NATURAL RESOURCES MANAGEMENT PLAN

and environmental assessment

PINNACLES

NATIONAL MONUMENT

CALIFORNIA

NATURAL RESOURCES MANAGEMENT PLAN

and Environmental Assessment

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CALIFORNIA

Prepared by

Pinnacles National Monument
National Park Service
Department of the Interior

April 1976

Negative Declaration

Department of the Interior

National Park Service

PINNACLES NATIONAL MONUMENT

California

Western Region

In compliance with the National Environmental Policy Act of 1969, the National Park Service has prepared an environmental assessment on the following proposed project:

Natural Resources Management Plan
Pinnacles National Monument

The assessment process did not indicate a significant environmental impact from the proposed action. Consequently, an environmental statement will not be prepared.

2/17/76
Date

Superintendent

4/12/76
Date

ACTING Regional Director, Western Region

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ABSTRACT

The Natural Resources Management Plan (NRMP) for Pinnacles National Monument incorporates management objectives, proposed research and management actions. These proposals have been established to restore and preserve natural ecosystems while simultaneously providing an enjoyable experience for the visitor.

Proposed research will entail identification of all plant species present; collection and checklist of insects; inventory of aquatic plants and animals; study of mammal ecology; survey of threatened plants and animals; and monitoring of visitor impact on management resources.

Proposed management actions include a prescribed burning program aimed at returning overmature chaparral vegetation to a more stable and productive community; revegetation of existing firebreaks for aesthetics, continuity of the ecosystem and inhibition of erosion; improvement and construction of trails for visitor safety and protection of surrounding biota; repair leaks or potential breakage points in Bear Gulch Dam and superficially camouflage it with native rock veneer; survey and fence monument boundaries to reduce trespassing, protect the natural resources and aid in law enforcement.

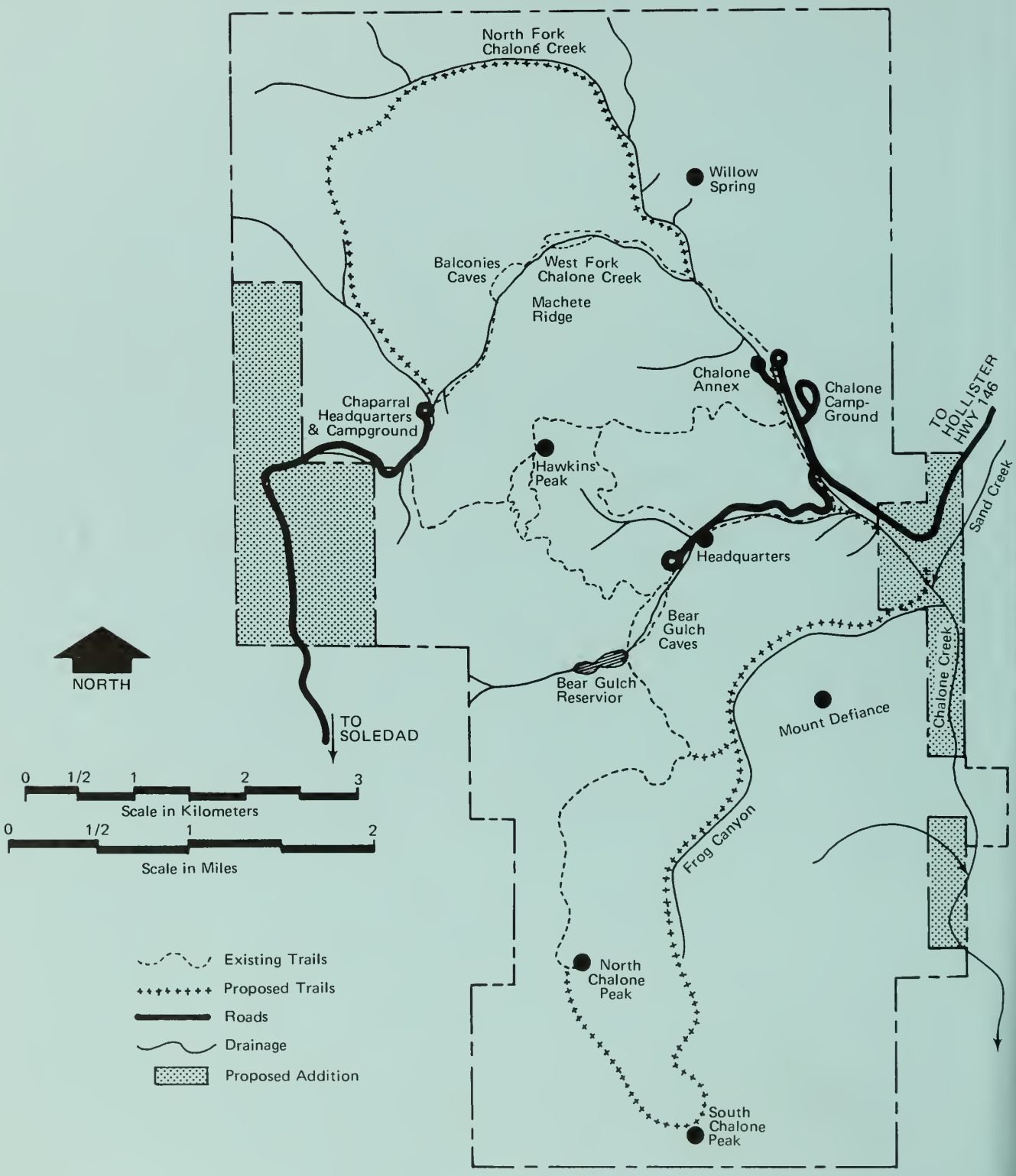


Fig 1. Pinnacles

RESOURCES MANAGEMENT PLAN

INTRODUCTION

In 1906 Pinnacles was set aside as a national forest preserve. Two years later, legislation established it as a national monument. The boundaries of the monument have since changed due to various land acquisitions from neighboring landowners. The most recent addition was the Balconies caves area, acquired in 1958. The original enabling legislation set Pinnacles aside for its pinnacled rocks and the adjacent caves. Recently recognized values include the monument's geologic history and its vegetative cover. There is a complete representative sample of coast range chaparral which is not represented in any other National Park Service area. It is imperative to maintain and properly manage this unique biotic community.

MANAGEMENT OBJECTIVES

Recently, as with other units of the National Park System, Pinnacles National Monument is experiencing increased visitation, especially from the San Francisco metropolitan area. Present visitor facilities are inadequate, outdated, and overtaxed at peak periods of use. Visitors are often turned away for lack of space and facilities. The facilities exist dangerously close to and are threatening the resources we seek to protect. Cognizant of these facts, the National Park Service has prepared a master plan for Pinnacles. This is a conceptual plan for preservation, interpretation, administration, and development of the national monument, as a guide for its management and future use. Its resources management objectives are:

Retain as much land as possible in a primitive or undeveloped category, and adhere to the standards for wilderness classification in those areas presently proposed as such, now before Congress.

Identify and curtail human-caused erosion, and promote the growth and reproduction of native vegetation.

Encourage research which will develop a better understanding of the chaparral environment and its specialized flora and fauna.

Eliminate feral animals, and maintain close cooperation with State agencies in the management of the resident deer herd and other animals.

Protect the existing natural resources by fencing the boundaries of the monument to discourage hunting and to eliminate trespass grazing by domestic livestock.

Establish an adequate program of fire control in cooperation with the State Division of Forestry to investigate the feasibility of introducing controlled wildfire as a natural element within the chaparral ecosystem.

This resources management plan consists of research and management proposals to protect and perpetuate natural conditions throughout the monument.

RESEARCH AND RESOURCES MANAGEMENT ACTIONS

RESEARCH PROGRAM

Future management policies and interpretation require knowledge of the basic biology of the monument. Studies or inventories are proposed to provide this basic information, determine areas for further study, identify problems, and recommend courses of action for their solution.

The chaparral community in Pinnacles exhibits fire-dependent characteristics. Existing research indicates that fire plays an important role in managing and maintaining certain ecosystems. Prior to or coinciding with the development of a fire management program, more information is needed concerning fire behavior, its actual effect on the chaparral ecosystem, prescribed burning techniques and the impacts of burning.

In order to maintain the dam and reservoir as a safe and pleasing feature, its structural soundness needs to be ascertained and its water quality kept suitable for its designated use. A survey is needed to determine the structural soundness of Bear Gulch dam and what may be needed to improve its condition. The reservoir water must meet water quality objectives set by the Regional Water Quality Control Board, Central Coast Region and standards set by the Environmental Protection Agency (EPA). A monitoring program will be needed to comply with these standards.

The cataloging of plants now in progress, will be completed with emphasis given to nonnatives, lichens, fungi, mosses, liverworts and the drier habitat plants. An extensive insect collection and checklist will be made. Life cycles of lesser known species and interrelationships with other animals and plants will be studied. An inventory of fresh water plants and animals will be made, with attention given to rare, endangered, or doubtful species. A survey of population size, location, range, and interrelationships of the monument's mammals will be made.

Special studies will provide data concerning the habitat, nesting areas, and status of the threatened prairie falcon and the endangered peregrine falcon, as well as determine the distribution of other birds of prey in the monument. This research will direct the placement of trails and recommend limiting visitor use in certain areas during nesting periods when necessary. Problem areas will be identified, and recommendations for future studies will be made. There is now an approved, nation-wide condor recovery plan with Fish and Wildlife Service as lead agency. This combined with a memorandum of agreement between the Service and Fish and Wildlife, Department of Fish and Game and the Endangered Species Act of 1973, will provide ways to identify threatened species within the monument and how to protect them.

Formation of a visitor carrying capacity for the monument is a requirement of the approved master plan for Pinnacles. Monitoring visitor impacts on the various resources is a necessary step towards the completion of this capacity study. Ultimately interpretation of these resource monitoring studies in conjunction with the land classification system and results of a backcountry use study of the monument's wilderness areas will provide a basis for the establishment of a maximum visitor level. Monitoring will include observation of soil erosion and compaction, vegetative degradation, water quality of monument streams and effects of increased visitation on wildlife species. Adverse conditions will be identified and recommendation for corrective resource management formulated.

MANAGEMENT PROGRAM

Management actions are proposed to protect the natural resources and to make the park visitor's experience more meaningful. The actions are in areas of fire, trails, survey and fencing, and dam improvement.

