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draft

DESERT NATIONAL SCENIC TRAIL

Feasibility Report and Environmental Assessment

U.S. Department of the Interior
National Park Service

Publication of this document should not be construed as representing either the approval or disapproval of the Secretary of the Interior. This document has been prepared pursuant to Public Law 90-542, the National Trails System Act, as amended, and provides information to the Secretary of the Interior for his consideration in making recommendations to Congress.

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SUMMARY OF FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

The idea of a border-to-border Desert National Scenic Trail originated with Russell Pengelly, an eastern Oregon schoolteacher and frequent visitor to the many outstanding natural areas of the Oregon desert. Pengelly formed the Desert Trail Association (DTA) in 1972 to promote the concept, seeking membership and participation from across the country. In 1976, the Association's lobbying effort resulted in the authorization of a feasibility study for the Desert Trail.

The study area for the analysis includes portions of California, Arizona, Oregon, Washington, Nevada, and Idaho. Much of the study area is within three major deserts: Sonoran, Mojave, and Great Basin. The more northerly portions of the study area, however, are grassland or high mountain forest. The study area is in general lightly populated, and much of the area is in public ownership. Climate varies from extremely hot and dry in southern desert areas to cold and moderately well watered in northern non-desert zones.

Prior to the initiation of the feasibility study, the DTA had intensively investigated and sought support for alignments only in Oregon and California, although at least two highly conceptual alignments for a border-to-border trail had been drawn. In view of the relatively undefined location of the Desert Trail, the approach taken in the feasibility study was a sifting process, involving the initial

formulation of a broad range of alternatives and the subsequent distillation, through public involvement and analysis, of that plan best capable of accomplishing the objectives.

Public attitudes toward the idea of a Desert Trail were tested by holding a series of public meetings throughout the study area and by mailing out a questionnaire for completion by all who expressed an interest. Expressions of interest in the Trail were modest, with neither proponents nor opponents generating a major outpouring of concern. Supporters, although of limited numbers, are in any event largely of one mind as to the desired design. The great majority favors a very simple trail design of cross-country character with as little construction as possible and few amenities such as water or campsites. Most express the view that the Desert Trail should be essentially different from other trails, providing the users with a challenge and the need to exercise their own resourcefulness and skills in such areas as map reading and compass use. Those opposing the concept do so on a variety of grounds, both economic and environmental; but the vast majority feel simply that the Trail would be a waste of the general taxpayer's money. They feel that opportunities for desert hiking and riding are already plentiful for those willing to invest time and trouble and that the individual should properly bear the costs of his own recreation.

Analysis of the alternatives indicates that costs and problems associated with implementation of a border-to-border Desert Trail would be

significant but not extreme. Implementation costs for the best alternative plan would approximate $6.2 million, with major costs incurred for preproject planning, especially archeological and rare plant clearances, and construction of portions of the Trail through particularly difficult terrain. Most of the Trail would be unconstructed, with guidance provided by point-to-point markers and detailed maps and trail guides. The remainder of the Trail would be constructed or routed on existing rights-of-way. Land acquisition for the Trail would be minimal, approximating $120,000. Annual operation and maintenance costs would amount to approximately $340,000.

All of the alternatives would include several areas of national significance, and these segments would be expected to attract significant levels of use. Substantial portions, however, would necessarily be remote from population centers and relatively unattractive to users. Consequently these portions would receive very little use. The total estimated initial use of the best plan would amount to about 110,000 visitor-days.

The project's adverse environmental impacts are expected to be minimal. The reasons for this are twofold: First, the alternatives under active consideration were selected in part because of their freedom from severe environmental problems. Several potential segments were briefly analyzed and then eliminated because of known environmental conflicts. Secondly, the plan includes safeguards for the avoidance of environmental conflicts

when detailed routes are finally selected. Minor negative impacts on soils, vegetation, cultural resources, and wildlife could be expected as a direct result of plan implementation; however, if the plan were to prove effective in accomplishing the environmental education objective, the indirect effect and indeed the net effect of the project on the environment could well be positive.

Although in absolute terms the Desert Trail would neither be prohibitively expensive nor particularly destructive to environmental values, there are a number of reasons for questioning the desirability of such a project.

First, the national significance of the Desert Trail as formulated is questionable. While the plan would incorporate a number of areas of recognized national significance and would, in a collective sense, provide a certain degree of national significance, much of the Trail would provide a relatively low-quality experience, which would be expected to attract very little use. The plan includes routing of substantial portions of the Trail on existing roads as an expedient to development of a separate trail right-of-way and the resulting need for extensive land acquisition. Adoption of the latter approach would substantially raise the cost of the project without measurably increasing overall quality or use.

Second, most of those expressing interest in the Desert Trail concerned themselves with limited segments, usually in their own state of residence. It appears that many prospective desert hikers and riders are concerned with the lack of past efforts to provide trails in their portion of the desert and see a Desert National Scenic Trail as a vehicle for addressing these localized concerns.

The demand for, and hence utility of, a continuous border-to-border trail appears to be limited. Very few public comments indicated an intention or desire to utilize such a Trail from border to border or even for any significant distance. It appears that the primary beneficiaries of a continuous trail would be a very few hardy and leisure-rich individuals willing and able to traverse not only the highly scenic and appealing sections of the route but also the considerably less attractive portions. Unfortunately, these "connector" sections would constitute a major portion of any alignment and would, because of environmental and safety considerations, be no less costly to implement and operate than would the sections providing for considerable public use.

Finally, there is every reason to believe that existing government programs, coupled with the natural processes of private enterprise, will produce far more timely and cost-effective answers to the bulk of the expressed demands. Opportunities for development of high-quality hiking and riding trails are scattered randomly across the various desert states. A number of such areas, offering trail potential ranging from a

few miles up to more than a hundred, were identified in the course of the feasibility study; however, because of the limited extent of the study area and the study's focus on the development of a continuous route, a number of desert areas with significant trail potential were undoubtedly bypassed.

The major unexploited opportunities for desert trail development are found on the National Resource Lands, administered by the Bureau of Land Management. Until quite recently, a systematic mechanism for the implementation of trails on the National Resource lands was lacking. However, with the passage of the Federal Land Policy and Management Act of 1976, a national policy was established to retain the great bulk of the public domain lands in public ownership and to manage them on a multiple-use basis. As a result of this Act, the Bureau is now and for several years will be engaged in a process of developing or updating comprehensive management plans for the National Resource Lands. This planning considers opportunities for all types of uses and is conducted with numerous opportunities for public involvement. It is within the context of this planning effort that steps can be taken both to provide needed trails and to protect resources of major significance to trail users.

While the creation of unconnected trail segments doubtless has considerably less symbolic appeal to many than a cross-nation National Scenic Trail, the National Trails System Act does provide a mechanism

for including trail segments of virtually any length in the National Trails System under the category of National Recreation Trails. Once trails are developed and made available for public use, the land managing agency can generally have the trail added to the System within a short time through fairly uncomplicated administrative procedures. Designation of several such National Recreation Trails in various types of desert surroundings would provide an excellent vehicle for encouraging increased use of and familiarity with the desert environments.

The greatest potential of the desert lands for hiking and riding, however, undoubtedly lies not in designated trail segments but rather in cross-country use in designated and de facto wilderness areas. This type of use offers a wealth of satisfaction to the user, providing opportunities to exercise technical competence while affording a degree of escape to solitude which is no longer available in most of the alpine wilderness areas. Unlike high mountain areas, where rugged terrain in many places confines travel to developed trails, the desert offers relatively few physical barriers to movement. The key to unlocking this potential is primarily information, both on the techniques of safe desert travel and on the attractions and character of the different areas. This information will be largely provided by the private sector as a natural response to demand. To some extent, this process has already been set in motion. Hiking and wilderness magazines have in recent years responded to a growing interest in desert travel by devoting ever more pages of

their publications to this subject. At least two new books are scheduled to be published on desert hiking in the near future. Organizations too, such as the Sierra Club and the DTA, have active programs for introducing novices to the skills and joys of desert travel. As interest in desert travel grows, the capabilities of these organizations to respond will grow as well.

The foregoing suggests several recommendations:

That a continuous Desert National Scenic Trail from Canada to Mexico not be implemented or further investigated.

That Federal and state land-managing agencies continue to investigate actively opportunties for stimulating trail use of the deserts through development of trails where feasible and desirable and through designation of such trails as National Recreation Trail components of the National Trails System.

That the private sector be recognized as having the primary role in the development and distribution of the information essential for the growth of widespread desert cross-country use.

INTRODUCTION

PURPOSE OF STUDY

The purpose of the study is to determine the feasibility and desirability of establishing a Desert National Scenic Trail from Mexico to Canada through the states of Arizona, California, Nevada, Oregon, Idaho, and Washington and, if such a trail proves to be feasible and desirable, to recommend a framework within which such a trail can be established.

HISTORY OF THE DESERT TRAIL

The Desert Trail was conceived in the middle 1960's by Russell Pengelly, an eastern Oregon high school biology teacher and naturalist. In 1972, Mr. Pengelly organized the Desert Trail Association, with the purposes both of promoting the creation of a Desert National Scenic Trail and generally encouraging the preservation and protection of the natural values of desert areas in Oregon and the other western states. A California chapter was subsequently formed to pursue the Trail concept in that state.

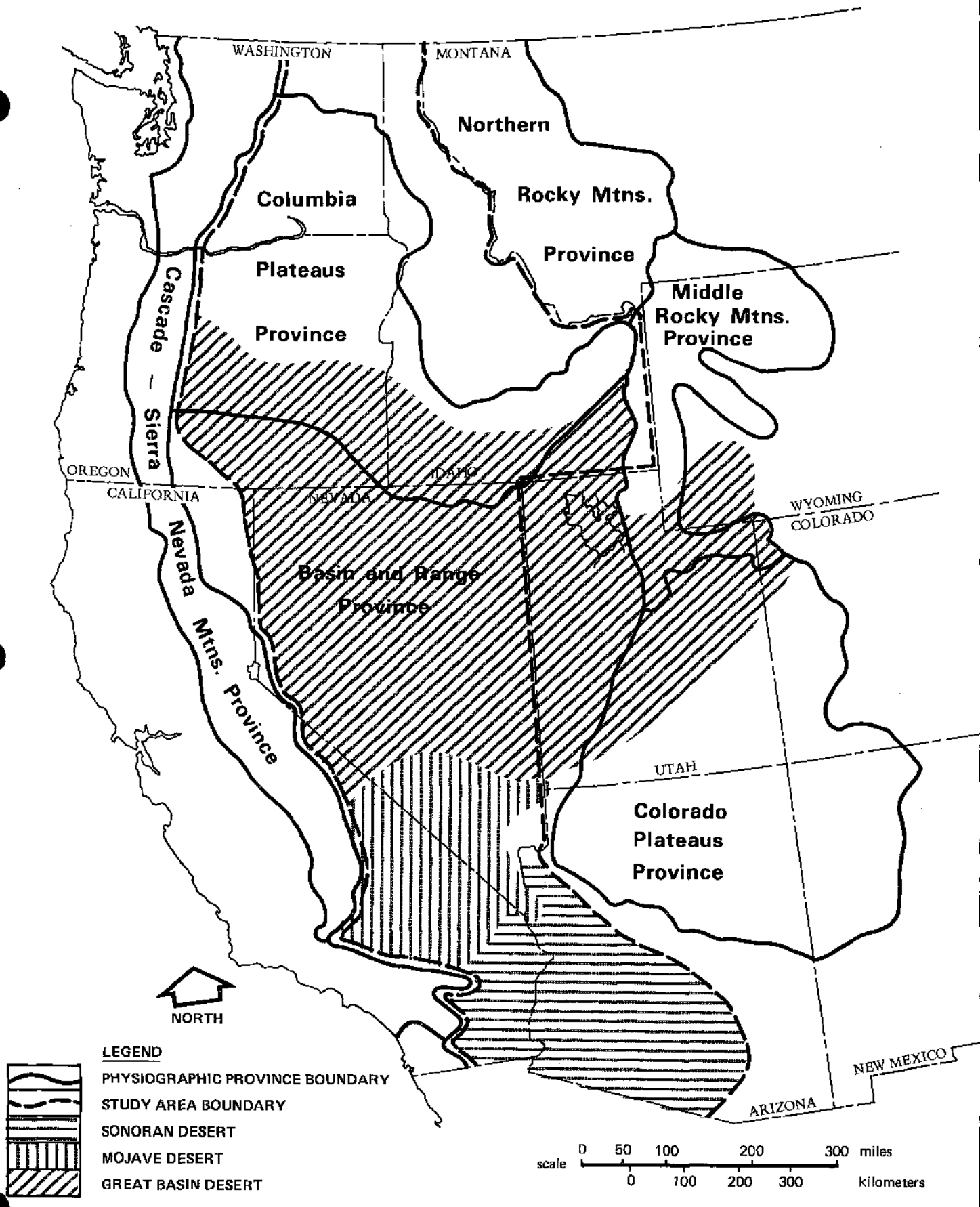
A feasibility study of the potential Desert National Scenic Trail was authorized in October 1976 (Public Law 94-527) and was initiated by the Bureau of Outdoor Recreation in the following October. The study responsibility was subsequently transferred to the National Park Service in March 1978, as part of a Department of the Interior reorganization.

THE STUDY AREA

STUDY AREA BOUNDARIES

The authorizing legislation for the Desert Trail Feasibility Study states only that the Trail shall extend through the states of Washington, Oregon, Idaho, Nevada, California, and Arizona between the borders of Mexico and Canada. Prior to the commencement of the feasibility study, the Desert Trail Association had published two maps of potential Desert Trail routes. The two routes were similar between the Canadian border and the Oregon-Nevada line but after that point diverged considerably, with one taking a route through eastern Nevada and terminating in Arizona and the other extending through western Nevada and terminating in California. Much of the Desert Trail Association routing in states other than Oregon and California was highly conceptual and without significant substance or public support.

Functionally, the study area is the area in which routes were considered. Its geographic limits include the portions of all the states named in the legislation commonly considered as desert environments, as well as the northeastern portion of Oregon, eastern Washington, and all of Idaho. These more northerly areas, while not desert for the most part, were necessarily included to provide flexibility in accomplishing the border-to-border objective indicated in the legislation. The study area is displayed on Map I.



ON MICROFILM

MAP 1
STUDY AREA
Desert Trail Feasibility Study

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LAND OWNERSHIP AND USE

The study area includes some 356,000 square miles. Of this area, approximately 70 percent is in public ownership, much of which is under the administration of either the Bureau of Land Management or the Forest Service and managed by these agencies on a multiple-use basis. Other significant Federal land managers are the Park Service, the Fish and Wildlife Service, and the Department of Defense. Map 2 shows Federal land ownership in the western states.

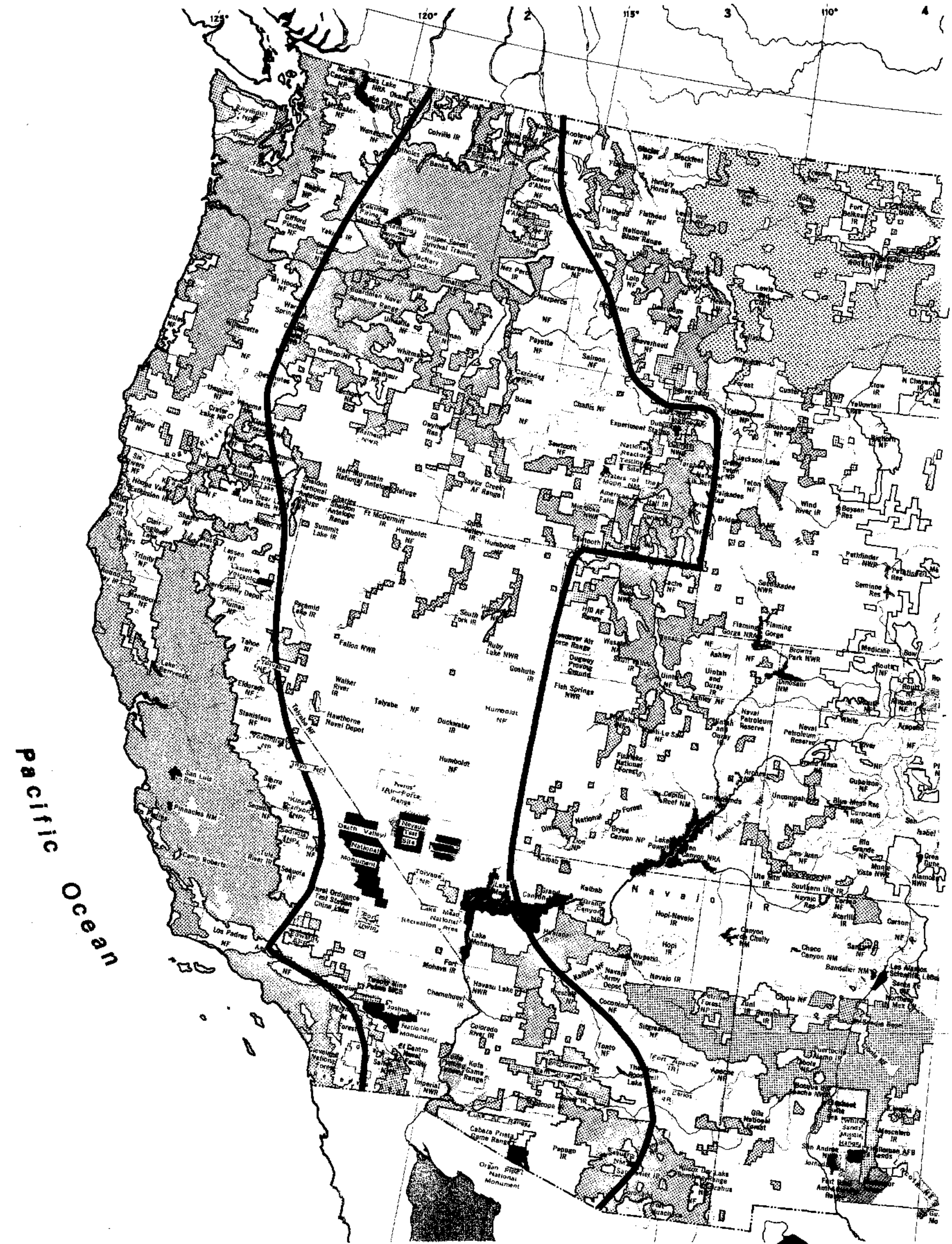
The roughly 30 percent of the study area in private ownership is concentrated in portions of the region having either sufficient rainfall or a significant source of irrigation water to support agricultural activities. Areas of concentrated private lands include the Salt River Valley, the Colorado River Valley, the Imperial and the Coachella valleys, the Humboldt and the Truckee-Carson valleys, the Snake River Plain, and the Walla Walla Plateau (includes Palouse Prairie).

Grazing constitutes the most widespread land use in the area, with more than 70 percent of the land used for this purpose. Grazing occurs in both forest and nonforest areas, on public and private lands, at a variety of elevations, and under many types of conditions. High mountain areas are grazed in midsummer, low deserts in midwinter. Quality of the grazing land varies substantially, ranging from areas producing high quality forage annually to those useable only in the occasional wetter-than-average year.

Accounting for use of about 8 percent of the total area, farming is accomplished largely by irrigation, the only major exception being in the northern part of the region where dryland grain farming is successful using alternate periods of cultivation and fallowness. Irrigated agriculture appears in the region wherever sufficient water is available. In addition to the major irrigated valleys mentioned above, numerous small valleys are also developed to, or even slightly beyond, the capacity of the water supply.

Timber production is a minor land use in the southern part of the study area but is highly significant in the more northerly areas, including the Blue Mountains and the Northern Rocky Mountains. Approximately 16 percent of the area is subject to this use.

Mining is economically important in parts of the study area but the acreage directly impacted is quite small since high-grade and economically extractable resources are concentrated. Large portions of the study area, however, contain low-grade mineral resources which may some day be worth extracting. Among the metals extracted in the study area are silver, gold, zinc, lead, copper, iron, mercury, and uranium. Nonmetals include limestone, gypsum, clay, pumice, talc, calcium chloride, diatomite, magnesite, phosphates, sand and gravel, and sodium and potassium minerals.



NORTH

MILES: 0, 100, 200, 300
KILOMETERS: 0, 100, 200, 300, 400, 500

Scale 1:7,500,000

STUDY AREA BOUNDARY

Private Lands

Bureau of Land Management

Other Jurisdictions as Indicated

MAP 2

LAND OWNERSHIP

Desert Trail Feasibility Study

ADAPTED FROM U.S.G.S. NATIONAL ATLAS-1970

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STUDY AREA BOUNDARY

1 Mostly cropland
2 Cropland with grazing land
3 Cropland with pasture, woodland, and forest
4 Irrigated land
5 Woodland and forest with some cropland and pasture
6 Forest and woodland grazed
7 Forest and woodland mostly ungrazed
8 Subhumid grassland and semiarid grazing land
9 Open woodland grazed (pinon, juniper, aspen groves, chaparral and brush)
10 Desert shrubland grazed
11 Desert shrubland mostly ungrazed
12 Alpine meadows, mountain peaks above timber line, sparse dry tundra, lava flows, and barren land
13 Swamp
14 Marshland
15 Moist tundra and muskeg
Urban areas - as defined by U.S. Bureau of the Census

ADAPTED FROM U.S.G.S. NATIONAL ATLAS-1970

NORTH

MILES 0 100 200 300
KILOMETERS 0 100 200 300 400 500

Scale 1:7,500,000

MAP 3

LAND USE

Desert Trail Feasibility Study

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In the energy field, the study area now produces only minimal oil and gas. However, substantial potential for such recovery has been identified in large portions of the study area. Geothermal resources are also prospectively valuable in a number of locations; and exploratory drilling is underway in several such areas, with at least some possibilities for near-term commercial power production. Coal is not found in the area.

The population of the study area is relatively small, and the proportion of the area committed to urban and industrial use is also small, accounting for somewhat less than 1 percent of the total area. The region in 1970 contained only four cities with populations over 100,000: Phoenix, Tucson, Las Vegas, and Spokane. The character of economic activity acts to limit the amount of land committed to industrial use since manufacturing activity is a relatively small part of the overall economy.

