park values, especially with regard to public safety, noise, and road kills of elk. The Department suggests that in selecting an alternative Caltrans also consider the impacts to the redwoods.

State Water Resources Control Board

The report acknowledges the "Water Quality Control Plan, Klamath River Basin 1A". Close adherence to this basin plan is essential to the protection of water quality and beneficial uses that the project must provide.

There is a trout hatchery at Prairie Creek -- U.S. 101. The project should be designed to protect the hatchery's rearing water and domestic supply from contamination, especially from upstream spills on the relocated highway. 12

Loss to construction of riparian vegetation and aquatic habitat resulting in 50 percent reduction in salmonids and other fishes in Boyes and May Creeks is unacceptable. Mitigation of these significant adverse impacts should be proposed. 13

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California Coastal Commission

The preferred alternative would significantly increase employment, population, and related demand for housing in the Orick and Klamath areas during the construction period. Actual immigration of employees and job seekers into these areas may be less than the total 500 person work force projected for the peak construction years, due to the availability of local workers unemployed because of declining timber industry employment. The total construction period population increase may, however, exceed 500 persons (even considering the potential to provide a significant portion of the construction work force from the local labor pool) when construction workers' families and support populations are considered. These increases in employment, population, and housing demand will be in addition to those which will occur as a result of the park's management and habitats restoration programs, which are also expected to have significant population effects in the Klamath and Orick areas.

Both Klamath and Orick are very small communities with limited housing supplies and public service capacities. (In fact, housing supplies in the area are being reduced by demolition of residences within Redwood National Park and Dry Lagoon State Park. Further demolitions are proposed in the national park's general management plan.) Accommodating even a portion of the construction work force in the area will require

12. The hatchery is on Lost Man Creek and should not be affected.

13. See comment number 7 above and response to Environmental Protection Agency comment number four.

development of temporary housing facilities, and may require modification or improvement in local utilities' water and/or sewer capacities. Improvement in police, school, recreation, and other social services may also be necessary.

Increasing local employment during the construction period is likely to cause significant increases in housing prices. Existing rental units in the area may no longer be affordable to low and moderate units during a period of shortage, and are unlikely to be affordable to new residents, such as park employees, with similar incomes. In addition, both Orick and Klamath include special populations, including native Americans and unemployed timber workers, for whom affordable housing may be a unique problem.

For these reasons, the final EIS should identify measures to mitigate or eliminate these effects of the bypass on new development, public works, and housing price. Feasible measures include coordination with local governments to identify through their general plan process suitable sites for temporary housing for the construction population. If properly sited and designed, these housing facilities could be redeveloped for recreational and visitor-serving uses to serve park visitors and other tourists upon completion of the construction. Overnight facilities planned for the national park, such as the Skunk Cabbage Creek campground or Cal-Pac mill site redevelopment, could also be constructed and operated to serve the construction workforce and then opened to visitor use. Consideration may also be given to opportunities to facilitate necessary public works improvements in Orick and Klamath and to improve police, recreation, school, and other local public services that would be needed. An alternative approach could encourage housing of the construction workforce in large communities such as Crescent City, McKinleyville, and the Eureka-Arcata area where its impacts would be minimal. Bypass construction employers could, for example, provide bus or jitney service from these areas to the construction site. In addition, the construction of other projects, such as redesign of the Cal-Pac mill and Freshwater spit area, could be coordinated with the bypass construction to ensure that construction employees do not squat on these or other public lands of the area. 14

Impacts to housing prices will not affect the coastal zone or California's coastal management program. The impacts to public works and new development will, however, directly affect the coastal zone by requiring construction of new housing at Klamath and adjacent to Orick for the construction workforce and any related improvements in public works, such as water and sewers in these communities, and by creating potential conflicts with recreation and protection of other coastal resources if workers squat on existing public land. The magnitude of these impacts cannot be determined because the report does not estimate the mix of local versus out-of-area workers in the construction workforce. In addition, the report does not assess the ability of out-of-area workers to find temporary housing at existing or new developments that would be consistent with Humboldt and Del Norte's local coastal programs for the Orick area or Klamath. This information is necessary to determine the project's effect on the coastal zone. 14

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Response to Comments by
the State Clearinghouse

14. It is not anticipated that temporary housing needs will extend beyond existing capacities in the Orick-Klamath area. The construction schedule has been revised as follows:

PHASE	YEARS	ESCALATED COST (Millions)	JOBS/ YEAR[1]	LOCAL WORKERS[2]	NONRESIDENT WORKERS
1. Clearing	1984-85	4.3	32	21	11
2. Grading	1985-88	82.4	404	202	202
3. Surfacing	1988-89	27.7	18	54	66

[1] Based on an 8 month working season. Overlapping phases 1 & 2, 2 & 3 in 1985 and 1988 will require only 1/2 of the Phase 2 Jobs indicated, as Grading will occur on 1/2 of the area during these years. See construction schedule Appendix G.

[2] Local labor force is estimated to be 65 percent in Phase 1, 50 percent in Phase 2 and 45 percent in Phase 3.

Based on housing used in other Caltrans projects, the following table shows the anticipated housing requirements.

PHASE	YEARS	TRAILER SPACES	HOUSE, ROOM OR APARTMENTS	COMMUTES
1. Clearing	1984-85	14	4	14
2. Grading	1985-88	253	84	67
3. Surfacing	1988-89	75	25	20

The Orick-Klamath area has approximately 1,200 full service and 1,700 partial service trailer/RV facilities. These trailer parks average about 60-70 percent occupancy, so on the average, unoccupied spaces are adequate.

The Orick-Klamath area also has about 140 cabins or motel units which again would be adequate for the demand, but may cause a conflict with tourists also wanting to stay in those units. Such competition might increase the price of those units.

Workers desiring houses would probably have to commute to the larger communities of Crescent City (about 30 miles or 45 minutes) or the Trinidad to Eureka area (about 40-50 miles and 45 to 55 minutes). Most would probably choose the latter because it is over four times as big, thus offering a larger variety and quantity of housing, jobs, and services. If a sufficient number of workers live in the Trinidad-Eureka area, it is conceivable that bus service or van pools to the project site might be provided. It is not anticipated that temporary housing, other than trailers, would be built in the project vicinity.

Other services (law enforcement, fire protection, utilities, health services and schools) will have moderate additional demands, especially during the 8-month construction season. Some workers, however, will stay the full year in anticipation of the next season's work. The construction workers who live in the Orick-Klamath area, particularly during the grading phase, will significantly increase the demand for goods and services in that area, thereby creating indirect employment. Because unemployment is relatively high in this area, these jobs will probably be filled by locals rather that people moving into the area.

It is anticipated that the increased sales tax revenue from the construction workers and the associated increase in economic activity, particularly in

Another issue that should be addressed is the gravel extraction sites on the Klamath River. Although it is not known at this time the amount needed, or the exact location of such sites, the impacts should be addressed when more information,is available. 15

James W. Burns

JAMES W. BURNS
Assistant Secretary for Resources

15. A location which meets Department of Fish and Game approval has been identified as a potential gravel source on the Klamath that could produce aggregates of sufficient quantity and quality for the bypass reqirements. See pages 13 and 52.

Primary aggregate need will be for the Grading and Surfacing phases of construction. No agreements have been negotiated to purchase gravel or material sources.

Some areas along Redwood Creek may be available for material sources, especially near its mouth.

COUNTY OF DEL NORTE

450 H STREET

CRESCENT CITY, CALIFORNIA 95531

AREA CODE 707
Tel. 464-3101

BOARD OF SUPERVISORS

October 27, 1981

John Voskez, District Director
Caltrans District 01
P.O. Box 3700
Eureka, Calif. 95502-3700

Dear Mr. Voskez:

The Del Norte Board of Supervisors has reviewed the attached letter from our Planning Director which has also been endorsed by our Planning Commission. The Board concurs with our Planning Commission. Our primary concern is housing impacts associated with construction workers during the projects construction and eventual completion. We request that the alternatives listed by our Planning Director be examined and a discussion of each be included on the Environmental Impact Statement. Also the authors should include a housing analysis of Crescent City and the surrounding area. We feel that we will experience housing impacts as well if not greater than Humboldt County and its urban area. 1

The Board also requests that any alternative chosen as a by-pass include a statement which would allow truck traffic at existing speed limits on the present route during off-season tourist months. This would reduce truck traffic during the tourist seasons while still allowing truck traffic during the poor weather months to use the existing route with less grades and at a much lower elevation. 2

Thank you for your consideration of our concerns.

Sincerely,

Dale S. Rupert, Chairman
Board of Supervisors

CC: Planning Dept.

Response to Comments by
Del Norte County

1. See response number 14 to the State Clearinghouse comments.

2. Through truck traffic use is intended only when emergency conditions warrant and at no other time (see page 7).

COUNTY OF DEL NORTE

PUBLIC WORKS BUILDING
700 FIFTH ST.
CRESCENT CITY, CALIFORNIA 95531

AREA CODE 707
Tel. 464-2119

PLANNING DEPARTMENT

October 13, 1981

MEMO TO: Honorable Board of Supervisors and Planning Commissioners

FROM: Ernest Perry, Director of Planning and Building

SUBJECT: US 101 Bypass of Prairie Creek

A draft environmental impact statement (eis) has been released by the U.S. Department of Transportation, U.S. Department of the Interior and CalTrans which evaluates a bypass route around Prairie Creek State Park. The preferred alternative, identified within the draft eis, is a route eastward of Prairie Creek connecting with the existing route of Highway 101 at the Humboldt-Del Norte County line and at the junction of Prairie Creek and May Creek. The attached summary lists each alternative and their respective impacts.

Alternative B is chosen by the authors as the preferred alternative. Such a route will have long-standing negative impacts to our local economy while providing a brief potential for increased employment during construction. The long-term economic costs are primarily increased fuel cost to local residents and increased shipping costs in and out of the County, both of which will be borne by the consumer. The only identified benefit is an improved "park experience" for the park visitor choosing not to take the bypass.

The County may choose to support alternative A (no project) or alternative B (the preferred alternative). Staff recommends that consideration be given to the following position:

1. Alternative B through F be found not to be prudent nor feasible alternatives because of economic, environmental and practical impacts; and
2. The authors be requested to elaborate on the positive and negative impacts of alternatives G and H. | 3

Additionally, missing from the existing eis is an examination of any indirect impacts of alternative B on the surrounding lands (eg. are any buffer zones going to be implemented?). | 4

The problem with the staff recommendation is that we assume that the decision on the route to be selected has not been made. It

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Response to Comments by
Del Norte County

3. Both alternatives would result in a shorter, more scenic route than any eastern alignment. Views of the ocean or of old-growth redwoods would be available along most of the drive. However, alternative G would require construction of a seawall or similar structure to protect the highway from ocean overwash. Alternatives G and H would eliminate or modify portions of the existing Gold Bluffs Beach Campground, the Ossagen Trail, James Irvine Trail and Miners Ridge Trail. Both alternatives would necessitate rather steep grades in the northern portion to take the highway from sea level to approximately 600 feet in elevation. Either alternative would severely impair the wild character of the Gold Bluffs area.

4. Indirect impacts resulting from alternative B are addressed in the Environmental Consequences section. Additional indirect impacts that could result include the severing of a portion of Simpson Timber Company's road network. New road would be constructed to reconnect the system. No buffer zones would be purchased east of the highway right of way.

is our understanding that the right-of-way necessary for alternative B has already been purchased. That, in fact, the only decision to be made is the type of bypass to be constructed around Prairie Creek within the purchased right-of-way. 5

Therefore, a significant impact of this project would be the increased need for temporary housing during construction. Under alternative B, about 50 workers would be employed during the first two years, 500 workers during the second two years, and about 175 workers during the fifth year with about 90% working at the project site. "There would be a large increase for housing." The eis further states that Orick and Klamath would not be able to accommodate this increase, and many workers would therefore commute from Arcata and Eureka. This "speculation" by the authors would be just as easily applied to the Crescent City area as a possible impact area for housing demand. 6

With the current high cost of housing and the high cost of providing local services, staff feels that the authors of the eis should expand on the housing impacts. An analysis should be provided of current housing available, alternatives should be explored including temporary housing and what could be done with the temporary housing after completion of the project, funding to local government to provide housing, subsidized housing, commuting distances, travel time, energy consumption, etc. This kind of analysis could provide Del Norte County, Klamath CSD, and our neighboring county to the south with information to anticipate housing demand, alternatives to provide housing, and perhaps plan another use for this temporary housing after construction. 7

EP/mem

cc: Public Works Committee

Attachment

Response to Comments by
Del Norte County

5. No land has yet been purchased. Because alternative B is the preferred alternative, an appraisal will be made of the right of way necessary for that alternative, in order to request the necessary funds from Congress. Congress, however, has not acted and no land has been purchased. Of course, that part through the National Park is already available.

6. Please see response number 14 to the California State Clearinghouse comments.

7. Same as above.

DEPARTMENT OF PUBLIC WORKS
COUNTY OF HUMBOLDT
1106 SECOND STREET EUREKA, CALIFORNIA 95501

Response to Comments by
Humboldt County

DEPARTMENT OF PUBLIC WORKS
COUNTY OF HUMBOLDT
1106 SECOND STREET, EUREKA, CALIFORNIA 95501
PHONE (707) 445-7491

10 November 1981

Mr. John Vostrez
District Director, 01
California Department of Transportation
P.O. Box 3700
Eureka, CA 95501

RE: Redwood National Park Bypass Environmental Impact Statement

Dear Mr. Vostrez:

The Humboldt County Department of Public Works, Natural Resources Division, has reviewed the EIS on the Redwood National Park Bypass. The report appears to be adequate with the following exceptions.

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The following information should be addressed in the section on seismicity.

> Approximately 1/2-mile north of the proposed bypass intersection the northwest trending Grogen Fault intersects Highway 101. The Grogen Fault is Pleistocene in age as evidenced by geomorphic offset. North of the Grogen Fault, three unnamed northwest trending faults intersect the proposed bypass at intervals of two miles. These faults are also Pleistocene in age, based on stratigraphic offset. The northwest trending South Fork Mountain Fault is located five miles due east of the proposed bypass (California Division of Mines, 1964, Geologic Map of California; G. Carver, 1980, Fault Map of Humboldt County). Because of the probability of other potentially hazardous faults intersecting the bypass, it is recommended that an engineering geologist be retained to review the design and construction of the project. 1

Costs of slope stabilization after project construction and maintenance of unstable areas should be estimated for the project. 2

The Environmental Consequences section of the EIS did not address the mandatory sections of "The Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance of Long-Term Productivity," "Irreversible and Irretrievable Commitments of Resources," and "Probable Unavoidable Adverse Environmental Effects." 3

Response to Comments by
Humboldt County

1. Comments received regarding the identification of secondary inactive faults located within the project limits have been researched by Caltrans Chief of Engineering Services and the Staff Engineering Geologist. Caltrans and the National Park Service are aware that the Geologic maps of the area are currently under revision (Kelsey 1981). The faults identified do not materially change the data presented regarding potential seismic hazard. Staff geologists will review the design and construction. Mention of the South Fork Mountain and Grogen fault complexes are now included in the seismicity portion of the affected environment section.

2. Costs of slope stabilization after construction and maintenance of unstable areas are impossible to quantify. Cut and fill slope design is arrived at after substantial engineering effort utilizing field foundation drilling and office analytical work. The resulting combination for slope ratios, benching widths and spacing, stabilization trenches, drainage blankets, etc., have been geared towards reducing risk of slope failures. Costs of after construction slope stabilization and maintenance may be higher, but erosion control measures will reduce these costs. Highways constructed through a comparable unstable area may have maintenance costs 40% higher than county route averages of $17,000 per mile ten years after construction.

3. The draft environmental impact statement was prepared primarily according to the Council on Environmental Quality (CEQ) National Environmental Policy Act regulations (40 CFR 1500). Modifications were made in the format to accommodate California Environmental Quality Act requirements (for example, the section on growth). The CEQ guidelines require that the discussion of Environmental Consequences include the topical sections listed in the comment; and the guidelines call for consolidation of these sections under the one heading. However, a section addressing these questions has been added.

10 November 1981
Mr. John Vostrez
Redwood National Park Bypass EIS

Potential Growth Inducing Impacts of the project from Ah Pah Creek north were not addressed. | 4

If there are any questions regarding these comments please feel free to call.

Sincerely,

Donald C. Tuttle

DONALD C. TUTTLE
ENVIRONMENTAL SERVICES MANAGER

DCT/KAG/lf

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Response to Comments by
Humboldt County

4. Please see response number 14 to the California State Clearinghouse comments. The bypass would not be expected to encourage growth except during the construction period.

1285 Grant St.
Arcata, CA 95521

1285 Grant St.
Arcata, CA 95521

November 30, 1981

Mr. John Vostrez,
District Director
Department of Transportation
1656 Union St.
Eureka, CA 95501

Re: Draft Environmental Impact Statement - Redwood Park Bypass - Highway 101

Dear Mr. Vostrez:

It has been my contention that the Bypass should never have been approved by Congress, and it should not be built. On March 17, 1980, I wrote to the Director of Transportation stating my reasons for opposing the project. After reading the Draft E. I. S., I believe that the reasons I stated then are still valid. Therefore, I am enclosing a copy of that letter.

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I do not believe that the Draft E. I. S. properly addresses the cost-benefits to the public. I am aware that "preferred" alternates are A Federal Legislative Mandate, and that you may not feel that the Bypass must be justified on sound economics. However, we are considering spending 100 million dollars, and I can not find reasons to justify that type of expenditure in the document. 1

Further, I do not believe that the Draft E. I. S. fully explores all of the possibilities on Alternate J (existing 101). The document addresses only the last 1.5 miles of narrow winding road south of the Klamath Freeway, where it proposes truck passing lanes. The Draft E. I. S. ignores other possibilities for Highway 101 between May Creek and the Hope Creek Trail. The existing alignment is good and it could easily be improved by widening. Caltrans has a 100' right of way through most of that area (only ½ mile is prescriptive). A combination of truck passing lanes, wider roadway, parking areas, and continuous left turn lanes should be considered. I do not believe that many old growth redwood trees would have to be cut, and certainly not many more than on the three acres that would be cut under the "preferred alternates". 2

If the Bypass is constructed, we will have spent in excess of 100 million dollars and will not have solved congestion on Highway 101 through the redwoods in Northern Humboldt and Del Norte Counties. The Orick to May Creek congestion will still exist, as well as the Klamath to Wilson Creek congestion. It does not make sense to me to spend that kind of money to establish a leisurely drive through such a short section of <u>one</u> of our redwood parks. There are many other leisure drives available throughout the Redwood Region. 3

Response to Comments by
Frank F. Schmidt

1. Cost effectiveness is presented in Appendix F.

2. Upgrading any portion of existing U.S. 101 through Prairie Creek Redwoods State Park through construction of passing lanes, left turn lanes and wider shoulders would remove a minimum of seven acres of old growth trees and understory vegetation of a park-like quality within the highway right of way. This vegetation is equivalent to the resources found in Prairie Creek Redwoods State Park. These improvements would not separate park and non-park traffic. Removal of trees along this highly scenic corridor to facilitate traffic speed would reduce the aesthetic values now found along the highway. The result would be continued conflicts between users without a significant improvement in the park visitors' experience.

3. We concur. Congestion will still occur on two-lane segments of U.S. 101 north and south of the bypass.

If funds are to be spent for highway improvement in Northern Humboldt, I suggest the following:

1. Concentrate on the Alternate J as I suggested above.
2. Construct a good road into Fern Canyon by improving the Davidson County Road.
3. Construct the Cal Barrel - Holter Ridge Loop.

We would spend considerably less money, improved congestion on Highway 101, and provided park users with two leisure drives.

I am suggesting that Congress erred when they approved the Bypass project. We simply can not afford to spend public funds in the manner proposed in the Draft E. I. S.

Very truly yours,

Frank F. Schmidt

Frank F. Schmidt

Encl.

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Response to Comments by
Frank F. Schmidt

4. Alternates J & I do not solve the park management problem of removing through traffic from the park. Items 2 and 3 have been included in Redwood National Park's General Management Plan.

1265 Grant St.
Arcata, CA 95521

1265 Grant St.
Arcata, CA 95521

March 17, 1980

Ms. Adriana Gianturco,
Director
Department of Public Works
Sacramento, CA

Redwood National Park
Bypass

Dear Ms. Gianturco:

I am opposed to the construction of the Redwood National Park Bypass. I voiced objection to the project through elected public officials in 1979.

Regardless of the current status of the project, I do not think it should be built for the following reasons:

1. The costs are excessive and are inflationary.
2. It will not be a fuel efficient route.
3. It will put winter traffice into snow and ice adding hazards to driving and causing excessive fuel consumption.
4. It will remove additional private lands from timber production.
5. It will not solve congestion on Highway 101; we can no longer afford to solve that problem.

As an alternate I suggest a combination of truck passing lanes, widening for tourist parking and left turn lanes.

I was a Caltrans right of way agent for almost 9 years and I have worked in this area since 1952.

I am aware that the project has been approved. I do not agree that we must continue; I suggest that we abandon the project.

Very truly yours,

Frank F. Schmidt

Frank F. Schmidt

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Response to Comments by
Frank F. Schmidt

5. Regarding reason no. 1, we believe short-term costs are more than offset by the long-term improvement in park resources and visitor experience. We concur with reasons 2 and 4, (see pages 69 and 71). When conditions are hazardous, all traffic will be allowed on the existing route. Reason no. 5 is the purpose of the demonstration project (see page 4). Improvements to the existing route will not eliminate through traffic-recreational conflicts, (see pages 22, 24, 183, 186 and 187).

November 11, 1981
3402 Fern Way
Arcata, CA 95521

Mr. John Vostrez
District Director
Caltrans District 01
P.O. Box 3700
Eureka, CA 95502

Dear Mr. Vostrez:

I am writing in response to the draft EIS for the proposed Highway 101 Bypass around Prairie Creek State Park. I am a geologist who has has been working in this area for four years, and I have several concerns about the proposed alternative.

I personally favor Alternative A - no action. I believe that the costs in financial and resource terms does not warrant the construction of a new highway. My objections to the proposed route are as follows:

1) The proposed route crosses May and Boyes Creeks. Damage to these creeks cannot be avoided. Aquatic habitat will be impacted, and stream channel stability may be threatened. Streams are sensitive to both short and long-term impacts, and will thus feel the brunt of highway construction now and long into the future. 1

2) Large road cuts and fills are needed. Road fills, especially in Franciscan terrain, are notoriously unstable, and even with the application of the best erosion control techniques, some failures will occur, increasing the sediment load of streams along the highway alignment. There are a few massive fills proposed, which I thick would be better suited for bridge construction if the highway must be built. 2

3) The road construction requires approximately 1 million tons of aggregate from the Klamath and Redwood Creek drainages. The effect of removing this much gravel from these rivers is not known, and is potentially harmful. 3

4) The EIS states that all possible care will be taken to avoid damage from road construction. However, I have already personally seen erosion problems caused by cat tractors clearing the proposed road alignment. I find it hard to believe that a major highway could be constructed here with minimal damage. 4

5. The channel of Prairie Creek would be channelized for a 700 ft. length. It has been well documented that channelization of streams causes adjustments of the stream channel outside of the channelized area. Prairie Creek is important in providing salmon habitat and should not be subjected to channelization without a more detailed description of the hydraulic effect of such work.