Prescribed burning. Fire has been suppressed inside the monument over the past 40 or 50 years. As a result, fire-adapted vegetation has not received the stimulus necessary for adequate reproduction and existing vegetation is largely overmature. The height of the vegetation has placed browse out of reach of the deer, causing an abnormal food shortage. In addition, this overmature stand of vegetation constitutes an extreme accumulation of fuel (figure 2).

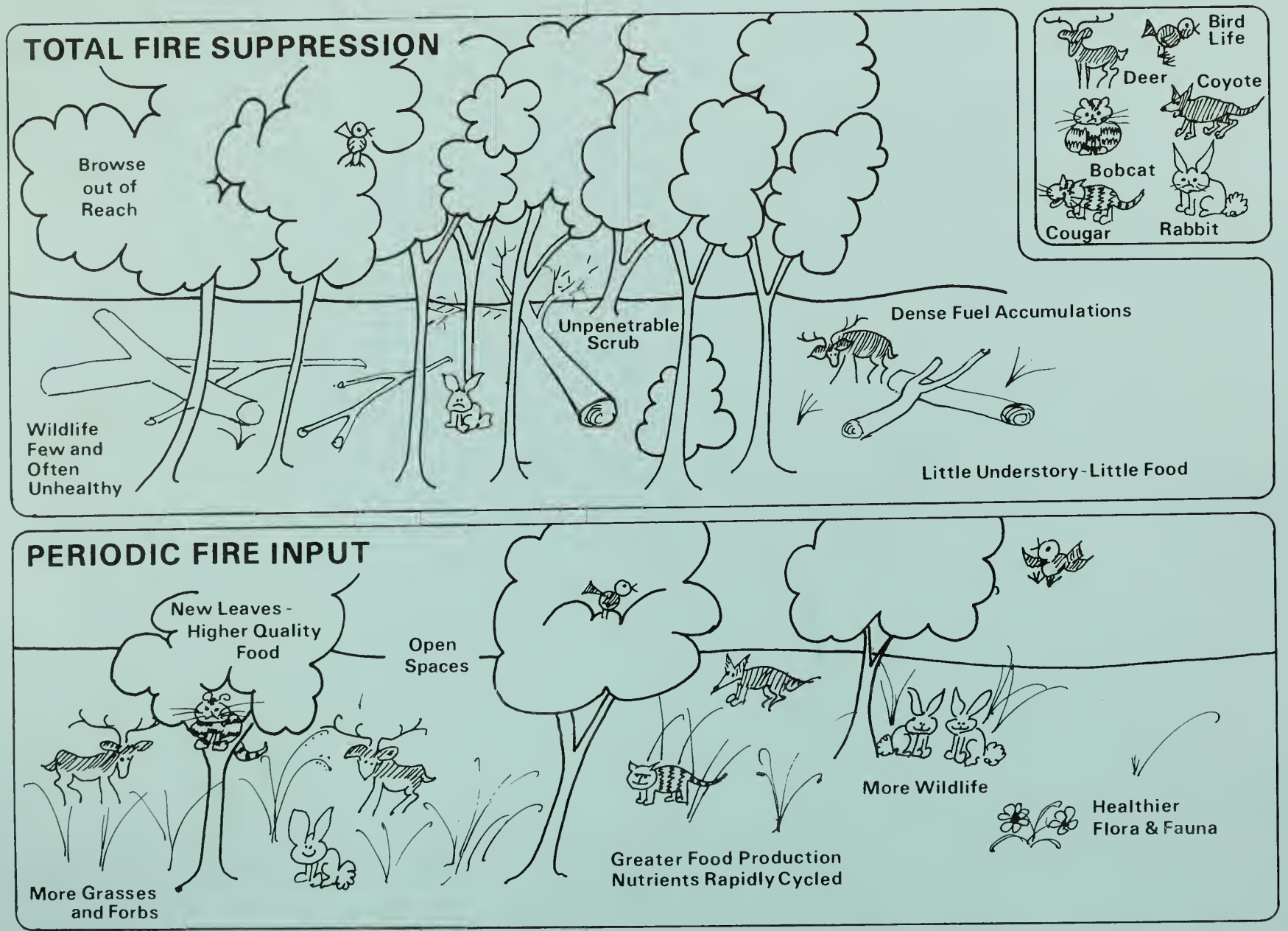


FIG 2. FIRE MANAGEMENT

Past research on controlled burning in chaparral communities will be analyzed. If additional studies are needed they will be conducted. Small test plots may be burned as part of the studies. The monument will be divided into sectors with natural boundaries capable of limiting the extent of fires. Agreements will be made with the California Division of Forestry (CDF), monument neighbors and federal fire control agencies for cooperation during burns. The sectors will be burned at various times on a rotation basis. The guidelines in Fire Management in the Western Region will be followed.

Fire Management in the Western Region is a plan, presently underway for integrated fire management in park areas of the Western Region, National Park Service. It proposed that these park areas will use a combination of fire suppression in certain zones, prescribed fire in certain zones at certain times, and natural fires in certain zones under certain conditions. The detailed draft environmental impact statement for this document has been submitted to the Department of the Interior for review.

With the anticipation of prescribed burning, agreements will be established describing responsibilities of various agencies and individuals in relation to fire management. The present agreement with the CDF is vague, and no agreements with neighbors exist. A meeting with monument neighbors will be held to establish an agreement so responsibility can be assumed if a controlled burn escapes onto adjacent property. Also a more highly refined agreement will be developed with the CDF.

Revegetate firebreaks. Before the trend of today's thinking on fire within the national parks, firebreaks were bulldozed into the hillsides of the monument. The scars of these firebreaks mar the scenery and create erosion problems. Where scars are old and are not healing over, the land will be planted with native shrubbery and annuals to restore the ground cover.

Repair trails. Trails throughout the park are severely deteriorated due to shortcutting and heavy rainfall. Some have reached the point of being dangerous to the visitor and damaging to the natural area. Visitors are hiking crosscountry in areas where there are now no trails. This is damaging the plant life, causing trails that are used, but not maintained or patrolled, and creating the possibility of lost visitors. The two cave trails are inadequately marked, which causes off-trail use that is harmful to both the land and the visitor.

Wet or dry wall retaining walls will be constructed at serious shortcut and erosional sites. These will be designed to discourage shortcutting and prevent shortcut damage and erosion. Handrails will be provided where necessary and steps will be enlarged. All prominent shortcuts will be obliterated and plantings of native shrubs will be made to screen potential shortcuts.

An old trail that has grown over from disuse will be reopened in the northern area of the monument (figure 1). It will be cleared of brush and built up where necessary in order to make it usable. In the south, a new trail will be built from North Chalone Peak to the saddle between it and South Chalone Peak, with a spur to the top of South Chalone. The trail will then descend into Frog Canyon and continue down the canyon to its junction with Chalone Creek. One or two bridges will probably be built. In addition, a half-mile of trail connecting the approximate midpoints of the North Chalone Peak and the Frog Canyon trail will be constructed.

In the Balconies caves area, an improved trail with the necessary means of ascent and descent will be installed the length of the cave from the former Old Pinnacles area to the junction with the Balconies trail of the west side. Trail work will be kept low key to facilitate a natural experience yet maintain a safe route. Appropriate warning signs will be installed. In the Bear Gulch caves, confusing painted arrows will be removed from the walls, trail surfaces will be repaired and brought up to standard, and retaining and guide walls will be built along trail edges to insure the trail is safe and easy to see.

Survey and fence monument boundaries. The monument is not fenced or posted. This invites trespass hunting and grazing, land disputes and legal problems. Hunting and grazing interfere with natural processes and with the visitor park experience. Before fences can be constructed, a survey of the monument must be made. After the survey, fences will be built to Bureau of Land Management standards.

Repair and recondition dam. Pinnacles is located along a fault line and is subject to frequent earth tremors and quakes. All measures necessary to insure and maintain the structural stability of Bear Gulch dam will be undertaken. In addition, existing leaks will be sealed and the flood gate valve repaired.

Bear Gulch dam needs to be reconditioned by veneering to enhance its aesthetic qualities. The dam was built in the 1930s by the Civilian Conservation Corps (CCC). Native rock was cut to veneer the dam but the project was left unfinished. There is still a bare concrete border extending the length of the dam which distracts from the natural setting. The cut rocks are still there, ready to complete the dam.

Bear Gulch dam is presently being prepared for the List of Classified Structures (LCS) in accordance with Executive Order 11593. Its assigned level of treatment is preservation with the recommendation of veneering.

Control pestilent species. The Beechy ground squirrel (Citellus Beecheyi) population is abnormally high in the monument, especially in the campgrounds and picnic areas. This unnatural increase is considered to be a reflection of the abnormally high artificial food supply resulting from park campers and picnickers. High densities of this rodent may manifest potential for sylvatic plague. The burrowing activities of these squirrels seriously gut the monument terrain and particularly developments such as campgrounds and picnic areas, thereby accelerating soil erosion and hazards to hikers.

Beechy ground squirrels are native to the monument and comprise an important link in the complex chain of ecological interrelationships. Population control of these rodents is apparent for the well-being of the park and its visitors.

A pesticide project of zinc phosphide-treated grain has been recommended for control. Monterey County Agricultural Commission has been consulted concerning their control program for these squirrels. Both Monterey and San Benito Counties have received authority from the State of California for use of active levels of zinc phosphide (1.0% or 1.6%). Periodic control application will be instituted when squirrel populations are deemed abnormally high. The use of commercial smoke bombs available through the U.S. Fish and Wildlife Service exists and has also proven to be an effective control on population densities.