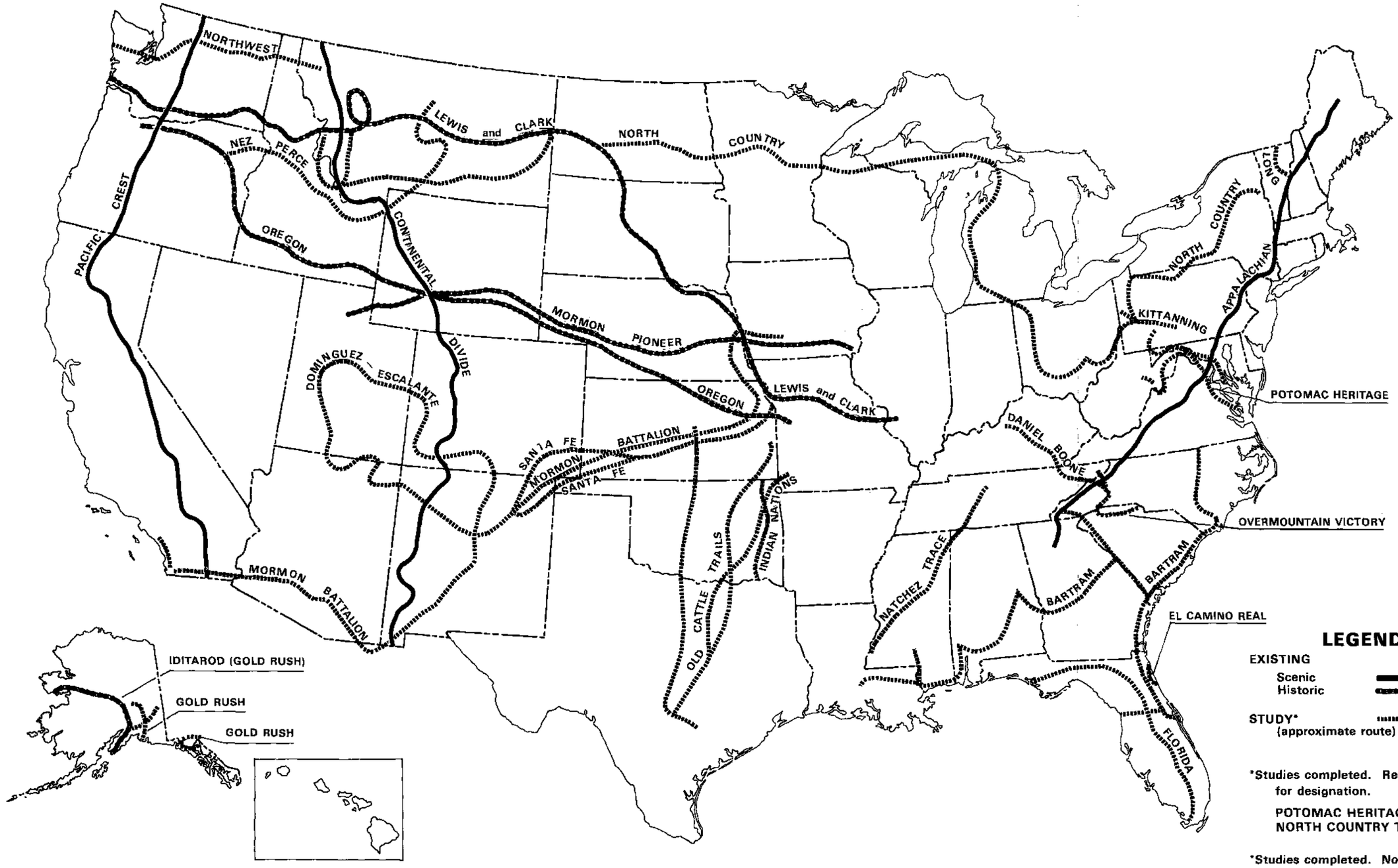
Military uses occupy rather substantial acreages in both the Sonoran and the Great Basin deserts. Major land areas in California, southern Arizona, and southern Nevada are committed to such uses as nuclear test ranges, aerial and surface gunnery ranges, and infantry and armor maneuvers. Because much of the land area is contaminated with unexploded ordnance, it is impractical in most cases to overlay other land uses involving significant human presence.

Much of the region is useful in the production of wildlife, with wildlife management an important consideration in the multiple-use management of much of the area. In addition to the multiple-use areas, there are several areas set aside primarily for the production and protection of wildlife species. Managed by either Federal or state authorities, these refuges are designed to serve in the production of common species for sport hunting or the preservation of dwindling species such as the desert bighorn, and the desert pupfish.

Much of the recreation use in the area occurs on multiple-use lands of the Forest Service and the Bureau of Land Management. A number of areas, however, have been set aside primarily for recreation use by Federal, state, and local agencies.

The National Park Service administers some fourteen different areas within the region, including national parks, monuments, recreation areas, and historical parks. All of the states within the region have active park programs and a number of sites. Local recreation areas are, for the most part, of limited size. Maricopa County, Arizona, which enjoys a wealth of major parks operated both by the County and by the City of Phoenix, is a notable exception.

The region is rather modestly represented at the present time in the Wilderness, Wild and Scenic River, and the National Trails systems. Only recently has the Bureau of Land Management obtained the authority



LEGEND

EXISTING
- Scenic
- Historic

STUDY* (approximate route)

*Studies completed. Recommended for designation.

POTOMAC HERITAGE TRAIL
NORTH COUNTRY TRAIL

*Studies completed. Not recommended for designation.

OLD CATTLE TRAILS
MORMON BATTALION TRAIL
LONG TRAIL
KITTANNING PATH
SANTA FE TRAIL
EL CAMINO REAL

MAP 4
NATIONAL TRAILS SYSTEM
National Scenic and National Historic Trails

BASIC DATA:
Taken from Heritage Conservation and Recreation Service Map of January 1979.

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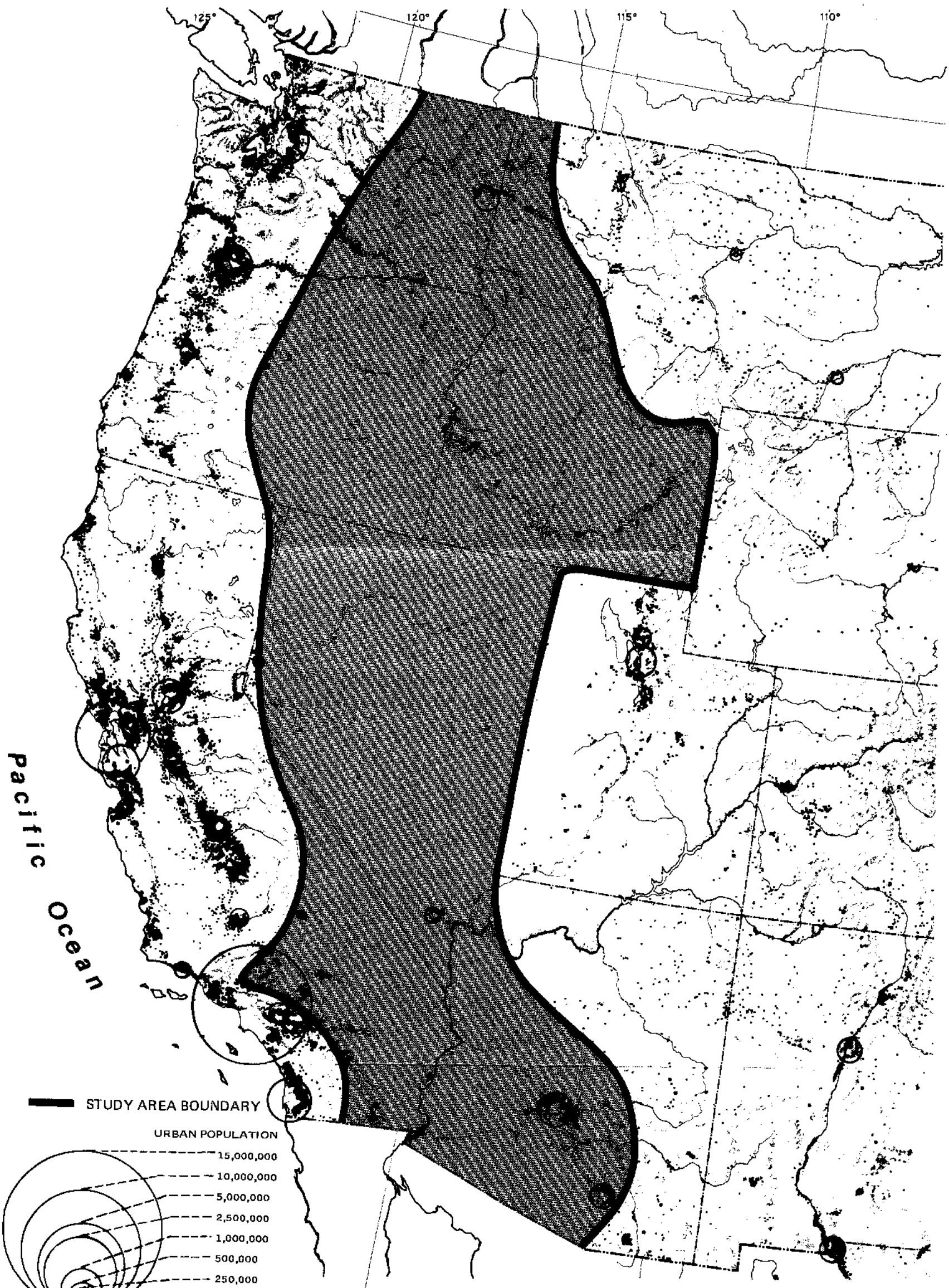
to study the potential of its lands for wilderness and make recommendations for such designation to Congress. Based on the large number of areas within the region apparently qualifying for such designation, it appears likely that substantial additions will be made in future years. Three of the area's rivers, the Middle Fork of the Clearwater, the Middle Fork of the Salmon, and the St. Joe River, all in Idaho, are included in the National Wild and Scenic Rivers System. Several additional rivers are presently being evaluated for such designation, including the John Day and Owyhee rivers in Oregon and the Bruneau, Moyie, Priest, and Salmon in Idaho. Two National Historic Trails, the Lewis and Clark and the Oregon trails, pass through the northern part of the study area. These trails were recently designated additions to the National Trails System and consequently have not as yet been implemented. Closely adjacent to the study area in several locations are the Pacific Crest Trail and the recently authorized Continental Divide Trail. In addition to these authorized components of the National Trails System, feasibility studies are in progress on two additional potential national scenic trails, the Nez Perce and the Northwest trails, both located in the northern part of the study area. Map 4 shows existing and potential national scenic and national historic trail components of the National Trails System.

SOCIOECONOMIC CHARACTERISTICS

The study area is in general quite thinly populated (approximately 4,000,000 in 1970), with only a few major cities. Some of the region's cities, however, particularly those in the desert portion of the area, are growing quite rapidly. Examples include Phoenix and Tucson in Arizona, Palm Springs in California, both Reno and Las Vegas in Nevada, and Boise in Idaho. Population projections indicate a 75 percent increase in the area by 2020, with population at that time amounting to more than 7 million. Map 5 shows the general existing population distribution.

A thumbnail sketch of the region's economy can readily be presented by comparing its sources of income with those of the rest of the country. A major economic activity of the region is agriculture, contributing approximately 7 percent of income as opposed to a nationwide figure of only 3 percent. Likewise, mining contributes about 2 percent of income in the region, compared to a figure of only 1 percent in the country as a whole. Another source of above-average income is government, which contributes 16 percent of regional income, 2 percent more than the national average. In one activity, manufacturing, the area is considerably less active than other parts of the country, earning only 11 percent of income from this activity compared with 22 percent for the



MAP 5

POPULATION

Desert Trail Feasibility Study

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rest of the nation. In other areas of economic activity, such as construction, transportation, trade, and finance, the region is similar to the national average.

CLIMATE

There is considerable climatic variation in the study area. Temperature variations are substantial between northern and southern areas, resulting both from differences in latitude and differences in elevation. For much of the study area, a dominant climatic influence is the Sierra Nevada/-Cascade Range, which produces a rain-shadow effect east as far as the Rocky Mountains and produces the Sonoran, Mojave, and Great Basin deserts. The portion of the study area lying within the Northern Rocky Mountain Province, of course, experiences considerably more precipitation than does the rest of the area. Tables 1 and 2 display climatic data for selected locations within the study area.

NATURAL RESOURCES

BASIN AND RANGE PROVINCE - A substantial portion of the study area is within the area defined by the physiographer Nevin Fenneman as the Basin and Range Province. (See Map 1). This large area, mostly enclosed by the Sierra Nevada/Cascade and Rocky Mountain ranges, consists of numerous north-south trending mountain ranges interspersed with alluvial fan basins of varying width. Faulting and uplift are responsible in large part for the formation of the Province's mountains and for the overall appearance of the terrain.

TABLE 1

Average Monthly Precipitation, Selected Study Area Locations

Data in Inches

	J	F	M	A	M	J	Jl	A	S	O	N	D	TOTAL
Phoenix, Az.	.73	.85	.66	.32	.13	.09	.67	1.12	.73	.46	.49	.85	7.10
Yuma, Az.	.39	.36	.24	.09	.01	.01	.23	.50	.38	.38	.12	.32	3.03
Palm Springs, Ca.	1.26	1.18	.72	.25	.02	.02	.28	.21	.34	.26	.40	1.34	6.28
Death Valley, Ca.	.21	.24	.17	.16	.07	.01	.12	.14	.11	.10	.18	.27	1.78
Las Vegas, Nv.	.53	.44	.35	.23	.12	.04	.50	.48	.34	.20	.31	.40	3.94
Reno, Nv.	1.19	1.02	.68	.54	.52	.37	.27	.17	.23	.51	.57	.70	6.77
Elko, Nv.	1.16	.89	.83	.82	.96	.71	.40	.30	.34	.75	.88	.53	8.57
Burns, Or.	1.62	1.27	.97	.75	.89	.88	.34	.29	.50	.86	1.16	1.43	10.96
Boise, Id.	1.47	1.16	1.01	1.14	1.32	1.06	.15	.30	.41	.80	1.32	1.36	11.50
Idaho Falls, Id.	.89	.71	.66	.66	.98	1.13	.46	.50	.63	.63	.62	.80	8.67
Sandpoint, Id.	4.49	3.30	2.97	1.97	2.05	2.33	.63	.83	1.71	3.37	4.21	4.88	32.74
Spokane, Wa.	2.47	1.68	1.53	1.12	1.46	1.36	.40	.58	.83	1.42	2.20	2.37	17.42

TABLE 2

Average Monthly Maximum/Minimum Temperatures, Selected Study Area Locations
Data in Fahrenheit degrees

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Phoenix, Arizona	65/38	69/40	75/45	84/52	93/60	102/68	105/77	102/76	99/69	88/57	75/43	68/39
Yuma, Arizona	69/42	74/46	80/50	89/58	95/64	104/72	108/80	107/80	104/74	92/62	78/50	70/44
Palm Springs, Calif.	69/40	73/44	79/47	86/52	94/58	102/64	108/73	106/71	102/66	91/57	79/48	70/42
Death Valley, Calif.	66/38	72/44	81/51	90/60	99/69	109/78	116/87	114/84	106/73	91/59	76/46	66/39
Las Vegas, Nevada	57/29	62/34	70/40	81/49	90/57	99/65	106/71	104/70	97/62	83/50	69/36	60/32
Reno, Nevada	45/18	51/23	56/25	64/30	72/37	80/43	91/47	89/45	82/39	70/31	56/24	46/20
Elko, Nevada	37/9	43/16	51/23	61/29	70/35	80/41	91/47	89/44	79/35	66/27	51/20	40/12
Burns, Oregon	35/15	41/20	48/25	59/32	67/39	74/44	86/51	84/49	76/41	63/33	48/24	38/19
Boise, Idaho	37/21	44/27	52/31	61/37	71/44	78/51	91/59	88/57	78/49	65/39	49/31	39/25
Idaho Falls, Idaho	30/12	34/15	43/21	57/31	68/40	76/45	87/52	84/50	76/41	62/32	44/21	33/14
Sandpoint, Idaho	32/19	37/22	46/27	58/34	68/40	73/45	83/48	81/46	71/41	57/34	42/28	34/23
Spokane, Washington	31/20	39/25	46/29	57/35	67/43	74/49	84/55	82/54	73/47	58/38	42/29	34/24

Although Fenneman divided the Basin and Range Province into several physiographic sections, it is more useful in this analysis to shift from physiographic to biologic subdivisions and organize the remainder of the discussion in terms of three major desert divisions: Sonoran, Mojave, and Great Basin.

SONORAN DESERT - Physiographically, this area, shown on Map 1, consists of broad sandy or rocky plains with interspersed, detached mountain ranges. In comparing the Sonoran Desert portion of the province with more northerly portions, it might be said that here there is more basin and less range. Mountain ranges are generally lower and more heavily eroded, many of them consisting primarily of Precambrian rock. Included within the area of the Sonoran Desert but differing somewhat from the rest in physiography is the Salton Basin, much of which is below sea level and was once the northern extension of the Gulf of California. The Basin is protected from the sea now by the broad delta deposits of the Colorado River. The portion of the Sonoran Desert in California is sometimes called the Colorado Desert.

Plant life in the Sonoran Desert is quite varied, but a common thread throughout the Desert is the creosote bush. Found in most areas mixed with other shrubs and trees, the creosote bush does form pure stands in some areas. Other shrubs commonly found in the Sonoran Desert are burrobrush, brittlebrush, and crucifixion thorn. An unusual feature of the Sonoran Desert, contrasting particularly with the shrub-dominated

deserts to the north, is the large variety of tree species. Among others are to be found the smoke tree, the desert willow, the paloverde, the ironwood, the elephant tree, and the honey and the screwbean mesquites. Found in the better-watered drainages are willows, cottonwoods, and salt cedars; and in a few locations in the mountains surrounding the Salton Sea and in the Kofa National Wildlife Refuge are found groves of the native California palm.

Although cacti are found throughout the Sonoran Desert, it is in the upland areas of Arizona, on the better-watered and better-drained slopes, that the cacti provide their most magnificent displays. The saguaro, rare west of the Colorado River, dominates the scene with its massive (up to 50 feet high) upright form; but a wide variety of smaller cacti, including the cholla, the buckhorn, the beavertail, and the prickly pear, add to the ornamental garden atmosphere of the area. Ocotillos, yuccas, agaves, and a wide variety of flowering ephemeral plants complete the unique floral display of the region.

Although not always apparent to the casual visitor, the fauna of the Sonoran Desert is quite varied. Bird life is particularly varied, with a wide variety of both resident and migratory species. A common species of considerable interest to many visitors is the roadrunner. Rodents dominate the assortment of mammals, with a wide variety of rats, mice, and ground squirrels. Larger species include coyote, kit fox, gray fox, lynx, mule deer, desert bighorn sheep, and the endangered Sonoran

pronghorn, now limited to a few animals in extreme southwest Arizona. A species unique to the Arizona portion of the Sonoran Desert is the pig-like javelina.

Among the wide assortment of amphibians and reptiles are found the now rare desert tortoise and, confined to Arizona, the poisonous Gila monster. The notable snakes of the region include several varieties of rattlesnake, including most commonly the Western diamondback, and the sidewinder, and the coral snake, which is limited to Arizona.

The climate in the Sonoran Desert, as suggested by the temperature and precipitation data in tables 1 and 2, is hot and dry. Summer temperatures are extremely high, largely precluding midday active recreation use, but winters are mild and ideal for all types of outdoor recreation. Although rainfall is universally low in the Sonoran Desert, the timing of the precipitation differs significantly between eastern and western sections. In the Arizona desert, rain occurs both in the winter, as a result of general Pacific storms, and in the late summer, as a result of storms originating to the south. As a result of its dual rainy season, the Arizona desert exhibits a range of plant and related animal life not found elsewhere in the Sonoran Desert. Western portions of the Sonoran Desert receive most of their precipitation in the months of December, January, and February.

Scenic highlights in the Sonoran Desert include both geologic displays and vegetative displays of all sorts. Examples of geologic displays are the eroded crags and pinnacles of the volcanic Kofa and Castle Dome mountains, the colorful rounded hills of the Carrizo region of the Anza-Borrego State Park, and the massive sand dunes of Imperial East Mesa. Displays of exotic vegetation, such as the various cacti, the elephant tree, and the smoke tree, occur on a year-round basis, but it is in the seasons following the rains that the visual effect is at its best. In Arizona, there are two such seasons, with unique sets of ephemeral plants, one in the spring following the winter rains and another following the summer rains. In western areas the floral season occurs in early spring, the intensity of the display providing an excellent index of the intensity of the winter rains.

MOJAVE DESERT - The Mojave Desert is located north of the Sonoran Desert, extending northward far enough to encompass Death Valley in California and a substantial portion of southern Nevada. Map 1 shows the general area covered.

Physiographically, the southern portion of the Mojave is similar to the Sonoran Desert, with short, low ranges of largely Precambrian rocks. The northern portion of the Mojave Desert area more closely resembles the Great Basin, with longer, higher mountain ranges displaying somewhat more recent strata. In the central portion of the Mojave, the predominant north-south orientation of the ranges gives way to a jumbled

mass of range orientations and rock types, for it is here that the influence of the Garlock Fault System (east-west) intersects with the influence of the great San Andreas Fault (north-south).

The Mojave is higher in elevation than the Sonoran Desert, generally 3,000 to 5,000 feet, with some extremely high ranges such as the Panamints, with peaks well over 10,000 feet. A significant feature of the Mojave is the large number of dry lakes. Since the Mojave is internally drained, moisture deposited on the desert runs to the lowest point and quickly evaporates, leaving behind the salts leached from the soil enroute. Other important features of the Mojave are its sand dunes, formed by the erosion of older granitic mountains. An outstanding example is the Kelso dunes area.

Biologically the Mojave is a transition zone between the Sonoran and Great Basin deserts and contains many plants common to those deserts in addition to quite a number of endemic varieties. Included among the Mojave's tree species is the Joshua tree, which in large part defines the extent of the Mojave and which appears in some areas in dense forests. At higher elevations are found species such as pinyon pine, juniper, and desert scrub oak. Willow and cottonwood, of course, are found in the better-watered drainages such as the upper Mojave River.