In conclusion I believe that the removal of many trees, the construction of

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Response to Comments by
Mary Ann Madej

1. The materials to be encountered are of a highly erosive nature. Even with the best erosion control techniques depicting "state of the art" today, there will be some erosion products generated. These will, in fact, contribute to problems affecting aquatic habitat, sediment bed loads, and basic roadbed stability; however, with those techniques applied, the magnitude should not be excessive, and should be considered short term impacts. Please see response to EPA comment number one.

2. We concur. Evaluation of recent foundation survey data compiled after circulation of the Draft EIS indicate the economic feasibility of structures at several areas with acute stabilization problems. (See Alternatives page 12).

3. The effect of gravel removal is unknown, but not necessarily harmful. River characteristics are sometimes benefitted through channel cleaning so the river system can contain peak conditions without errant escapement of flowing waters. To properly assess this impact, studies will need to be made covering the specific conditions for the sites selected. Field reconnaissance of possible sites for gravel have identified three gravel bars on the Klamath River along with lower Redwood Creek. Development of two bars on the Klamath would result in substantial riparian habitat loss and hydraulic damage. The quality and quantity of gravels available from each source is unknown, but it apppears as if any of the bars investigated on the Klamath River could supply enough gravel alone without operating in the streams or modifying the stream channel. (See pages 13 and 52.)

4. See response 8 and 9 to State Clearinghouse comments.

In conclusion I believe that the removal of many trees, the construction of large road cuts and fills, the damage to stream channels and the channelization of Prairie Creek constitute too high of costs to build a highway that is not really necessary. Tourists have the option of pulling off the highway in several locations to view elk in the wild. Logging trucks are a fact of life on highways throughout the North Coast, and to spend millions of dollars to construct a short bypass seems totally wasteful to me.

Thank you for considering my letter.

Sincerely,

Mary Ann Madej

Mary Ann Madej

November 20, 1981

Mr. John Vostrez, District Director
Department of Transportation
State of California
Eureka, California 95501

RE: U. S. 101 By-Pass, Draft E. I. S.

Dear Mr. Vostrez:

I am a forester employed by a local forest products enterprise. As such I am naturally concerned with what I feel is an unnecessary taking of 1,600 acres of forest land out of multiple use to build an unneeded freeway. I wish to comment on the E.I.S.; however, from a private citizen's standpoint.

The idea of building a new highway by-pass that would increase fuel consumption by 35% such as Alignment "B" is completely contrary to the national energy policy and good commonsense. Although the existing traffic pattern is less than desireable from the viewpoint of park personnel, the frequency of accidents is below the state average. Not so for the proposed Alignment "B". It is anticipated accidents would increase in number and severity. Hardly an appealing thought. 1

As a taxpayer and consumer, I am appalled by the idea of constructing a 12 mile multi-lane freeway ultimately costing as much as $167 million merely because the current transportation system creates an alledged "undesireable experience" for park visitors from a park management viewpoint. This type of expenditure is contrary to public opinion and sound fiscal policy.

As a motorist, I have traveled through the Prairie Creek Redwoods State Park many times. I am aware of the traffic in the summer months. I am also aware of the lack of traffic during 75% of the year. My recommendation is to continue to use the existing U. S. 101. Passing opportunities can be increased and existing locations can be improved without effecting the ecological integrity of the park experience.

In addition, the speed limit can be reduced to 40 or 45 m.p.h. This is done in Richardson Grove State Park. On page 34 it is indicated special legislation would be necessary to do this. This sounds ridiculous! Speed limits are changed everyday depending upon various traffic conditions and public pressures. But if it takes legislative action, so be it. I am convinced that non-park users of U. S. 101 would gladly accept a reduced speed limit in lieu of using a longer, higher elevation, more hazardous and costly route even if the by-pass did save them 5 minutes. It is stated on page 29 that reducing the speed limit was considered and eliminated from further consideration. It does not say who was involved in this deliberation and decision making process. Perhaps the public should be this time. I am certain if the by-pass is constructed, the speed limit through the park would be reduced as soon as possible. 2

113

Response to Comments by
Robert E. Dean

1. Increased fuel consumption would be a trade off for park management advantages, see pages 186, 187. The traffic accident issue has been reassessed, (see Table 6, page 50, and page 75).

2. Current State law requires that traffic speed limits (including the one through Richardson Grove) be established by roadway and prevailing traffic conditions. Special legislation is necessary to reduce speed limits below existing conditions. See page 24. A lower speed limit, however derived, would not alleviate through traffic-park user conflicts. In the event the bypass is constructed, the existing road may become part of the State park and the speed limit could be reduced to conform with park management policy.

Selection of the alternatives eliminated from further consideration is the responsibility of Caltrans, FHWA and the National Park Service. This selection was made following the initial public informational meetings held in June 1980.

Several references are made to projections of traffic densities (pages 1 and 8) in future years. Also, an estimate of noise levels by the year 2000 is made (page 78). Making these kinds of estimates for conditions 20 years in the future when the economic and energy pictures are so uncertain is ludicrous. And to state that carbon monoxide concentrations can be expected to decrease in future years as a result of more effective emmission controls ignores the fact that whatever the emissions are they will be 35% higher using the by-pass highway because of the increased fuel consumption. 3

When all of the detrimental effects of constructing this freeway by-pass around Prairie Creek State Park are weighed against the single purpose of it's use, the rational decision must be to use and improve the current route.

Very truly yours,

Robert E. Dean

Robert E. Dean
2008 Parton Lane
Arcata, California 95521

CC: Redwood National Park
Donald Clausen

Response to Comments by
Robert E. Dean

3. Twenty-year projection of traffic is merely a planning tool for an estimate of future situations given certain conditions and should be accepted as such. The air quality statement regarding decrease in carbon monoxide is a general one not intended as a comparitive between alternates. Fuel consumption, alignment, traffic mix, and projected emission standards are components of the air model analysis. The main point is that emissions will be below the maximum allowed by California and national standards.

November 28, 1981

Redwood National Park
P.O. Box 38
Arcata, CA 95521
Attn.: John Hacklin

Gentlemen:

We have reviewed the Draft Environmental Impact Statement for the U.S. 101 Demonstration Project at Redwood National Park. Enclosed are our comments.

Yours truly,

Charles Wilson

Charles Wilson
President, Citizen's Review
7420 W. 83rd St.
Los Angeles, CA 90045

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Review of the Draft Environmental Impact Statement for the U.S. 101 Demonstration Project at Redwoods National Park

Response to Comments by
Charles Wilson, Citizen's Review

In summary, here is our opinion:
1. We oppose alternates G, H, I, and J because they would severely damage the park we are trying to protect.
2. We oppose alternatives B, C, D, E, F, L, and M because they will not divert significant amounts of traffic around the park, will not serve the needs of the traveling public, and will not preserve the natural beauty of the park.
3. We disagree that alternative K should be eliminated from consideration. We have found numerous serious errors in the descriptions of alternative K which lead us to feel that this alternative was never given serious consideration and no attempt was made to make it a viable alternative.
4. Second to alternative K we prefer alternative A. It may not be perfect, but is clearly superior to any of the construction alternatives.

Following are our more detailed comments:

Driving Time

All the bypass alternatives emphasize the maximum vehicle speed but seem to downplay driving times between end points. This criteria is alluded to on page 1: "a conflict exists between visitors to RNP and the commercial traffic using this highway. Tourists tend to drive slowly, while commercial drivers want to drive at the maximum speed limit." Page echoes this sentiment with "...drivers might be frustrated ..." by having to reduce speed.

A clear sign of trouble is on page 87 where it says that the bypass "would take longer to travel than the existing route except during the peak tourist season." Page 87 makes more exceptions: "the heavier vehicles and small-engine cars would be restricted by the steep grades. In the steeper sections, some vehicles might be moving at speeds of 10 mph." Then if you remember page 15: "a brakes-and-load check area is being considered for both northbound and southbound traffic in the area of the summit", it becomes clear that many vehicles are going to always be taking longer to travel. Page 87, however, still states "during the peak tourist season, the bypass route would save through-traffic approximately five minutes." The cause of this alleged advantage is described by the contradictory sentence on page 60: "During the peak month of August, traffic flow is unstable with frecuent backups, momentary stoppages, and speeds decreasing to 30 mph at times." (momentary stoppages but decreasing to only 30 mph?)

We made an attempt to calculate the driving times from end to end of the bypass, particularly for these heavier loaded trucks. Since trucks would constitute about one fourth of the traffic using the bypass, the effect on them is considered to be very significant.

The bypass route is 12.03 miles long per the stationing given. The existing route is 2.3 miles shorter (page 87) or 9.73 miles long. Using the speeds given on page 8 and scaling the McGarvey Creek length at 2.6 miles, we calculate the average driving time to be 2.6 mi.@35mph, 7.13 mi.@50mph, or 13.0 minutes.

Using 12.03 miles at 55mph, the bypass alternatives would take 13.1 minutes. But then we considered the heavier vehicles and the small-engine cars on the steep grades.

1. We concur. Driving times on the bypass would be longer except during the peak tourist season.

116

Review of the Draft Environmental Impact Statement for the
U.S. 101 Demonstration Project at Redwoods National Park

In summary, here is our opinion:
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2. We oppose alternatives B, C, D, E, F, L, and M because they will not divert significant amounts of traffic around the park, will not serve the needs of the traveling public, and will not preserve the natural beauty of the park.
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Using 12.03 miles at 55mph, the bypass alternatives would take 13.1 minutes. But then we considered the heavier vehicles and the small-engine cars on the steep grades.

116

Response to Comments by
Charles Wilson, Citizen's Review

1. We concur. Driving times on the bypass would be longer except during the peak tourist season.

We picked stations 480 to 690 (3.98 mi.) for the northbound slow area (page 18 indicates 4.8 mi. of northbound passing lanes for alternative C), assumed 5 minutes at he check area, and 55 mph elsewhere. That is 3.98 mi.@10mph, 5 min., and 8.05 mi. @ 55mph, giving 37.8 minutes end to end.

We picked stations 1020 to 870 and 780 to 690 (total 4.55 mi.) for the southbound slow area (page 18 indicates 5.8 miles of southbound passing lanes for alternative C), assumed 5 minutes at the check area, and 55 mph elsewhere. That is 4.55 mi. @ 10mph, 5 min, and 7.48 mi. @ 55mph, giving 40.5 minutes end to end.

Since at least half of the logging trucks are loaded and would be a "heavier vehicle", and since the shift to small-engine cars is well documented, it appears that there will be a severe impact on some people due to an increase in driving time between end points. We consider the additional 190% to 216% (22.8 to 27.5 minutes more) in driving time to be significant. 1

Traffic volumes

From the report we gleaned that 1980 ADT for December was 4000, August was 7500, and annual was 4900. Year 2000 ADT for December was not given, August was 11170, and annual was 7300. Composition of traffic in August was 55-60% tourist, 11% truck, and 30-35% local. It was stated that local and truck traffic would use the bypass. Using these figures, we calculated that the ADT on the bypass might possibly range from 3075 in August 1980 and 4580 in August 2000 up to 4165 for annual 1980 and 6205 for year 2000, the maximum ADT on the bypass.

We realise that traffic volumes are a difficult thing to predict. In the early 50's the predictions were lower than what materialized, then in the 60's they tended to be higher than reality. The traffic volumes are only projections of past volumes. Increases in gas prices, changes in the amount of lumber to be cut, changes in the amount of remaining old-growth redwoods, fluctuations in the number of tourists will all affect traffic volumes. The report says "visitation to the region is expected to increase, although no statistical projections are available at this time." Gas prices and lumber remaining to be cut are much better known and are "expected" to cause a decrease in the amount of traffic.

Since the traffic volumes are such an unpredictable matter, we request that the report should be changed to eliminate the built-in bias towards the certainty of higher traffic volumes. On page 1, 5th paragraph, for example, the words "would probably" should be changed to "might possibly". Page 78 is similar: "noise levels would increase along US 101 as traffic volumes increased" should read "noise levels might increase along US 101 if traffic volumes increased." On page 86, "traffic flow would probably be unstable" should read "traffic flow might possibly be unstable". Our language affects the way we think, and the implication that growth is a certainty can affect the conclusions drawn from the report. 2

Bypass lanes

Other than safety considerations, the very low volume of traffic on the bypass indicates that one traveling lane in each direction is adequate. There is a paved parking shoulder in all the proposed sections for any stalled cars or trucks.

An uphill passing lane is justified for the slow, 10 mph vehicles. Since the report says the heavier loaded trucks and small-engine cars would be traveling at 10 mph, and since at least half of the truck traffic would be heavily loaded, it was estimated that one fourth of the truck traffic would be traveling at 10 mph at times. 3

Response to Comments by
Charles Wilson, Citizen's Review

2. We have changed the wording as suggested. (See pages 1, 67, and 74.)

3. Added lanes for capacity and safety for truck traffic are needed on the downhill grades as well as the uphill portions. Because downhill grades will limit truck speeds also, the additional lanes are necessary to provide adequate maneuvering room and passing opportunities. In any event, safety is a primary consideration. Alternatives C, E and L were not recommended for this reason.

truck traffic would be heavily loaded, it was estimated that one fourth of the bypass traffic would be traveling at 10 mph at times.

If higher gas prices and the shift to smaller cars continues, this proportion might well be increased, but even with any increases, the volumes are still so low that a single passing lane could handle them.

Alternate L, the two lane road with no passing lanes, would be a death trap and is opposed. Alternate M, the four lane road with an additional passing lane, would be grossly overbuilt. Alternatives B and D, the four lane roads with an additional passing lane, would also be grossly overbuilt. Alternative F is similarly opposed. Only alternatives C and E have appropriate lanes, but, as stated previously, all bypass alternatives are opposed.

Impact of more government ownership

Government already owns 53% of California. Many eastern and midwestern states have more private land area than California. Government already owns over 75% of the land within a 200 mile radius of Crick. While 1500 acres may seem miniscule compared to the size of Humboldt County and the State of California, it should be recognized that government ownership and control is not decreasing. Each governmental agency always seems to have such a good, justifiable reason for each acquisition and regulation. Easements, zoning, Coastal restrictions are examples of the partial taking of ownership rights. If government shows no signs of reducing its ownership and control, then will private ownership and control disappear as in the U.S.S.R.?

Noise from the bypass

All the bypass alternatives would be an unpleasant, noisy intrusion into the park. It seems hard to believe that at one time a single chain saw on a far mountainside was intolerable to some. Now it is apparently acceptable to blast the forest at will. No mention is made that trucks on grades and trucks changing gears make more noise than trucks on the level. There is no mention that decibels are not the only measure of noise impact. All of alternatives B, C, D, E, and F would impact areas of the park which were previously beyond the sound of trucks and cars. If any of these alternatives were built, there would be no place east of Praire Creek which was beyond the sound of a motor vehicle. The area would be surrounded by a constant roar.

Praire Creek

The impact on Praire Creek of the southern intersection is unacceptable. Praire Creek is a charming stream and adds a unique character to the park which the trees by themselves cannot do. Praire Creek must not be defiled by the highway created to "save" the park.

While it is poor practice to scale a plan, the plan presumably was drawn to scale and the proposed stream channelization and highway alignment are apparently in their correct locations. Using the scaled dimensions, several significant things were noted.

a. The proposed highway centerline curve radius is about 2450 feet. A radius of 1100 feet is a safe radius for 65 miles an hour. For comparison, the existing highway adjacent to Praire Creek has a 900 foot radius and has a much narrower roadway.

b. The side slopes in the intersection are about 100 feet. Assuming 20 feet from the surface of the proposed highway to the surface of the roadway underneath, it appears that slopes of 5:1 are being used. Even poor soils should be capable of 2:1 slopes, reducing the overall width of the intersection by about 120 feet.

c. Retaining walls could be used instead of 5:1 slopes to reduce the ~~the~~ width of the intersection by about 180 feet.

Response to Comments by
Charles Wilson, Citizen's Review

4. It is true that trucks on grades make more noise than trucks on the level. However, the model which predicted the extent of beyond-standard noise levels took the grades into account. It is also true that alternatives B-F would impact lands previously unaffected by vehicular noise, but vehicular noise will not be a constant roar or even audible everywhere between the existing road and the bypass.

5. Placement of interchanges in lieu of at-grade intersections at the ends of the project is preferable to facilitate smooth traffic flow into and out of the State park. These features will eliminate potential congestion and provide adequate safety at the bottom of 4 miles ± sustained grades.

The southern interchange has been located to effect the least environmental and aesthetic damage. May Creek lies between two low ridges that restrict interchange alignment if excessive excavation at the southern entrance to the state park is to be avoided.

The interchange shown in the Draft EIS is a schematic representation to only indicate the general configuration of the facility and is not intended to be used to base assumptions for the ultimate design of the entire project. The scale is omitted in the Final EIS.

Slope limit lines are not shown; designed fills higher than 10 feet will generally be 1 1/2:1, barring special foundation problems. No information was given in the Draft EIS that would indicate the need for 5:1 sideslopes in the interchange though contour grading may be used for aesthetic reasons. The interchange will incorporate adequate safety design and limit wetland impacts where possible. Data was not provided in the Draft EIS to critique ramp lengths to maintain a degree of design flexibility. Design criteria for interchanges is based on grade differentials and minimum sight and stopping distances, not traffic volume.

The roadway width recommended in the preferred alternative (Alternative B) is based on safety and capacity for the type of terrain traversed. The minimum curve radius on the bypass is 1,000 feet, adequate for 55 miles per hour. The roadway south of the project is relatively level and not currently proposed for widening.

The interchange configuration now proposed reflects the best compromise to best meet wildlife and wetlands concerns and design criteria. See pages 60, 61, 64, 66, 171 and 173.

d. Since traffic volumes are relatively low, the acceleration and deceleration lanes seem exceedingly long.

e. It is highly questionable whether the bypass itself will be built, much less the highway to the south, so it is pointless to overdesign one section of the highway while the existing highway will remain nearby. The proposed highway section at the intersection scales 95 feet wide in some places which seems inappropriate when the highway 1200 feet to the south is 24 feet wide.

f. Even assuming that future construction might indicate that the overpass should be constructed in its ultimate location, the alignment south of the bridge could still be modified to avoid Prairie Creek and most of the wetlands. The join with the existing highway should definitely be moved 1200 feet to the north. The whole intersection could also be moved northeasterly several hundred feet.

g. The traffic volumes are very low on the bypass. Note that the bypass is not a freeway since there are at grade intersections proposed at Ah Pah and at Cal Barrel Road. Considering the use of the 2450 foot horizontal curves on the only details of the design shown, it appears that the entire project may have been overdesigned using horizontal curve criteria that is inappropriate for a highway of this nature and which greatly exceeds the needs for safety. An at grade intersection at Prairie Creek may be more desireable than a grade separated one.

h. The enclosed rough sketches indicate how the intersection might be moved to avoid Prairie Creek. With more complete information, the State can surely do better.

Alternate K

We disagree that alternative K should be eliminated from consideration. Most of the references to alternative K in the report are incorrect, and alternative K is incorrectly grouped with the structured alternatives.

Page 34 says alternative K is a "non-structured alternative". Page 83, 5th paragraph refers to the "land to be acquired under any of the alternatives" and the seventh paragraph on page 83 refers to "land acquisition and timber harvest reduction from implementation of any of the alternatives". Apparently there was a vague knowledge that not all the alternatives were alike because just prior to the above statements, in paragraph four, it states "...acreage would be acquired for the US 101 bypass under any of the alternatives except the no action alternative". The table in Aprendix F perpetuates this error by showing that Alternative K will cost $62 million. That the errors were not mere typographical errors is substantiated on page one which states "the three alternatives concerning the existing highway ... are eliminated because they would result in the destruction of prime park resources, which the park was established to preserve."

Consideration of alternative K from the safety standpoint is also in error. Appendix E indicates that alternative A is "high" for providing safe roads, but alternative K is "moderate". Since alternative A is identical to alternative K except for the lower speeds, alternative K would be at least as "safe" as alternative A.

We calculated the driving times between end points for alternative K. A speed limit of 40 mph would mean 2.6 mi. @ 35 mph, 7.13 mi. @ 40 mph, giving 15.1 minutes, only 2.1 minutes more than the existing.

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Response to Comments by
Charles Wilson, Citizen's Review

6. Alternative K presents actions which could be accomplished with minor modifications to the existing highway. The summary and discussion have been changed regarding Alternative K. See pages 1 and 24.

The Table in Appendix F has been changed, see page 149. Alternative K will have low cost, and alternatives A and K both are high in providing a safe road since the accident rate on this segment of U.S. 101 is below the state average for roads of this size and type.

If driving time between end points is going to be extended on the bypass, then there is no reason that an enforced maximum speed which would also extend the driving time the same amount could not be equally acceptable. The speed limit for Alternate K, as a ridiculous example, could be reduced to 15 mph and still equal the driving times for the loaded logging trucks!

Page 34 says "enforcement of a lower speed limit might be difficult and would result in the need for additional park personnel." No attempt is made to evaluate the cost of this enforcement. Alternatives B, D, E, and F range in total cost (1986 prices) from 93 to 167 million dollars. Since the money will be borrowed by the government, interest alone would cost 15 to 25 million dollars <u>each</u> year, and amortization would cost millions more. Even $15 million a year could provide a lot of enforcement, even to the ridiculous extent of posting police officers at every single mile along the highway. | 7

Page 34 says "noise would be reduced" for alternative K, but no detailed evaluation was made of how much. | 8

<u>Holter Ridge Road</u> The development of Holter Ridge Road to connect the bypass and Bald Hills Road was not evaluated in the RNP EIS's and should not be avoided a second time. If no evaluation is made, then the connection should be deleted. | 9

<u>Miscellaneous</u>

If a bypass route were constructed and became the new US 101, would the existing route revert to Humboldt County to be maintained at county expense? | 10

If a bypass route were constructed, what would be the disposition of the 750 acres of severed lands? | 11

On page 33 there is reference to an "8.75-mile segment of US 101", but it is not clear where this segment is located. | 12

Response to Comments by
Charles Wilson, Citizen's Review

7. Alternative K would require an additional two person years to enforce lower speed limits at an approximate cost of $38,000 per year.