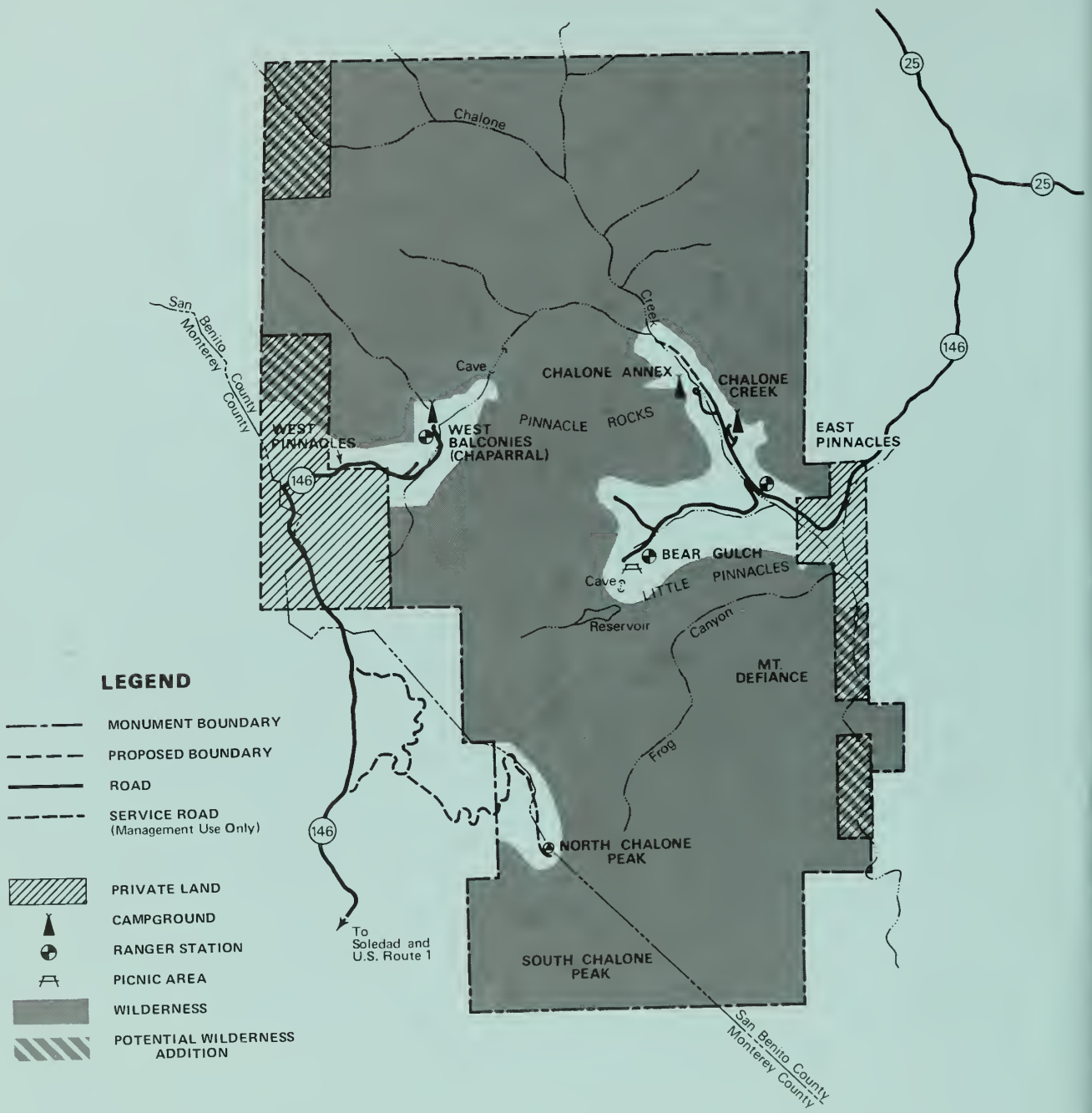
RELATIONSHIP OF THE PROPOSAL TO OTHER PROJECTS AND PLANS

A wilderness plan for Pinnacles National Monument was developed in 1967. The proposal considered only those lands in the southern half of the monument for wilderness classification. This proposal became subject to revision after the Department of the Interior's guidelines for wilderness classification were revised in 1972. Subsequently a new wilderness plan for Pinnacles was submitted to Congress in 1974 for review and is now awaiting hearings prior to approval (figure 3).

An interpretive prospectus was also approved in 1967, and NRMP proposals are in agreement with the prospectus.

The master plan for Pinnacles National Monument proposes the following development-related actions, which are more related to visitor use than resources management. Therefore they are not discussed in this plan.

> Proposed land acquisitions (figures 3 and 4) on east and west boundaries to be utilized as visitor staging areas, transfer operational facilities to edge of monument and construct facilities to replace them, expand and upgrade those to be removed from within the monument;



ACREAGE

GROSS PARK ACREAGE	15,954.51
FEDERAL LAND	14,177.77
PRIVATE LAND	1,776.74
WILDERNESS	12,952.23
POTENTIAL WILDERNESS ADDITION	710.00

Fig 3. WILDERNESS PLAN

PINNACLES NATIONAL MONUMENT

UNITED STATES DEPARTMENT OF THE INTERIOR . NATIONAL PARK SERVICE

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Construction of trails in Juniper Canyon, from the east boundary to Bear Gulch, from the west boundary to Chaparral, from the Balconies trail to the Bear Gulch trail;

Removal of east and west side campgrounds and their conversion to picnic areas;

Provision of shuttle service within the monument in lieu of private vehicles;

Construction of a shuttle terminus and restroom at the old quarry;

Removal of unneeded structures from the monument;

Elimination of unneeded parking areas;

Provision of commercial power to the west side.

ENVIRONMENTAL REVIEW

The Natural Resources Management Plan for Pinnacles National Monument presents a long-term action program for managing its resources. Its accompanying environmental assessment describes, analyses and documents the environment. This incorporates the environmental impact of the proposals, mitigating measures, adverse effects and alternatives to the proposals. The overall purpose of the plan is to stabilize the monument's ecosystem and return it to a more natural state, while simultaneously enhancing the park visitor's experience.

Proposed studies will furnish necessary information for present and future management decisions by increasing our knowledge and awareness of the natural systems. The proposed management actions of prescribed burning, revegetation, trail and dam repair, fencing and squirrel control will be aided by research, inventories and monitoring programs.

A no action alternative was considered for each proposed action. In that case, continued fire suppression would mean eventual loss of characteristic fire-resistant plant species and dangerous accumulation of dense fuel. No action on trails, dam and squirrels would amount to inadequate maintenance for park aesthetics and visitor use. There will be temporary damage to plants and animals during construction and burns, but these adversities will be short lived and are far outweighed by their long-term benefits.

Because none of the proposed actions entail significant environmental impacts, it is recommended that the Pinnacles Natural Resources Management Plan be assigned a negative declaration. Unless significant controversy develops during public review, a full environmental impact statement will not be prepared.

The resources management planning effort at Pinnacles National Monument will be translated into an action program when the 30-day public review period has expired.

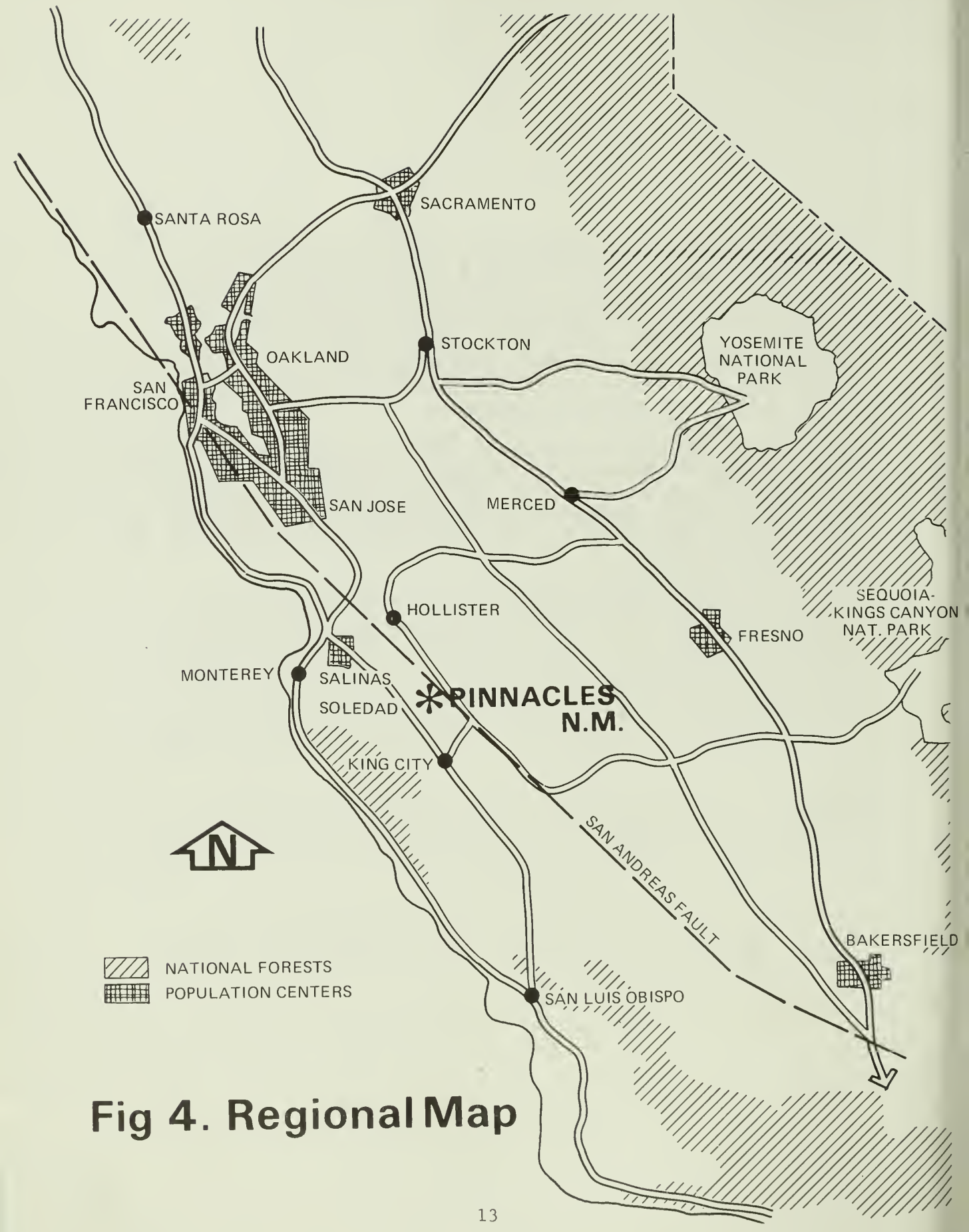

Fig 4. Regional Map

ENVIRONMENTAL ASSESSMENT

The environmental assessment for the Pinnacles resources management plan consists of the preceding description of the proposal and the following sections.

DESCRIPTION OF THE ENVIRONMENT

GEOGRAPHY

Pinnacles National Monument is located in central California, about 140 miles from the San Francisco Bay area and 200 miles from the Los Angeles basin (figure 4). It is 34 miles south of Hollister, and can be reached on the northeast side by California 25, and the southwest by U.S. 101.