The Mojave is the northern limit of the creosote bush, which appears in pure stands in some of the basins. Other common shrubs include

burroweed; rabbit brush; and, at higher elevations, blue sage. Sagebrush also appears in the Mojave, though it is for the most part confined to the more northerly portions of the area. Sheepfat is found in the dry lake basins, along with other plants tolerant of alkaline soils. A variety of annuals provides springtime color on the Mojave.

The range of wildlife species in the Mojave is similar to that of the Sonoran Desert, with particularly large varieties of birds; reptiles; and, among mammals, rodents. Three animals are of particular interest: the desert bighorn sheep, the pupfish, and the burros. The desert bighorn sheep has long been a subject of concern because of its limited numbers. In many places in the Mojave, considerable effort is being made to preserve this species. A substantial portion of southern Nevada is included in the Desert National Wildlife Refuge, which is managed by the Fish and Wildlife Service as bighorn sheep habitat. Extensive efforts are also being made in California both on National Resource Lands and within Death Valley National Monument. In general, the habitat most critical to bighorn sheep is the very high and very isolated terrain, along with adjacent watering holes. Bighorn sheep are extremely sensitive to human presence.

Pupfish have become well-known to the American public during the last few years as a result of litigation having to do with protection of some extremely rare species. Pupfish are relic populations of fish which, in an earlier and much wetter age, inhabited the once large lakes of the

Mojave area. As the Sierra were uplifted and the rain shadow effect appeared on the Mojave, the lakes shrank until those fish species capable of surving were confined to smaller and smaller areas. Today, the pupfish are confined to a few springs. There are several species, some reasonably common, and others, such as the Devil's Hole and Owens River varieties, having extremely limited ranges. Another species, the Tecopa pupfish, was recently declared to be extinct.

Burros were first imported into the Mojave by early-day miners. Those which were released by or escaped from man have been extremely successful in adapting to life on the desert and have reproduced to the extent that they are now a major nuisance and a threat to the survival of indigenous wildlife species, particularly the desert bighorn. Burros are, however, a source of considerable interest to visiting recreationists.

As suggested by the climatic data in tables 1 and 2, the Mojave is a dry (1.5-5 inches of annual precipitation) and frequently very warm area. Most of the rain falls in winter, although some rain does occur in brief but intense summer thunderstorms. Located within the area is Death Valley, long a symbol of the most extreme desert heat. Much of the Mojave is, of course, considerably higher than Death Valley; hence, temperatures are not nearly so extreme. Nevertheless, temperatures generally preclude much active midsummer outdoor recreation use. Winter midday temperatures are comfortable from November through March, even in Death Valley, though nights can be quite chilly in the higher

elevations. Occasional snow powders the Mojave uplands during this period. High winds, either from the coast or from the northeast, (known as Santa Anas) blow in both winter and spring months, sometimes producing violent sandstorms over a wide area.

There are many attractions on the Mojave for the wandering recreationist. Among the geological areas of interest are wonders such as Death Valley, with its incredible elevation differences and its graphic displays of faulting; the extensive sand dunes of the Devil's Playground; the deeply eroded and colorful Afton and Amargosa canyons; the beautiful uplifted and weathered Cima Dome; the recent volcanic displays of the Cinder Cone Natural Landmark; and the fossils of the Rainbow Basin.

Vegetation on the Mojave provides another range of attractions for the visitor. The Joshua tree, of course, is a permanent and striking scenic element of the Mojave, in some places growing in dense forests. The Mojave's floral season is also a tremendous attraction for the recreationist. The floral displays occur from February through May; however, their specific timing varies considerably depending on elevation and rainfall. Spring floral displays following wet winters can be very striking.

GREAT BASIN DESERT - The area categorized as the Great Basin Desert lies principally within the Basin and Range Province; however, the northern

end of the Desert overlays the southern reaches of the Columbia Plateaus in both Oregon and Idaho.

The Great Basin Desert is high desert, with ranges more than 11,000 feet rising from basins frequently already 4-5,000 feet. An important characteristic of the Basin and Range portion of the Desert is that it is internally drained; accumulated rainfall and snowmelt evaporate from the numerous large dry lakes which are found throughout the region. The Columbia Plateaus portion of the Desert is drained by the Snake River system. Physiography in the Columbia Plateau portion differs considerably from the lower portion in that the landforms are a product more of massive lava flows rather than the fault blocking which is characteristic of the Basin and Range Province. Found in the Columbia Plateaus portion are the buttes and mesas of the Harney High Desert, the deeply incised "breaks" of the Owyhee and Snake rivers, and the broad expanses of lava flows on the Snake River Plain.

The Great Basin Desert's considerable relief produces a wide variety of vegetation; however, this variety is not always apparent to the casual observer, who may find his senses somewhat dulled by the apparent endless expanses of sagebrush. At lower elevations, this desert is dominated by low shrubs, lacking the large cacti and small trees of the more southerly deserts. Sagebrush is a characteristic shrub of the Desert, giving way to the almost as plentiful shadscale in more alkaline areas. Other common plants include hop sage; mule fat; rabbit brush; and, in basin

areas, greasewood; salt bush; pickleweed; and salt grass. As elevations increase, vegetation changes to pinyon-juniper woodland; mountain shrubs (Gambel oak, bitterbrush, mountain mahogany, ceanothus); aspen forests; and finally coniferous forests.

The variety of life zones in the Great Basin Desert produces a commensurate variety of animal species. Large mammals include mule deer, elk, antelope, desert bighorn, black bears, and mountain lions. Other species of interest include foxes, bobcats, and coyotes, and a supporting cast consisting of numerous varieties of rodents. Reptiles are common and varied, and bird life, both resident and migratory, is tremendously varied, with numerous species of raptors, waterfowl, and songbirds. Substantial portions of the Desert are committed to primary use for the preservation and enhancement of different wildlife species.

Climatically, the Great Basin Desert is characterized by cold winters, hot summers, and relatively little precipitation, although generally more than in either the Mojave or Sonoran deserts. Tables 1 and 2 present climatological data for several points within the Great Basin Desert and serve to further describe weather patterns.

In addition to its many localized scenic attractions, the Great Basin Desert's very vastness and seeming emptiness are scenic attractions in themselves. Views from the ranges offer almost endless vistas of largely untouched terrain. Beyond this macroattraction, the Desert does offer a

wide range of more localized scenic attractions, including hot springs; graphic examples of recent volcanism, sculptured and subtly-colored rock formations; and in the right season, colorful wildflower displays.

COLUMBIA PLATEAUS PROVINCE - The Columbia Plateaus Province is generally an area of extensive lava flows lying north of the Basin and Range Province and between the Cascade-Sierra and Northern Rocky Mountain provinces. As portrayed on Map 1, the Province includes substantial portions of eastern Washington, eastern Oregon, and southern Idaho. Climatically, the Province is not unlike the Great Basin, with cold winters, hot summers, and relatively limited precipitation. Climatic data is shown on Tables 1 and 2. The Province is divided into several sections, described in more detail below.

WALLA WALLA PLATEAUS SECTION - Occupying eastern Washington and eastern Oregon west of the Blue Mountains, the Walla Walla Section is a rolling basaltic plateau with young incised valleys. The area is now largely agricultural, particularly in the loessial hills of the Palouse and Nez Perce Prairies. The natural vegetation is mixed sagebrush/grassland with scattered pines.

BLUE MOUTAINS SECTION - The Blue Mountains, occupying northeast Oregon, predate the surrounding terrain and rise like an island out of the surrounding sea of basalt. Rising to elevations of more than 10,000 feet, these forested mountains are, in many physical and land-use

respects, similar to the mountains of the Northern Rocky Mountains Province which will be discussed below.

PAYETTE SECTION - This section includes both southeast Oregon and southwest Idaho. This is an area of mesas deeply dissected by streams such as the Snake and Owyhee rivers and their many tributaries. The deeply incised canyons offer dramatic scenery and isolation, both for man and animal, from the trappings of civilization. Natural vegetation in the area includes sagebrush at lower elevations, turning to juniper and mountain mahogany at higher elevations. Extensive stands of juniper are found in some portions of the section.

HARNEY SECTION - The Harney section occupies the southcentral portion of Oregon. An area of scenic buttes and mesas separated by wide areas of lava dust and sand, the Harney Basin is internally drained, having been hydrologically isolated from the Snake River system by ancient blocking lava flows. The natural vegetation of the area is grass and sagebrush mixed with some stands of pine and juniper. A prominent feature which defines the eastern extent of the Harney Section is Steens Mountain, a massive 50-mile-long fault block which rises more than 10,000 feet in elevation and drains most of its considerable snowmelt into Harney and Malheur lakes.

SNAKE RIVER PLAIN SECTION - This section is a plateau formed by very recent lava flows and extends along the base of the Northern Rockies from central Idaho east almost to the border with Montana. A substantial

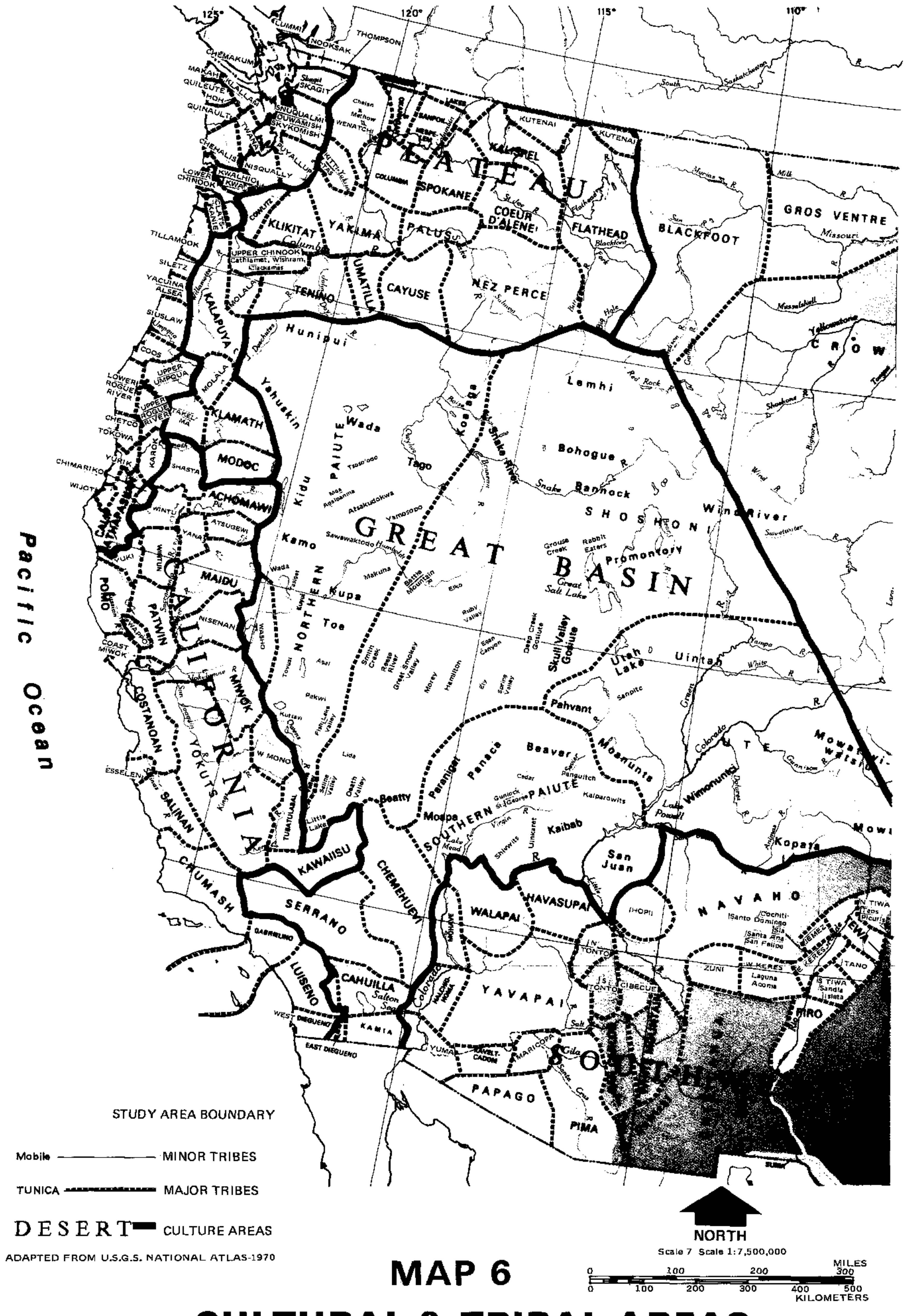
portion of the Plain has lava so recent that it is almost unweathered; hence much of the Plain is little developed and offers extensive opportunities both for escape from civilization and for viewing the results of extensive volcanism. Flora on the Plain is largely bunchgrass and sagebrush. Some loess-covered sections, however, do provide good cropland.

NORTHERN ROCKY MOUNTAINS PROVINCE - The Northern Rockies occupy most of northern Idaho. Physiographically the Northern Rockies consist of high, steep mountains with narrow intervening valleys. Much of the land is lightly used, with substantial portions committed to wilderness use; and most of the area is attractive for a variety of recreation uses. This area offers particularly high-quality cold-water fishing and big-game hunting. Agriculture is limited largely to small irrigated operations in the valley bottoms.

The Northern Rockies are largely forested, with pine and fir at intermediate elevations and fir and tamarack in the higher zones. Climatologically the area is considerably colder and wetter than other portions of the study area Higher elevations are accessible only for a short period in the summer.

CULTURAL RESOURCES

PREHISTORY - Prehistory of the study area is far too complex for detailed discussion here and, in any event, is of limited relevance to the



MAP 6

CULTURAL & TRIBAL AREAS

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project. Map 6 indicates tribal distributions prevailing in the mid and late 19th Century. Culture areas, also shown on the map, represent groupings of tribes with similar cultural characteristics. As indicated, the study area overlays four major culture areas: Plateau, Great Basin, California, and Southwest.

HISTORY-The earliest European contact -- Spanish exploration and missionary activity -- occured in the most southerly portions of the study area. As early as the mid 16th Century, Spanish explorers such as Nisa, Cardenas, Coronado, and Diaz traveled north from Mexico into much of what is now the State of Arizona. They were followed in the 18th Century by those such as Garces, Kino, and De Anza, who ranged throughout Arizona and southern California. Not until the early 19th Century were other portions of the study area explored to any considerable extent. A central focus in this later period was the northern portion of the study area, explored by such people as Lewis and Clark, McKenzie, and Thompson for travel routes and fur-trapping potential. By the middle of the 19th Century, fur trappers had extended their activities throughout much of the study area; and westward-bound emigrants began to trickle along the soon-to-be-crowded emigrant trails.

The great western movement of the 19th Century proceeded along several major trails extending through the study area. Best known, of course, is the Oregon Trail. Other important routes included the California

Trail (with several variations for crossing the Sierra Nevada Range), the Applegate-Lassen Trail, and the Noble Road.

Because of the harsh environment, few of the emigrants chose to stay in the study area, choosing rather to move on to the West Coast. However, by the late 19th Century mining had become a significant force drawing settlers into portions of the study area. Important precious metal discoveries in Arizona, Nevada, and Idaho produced large, but often temporary, cities almost overnight. The remnants of these boomtowns in many locations in the region are now important historical attractions.

By the beginning of the 20th Century, the less volatile but longer-term agricultural, grazing, and forestry values of the region had been recognized; and the potentials offered by these resources were well on their way to being realized. Valleys with good soil were being farmed to the limits of their capability, extensive grazing of cattle and sheep was underway to feed the growing coastal markets, and forest resources were being increasingly utilized.

DEMAND FOR A DESERT TRAIL

Several indicators of demand for a Desert Trail were examined. Among them are the degree of interest expressed in the Desert Trail, the results of broad-scale surveys regarding public interest in trail activities, and the observed patterns of use on existing trails. These indicators are discussed in turn below.

EXPRESSED PUBLIC INTEREST

The Desert Trail Association, headquartered in Burns, Oregon, has been in existence for several years and claims membership of approximately 250. Most members are located in Western states, but there are members located throughout the country and in a few foreign countries. A chapter has also been formed in California, with membership of approximately 30.

During the public involvement stage of the study, public meetings were held on weekday evenings at 11 different locations within the study area. Over 1,500 individual notices were sent out prior to the meetings to individuals and organizations thought to have an interest in the Desert Trail. In addition, press releases were issued to all newspapers in all the study states. Turnouts at the meetings were very modest, ranging from a low of 2 at the Lake Havasu City meeting to a high of 30 in Phoenix. A total of 180 individuals attended the meetings, of which some 121 represented interested citizens and the remainder represented attendance by various government agencies with responsibilities related

to the Trail. A majority of the citizens attending the meetings expressed support for the idea of a Desert Trail; however, a significant number expressed strong opposition.

The 11 public meetings were supplemented by an information packet and questionnaire distributed both to the meeting attendees and to anyone writing in or calling in to request it. The availability of the information packet/questionnaire was also announced in both the meeting notices and the press releases. Approximately 1,600 copies of the packet were distributed. Of these, approximately 200 were returned, 80% of which favored a Desert Trail and 20% of which opposed the Trail's implementation. Because the questionnaire was the method used to record formally the views of the public meeting attendees, a considerable portion of the returned questionnaires were completed by attendees.

SURVEY INDICATORS

Both onsite and household surveys are conducted periodically by recreation planning and resource management agencies to determine the extent of existing use and potential demand for certain recreation activities. The results of some of the surveys pertaining to trail demand in portions of the study area are discussed below.

Arizona conducted household surveys of perceived recreation needs as part of its 1977 State Comprehensive Outdoor Recreation Plan (SCORP) update. Among the households surveyed, 0% indicated a need for

additional hiking and backpacking trails, while 1% indicated a need for additional horseback riding trails. While these statistics do not indicate that additional trail opportunities would not be used, it does convey the sense that trails are a relatively low priority need in Arizona.

California's Department of Parks and Recreation utilized its computer-based PARIS system to project the need for additional recreation facilities by county. The Table below displays PARIS needs estimates for trails for 1980 and 1990 for the counties through which the Desert Trail would pass.

TABLE 3

Miles of New Trail Needed: California Counties

County	1980	1990
Imperial	432	587
San Diego	1699	2415
Riverside	1330	2103
San Bernardino	3139	4428
Inyo	382	763

The data shown indicate substantial need for additional trails in the California portion of the study area. State officials, however, do express some reservations about the utility of the PARIS data in an absolute sense because of some data inadequacies on both the supply

and demand sides. PARIS data is considered to be primarily useful in a more relative sense.

The most recent SCORP demand/supply estimates for Nevada show quite substantial surpluses in trails in that State. For backpacking, the data indicate a statewide surplus of 2,970 miles in 1985, shrinking down only to 2,950 in 1995. For horseback riding, Nevadans will enjoy a statewide surplus of 2,840 miles in 1985 and 2,790 in 1995. The plan does indicate reservations regarding the adequacy of some of the inventoried trails to accommodate use.

The Oregon SCORP projects needs for trails by county up to the year 1990. The table below displays needs for the two counties potentially traversed by the Desert Trail.

TABLE 4

Miles of New Trail Needed: Oregon Counties

County	1980	1990
Harney	-87	-83
Malheur	21	27

As indicated above, the statistics indicate a surplus of trails in Harney County and a deficiency in Malheur. In addition to developing statistics, the State also conducted a series of public meetings to determine perceived needs. Residents of both counties attending the meetings indicated a need for additional miles of trails.

Idaho's 1977 SCORP demand/supply projections indicate that needs for trails have been satisfied at least through the year 2000.

Overall, the SCORP projections are mixed, ranging from indications of extensive need in California to extensive surplus in both Nevada and Idaho. Projections for Oregon and Arizona provide limited support for new trail investments.

USE OF EXISTING TRAILS

Although direct expressed interest and household survey results are important indicators of public demands, the actual on-site use of a trail is best estimated based on experience with a relatively similar facility. The reason for this is that many who see no need for a facility will nevertheless make use of it once it is constructed. In addition, some of the use already existing in other areas may be diverted to the new site.

Ideally, use of the Desert Trail would be estimated based on experience with a closely similar facility, one with national recognition and a similar array of attractions. Unfortunately, such a comparable trail does not exist. There are relatively few nationally recognized trails, and those are all located in high mountain surroundings very much unlike the Desert Trail.

Differences notwithstanding, experience with the Pacific Crest Trail (PCT) does offer at least something of a basis for estimating use of the

Desert Trail since it is of national significance and provides long distance trail opportunities. Portions of the PCT have been in existence for some time and there is at least some data, albeit primitive, on its use.

Data from the PCT cannot, of course, be used directly for estimating Desert Trail use since the land resources are so very different. Much of the PCT is located in extremely scenic alpine terrain with high appeal to a wide range of recreationists. Although the scenic appeal of the desert is also intense to many, in general desert scenery has been less appreciated and sought-after. In addition, the areas traversed by the PCT tend to lend themselves more readily to trail use, e.g., the Sierra Nevada Range in mid-summer demands very little preparation and even less skill from users, and permits them to carry very modest amounts of equipment. Consequently, it is possible for the elderly, families with small children, and recreationists with only a casual interest in backpacking to use portions of the PCT. It is expected that the Desert Trail, given the cross-country design and the burden of planning and supply placed on the user, would provide a considerably more demanding experience which would tend to limit the range of users.

Also tending to reduce Desert Trail use relative to the Pacific Crest Trail would be the general unattractiveness of substantial portions of the Desert Trail in summer months, when much of the average person's recreation time is available. It is expected that much of the Desert

Trail use would occur in spring months, when water is most likely to be available and floral displays are at their finest. A final reason to expect lower use on the Desert Trail is its generally greater isolation from population centers. The large population centers on the Pacific Coast are located in close enough proximity to the PCT to allow relatively frequent weekend use, and in some cases even day use, by residents. Use of most of the Desert Trail will require considerably more travel for most users.