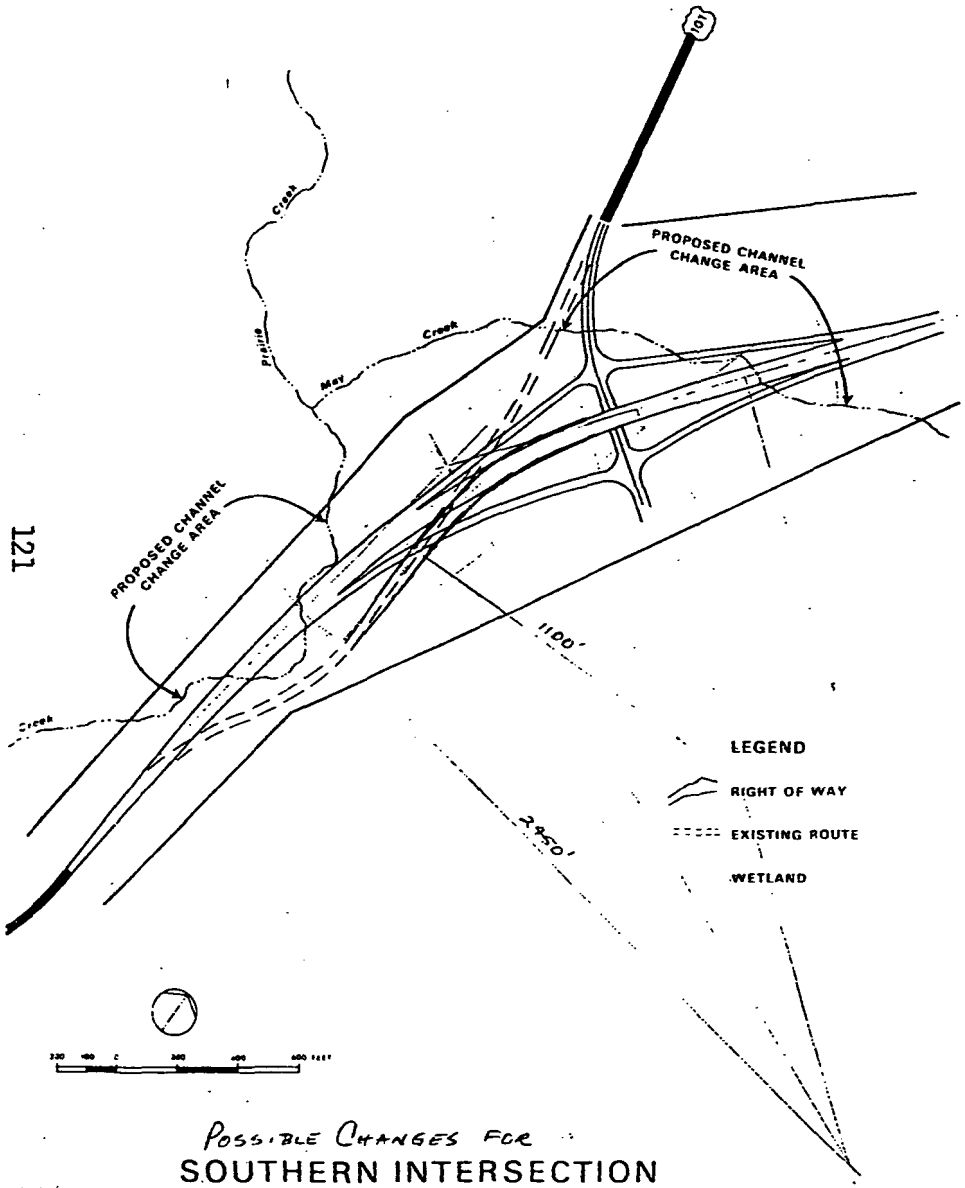
8. The noise reduction that would result from the lower speed limit proposed in alternative K would be approximately 2 dBA.

9. The Holter Ridge Road was evaluated in the Environmental Impact Statement accompanying the Redwood National Park General Management Plan.

10. Under current State law the existing route would revert to the County. The County could then revert the right of way to the California Department of Parks and Recreation.

11. The severed lands would become part of Redwood National Park.

12. The sentence has been changed. See page 24.



Possible Changes for
SOUTHERN INTERSECTION
REDWOOD NATIONAL PARK/CALIFORNIA

November 11, 1981

November 11, 1981

Re: attached

Dear Sir,

I wish to express complete opposition to this Route 101 Prairie Creek State Park Bypass project on the following grounds:

1. It is totally unnecessary.
2. It is a waste of public money in recession times.
3. This money should be used to upgrade existing roads and bridges in Humboldt, Del Norte Counties.
4. This proposal is an unnecessary destruction and cutting up of this state park and area.

Please reply.

Very truly yours

John F. Forward II

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November 19, 1981

01-Hum,DN-101-125.6/R135.0,
0.0/0.5
Redwood National Park Bypass
01101 194401

Mr. John F. Forward II
1623 Swanson Lane
Eureka, CA 95501

Dear Mr. Forward:

Thank you for your letter of November 11, 1981 stating your position on the Prairie Creek State Park Bypass Project. Your comments will be considered in the alternative selection process and will be included in the Final Environmental Impact Statement. Thank you for your input.

Very truly yours,

JOHN VOSTREZ
District Director

By ORIGINAL SIGNED BY
J. E. Thorne, Chief
Environmental Planning Branch

P.O. Box 41
Arcata, CA 95521

15 November 1981

John Sacklin
Redwood National Park
P.O. Box 55
Arcata, CA 95521

Dear Mr. Sacklin:

I have reviewed the DEIS for the U.S. 101 Demonstration Project, Redwood National Park, Prairie Creek Redwoods State Park, in Humboldt and Del Norte counties, P.M. 125.6/RB 5.0, 001 C.S. I find the document is, in some instances, too general and does not adequately discuss the project. The following areas should be dealt with in the final E.I.S.

1. The Need for the Project section whould be expanded to include the following:

   a. The number of days per year that traffic congestion occurs.
   b. The number of hours per day that congestion occurs.
   c. The average length of traffic delay encountered by drivers during congested periods.
   d. The number of cyclists per year who desire segregation from traffic.
   e. The amount of time saved for the driver using the bypass during congested and non-congested periods. | 1

Without the above information, it is impossible to compare the benefits of the project to the negative impacts of increased energy usage, increased accident rates, and increased sedimentation of North Coast streams thus defeating the purpose of the EIS.

2. The Affected Environments Socioeconomic section whould be expanded to include:

   a. A quantitative summary of employment and unemployment data for the two counties covering the last decade.

   b. A quantitative summary of the housing situation in communities where new construction workers would seek housing. | 2

Simply listing other documents where socioeconomic data for Humboldt and Del Norte counties may be found is not adequate for an E.I.S. The general public and decision-makers may not have easy access to those documents and obtaining them would require additional expense.

3. The Environmental Consequences section should be expanded to include:

   a. A more thorough quantitative discussion of mitigation measures to reduce stream sedimentation. | 3
   b. A quantitative discussion of the project's effect on the housing market. | 4
   c. A more thorough discussion of the project's effect on the North Coast's economy.

Sincerely,

Fran McConnell
(Mrs. Glen E. McConnell)

123

Response to Comments by
Mrs. Fran McConnell

1. Congestion on the existing highway may occur between Memorial Day and Labor Day or approximately 100 days per year usually 6 to 8 hours per day. Traffic delay time on the existing route during congested periods is approximately 5 minutes. The delay is a result of motorist driving habits through the park and not a function of highway capacity. Even during peak traffic flows, the highway is not operating at capacity. Delay is primarily attributed to the fact that visiting motorists are enjoying the scenery and that roadway geometrics cause reduced speeds and limit passing opportunities. The bypass may save the auto motorist approximately 5 minutes and increase truck driving time about 11 minutes during congested period (29 minutes vs. 18 minutes). Travel time during uncongested periods would be approximately 1/2 minute longer for automobiles using the bypass and 15+ minutes for trucks.

Bicycle traffic has been increasing and Caltrans estimated 50 bicyclists per day passed through Prairie Creek Redwoods State Park in 1980. Seasonal variations range from 80 to 90 in summer to zero on some winter days. Over 90% of the bicyclists would probably prefer to use the existing route because of the steep sustained grades encountered on the bypass.

Bicycle counts on the Avenue of the Giants (Route 254) and U.S. 101 78 miles south of the bypass project indicate 60% of the bicyclists prefer to use the Avenue of the Giants. Although the grades on these routes are similar and safer, 8-foot shoulders are provided on U.S. 101, the majority of the bicyclists opt for a more scenic and quieter ride with less traffic.

This information has been incorporated in the Needs section and in the Highway Users Portion of the Environmental Consequences section as appropriate.

2. The affected environment has been corrected to include the following information: The labor force in Humboldt County is just under 50,000 workers with about 43,000 or 88 percent employed. In Del Norte County there are about 7,500 workers and 87 percent or 6,500 are employed.

Unemployment rates in Humboldt and Del Norte Counties are as follows:

UNEMPLOYMENT RATE
(in Percent)

Year	Humboldt	Del Norte
1974	12.7	16.3
1975	16.1	20.0
1976	13.6	16.6
1977	13.8	13.4
1978	13.2	12.4
1979	11.5	13.0
1980	12.0	13.0
1981	12.1	13.2

Please see response number 14 to the California State Clearinghouse comments for a summary of the housing situation in the project area.

3. See response to Environmental Protection Agency comment number one.

3. See response to Environmental Protection Agency comment number one.

4. Please see the response to comment number 14 of the California State Clear-

CALIFORNIA LICENSED FORESTERS ASSOCIATION

Response to Comments by
California Licensed Foresters Association

1. We concur. See page 71.

November 17, 1981

Mr. John Vostrez
District Director
Department of Transportation
State of California
Eureka, California 95501

Re: Draft Environmental Impact Statement - U.S. 101

Dear Mr. Vostrez:

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After thoroughly studying the subject document, the only logical conclusion is to take the necessary steps to improve the existing route of U.S. 101 through Prairie Creek Redwoods State Park (Alternative A).

As professional foresters and land managers concerned with the environment and the wise use of our natural resources, we are distressed by the likely possibility of additional and needless impacting of the land and streams involved. All soils affected have a moderate to high potential for erosion and it seems to be foolhardy to undertake unnecessary ground disturbance in this area. Adopting Alternative "B" would also sever an established transportation network of the present private landowner, thus requiring even more additional replacement road construction with the same environmental concerns. 1

In addition, we feel that further erosion of the commercial timber base in an area of high productivity is unwise and harmful to the north coast economy. Continuous withdrawal of timberland has inflated the price of lumber and increased the unemployment rate in a segment of the economy already heavily depressed, and the proposed recommendation in the E.I.S. pertaining to alignment "B" would needlessly add 1600 more acres to a single purpose use.

-1-

220 Montgomery Street Suite 1405 San F
[illegible] (415) 391-8080
[illegible] (916) 447-4113

When all of the detrimental effects of constructing the freeway by-pass around Prairie Creek State Park are weighed against the single purpose of its use, the rational decision must be to use and improve the current route.

Sincerely,

CALIFORNIA LICENSED FORESTERS ASSOCIATION

Jon J. Reed
President

JJR/rm

National Parks & Conservation Association

1701 Eighteenth Street, N.W.• Washington, D.C. 20009

RUSSELL D. BUTCHER
Regional Representative
SOUTHWEST
BOX 970
GLENDORA, CA 91740
(213) 963-1815

(202) 265-2717

November 23, 1981

Mr. John Vostrez, District Director
California Department of Transportation
District 01, P.O. Box 3700
Eureka, California 95501

Dear Mr. Vostrez:

National Parks & Conservation Association, which was founded 62 years ago to help promote the protection and public understanding of the national parks and similar outstanding scenic and cultural areas, wants you to know of our enthusiastic support of your Preferred Alternative B freeway bypass proposal. This long-favored route would leave virtually unimpaired the magnificent dedicated memorial redwood groves in Prairie Creek Redwoods State Park--within the Congressionally authorized boundary of Redwood National Park.

As you know, the memorial groves at Prairie Creek are a national treasure that have been saved by private donations through the Save-the-Redwoods League from scores of people throughout the United States--donations that have been matched by funds from the State of California. As such, these magnificent virgin-growth redwoods are being held in trust by the state for the inspiration and enjoyment of all present and future generations of visitors.

A plan that would place a commercial-and-through-traffic four-lane freeway outside the state park, to the east through already logged-off lands, and that would allow the existing two-lane road to become a park roadway purely for the visitor's enjoyment of the Prairie Creek Redwoods is, in our Association's view, an ideal solution to the existing conflict between commercial and park traffic.

NPCA hopes that planning and construction of the Prairie Creek freeway bypass--which has been proposed for nearly twenty years--will soon move ahead. We are aware that construction cost estimates have apparently risen sharply over the past few years, but we strongly believe that the latest cost figures are still a reasonable and necessary investment to save the irreplaceable natural values within Prairie Creek Redwoods State Park. The bypass will, in fact, enhance those park values.

With NPCA's thanks to you and Caltrans for your own concern for the Redwoods!

Sincerely yours,

Russell D. Butcher
Southwest-and-California Representative

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Save-the-Redwoods League

114 SANSOME STREET, ROOM 605, SAN FRANCISCO, CALIFORNIA 94104

TELEPHONE (415) 362-2352

October 13, 1981

COMMENTS BY THE SAVE-THE-REDWOODS LEAGUE ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT, U.S. 101 DEMONSTRATION PROJECT, REDWOOD NATIONAL PARK-PRAIRIE CREEK REDWOODS STATE PARK, IN HUMBOLDT AND DEL NORTE COUNTIES, CALIFORNIA P.M. 125.6/R135.0, 0.0/0.5 Released September 25, 1981.

The Save-the-Redwoods League has been concerned with the routing of Highway 101 in the vicinity of Prairie Creek Redwoods State Park for more than 20 years. The League provided more than half of the funds for the purchase and protection of Prairie Creek Redwoods State Park. The League supports the construction of the Redwood National Park Bypass to divert motor vehicle traffic around Prairie Creek Redwoods State Park on the East Ridge alignment. This action will protect the integrity of the redwoods preserved at Prairie Creek Redwoods and best serve the needs of the traveling public.

The League further supports Alternative B, the preferred alternative. This alignment would provide for the construction of a new freeway diverting all commercial and high speed local traffic through cutover land with little impairment to the existing park.

(continued)

(continued)

Highway 101 from Del Norte County line through Prairie Creek Redwoods State Park, to Orick, has become a dangerous route for heavy through commercial traffic and a source of conflict between commercial use and park visitor use. Park visitors to the redwoods drive slowly in the park while commercial truck drivers want to travel at the maximum speed limit. Therefor, dangerous congestion occurs since this is the only major north-south highway in the region.

To resolve the conflict, Congress directed in PL 95-250 that a freeway bypass be built east of Prairie Creek Redwoods State Park. The benefits of the bypass will apply to the entire northcoast community as well as to park visitors.

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1. During peak summer months 50-60% of all traffic along the bypass portion of Highway 101 is tourist related. Scenic resources are the primary factor in the visitor's enjoyment of the redwood country and undisturbed views of the redwood forest are a necessity in terms of a positive park experience. The bypass would leave the old highway through the park for sight-seeing travel only, allowing visitors to drive through scenic areas at a safe, leisurely pace without the pressure of high-speed, destination-oriented traffic.
2. The bypass road is designed to divert commercial and through traffic around the park which would improve traffic flow and the travel-time during peak summer months for non-park users.
3. Speed, noise and the large-truck traffic, including logging vehicles, creates an undesirable experience for visitors along the scenic highway. Such traffic would be diverted to the bypass east freeway route.
4. Reduction of traffic through the park will protect park resources, especially the redwoods growing along the highway, from the effects of excessive automobile emissions and dangerously heavy traffic.

(continued)

5. More visitors will be attracted to the area since they would be able to relax and drive slowly without the danger of accidents from high speed vehicles.

6. Construction of the bypass will provide jobs and stimulate the local economy.

7. The segment to be bypassed is limited to state park uses oriented to serve park visitors, ie: administrative offices, campground complexes, employee residences, trailheads, road-side turnouts for scenic views. There would be no impact on private development in this area as none exists or is planned.

It will be a major benefit for visitors to the park and to the citizens of the northcoast region if approval for the Redwood National Park Bypass is obtained. The Save-the-Redwoods League urges the construction of the bypass freeway according to the preferred alternative, B, so that the existing road through the park can be properly used as a scenic parkway and as a destination access to Prairie Creek Redwoods State Park and Redwood National Park.

The Save-the-Redwoods League would vigorously oppose any routing of a freeway through Prairie Creek Redwoods State Park on any other alignment and would oppose any widening of the existing highway which would destroy old-growth redwoods now protected in the park.

John B. Dewitt
Executive Director
Save-the-Redwoods League

MILLER REDWOOD COMPANY

Manufacturers of Forest Products

P O BOX 247 / CRESCENT CITY CALIFORNIA 95531 / PHONE 707 464-3144

October 22, 1981

John Vastrez
Post Office Box 3700
Eureka, CA 95501

Mr. Vastrez:

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Regarding the proposed Highway 101 bypass around Prairie Creek State Park, it is our contention that the most economically feasible and the least disruptive solution to the segregation of park and through traffic would be to simply widen and realign the current route.

Respectfully,

Sheal L. Anderson
Assistant General Manager

m

REDWOODS FOREVER

MATTHEWS MACHINERY CO.
POST OFFICE BOX 3460 · EUREKA, CALIFORNIA 95501 · TELEPHONE (707) 443-1653

November 12, 1981

Mr. John Vostrez, District Director
Caltrans District 01
P. O. Box 3700
Eureka, CA 95502-3700

Dear Mr. Vostrez:

Thank you for giving us the opportunity to again make our feelings known regarding the Route 101 Prairie Creek State Park Bypass Project.

When the first hearings were held on this project I headed a group which was strongly in favor of the beach route - along Gold Bluffs, and I still feel just as strongly that this is the best route.

With the whole nation being energy conscious now, I think it is more important than ever that the beach route be considered over and above the "road over the mountain".

It would be one of the most scenic pieces of highway in the State of California - would provide access to Fern Canyon (which many people are virtually locked away from now), and would be so much more economical to build - and to travel on when it is completed. 1

Perhaps you will say that this idea was "put to sleep" many years ago, but things have changed since then including the cost of building highways, so please think about it, wont you? 2

Sincerely yours,

Fern Enke

FE/s

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Response to Comments by
Matthews Machinery Co.

1. The increased energy requirements that would result from bulding the bypass on the proposed easterly alignment are a trade off to preserve park resources. Improvement of access to the Fern Canyon area has been proposed in the Redwood National Park's General Management Plan.

2. We have considered this alternative and believe a route along Gold Bluffs Beach would cause irreparable harm to park resources.

THE WILDLIFE SOCIETY

FOUNDED 1937

HUMBOLDT CHAPTER

Humboldt State University
Arcata, California 95521

November 29, 1981

John Vostrez
District Director
Caltrons District 01
P.O. Box 3700
Eureka CA 95501

Dear Sir,

The Humboldt Chapter of the Wildlife Society wishes to comment on the Draft Environmental Impact Statement (EIS) of the U.S. 101 Demonstration Project; the proposed U.S. 101 bypass of Prairie Creek State Park. The Humboldt Chapter supports Alternative A, the no action alternative. It is our opinion that there is not sufficient need for a rerouting of U.S. 101 around Prairie Creek State Park. Caltrans figures in the Draft EIS, show that average vehicle numbers during August have declined in the period 1976-1980. This seems to express a trend towards decreased tourist traffic during the summer months in recent years. If the national economy continues to fluctrate and gas and diesal prices continue to rise, the trend depicted in Caltrans figures can be expected to continue. The present location of U.S. 101 is sufficient to handle present and future traffic needs. To restate our opinion, the Humboldt Chapter of the Wildlife Society does not see that a change is necessary for U.S. 101 and we support Alternative A, the no action alternative.

In response to Alternatives B-F, there are 3 major points that we feel eliminate all of these alternatives from consideration: (1) The ecological damage from construction and maintenance of a 2- or 4-lane highway along the eastern perimeter of Prairie Creek State Park would be severe and, in come cases, irreparable. Specifically, erosion and increased sedimentation caused by land disruption would be detrimental to anadromous fish that use local streams for spawning.* Also, acres of stream, riparian, forest and wetland habitat would be obliterated.

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Response to Comments by
The Wildlife Society
Humboldt Chapter

1. We concur that there has been a short-term decrease in traffic; however, long-term trends indicate a gradual rise and reversal of this trend. Traffic characteristics in the Existing Conditions Section have been revised to reflect the most current predictions.

2. We disagree that the level of service would be reduced with the projected increase in traffic volumes. See 4(f) Involvement sections.

3. We concur that there would be impacts from constructing a bypass. Extensive mitigation measures have been developed to minimize these impacts. See Mitigation Measures and Appendix G. Damage to fisheries will be significant, particularly in the short-term (see Appendix H). Losses would be mitigated by habitat restoration and increased hatchery production. Riparian and wetland habitat will be replaced (see Appendix E).

(2) Wildlife populations within and around Prairie Creek State Park could be negatively affected by new areas of the Park being opened to easy public access. This increased access increases the possibility of illegal poaching and disturbance to park wildlife. A second major throughway in the Park will increase the potential for road kills. 4

(3) The benefits of any of the proposed bypass alternatives appear minimal compared to the costs of construction and maintenance of a bypass and the additional costs to the public and park officials. By all conservative estimates, the money allocated to Caltrans by The Surface Transportation Assistance Act of 1978 covers less than half the expected cost of the highway bypass construction. Through traffic will be required to use the new route, which will increase energy expenditures for the long grade (p. 82, Draft EIS) and will save travel time during only one or two months a year (p. 87, Draft EIS) secondary costs will be incurred by requiring the state park personal to supply increased patrols in the eastern portion of Prairie Creek State Park to park values. 5 6

It does not appear that a relocation of U.S. 101 is necessary at this time or in the future. We strongly suggest that you re-evaluate your criteria for a Need for Action and recognise that an allocation of funds does not naccesarily justify this project.

Thankyou for the opportunity to review this Draft Environmental Impact Statement and to express our viewpoint.

Sincerely,

Christopher Canaday

Christopher Canaday
Chapter President

Response to Comments by
The Wildlife Society
Humboldt Chapter

4. We concur. These conditions could potentially exist during construction. The new bypass will be a limited access facility and no trailheads or access points into the park are foreseen.

5. Additional money has been appropriated. See Appendix B and page 2.

6. We concur.

639 Main Rd., Hanover Green
Wilkes-Barre, Pa. 18702
November 25, 1981

Mr. John Sacklin
Redwood National Park
P.O. Box SS
Arcata, CA 95521

Dear Mr. Sacklin:

This letter is in reference to the Draft Environmental Impact Statement for the U.S. 101 Demonstration Project.

While I agree in principle with the proposed construction of a bypass around Prairie Creek Redwoods State Park, I cannot support the preferred alternative at this time. Considering the financial and budgetary constraints imposed by the current economic conditions and the Reagan Administration, I believe that Alternative A (no action) should be selected. There are numerous "problems" within the units of the National Park System which deserve priority attention, such as the restoration of Yosemite Valley, the purchase of various inholdings, and the deteriorating physical facilities throughout the parks.

Given the projected expenditure of $102 million for the bypass project, I believe that this proposal should be shelved. Surely there are more pressing needs to be fulfilled within the National Park System.