The monument is largely covered by coast range chaparral and is the only National Park Service area containing a complete representation of this type chaparral. The relief is very high with elevations ranging from 760 feet in the southeast quadrant of the monument to 3,305 feet on North Chalone Peak, a difference of 2,545 feet in 2.4 miles.

Two water gaps, now occupied by the Bear Gulch and Balconies caves, were formed as a primary eastward drainage cut through the Pinnacles formation during block faulting. All monument drainage ultimately flows into Chalone Creek which flows southward along the eastern boundary then westward below the southern boundary and finally empties into the Salinas River. One major drainage, Bear Gulch, is impounded at its upper end by a manmade dam which forms Bear Gulch reservoir. Surface streams flow during the spring and very early summer. Underground flows exist in the major drainage channels on a year-round basis. Pinnacles' water supply taps one of these flows in Chalone Creek, opposite the Chalone Creek Campground.

GEOLOGY

Pinnacles geology is of coequal importance with the chaparral vegetational component. Much of its volcanic rock consists of pyroclastics mixed with rock derived from quiet flows and rock altered by thermal,

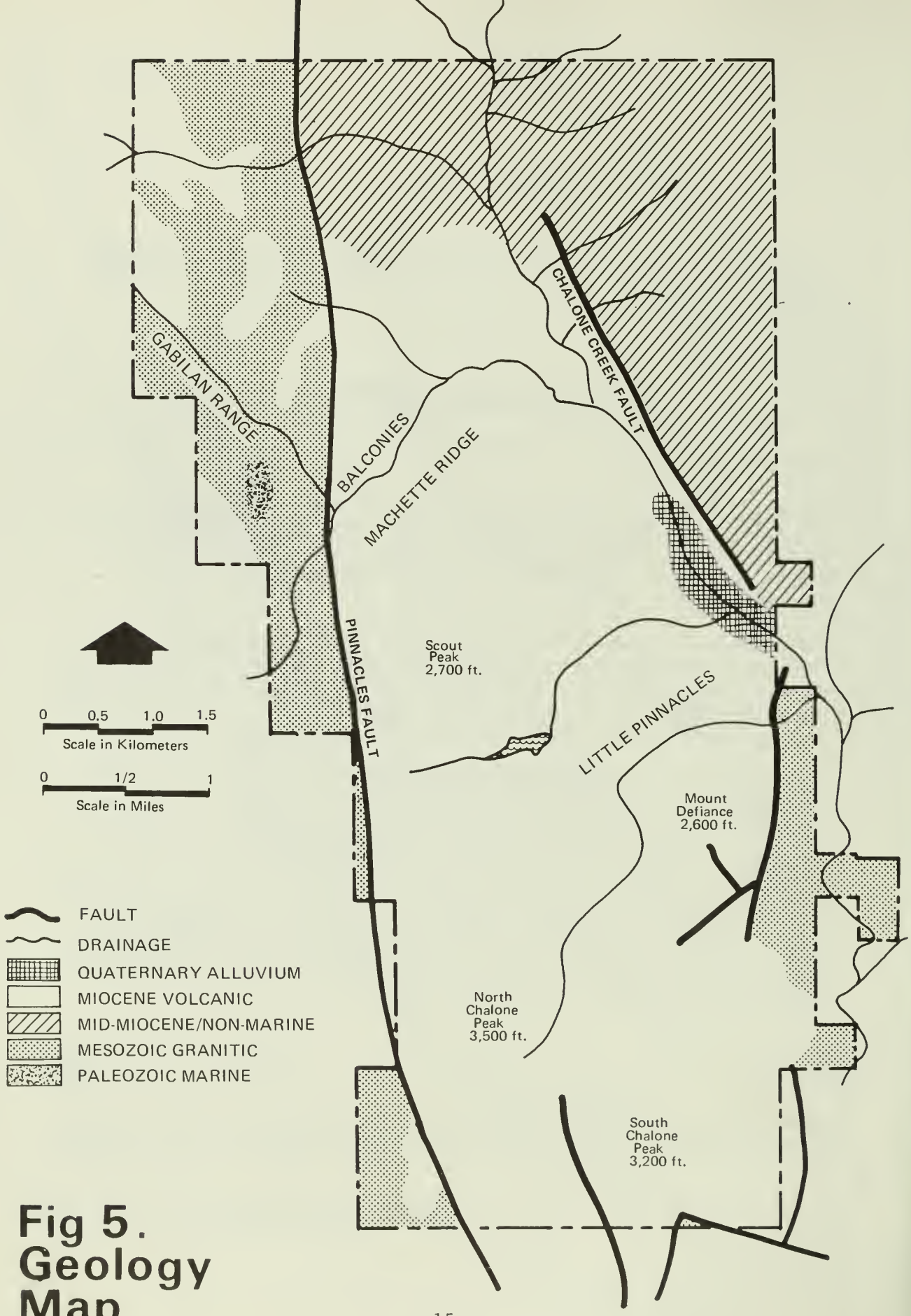

Fig 5. Geology Map

chemical, or climatic activity. Only microfossils are known in the Pinnacles Formation and all of these are thought to be marine in origin. The Chalone Creek Fault, a major fault, extends from the middle of Pinnacles' north boundary southeastward through Chalone Creek Campground, past the east entrance station, and out of the monument about one-fourth of the way from the southeast corner of the east boundary. This fault is believed, by some, to be an ancient trace of the San Andreas Fault. It is postulated it became inactive some 10 million years ago when the present active trace was formed, parallel to and four miles east of this fault trace. Since then, block faulting is believed to have raised the eastern edge of the Pinnacles formation adjacent to the Chalone Creek Fault. Two primary drainage channels have cut water gaps through these rocks, one at the upper end of Bear Gulch and one between Machette Ridge and the Balconies cliffs. The gaps were later roofed over when large rocks spalled off the adjacent cliffs, slid down the slopes, and became wedged in the tops of the gaps to form the talus caves of Pinnacles (figure 5).

Earth movement along the San Andreas Fault zone has displaced Pinnacles rocks about 195 miles north of their theoretical point of origin, which is believed to lie near Highway 138 between Lancaster and Gorman, California. The right lateral movement of displacement is still occurring at a rate averaging four centimeters a year.

SOILS

Pinnacles soils have no unusual features. They are sandy loams or loamy sands with large amounts of gravel, typically thin, and undeveloped with low ability to retain nutrients and water (figure 6). Nutrient supply is low but well balanced. Small areas of soil are quite rich in humus but average only two feet in depth; they are thus too shallow to effectively retain moisture during the dry season of the year. In general, water is either absorbed quickly or runs off rapidly. The soils offer little resistance to root growth, thus allowing extensive root development. These properties tend to increase moisture loss from the soil, causing less water to be available for the plant cover. Because of high summer temperatures and an arid summer condition, the principal growing season occurs in spring when water is abundant, in spite of poor water retention by the soils. When the plant cover is disturbed, the above conditions allow heavy erosion to occur in periods of intense rainfall. The naturally occurring vegetation aids in maintaining soil equilibrium during all seasons of the year, but agricultural practices such as crop production and grazing tend to aggravate erosional tendencies in a delicately balanced ecological equilibrium, which makes the agriculturist and the environment both losers. A brief description of major soil types follows.

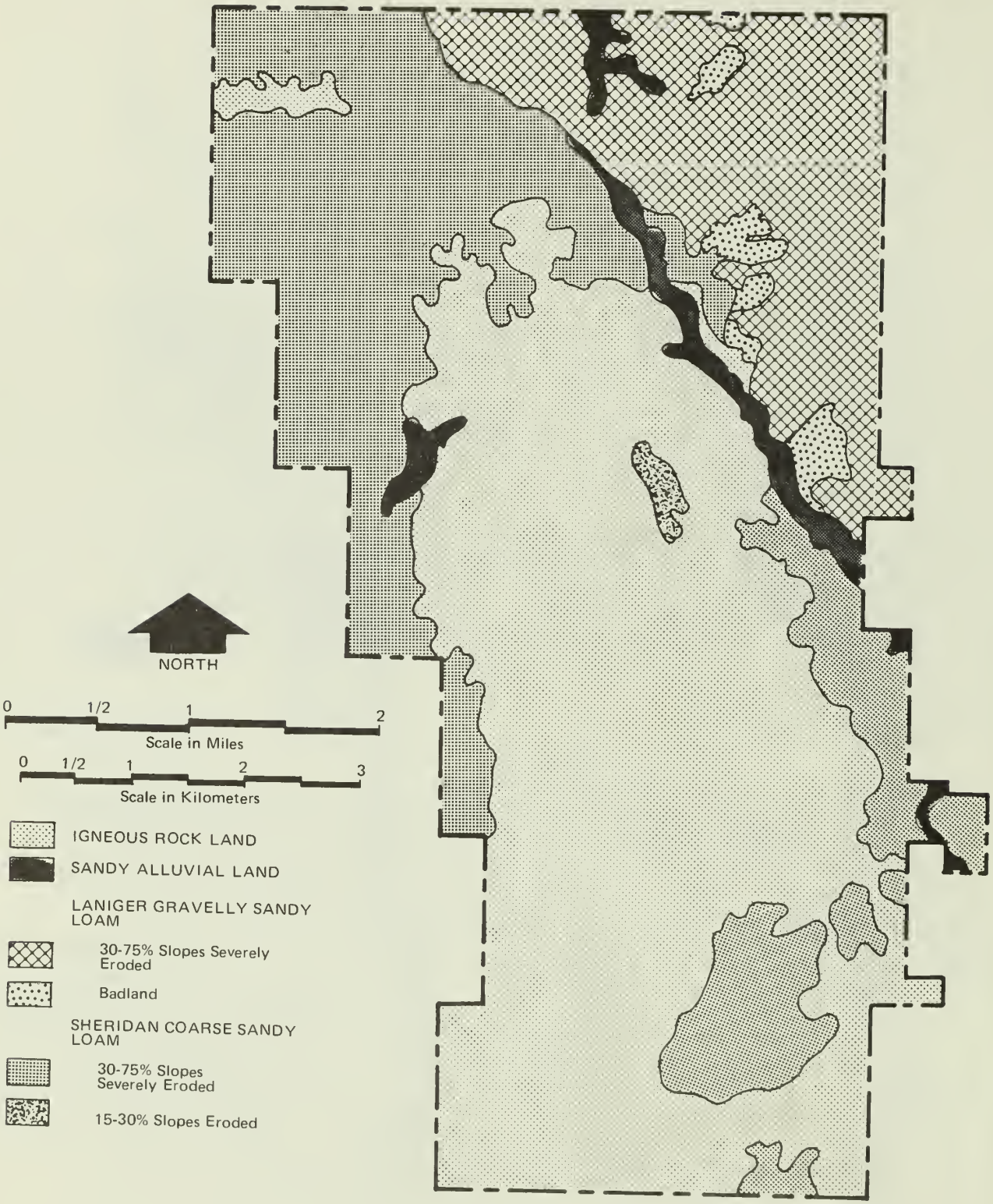

Fig 6. Soil Types

Laniger series soils are derived from a coarse, poorly consolidated sandstone and all of these lie east of and parallel to the Chalone Creek Fault. They are not of the same origin, or from the same geographic location, as soils west of the Chalone Creek Fault separating them. The surface layer in these soils ranges from eight to 22 inches in thickness, is grayish brown, and described as gravelly loam in texture. The subsoil is 12 to 26 inches thick, pale brown, and gravelly, coarse sand loam. The series is low in fertility, its water capacity is 1.5 to 4 inches, permeability is rapid and runoff is rapid to very rapid. Topographic characteristics in the area of these soils are badland type erosion and large semicircular slumps.