In view of these considerations, it is anticipated that use of the Desert Trail will be only a fraction of that experienced on the PCT. Based on PCT use patterns, adjusted downward to reflect the above-mentioned factors, the following five categories of annual use are estimated for segments of the Desert Trail:

Segment Description	Category	Visitor Days per Mile
Segments with high scenic attractions, readily accessible to day use and weekend use from major metropolitan areas.	I	300
Segments with high scenic attractions, but located beyond convenient weekend travel distance from major metropolitan areas.	II	120
Segments with moderate scenic attractions, readily accessible from a major metropolitan area.	III	45

	Category	Visitor Days per Mile
Segments with moderate scenic attractions, not accessible for weekend use from a major metropolitan area.	IV	20
Connector segments having little scenic appeal. Chiefly useful to those making very long distance trips.	V	5

SUMMARY OF DEMAND INDICATORS

None of the demand indicators considered suggests intense demand for implementation of the Desert Trail. Public response to the project was minimal, with a considerable portion of those taking a stand on the project expressing opposition. Survey data show positive support for trail development only in California: in the other four states the data is negative or at best marginal. Finally, a comparison of the Desert Trail's probable attractiveness with an existing National Scenic Trail suggests it would attract fairly modest levels of use.

ALTERNATIVE DESERT TRAIL PLANS

PLAN GENERATION PROCESS

PLANNING CONSTRAINTS AND OBJECTIVES - The concept of the Desert Trail authorized for study is quite broad and provides considerable leeway for the consideration of alternatives. However, the National Trails System Act does impose several constraints on the design and location of a national scenic trail. National scenic trails must:

1. Have sufficient quality to draw users from across the conterminous United States.

2. Be primarily land-based.

3. Be continuous.

4. Be several hundred miles in length.

Recognizing the above constraints as setting minimum requirements, alternative plans for the Desert Trail were formulated based on realizing several objectives. These objectives are:

1. To provide a Trail extending from the Mexican border to the Canadian border.

2. To provide Desert Trail opportunities for a wide variety of user groups and population centers.

3. To include a variety of desert-related natural and cultural phenomena.

4. To minimize adverse environmental impacts and utilize the Trail where possible as a tool for reducing existing or prospective environmental damage.

5. To minimize program and opportunity costs.

PUBLIC INVOLVEMENT PROCESS - Because the route and the character of the Desert Trail were both largely undefined at the start of the feasibility study, the first step taken in the study consisted of establishing several State Desert Trail Task Forces to tackle the various routing and design questions in their various states. Such groups were formed in all the states named in the authorizing legislation with the exception of Washington. (An early determination was made that routing the Trail through eastern Washington would be impractical due to land use and ownership patterns.) The Task Forces, which consisted primarily of representatives of prospective user groups and land management agency personnel, met several times and produced a number of options both for routing and designing the Trail.

The Task Forces began their work by formulating a wide range of route options. Following further analysis, many of these were rejected based on insurmountable institutional obstacles (e.g., military installations), environmental concerns (e.g., critical wildlife habitat), and economic

concerns (e.g., concentrations of private land). Routes found by the Task Forces to be feasible and desirable are shown on Map 7.

Following the Task Force activities, 11 public meetings were held in 5 western states to obtain public reactions to the Task Forces' options and to receive any additional original ideas. The meetings were supplemented by a combination information booklet/questionnaire distributed both to the public meeting attendees and to others requesting it. Approximately 1,600 questionnaires were distributed during the public involvement process; about 200 were eventually returned and were used in appraising route and design options and in developing recommendations.

SELECTION OF PLANS FOR FURTHER ANALYSIS - The expression of public interest provided the primary filter for elimination of the less desirable Task Force generated segments. In addition, two major segments among the Task Force alignments had to be dropped for other reasons. The routing along the east shore of Pyramid Lake was precluded by a decision by the Pyramid Lake Paiute Tribe not to permit passage of the Trail across the Reservation. Also, the Fish and Wildlife Service reanalyzed the potential impact of the Trail on critical habitat in the Kofa National Wildlife Refuge and concluded that the presence of the Trail there would conflict with primary refuge management objectives.

Public commenters suggested a number of route options not presented in the public meetings. Most of the options, however, had been considered by the various Task Forces in early meetings and had been rejected for

one reason or another. Those suggestions not previously considered were analyzed but were found to be infeasible.

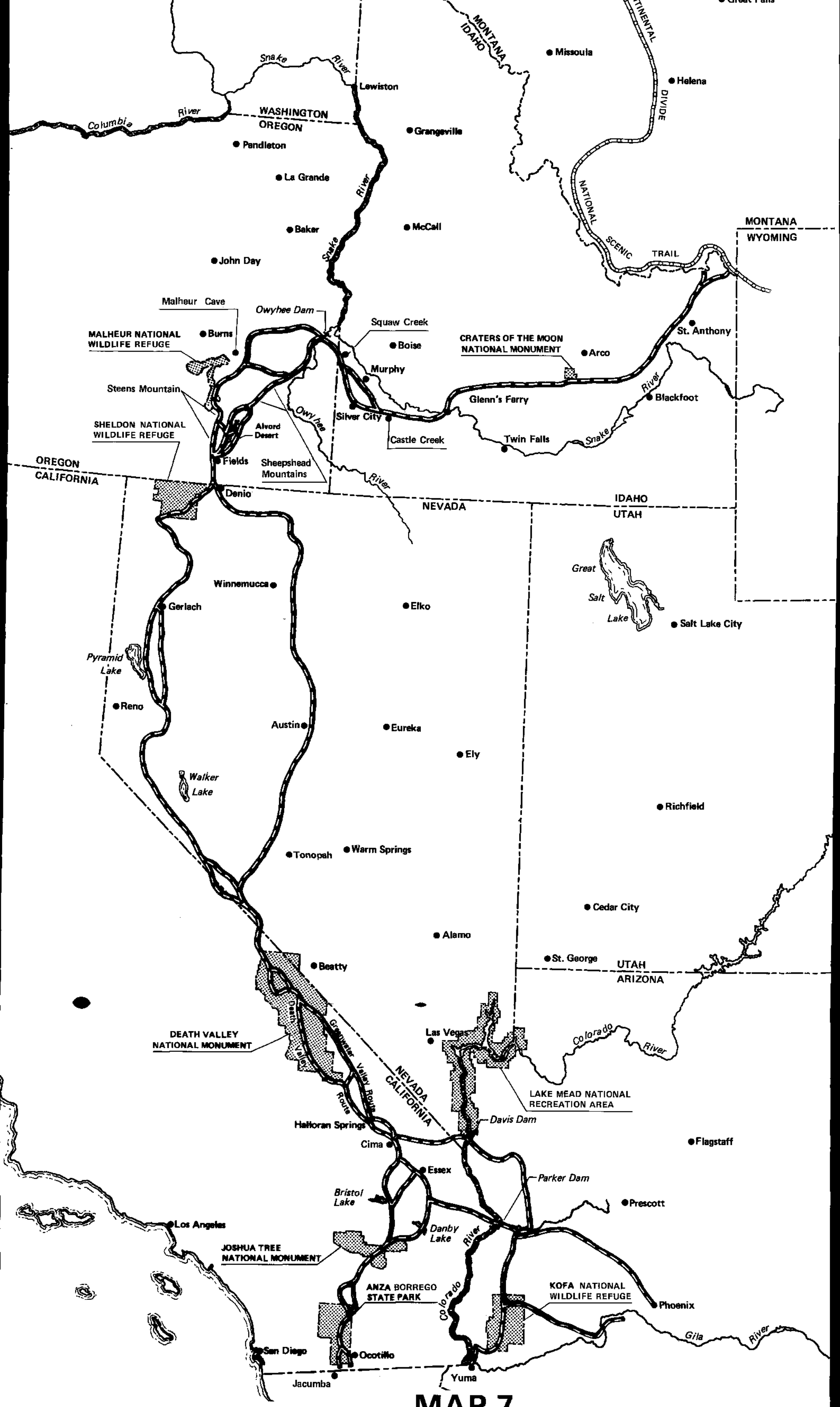
Map 8 highlights the network of segments selected for more detailed analysis.

In addition to supporting and rejecting certain segments, the public response suggested the need to appraise several different overall Trail concepts. These include:

1. Single-corridor trails originating at the Mexican border either in California or Arizona and extending through Nevada, Oregon, and Idaho to connect with the authorized Continental Divide National Scenic Trail on the Idaho-Montana border. The Continental Divide Trail then would provide the cross-country traveler with a route for the final distance to the Canadian border.

2. A trail as above, but with dual corridors in the most southerly reaches to include routes in both southern California and in Arizona. This concept addresses the desirability of having wide desert diversity represented in the Trail.

3. Bifurcations in some selected northerly portions of the Trail to provide winter and summer alternate routes, thereby expanding the season of use for the Trail.



MAP 7

TASK FORCE ALTERNATIVE ALIGNMENTS
Desert Trail Feasibility Study

NORTH

SCALE 0 50 100 miles
0 50 100 150 kilometers
One inch equals approximately 50 miles.

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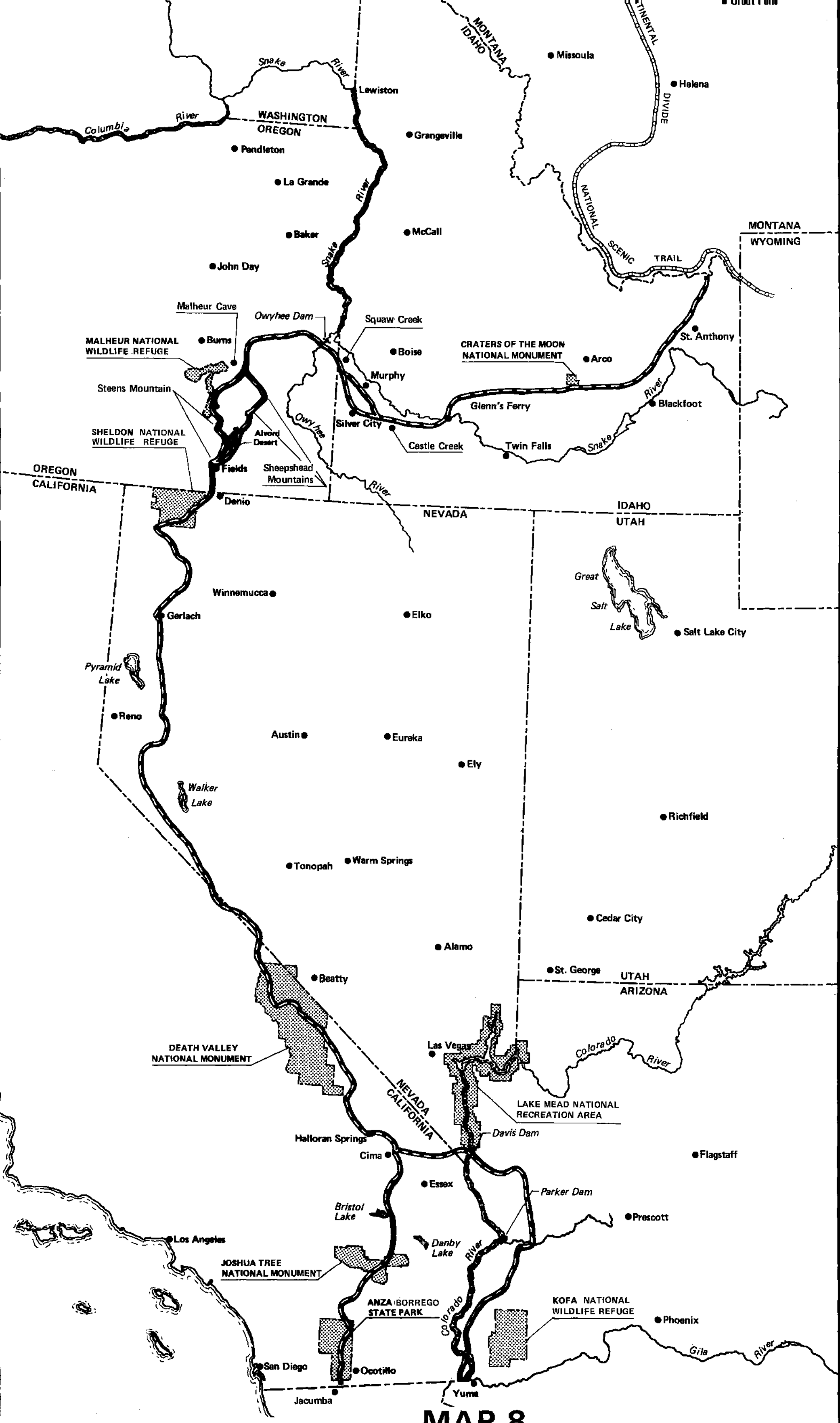

MAP 8

ALIGNMENTS SELECTED FOR FURTHER ANALYSIS
Desert Trail Feasibility Study

NORTH

SCALE 0 50 100 miles
0 50 100 150 kilometers
One inch equals approximately 50 miles.

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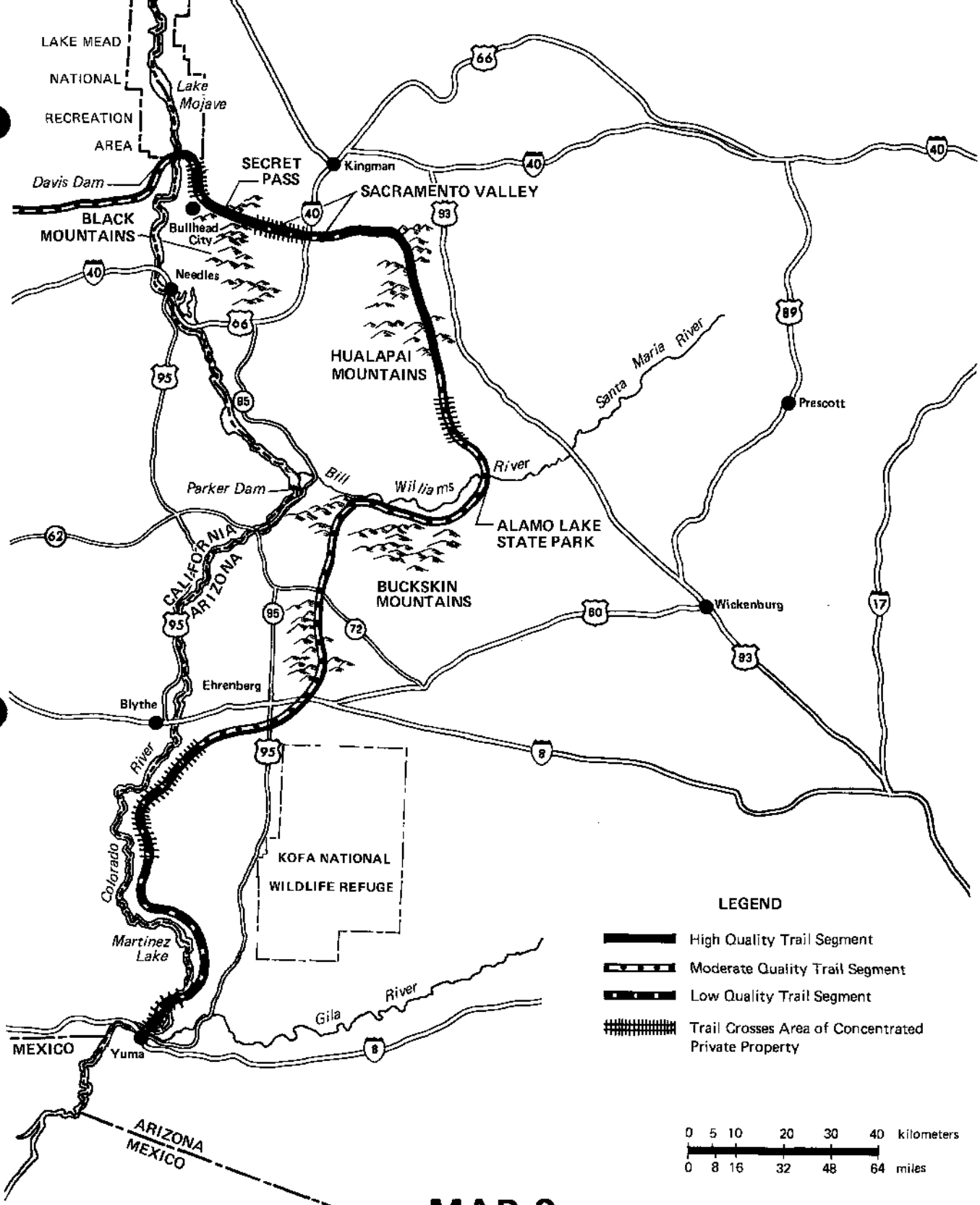

LEGEND

- High Quality Trail Segment
- Moderate Quality Trail Segment
- Low Quality Trail Segment
- Trail Crosses Area of Concentrated Private Property

0 5 10 20 30 40 kilometers
0 8 16 32 48 64 miles

MAP 9

ARIZONA ALIGNMENTS

Desert Trail Feasibility Study

NORTH

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4. Combinations of the above concepts.

The alternative plans are discussed in turn later in the report.

In addition to guiding alternative route selection, public response also provided clear direction for the design of the Desert Trail. Although a variety of designs were considered at the Task Force meetings, the overwhelming public attitude, expressed both by horse users and hikers, is that the Trail should be as simple as possible, using minimal construction and allowing the Trail users to make their own arrangements for needs such as camp shelters and water. The expression of interest in this simple design in most cases extends beyond the desire for economy of implementation; rather, many of those interested in eventually using the Desert Trail see it as offering a more challenging and essentially different experience than more highly-developed National Scenic Trails such as the Appalachian and Pacific Crest Trails. In view of the overwhelming majority on the subject of design, all the plans discussed are based on a very simple and minimal design.

GENERAL FEATURES OF PLANS

DESIGN - The design of the Desert Trail would include three different types of sections:

1. Point-to-Point Design: Substantial portions of the Trail e.g., open desert plains and higher elevations with terrain suitable for cross-country hiking and riding, would not have to be

constructed in the manner of conventional trails. Guidance for the user on these segments would be provided by a combination of on-the-ground markers (e.g., signposts and rock cairns) and detailed booklets and maps containing information on landmarks, compass bearings, water sources, access points, and miscellaneous points of interest. Between designated points, the user would choose his own specific pathway. Over a period of time, given significant use levels, it would be expected that a primitive treadway would become apparent and would subsequently serve as the primary route.

2. Conventional Construction Design: A conventional hiking/riding cross-section would necessarily be utilized in several locations. The purpose of the constructed segments would be one of the following:

   a. Provide passage through terrain capable of being traversed only with considerable difficulty. A notable area in this category would be the zone of unweathered lava on the Snake River Plain.

   b. Provide guidance around, or on easements through, private property.

c. Provide guidance through areas where landmarks or on-the-ground markers fail to provide safe and reliable guides for trail users.

d. Provide a means of routing Trail users away from areas of sensitive environmental concern, including both natural and cultural features.

e. Provide the use of an existing trail segment.

3. Multiuse Roadway Routing: Development of a continuous trailway from Mexico to Canada isolated from all motor traffic, while optimum from the standpoint of trail users, is clearly neither realistic nor economically feasible. Use of existing roadways would be incorporated into the Trail plan where:

   a. Necessary to pass through concentrations of private property.

   b. Trail attractions are minimal, use is expected to be low, and an existing roadway provides a natural trailway.

   c. A road passes through scenically attractive terrain and developing a separate trail would not measurably improve experience quality.

Routing of the Trail for considerable distances on roadways is not completely in keeping with the letter or the spirit of the National Trails System Act, which states in Section 7(c) that "The use of

motorized vehicles by the general public along any national scenic trail shall be prohibited...." The Act, however, appears to have been created primarily on the model of forest and high-mountain trails. The desert provides somewhat different working material from the standpoint of trail development.

The lack of screening vegetation makes it considerably more difficult to provide a natural trail experience in the desert than in forest areas. In forest areas, a few hundred feet of buffer zone between the trail and the conflicting use is enough to provide considerable esthetic protection. In desert areas, however, equivalent protection in many cases could be achieved only by use of a buffer more than a mile in width. The problem of esthetic protection is compounded by the general developability of much of the desert for roads, and consequently many desert areas have fairly dense networks of road systems.

Although it should be possible to route many portions of the Trail through areas free of conflicting developments, many sections will necessarily pass through areas well-supplied with roads and other development. Where such developments exist, and cannot be bypassed, the advantages of attempting to provide a continuous separate right-of-way would seem to be marginal. Rather, it seems that existing roads, where available and coincidental with the general route of the Trail, would provide an expedient means of conveying the users through the area; and the quality of the experience would be only slightly lower than that

which would be provided by a totally separate right-of-way still within the sound and sight of roadways and other intrusions. Selection of such routes would, of course, be made with consideration of the existing and expected levels of traffic.

Routing of the Trail on roads to the extent considered likely would require a special provision in the authorizing legislation. Inclusion of this type of provision would not be without precedent. In recognition of similar problems associated with desert portions of the Continental Divide National Scenic Trail, the authorizing legislation for that Trail specified that: "Notwithstanding the provisions of Section 7(c), the use of motorized vehicles on roads which will be designated segments of the Continental Divide National Scenic Trail shall be permitted in accordance with regulations prescribed by the appropriate Secretary."

Other important design considerations include access, camp areas and water. Access to the Trail would be provided at road crossings and by marking or construction of feeder trails from parallel roads or trails. Facilities at road access points would be limited to directional and informational signs and displays, small unpaved parking areas,and garbage cans. Information available at the access points would inform the prospective user of the character of the route ahead and any precautions to be observed in traversing it.

Camp areas would not, for the most part, be developed unless use patterns indicate a need for designated sites for environmental protection purposes or to prevent trespass on adjacent private lands.

Water would primarily be the responsibility of Trail users. Users would be required to carry their own water, cache supplies in areas where permitted, or locate and treat water from natural sources located along the route. Provision of water by government agencies would be limited to a few areas where such provision can be accomplished at minimal expense, as part of a larger recreation program, or where demand is sufficient to justify such development.

While most Trail advocates prefer to leave water supply in the hands of the individual user, a number of suggestions were made in the course of the study for several types of government action. Included were such ideas as fencing of springs, development of wells, and placement of holding tanks for water to be trucked in. These suggestions are not practical from an economic standpoint and undesirable from a safety standpoint.