Sincerely,

Robert E. Morgan

134

SIERRA CLUB
Redwood Chapter
North Group
[illegible] BOX 238
ARCATA, CALIFORNIA 95521

November 18, 1981

Public Hearing on Route 101 Prairie Creek State Park Bypass Project

The Executive Committee has reviewed the Draft EIR for the Prairie Creek Bypass and wishes to offer the following comments:

We find the build alternatives too resource damaging and too costly to be acceptable. While we have no quarrel with the objective of removing through traffic, particularly logging trucks, from the scenic Prairie Creek corridor, we cannot support any of the build alternatives. Interchanges, channelized and sedimented streams, instabilities and massive cuts and fills, steep grades, and a wide swath of cleared land are simply not compatible with the resource-protecting purpose of National Park management.

We are in total sympathy with the reason behind the legislation which authorized a demonstration project; the National Sierra Club and Save-The-Redwoods-League have long advocated the removal of traffic which impinges upon the Park experience. However, when the solution to the problem poses a greater threat to the quality of the Park than the problem itself, then we cannot support such a solution.

We all recognize that Redwood National Park is unique, not only for its magnificent resources, but also for the special situations that came with the Park--logged lands in need of rehabilitation, degraded fish habitat, disturbed native plant communities, overlapping State and Federal Park administration, and a major traffic corridor through its old-growth groves. These special situations require that we be accepting, at least for now, of some activities, some conditions, and some experiences that are not what we want in the Park, but which cannot be presently avoided.

Greater consideration should be given to a No Build alternative, but we would not support improvements which could result in the removal of trees or affect the aesthetic qualities of the present corridor. Such simple things as speed limits, signing, and highway-user education might reduce conflicts between through traffic and Park visitors. For example, requiring all slow traffic to pull off the highway at turnouts or enforcing a reduced speed during daylight hours of summer, or educating drivers to understand the unique situation and asking for tolerance and thoughtfulness might go a long way in solving some of the problem without resource damage and little expense. We simply have to be more innovative than we have been in the past; neither the environment nor the taxpayer can afford projects of the magnitude proposed in this Draft EIR.

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Response to Comments by Sierra Club

1. See expanded discussion of Alternative K.

The Sierra Club commends Redwood National Park staff for the fine accomplishments of the past few years. After a decade of total neglect, Redwood is receiving the care and attention it deserves and we appreciate the efforts of a skilled and dedicated staff. We have supported Park management in the past and will continue to do so in the future; we cannot, however, support the proposed bypass because the environmental and economic costs are too great.

Thank you for receiving our comments.

For the Executive Committee,

Susie Van Kirk

Susie Van Kirk,
Conservation Chairman

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APPENDIX A: LEGISLATION
[Excerpted from Public Law 95-250 March 27, 1978]

...he State of California designates a right of way for a bypass highway ...ound the eastern boundary of Prairie Creek Redwood State Park prior to ...ober 1, 1984, the Secretary is authorized and directed to acquire such lands ...interests in lands as may be necessary for such a highway and, subject to ...ch conditions as the Secretary may determine are necessary to assure the ade-...ate protection of Redwood National Park, shall thereupon donate the desig-...ed right of way to the State of California for a new bypass highway from a ...int south of Prairie Creek Redwood State Park through the drainage of May ...eek and Boyes Creek to extend along the eastern boundary of Prairie Creek ...dwood State Park within Humboldt County. Such acreage as may be necessary in ...e judgment of the Secretary for this conveyance, and for a buffer thereof, ...all be deemed to be a publicly owned highway for purposes of section 101(a) ...) of this amendment effective on the date of enactment of this section.

APPENDIX C: FAUNA AND HABITATS, REDWOOD NATIONAL PARK

Species	Habitat Type												
	Marine	Offshore Rocks, Islands	Intertidal	Seashore/Sand/Gravel	Saltwater Marsh	Freshwater Marsh	Rivers/Streams	Coastal Strand	Coastal Shrub	Riparian Vegetation	Coastal Spruce Forest	Redwood Forest	Prairie
Invertebrates													
Green Anemone	X	X	X										
Acorn Barnacle	X	X	X										
California Mussel	X	X	X										
Common Sea Star		X	X										
Reptiles & Amphibians													
Western Fence Lizard							X		X	X			
Red-bellied Newt							X			X		X	
Pacific Giant Salamander							X			X		X	
Northern Pacific Rattlesnake									X	X			X
Common Garter Snake						X	X	X	X	X	X	X	X
Rubber Snake (Boa)										X	X	X	
Western Toad						X	X	X	X	X	X	X	X
Fish													
King Salmon	X						X						
Silver Salmon	X						X						
Steelhead Trout	X						X						
Coast Cutthroat	X						X						
Birds													
Double-crested Cormorant	X	X	X										
Common Raven								X		X	X	X	X
Common Egret					X	X	X						
Killdeer					X	X	X	X		X			X
American Goldfinch								X	X				X
Common Murre	X	X											
Western Gull	X	X	X	X	X	X	X						
Red-tailed Hawk										X	X	X	X
Great Blue Heron					X	X	X						
Steller's Jay								X	X	X	X	X	X
Belted Kingfisher	X		X			X	X			X			
Mallard						X	X						

Species	Habitat Type											
	Marine	Offshore Rocks, Islands	Intertidal	Seashore/Sand/Gravel	Saltwater Marsh	Freshwater Marsh	Rivers/Streams	Coastal Strand	Coastal Shrub	Riparian Vegetation	Coastal Spruce Forest	Redwood Forest	Prairie
Birds (Cont.)													
Kestrel											X		X
Great Horned Owl										X	X	X	X
Brown Pelican	X	X		X									
Red-shafted Flicker (Common)									X	X	X		X
Varied Thrush											X	X	
White-crowned Sparrow								X	X	X	X		X
Mammals													
Black Bear							X	X	X	X	X	X	
Bobcat								X		X	X	X	
Coyote								X	X	X	X	X	X
Black-tailed Deer									X	X	X	X	X
Roosevelt Elk								X	X		X	X	X
River Otter							X			X			
Racoon								X	X	X	X		
Harbor Seal	X	X	X	X			X						
Steller's Sea Lion	X	X		X									
California Sea Lion	X	X		X									
California Gray Whale	X												

APPENDIX D

QUALITY - POLLUTANT BURDEN ANALYSIS

North Coast Air Basin has good air quality now and does not exceed the dard for carbon monoxide (CO), ozone (O_3), total suspended particulates), or sulphur dioxide (SO_2).

analysis addresses CO and the pollutants that are precursors to ozone namely hydrocarbons (THC) and NO_x. Motor vehicle traffic is the producer of CO and a significant producer of hydrocarbons (THC) and NO_x when exposed to sunlight form ozone.

lysis shows that the tonnages of CO, THC, and NO_x will be reduced by the 2000 for both the build (Freeway) and no build alternates. The reduction less for the build (Freeway) alternate due to the increase in length of the ild (Freeway) alternate. The existing length is 7.5 miles compared to a ngth of 11.9 miles for the build (Freeway) alternate.

ith or without this project no increase in pollutant burden will occur mainly e to stricter emission controls on vehicles. The reduction of emissions from e vehicle fleet will be greater than the increase of emissions from the reased vehicle miles traveled (VMT).

POLLUTANT BURDEN
(TONS/DAY)

ALTERNATE	CO	THC	NO_x
980 (Existing)	0.534	0.061	0.211
000 (No Build)	0.300	0.033	0.156
000 (Freeway)	0.440	0.048	0.210

PERCENT OF POLLUTION REDUCTION
FROM 1980 (EXISTING)

POLLUTANT	CO	THC	NO_x
000 (No Build)	43.82%	45.90%	26.07%
000 (Freeway)	17.60%	21.31%	0.47%

APPENDIX D: CO Dispersion Chart (ppm)

Dist (M)*	Alternative A 1980 No Bypass			Alternative A 2000 No Bypass			Alternatives B, C, D, E, F 1980 Park Only			Alternatives B, C, D, E, F 2000 Park Only			Alternatives B and D 1980 Freeway (4 lane)			Alternatives B and D 2000 Freeway (4 lane)			Alternatives C and E 1980 2 Lane Truck Lane			Alternatives C and E 2000 2 Lane Truck Lane		
	AG	DP	FL	AG	DP	FL	AG	DP	FL	AG	DP	FL	AG	DP	FL	AG	DP	FL	AG	DP	FL	AG	DP	FL
15	6.4	6.2	6.4	3.6	3.5	3.6	1.5	1.5	1.5	0.9	0.9	0.9	5.4	6.7	5.4	2.9	3.6	2.9	5.1	5.6	5.1	2.7	3.0	2.7
30	4.1	3.8	4.1	2.3	2.1	2.3	1.0	0.9	1.0	0.6	0.6	0.6	3.3	3.0	3.3	1.8	1.6	1.8	3.2	2.9	3.2	1.7	1.6	1.7
46	3.1	2.9	3.1	1.7	1.6	1.7	0.7	0.7	0.7	0.4	0.4	0.4	2.4	2.2	2.4	1.3	1.2	1.3	2.4	2.2	2.4	1.3	1.2	1.3
61	2.5	2.3	2.5	1.4	1.3	1.4	0.6	0.6	0.6	0.4	0.3	0.4	1.9	1.8	1.9	1.0	0.9	1.0	1.9	1.8	1.9	1.0	0.9	1.0
91	1.7	1.7	1.7	1.0	0.9	1.0	0.4	0.4	0.4	0.3	0.2	0.3	1.3	1.3	1.3	0.7	0.7	0.7	1.3	1.3	1.3	0.7	0.7	0.7
122	1.3	1.2	1.3	0.7	0.7	0.7	0.3	0.3	0.3	0.2	0.2	0.2	1.0	0.9	1.0	0.5	0.5	0.5	1.0	0.9	1.0	0.5	0.5	0.5
152	1.0	1.0	1.0	0.6	0.5	0.6	0.2	0.2	0.2	0.1	0.1	0.1	0.8	0.7	0.8	0.4	0.4	0.4	0.8	0.7	0.8	0.4	0.4	0.4

AG = At Grade
DP - Cut (10 foot)
FL - Fill (10 foot)
* M - Meter - 3.28 feet

Note: Background levels are not included in this chart

APPENDIX E: COMPLIANCE

Preliminary inventories of cultural resources have been completed as described in the "Affected Environment" section of this document. Any action that would affect cultural resources will be subject to compliance under Section 106 of the National Historic Preservation Act of 1966. A representative of the State Historic Preservation Office has been consulted during the development of this document. A proposal for compliance with Section 106 accompanied the draft EIS for review and concurrence by the State Historic Preservation Officer. Since archaeological survey work will be implemented in a phased approach, a determination of effect cannot be prepared at this time. Survey work would continue as the land is cleared and archaeological resources would be protected under NPS policy.

All of the building alternatives presented in this document will require the acquisition of state park and/or federal lands that are subject to provisions of section 4(f) of the Transportation Act of 1966 (49 U.S.C. 303). The law permits the Secretary of Transportation to approve a program or project which requires the use of these lands only if (1) there are no feasible and prudent alternatives to the use of such land, and (2) such program or project includes all possible planning to minimize harm to the section 4(f) land resulting from such use.

Pursuant to 49 U.S.C. 303, a draft 4(f) statement regarding this action was concurrently prepared and distributed by Caltrans with the draft EIS to the agencies required. A discussion of 4(f) involvement is included in this document.

The Klamath River material source is within an area designated "recreational" under the California and Federal Wild and Scenic Rivers System. No lands within the coastal zone, or prime and unique farmlands are affected by this project. Caltrans will obtain a 404 permit from the Corps of Engineers, a stream alteration permit from the California Department of Fish & Game, and a permit from the California Water Quality Control Board.

Informal consultation with the U.S. Fish and Wildlife Service has been completed. The U.S. Fish and Wildlife Service has stated that no threatened or endangered species are in the project area (see pages 95 and 96).

Statements of findings concerning the impacts on wetlands and floodplains are included.

APPENDIX F: Cost-Effectiveness

Objectives	NO ACTION	4 Lanes Through State Park	2 Lanes With Uphill TPL Through State Park	4 Lanes Avoid State Park	2 Lanes With Uphill TPL Avoid State Park	2 Lanes With Uphill & Downhill With TPL Through State Park	Gold Bluffs Area	Gold Bluffs	Widen Existing Alignment to 4 Lanes	TPL or Existing Alignment	Reduce Speed Limit on Existing Route	2 Lane Road With No TPL on Preferred Alignment	4 Lane Road With TPL on Preferred Alignment
	A	B	C	D	E	F	G	H	I	J	K	L	M
Reduce the conflict between tourist traffic and destination-oriented commercial and through-traffic.	low	high	high	high	high	high	high	high	moderate	moderate	low	high	high
Reduce congestion so that visitors can have a more parklike experience driving through the redwood groves.	low	high	high	high	high	high	high	high	moderate	moderate	low	high	high
Provide safe roads	moderate	moderate	low	moderate	low	moderate	Safety dependent upon road design		high	high	high	low	high
Maintain old growth redwoods as prime scenic resources.	high	moderate	moderate	moderate	moderate	moderate	low	low	low	low	high	moderate	moderate
Protect other natural resources.	high	low	low	low	low	low	low	low	moderate	moderate	high	low	low
Conserve energy	high	low	low	low	low	low	moderate	moderate	moderate	moderate	high	low	low
1989 construction cost (in millions)	0	$ 115	$ 103	$ 170	$ 157	$ 113	$ 57[a]	$ 90[a]	$ 34.5	$ 20.5	< 1	$ 49[a]	$ 67[a]

* Costs have not been computed.

[a] Costs are for 1980 construction; no 1989 construction costs have been completed since the alternatives were eliminated from further consideration.

APPENDIX G: EROSION CONTROL MITIGATION CONCEPTS AND RISK ANALYSIS

MAJOR ENVIRONMENTAL ISSUES AND PROPOSED MITIGATION

The major areas of environmental concern as previously discussed in the Environmental Consequences Section indicate that great environmental damage could occur unless the project was carefully planned and the best state-of-the-art measures of engineering design, erosion mitigation and stability control were used. Most of the concepts have been worked out, and erosion control design is proceeding on specific cut and fill areas on the project.

Stability and Erosion

Subsurface investigations indicate that most of the underlying soils are of poor quality and need special treatment to support the fills and to maintain stable slopes in the cuts.

.. Cuts. Slopes are proposed at 1:1, 1 1/2:1; 2:1. The slope rate is an effective technique to reduce slope instability. Benches 20 feet wide at 30 to 60 feet high intervals are also proposed to better control surface erosion and intercept raveling and small "pop-outs" that may occur.

Tops of the benches will consist of shallow V-ditches covered by roving material to prevent erosion. Roving is a fiberglass material produced as strands or fibers, applied through a nozzle to form a mat on the ground surface. The mat is sprayed lightly with an asphaltic emulsion to tie it together. Woody plant seed, and wood fiber will be applied for revegetation. A 12-inch slotted or perforated metal pipe will be laid in the ditch. (See Figure G-1, page 151.)

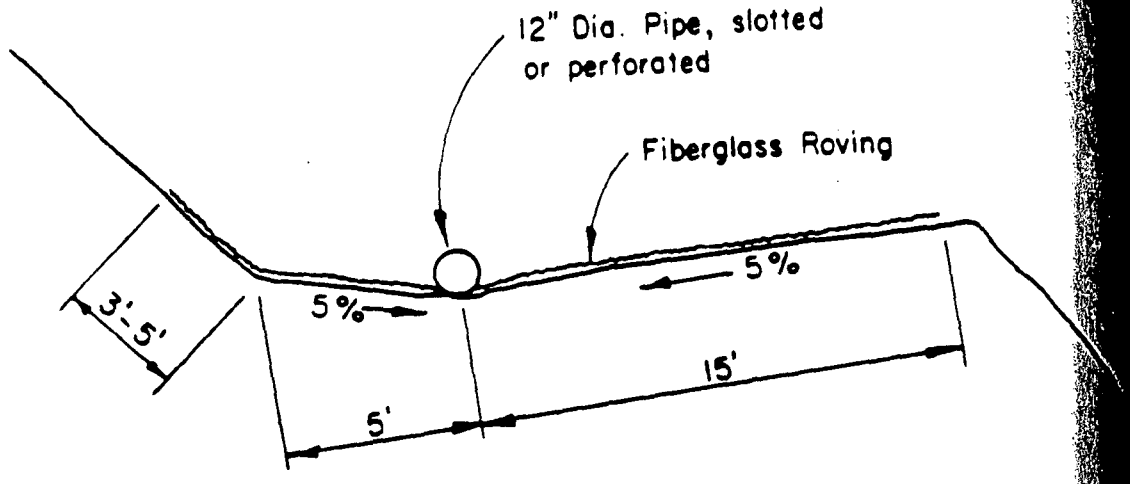
This bench drainage concept is used mainly to assure that a small slide or material build-up on the bench will not impede water flowing along the bench causing it to pond and go over the edge. The water on the benches will run to the lower end where it will be directed onto a gabion apron and thence into a gabion ditch running down the slope to road level where it will flow into another system of gabion-lined ditches (see Figures G-2 and G-7 on pages 152-158), through sediment control systems and finally into existing watercourses. Gabions are essentially wire baskets filled with coarse gravel 4 to 6 inches in size. They are proposed extensively on this project because they can adjust to ground movement and high water velocity and still maintain a high degree of stability.

The surface of the slopes will be hydroseeded with fast-growing grasses to establish a good mat of growth before winter rains begin.

The benches will be seeded with "woody" plants to establish a strong, deep-rooted cover and help stabilize the cut.

Top-of-cut ditches are also planned in some areas where run-off would flow over the cut face from the surrounding hillsides. These ditches would also be lined, where necessary.

Cut Slopes



BENCH CROSS SLOPE 5-7%

Figure G-1

NOTE:

- Benches to be covered with fiberglass roving and a "woody" seed mixture and taken to ± 1 foot of slope face.
- 12" diameter perforated or slotted pipe to go entire length of bench, outle to rock lined ditch.
- Cut off ditches will be constructed above cut slopes where appropriate.
- Cut slope faces will be hydromulched with a mixture of grass seed, fertilizer, wood fiber and a stabilizing emulsion.
- Cut slope benches will be hydromulched with a mixture of "woody" seed, and wood fiber.

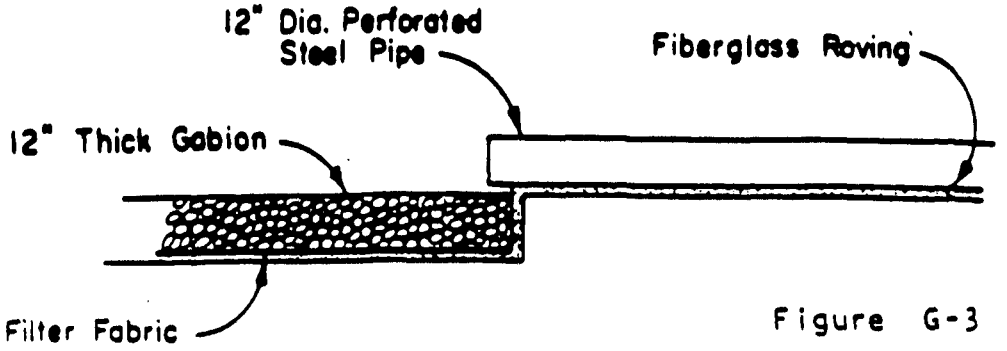
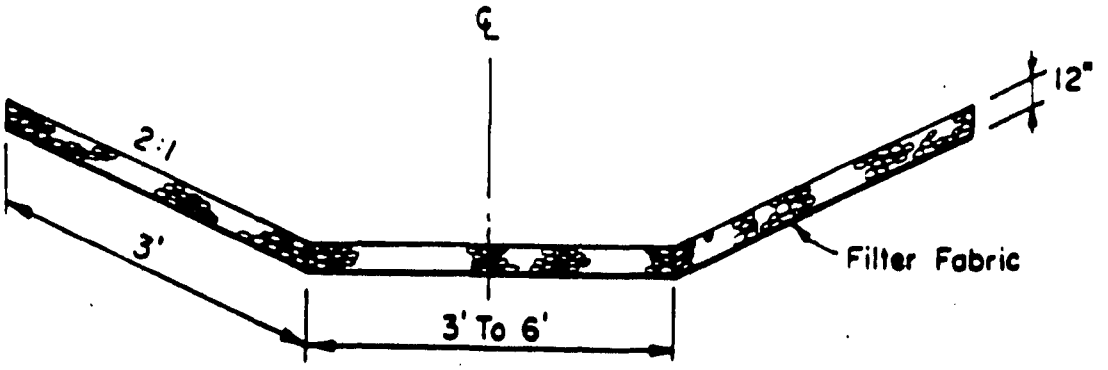


Figure G-3

BENCH JUNCTION



GABION OR ROCK LINED DRAINAGE DITCH

Figure G-2

G-1

and

utlet

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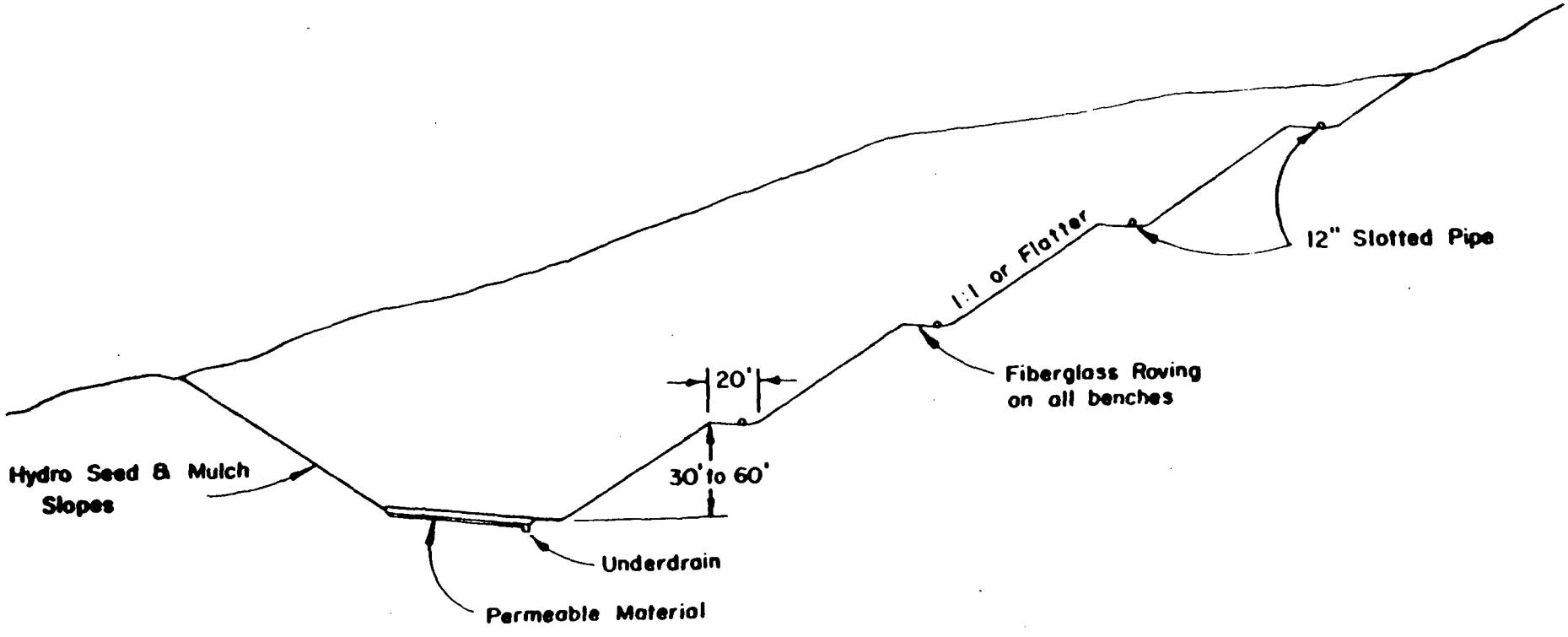
and

Rock Lined Drainage Ditches

Rock lined ditches will be either with or without gabion baskets over a filter fabric. Gabion baskets will be used when slope steepness exceeds 10-20%, when erosive soils are encountered in drainage ditches, and when well graded angular rock is unavailable.