Igneous rock land soils comprise 30 to 90 percent of the area. They are quite shallow and excessively drained. The areas where they occur are near the rocky spines of igneous rock outcrops along ridgetops.

Sheridan series soils are well drained to excessively well drained loamy soils underlain by weathered granite and other igneous rocks. The oakgrass savannah occupies a large part of these where more humus has accumulated than elsewhere. Average thickness is 18 to 24 inches, water holding capacity is two to four inches, runoff is rapid to very rapid, and the erosion hazard is very severe. The Laniger and Sheridan soils are characterized as potentially erosive, a major problem that makes them unsuitable for cultivation. Since grazing is not permitted, the only recommended use is for woodland and wildlife preserve. Maintenance of a close-growing plant cover and plant residues is recommended at all times.

Sandy alluvial land occurs mainly in the bottom of Chalone Creek where it is covered with riparian vegetation. The deep, coarse textured soil has a water holding capacity of four to six inches and its reaction is slightly alkaline.

HYDROLOGY

The occurrence of water resources within the park are influenced by the geologic structure of the area. For example the stream sources reflect the formational weakness caused by faulting.

Surface water runoff drains out of the monument via Chalone Creek. The headwaters and several tributaries of Chalone Creek originate a short distance outside the monument. There is a dam in the stream flowing through Bear Gulch, but the water in the reservoir is presently not being used.

There are at least nine springs known within the monument. Several of them have been used as a water supply, but now are for emergency use only. Generally, the springs occur either at fault contacts or at lithologic contacts. The storage of water for the springs appears to be from fractures in the volcanic rocks.

Present water supplies for the monument is from wells. At least one of the wells is a flowing artesian. Another of the sources is from a horizontal infiltration gallery installed in alluvium.

Ground water is largely controlled by the geology of the monument. There are rock units within the monument that can be grouped into three geohydrologic units: 1) granitic and metamorphic rocks, 2) volcanic rocks, and 3) sedimentary rocks. Most of the monument is underlain by volcanics, however, the western and southeastern sides are underlain by granites and the northeastern corner by sedimentary rocks.

The occurrence of water is regulated largely by the geologic structure and fractures in the rocks. Three northward trending faults transverse the monument and have produced a structural trap for ground water. The fractures associated with faulting within the volcanics create the permeability of the rock units. With the exception of the sedimentary rocks, water yielding potential of rocks in the monument is dependent upon the location of fractures or fault planes.

Water quality in the monument is essential to those animals that inhabit the riparian communities, and the park visitors. Litter and human waste are emptied into the reservoir above the caves and into the stream water in the caves. This not only endangers the fish down stream, but also aquatic insects and other life as well. High bacterial counts recorded, from 735 to 16,000 ppm of E. coli equivalents, and large amounts of nutrients encouraging the growth of algae could create a potential breeding ground for infectious diseases. This may have been a contributing factor to the large dieoff of deer, racoons, foxes, and other animals which occurred in the late summer of 1972. Dead animals examined by the U.S. Public Health Service revealed they were infected by a bacterium of the genus Arizona, a type closely related to the genus Salmonella of typhoid poisoning and ordinary food poisoning. An incident of this type has not reoccurred since 1972.

The reservoir, as any enclosed body of water, is subject to the process of eutrophication. Natural succession of aquatic ecosystems predictably proceed towards a semiterrestrial or fully terrestrial state. This aging process is measured in terms of geologic time and may not be noticeable during one's lifetime. Eutrophication is occurring and may be accelerating due to human impact. There is a continual accummulation of sediment at the bottom of the reservoir. This sediment is in part due to detritus resulting from eutrophication, silt from runoff water and general litter from human and wildlife visitors.

CLIMATE

The climate is one of regular annual cycles. Temperatures range from as low as 10°F in December and January to near 120°F in August and September (figure 7). Precipitation usually begins near October, increasing in amount and frequency through March, and tapers off until it stops completely in May or June (figure 8). Rain is rare, but not unknown, from June to September. Snow occurs in small amounts almost every year between mid-December and January. On rare occasion it may cover the entire monument to a depth of 6 to 12 inches. Average annual precipitation lies near 16.5 inches with recorded extremes from seven to 32 inches. Though summers are normally quite hot, low temperatures usually drop into the high 40s and low 50s with day/night ranges as large as 70°F. Winter day/night temperatures usually vary no more than 25°F and are usually quite mild without many days below freezing. Thunderstorms occur once every few years, however, violent wind or weather is rare.

LAND CLASSIFICATION

The four classes of land and the four biotic communities in the monument should be considered together. The land classes are II, III, IV, and V (figure 10). They have been determined according to previously established visitor use patterns. The four biotic communities of Pinnacles are all unusually distinct from one another, thus providing an outstanding opportunity to interpret the concept of biotic communities to the visitor (figure 9). The two extremes are the arid xeric communities of the rocky outcrops and the moist riparian communities in protected situations and in the canyon bottoms. Together, these two communities occupy about nine percent of the monument's land area. The two remaining communities occupy the steep hillsides and hilltops, wherever there is any soil, and cover the remaining 91 percent of the monument's land area. The oak-grass savannah, foothill woodland community, covers about eight percent of the monument and the brushy chaparral communities cover the other 83 percent. Privately owned ranch land and leased Bureau of Land Management land surrounding the monument is about 75 percent oak-grass savannah and 25 percent chaparral. This difference in biotic community distribution from that within the Pinnacles is due partly to the topography but mostly to cut-and-burn practices for the encouragement of grass to feed livestock. No land within the monument is of any great value for crops, grazing, or other agricultural purposes and the parent rock has yielded no commercially valuable quantity of minerals. Streams are intermittent and only flow on the surface during the late winter and spring months with dependable regularity. The impounded reservoir does not now serve its original purpose, which was flood control and the provision of water for fire control. The 40 acre feet of water it can hold has an unknown effect on the streambed and the reservoir's surroundings, but visitors find the presence of a reservoir in a dry area pleasing and refreshing.