From an economic standpoint, the cost of water supply, if undertaken by public agencies, would be substantial, not only because of the initial investment but also because of the requirements for treatment and frequent monitoring imposed by the Safe Water Drinking Act. Under present regulations, even modest improvements to natural sources, e.g., piping of spring water or fencing of a portion of the flow to prevent

contamination by stock, carry the implication of "safe" water and hence lead to requirements for treatment and frequent monitoring. The cost of such monitoring and treatment in some of the remote portions of the Trail would be exceedingly high. Use of tanks and periodically filling them from tank trucks would add an additonal financial burden.

From the safety standpoint, public expectation of a guaranteed water supply could lead to considerable hazard for the Trail user. Springs and wells, of course, can vary substantially in their seasonal output; failure of an agency to provide frequent inspection of such sources and timely distribution of such information to the public could lead to serious problems. Use of holding tanks would pose even greater hazards because of the dangers of vandalism, equipment failure, or unexpected levels of demand.

LAND ACQUISITION - The National Trails System Act requires "That in selecting rights-of-way full consideration shall be given to minimizing the adverse effects upon the adjacent landowner or user and his operation." Further, the Act restricts acquisition by condemnation to a maximum of 125 acres per mile, allowing for a corridor about 1,000 feet wide.

Acquisition needs on the Desert Trail are expected to be minimal. All of the alternative routes cross a preponderance of well-blocked public land. Where there are private lands, they can be crossed in many cases by use of existing rights-of-way. Where acquisition is the only

alternative for providing route continuation, in most cases it would be expected that minimum easements necessary for user passage, rather than the maximum permitted corridor would be acquired.

CORRIDOR PROTECTION - The quality of experience possible on the Desert Trail, i.e., the quality of its natural and scenic character, will be to a large extent dependent on the long-term control of land use on and adjacent to the Trail alignment.

Corridor protection on the desert is much more difficult and, in terms of benefits foregone, much more costly to obtain than a similar degree of protection in mountainous and heavily-forested areas. In many forested areas, a few hundred feet on either side of the trail can serve to protect the esthetics of the trail experience, while in desert areas, an equivalent degree of protection might require a corridor of several miles. Access conditions, too, are quite different. High mountain areas, because of difficult terrain, are not readily accessible to motorized vehicles in the absence of developed roads and trails. Much of the desert, on the other hand, is readily accessible to a variety of off-highway vehicles and for years has been a favored playground for these recreationists.

The National Trails System Act indicates that national scenic trails are not intended to supersede or preclude other uses of the public lands but are rather to be integrated with those uses. In view of this requirement, it is clear that corridor protection for the Desert Trail

will be variable throughout its length and a function in large part of other economic and environmental values associated with the lands through which it passes.

The routes described in this report are conceptual in nature, intended to describe in very general terms the route of the Trail and the resources which it would traverse. When the detailed post-authorization location studies are accomplished by the land managing agencies, the route will be located with full consideration of the potential for long-term protection of Trail values. In some cases, it will be possible to locate the Trail in areas enjoying substantial protection from conflicting land uses; e.g., legislatively established wilderness areas and other areas administratively determined to be appropriate for management primarily for protection of particularly outstanding natural values. In other cases, to provide for continuity, it may be necessary to locate the Trail through areas which either have experienced or will experience considerable esthetic degradation. In all cases, the existence of the Trail will constitute a value to be considered in land management decisions; the extent to which such decisions afford esthetic protection to the corridor will be a function of the tradeoff values involved.

ADMINISTRATION - Responsibility for acquiring, developing, and operating the Desert Trail would be distributed among several different agencies.

In general, the agency administering the land over which the Trail passes would have such responsibility.

Major roles in all alternative plans would be assumed by the Bureau of Land Management, the National Park Service, the Fish and Wildlife Service, and the Forest Service. Where the Trail crosses state-owned land, the state would assume financial responsibility for implementation and operation. Neither Indian Reservations nor lands administered by local government, with the exception of local roadways, are crossed by any of the alternatives.

Responsibility for overall administration and coordination of Desert Trail matters should rest with the Secretary of the Interior, in consultation with the heads of other Federal and state agencies whose lands are involved. Such responsibilities would include:

1. Establishment of an Advisory Council as provided for in Section 5d of the National Trails System Act as amended.

2. Completion of a comprehensive plan for the acquisition, management, development, and use of the Trail as required in Section 5e of the Act.

PLAN DESCRIPTIONS

ALTERNATE ROUTES - Map 8 displays the network of segments of which the various plans are comprised, while Table 5 indicates the segments to be included in the various plans. All plans labeled A (1A, 2A etc.) include

TABLE 5

Desert Trail Route Alignments

SEGMENT	PLAN											
	1	1A	2	2A	3	3A	4	4A	5	5A	6	6A
Yuma - Davis Dam	X	X	X	X					X	X	X	X
Davis Dam-Cima	X	X	X	X					X	X	X	X
Jacumba-Cima					X	X	X	X	X	X	X	X
Cima - Fields, Oregon	X	X	X	X	X	X	X	X	X	X	X	X
Fields - Malheur Cave												
Via Steens Mountain	X	X			X	X			X	X		
Via Sheepshead Mountains		X	X	X		X	X	X		X	X	X
Malheur Cave - Squaw Creek	X	X	X	X	X	X	X	X	X	X	X	X
Squaw Creek - Castle Cr. via:												
Low Elevation "Winter Route"		X		X		X		X		X		X
High Elevation "Summer Route"	X	X	X	X	X	X	X	X	X	X	X	X
Castle Creek-Continental Divide	X	X	X	X	X	X	X	X	X	X	X	X

low elevation routes in both Oregon and Idaho intended to provide for a somewhat longer use season. Table 6 describes the major features associated with the various segments.

Plans 1 and 2 represent single-corridor plans originating in Arizona and traversing deserts in California, Nevada, Oregon, and Idaho, terminating with a connection to the Continental Divide National Scenic Trail. The major difference between the plans is in Oregon where Plan 1 is routed via Steens Mountain and Plan 2 traverses the Sheepshead Mountains to the east.

Plans 3 and 4 are single-corridor plans originating in California and proceeding to the connection with the Continental Divide Trail via Nevada, Oregon, and Idaho. The main difference between these two plans is also in the Oregon routing.

Plans 5 and 6 include two corridors in the more southerly reaches, one originating in California and the other in Arizona. As with the single-corridor plans, the primary difference between these plans is in the Oregon routing.

LAND OWNERSHIP AND USE - Land ownership on all the segments is generally well-blocked public land. Most of the Federal lands are administered either by the Department of the Interior or the Department of Agriculture. (See Map 2). A substantial portion of the route in California passes through the Anza-Borrego Desert State Park,

TABLE 6

Description of Desert Trail Route Segments

Yuma - Davis Dam

This segment originates in Yuma and follows the Colorado River on levees and roads north to the vicinity of Ehrenberg before turning east cross-country, passing through the Dome Rock Mountains to the vicinity of Quartzite. Continuing north from Quartzite, the Trail would pass first through the Plomosa Mountains and then through the Buckskin Mountains. Both ranges offer outstanding scenery. The Trail would continue upstream along the Bill Williams River to the area of Alamo Reservoir and the Alamo Lake State Park. From Alamo Reservoir, the Trail would continue north through a portion of the scenic Hualapai Mountains, arriving at Davis Dam via Secret Pass Canyon.

Davis Dam - Cima

This route would pass to the north of the scenic Dead Mountains and then follow the alignment of the historic Old Government Road past the ruins of Fort Piute, meeting the California alignment south of Cima.

Jacumba - Cima

This segment would originate at the border town of Jacumba, enter the south end of Anza-Borrego State Park and continue north for more than 50 miles before leaving the Park. Exiting the Park at its northeast corner, the route would hug the northeast slope of the Santa Rosa Mountains for several miles before turning east to cross the Coachella Valley via existing roads to the Mecca Hills. The route would extend northeast through the colorful canyons of the Mecca Hills, where the folding and faulting work of the San Andreas Fault is highly evident, and then traverse the Cottonwood Mountains enroute to the Joshua Tree National Monument. The route through the Monument, a massive area of more than half a million acres, would offer the visitor an opportunity to experience a variety of desert phenomena in a wilderness atmosphere free of disruptions.

From the north boundary of the Monument, the route would extend north, passing to the south and east of the Calumet Mountains, crossing the rail line west of Cadiz, and extending north through Granite Pass and Foshay Pass to the Mid-Hills and the vicinity of Cima. Significant trail resources would include Amboy Crater, which is within a reasonable proximity; good views of the impressive Kelso Dunes, located several miles to the west; the caves of Providence Mountains State Recreation Area; and the grotesque geologic formation near BLM's Hole-In-The-Wall Campground.

Cima-Fields, Oregon

Continuing north from Cima to Halloran Springs, the route crosses Cima Dome, an area of considerable geologic interest. The Dome, consisting of uplifted prevolcanic rock, rises gently to a height of 5155'. In addition to geologic features, the Dome also offers an outstanding forest of Joshua trees. From Halloran Springs, the route would trend north, passing the Silurian Hills and the Dumont Dunes before moving northeast to enter the Greenwater Valley. The route would continue through the Greenwater Valley for many miles before descending into Death Valley National Monument. The route through Death Valley would offer the visitor a wide array of opportunities to experience both natural and cultural features associated with this legend-rich-area.

From Death Valley, the route would continue north into Nevada,leaving behind the Mojave Desert and entering the sagebrush and shadscale of the Great Basin Desert. Roughly paralleling the border for several miles, the route would cleave to the eastern foot of the White Mountains, home of the ancient bristlecone pines. The Trail would then extend northwest to the pinyon-juniper surroundings of the Toiyabe National Forest, which would provide the setting for the Trail until it drops back to desert shrub surroundings north of the Pine Grove Hills. A portion of this segment would roughly approximate the route of the great explorer Fremont.

Continuing north to the west of the Singatse Range, the route would approximate for a distance the route of the Sonora Emigrant Route and pass by Fort Churchill State Park, which protects and interprets the ruins of the once impressive adobe Army installation. From Fort Churchill, the route would turn east to circle Lahontan Reservoir, managed as a State Park, and then utilize the right-of-way for the Truckee Canal to the vicinity of Fernley. From Fernley, the route would parallel the Truckee Range, Nightingale Mountains, and Selenite Range to the vicinity of Gerlach.

Continuing north, on the route over which Fremont dragged his famous brass cannon, the route next passes the Great Boiling Springs near Gerlach, one of the many such springs found in the area. Passing the historic Granite Springs Station, a one-time temporary army camp, the route first skirts and then crosses the formidable Black Rock Desert to the moonscape-like setting of Black Rock Point and Spring, a treasured oasis to the arriving emigrants after the terrible dry crossing of the desert. Skirting the western slope of the colorful Black Rock Range to the beautiful but dangerously hot Double Hot Springs, another emigrant campsite, the Trail follows the alignment of Mud Meadow Creek past the ruins of the historic mining town of Hardin City and on to Mud Meadows and Soldier Meadows. The latter, now a working ranch, has several structures remaining from the Army presence of the 1860's.

The Trail leaves the broad valley setting at Soldier Meadows to enter the narrow Fly Creek Canyon, which is filled with potholes and interesting rock formations. Passing the lovely High Rock Lake, the route enters High Rock Canyon and soon arrives at Register Rocks, where the emigrants carved their names on the Canyon walls. Both historical and archeological evidence join with scenic beauty to make High Rock Canyon

Cima - Fields, Oregon (Continued)

one of the most significant areas on the route. The canyon, which provided explorers and emigrants with a natural and well-watered route through the rugged volcanic region, is today largely unmarred.

Continuing northwest through the narrow Upper High Rock Canyon, a troublesome passageway for the emigrants' wagons, the route arrives at Emigrant Spring. From this point, the Desert Trail route turns northeast, while the historic emigrant trail continues to the west. Passing to the south of Massacre Lake, named for a supposed massacre of an emigrant train by hostile Indians, the route enters the Sheldon National Wildlife Refuge, administered by the U.S. Fish and Wildlife Service and managed primarily for indigenous wildlife species, including antelope, California bighorn sheep, mule deer, sage grouse, and a host of other small mammals and birds. Leaving the Refuge at its eastern boundary, the route would continue on to ascend the wild and beautiful Pueblo Mountains, continuing for several miles through the Pueblos before descending to the small town of Fields, Oregon.

Fields - Malheur Cave via Steens Mountain

The key attraction on this segment would be Steens Mountain, a 10,000' high fault block rising dramatically from the desert floor. Steens Mountain offers both dramatic scenery, and opportunities for experiencing a wide range of biological phenomena in the several vegetative belts. The route would extend northeast from Fields, circling to the east of Alvord Lake and providing dramatic views of the Mountain's east scarp before turning west to ascend the Mountain and traverse some of its higher elevations. Dropping down the west slope, the route would then turn north to parallel the east boundary of the Malheur National Wildlife Refuge for several miles before passing through the Diamond Craters, an area of recent lava flows offering a wide variety of volcanic phenomena. From Diamond Craters, the route would pass Riddle Mountain and continue to the vicinity of Malheur Cave.

Fields - Malheur Cave via Sheepshead Mountains

This route would commence northeast to follow the eastern margin of the Alvord Desert, offering excellent views of Steens Mountain, and then continue to ascend and traverse the Sheepshead Mountains. The Sheepsheads, while less scenically striking than Steens Mountain, are remote and little used by recreationists and would offer both high quality desert scenery and a wilderness escape from the more heavily used areas. From the Sheepsheads, the route would turn to the northwest, crossing the northern end of Steens Mountain and continuing to Malheur Cave.

Malheur Cave - Squaw Creek

From the Malheur Cave area, the route would continue north to the vicinity of Warm Springs Reservoir, then turn to the east to traverse remote and scenic high desert for many miles before crossing the Owyhee River via Owyhee Dam. From the dam, the route would continue into Idaho and the area of Squaw Creek, passing first near the scenic canyons of the Succor Creek State Recreation Area.

Squaw Creek - Castle Creek Via Summer Route

This segment traverses the west slope of the Owyhee Mountains for several miles, then crosses the Silver City Range to terminate at Castle Creek. Vegetation in this segment ranges from sagebrush in the lower elevations to Ponderosa Pine in the upper reaches. Elevations up to 8,000' would preclude use of the route in early spring and late fall but would provide excellent trail experience in summer months. Attractions are numerous, including the scenic Jump Creek Canyon, the scenic, geologic, and historic features of the Owyhee Mountains, and the historic Silver City area.

Squaw Creek - Castle Creek Via Winter Route

This segment would traverse the east slope of the Owyhee Mountains at approximately the 4,000' level, rejoining the winter route at Castle Creek. This lower elevation route, providing a somewhat longer use season, would pass near the scenic deep canyons of both Squaw and Reynolds Creeks, offering opportunities for scenic side trips.

Castle Creek-Continental Divide

High desert vegetation would prevail throughout much of the reach. The portion of the route south of the Snake River would include a number of significant features - the scenic canyons of Jack's Creek; Indian Bathtub on Hot Creek; the Bruneau River (a possible addition to the National Wild and Scenic River System); the massive Bruneau Sand Dunes; a portion of the south alternate route of the Oregon Trail; and, finally, the historic crossing of the Snake River at Glenn's Ferry, where Three Island State Park is located.

North of the Snake River, the Trail would ascend to the ridgetop of the Bennett Hills, affording good vistas of Camas Prairie to the north before dropping south to the Gooding City of Rocks, where are found numerous scenic canyons and an abundance of rhyolitic formations. Near Magic Reservoir, the Trail would pass near the lava formations of the Shoshone Ice Caves, a preview of the extensive lava flows to be encountered a few miles to the east. The Trail passes through nearly forty miles of recent lava flows, past landmarks such as Snowdrift Crater and North Laidlaw Butte, before entering the Craters of the Moon National Monument. The Monument offers extensive evidence and interpretation of the recent lava flows. A number

Castle Creek-Continental Divide (Continued)

of side trails would be available to connect with the main features of the Monument.

Leaving the Monument on the east, the route continues past Big Southern Butte and Hell's Half Acre, both National Natural Landmarks, and past the extensive Juniper Mountain sand dunes.

The route would then extend north from the dunes area, passing through the Targhee National Forest to the west of Island Park Reservoir and climbing on existing forest trails to the Continental Divide, where the Desert Trail would terminate. This route would provide a relatively direct connection to the proposed Continental Divide National Scenic Trail, which then would provide a continuous route to Canada.

administered by the State of California. Concentrations of private land do occur in proximity to the route, however, in several locations, as indicated on Maps 9-13.

Land use along most of the routes consists of non-intensive grazing, occurring either on Federal multiple-use lands or on privately-owned range. See Map 3. The major exceptions are discussed below.

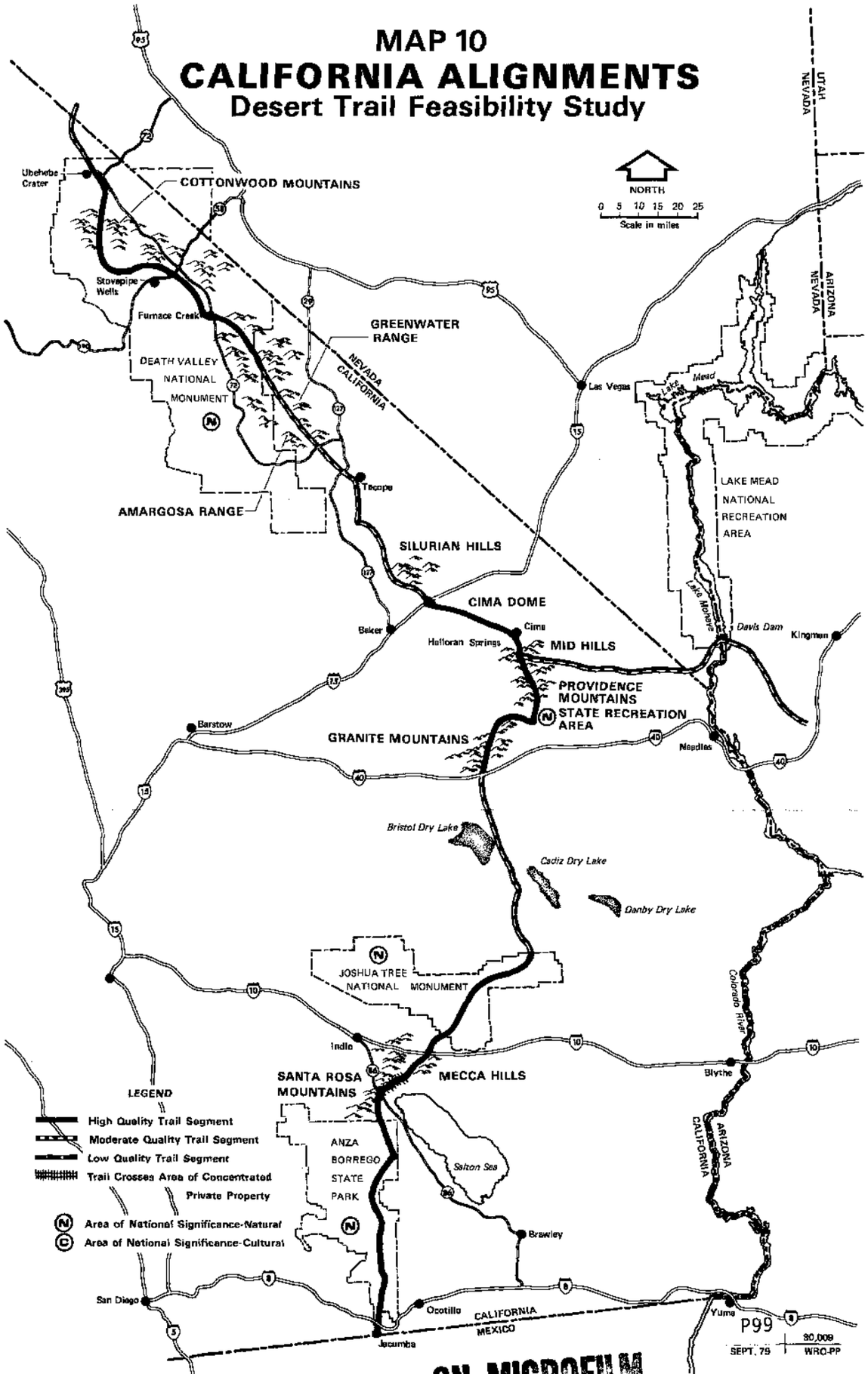
Colorado River, California and Arizona - Land use patterns on the lower Colorado River are complex, with significant areas committed to urbanization, irrigated agriculture, water resource development, single-purpose wildlife management, and developed recreation. Approximately 90 miles of Trail would pass through this complex.

Sacramento Valley, Arizona - This area west of Kingman is in the process of being developed into subdivisions and is expected to be well-urbanized in a few years. Some 20 miles would pass through this area.

Bullhead City to Davis Dam, Arizona - Land use includes intensive urban development and water resources development. Approximately 6 miles of the Trail would be routed through this area.

Anza-Borrego Desert State Park, California - Approximately 62 miles of the Trail would pass through this area of single-purpose recreation land.