All drainage ditches, culvert pipes, etc., will have energy dissipators on the outlet ends.



TYPICAL CUT SECTION
DRAINAGE DETAIL

Fills. Slopes of 1 1/2:1 or flatter are proposed. Most of the fills will require sub-excavation from 5 feet to approximately 75 feet below the ground surface because of poor support from the existing soils. These excavations will be lined with 2 feet of permeable material, wrapped in filter fabric, to drain the ground water out from under the fill. The excavations are backfilled with suitable material, and the fill constructed thereon.

The main problem areas for fills lie on the slope faces which are subject to erosion and saturation.

Erosion control recommendations include extensive treatment of the slopes. A process called "layering" will be used, mostly on 1 1/2:1 slopes. This entails inserting layers of filter fabric 12 feet or more from the slope face into the fill as it is constructed. The layers are from 10 to 15 feet apart, generally (see Figure G-4). The layers prevent the run-off from deep cutting and gullying in the slope face.

Additionally, all slopes will be treated with punched straw applied in two lifts to obtain a thick cover and with seed, fertilizer and fiber placed with a hydromulcher. (All of the erosion control work for both cuts and fills will be done as they are built to assure controlled placement and maximum time for growth to occur.)

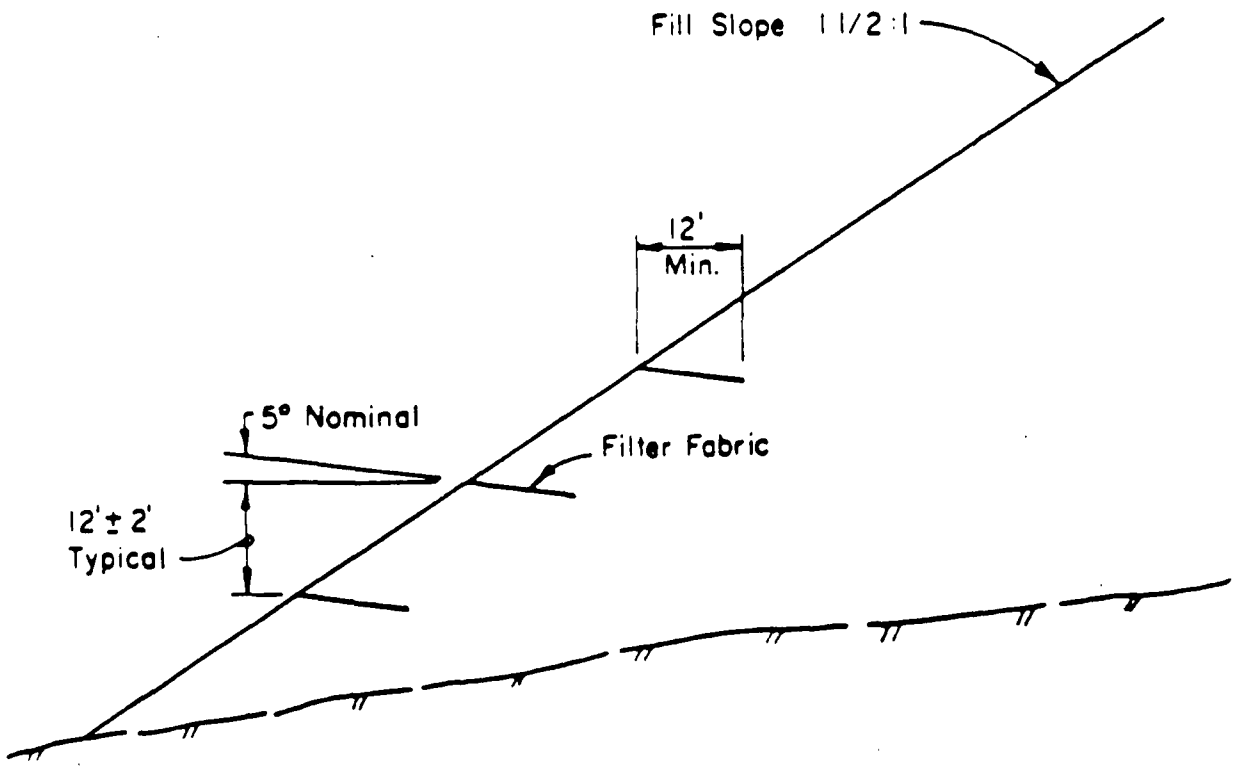
AC berms will be placed at the top of all fill slopes steeper than 4:1 that will direct the water to rock-lined ditches running down the fills and into various sediment traps before release back into the existing waterways and creeks.

These sediment traps consist of settlement basins designed with sufficient capacity to retain run-off of a 30 minute storm at minimum. Some basins will require periodic cleaning during construction. Where terrain permits, basins will be of adequate size to eliminate need for cleaning. Basin areas will revegetate and blend into the natural surroundings. (See Figure G-5.)

Silt fences will also be used below fill slopes and in small drainage ways. Clearing will be necessary for the catch basins but very little for the silt fences. (See Figure G-6.)

A variation of the settlement basin is also being considered which may be built at either end and on top of the culvert running under the fill. This entails extending the pipe beyond the toe of the fill and building a sediment trap at the toe with the water running directly into the pipe, either through a riser or directed to the streamflow. (See Figures G-7 and G-8.)

The above measures of erosion control must be installed and maintained correctly. The District is proposing one individual or a small staff of knowledgeable people whose sole purpose will be to oversee all drainage and erosion control installations. This group will work directly under the Resident Engineer and have the responsibility to see that the erosion plans are followed and built to work properly.



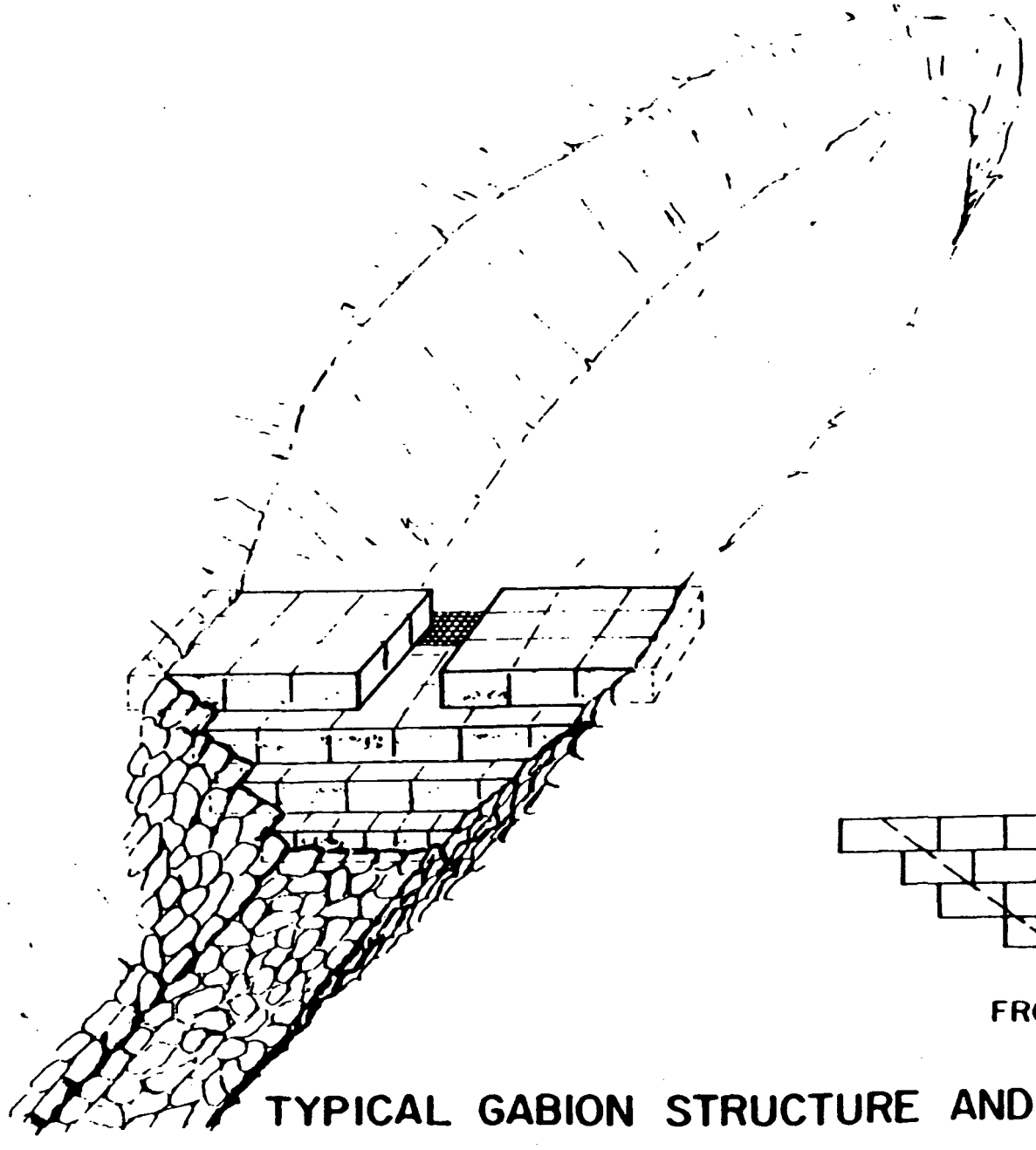
TYPICAL SECTION

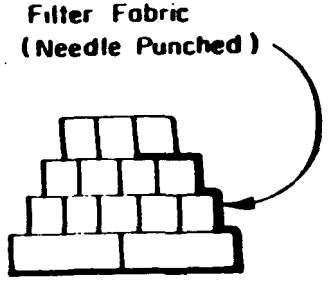
FABRIC LAYERING OF FILL SLOPES

Figure 3-4

Fabric Layering Method

Place 4 ounce needle punched geotextile fabric, 12 feet wide or wider, on 12 feet ± 2 feet vertical intervals, beginning at 15 feet of fill height. The fabric layers shall be placed in the fill slope at an upward angle of approximately 5 degrees from the horizontal.





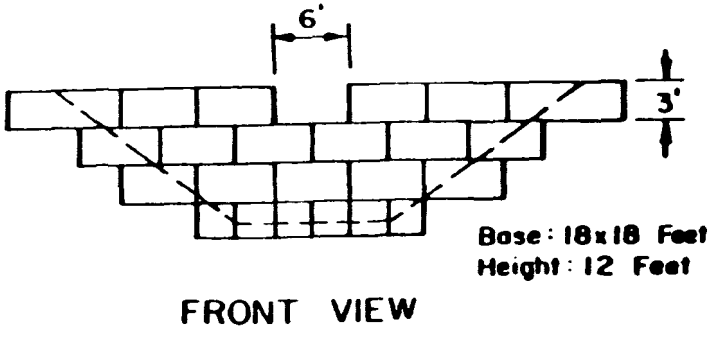
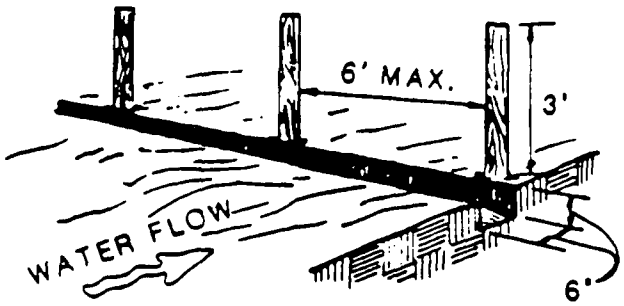


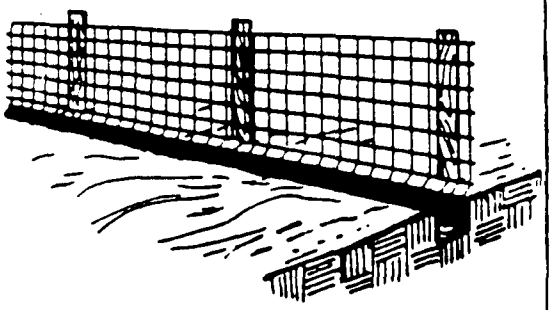
Figure G-5

TYPICAL GABION STRUCTURE AND SEDIMENT BASIN

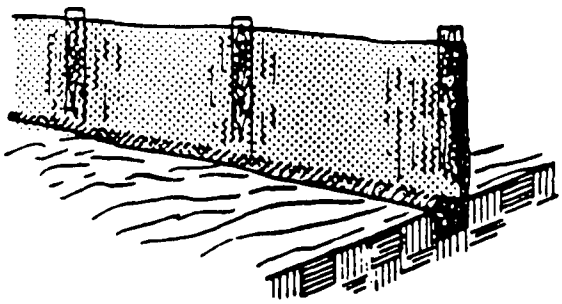
1. Set Metal or wood (4"x4" or 4" DIA.) posts to a depth of 3'. Excavate a 6"x6" trench upslope along the line of posts.



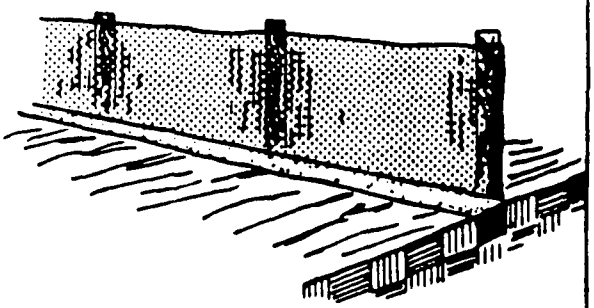
2. Secure wire fencing to the posts.



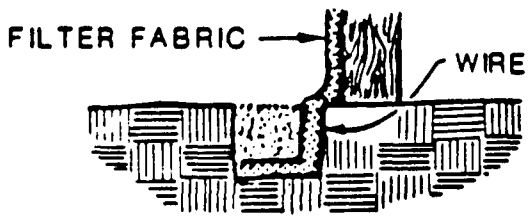
3. Attach the filter fabric to the wire fence and extend it into the trench.



4. Backfill and compact the excavated soil.

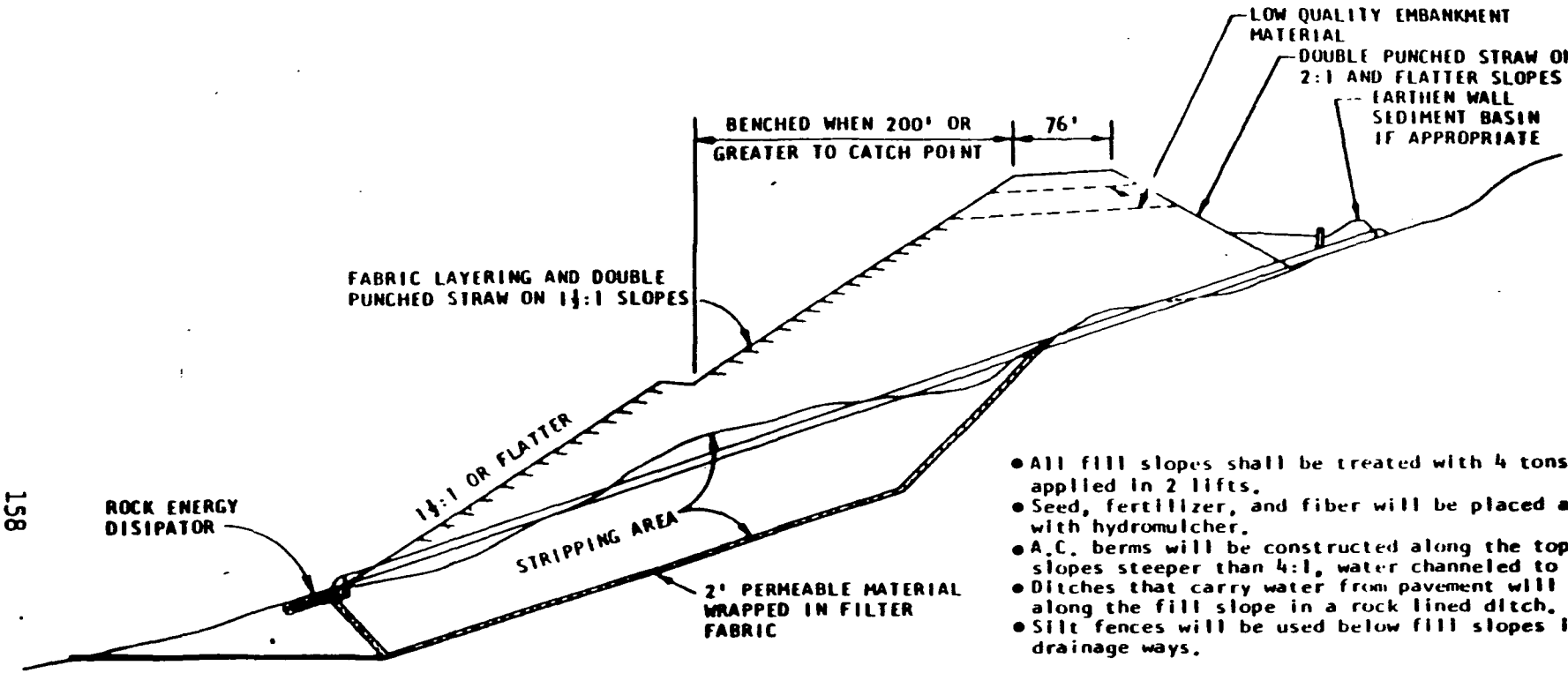


Extension of fabric and wire into the trench.



CONSTRUCTION OF A SILT FENCE

Figure G-6



- All fill slopes shall be treated with 4 tons of punched str applied in 2 lifts.
- Seed, fertilizer, and fiber will be placed after 1st lift with hydromulcher.
- A.C. berms will be constructed along the top of all fill slopes steeper than 4:1, water channeled to downdrains.
- Ditches that carry water from pavement will be brought down along the fill slope in a rock lined ditch.
- Silt fences will be used below fill slopes in small drainage ways.

NOTE: Some erosion control devices may have to be built outside planned right of way.

TYPICAL FILL SECTION DRAINAGE DETAIL

Figure G-7

TYPICAL SURFACE DRAINAGE DETAIL

Figure G-8

Construction Scheduling

The project is of such huge magnitude that the size alone creates problems. Due to heavy winter rains, the construction season is relatively short here on the north coast of California. Large projects often take two or more construction seasons to complete. This bypass project is estimated to take at least six construction seasons. This poses the problem of erosion and slope stability over five winters during construction.

The project will probably be broken into two sections and constructed in three stages on each section. The first stage will be clearing, the second stage grading and structures, and the third stage base and paving.

The work lends itself well to one-half the project length at a time mainly because the dirt balance and haul directions split near the center and go north and south from that point.

The earliest advertising date for the first clearing contract (north half of project) is the spring of 1984. If the first project is advertised in 1984, we anticipated the following schedule of the remaining stages:

1984 - Clear north half of project.
1985 - Grading north half of project. Clear south half of project.
1986 - Grading north & south half of project.
1987 - Grading north & south half of project.
1988 - Surface north half of project. Grading south half of project.
1989 - Surface south half of project.

At the completion of each contract, the project will be "winterized" using both temporary and permanent erosion control techniques and devices. It is also planned to have a winter patrol that will be "on the job" to spot weak points or prevent potential failures before they can become major problems.

Winterizing would call for preparing the project, at whatever stage of completion it was in, for the rainy season. The contractor would begin this work well ahead of the winter months, in fact, some of the erosion control measures would be done along with the rest of the work. It is proposed to use large wood chippers to reduce brush and small trees to chips. A heavy blanket of chips would cover the bare ground as the clearing work was completed. Silt fencing, straw and wire mesh and temporary catch basins will all be used as appropriate to protect each phase of the project during the winter months. Permanent erosion control devices will also be constructed as soon as practicable to add to the overall effort.

Cost

The extensive erosion control measures and special engineering solutions called for in the project should be effective but expensive.

It is currently estimated that the erosion and surface stability control designs are adding approximately $1/2 million per mile to the cost. The subsurface excavations called for under the fills will add another $12 million.

ANALYSIS

What is the risk of sedimentation in flowing streams on the Redwood National Park project due to cut or fill failures?

Based on extensive geological investigations, we have a relatively accurate representation of the subsurface geology and soil conditions. However, with all that is known about conditions through the project we have concluded that a mathematical probability of fill or cut failure cannot be predicted and we have not attempted such estimates. Rather we have examined the consequences should a failure develop.

Fills

Based on the data that has been gathered, design is underway on the necessary stabilization features to ensure as fully as technically and economically possible that fills are founded on soil structures capable of carrying the loads that we would impose upon them. Construction of fills entails a mixing of selected excavation materials resulting in a more homogeneous mass than that encountered in the cuts. This results in greater confidence in the results of mathematical analyses applied to internal stability of constructed embankments. The above, combined with the stabilized foundations, makes us confident that embankment failures will be minimized.

Absolute safety in the underlying Franciscan shale foundation material may not be achievable. The wet winter climate, clayey character of the bedrock, and steepness of the terrain combine to present roadway stability problems, which, in spite of the proposed stabilization, may yield foundation failure resulting in further distress during or subsequent to project construction.

The consequences of failure where situation and mud flow does reach the adjacent countryside could result in deposition of material in and around trees and covering of the lower story brush. It could also reach flowing streams and cause serious impacts to fisheries. The trees will not generally be affected to any major degree and the ground cover will be reestablished within 2 to 3 years. If sediment reaches the streams in any significant amount, it will be many years before recovery of the fishery would be realized unless expensive mitigation measures are completed. It is unlikely that the fishery resource would be completely destroyed. Mitigation for fisheries impacts is discussed on page 56.

About six miles (185 project acres) of the 12-mile project will drain into the park. The other six miles (275 project acres) will drain to the east away from the park. The highway will cover about three percent of the area within the eight drainage areas through which the highway traverses.