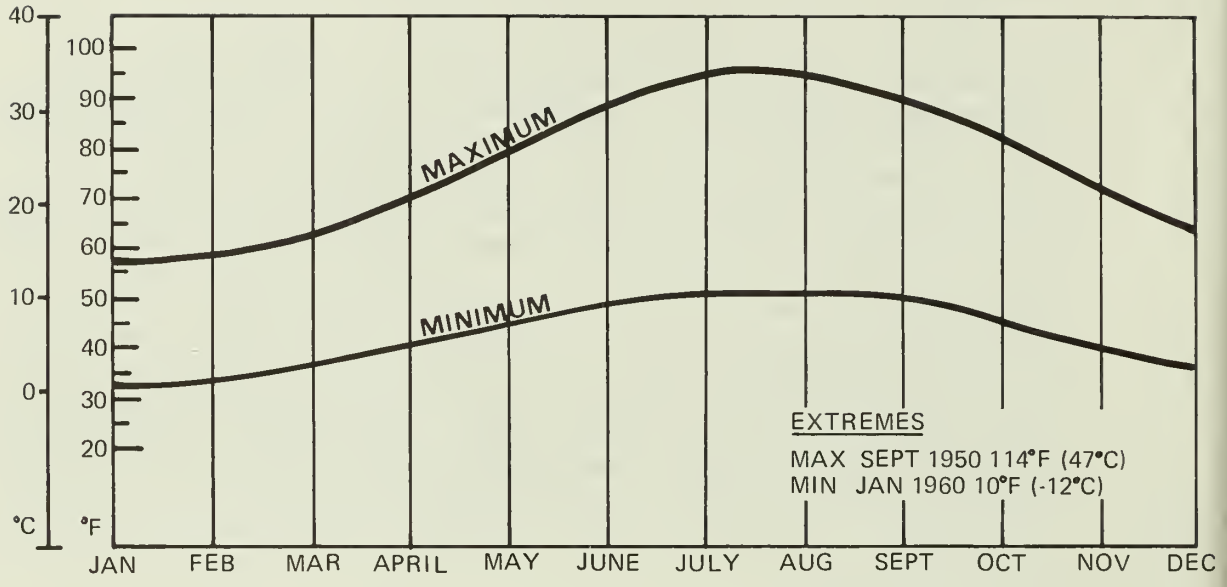

FIGURE 7. AVERAGE MAXIMUM & MINIMUM TEMPERATURES
FROM 1956 - 1972

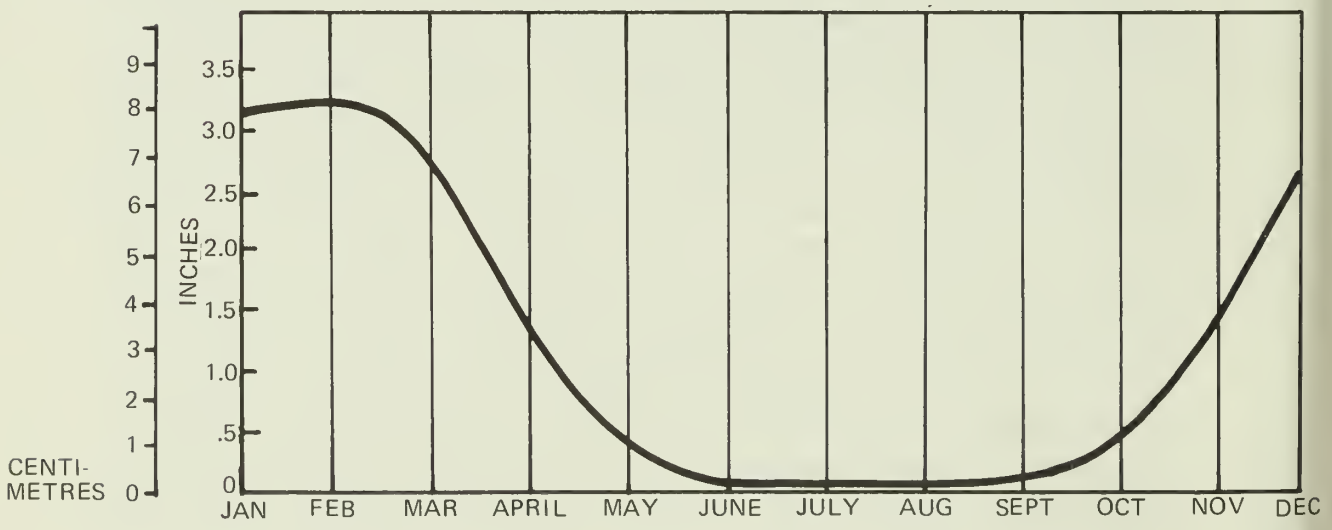

FIGURE 8. AVERAGE RAINFALL
FROM 1962 - 1973

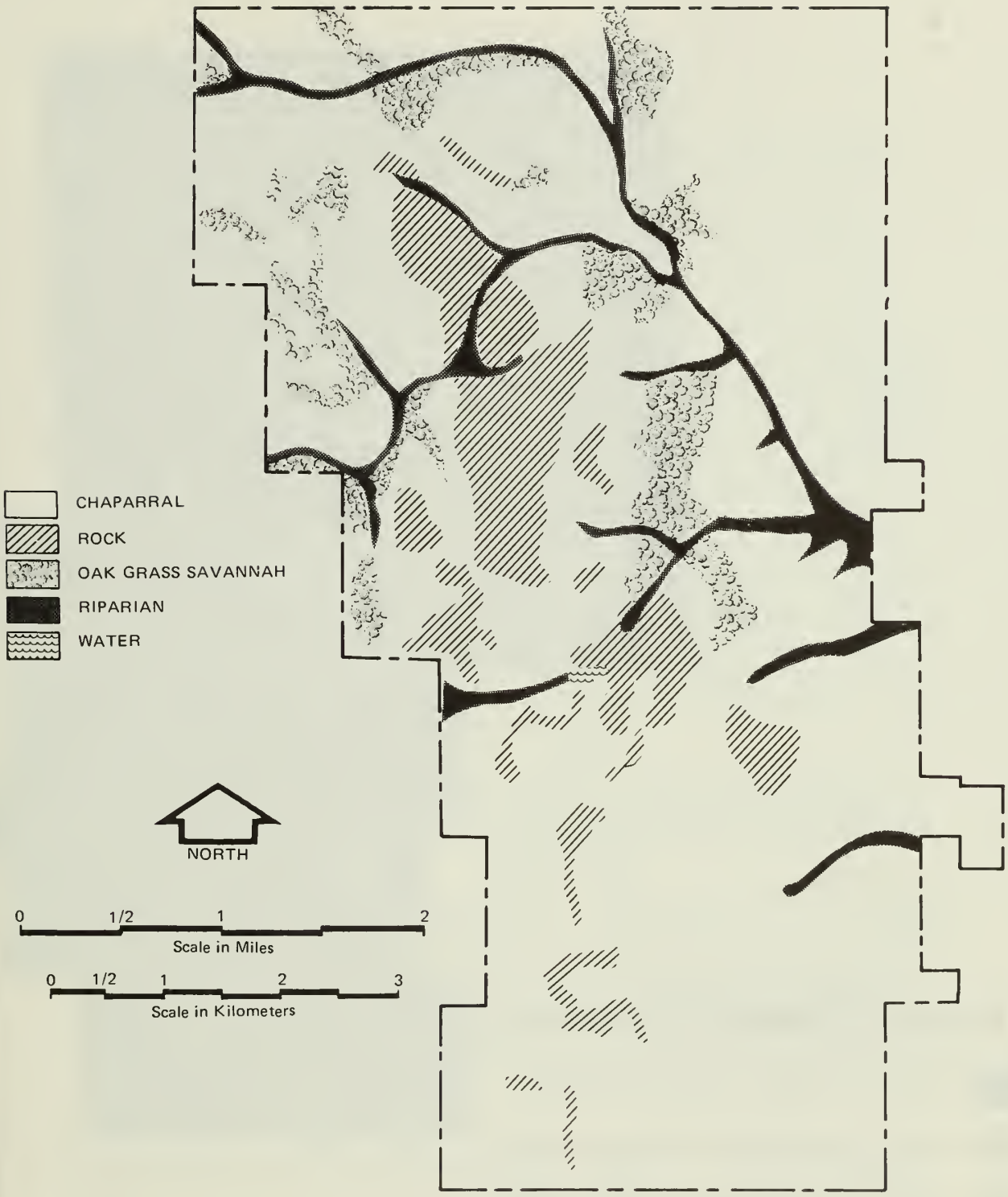

Fig 9. Vegetative Cover

10. Land Classification

CLASS II · GENERAL OUTDOOR RECREATION

CLASS III · NATURAL ENVIRONMENT AREA

CLASS IV · OUTSTANDING NATURAL AREA

CLASS V · PRIMITIVE AREA

0 miles 1

NORTH

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WILDLIFE

Wildlife is relatively abundant within the monument but compared to the plant communities little is known about them. More is known about large animals and easily trapped animals. A great deal is known about the ecology of certain specific wildlife species, especially those of importance to the monument such as the black-tailed deer which is both native and a part of the natural scene. Due to limited area and proximity of neighboring ranches, it has been difficult to sustain populations of large predators such as the mountain lion and coyote. The prey population of these predators are therefore quite erratic. Smaller predators and herbivores seemingly have less difficulty in maintaining a stable predator/prey distribution. A more stable food-shelter ratio is lacking, predominantly due to fire suppression in plant communities. Relatively little is known about insects, microfauna or bats of the monument although they do play a large role in the ecological scheme as a whole.

Fish are rare in Pinnacles. The three-spined stickleback has been identified as a native inhabitant of the monument waters. It is a carnivorous fish that feeds predominantly on aquatic insect life. These fish are known to inhabit the riparian communities of Bear Gulch and the north fork of Chalone Creek. The reservoir is only known to harbor tadpoles and aquatic insects, the presence of sticklebacks has been recently confirmed.

Mammals of Pinnacles include black-tailed deer, bobcats, gray fox, coyotes, raccons, bats, badgers, rabbits, elephant-eared kangaroo rats and other small rodents. Occasional sightings of the mountain lion have also been recorded in the monument.

Amphibians and reptiles known to inhabit the monument are the Pacific pond turtle, southwest pond turtle and the two-striped garter snake. The Pacific pond turtle is 6-8 inches long and at one time inhabited the majority of sluggish streams on the Pacific slope. It shares a common habitat with the three-spined stickleback. Their population and distribution has greatly decreased due to habitat disturbance by stream channelization, predation by man and increased concentration of water pollutants.

Intense use of riparian areas has tended to denude vegetation, thus destroying various habitats essential to snails, turtles and other animals requiring moist and/or dark habitats for part of their life cycle.

Invertebrates known to inhabit Pinnacles are few, due to lack of research. Occasional fresh tests of an unknown species of terrestrail snail have been found in various locations. Mantidflies and

wingless grasshoppers have been sighted on rare occasions within the monument. A fairly large insect collection has been made of specimens from the area surrounding Pinnacles.

Endangered species with historical or present distribution in Pinnacles are the California condor (Gymnogyps californianus) and the American peregrine falcon (Falco peregrinus anatum). There may be other endangered species of fish, mammals and amphibians present in the monument, but more research is needed to substantiate identification and observations.

The California condor was a common nesting species in Pinnacles until 1900. Rare and sporadic observations of the condor are made every few years. Some reasons for its decline are disturbance by man, habitat modification, hunting, eating of strychnine bait or poisoned animals, and possible shortage of food during nesting and breeding periods.

Federal and State agencies recognize the California condor as an endangered species. They have both initiated regulations prohibiting harassment and possession, with penalties of up to one year in jail or $1000 fine or both. There is constant cooperation of State, Federal and private conservation agencies in law enforcement, education, land management and research.

The American peregrine falcon found suitable nesting habitat at Pinnacles. Observations of activity were recorded until 1968. Its probable decline was due to cumulative effects of chlorinated pesticides and their breakdown products obtained from prey, specifically, DDT and DDE which increased adult mortality and reduced reproduction by causing eggs to become thin-shelled and non-viable. Habitat destruction and collection of young and adults for falconry have also been serious factors.

Federal and State agencies recognize the peregrine falcon as an endangered species and have initiated laws to protect them. Protective measures proposed or already initiated include protection and retention of habitat, eliminate use of food chain pesticides, establish interagency and international conservation agreements, development of propagation techniques, establishment of refuges and increased enforcement on hunting by falconers.

Pestilent population densities of Beechy ground squirrel (Citellus Beecheyi) are obvious inhabitants within portions of Pinnacles National Monument. They mark the scenery with their physical presence and burrows that pocket partiuclar heavy visitor use areas. This squirrel is gray-brown with rows of spots along its sides. Its natural food supply has been supplemented by artificial food supplied by park visitors. The abundance of available foodstuff has made a marked increase in their population density.

Natural predators in or adjacent to population concentration areas of these rodents such as snakes, hawks and badgers are too few to adequately suppress this abnormal population. Adjacent land users and control programs may have the single greatest bearing on the level of predator populations.

VEGETATION

The southern California coastal range, which includes Pinnacles, supports a broad-leafed sclerophyll vegetation type. Broad-leafed sclerophyll vegetation has wide leaves as opposed to needles or spiny leaves. They are usually small in size, hard to the touch, have various coatings of waxes and oils, hairs on their surfaces or other means of reducing moisture loss. Pinnacles National Monument is the only National Park Service area within this southern coast range province. It is therefore of great importance to preserve and protect this unique vegetation type.

Broad-leafed sclerophyll vegetation may be divided into two formation type communities: 1) broad-leafed sclerophyll forest and 2) broad-leafed sclerophyll chaparral. The forest formation is dominated by sclerophyllous evergreen trees and includes some deciduous species. The chaparral formation is predominantly sclerophyllous evergreen shrubs. The two most important distribution factors of these formations are moisture accessibility and susceptability to fire and the resulting succession after fire.