MAP 10
CALIFORNIA ALIGNMENTS
Desert Trail Feasibility Study



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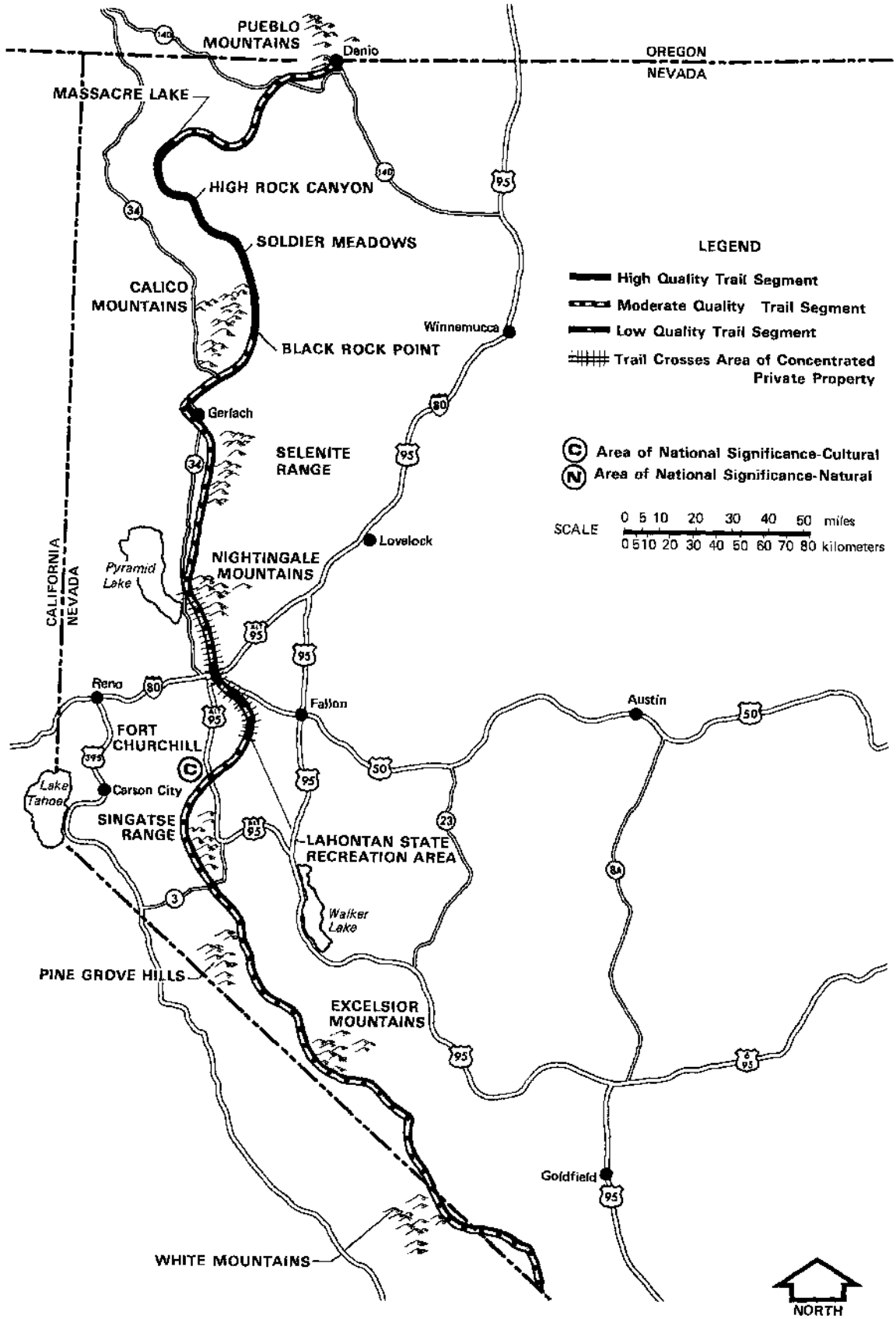

MAP 11
NEVADA ALIGNMENTS
Desert Trail Feasibility Study

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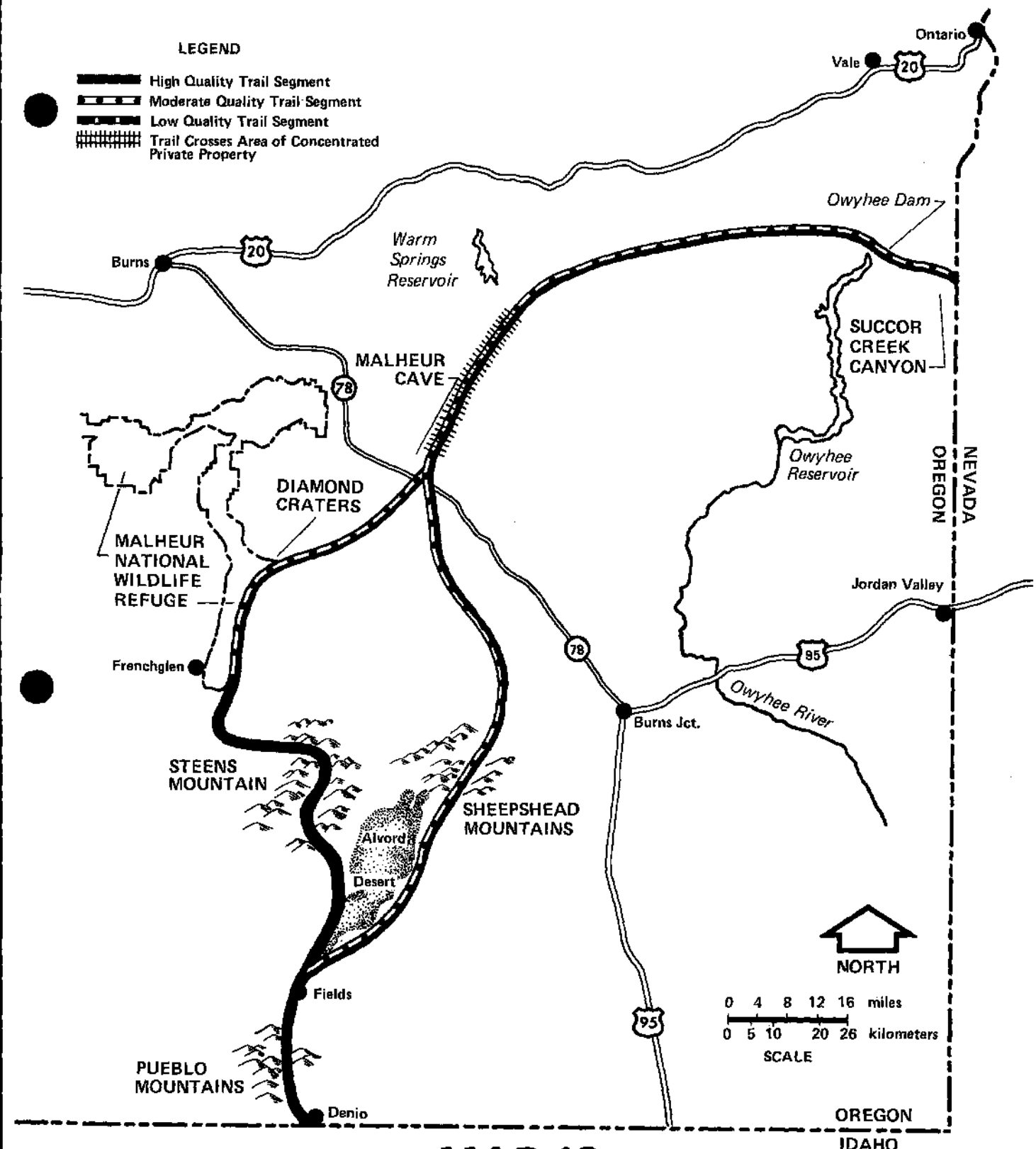
ON MICROFILM



MAP 12

OREGON ALIGNMENTS

Desert Trail Feasibility Study

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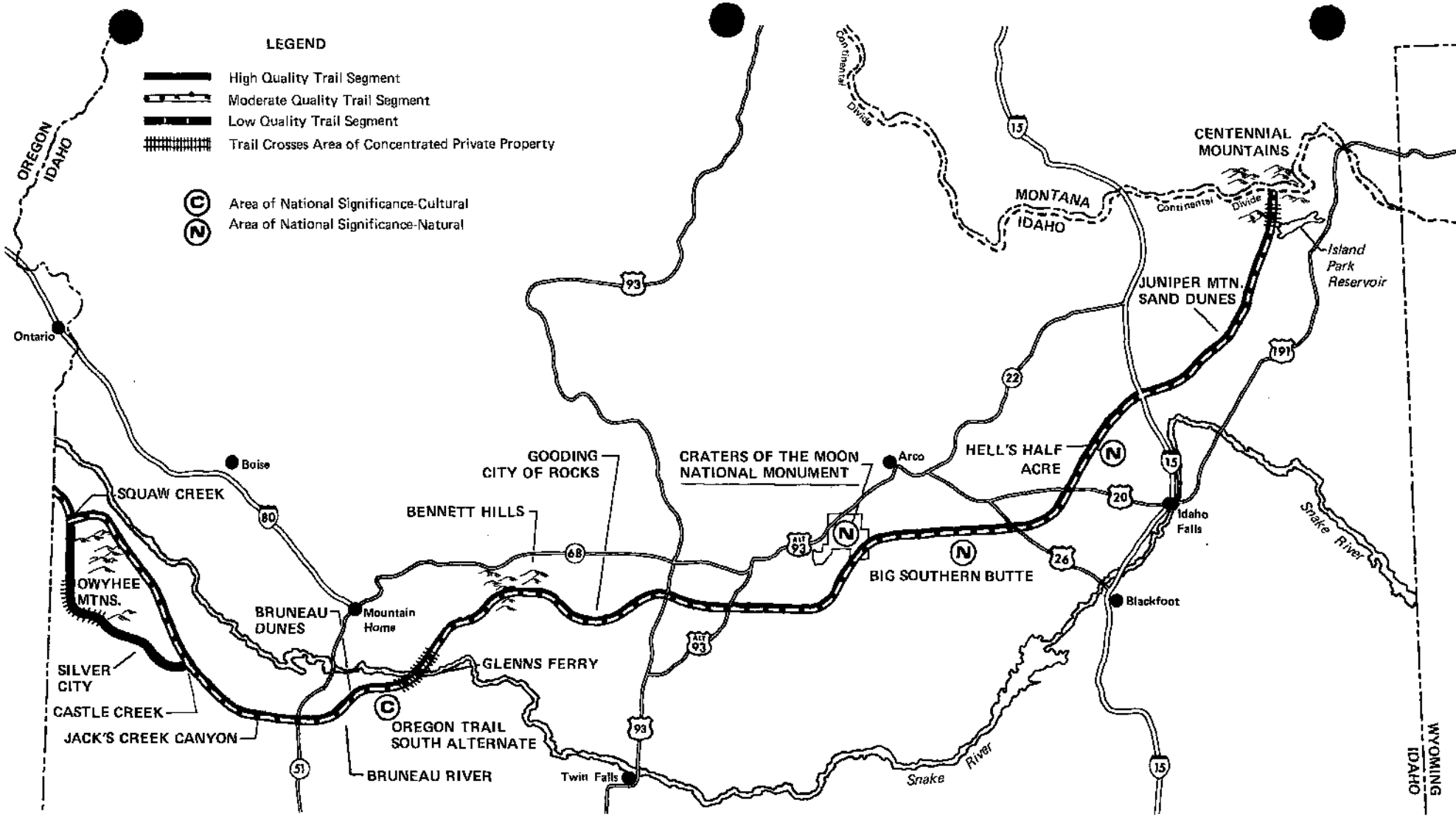
ON MICROFILM



MAP 13

IDAHO ALIGNMENTS

Desert Trail Feasibility Study

Scale

miles 0 5 10 20 30 40 50

kilometers 5 10 20 30 40 50 60 70 80

NORTH

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North End of Salton Sea, California - The Trail would pass by approximately 12 miles of urban and intensively farmed lands.

Joshua Tree National Monument, California - The monument is managed for recreation and preservation. Some 35 miles would pass through the monument.

Death Valley National Monument, California - 112 miles would pass through the monument.

Truckee Canal, Nevada - The right-of-way for this water conveyance facility would be used as an expedient for routing the Trail through concentrations of private property. Some 20 miles would be located adjacent to the Canal.

Charles Sheldon National Wildlife Refuge, Nevada - The primary use of this area is for preservation and enhancement of wildlife species. Recreation use is permitted to the extent that it does not conflict with wildlife management. Some 62 miles of the Trail would be routed through this area.

Craters of the Moon National Monument - Approximately 6 miles of the Trail would pass through the monument.

Mineral Extraction Areas - Mining areas occupy relatively minor acreages but have in some cases significant esthetic effects for many miles. Small areas of mineral extraction activity could

be closely bypassed in virtually any of the segments under consideration depending on final route selection. Avoidance of such areas will, of course, be an important route selection criterion.

NATIONALLY SIGNIFICANT QUALITIES - National significance of a trail relates to overall quality, collective significance, and significance of the specific resources which are incorporated into the trail.

From the standpoint of quality, all of the alternatives present a rather mixed array. Some segments offer extremely high quality opportunities, capable of attracting users from long distances. Substantial portions of the alternatives, however, will be devoid of such attraction value and will be chiefly useful to a very few making very long trips. Because of the need to route substantial portions of the route on existing roads and the difficulties foreseen in controlling conflicting activities on adjacent lands, many segments of the Trail would offer a quality of experience inferior to other desert trail opportunities available in protected areas such as national parks and monuments and designated wilderness areas.

In a collective sense, all the routes under consideration are unique and significant in that they tie together a great number and diversity of desert natural and cultural features. Three of the four major North American deserts, the Sonoran, Mojave, and Great Basin, are included in all potential routes. No other trail offers the potential for traversing

such a wide variety of resources and for traveling such great distances through desert environments.

The specific features along the route identified as having national significance are discussed below. Included in this category are only areas such as national monuments and national landmarks, which have been formally evaluated and determined to be of national significance. These areas are indicated on Maps 9 to 13.

Anza-Borrego Desert State Park, California - On the natural side, this park contains a wide array of both geologic and biologic phenomena of great interest. Cultural significance extends both to prehistory and to historic events related to the passage of De Anza through the area in the 18th Century. This park is a registered National Natural Landmark.

Joshua Tree National Monument, California - This monument contains a wide variety of natural phenomena, including prime areas representative of both the Sonoran and Mojave Deserts.

Providence Mountain State Recreation Area, California - This unique park contains Mitchell Caverns and Winding Stair Cave, fascinating examples of two different types of caves. The caves are National Natural Landmarks.

Death Valley National Monument, California - Death Valley's significance is both cultural and natural. Cultural features

include both prehistoric and historic aspects, while natural phenomena include both dramatic geology and extreme climatic conditions.

Fort Churchill, Nevada - This once impressive adobe Army installation, now extensive ruins managed as a Nevada State Park, is registered as a National Historic Landmark. The Sonora route of the California Emigrant Trail passed through this area, as did the Pony Express.

South Alternate of the Oregon Trail, Idaho - The Trail would closely parallel, and might in some places be aligned to coincide with, a portion of the South Alternate of the Oregon Trail. The Oregon Trail is a National Historic Trail component of the National Trails System. Evidence of the emigrants' wagon ruts on the route remains in some locations.

Craters of the Moon National Monument, Idaho - The monument preserves and interprets a portion of the recent Snake River Plain lava flows. The designation is indicative of the area's national significance.

Big Southern Butte, Idaho - This distinctive landform is visible for many miles across the Snake River Plain. It has been designated a National Natural Landmark.

Hell's Half Acre, Idaho - This National Natural Landmark contains many thousands of acres of recent lava flows.

A number of areas with at least some apparent potential for national designation are also found along the routes. Included would be areas such as the Mecca Hills, Cima Dome, Applegate-Lassen Emigrant Trail, Steens Mountain, and the Bruneau River. These areas are also shown on Maps 9 to 13.

ECONOMIC CONSEQUENCES

USE AND BENEFITS - All major land use actions have impacts on both national output and on regional income distribution. National output may be affected both by the economic efficiency of the plan itself, i.e., do user benefits exceed implemention and operation costs or vice versa, and by the related impacts on adjacent lands' economic values which may be reduced, increased, or eliminated by controls aimed at protecting the quality of the Trail experience. Regional income distribution may be affected either by changes in the regional incidence of spending, e.g., more spending in desert areas by recreationists, or by reductions in potential economic activity due to the aforementioned land use controls.

Because of the conceptual nature of the planning for the Desert Trail, it is impossible to get a firm handle on the extent to which economic values of adjacent lands will be impacted. The effect is, however, expected to be quite small based both on the opportunities to route the Trail to

avoid extensive economic conflicts and on the intent of the National Trails System Act that trail activities be integrated with other land uses rather than preclude them. In view of the uncertainties and the anticipated small magnitude of this effect, it will not be examined further in the course of this analysis.

The importance to regional income of visitor expenditures is obviously largely dependent on how the region is defined. From the standpoint of the previously defined study area, the Desert Trail would be expected to produce very minor increments of new income. Not only are use levels for the Desert Trail expected to be relatively low, but the type of activity does not lend itself to large expenditures. In fact, many trail users arrive at the use area already fully equipped. From the standpoint of a few small towns near the Trail, the effect could seem larger. While it would be possible to produce some estimates of such expenditures, it would not be worthwhile to do so because the minor quantities involved would not constitute a significant decision-making criterion.

The remainder of the section will be concerned with relating user benefits and plan implementation and operation costs.

As indicated in the section on demand, use of the Desert Trail is expected initially to range from a low of 5 visitor-days per mile in remote connector sections up to 300 visitor-days per mile in highly scenic and accessible reaches. Increased population in future years will likely increase the demand for the Desert Trail. Table 7 displays use

TABLE 7

Annual Use: Desert Trail Segments

Segments	Miles	Use Season	Visitor Days/Mile (1980)	1980 Use	2020 Use*
Arizona:					
Yuma to Ehrenberg	90	Oct-May	5	450	600
Ehrenberg to Hualapai Mountains	149	Oct-May	20	2,980	3,960
Hualapai Mountains	32	Oct-May	120	3,840	5,110
Sacramento Valley	20	Oct-May	5	100	130
Black Mountains	15	Oct-May	120	1,800	2,390
Bullhead City-Davis Dam	6	Oct-May	5	30	40
California:					
Jacumba to Salton Sea	75	Oct-May	300	22,500	29,930
Salton Sea - North Side	12	Oct-May	5	60	80
Mecca Hills thru Joshua Tree National Monument	56		300	16,800	22,340
Joshua Tree Natl. Mont. to Int. 40	63	Oct-May	20	1,260	1,680
Interstate 40 to Interstate 15	78		120	9,360	12,450
Int. 15 to Death Valley Natl. Mont.	90		20	1,800	2,390
Death Valley National Monument	112	Oct-May	120	13,440	17,880
Death Valley NM to Nevada Line	20	Oct-May	20	400	530
Nevada-California:					
Davis Dam to Cima	58	Oct-May	20	1,160	1,540
Nevada:					
Nevada Line to Lahontan State Recreation Area	244	Apr-Oct	20	4,880	6,490
Lahontan SRA to Fernley	20	Apr-Oct	5	100	130
Fernley to Black Rock Point	130	Apr-Oct	20	2,600	3,460
Black Rock Point to Massacre Lake	56	Apr-Oct	120	6,720	8,940
Massacre Lake to Oregon Line	74	Apr-Oct	20	1,480	1,970

*OBE-ERS Series E. Projections

TABLE 7 (Continued)

Annual Use: Desert Trail Segments

Segment	Miles	Use Season	Visitor Days/Mile (1980)	1980 Use	2020 Use*
Oregon:					
Oregon Line to Fields	26	Jun-Sep	120	3,120	4,150
Fields to Malheur National Wildlife Refuge	60	Jun-Sep	120	7,200	9,580
Malheur NWR to Malheur Cave	46	May-Oct	20	920	1,220
Fields to Malheur Cave via Sheepshead Mountains	94	May-Oct	20	1,880	2,500
Malheur Cave to Idaho Line	102	May-Oct	20	2,040	2,710
Idaho:					
Idaho Line to Squaw Creek	10	May-Oct	20	200	270
Squaw Creek to Castle Creek via					
High Elevation "Summer Route"	62	Jun-Sep	120	7,440	9,900
Low Elevation "Winter Route"	66	May-Oct	20	1,320	1,760
Castle Creek To Continental Divide National Scenic Trail	380	May-Oct	20	7,600	10,110

*OBE-ERS Series E Projections

estimates for the various reaches for 1980 and 2020, and Table 8 displays use estimates for the various plans.

The dollar value of the use occurring on the Desert Trail is difficult to estimate. While substantial research has been done in evaluating the monetary value of certain types of recreation activities, virtually no data is available regarding trail use. However, the ready availability of substitutes, i.e., opportunities for cross-country desert riding and hiking are plentiful and at least as accessible, and the marginal contribution of the Trail in facilitating use suggest that the willingness of users to pay for the Desert Trail would be rather low.

PLAN COSTS - Costs of the Desert Trail include those associated with pre-implementation planning, land acquisition, trail and support facility construction, and operation and maintenance. These cost elements are discussed in turn below. The base year for cost estimates is June, 1979.

Extensive preimplementation planning will be necessary to convert the conceptual plan presented in this report to a detailed site plan capable of guiding plan implementation. In addition to engineering studies, these postauthorization studies will necessarily include extensive environmental analysis to permit location and design of the Trail in such a manner as to avoid serious impacts. Major efforts would be made in the areas of archeological and rare plant corridor clearance. Expenses would be quite low in areas where the Trail would be routed largely on existing routes but quite high in open, little-used desert areas which would

TABLE 8

Annual Use: Alternative Plans

Plan	1980 Use	2020 Use
1	75,100	99,900
1A	78,300	104,100
2	68,900	91,600
2A	70,200	93,400
3	109,900	146,200
3A	113,100	150,400
4	103,700	137,900
4A	105,000	139,700
5	120,300	160,000
5A	123,500	164,300
6	114,000	151,600
6A	115,400	153,950

require extensive surveys. The costs of this postauthorization planning are estimated to average approximately $250 per mile and are summarized in Table 9.

Land acquisition is expected to produce relatively minor costs for two reasons. First, one of the primary criteria used in the selection of alternative plans was the availability of well-blocked public land. Second, in view of the high costs and relatively limited incremental utility of acquiring separate trail rights-of-way through areas of concentrated private property, the recommended design provides for traversing those areas via existing motor traffic routes or other less-than-scenically-outstanding corridors. That acquisition which is required would be limited primarily to minimum easements necessary to permit passage of trail users between areas of public land. Because specific routes have not as yet been determined, land acquisition costs were estimated on a per-mile basis, based on a series of detailed analyses of randomly selected test sections. The estimated cost of land acquisition is $70 per mile of Desert Trail (not to be confused with the per-mile costs of the easements). The costs for the various plans are displayed in Table 9.