In comparison to the 11,000 acres that were previously heavily logged within these drainage areas, the potential damage from the 460-acre highway project will be small in comparison to the logging damage that was caused to the fishery and vegetation in the area. In addition, the highway project damage will be mitigated to the extent practical, whereas logging in past years was not regulated or mitigated.

DRAINAGE	TOTAL AREA	ROADWAY AREA
May Creek*	1251 (Acres)	48 (Acres)
Boyes Creek*	1058	53
Prairie Creek*	1143	53
Brown Creek*	879	21
Ah Pah Creek	3531	86
Prairie Creek	310	11
No. Fork Ah Pah	4528	118
McGarvey Creek	2091	70
TOTALS	14791	460

*Drains mainly toward the Park properties.

Cuts

The cuts present different stability conditions. Borings taken in the various cuts indicate the type of material we expect to encounter during excavation. Slopes and benching frequency have been established using boring information, and the judgment and experience of the District 01 Materials Engineer and Engineering Geologist with the concurrence of the Translab Senior Engineering Geologist. We feel the designs are reasonable given the existing conditions.

It must be realized, however, that the mass left in the cut slope is natural and not homogeneous. Existing dips, strikes, soil makeups, changes in soil depth, aquifers, etc., all lead to localized areas which differ from the assumed average condition that the cut slope designs were based on. As a result, the potential for cut slope failures exists. Some will occur even though our designs are based on geological analyses. Until the cut slopes are excavated, there is no way of determining which might be unstable. Again, we cannot predict which, if any, of the slopes might ultimately fail.

Since total stability assurance is precluded, the risk of a cut slope failure introducing significant erosion material into streambeds must be addressed. If the roadbed has been completed and the proposed surface drainage is in place, we anticipate that a minimum of the slope failure material will adversely impact a watercourse. Most of the failed material will come to rest on the roadway surface. This material will be removed by Maintenance operations and placed into prepared disposal areas. Some sediment will be washed from the slide face by rainfall and surface drainage. It will be transported downgrade to the closest fill area. Most of this material can be trapped by the planned erosion and sedimentation control measures as previously described. With these measures in place, slope failures should be considered primarily as a disposal and slope restoration problem rather than a sedimentation problem.

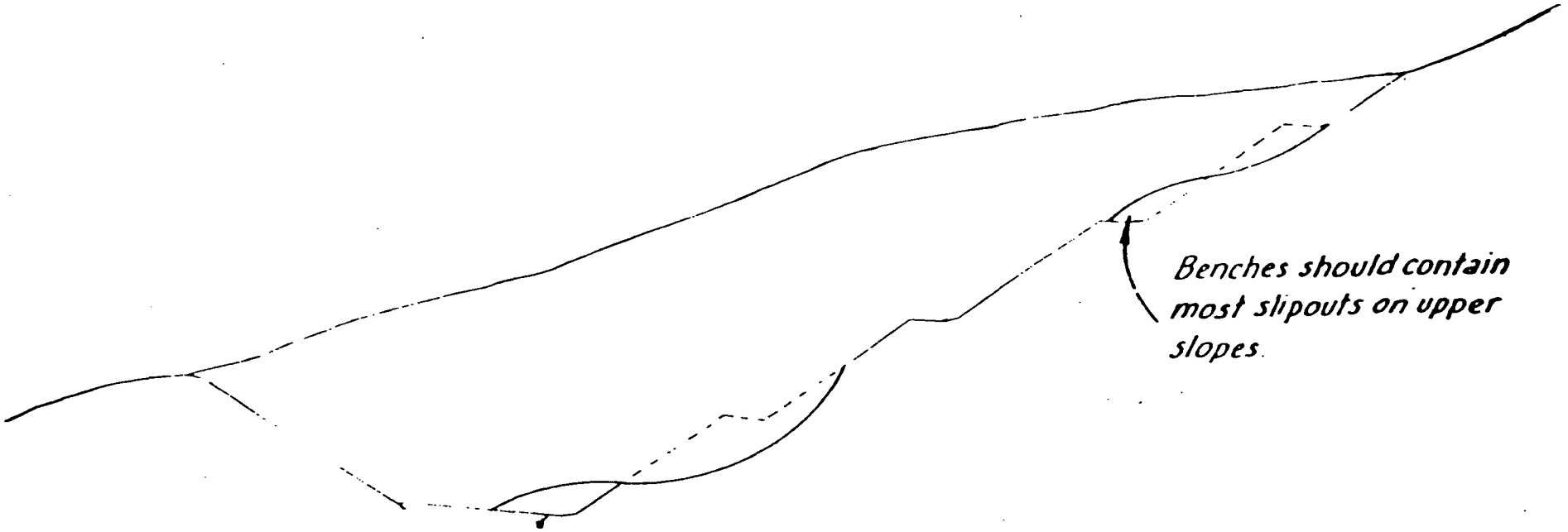
Another possibility is cut slope failure during construction. A failure during the active construction season would represent no more of an erosion problem than normal roadway or embankment construction underway. It would result in

more material to move to a predetermined embankment location, unless it occurs near the end of the construction season. Sedimentation control measures, coupled with an aggressive winterization program, should minimize impact.

Should a slope fail after implementation of the winterizing program, some material will be exposed to raindrop impact without protection. Early installation of the sedimentation control measures should minimize the impact of this type of failure.

In summary, it is improbable that significant embankment failures will occur. It is probable that cut slope failures will occur, however, mitigation measures are being incorporated into all phases of the design for this project to minimize adverse environmental impacts.

The engineering and environmental problems resulting from the construction of the bypass are essentially the same problems the District has faced on most major projects. The tremendous size of the project and the fragile and sensitive environmental issues, however, have pointed up the potential of high environmental damage unless the best state-of-the-art measures are incorporated into the planning and design to control erosion and minimize slope failures. The District believes that these issues can be successfully controlled, although the cost will be high.



CUT FAILURES

Figure G-9

APPENDIX H

METHODOLOGY: FISHERIES RESOURCES INVESTIGATION AND VALUATION. By California Department of Fish and Game From Wood, 1982)

Stream sections were surveyed by a professional fisheries biologist. As an area of spawning gravel was encountered, it was first measured; then based upon gravel size, water depth and flow, a determination was made of which species were most likely to be utilizing the area. These included Chinook salmon (KS), coho salmon (SS), steelhead (SH), and cutthroat trout (CT).

The spawning sites were then quality rated based on both gravel composition and compaction. The site was assigned a value of high, medium, or low, reflecting its overall quality as a potential spawning site. On the north coast, gravels may become compacted and affect their suitability as spawning sites. Therefore, ratings of good (meaning little compaction) medium, poor, or very poor were also assigned to each site.

Information on area and quality of spawning sites was used to estimate the numbers of fish that may use each area. Literature was researched (Briggs 1953; Shapovalov and Taft 1954) and biologists were consulted to determine the average redd size in the affected streams as well as the number of fish that might be expected on each redd. By dividing the redd size into the area of the spawning site, the numbers of redds per site is calculated. Multiplying this by the number of fish per redd yields numbers of fish per site.

However, this would assume ideal conditions of high quality gravel and good (very little) compaction. In order to correct for variations in these characteristics, a matrix was developed of correction factors that reflect fish utilization of poor quality spawning sites.

After the numbers of fish were calculated the methods of Kesner (1977, Everest (1978) and Smith (1982) were used to provide an economic evaluation of the fishery. The area specific factors used and the values assigned for our calculations are shown on the bottom of the tables. These were derived from current market conditions and discussions with local fishery biologists.

APPENDIX H

TABLE 1
FISHERY RESOURCES: REDWOOD PARK BYPASS
SALMON - 1982

Creek	Species	Potential/ Present	# Fish on Redds	# Fish/ Redd	Total	Total Catch	Comm'l	Sport	Comm'l	Valuation Sp. Ocn.	Sp. Inl.	Total
McGarvey	SS	Pot.	118.6	2.5	297	1,188	950	238	$ 8,126	$11,975	$ 3,060	$23,161
	SS	Pre.	63.5	2.5	159	636	509	127	4,350	6,411	1,638	12,399
Ah Pah	SS	Pot.	375.1	2.5	938	3,752	2,251	750	25,979	37,820	9,665	73,464
Ex. S., Fk.	SS	Pre.	270.6	2.5	677	2,708	2,166	542	18,523	27,297	6,976	52,795
May	SS	Pot.	34.4	2.5	86	244	275	69	2,253	3,468	886	5,707
	SS	Pre.	21.4	2.5	54	216	173	43	1,477	2,177	556	4,211
Boyes	KS	Pot.	4.9	3.1	15	60	48	12	1,027	65	155	1,787
	KS	Pre.	0.6	3.1	2	8	6	2	136	81	21	237
	SS	Pot.	17.2	2.5	43	172	138	34	1,176	1,734	443	3,353
	SS	Pre.	3.4	2.5	9	36	29	5	246	363	93	702
Prairie	KS	Pot.	196	3.1	608	2,432	1,946	486	41,247	24,515	6,265	72,026
	KS	Pre.	119.1	3.1	369	1,476	1,181	295	25,033	14,878	3,802	43,713
	SS	Pot.	499	2.5	1,248	4,902	3,994	998	34,145	50,310	12,859	97,324
	SS	Pre.	308	2.5	770	3,080	2,464	616	21,067	31,046	7,934	60,048

SS = Coho Salmon KS = Chinook Salmon

Catch/Escapement ratio - 3:1. 80% catch to comm'l fishery. Dressed wts. KS = 10.6 lbs., SS = 5.7 lbs.
Price/lb.: KS = $2.00; SS = $1.50: Spt. catch-81.3%, Ocn-18.7% Inl.
Angler Days - $63 for Ocn. $28 Inland. 1 angler-day/fish Ocn. 2.3 AD/fish Inland.
Ave. Redd sizes - KS = 60 ft. sq.; SS = 30 ft. sq.; SH = 25 ft. sq.

APPENDIX II

TABLE 2
FISHERY RESOURCES: REDWOOD PARK BYPASS
TROUT - 1982

Creek	Species	Fish on Redds	Fish/Redd	Fish	Total Catch	Ang. Days	Value of Fishery
McGarvey	Pot. SH	240.9	2.1	506	152	304	$ 8,501
	Pre. SH	145.5	2.1	306	92	184	5,741
Ah Pah	Pot. SH	476.6	2.1	1,001	300	601	16,817
	Pre. SH	340.1	2.1	714	214	428	11,995
May	Pot. SH	64.5	2.1	135	41	81	2,268
	Pre. SH	41.0	2.1	86	26	52	1,445
	Pot. CCT	29.1	2.1	61	18	36	1,008
	Pre. CCT	19.6	2.1	41	12	24	689
Boyes	Pot. SH	26.9	2.1	56	17	34	941
	Pre. SH	6.2	2.1	13	4	8	218
	Pot. CCT	7.8	2.1	16	5	10	280
	Pre. CCT	3.0	2.1	6	2	4	112
Prairie	Pot. SH	656.9	2.1	1,379	414	828	23,175
	Pre. SH	388.4	2.1	816	245	490	13,709
	Pot. CCT	2.1	2.1	4	1	2	54
	Pre. CCT	1.3	2.1	3	1	2	54

SH = Steelhead CCT = Coastal Cutthroat Trout

Escapement = 0.3:1
Angler Days/fish = 2

GROSS FISHERY VALUE

Stream	Habitat Length	Species	Value	Comparative Gross Value Per Mile Year
McCarvey	3 Miles	Coho	$ [illegible]	
		Steelhead	[illegible]	
			$ [illegible]	$ 6,047
[illegible] Fah (Main Fork)	2.5 Miles	Coho	$ 52,795	
		Steelhead	[illegible]	
			$ 64,790	$25,916
Prairie	2.2 Miles	Coho	$ 60,048	
		Chinook	[illegible]	
		Steelhead	13,709	
		Cutthroat	54	
			$117,524	$53,420
May	0.8 Mile	Coho	$ 4,211	
		Steelhead	1,445	
		Cutthroat	698	
			$ 6,345	$ 7,931
Boyes	1.4 Miles	Coho	$ 704	
		Chinook	237	
		Steelhead	218	
		Cutthroat	112	
			$ 1,269	$ 906

Angler Days/fish = 2

APPENDIX H

TABLE 4
FISHERY RESOURCES: REDWOOD PARK BYPASS
SMOLTS - 1982

Creek	Species	Potential/ Present	Spawn Pop.	Smolts
McGarvey	SH	POT	241	13,757
	SH	PRE	146	8,322
	SS	POT	297	21,600
	SS	PRE	159	11,564
Ah Pah	SH	POT	297	16,929
	SH	PRE	159	9,063
	SS	POT	938	68,218
	SS	PRE	677	49,236
May	SH	POT	65	3,705
	SH	PRE	41	2,337
	SS	POT	65	4,727
	SS	PRE	41	2,982
Boyes	SH	POT	27	1,539
	SH	PRE	6	342
	SS	POT	43	3,127
	SS	PRE	9	655
	KS	POT	15	4,000
	KS	PRE	2	533
Prairie	SH	POT	657	37,449
	SH	PRE	388	22,116
	SS	POT	1,248	90,764
	SS	PRE	770	56,000
	KS	POT	608	*162,133
	KS	PRE	369	98,400

SH: Females x 5,000 eggs x 1.14% survival = smolts produced
SS: Fish/Redd x 4 escapement / 5.5% survival = smolts produced
KS: Fish/Redd x 4 escapement / 1.5% survival = smolts produced

APPENDIX H

TABLE 5
FISHERY LOSS MITIGATION
COST SUMMARY

ge	Species	Est. Smolt Population[1]	Short-Term Loss Estimate	Short-Term[2] Cost Range	Long-Term[3] Costs	Total
y Cr.	Coho	16,200	60-80%	$ 7,192-9,590	$ 3,476	$10,668-13,066
y Cr.	Steelhead	10,318	70-90%	9,476-12,183	3,926	13,402-16,109
Cr.	Coho	51,163	40-60%	15,144-22,717	10,980	26,124-33,697
Cr.	Steelhead	12,697	50-70%	8,328-11,660	4,830	13,159-16,490
KLAMATH DRAINAGE				$40,140-56,150	$23,212	$63,352-79,362
e Cr.	Coho	56,000	13.6%	$ 5,636	$12,018	$17,654
e Cr.	Steelhead	22,116	13.6%	3,946	8,415	12,361
e Cr.	Chinook	98,400	13.6%	9,903	21,117	31,020
Cr.	Coho	2,982	75-100%	1,655-2,207	640	2,295-2,847
Cr.	Steelhead	2,337	75-100%	2,300-3,066	889	3,189-3,955
Cr.	Coho	655	25-45%	121-218	130	251-348
Cr.	Steelhead	342	25-45%	112-202	140	252-342
Cr.	Chinook	533	25-45%	99-177	114	213-291
PRAIRIE CREEK DRAINAGE				$23,772-25,355	$43,463	$67,235-68,818

ishery Loss Replacement Cost Range $130,587 - $148,180

f potential in Klamath Drainage.

-term losses are for a 4-year construction period. Smolt costs are $0.185/salmon, 8/steelhead.

term losses are based on 12% losses for the year after construction, decreasing to 4% with n of 5.8% for 20 years.

WETLAND STATEMENT OF FINDINGS

NATIONAL PARK SERVICE
CALIFORNIA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

U.S. 101 DEMONSTRATION PROJECT

In accordance with Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), and their implementing guidelines, a review of alternatives to avoid the adverse impacts associated with development in wetlands was undertaken by staffs of the National Park Service, the California Department of Transportation, and the Federal Highway Administration. The proposed highway would remove seven-tenths (0.7) acres of wetland vegetation along Prairie and May Creeks in the vicinity of the southern interchange with existing U.S. 101 (see map on page 41). The course of action selected is the only practicable alternative to meeting highway alignment standards in the vicinity of the southern interchange. However, design of the highway in this vicinity minimizes use of wetlands and through consultation and agreement with the U.S. Fish and Wildlife Service and California Department of Fish and Game, replacement of lost habitat will occur. A brief discussion of the alternatives considered and reasons for accepting or rejecting each follow:

Alternative sites for the southern interchange would include moving the highway alignment east away from Prairie Creek, or south to the vicinity of Lost Man Creek. However, moving the highway east would result in a 200-foot or larger cut in a small ridge adjacent to May Creek. If the interchange were moved south to the vicinity of Lost Man Creek, loss of additional wetland and riparian vegetation along with significant encroachment of the base floodplains of Prairie and Lost Man Creeks would occur. In addition, several cuts and fills in excess of 200 feet would be necessary. Any other alignments to avoid drainage areas would be in steep, unstable terrain, requiring cuts in excess of 300 feet.

Alternative actions include use of bridges to cross over the wetland (and floodplain) areas. However a bridge over Prairie Creek would cost approximately $5,000,000, while replacement costs for the wetlands area involved would be less than $10,000. In addition a bridge would shade the wetland, reducing productivity and habitat values.

No action would retain existing traffic patterns and no bypass would be built. No separation of through and recreational traffic would occur and thus not meet the purpose of the project. Wetland areas would remain unchanged.

The proposed action is in conformance with the State of California, Resources Agency Basic Wetlands Protection Policy (memorandum, September 19, 1977) and with the Humboldt County General Plan (Preliminary Draft, August 1983) Sensitive and Critical Habitats Policies and Standards.

The southern interchange area and bypass alignment have been designed to minimize both encroachment in the wetland and large cuts in a hillslope at the entrance to Prairie Creek Redwoods State Park. In addition, a retaining wall will be constructed along the western edge of the highway fill in the vicinity of Prairie Creek to minimize encroachment on Prairie Creek and its adjacent

wetland and riparian vegetation. To replace the lost wetland, concurrence among the California Department of Transportation, California Department of Fish and Game, U.S. Fish and Wildlife Service, and California Coastal Conservancy, has been reached and a mitigation bank has been developed, with two alternative sites. The first would be along lower Prairie Creek from south of the State park to Redwood Creek. This area has adequate acreage for both wetland (0.7 acre) and riparian (13.6 acres) replacement needs. An alternative site along McDonald Creek (5 miles south of Orick near Stone Lagoon) would provide approximately 1 acre of riparian habitat. Lands at the mouth of Redwood Creek in the Strawberry Creek area would be potential mitigation. This alternative would be limited by acquisition and elevation for riparian restoration. As a result, natural or beneficial wetland values would be replaced and, in accordance with the U.S. Fish and Wildlife Service Mitigation Policy, no net loss of in-kind habitat would occur.

The National Flood Insurance Program Criteria for Land Management and Use (44 CFR 60) are inappropriate since no reduction in floodplain capacity will occur as a result of the wetland loss or restoration.

FINDING

Based upon the above considerations, it is determined that there is no practicable alternative to the proposed new construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

FLOODPLAIN STATEMENT OF FINDINGS

NATIONAL PARK SERVICE
CALIFORNIA DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

U.S. 101 DEMONSTRATION PROJECT

In accordance with Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), and their implementing guidelines, a review of alternatives to avoid the adverse impacts associated with development in floodplains was undertaken by staffs of the National Park Service, the California Department of Transportation, and the Federal Highway Administration. The proposed highway would cross May, Boyes, Ah Pah, and McGarvey creeks or their tributaries, while the materials source would be a gravel bar on one side of the Klamath River. A longitudinal encroachment and channel change would occur on Prairie Creek.

Location hydraulic studies have been conducted on all crossings and the Klamath River. These studies are on file at the Caltrans District 1 Office. Although there would be 20 floodplain encroachments as a result of the bypass, only two (Prairie and May creeks) would result in significant impacts on natural and beneficial floodplain values. Encroachment at these two locations would remove a total of 7.4 acres of riparian vegetation and 0.7 acre of wetland and modify the overall appearance of the May and Prairie Creek floodplains at the south entrance to Prairie Creek Redwoods State Park. Minor backwater flooding would occur along May Creek, but no significant risks are associated with any of the encroachments. None of the encroachments would support incompatible floodplain development.

The course of action selected to be implemented is the only practicable alternative to meeting highway alignment standards. However, with design details to reduce encroachment and flood damage, the adverse impacts are minimized.

Alternative sites, which would move the highway east to avoid the Prairie Creek floodplain and cross May Creek at a much higher elevation, would require significant (200-foot and larger) cuts in a small ridge adjacent to May and Prairie creeks. Alternative actions include bridges over Prairie and May creeks to cross over the floodplain areas. However, the bridges would cost $10 to $15 million and shade the wetland and riparian habitats, reducing their productivity and value. Discussion and evaluation of alternatives to longitudinal encroachments are also included under Materials Sources, page 52, and Wetlands, pages 64, 65 and 171.

No action would retain existing traffic patterns and no bypass would be built. No separation of through and recreational traffic would occur and thus not meet the purpose of the project. Floodplain areas would remain unchanged.

The proposed action is in accordance with the Humboldt County General Plan (Preliminary Draft, August 1983), Hazards and Resources Goals, Policies, and Standards.

The National Flood Insurance Program Criteria for Land Management and Use (44 CFR 60) are inappropriate since no reduction in floodplain capacity will occur.

SUMMARY OF FLOODPLAIN ENCROACHMENTS

STATION*	CREEK NAME	1*	2*	3*	4*	5*	6*	7*	REMARKS
450-460	Prairie	Yes	No	No	Yes	Yes	Yes	Yes	Channel Change 3.25 Acres Riparian Habitat & 0.56 Acre Wetland Habitat Affected
474	May (Mae)	No	No	No	Yes	Yes	Yes	Yes	120" SCPP & Bridge 4.13 Acres Riparian Habitat 0.11 Acre Wetland Habitat
496+50	-----	No	No	No	No	No	No	Yes	36" Culvert
564-568	S. Fork Boyes	No	No	No	No	No	No	Yes	0.16 Acre Riparian Habitat
585	S. Fork Boyes	No	No	No	No	No	No	Yes	42" Culvert 0.14 Acre Riparian Habitat
596	Boyes	No	No	No	No	No	No	Yes	72" Culvert 0.29 Acre Riparian Habitat
622	Boyes	No	No	No	No	No	No	Yes	Bridge
630	-----	No	No	No	No	No	No	Yes	Bridge
795	Ah Pah	No	No	No	No	No	No	Yes	60" Culvert 0.55 Acre Riparian Habitat
827+50	N. Fork Ah Pah	No	No	No	No	No	No	Yes	60" Culvert 0.50 Acre Riparian Habitat
835	N. Fork Ah Pah	No	No	No	No	No	No	Yes	30" Culvert 0.24 Acre Riparian Habitat
869	N. Fork Ah Pah	No	No	No	No	No	No	Yes	48" Culvert
895	N. Fork Ah Pah	No	No	No	No	No	No	Yes	48" Culvert
908	N. Fork Ah Pah	No	No	No	No	No	No	Yes	24" Culvert 0.2 Acre Riparian Habitat
911+50	N. Fork Ah Pah	No	No	No	No	No	No	Yes	30" Culvert 0.43 Acre Riparian Habitat
946	N. Fork Ah Pah	No	No	No	No	No	No	Yes	30" Culvert 0.27 Acre Riparian Habitat
1001-1010	McCarvey	No	No	No	No	No	No	Yes	72" Culvert 0.73 Acre Riparian Habitat
1025-1033	McCarvey	No	No	No	No	No	No	Yes	60" Culvert 1.55 Acres Riparian Habitat
1060-1067	McCarvey	No	No	No	No	No	No	Yes	60" Culvert 1.11 Acres Riparian Habitat
-----	Klamath River	Yes	No	No	No	No	No	Yes	Material Source

1*. Is the proposed action a longitudinal encroachment of the base floodplain?