Forests of broad-leafed sclerophyll trees do not dominate the Pinnacles area as does the chaparral. This vegetation type usually occurs in small discontinuous stands, primarily dependent on moisture availability. They favor areas receiving more than normal amounts of water and/or shade such as canyons and stream areas.

Chaparral vegetation is a climatic response to the Pinnacles area. It rains in the winter but not in the summer so the vegetation consists of fast-growing annuals and drought-resistant shrubs. The annuals thrive during the winter and spring, leaving their seeds to survive through the summer. Drought-resistant shrubs have adapted characteristics to reduce transpiration, such as deep roots and waxy leaves.

A long history of fire suppression has resulted in over-mature chaparral vegetation. This suppression has reduced reproduction, caused crowded conditions, effected encroachment of non-fire-resistant species and has put browse for deer out of reach. Fire is an important factor in preventing forest species from replacing the chaparral. Fire stimulates seed germination and sprouting of fire-adapted species and eliminates or suppresses non-fire-adapted species.

Evidence shows that there is a shift in vegetation taking place, resulting from fire prevention tactics. Non-fire-adapted forest species are gradually invading the chaparral, such as digger pines and California live oak. This succession is closely related to fire suppression and will continue to spread through the chaparral unless burning programs are initiated.

There are currently no more than 31 identified species of exotic plants at Pinnacles. Most of these probably came in with feed for livestock and draft animals during the Civilian Conservation Corp days. We do not know how serious the encroachment of these plants may be and we will not know until studies can be made to determine their relative impact upon the monument's general ecology. Studies now in progress indicate little or no regeneration of blue oak, manzanita, buckbrush, chamise, and other trees and shrubs on the hillside slopes in the past 10 to 30 years, or more. This lack, plus overmature stands of parent stock, has severely decreased browse and, probably, fruit and seed production of plants shaded out by the unnaturally dense over-story. As a result, there may be a gross imbalance of animal populations which could yet lead to catastrophic losses ranging from the largest vertebrates down to the smallest invertebrates. To prevent this, our goal may be to maintain a diverse vegetational mosaic through planned periodic burning programs not only to encourage regeneration of fire-dependent vegetation, but also to help eliminate exotic plants that may be having a deleterious effect upon the general ecology.

POPULATION

The population within a 100-mile radius of the monument is near 4.5 million and the population within a 200-mile radius is close to 15.5 million persons. Overall population density is quite high since the areas within the described circles are only 45 percent land. About 95 percent of the total population is urban and lives in either the San Francisco Bay area or the Los Angeles basin. Driving time to Pinnacles from these areas will vary from two to six hours. As the population increases, and the parks nearest the urban areas become more congested, people tend to range further from home. The result is continued growth of Pinnacles' visitation, which has already reached a saturation point on weekends and holidays during the spring and fall months. Regular weekdays and summer weekends are still far from crowded, with few exceptions. There are times in which increased visitation can and probably will occur.

The growing shortage and increasing prices of gasoline may restrict long-distance travel to park areas. A roundtrip to Pinnacles from the San Francisco Bay area may be made on a tank of gasoline, and

those visitors who limit travel may choose Pinnacles as a final destination, instead of the more popular Yosemite or Sequoia and Kings Canyon National Parks. Travel patterns are hard to predict, but the avialability of Pinnacles to potential users will remain high.

ECONOMIC ACTIVITY

Most of the adjacent land is owned by ranchers, or leased by them from the BLM, and used to graze livestock. San Benito County is primarily agricultural and only a small, but growing, portion of its economic activity lies outside agriculture. Twenty-two light industrial plants employ some 4,300 people, 1,350 of whom are employed in food processing plants directly dependent upon agriculture. The remainder are primarily involved in the manufacture of recreational vehicles, explosives, and construction supplies for two modular building firms, and local contractors. There are three towns in the county with a total population of 11,000 out of a county population of 19,000. About 8,000 live in Hollister where most of the economic activity is centered. Though most visitors pass through Hollister and Tres Pinos, their impact on the economy is slight since the towns have little to offer the visitor at this time. A small campground 25 miles north of Pinnacles has been in operation since the spring of 1973. It has been only moderately successful so far, mostly because of its distance from Pinnacles. Agricultural activity not adjacent to the monument such as grape vineyards and barley fields does not seem to affect monument activities.

Monterey County is more diverse in economic activity and more heavily populated than San Benito County. Besides the area around Soledad, San Benito County seems to influence, and be influenced by Pinnacles. Highway 101 runs the length of the county and Pinnacles traffic is now an insignificant part of the normal travel at any time. Soledad appears to be the only part of Monterey County that would materially benefit by any increase in travel to the west side of Pinnacles.

Some results of heavy weekend traffic and holiday travel are beginning to show. One is erosion and vegetation denudation around the campgrounds, picnic areas, parking lots, Bear Gulch Caves area, and land adjoining the monument. Trespass on private land near the monument is a steadily growing problem. Most of this land is used to graze cattle. Trespassers build illegal fires, use unsafe and unhygenic waste disposal practices, cut down trees and brush for firewood, and leave litter, some of which is capable of harming any livestock chancing to ingest it.

In addition, they have frequently cut fences, driven across fragile pasture and cropland, torn down unoccupied buildings, stolen or damaged agricultural equipment, and shot cattle. The economic interaction between the monument, the park visitor, and local ranchers is not good and must be rectified. In addition, the previously mentioned practices of neighboring ranchers pertaining to their management of land and wildlife are definitely not policies for management of natural areas. A prime objective will have to be an effort to reach a written, as well as informal, instrument of cooperation and understanding with Pinnacles neighbors so we may help each other with our mutual problems and have a means of getting together before any problems becomes too big to easily manage.

HISTORY, ARCHEOLOGY AND PALEONTOLOGY

There are no properties listed on the National Register of Historic Places at this time. All structures have been evaluated in accordance with Executive Order 11593 and seven structures, including Bear Gulch dam, are being included on the List of Classified Structures (LSC). The dam and six buildings were built by the CCC during the 1930s and have been determined historically significant by the Western Region Historic Preservation Office. After approval to the LCS, the structures will be eligible for nomination to the Register. Copies of the reports have been submitted to the State Historic Preservation Office and the Advisory Council on Historic Preservation. A determination of eligibility for two archeological sites near Oak Tree Spring and Juniper Canyon is in preparation.

Spotty archeological research has been done in Central California, and since the mission system had greatly disrupted the native way of life by the time ethnographic studies were made, we know very little about the aboriginal inhabitants of the Pinnacles area. Kroeber did study the Costanoans at Soledad in the early years of the century, so we do have an ethnographic starting point for further research. However, the geographic distances separating Soledad from the Pinnacles, as well as the fact that sites within the monument seem to be of a seasonal or migratory nature, should be considered before direct comparisons are made.

Ethnographically, the Costanoans were a hunting and gathering group much like many others native to California. They gathered acorns and other plant foods in season, following the harvest as plants matured in higher elevations. They also hunted rabbits with nets and clubs, and other smaller mammals with deadfalls. They also hunted deer when they were available and fishing was practiced during much of the year.

Foods were processed in bedrock mortars and portable mortars with cobble pestles. The mano and metate were also used. These stone tools are the most enduring artifacts left by these people. Baskets and nets were used in the gathering, processing, and storing of food.

Permanent villages were made up of large domed houses covered with reeds and grasses, circular brush enclosures, used for dances and ceremonies, and small conical sweat houses. Cemeteries were nearby, but not in the villages. Large shell mounds and trash middens were usually associated with permanent villages. Unfortunately, we know very little about the makeup of seasonal hunting and gathering camps. Probably they were ephemeral in nature with makeshift shelters and bedrock mortars where outcrops of suitable stone permitted. A midden may or may not be visible at these sites.

Politically and socially, the Costanoans were much like other Central California groups with hereditary chiefs (either male or female), perhaps moieties, and the standard puberty rites. Three types of shamans were specifically noted (again either male or female): weather shamans, grizzly bear shamans and curing shamans. There was an annual burning ceremony for the dead.

Clothing seems to have been minimal but personal adornment was quite important. This included shell and bone, wooden and shell tubes used for necklaces, labrets, and ear spools. Shell discs and especially whole Olivella shells were used as money.

Thirteen archeological sites were identified in 1966 by W.H. Olsen, L.A. Payen, and J.L. Beck and are described in their manuscript report "An Archeological Survey of Pinnacles National Monument, San Benito County, California". An archeological overview is in preparation. An historic resources study is needed and has been requested by the Superintendent. The sites so far recorded include bedrock mortars, midden and some lithic and bone scatter. These sites are close to a source of water in all cases, which is to be expected. Historic locations and remains of homesteader developments are not well known and need to be identified. Most of these known archeological sites are in close proximity to trails, campgrounds, picnic areas, and other facilities and have been directly and indirectly impacted from past and present land use activities. All of these sites will be preserved and none will be disturbed by the resources management plan actions.

CULTURAL ACTIVITIES

The schools nearest to the east side of Pinnacles are the Jefferson Elemenatry School 10 miles distant, Bitterwater School 16 miles south, and the San Benito Joint Union High 35 miles south. The schools nearest the west side are the Soledad schools, 14 miles from the monument. Two junior colleges are located in Salinas, 40 miles from Soledad, and in Gilroy, 15 miles from Hollister.

The San Benito County Fair is held annually around September or October at the Bolado Park Fair Grounds eight miles south of Hollister and 27 miles north of Pinnacles. About mid-July there is an annual rodeo and fiesta in San Juan Bautista. Monterey County has, in addition to its fair, a county symphony orchestra, and annual Bach festival at Carmel, art shows at Carmel and Monterey several times a year, dramatic shows, and annual rodeo at Salinas, and virtually every kind of cultural event, over and above those mentioned, that any big city would be apt to offer. Most of these activities are concentrated on the Monterey peninsula.

All the main church sects can be found at Tres Pinos, Hollister, King City, and Soledad. Some less common types of worship can be found in towns further away, especially on the Monterey peninsula.

About 76 percent of the population of San Benito County and a smaller percentage of Monterey County is of Mexican origin or nationality. These people, and the influence of the original Spanish settlers, give a distinct Latin American flavor to the area. Many customers are carried over into the cultural life of this area, as evidenced by the annual Cinco de Mayo festivities. Many of the visitors to the west side are Spanish speaking; some speak no English. As a result, there is a need for bilingual Spanish/English speaking employees and bilingual programs to be instituted.