Construction costs would be incurred for signs and markers, trailheads, gates, and construction of conventional trail crosssections in areas requiring such treatment. The totals of such expenses are estimated at

TABLE 9

Desert Trail Costs ($1,000's)

Plan	Implementation Costs				Annual Operation and Maintenance Costs
	Preconstruction Planning	Land Acquisition	Construction	Total	
1	$461	$129	$6,115	$6,705	$368
1A	501	140	6,647	7,288	400
2	458	128	6,076	6,662	366
2A	474	133	6,295	6,902	379
3	429	120	5,697	6,246	343
3A	469	131	6,228	6,828	375
4	426	119	6,683	7,228	341
4A	443	124	5,876	6,443	354
5	522	146	6,926	7,594	417
5A	562	157	7,457	8,176	449
6	519	145	6,886	7,550	415
6A	535	150	7,105	7,790	428

$3320 per mile and are shown for the various plans in Table 9. It is expected that only a minor portion of the route would require new trail construction.

Operation, maintenance, and replacement costs of the Trail are expected to be relatively low because of the many miles of point-to-point design and the considerable portion located on existing roads. Annual costs are estimated at an average of $200 per mile and are summarized for all segments in Table 9.

Implementation of a Trail would produce some additional employment associated with operation and maintenance. The number of additional workers would be a direct function of the expenses for operation and maintenance and would be expected to range from about 25 for Plans 3 and 4 to 30 for Plan 5A.

ENVIRONMENTAL CONSEQUENCES OF THE PLANS

DIRECT EFFECTS - The alternative plans are expected to have direct effects in the areas of soils, vegetation, wildlife, visual quality and cultural resources; and these effects are discussed in turn below. The plans are not expected to have appreciable effects in the areas of air or water quality.

SOILS - None of the alternative plans is expected to have serious adverse impacts on soils because of the relatively limited extent of land

potentially altered and because of the potential for adjusting the alignment to avoid areas that have severe problems.

The area of land potentially impacted by the Trail alternatives is relatively minor. Substantial portions of the route, approximately 45 percent, will be located on existing roads, producing no impact on soils.

Approximately 15 percent of the Trail will consist of newly-constructed trail with tread ranging between 18 and 30 inches. The remainder of the Trail would be a point-to-point design. These sections introduce a considerable degree of uncertainty into estimates of affected area since experience with this type of trail is limited. While the section would not be constructed, foot and horse travel would disturb and compact the soil. It is anticipated that initial years of use may result in divergent routes, with a braided pattern of travel; however, to the extent that use levels are significant, it appears likely that users will establish, by wear, a single best route between points. The extent of this affected area would be assumed to be the same as for the constructed trail segments.

Disturbed areas would not, of course, be confined entirely to the Trail itself. Additional areas will be disturbed by the development of access sites at numerous points along the route. The total number of acres potentially impacted would range from 300 to 400 acres, depending on the length of the alternative.

Soil orders, suborders, and great groups are shown on Map 14. The sensitivity of the soils in the study area varies significantly based on such variables as surface texture and composition, slope, and climate. In view of the extreme variability of this potential and the generality of the alternative alignments, it is impossible to focus closely on the absolute erosion potential of the plans or to provide meaningful comparisons of such potential among the plans.

The final location of the Trail following authorization would be chosen with full consideration of soil capabilities. Localized areas of unstable soil would be avoided wherever possible; where such soils are impossible to avoid, the Trail would be properly engineered to prevent problems.

VEGETATION - The different alignments will traverse a variety of vegetal types. These types are briefly described below, and the miles of each type traversed by each alternative are enumerated in Table 10. Map 15 displays vegetative patterns in the study area.

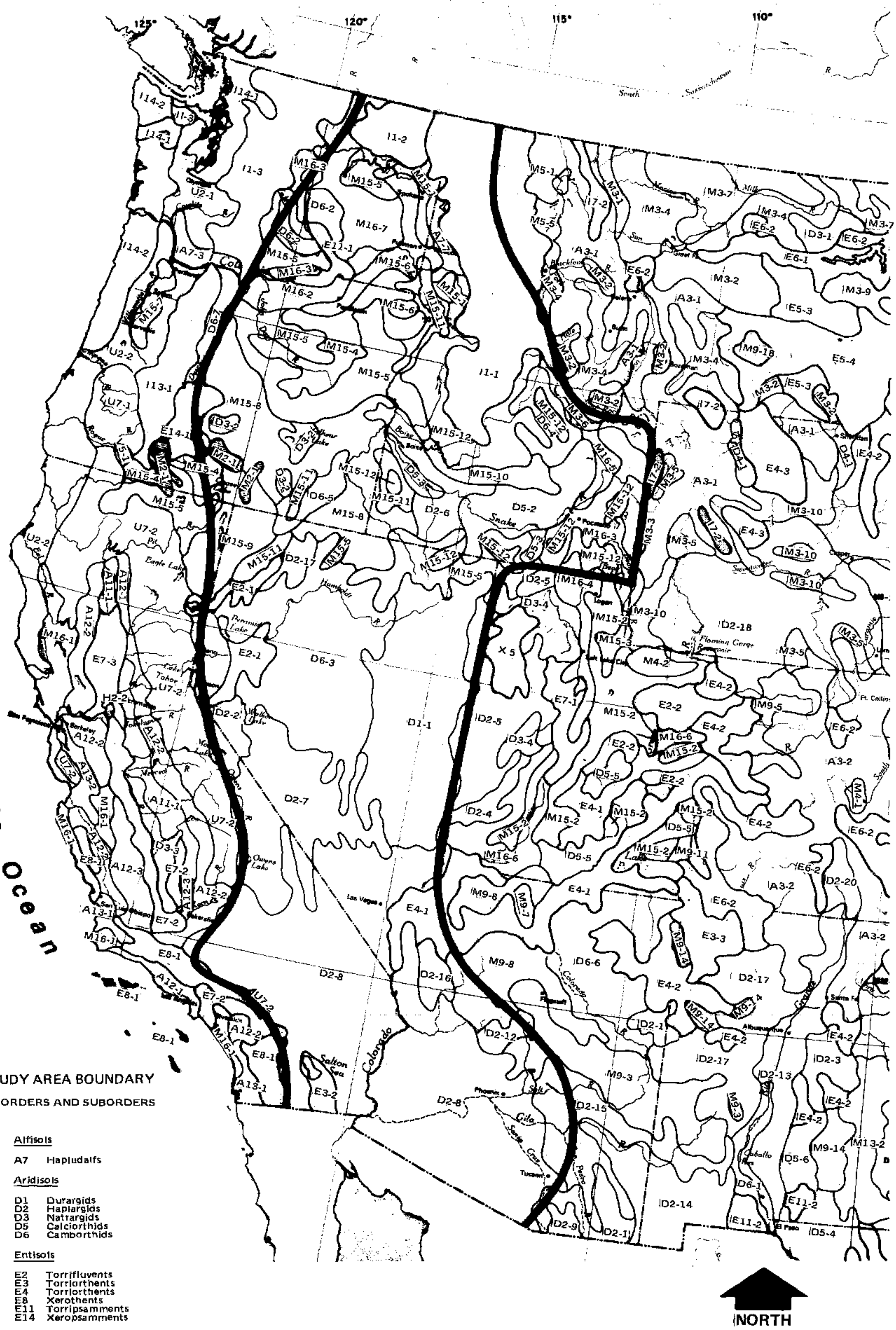
Southern Desert Shrub is the vegetation of the hottest and most arid portions of the study area, basically the Sonoran and the Mojave deserts. This type includes cacti, Joshua trees and other yucca, ironwood, mesquite, creosote bush, saltbrush, galleta, and black sage. Cacti are particularly richly represented in Arizona.

TABLE 10

Miles of Vegetative Types Traversed, Desert Trail Alternative Routes

Plan	Southern Desert Shrub	Northern Desert Shrub	Grassland	Woodland	Conifer Forest	Other*
1	583	948	57	106	25	123
1A	583	1099	57	106	25	132
2	583	948	52	101	25	121
2A	583	1009	52	101	25	126
3	539	948	51	79	12	87
3A	539	1099	51	79	12	96
4	539	948	48	74	12	83
4A	539	1009	48	74	12	88
5	812	948	57	111	25	133
5A	812	1099	57	111	25	142
6	812	948	52	106	25	131
6A	812	1009	52	106	25	1361

*Includes urban, cultivated, and barren lands.



STUDY AREA BOUNDARY

SOIL ORDERS AND SUBORDERS

Alfisols

A7 Hapludalfs

Aridisols

D1 Durargids
D2 Haplargids
D3 Natrargids
D5 Calciorthids
D6 Camborthids

Entisols

E2 Torrifluvents
E3 Torriorthents
E4 Torriorthents
E8 Xerothents
E11 Torripsamments
E14 Xeropsamments

Inceptisols

I1 Cryandepts

Mollisols

M2 Haplaquolls
M15 Argixerolls
M16 Haploxerolls

NORTH

MAP 14

SOILS

Desert Trail Feasibility Study

0 100 200 MILES
0 100 200 300 400 500 KILOMETERS

Scale 1:7,500,000

ADAPTED FROM U.S.G.S. NATIONAL ATLAS-1970

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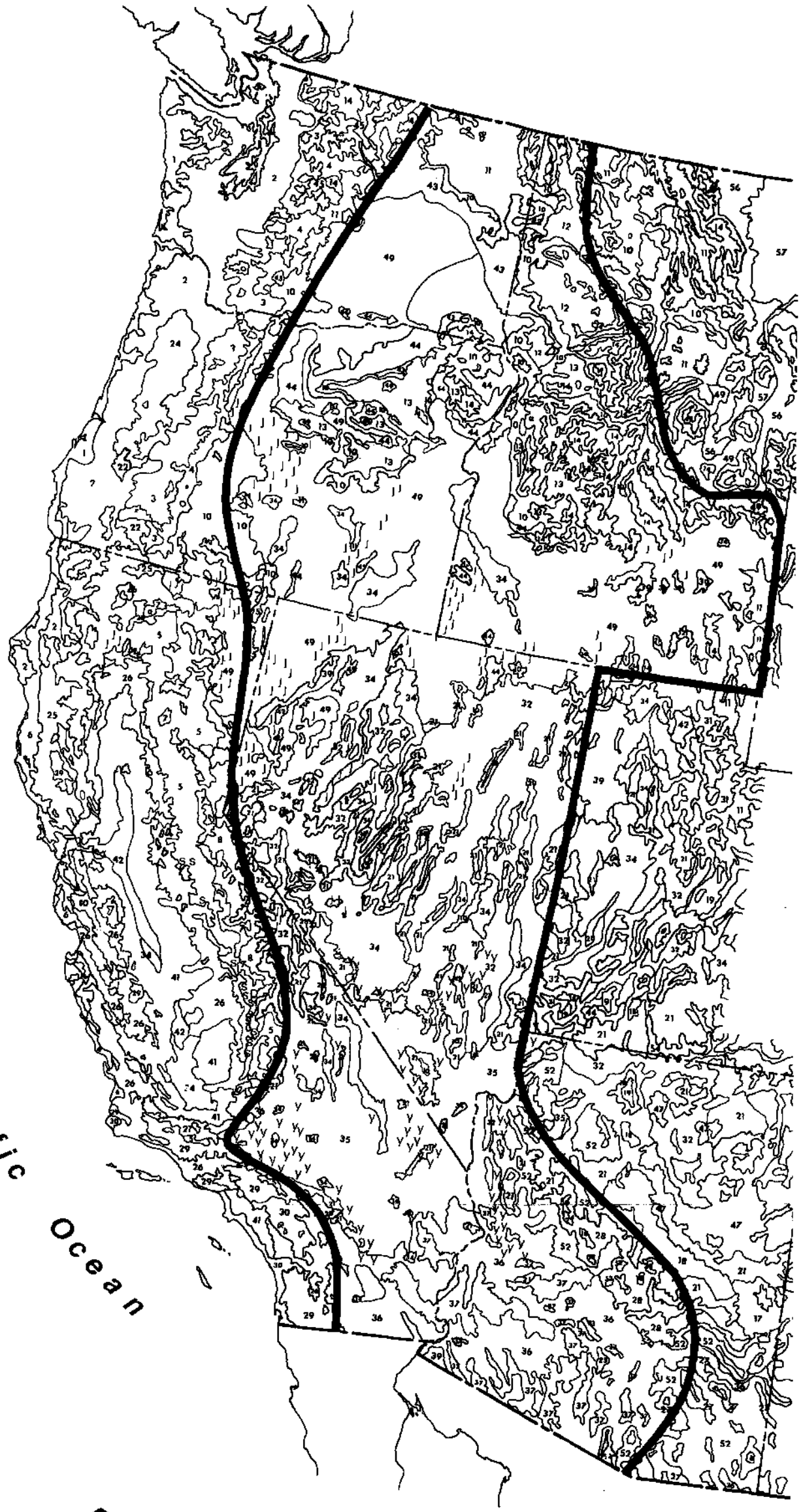
SEPT. 79 | WRO-PP

ON MICROFILM



NEEDLELEAF FORESTS

1 Spruce-cedar-hemlock forest (Picea-Thuja-Tsuga)
2 Cedar-hemlock-Douglas fir forest (Thuja-Tsuga-Pseudotsuga)
3 Silver-fir-Douglas fir forest (Abies-Pseudotsuga)
4 Fir-hemlock forest (Abies-Tsuga)
5 Mixed conifer forest (Abies-Pinus-Pseudotsuga)
6 Redwood forest (Sequoia-Pseudotsuga)
7 Red fir forest (Abies)
8 Lodgepole pine-subalpine forest (Pinus-Tsuga)
9 Pine-cypress forest (Pinus-Cupressus)
10 Western ponderosa forest (Pinus)
11 Douglas fir forest (Pseudotsuga)
12 Cedar-hemlock-pine forest (Thuja-Tsuga-Pinus)
13 Grand fir-Douglas fir forest (Abies-Pseudotsuga)
14 Western spruce-fir forest (Picea-Abies)
15 Eastern ponderosa forest (Pinus)
16 Black Hills pine forest (Pinus)
17 Pine-Douglas fir forest (Pinus-Pseudotsuga)
18 Arizona pine forest (Pinus)
19 Spruce-fir-Douglas fir forest (Picea-Abies-Pseudotsuga)
20 Southwestern spruce-fire forest (Picea-Abies)
21 Juniper-Pinyon woodland (Juniperus-Pinus)

BROADLEAF FORESTS

22 Oregon oakwoods (Quercus)
23 Mesquite bosques (Prosopis)

BROADLEAF AND NEEDLELEAF FORESTS

24 Mosaic of numbers 2 and 22
25 California mixed evergreen forest (Quercus-Arbutus-Pseudotsuga)
26 California oakwoods (Quercus)
27 Oak-juniper woodland (Quercus-Juniperus)
28 Transition between 27 and 31

SHRUB

29 Chaparral (Adenostoma-Arctostaphylos-Ceanothus)
30 Coastal sagebrush (Salvia-Eriogonum)
31 Mountain mahogany-oak scrub (Cercocarpus-Quercus)
32 Great Basin sagebrush (Artemisia)
33 Blackbrush (Coleogyne)
34 Saltbush-greasewood (Atriplex-Sarcobatus)
35 Creosote bush (Larrea)
36 Creosote bush-bur sage (Larrea-Franseria)
37 Palo verde-cactus shrub (Cercidium-Opuntia)
38 Ceniza shrub (Leucophyllum-Larrea-Prosopis)
39 Desert: vegetation largely absent

GRASSLAND

40 Fescue-oatgrass (Festuca-Danthonia)
41 California steppe (Stipa)
42 Tule marshes (Scirpus-Typha)
43 Fescue-wheatgrass (Festuca-Agropyron)
44 Wheatgrass-bluegrass (Agropyron-Poa)
45 Alpine meadows and barren (Agrostis, Carex, Festuca, Poa)
46 Fescue-mountain muhly prairie (Festuca-Muhlenbergia)
47 Grama-galleta steppe (Bouteloua-Hilaria)
48 Grama-tobosa prairie (Bouteloua-Hilaria)

SHRUB AND GRASSLAND COMBINATIONS

49 Sagebrush steppe (Artemisia-Agropyron)
50 Wheatgrass-needlegrass shrubsteppe (Agropyron-Stipa-Artemisia)
51 Galleta-three awn shrubsteppe (Hilaria-Aristida)
52 Grama-tobosa shrubsteppe (Bouteloua-Hilaria-Larrea)
53 Trans-Pecos shrub savanna (Flourensia-Larrea)
54 Mesquite-acacia-savanna (Andropogon-Setaria-Prosopis-Acacia)
55 Mesquite-live oak savanna (Androgopon-Prosopis-Quercus)

J,J,J Juniper, red cedar (Juniperus spp.)
S Giant sequoia (Sequoia wellingtonia)
Y Joshua Tree
Y,Y (Yucca brevifolia)

NORTH

0 100 200 MILES 300
0 100 200 300 400 500 KILOMETERS

Scale 1:7,500,000

MAP 15

STUDY AREA BOUNDARY

ADAPTED FROM U.S.G.S. NATIONAL ATLAS-1970

VEGETATIVE COVER

Desert Trail Feasibility Study

ON MICROFILM

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Northern Desert Shrub is the vegetation of the colder Great Basin Desert. Plant species include sagebrush, hopsage, rabbit brush, ephedra, horsebrush, and a wide variety of grasses. Salt desert areas include alkali-tolerant plants such as shadscale, winterfat, bud sage, and greasewood.

Grassland would be traversed in limited locations in Arizona, Nevada, Oregon, and Idaho. As suggested by the label, principal vegetation consists of grasses, with substantial variation in species between northern and southern grassland areas. Most of the grasslands have been considerably modified from their natural form since the advent of heavy grazing.

Woodlands occupy intermediate elevations in the study area. Common species include pinyon pine, juniper, ceanothus, bitterbrush, Emory and Gambel oak, sagebrush, and a wide variety of forbs and grasses.

Coniferous Forest is encountered only in the Hualapai Mountains in Arizona and in the extreme eastern part of Idaho in the area of the Continental Divide. Overstory species include Ponderosa pine, Douglas fir, and Engelmann spruce. The understory may include species such as low sagebrush, snowberry, serviceberry, bitterbrush, Gambel oak, mountain maple, and alder. Open and semiopen areas may produce a variety of grasses and provide good grazing values.

Other vegetative types include urban and cultivated lands. It should be noted that the categories discussed above are general and do not include some of the mixed types and more unique vegetative types which occur at limited locations in the study area.

The overall project impact on vegetation should be limited due to the limited amount of surface disturbance foreseen. Between 300 and 400 acres of vegetation would be directly impacted.

These aggregate figures do not, of course, address the increasingly recognized problem of rare plant protection. Because of the limited extensive rare plant surveys undertaken in desert areas, it is impossible to determine to what extent the alternatives may conceivably pose a threat to rare plants. Prior to selection of a specific route for the Trail, on-the-ground surveys of the area would be accomplished to ascertain the presence of any such species. Steps could then be taken to avoid damage. Costs have been included in the plan for such surveys.

A continuing problem of considerable importance in Arizona is the theft of plants, particularly cacti, from the public lands. Creation of a trail may have some effect on such theft by providing access. However, the physical limitations of hiking and horseback riding make it unlikely that losses will be large. In fact, it is possible that the presence of environmentally conscious recreationists on the desert would be an aid in the prevention of such illicit activity.

FISH AND WILDLIFE - With two exceptions, discussed below, contact of the alternative alignments with fishery resources would be limited and impacts insignificant. Potential for adverse effects does exist with respect to the several limited-range remnant fish populations inhabiting springs at a variety of desert locations. Such populations are found in California, Nevada, and Oregon and could be seriously impacted through contamination by ignorant or malicious trail users. Several such species are listed as threatened or endangered under the Endangered Species Act.

A second potential fishery conflict exists in the Steens Mountain area with respect to the Redband Trout, which has a limited range in Eastern Oregon and which is plentiful in the streams of Steens Mountain. Heavy trail use adjacent to these streams could contribute to erosion and pollution and hence deterioration of fish habitat. In addition, considerable additional fishing pressure on the streams occasioned by national trail designation could have the effect of dangerously reducing populations.

Wildlife would be affected in one degree or another throughout the length of the alternatives, both by habitat destruction and by the disturbance of human presence.

The habitat values of the previously listed vegetal cover types traversed and impacted by the project alternatives are briefly discussed below.

Southern Desert Shrub in general has low productivity for wildlife in terms of animals per acre. This habitat does provide for a number of unique and interesting species, however; and some areas contribute importantly to the survival of species such as bighorn sheep and Sonoran antelope.

Northern Desert Shrub provides principal habitat for pronghorn antelope, sage grouse, and chukar, was well as a variety of other animals. Where located near forested areas, this vegetal type provides important winter range for deer and elk. Salt desert areas are considerably less valuable than sagebrush zones but still contribute importantly to pronghorn antelope range.

Grassland is of relatively modest value as wildlife habitat unless interspersed with other types of vegetal cover, at which time its value increases considerably.

Woodland provides deer and elk range, particularly where it occurs in open stands understoried with shrubs, forbs, and grasses. This vegetal type also supports a wide variety of other animals.

Coniferous Forest areas, interspersed with brushy areas and open meadows, provides extremely important habitat for mule deer, elk, moose, black bear, and a variety of smaller animals.

Actual destruction of vegetation by the project, as indicated above, will be limited; hence wildlife habitat will be only very slightly reduced by project construction.

Human presence itself, however, may have an adverse impact on wildlife populations, particularly in areas where use is heavy, occurs in particularly critical periods; e.g., fawning season, or affects limited but essential resources such as water or critical cover. Although most species should not be significantly affected by the levels of use anticipated for the Trail, one species which is particularly sensitive to human presence is the bighorn sheep. Although many alternative routes were originally eliminated because of conflicts with critical bighorn habitat, several of the segments remaining among the alternatives do pose at least some potential for conflict with bighorns. Areas with such potential conflicts include:

Plomosa Mountains, Arizona

Buckskin Mountains, Arizona

Amargosa Range, California

Panamint Range, California

San Jacinto/Santa Rosa Mountains, California

White Mountains/Silver Peak Range
California/Nevada

Sheldon National Wildlife Refuge, Nevada

Pueblo Mountains, Oregon

Steens Mountain, Oregon

Big and Little Jack's Creek, Idaho

Avoidance of conflicts with the wildlife populations will be a major consideration in detailed planning following project authorization, with particular attention necessarily given to animals listed by the Secretary of the Interior as threatened or endangered. Close coordination will be maintained with Federal and state fish and wildlife agencies. Measures taken to avoid conflicts will include routing the Trail away from areas of critical wildlife importance and education of users in proper use of desert water sources; i.e., making camp a sufficient distance from water sites so as not to preclude wildlife use.