2*. Are the risks associated with the implementation of the proposed action significant?

3*. Will the proposed action support probable incompatible floodplain development?

4*. Are there any significant impacts on natural and beneficial floodplain values?

May Creek interchange will be a significant impact in the overall appearance of the May Creek-Prairie Creek floodplains at the south entrance to Prairie Creek Redwoods State Park.

5*. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.

Extensive erosion control measures will be implemented to minimize risk of erosion damage. A total of 13.6 acres of riparian habitat and 0.7 acre of wetlands will be replaced along Prairie Creek south of the project to mitigate loss of habitat incurred. Acreages to be replaced are indicated in the remarks column. A discussion of impacts is given in the Environmental Consequences section of the Park Bypass FEIS. (See page 66.)

6*. Does the proposed action constitute a significant floodplain encroachment as defined in FHPM 6-7-3-2, paragraph 4g?

7*. Are Location Hydraulic Studies that document the above answers on file in agency's office? If not, explain.

* Approximate location of Engineering Stations are shown on the Alternative B Map, see page 9 of the Final EIS.

ensive erosion control measures will be implemented at all encroachments inimize risk of erosion damage, and wetland and riparian vegetation be replaced.

National Flood Insurance Program Criteria for Land Management and Use CFR 60) are inappropriate since no reduction in floodplain capacity occur.

NDING

ased upon the above considerations, it is determined that there is no acticable alternative to the proposed new construction in floodplains that the proposed action includes all practicable measures to minimize rm to floodplains which may result from such use.

ecommended:

Howard H. Chapman — 1-31-84
Howard H. Chapman — Date
egional Director, Western Region

pproved:

Russell E. Dickenson — 1-31-84
Russell E. Dickenson — Date
Director, National Park Service

U.S. 101 Demonstration Project

Redwood National Park

Prairie Creek Redwoods State Park

in

Humboldt and Del Norte Counties

California

PM 125.6/R135.0,0.0/0.5

4(f) EVALUATION

Pursuant to 49 U.S.C. 303

California Dept. of Transportation
P. O. Box 3700
Eureka, California 95501

DISCUSSION OF 4(f) INVOLVEMENT

The build alternate recommended for construction (Alternate B) will require acquisition of State Park and/or Federal lands which have been determined to be Section 4(f) property under the Department of Transportation Act of 1966.

Section 4(f) lands are those protected by 49 U.S.C. 303. They include publicly owned lands from parks, recreation areas, or wildlife or waterfowl refuges of national, state or local significance, or any land from an historic site of national, state or local significance as determined by the officials having jurisdiction over the lands. The Secretary of Transportation is permitted to approve a program or project which requires use of these lands only if:

1. there is no feasible and prudent alternative to the use of such land, and

2. such program or project includes all possible planning to minimize harm to the Section 4(f) land resulting from such action.

Project Description

The project will relocate Route 101 in northern Humboldt County along the eastern boundary of Prairie Creek Redwoods State Park, through the May Creek and upper Boyes Creek drainages and conform with existing Route 101 alignment 0.5 mile north of the Humboldt/Del Norte County line, a distance of 12 miles (see Alternative B map, page 9).

History and Need

Constructed in 1928, Highway 101 north of Orick follows Prairie Creek into a large and magnificent stand of redwoods. At the time of construction, a strip of highway right of way predominantly 100 feet in width was acquired from logging companies and individual owners. Since that time, the California State Park System has made purchases of the properties adjacent to the highway and formed Prairie Creek Redwoods State Park.

The State Park now encompasses some 12,500 acres, most of which were acquired over the years through donations from various individuals and organizations (primarily Save-the-Redwoods League) and matching Park bond monies. It is the area headquarters for the Trinidad district of the State Park system and is one of ten areas administered by the Eureka office of the State Department of Parks and Recreation.

This segment of roadway is approximately 9.8 miles in length. It has two 12-foot driving lanes and, for the most part, 4-foot shoulders, although in places there are 10 to 12-foot diameter redwoods encroaching into the paved shoulders immediately adjacent to the traveled lane. Adjoining the roadway in many places through the park are paved widened areas for tourists to pull out of the traveled way. The alignment through the park allows an easy 50 MPH driving speed (when not impeded by slow moving vehicles), except toward the northerly limits where the highway leaves Prairie Creek and climbs over a divide into the McGarvey Creek watershed. The curvilinear alignment here reduces comfortable driving speed to near 35 MPH.

Extensive route studies made in 1963 considered two alignments east of Prairie Creek Redwoods State Park and two alignments westerly of the park paralleling the beach, plus expanding the existing facility through the park. No route adoption was made at that time because of controversy and potential funding uncertainties.

In 1968, the United States Congress authorized the establishment of Redwood National Park for the purpose of preserving 58,000 acres of northern California coastal redwood forest. The total park area includes three State parks - Prairie Creek Redwoods (12,500+ acres), Jedediah Smith Redwoods (9,180+ acres) and Del Norte Coast Redwoods (6,400+ acres). These State parks are within the overall boundaries of Redwood National Park, but remain under State ownership and management.

During 1973, efforts were made to develop a bypass alignment which would establish an easterly boundary for additional parkland acquisition. To this end, the California Department of Transportation engineered a feasible alignment in cooperation with the California State Department of Parks and Recreation and Save-the-Redwoods League. Recent park developments precluded consideration of both of the westerly and one of the easterly alignments proposed in 1963.

In 1978, the Redwood National Park Expansion Act (Public Law 95-250) was passed to enlarge the National Park by 48,000 acres in order to extend the protection of existing resources. The enlarged area extends south from Prairie Creek Redwoods State Park to include more of the Redwood Creek drainage.

The number of visitors to the park has increased considerably and a growing conflict has become apparent between the through traffic (heavy commercial trucks, non-tourists, etc.) and the summer throngs of slow moving, recreation oriented travelers. In spite of this apparent conflict, the accident frequency rate is only approximately half that expected for this type of road. During the 1980-82 period the actual rate was 1.39 accidents per million vehicle miles (MVM) as compared to a Statewide average expected rate of 2.55. Future accident rates may increase because of increased congestion.

The average daily traffic (ADT) count, which is presently 3,700 vehicles, is expected to increase to 9,800 vehicles by the year 2010. Trucks make up approximately 15% of this traffic volume on an average day, with tourist traffic accounting for 15% of this volume and the remainder being local cars.

In 1982, during the peak month of August, current traffic counts average 5,900 vehicles per day and are expected to increase to 15,700 per day by the year 2010. The distribution of vehicles shifts to 55 to 60% tourist vehicles during this month, with truck traffic making up 11% of volume and local cars constituting approximately 30 to 35% of daily volume.

When traffic volume is at capacity, operating conditions are poor. This is reflected by low speeds, frequent stops, and high delay. It is necessary for traffic volumes to be less than capacity to insure an adequate level of service.

Highway level of service is a planning designation used to describe a range of traffic operating conditions for a given highway facility. Six levels of service have been established for various types of facilities. These levels are

designated "A" through "F" from best to worst to cover the entire range of traffic conditions that may occur. Each level B through D also designates operating highway speeds based on safety, geometrics and prevailing traffic conditions.

A desired level of service is assigned a route based on relative importance of a route within the roadway network. It may not be economically feasible to attain a desired level on some segments because of restrictions that may be placed on alignment such as mountainous terrain.

Operating conditions for levels of service are as follows:

Level of Service

A	Free flow with low volumes and high speeds. Low density and speed controlled by driver desires. Little restriction in maneuverability.
B	Stable flow - operating speeds are slightly restricted by traffic conditions. Drivers have reasonable freedom to select speed and lane. Low probability of restricted traffic. The lower limit of B level is associated with service volume used in rural highway design.
C	Stable flow - maintained at a relatively satisfactory operating speed. More closely controlled maneuverability by higher volumes. Most drivers restricted in their freedom to select speed, change lanes or pass.
D	Approaches unstable flow. Tolerable operating speeds. Fluctuation in volume and temporary restrictions if flow causes drops in operating speeds. Little freedom to maneuver. Conditions can be tolerated for short periods.
E	Flow is unstable. Cannot be described by speed alone. Even lower operating speeds than level D. Volumes at or near capacity of the highway. May have momentary stoppages. At capacity usually indicates 30 MPH speeds.
F	Forced flow - low operating speeds. Usually result in vehicles backing up from restricting situations. Speed reduced substantially and stoppages because of congestion.

The route has been assigned a relatively high level of service of B-50 (i.e., minimum speeds no lower than 50 and stable flow conditions). The level of service of the segment of the route through Prairie Creek Redwoods State Park is currently rated D-35 which approaches unstable flow at 35 MPH.

By the year 2000 if no bypass is constructed, the level of service will drop to E-30 (i.e., unstable flow).

Level of service during heavier traffic conditions in August now is E-30 and will still be in this range by the year 2000.

The Redwood National Park Expansion Act of 1978 provided for the Secretary of the Interior to acquire and donate to the State of California for highway construction purposes lands to be used for a bypass from a point south of Prairie Creek Redwoods State Park through the drainages of May Creek and upper Boyes Creek to extend along the eastern boundary of Prairie Creek Redwoods State Park within Humboldt County, California, to remove U.S. 101 traffic from the central, established portions of the park to best serve the needs of the traveling public while preserving the park's natural beauty.

The Surface Transportation Act of 1978 authorized the Secretary of Transportation to carry out a demonstration project on the Federal-aid Primary System for construction of the specified eastern bypass route. This Act also authorized $50 million ($25 million of which has been appropriated to date) for construction of the new highway that would bypass Prairie Creek Redwoods State Park. An additional $55 million was appropriated in the Federal Aid Highway Act of 1981. The Federal government will supply 90% of the funds required for the project. Caltrans will supply 10% in matching funds.

This project is a Demonstration Project whose purpose is to show to what extent the "bypass" will divert through traffic around the park and relieve the present congestion and conflict of the single route presently available.

The U.S. Department of Transportation will report the results of the demonstration project to Congress.

In order to accomplish this legislative mandate, the highway corridor would pass through a portion of the recently acquired land within Redwood National Park that lies south and east of Prairie Creek Redwoods State Park. In addition, a small protruding corner of the State Park may be affected because of the difficulty of bypassing this piece entirely.

Recognizing the conflict between highway oriented uses and park use, the Redwood National Park General Management Plan shows a relocation of Highway 101 along the eastern park boundary, the intent being a separation of the uses to the benefit of each.

The proposed highway is located in steep, rugged terrain subject to substantial rainfall and poses unique engineering challenges. Solutions to these problems limit alignment alternatives if acceptable design standards are to be attained at reasonable cost and with minimal environmental effects.

The Federal government is responsible for acquiring the right of way for the bypass project. Title will subsequently be transferred to Caltrans.

III. Description of 4(f) Lands

A. Setting

The 4(f) lands involved in this proposed project are Redwood National Park and Prairie Creek Redwoods State Park which lies within the overall National Park boundaries but remains in State ownership and management.

Redwood National Park extends for nearly fifty miles in a narrow, irregular belt along the rural northwestern California coast in Humboldt and Del Norte Counties. It contains approximately 106,000 acres.

It, and the three State Parks included therein (Prairie Creek Redwoods, Del Norte Coast Redwood, and Jedediah Smith Redwoods) contains magnificent groves of old-growth redwood trees, many miles of rugged coastline, and abundant varieties of scenic and unique landscapes and habitats.

The area of Redwood National Park has a climate characterized by mild, wet (72-100" of precipitation) winters and cool summers with frequent coastal fog. The inland regions experience warmer temperatures in the summer and colder winters.

Redwood National Park lies within three major watershed basins - the Klamath and Smith Rivers and Redwood Creek. Alluvial bottomland and river terraces that are subject to periodic flooding make up about 1,500 acres of park land. Some 100 acres of wetlands exist and provide excellent migratory bird habitat. Twenty miles of the park's 34 miles of coastline are accessible to visitors.

Old-growth redwood forest is the most widespread unaltered vegetation in the park. The Redwood National Park was established to ensure these trees are preserved for public inspiration, enjoyment and scientific study. Other types of vegetation in the park include coastal strand, freshwater marsh, coastal shrub, coastal spruce forest, second-growth redwood forest, recently harvested redwood forest, prairie, Ponderosa pine stands, chaparral, Oregon white oak, and riparian.

Redwood National Park and the surrounding areas provide a wide range of wildlife habitats. Mammals include black bear, bobcat, coyote, black-tailed deer, Roosevelt elk, river otter, racoon, Harbor seal, sea lion, dolphin, gray whale, several species of reptile and amphibian, and invertebrate in the marine zones. Two major wildlife migration routes pass through the park. The Pacific flyway is an important avian migration route during fall and spring. Marine waterfowl are also abundant. Eagle, peregrine falcon and prairie falcon are occasionally observed in the area. Fish found in the park include silver and king salmon, rainbow trout, and coast cutthroat trout.

U.S. 101 bisects the park system for some 40 miles and is the only through route that serves this area of the State.

Prairie Creek Redwoods State Park is bounded by the Pacific Ocean on the west with wide sandy beaches lying along the foot of fairly high bluffs. There is excellent fishing during certain times of the year including some commecial surf fishing. The beach affords areas for picnicking, hiking, rock and shell collecting and limited water activity. (The water is cold and the surf dangerous.)

Proceeding east, one crosses the low, rugged range of hills that lie along the beach then drops down into a relatively flat, wide valley that is widest at the south end, narrowing as it runs northerly. The east side of the valley is bounded by steep hills that continue easterly for many miles and attain elevations of nearly 1,800 feet. These hills form the easterly boundary of the park and are the terrain over which the realigned portion of U.S. 101 is to be built. (The present highway runs through the middle of the valley on good alignment.) This realignment will skirt the eastern boundary of the State park as it climbs up and over the ridges of this coastal range. The terrain is extremely precipitous and the ground surfaces are impenetrable because of dense cover of downfall from past logging residue through which berry bushes and young trees are growing, along with gullies formed by extreme erosion of the hillsides.

Preliminary foundation investigations indicate that the erosive soils, along with heavy winter rainfall, contribute to relatively rapid changes in land forms unless the surfaces are closely controlled and protected.

B. Facilities, Existing and Planned

Redwood National Park is composed of six management units - Jedediah Smith Redwoods State Park, Del Norte Coast Redwoods State Park, Klamath unit, Prairie Creek Redwoods State Park, Orick unit, and Redwood Creek unit. The National Park headquarters is located in Crescent City, California. Total visitors to the National Park in 1978, minus figures for the three State parks, were 513,000. Visitor growth is expected to increase depending somewhat on the price and availability of gasoline.

Jedediah Smith Redwoods State Park offers 107 campsites and 68 picnic sites. No expansion of State facilities is planned at this park. It is within the Hiouchi district of the State Park system. The park was established in 1929 and offers overnight camping, picnicking, swimming, hiking and fishing. Total visitor days for 1979-80 were 174,947. The National Park Service's Hiouchi ranger station offers information/orientation services. A visitors' center is proposed in the late 1980's for this eastern entrance to Redwood National Park.

Del Norte Coast Redwoods State Park, also a part of the Hiouchi district of the State Park system, has 12 miles of maintained trails including some along the coast. The State campground at Mill Creek provides 145 campsites and 20 picnic sites. The State Department of Parks & Recreation has no plans to expand its facilities at this park. The park was created in 1925. 1979-1980 visitor days totaled 73,323. The National Park Service proposes to build a small activity site on Crescent Beach and to downgrade one road to tail status.

The Klamath unit of Redwood National Park contains a number of hiking trails and picnic areas. An extension of the coastal trail is planned, as well as an activity site at Lagoon Creek. A visitor information area will be established at the Klamath townsite. There is also an 8-mile coastal drive in the Klamath unit. Redwood Ranger Station is located north of Klamath.

The Orick unit is the southern entrance to Redwood National Park. It contains the trailhead for Redwood Creek Trail and the Lady Bird Johnson Grove. A visitor information/service center and ranger offices are located in Orick. Proposed National Park improvements include extending Bald Hills Road over Holter Ridge to connect to the bypass opposite Cal-Barrel Road, completing the section of the coastal trail through that unit, providing an information service at the Caltrans Roadside Rest (northbound) near Trinidad, working with Caltrans and the Coastal Commission on improving facilities in the vicinity of Freshwater Lagoon.

The Redwood Creek unit offers shuttle buses which carry visitors to the trailhead one mile from the Tall Trees Grove. Picnicking is allowed in this unit, but there are no established campsites. Future National Park Service plans are to provide 50 miles of hiking trails in the basin, including 15 miles of horse trails.

An at-grade intersection may be provided on the new bypass alignment to accommodate Holter Ridge Road to serve as an alternate for the lower portion of Bald Hills Road.

Prairie Creek Redwoods State Park - Overnight camping is allowed at the 100 established campsites. There are 21 picnic sites. None of these facilities are located in the proposed bypass area. There are 91 miles of hiking trails and 20+ miles of road, in addition to the State highway. There are 6 miles of ocean frontage. Thirteen permanent staff membes (6 rangers, 1 administrator, 6 maintenance) are employed here. In the summertime there are 30 seasonal maintenance employees as well. 1979-80 visitor days totaled 283,883. A visitor center, campfire center and handicapped interpretive facility in the form of a special trail (Revelation Trail) for the blind are available. Running water and hot showers are available for campers' use.

Characteristics of the park include two herds of Roosevelt Elk (Wapiti) of about 100 animals each (one herd on the prairie and one on Gold Bluff Beach). These animals range over the entire park area. Management of the herds is the responsibility of the California Department of Fish and Game. Parks and Recreation does coordinate with Fish and Game for removal of sick animals, etc. Any measures taken to keep the animals from crossing the bypass would present a barrier to their range. Therefore, none are proposed. Warning signs will be placed to alert drivers to the hazard.

No further development within the park is proposed by Parks and Recreation other than minor relocations of campsites. State Park management is considering relocation of the roadway across the elk prairie and visitor center at some future date. No firm plans are formulated.

An outstanding feature of Prairie Creek Redwoods State Park is the world famous Fern Canyon. The canyon is 3/4 mile in length and has 100-150' high walls covered with ferns. There is a 4-mile hiking trail to the canyon from park headquarters. It can also be reached by a County road (Davison Road) which is 6 miles in length. This road usually requires yearly repairs due to storm damage.

The park is not subject to flooding of any major extent. The bluffs along Gold Bluff Beach are actively eroding because of high tides and waves. The beach campsites are disturbed each year and are replaced. The park road along the beach (5+ miles) to Fern Canyon has to be rebuilt each year.

The Redwood National Park General Management Plan discusses proposed improvements in the Prairie Creek Redwoods unit. These include development of an activity center in the southern portion of the National Park in the summer of 1984, overnight camping and day-use activities on Skunk Cabbage Hill, realigning of Davison Road in cooperation with the County of Humboldt to provide access from May Creek to Gold Bluff Beach, cooperating with the State Park plans to modify the campground in connection with the south area activity center, completing the coastal trail, and relocating Gold Bluff Beach campsites in cooperation with State Park officials.

An interchange is proposed at May Creek where the bypass swings away from the existing roadway. The design will be coordinated with the park staff to facilitate use of the park improvements as described above.

It is anticipated that appropriate signing will effectively channel the park-use traffic through the Park while the highway-oriented traffic will proceed on the bypass. A reduced speed limit on the existing route will also encourage

through traffic to use the bypass. Bypass traffic will be allowed to use the existing route during hazardous or emergency conditions.

C. Relationship to Similarly Used Lands Nearby

Operations at Redwood National Park are closely linked with those of the California Department of Parks and Recreation at the three State parks encompassed by the National Park (see Existing Conditions Map).

Other areas in the vicinity which have similar uses and facilities include the following State parks:

Pelican Beach, north of the National Park in Del Norte County, day use only; Dry Lagoon, to the south, primitive camping and day use; Patrick's Point, overnight camping (135+ sites); Trinidad Beach, day use.

Humboldt County Park system facilities include Big Lagoon County Park. This is primarily a beach area for day use with limited overnight camping.

Del Norte County Park system day use facilities in the vicinity of Redwood National Park include Ruby Van Deventer Park on the Smith River, Point St. George Beach northwest of Crescent City, Florence Keller Park 8 miles north of Crescent City, Lake Earl public boat ramp, boat ramps on the Klamath and Smith Rivers, and Pebble Beach access one mile northwest of Crescent City.

A number of private campgrounds are located along the Klamath River, and near Orick and Dry Lagoon.

All of the above facilities lie within a 35-mile radius of Prairie Creek Redwoods State Park. There are very few private campgrounds available to overnight campers along this segment of U.S. 101.

D. Access

U.S. 101 is the only north-south public through highway and access to the northwestern sector of the California coastal area. There is a 16-mile, 4-lane segment of the highway from Eureka, 44 miles south to Big Lagoon, a 4.3 mile segment north of the State Park to the Klamath River, then 21 miles of 2-lane to Crescent City.

Highway 299 runs east-west between Arcata and the Central Valley, and Highway 199 runs east-west between Crescent City and the south-central Oregon border.

During the peak summer months, this major arterial carries a wide variety of commercial and private vehicles which leads to congestion and differences of purpose. There are tourists that have come to see the redwoods, camp, hike, and fish at a leisurely pace. There are also logging trucks that must make up their entire yearly income during this dry season and want to pass through the area quickly since time is money. In addition, there are the many supply vehicles that serve the communities along the entire route from San Francisco to Oregon and beyond.

Traffic increases from 4,000 ADT in December to 6,900 ADT for the peak month of August. Through the park, long queues of cars, campers, trucks and RV's have

become a common experience because of reduced speeds, capacity problems, congestion and increased accident rates. In recent years, bicyclists have increased and are creating special needs and problems of their own.

Alternatives (Description and Location)

From the early 1960's to the present, many alternative routes have been studied and evaluated along with many minor variations. They have all been limited by extreme restrictions of terrain and environmental constraints.

The alternatives include the following options: no action, non-structural alternatives, reconstruction of the existing road, a westerly bypass corridor, and an easterly bypass corridor. All the options will affect 4(f) lands, or not comply with P.L. 95-250.

. No Build - (Alternative A)

No action would not separate traffic, reduce conflicts, or require taking of any 4(f) lands. Maintenance costs would remain relatively constant. Congestion, accidents and noise could be expected to increase with anticipated future traffic volumes. Energy costs would be the least of any alternative.