An area of particular significance from the standpoint of fish and wildlife is Steens Mountain. Steens Mountain has in recent years experienced a great upsurge in use, which threatens to disrupt several populations, including mule deer and the already-mentioned Redband trout and bighorn sheep. In the long run, the Bureau of Land Management expects to assume a more intensive management role on the Mountain and to be in a position to control use and impact. It is recommended that implementation of a national scenic trail segment across Steens Mountain not be undertaken until such management has been established and demonstrated capable of managing the overall human impact on the

Mountain. Under such management, the Desert Trail would constitute merely an alternate source of access but would not create net adverse impacts.

VISUAL QUALITY - Trail features affecting visual quality include the trail itself and supporting facilities such as access points. The Trail itself will vary from a route marked with posts and cairns to a constructed cross-section 18 to 24 inches in width. Supporting facilities will include parking lots, trash cans, and informational and directional signs. Development of these facilities would incorporate rustic designs intended to blend with the environment. While some negative impact on visual quality would result from trail implementation, it should be minimal.

Trail operation will likely result in some adverse visual quality through littering. This problem will be exacerbated in areas where water supply difficulties dictate the use of caching. The primary weapon against littering is user education aimed at promoting the "pack in/pack out" principle. Such an education program would not be expected to be totally effective, however.

ARCHEOLOGICAL AND HISTORICAL RESOURCES - Opportunities for conflict with archeological resources exist in varying degrees throughout the alternative routes. Costs are included in the plan to provide for archeological clearance of the selected alignment, and this precaution should provide for avoidance of most significant areas. Departure of

the users from the selected alignment for side trips, camping, etc., may result in some limited contact with archeological sites and, likely, at least some pilfering. Impacts from this type of activity may be somewhat mitigated by informational programs and, in any event, should not be highly significant.

Historical resources may be bypassed by the Trail alignment at a number of locations. Selection of trail alignments would involve consideration of the potential for damage to such features, and in some cases the Trail would be relocated or resource protection would be provided. In remote and highly attractive areas with high historic values; e.g., High Rock Canyon in northwest Nevada, some destruction of historic features by vandalism and some pilfering of artifacts would probably be unavoidable.

INDIRECT EFFECTS - The indirect effects of a Desert Trail may well be considerably more significant than the direct effects; however, they can only be hypothesized in the grossest qualitative terms.

A major goal of the Desert Trail Association in urging implementation of a Desert Trail is to instill in the population a greater understanding of and appreciation for the desert. From the environmental quality protection standpoint, such appreciation may have both negative and positive aspects. To the extent this change in attitude occurs, it may be expected that the overall level of recreation use on the deserts, including both use of developed areas and unregulated cross-country use, will increase substantially with accompanying increased impacts on

environmental factors. It may also be expected that the constituency for preservation-oriented management of public desert lands will increase significantly, with possible impacts on overall public land management policy. This could result in increased protection for environmental factors such as soils, vegetation, fish and wildlife, and cultural resources but could render more difficult the extraction of natural resources of economic value, including sources of energy. Finally, increased interest in desert recreation may have the effect of re-distributing some use away from the already heavily-used high mountain environments, thereby benfiting environmental values in those regions.

MITIGATING MEASURES - Primary mitigation for potential impacts will be accomplished by preconstruction planning designed to route the Trail away from sensitive soils, rare plants, critical fish and wildlife habitat, cultural resources, and lands with high economic value. To the extent that subsequent use patterns produce significant adverse effects on environmental values or interfere unduly with realization of important economic values, the National Trails System Act provides procedures for the relocation of segments. All planning and development activities will, of course, conform to the requirements of both the Endangered Species Act and the Archeological and Historic Preservation Act; and planning will be fully coordinated with relevant Federal and state agencies with expertise and interests in these areas.

In the case of Steens Mountain, where the overall use levels are a threat to environmental values, implementation of the Trail would be contingent on the successful implementation of a plan by the Bureau of Land Management to control use consistent with maintenance of environmental quality.

A thorough information program aimed at educating the user public on the environmental sensitivities of the deserts and providing guidance for nondestructive trail use will also be a useful tool to mitigate potential damage.

Proper design will be used both to blend the Trail and its supporting facilities into the environment and to prevent erosion in areas of sensitive soils.

PLANNING CONFLICTS - None of the alternatives has major conflicts with Federal, state, or local land use plans. Conflicts in the implementation stage will be avoided by the implementing agencies' maintaining close coordination with other planning agencies during the postauthorization detailed planning process.

ENERGY ASPECTS - None of the alternatives will produce significant impacts on energy consumption rates, and differences among the alternatives will be minimal. Because the Trail would offer a relatively distant attraction to city dwellers in need of recreation and because of the need for land managing agencies to maintain Trail portions in

isolated areas, the Trail would be expected to increase energy consumption to some limited extent.

Energy production may be somewhat impacted by land use controls associated with protection of a trail corridor. Although major consideration would be given in the detailed planning process to avoidance of significant energy resources, in some instances it may be found desirable to preclude or closely control extraction in the area of the Trail. Such areas would not be expected to be extensive.

NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL - The Trail, regardless of the alternative selected, would have negligible impacts in this area.

URBAN QUALITY - Implementation of the Desert Trail will have no effect on urban areas.

UNAVOIDABLE ADVERSE EFFECTS - Unavoidable adverse effects include soil and vegetative disturbance, loss of wildlife values through habitat destruction and human presence, scenic degradation through construction and littering, and increased disturbance and vandalism of archeological and historic sites. All of these effects should be minor.

THE RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY - A Desert Trail would constitute a long-term investment with use continuing indefinitely. The existence of the Trail would in some cases contribute to land management decisions affecting the economic

values of adjacent lands both in the near term and the long term. The extent of such values are not expected to be great.

IRREVERSIBLE RESOURCE COMMITMENTS - The Trail will represent an irreversible commitment to the extent that physical modifications of the land, occurring as a result either of construction or trampling by a large number of users, will be, for all practical purposes, permanent. Impacts associated with continuing use, however, can be largely eliminated through relocation of the Trail to new areas.

THE NO PROJECT ALTERNATIVE

DESCRIPTION

The nature of the public response to the Desert Trail suggests popular expectation that such a Trail would meet three basic needs. First, there is a perceived need generally for additional trail opportunities in the deserts. Second, many desert enthusiasts perceive a need for dramatic symbolism, such as designation of a Desert National Scenic Trail, to encourage others to explore and learn to appreciate the desert environments. Third, and probably least significantly, there is a perceived need for a continuous designated route from Mexico to Canada. This section will examine the likely means of addressing these needs in the absence of authorization and implementation of a Desert National Scenic Trail.

THE NEED FOR TRAIL OPPORTUNITIES - Compared with forested areas, there are relatively few marked, developed, and well-publicized trails in the multiple-use desert areas. While hiking and horseback riding have long been essential ingredients of forest and high-mountain recreation, there has been no such tradition of trail use in desert recreation. With the recent growth of interest in the more subtle aspects of the desert, public demands are beginning to emerge for trails, particularly in the more scenic and readily accessible areas.

Most of the public desert lands with unrealized potentials for trail development are those managed by the Bureau of Land Management. As a

result of the Federal Land Policy Act of 1976, which established a general policy of retention of the public domain lands in Federal ownership, the Bureau of Land Management is now in a position to develop and implement long-range multiple-use plans on its lands. Over the next few years, the Bureau will be completing and updating Management Framework Plans for all its management units; and it is within the context of this comprehensive planning program that opportunities for trail development can be considered and acted upon.

In evaluating these potentials, the Bureau will not, of course, be constrained, as was the Desert Trail study, by a limited study area and the need to integrate all segments into a continuous trail. Rather, the Bureau will be in a position to consider trail development in all the desert states. While a number of valuable segments were identified in the course of the Desert Trail study and can likely be implemented by the Bureau, they will likely be supplemented by a number of other segments as well, providing a wide range of geographical locations and types of phenomena.

Of considerable significance to trail use in the deserts is the designation of wilderness areas on the National Resource lands. The Bureau is in the process now of inventorying and evaluating lands qualifying for such designation and over the next few years will be presenting to Congress the basic information and recommendations necessary for Congressional designations. While the areas to be so set

aside are unknown at this time, it seems likely that the areas will be substantial. Experience with high-mountain wilderness has been that such designation acts as a magnet for trail users, and it is likely that wilderness designation will provide the Bureau with powerful popular demands for trail development.

The extent and timing of such trail development is impossible to gauge, being dependent both on the extent of potential trail development opportunities and the financial resources made available to the Bureau for trail implementation. Budgeting of funds for trail development would, of course, be made in the context of the priorities for other recreation needs and other public land management actions.

The greatest potential of the desert for hiking and riding, however, lies not in a few designated and developed trails but rather in cross-country use. The designated and de facto wilderness areas of the desert offer tremendous opportunities for cross-country hiking and riding and require virtually no facilities for utilization. This type of use offers a wealth of satisfaction to the user, providing opportunities to exercise technical competence while affording a degree of escape to solitude which is no longer available in most of the alpine wilderness areas. Unlike high-mountain areas, where rugged terrain in many places confines travel to developed trails, the desert offers relatively few physical barriers to movement, permitting the user a sense of wilderness unattainable on a developed trail.

The key to unlocking this cross-country potential is primarily information, both on the techniques of safe desert travel and on the attractions and character of the different areas. This information will be largely provided by the private sector as a natural response to demand rather than by a government program. To some extent, this process has already been set in motion. Hiking and wilderness magazines have in recent years responded to a growing interest in desert travel by devoting ever more pages of their publications to this subject. At least two new books are scheduled to be published on desert hiking in the near future. Organizations too, such as the Sierra Club and the Desert Trail Association, have active programs for introducing novices to the skills and joys of desert travel. As interest in desert travel grows, the capabilities of these organizations to respond will grow as well.

The NEED FOR SYMBOLISM - One of the most often cited reasons for having a Desert National Scenic Trail is that such designation would identify the desert as an attractive place to ride and hike and would encourage many of those who now confine themselves to high-mountain areas to spend more time in the desert, become familiar with it, and become more protective toward it.

With or without Desert Trail authorization, it can be expected that this interest and attitude will be fostered by two other programs. First is the wilderness program, which, as indicated above, can be expected to

draw large numbers of visitors into the desert merely as a result of designation. Second, following the development of high-quality desert trails by the Bureau of Land Management, it would be expected that many would be designated as national recreation trails and thereby included in the National Trails System, enjoying the status and public exposure of other such units. The Forest Service is now in the process of adding many of its better forest trails to the National Trails System through this vehicle.

It is impossible to estimate how extensive such designation might be; however, given the number of potential high-quality trail segments discovered in the process of the Desert Trail study, it seems likely that there could be a substantial number qualifying for such designation.

THE NEED FOR A CONTINUOUS DESERT ROUTE BETWEEN MEXICO AND CANADA - In the absence of authorization of a Desert National Scenic Trail, little would be done by the government to facilitate or encourage border-to-border desert hiking and riding.

However, the barriers to such activity when accomplished on an individual basis are not excessive. The terrain for the most part is reasonably conducive to cross-country travel, and land ownership patterns would provide only a few problem areas. In fact, the occasional hiker could probably trespass on private property without incident in many of the more remote areas of the desert.

Next to time, energy, and financial resources, the greatest need of the border-to-border trail user would be for information. There are a number of examples of long-distance hikes and trail rides which have been accomplished in the deserts, many of which have been well-documented in books and magazine articles. The information from these sojourns, coupled with the routes analyzed for the Desert Trail study and more specific information available from the various land management organizations, should enable anyone seriously interested in making a really long-distance hiking or riding trip to obtain sufficient information to do so. In fact, given the primitive nature of most sections of the Desert Trail and hence the need for extensive planning and logistical support, it would seem that the additional research burden placed on the individual would be a relatively minor increment.

ECONOMIC CONSEQUENCES

Many of the actions discussed under the No Project Alternative would occur with or without implementation of a Desert Trail. The only major difference lies in the activities of the major land managing agencies in expansion of trail opportunities. Without a Desert Trail, funds made available for trail development would likely be spent only on trail segments capable of providing for substantial public use at a reasonable cost. The economic returns on such investments would be expected to be relatively high since only the better opportunities would be exploited.

Assuming equivalent funding for trails with or without the Desert Trail, the No Project Alternative would produce roughly the same degree of effect in terms of benefits foregone due to land-use controls and local economic impacts due to increased recreationist spending.

ENVIRONMENTAL CONSEQUENCES

The implementation of only the high-quality segments would, as in the case of the alternative Desert Trail plans, result in only very minor direct negative impacts on environmental values. The same procedural safeguards would exist, requiring extensive preconstruction environmental surveys and including location criteria for routing trail segments away from environmentally sensitive resources.

COMPARISON OF ALTERNATIVES

The decision-making process requires two stages -- first, an evaluation of the alternative plans for a Desert Trail and a selection of the best of these alternatives and, second, a comparison of the best Desert Trail plan with the no project alternative to determine if implementation of a Desert Trail offers significant net benefits.

COMPARISON OF ALTERNATIVE DESERT TRAIL PLANS

The alternative plans are compared in terms of national significance, economic consequences, and environmental consequences.

NATIONAL SIGNIFICANCE - The relative quality of the plans from the standpoint of national significance is evaluated below in terms of overall quality, collective significance, and significance associated with the inclusion of individual components.

While there are minor differences among the plans in overall quality and collective significance, they are not significant enough to provide meaningful decision-making criteria. From the quality standpoint, all plans have segments of high quality and value and segments of rather low quality. In a collective sense, all the plans include representation of three major desert divisions and good representation of the natural phenomena peculiar to each.

Table 11 summarizes the extent to which areas identified as being of national significance are included in the various plans. Differences

TABLE 11

Inclusion of Areas of National Significance in Alternative Plans

Area of National Significance	Plan											
	1	1A	2	2A	3	3A	4	4A	5	5A	6	6A
Anza Borrego State Park					X	X	X	X	X	X	X	X
Joshua Tree National Monument					X	X	X	X	X	X	X	X
Providence Mtns. State Recreation Area					X	X	X	X	X	X	X	X
Death Valley Natl. Monument	X		X	X	X	X	X	X	X	X	X	X
Fort Churchill	X		X	X	X	X	X	X	X	X	X	X
Oregon Trail-South Alternate	X		X	X	X	X	X	X	X	X	X	X
Craters of the Moon National Monument	X		X	X	X	X	X	X	X	X	X	X
Big Southern Butte	X		X	X	X	X	X	X	X	X	X	X
Hell's Half Acre	X		X	X	X	X	X	X	X	X	X	X
Number	6	6	6	6	9	9	9	9	9	9	9	9

are not great among the plans, with the bulk of the nationally significant areas located on segments common to all plans. The only significant difference lies in the choice between the Arizona and the southern California routing: Use of the California routing adds three additional dsignated areas. However, because of the differences in the significance of the various areas and the extent to which their significance can be incorporated into the trail experience, the number of such areas in a given plan is a quality indicator of rather modest value.

ECONOMIC CONSEQUENCES - The plans vary substantially in their relative efficiency in providing for recreation opportunities. Table 12 summarizes benefit-cost information for the plans.

The most economically efficient plan is Plan 3 which originates on the California-Mexico border and proceeds north to a connection with the Continental Divide Trail via Nevada, Oregon (Steens Mountain route), and Idaho. Expansion on this basic single-corridor theme is made only at relatively high cost. For example, inclusion of the "winter" routes in Oregon and Idaho (Plan 3A) increases average cost per visitor-day only $ .44; however, the incremental cost per visitor-day is a whopping $22.50. In the same line, use of a dual corridor in Arizona and California (Plan 5) increases average cost per visitor-day only $ .78; but the incremental cost is $15.96 per visitor-day.

TABLE 12

Benefit/Cost Data: Alternative Plans

Plan	Total Visitor Days/1980	Total Annual Costs*	Cost Per Visitor Day
1	75,100	829,000	$11.04
1A	78,300	901,000	11.51
2	68,900	824,000	11.96
2A	70,200	854,000	12.17
3	109,900	773,000	7.03
3A	113,100	845,000	7.47
4	103,700	838,000	8.08
4A	105,000	797,000	7.59
5	120,300	939,000	7.81
5A	123,500	1,012,000	8.19
6	114,000	934,000	8.19
6A	115,400	964,000	8.35

*Initial costs annualized based on 6-7/8% discount rate used for analysis of water resources investments.

The least efficient plans are those utilizing the Arizona alignment in lieu of the California alignment. This results from the relative unattractiveness of a significant portion of the Arizona alignment. In contrast, the California alignment combines a relatively high-quality route with the proximity of large populations.

ENVIRONMENTAL CONSEQUENCES - The environmental consequences of the alternatives are expected to be roughly equal, producing only minor adverse impacts invariably associated with the increased contact of human beings with the environment. Major impacts will be avoided by routing the Trail segments away from sensitive areas or making routing of the Trail through such areas contingent on management adequate to maintain impacts within acceptable limits.

SELECTION OF BEST DESERT TRAIL PLAN - The plans do not differ significantly in either national significance or environmental consequences. Major differences do, however, exist with respect to economic consequences, and, based on that criterion, Plan 3 appears to be the best choice.

Plan 3 does not incorporate the low-elevation "winter" routes supported by several contributors to the planning process. In view of the very limited transportation value of the Trail and the expectation that most people will use only small sections at one time, the need for inclusion

of such "winter" segments, which would be less scenic than the "summer" segments, does not appear sufficient to warrant the rather substantial incremental cost.

Plan 3 also does not incorporate an Arizona routing and thereby fails to include an important range of Sonoran Desert phenomena. Unfortunately, much of the very high-quality Arizona Sonoran Desert resources desirable for trail use are either controlled by or blocked by adverse institutional arrangements. Consequently an Arizona alignment worthy of inclusion in a National Scenic trail is not attainable.

COMPARISON OF BEST DESERT TRAIL PLAN WITH NO PROJECT ALTERNATIVE

As indicated in the section on the No Project Alternative, public response to the Desert Trail suggested the need for:

1. Trail opportunities in the deserts
2. Symbolism
3. A continuous route from Mexico to Canada

This section will compare the effectiveness of Plan 3 and the No Project Alternative in meeting these needs.

THE NEED FOR TRAIL OPPORTUNITIES - The authority and capability for development of trails in desert areas already exists among the land-managing agencies. In the absence of an integrated long-distance Desert Trail authorization, agencies would likely spend available trail implementation and operation funds only in the higher-value areas

capable of attracting significant levels of use. Such trails could be long or short and located in a wide variety of different desert settings. Many would likely be implemented in the still-to-be-determined wilderness areas.

From the standpoint of economic efficiency, a Desert National Scenic Trail appears to be a rather poor way to provide for increased trail opportunities since the continuity requirement obliges the land-managing agencies to budget funds not only for high-value segments but for the moderate and low-quality segments as well. Using the cost and benefit data developed for the Desert Trail alternatives as a rough guide, high-quality and highly accessible segments could be implemented for a cost of about $1.50 per visitor-day, while high-quality but more remote segments would have an implementation cost of about $3.75. These figures can be compared with the estimate of $7.03 for Plan 3, which necessarily includes a considerable mileage of moderate and low-quality segments.

As discussed in the No Project Alternative section, the greatest potential for desert hiking and riding, in any event, lies in cross-country use; and this use will be stimulated by private sector information flows independent of the creation of designated trails.

SYMBOLISM - The creation of a Desert National Scenic Trail would doubtless provide an effective means of stimulating additional trail use of desert areas. However, expenditure of equivalent funds for

development of only high-quality areas and their subsequent designation as national recreation trails, would also offer an effective means of advertising desert attractions. The latter approach, free from the continuity requirement, would also allow for readily accessible opportunities for a wider range of population centers. In summary, the national scenic trail alternative does not appear to offer particular advantages in providing symbolic inducement for use of desert areas.

As indicated in the No Project Alternative section, an important symbolic contribution will also be afforded by the designation of wilderness areas in the desert.

A CONTINUOUS ROUTE FROM MEXICO TO CANADA - Creation of a desert trail would, to some extent, facilitate and encourage very long-distance riding and hiking use. However, the demands of such travel, even with an established desert trail, would be such as to preclude all but a few from undertaking cross-nation, or even cross-state trips. Long-distance desert travel is, of course, already largely available to those willing to gather sufficient information. In view of these considerations, it appears that the value of a designated route from Mexico to Canada is no more than marginal.

FINDINGS AND RECOMMENDATIONS

It is recommended that a Desert National Scenic Trail not be authorized. There are several reasons for this recommendation.

First, public support for such a Trail appears to be extremely limited. While a limited number of desert enthusiasts actively support designation of a Desert Trail, the vast majority of the public appears largely uninterested. In addition, a number of individuals have indicated their opposition to creation of a Desert Trail as a waste of the taxpayers' money.

Second, none of the alternative routes examined offer the kind of nearly continuous high-quality trail opportunities which a national scenic trail should offer. While no cross-nation trail can realistically be expected to provide uninterrupted scenic attractions, substantial portions of all the alternative Desert Trail routes would offer very modest scenic attractions and would be expected to attract very little use. The overall quality would be considerably lower than that of any of the authorized national scenic trails. In view of these quality deficiencies, it is impossible to find the Desert Trail to meet the criterion of national significance required of a national scenic trail.

Finally, the major objectives of Desert Trail supporters can be more efficiently met through a combination of existing government programs and the activities of the private sector. Existing government programs

are capable not only of providing for developed trails in areas of demonstrated need but also of providing recognition of the desirability of desert riding and hiking through designation of such trails as national recreation trail components of the National Trails System. The private sector is capable of stimulating and facilitating cross-country desert travel through the development and distribution of the essential information.

GPO 692-982