. Non-structured Alternate - (Alternative K)

This option would consist of speed zones, added enforcement and minor improvements, such as signing to advise travelers of existing turnouts. These turnouts are difficult to enter and exit safely, because they are small in size and hard to recognize. These areas are also used as temporary parking for trailheads and memorial groves, restricting their use as turnouts. Other turnouts could be developed as trees fell from natural causes. Any significant expansion of turnouts would require taking old growth trees, because existing turnouts are usually limited by old growth trees or other vegetation of park-like quality adjacent to the roadway. This option would not separate traffic or reduce conflicts. Expansion of turnouts would be limited to natural mortality of trees if taking 4(f) resources is to be avoided. Noise levels from traffic could be about 2 dBA lower than no-build but by the year 2000, would still affect 3-1/2 to 4 times more State Park land (750 acres) with noise levels in excess of the 57 dBA standard than the build alternatives on the easterly alignment. Energy and maintenance costs would be similar to the no-build alternative. Any arbitrary reduction of the speed limit would require special legislation. This proposal was rejected because of legal, operational and enforcement reasons.

. Improvement of the Existing Route - (Alternatives I & J)

Major improvement would incorporate widening the existing route to 4 lanes (Alternative I). Minor improvements would provide a 40-foot 2-lane road for the southerly 7-mile portion through the State Park and passing lanes 1-1/2 miles long over Ah Pah Ridge (Alternative J). Vertical alignment would be improved to gain better sight distance for added passing opportunities. Removal of a minimum of 7 acres of park-quality vegetation within the right of way to 20 additional acres for the 4-lane option over Ah Pah Ridge would result if these improvement concepts were implemented.

Alternatives I and J like A and K would not separate traffic or alleviate conflicts but could be built at much lower costs ($20 million to $35 million for construction). These options would not be consistent with the Redwood National Park General Management Plan, and were rejected because they would fail to meet Park management objectives.

Easterly Corridor Alternatives

Seven alternatives and two alignments were studied that would be within the corridor east of the park mandated by Congress. All would require taking 4(f) lands to prudently meet the need to separate park and through traffic.

The build alternatives under consideration are designated B, C, D, E and F. Two alignments are proposed, to pass through or avoid State Park land. Alternatives B, C and F right of way would require 484± acres of Federal park land which is primarily composed of second growth redwood forest, 13 acres of State park land which consists of old growth redwood forest and also 598 acres of private second growth forest. Alternatives D and E would avoid State Park land, require 404 acres of Federal land, plus an additional 170 acres of private forest. All build alternatives would also require acquisition of a 33± acre gravel bar to provide a source of aggregate material.

There were two width variations on the easterly bypass alignment that were eliminated from further consideration: Construction of a two-lane facility with no passing lanes (Alternate L) was rejected because of poor safety aspects caused by long sustained grades; the construction of a four-lane facility with truck passing lanes (Alternate M) was eliminated because projected traffic volumes do not warrant this capacity. Alternatives L and M would have about the same right of way requirements as Alternative B.

The five build alternatives are:

Alternate B - A four-lane bypass with 12-foot lanes, 8-foot shoulders and 6-foot median (see Typical Sections) following an eastern alignment which passes through a corner of Prairie Creek Redwoods State Park. Approximately 460 acres would be cleared, including about 4.5 acres of old growth redwoods in the State Park and 205 acres of Federal park land.

Alternate C - A two-lane alignment with 12' lanes and 8' shoulders, with uphill truck passing lanes, which passes through a corner of the State Park. Approximately 415 acres would be cleared, including 183 acres of Federal park land and the same 4.5 acres of old growth.

Alternate D - A four-lane bypass, the same width as Alternate B, which would miss the corner of the State Park by means of a 2,100' long bridge over Ah Pah Creek gorge. A bridge at this location would increase costs $50 million or 50% of present costs. Approximately 440 acres would be cleared (205 acres of Federal park land).

Alternate E - A two-lane alignment, with uphill truck passing lanes as alternate C, which would miss the corner of the State Park by means of a 2,100' long bridge over Ah Pah Creek gorge. Approximately 395 acres would be cleared, including 183 acres of Federal park land.

Alternate F - A two-lane alignment with uphill and downhill truck passing lanes which passes through a corner of the State Park. Because of the steep grades the design is the same as Alternate B except for a 0.7-mile segment of two-lane roadway (including transitions) that would be constructed immediately north of the portion which passes through the State park lands. Approximately 459 acres would be cleared. Impacts on 4(f) lands would be similar to Alternate B.

NOTE: Alternative B has been proposed as the alternate that best meets all of the qualifications for this project because of safety, cost, and effective park management considerations.

Alternatives C and E would not provide adequate passing opportunities on downgrades where heavy vehicles would travel slowly. Alternatives D and E would have excessive cost. Alternative F would require two added merging movements for little cost advantage ($2 million at present costs) over Alternative B.

Comparative impacts of alternatives considered are summarized in Table 6 in the Environmental Consequences section and a summary of how alternatives meet objectives is included in Appendix F.

An alternative east of the park on an alignment designed to completely avoid 4(f) lands would require a road at least 45 miles long. Such an alignment would probably connect to Route 299 about 20 miles east of Route 101 (see Location Map), follow the Redwood Creek drainage to pass easterly of Schoolhouse Peak, the southeasterly limit of the park boundary (see Existing Conditions Map). Northerly of Schoolhouse Peak, the park boundary would be followed as closely as possible to connect with Alternative D & E alignment. The route would traverse rugged terrain. Chronic stability problems would occur with the associated water quality, erosion, and fisheries concerns of proportionate magnitude. The costs would be infeasible, an estimated $550 million.

Westerly Bypass Corridor Alternatives

Westerly corridor options were proposed in the early 1960's as viable alignments that would avoid the long, steep grades that would be encountered on alignments in the easterly bypass corridor. Subsequent park development precludes any serious consideration of westerly corridor alternatives. Implementation would result in an irretrievable loss of park resources and be inconsistent with National Park Service management goals. Two basic alignments were proposed; along Gold Bluffs Beach (Alternative G) and along Gold Bluffs (Alternative H).

Alternatives G and H each had two variations of access to the coast; one following Davison Road, 11.7 miles long, or improving the existing route between Davison Road and May Creek, then following Squashan Creek. Total length would be 12.4 miles (see Alternatives Eliminated Map, page 23). These westerly route options would be 2-lane roadways; approximately 2-1/2 to 6-1/2 miles would have passing lanes. Estimated current costs (1983) would range from $57 million on both versions of the Beach route to $90 million on the Davison Road-Bluff route. Approximately 450 to 640 acres of right of way would be needed. Virtually all of these lands would be park land.

On the Bluff alignment, at least 10 dedicated old growth redwood groves would be taken. In addition, a bridge or large fill would be required to cross Fern Canyon, a major feature of Prairie Creek Redwoods State Park.

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V. Area Affected

A. National Park

The portion of the National Park adjoining Prairie Creek Redwoods State Park on the southeast and east was legislatively acquired from private interests in 1978. The area was logged over during the early 1960's and, since that time, a dense under story of brush, vines, small trees and native grasses has formed a nearly impenetrable jungle along the May Creek and upper Boyes Creek drainage areas. Slopes are very steep and, as the project alignment swings off the existing highway, it starts climbing the sidehill that forms the north side of the May Creek drainage. A 5 to 7% grade climbs for 4 1/2 miles before topping the first summit.

The project corridor that has been identified by the California Transportation Department will be donated under legislative direction by the Federal government as a transportation corridor. Four hundred ± acres of Federal land is included in the corridor for the approximate six miles of roadway encompassed therein.

There are a few old-growth redwoods at the beginning of the project where May Creek crosses the present highway and at Ah Pah Creek Road. When this area was logged in the early 1960's, these trees were left for various reasons such as seed trees, or were diseased or deformed or not merchantable at the time.

A total of 0.7 acre of wetlands and 7.4 acres of riparian habitat within the right of way at the May Creek-Prairie Creek area would be removed in construction of the southern interchange. An additional 0.6 acre of riparian habitat in the headwaters of Boyes Creek on Federal park land would also be lost in construction. Approximately 13.6 acres of riparian and 0.7 acre of wetland would be replaced.

The 400± acres required represents less than 1% of the total of 78,000 acres (not including the three State Parks contained therein) now included in the Redwood National Park. Most of the area has been logged and there are no planned or existing facilities in the section to be used. The project is not expected to have any particular adverse effect upon the adjoining lands.

The traveling public cannot get off the road except at designated access points. Visually, some motorists may regard the new cuts and fills as an adverse aesthetic impact for a few years until ground cover is re-established. Some of this new construction will be visible from the Prairie Creek Redwoods State Park and heavy vehicles negotiating the steep grades will be heard in the park and camping areas, especially at night. These noise levels will not exceed the standard in campground areas. If the project is constructed, traffic noise impacts will be moved to peripheral low use park areas. Approximately 860 acres of fringe park area would exceed the 57 dBA standard by the year 2000.

No project would result in 940 acres of premium State Park land along the existing route that will be in excess of the standard by the same period (see page 80).

Summary

The map of the project area, Alternative B map shows the present boundaries of Redwood National Park and Prairie Creek Redwoods State Park and the lands that would be affected by the project.

The Federal park land that would be affected by the project has been logged within the past 25 years. These lands will require many years to attain questionable park value while the visitor experience of high-value park property along the existing route is degraded during high use periods by congestion and tourist-through traffic conflicts. The use of these peripheral park lands for transportation purposes would be a trade off to alleviate park management problems generated by through traffic. These problems would not be solved by improvements to the existing route or non-structured alternatives. Costs of other resources besides the committment of 400± acres of park land would include: a potential risk of failure of erosion control measures, an estimated 30% short-term loss of affected fisheries, (16% in park drainages), increased energy consumption and higher maintenance costs.

B. Prairie Creek Redwoods State Park

The proposed alignment will turn westward and go through a small corner of the State Parkland in order to avoid the Ah Pah Creek canyon. For the selected roadway section (four-lane width) approximately 4.5 acres will be required. Right of way necessary for the bypass alignment will be conveyed to the Federal government by the State Department of Parks and Recreation.

This portion of park land contains old-growth redwoods interspersed with fir, hemlock and Port Orford cedar. A tree count of the area showed that 48 redwoods, 43 fir and 33 hemlock and cedar will be removed within the roadway construction area, a total of 124 trees.

Clearing required for the highway corridor through this area may result in increased loss of old-growth trees, due to blow down, along the newly exposed edges of the cleared property.

The total area of the Prairie Creek Redwoods State Park is 12,500 acres. Approximately 80% of this area is covered with redwoods, fir and hemlock.

The State Park system acquired this land about 1928 using Park bond funds and funds supplied by Save-the-Redwoods League. Later, 10 acres were dedicated by the Eastman family as Eastman Grove. There is also another approximately 7 acres unnamed grove adjacent and south of Eastman Grove. The proposed line will cut across a small piece of both groves and will also leave a small severed tip on the east side (approximately 3 acres).

At this point, some discussion is probably appropriate concerning the position of the "principles" involved. During the several project team meetings held to date, the response from the members indicates that the option of going through this park corner versus crossing Ah Pah Creek is a reasonable and proper one. The team members see this alternate as the only viable one and a reasonable trade-off to route traffic out of the Park. The Save-the-Redwoods League, National Park Service and State Park management all support this action.

The Save-the-Redwoods League has contacted Dr. and Mrs. Eastman with the proposal to combine the remainder of the unnamed grove with the remainder of the Eastman Grove, creating a new Eastman Grove of twelve + acres. This proposal apparently is fully acceptable to the Eastman family (see Appendix 1).

The tip remaining on the east side will remain Park land and the cluster of redwoods will enhance the scenic views of the traveler.

The effect of this taking on the remainder of the park would be extremely small. There is no access to this area except on foot; there is no formal planning for future use or development of any kind. In fact, it is an area that few people would have ever seen under existing circumstances.

Summary

- On the eastern edge of Prairie Creek Redwoods State Park about half way between the north/south extremities the boundary forms a right-angled point as it follows the section line.

- On a straight line, this remote and secluded area lies approximately two miles east of U.S. 101 and is situated on an abrupt steep hillside that descends for nearly 400 feet into Ah Pah Creek. This deep gorge cuts across almost at right angles to a projected center line as the new alignment approaches this section of land. This situation is what has created the problem of either cutting through a small corner of the Park or going across this deep gorge with a bridge structure in order to miss the Park corner.

- A bridge structure could be built, but the cost of high piers and foundation stability problems make this alternative an unreasonable, imprudent option. Poor foundation and support will necessitate an increase in pile depth by 2-1/2 times, from about 40 to 100 feet, with a subsequent increase in cost over a normal structure of this size and height. The structure would be approximately 2,100' long and, about 280 feet above the canyon floor. The extraordinary height would require extreme construction methods that would approximately double the cost of the bridge. A four-lane roadway section (Alternate D), would cost approximately $51 million to build in 1983. By the time the project was built, the cost would escalate to approximately $60 million. The bridge structure proposed for a two-lane facility with uphill truck passing lane (Alternate E) would cost approximately $41 million in 1983 and $48 million by the time the project was built.

VI. Mitigation Measures to Minimize Harm (Both National Park and State Park Land)

A. Trees

The design objective is to keep to a minimum the number of trees cut. Use of timber cribbing retaining walls and selective fill materials will be designed to protect individual old growth trees. Use of cribs may also help to maintain a healthy condition which should reduce the number of potential blow downs that may occur along edges of exposed areas created by the new roadway.

Trees to be cut may become the property of the contractor or may be removed by the State Park or National Park Service for their own use.

B. Erosion

Foundation investigations indicate that the soils and underlying strata are unstable in some locations. Approximately 40% of the area cleared would drain toward park property. Design features and erosion control measures will be implemented to minimize the risk of slope failure and the effects of construction. Special innovative techniques using state-of-the-art concepts will be followed to minimize erosion impacts and attain stability to protect adjoining lands and drainages.

A multi-disciplinary team has been formed to assist in the development of a comprehensive erosion control plan to be implemented and monitored through all phases of construction. Control measures would include: selection of proper slope gradients, benching, interception ditches, energy dissipators, embankment layering and establishment of grasses and woody plants.

Ground water and seeps will be controlled by sub-surface drains and stabilization trenches to prevent excessive flow and seepage into new embankments.

During construction, the contractors are responsible for "winterizing" all worked areas before winter rains begin, including temporary drainage facilities, grading to control surface runoff, and building settling ponds and silt basins.

Further discussion on erosion control mitigation is given on page 73 and in Appendix G, page 150.

C. Land Acquisition

Replacement lands will not be required from the Federal government by the State Park system. State park lands needed for the right of way will be conveyed to the Federal government as a trade-off for removing through traffic from the central part of the State Park.

The 4.5 acres that would be converted to highway purposes is minimal in comparison to the 10,000 acres of forest area in the State Park.

The existing Caltrans right of way through the State Park is used for Park purposes by the public, also the trees and vegetation on the right of way complement the adjacent park lands. This right of way consists of a strip 100 feet wide, eight miles long, or approximately 100 acres. California Streets and Highways Code specifies right of way relinquishments are made to cities and counties. Humboldt County would accept this relinquishment on the provision that lands could be reverted to the State Parks System.

An 882 acre parcel now owned by Simpson Timber Company would be severed by acquisition of the right of way. These lands, located in the northeasterly corner of the park, would be acquired with the right of way by the National Park Service and become part of Redwood National Park. A 33 acre gravel bar owned by Simpson Timber Company would be required to provide aggregates needed for construction. The bar is located on the Klamath River south of the Humboldt/Del Norte County boundary, see page 52. Therefore, even with the 484+ acre commitment of Federal park lands for the highway right of way, the total acquisition would, in effect, result in a 400+ acre net increase to the 106,000 acre Redwood National Park and provide an added buffer between commercial timberland and the State Park. In addition, the severed lands would serve

as a buffer zone to mitigate potential impacts resulting from commercial forestry activities on adjoining land. It is expected the severed lands should not be required for right of way, expansion, normal maintenance or operational improvements.

D. Fishery Loss

A fish inventory estimate based on spawning areas has been made by the California Department of Fish and Game. Sixteen percent loss of annual smolt production from the present level is anticipated in the short term due to construction and about a 6 percent loss in the long term from added sediment in Prairie Creek drainage streams on park lands affected (see Appendix H).

Monetary compensation for habitat restoration and fish replacement for these losses will be provided by Caltrans (see page 56).

E. Design

Specific features will be developed (such as use of retaining walls and log cribs) during design in consultation with the National Park Service.

Alignment will be designed to minimize grading requirements.

VII. Coordination

This project represents a coordinated effort among the State Department of Transportation (Caltrans), Federal Highway Administration, National Park Service, State Department of Parks and Recreation (see Appendices 2 and 3), State Department of Fish and Game, Save-the-Redwoods League, Sierra Club, Humboldt and Del Norte Counties, the trucking industry, local Native Americans and the public.

An interdisciplinary Project Development Team concept is being used for the project.

Public informational meetings were held at two locations in June of 1980 to explain the proposal and encourage citizen participation. A public hearing was held in Orick November 18, 1981 to obtain additional public input for the project. A preliminary discussion of 4(f) involvement was sent with the Draft Environmental Impact Statement to the following concerned agencies: Department of Interior, Housing and Urban Development, and the California Department of Parks and Recreation. Comments were received from the Department of the Interior (see pages 82-84).

Informal meetings among National Park Service staff, Caltrans and the Federal Highway Administration are held at short intervals to coordinate the collection of environmental data, research projects and writing of the environmental document.

VIII. Determination

Based on the considerations above, it is determined that there is no feasible and prudent alternative to use of land from the Prairie Creek Redwoods State Park and Redwood National Park and that the proposed action includes all possible planning to minimize harm to the Prairie Creek Redwoods State Park and Redwood National Park resulting from such use.

APPENDIX 1 4(f)

Save-the-Redwoods League

114 SANSOME STREET, ROOM 605, SAN FRANCISCO, CALIFORNIA 94104
TELEPHONE (415) 362-2352

January 25, 1980

Mr. John Vostrez
District Highway Engineer
TRANSPORTATION DEPARTMENT OF CALTRANS
District Office 1
1656 Union
Eureka, California 95501

Dear Mr. Vostrez:

This letter confirms that the Save-the-Redwoods League supports the east ridge freeway alignment at Prairie Creek Redwoods State Park as discussed in our conference November 30, 1979. The League favors either alternate * number one or alternate number two through the small corner of the park in Section 25 as outlined in our conference by Mr. Delbert A. Brown.

Since our meeting, I have conferred with Dr. and Mrs. William Eastman who established the 10 acre grove in memory of their son at Prairie Creek Redwoods State Park. In their conversation with me, they have agreed to alternate one or two and, we plan to add 5 acres of old-growth timber which is now not named to their grove in lieu of the 1.8 acres of the Eastman Grove which would be taken by freeway construction.

We hope that your plans will go forward in accordance with the time schedule you outlined in our meeting. The League also favors closing old Highway 101 at the north end of Prairie Creek Redwoods State Park when the freeway is completed and turning over administration of the old highway to the California Department of Parks and Recreation at Prairie Creek Redwoods State Park. This will greatly enhance the visitor's experience in visiting Prairie Creek Redwoods State Park.

With best wishes for successful completion of the freeway bypass around the park,

Sincerely,

John B. Dewitt

JBD/vlo

Alternate 1 - Same alignment as Alternates B and C.
Alternate 2 - Same alignment as Alternates B and C with crib instead of portion of fill.

United States Department of the Interior

NATIONAL PARK SERVICE
REDWOOD NATIONAL PARK
DRAWER N — 1111 SECOND STREET
CRESCENT CITY, CALIFORNIA 95531

IN REPLY REFER TO:

D30(101)

September 4, 1980

John Vostrez
District Director
California Department of Transportation
District 01
P. O. Box 3700
Eureka, California 95501

Dear Mr. Vostrez:

In response to your request of August 20, 1980, we are enclosing a statement describing the significance of Redwood National Park.

If you have any questions, please contact John Sacklin at our Arcata office, (707) 822-7611.

Sincerely yours,

Robert D. Barbee
Superintendent

Enclosure

Year of the Visitor

SIGNIFICANCE OF REDWOOD NATIONAL PARK

Natural Resources

The most significant resource of the park is the redwood forest. The coast redwoods (Sequoia sempervirens) grow naturally only along a narrow coastal zone in northern California, from about Monterey to just barely into Oregon. Earlier preservation efforts by Save-the-Redwoods League resulted in the California State Parks which feature old growth stands. Because of timber harvesting on private lands, in the near future, state and national parks will contain the only remaining old growth of the original range.

Redwood National Park consists of 106,000 acres of land and is located at the northern end of the redwood range, a region of low coastal mountains, deeply dissected by streams and rivers. It is young geologically, leading to rugged topography and steep slopes. The ocean-moderated climate produces growing conditions favorable to redwoods. The winter season is marked by abundant rainfall, up to 100 inches a year. The summer features frequent coastal fog. Seasonal variations in temperatures are moderate.

The tallest known tree in the world is located in the park immediately adjacent to Redwood Creek. Also in this area are the second, third and sixth known tallest trees.

Within the national park boundaries, 85 percent of the acreage is forest land. Of that, over half is second-growth cutover lands containing coast redwoods and in time will be a valuable resource. The remaining 15 percent is composed of coastal vegetation, beaches, rock outcrop and prairie.

In addition to the redwood forest, the Park Acts also specify that the associated streams and seashore are to be preserved. The major rivers in the park are the Klamath and Smith. These are known for their anadromous fish resources, specifically silver and king salmon, and steelhead.

The length of the park coastline is approximately 35 miles. Both sandy beaches and rocky cliff areas are represented. Tidepools with an abundance of marine plant and animal life are found along the rocky coast. A number of marine animals such as sea lions, seals and whales frequent the park coastline.

Cultural Resources

The story of human involvement in the redwoods encompasses a variety of activities and viewpoints, over at least several centuries, and helps a park visitor understand the present landscape.

Within the park, several prehistoric and historic sites have been recorded. These are locations formerly used by Tolowa, Yurok and Chilula native California peoples, many of whom continue to live in communities of the region. Although native structures no longer exist within the village sites of the park, the locations contain much subsurface evidence of environmental use and adaptation by these culturally distinct people whose historic societies were similar to both interior northern California tribes and those of the Oregon coast.

Aside from the native sites, the area encompassed by Redwood National Park has a rich history dating from the days of coastal exploration by Spaniards, Britons and Americans. The early 19th century fur trade was represented by the activities of Jedediah Smith and others in the park. Coastal shipping, with attendant wrecks and disasters, was important to the area. Gold mining brought may Americans to the region, and there was even some silver and copper mining activity.

The area is crisscrossed with historic roads and trails, with ferries used to cross the Klamath before bridges were built. The lumber industry was active as far back as 1850, and logging railroads reached into the woods to bring timber to the mills. Hotels and resorts have operated historically at scattered locations up and down the coast. Coastal defense, during World War II, was an historically significant activity in the park.