PROBABLE FUTURE ENVIRONMENT WITHOUT THE PROPOSAL

The future environment of Pinnacles without the proposed actions will not remain unchanged. It will follow its current trend, further away from a natural condition. If one or all of the proposals are not implemented, future efforts to properly maintain and manage the monument will suffer.

Without fire, the chaparral and surrounding communities will continue to grow beyond maturity, with the possibility of losing this representative unit. Intrusion of other species and possible die-off of some native species would destroy the existing ecosystems. With the accumulation of fuel from the lack of burns, a fire may burn out of control, having catastrophic effects.

Trails would continue to deteriorate with increased damage to soil, plants and hikers and possible closure of the trails. Conditions in the caves could also become detrimental enough to close them. Off-trail travel in outlying areas would mean continual damage to plants and wildlife and potential for lost hikers.

If the monument is not fenced, trespass grazing and hunting will continue to damage plants and animals. The problems inherent with no fences could take a large amount of park staff time.

ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

The primary impact of this resources management plan is to relieve the monument ecosystems of numerous adverse conditions under which they have had to function for the past century. Modern people have not always understood or sympathized with the natural environment, having deemed themselves as separate and apart from such considerations.

Initial adverse environmental impacts were felt during the time of the Spanish land-grant settlers when vaqueros roped, shot, and otherwise destroyed the clumsy California condor for sport. Present topographic maps still show traces of the large ranchos, such as the Rancho Cienega de los Paicines from whence came the town name Paicines. Livestock operations dating from these early days have continued, with added environmental burden of increasing population and its resulting diversity of activities incompatible with the original environment.

It is not known precisely what the original ecosystems were but a reasonable approximation can be made through historical records and ongoing research. We neither expect to reverse the trend of the past 200 years in the areas outside the monument nor attain a complete and total recovery of the original ecosystems within the monument. In the first instance, the very idea is impractical under our present society. In the second instance, we do not know, and we may never know, the exact status and composition of the biotic communities. Also, the land area of the monument is too small to support a total systems function without some kind of outside support. The effects upon the monument by external activities, and their results, cannot be completely eliminated. Some of these external factors are photochemical smog drifting in from areas 70 to 125 miles away, possible change in weather pattern due to urbanization, range reduction for large predators and ungulates and extirpation of predator species when they range outside the monument by imposition of various agricultural and development practices.

The proposed actions are planned to reduce known adverse influences, discover any not now known and maintain action which will permit the public to experience a small sample of its natural heritage. More specifically, the impacts of projected actions are as follows:

Acquire needed research on the resources on Pinnacles. More information is needed concerning fire ecology, botany, zoology, entomology, limnology and endangered species. Lack of information about the

above subjects will hinder development of well substantiated programs. This will prove to be detrimental to the biotic communities, natural resources management program, interpretive program and park maintenance.

The survey to determine the structural soundness of Bear Gulch dam is to prevent possible failure. This will assure safety for the public, plant and animal inhabitants and park structures. The reservoir will also undergo periodic monitoring to maintain water quality objectives specified by the California Water Quality Control Board, EPA and U.S. Public Health. It may be necessary to manipulate the natural process of eutrophication and human-induced pollution to stay within the specified limits.

Failure to encourage research of this kind will be disregarding NPS policies regarding natural areas and mandates enacted by Congress concerning the National Park Service. Research will produce valuable management tools which will eliminate much guesswork and aid in producing a high management standard for the monument and its resources.

Monitoring visitor impact on the monument's resources will insure protection of the diminutive monument resources from overuse and eventual destruction. Identifying damaged resources and manipulation of visitor use patterns will facilitate corrective management practices to reinstate and retain a viable biotic community in the monument.

Initiate a prescribed burning program for the purpose of maintaining a healthy chaparral ecosystem and to prevent dangerous accumulation of fuel. Present information indicates burning is needed to stimulate the reproduction of many plants in the chaparral community such as ceanothus, manzanita, chamise, and holly-leaf cherry. It also indicates that lack of burning produces overmature brush that is too high for deer browse, extremely low in fruit and seed production, and an extremely high fuel accumulation. Animal life is also seriously affected by the presence or absence of periodic burning. Herbivores and omnivores are totally dependent upon the cycles of plant growth and reproduction and carnivores are indirectly dependent on them.

The burning program will have a number of short-term negative impacts: smoke and inconveninece to visitors during burning should be temporary; some animals and plants will be killed in the process; burned-over areas will be an eyesore until they regrow; and there is the possibility of a fire getting out of control and crossing monument boundaries.

Refine the fire protection agreement with the CDF and fire protection plans within the monument so they are in agreement with the Administrative Policies for Natural Areas of the National Park System. Without such an agreement chaotic conditions may develop between agencies operating under separate regulations and philosophies.

Revegetation of internal firebreaks will reunite the presently disjointed chaparral. A continuous expanse will ensure a more efficient community and greater survival potential. In the event of a fire, accessibility and internal control will be impossible except at certain strategic geographic locations. Periodic fire stimulates chaparral communities but may become destructive if vegetation is overmature with large amounts of accumulated fuel.

Stabilize and bring all existing trails up to standard by constructing retaining walls and planting native shrubs to curtail shortcut damage. Through design incentives, visitor safety may be enhanced by eliminating unintentional trap and pitfall type situations. Shortcutting may still occur but a solid retaining wall is not as conductive to this, especially if steep, and shortcutting will not create the scarring and erosion problems that now exist. Level trails with firm edges and handrails in appropriate places offer adequate safety for the hiker. In addition, retaining wall stabilization will eliminate the piles of gravel that now accumulate on the trails below established shortcuts making treacherous footing for the hikers.

Bring up to standard the trails through both caves. The Bear Gulch caves will remain essentially the same and the Balconies caves will advance to a less primitive condition. This will increase visitor safety and reduce temptation to shortcut due to trail delineation, decreasing environmental impact. Only what is necessary for safety will be added to the Balconies caves and what is not needed will be removed from the Bear Gulch caves.

Construct a trail from North Chalone Peak down Frog Canyon to Chalone Creek, including a short connecting trail with the Chalone Peak trail about one-half mile above Bear Gulch reservoir. This will put people in a wilderness area which is not now accessible, and that cannot sustain heavy visitor use without damage. Because of the steep gradient and the length of the trail, those interested enough and capable of hiking the trail may be relatively few, thus making extra impact upon the area minimal. Impact upon the area around the trail will be concentrated around its lower end where it is already present and will not extend beyond the connector trail and the lower end of Chalone Peak trail. Since a bedrock mortar site is known to exist at the head of Frog Canyon, possible impacts would result from increased visitor use of areas made accessible by this trail.

Reopen a wilderness trail above the north fork of Chalone Creek from a point on the Balconies trail past Willow Springs, then in a large arc behind the Balconies, and south to Chaparral Campground. The area through which this trail runs is in the process of revegetation from previous ecological damage. A trail would grant access to the visitor and allow him to see vegetative recovery in action, foot patrols could more easily and frequently be made, and livestock trespassing and poaching could more easily be reduced. The added protection

may help accelerate the recovery process by keeping a tighter control on activities we cannot now observe or have knowledge of.

The negative impacts of the trail work include: temporary inconveniences to visitors during construction; the caves will lose some of their natural appearance, as will the trails that need retaining walls and stabilization; construction of new trails will destroy some plants and encourage increased visitor use of these sections. This should have an overall negative impact on these areas, with increasing problems of soil compaction, illegal camping, trail cutting, and erosion.

Survey and fence the monument boundary to aid in the protection of the monument's natural resources and help promote better relations with the monument's neighbors. Uncertainty of the legal boundary poses law enforcement problems with hunters and poachers who enter the monument accidentally or intentionally. Lack of boundary fencing also causes livestock trespass problems, which are difficult to control, and makes it difficult to carry out agreements with the California Division of Forestry with respect to fire protection. Installation of the fencing will cause some plant destruction, limited noise and visual distraction. Most wildlife movement in and out of the park will not be restricted.

Repair and recondition Bear Gulch dam to alleviate visual and structural problems. To many visitors, the reservoir appears as an oasis in the midst of a desert, surrounded by pinnacled rocks. When viewed from the wilderness, however, the dam poses as a concrete scar. Veneering the uncompleted portion of the dam with native rock will alleviate this visual objection. Rock cut by the CCC prior to World War II already exists at the site. Necessary materials will be packed in by mule and use of heavy equipment is not forseen.

The Western Region Historic Preservation Office has assigned preservation as the level of treatment for Bear Gulch dam. Completion of the dam was also recommended, in the manner prescribed by the CCC. Although veneering will alter the existing structural appearance of the dam, it will not change its historical significance.

If the dam is adequately repaired and reconditioned it will be safer, aesthetically pleasing and less intrusive on the natural scene. During dam repair and veneering, visual and noise distractions will be present for short periods of time.

The proposed combination of repair, inspection and maintenance for the dam will minimize the chance of structural failure in the event of a sizable quake. Although the proposed actions comprise a conscientious program to insure public health and safety, the possibility of an earthquake accompanied by adverse effects on the dam, reservoir and visitors exists.

Beechy ground squirrel control will reduce the potential for a plague epidemic and destructive burrowing activity. The recommended pesticide control program will be in accordance with Executive Orders 11643 and 11870 which provides safeguards for wildlife and the environment. These orders will preclude the chance of secondary poisoning to birds of prey and other predators, which contributed to their former decline.

MITIGATING MEASURES INCLUDED IN THE PROPOSED ACTION

The proposed actions may all have some noticeable impacts upon the monument, and its visitors. However, all the proposals contain some form of mitigating measure to help offset adverse effects. We believe these measures will make the ultimate results weigh heavily in the plus column.

Establishing formal study programs will yield basic information needed to make wise and intelligent use of monument resources; provide a foundation of planning management improvements; serve to bolster the available interpretive program materials; answer questions about prescribed burning; enhance the unique qualities of the area; identify rare and endangered plant and animal species, the number of each species present, and what measures will be necessary to perpetuate them.

During prescribed burning, control precedures will be followed and the effects on plants and animals will be monitored. The local Air Quality Control Board will be consulted to coordinate the fires.

Revegetation of internal firebreaks will provide an uninterrupted panorama of the park, which is not now available. It will aid in the restoration of microenvironments, permit more continuous wildlife cover and restore the overall ecology of the monument to some semblance of its former status.

Retaining walls, improved steps, and other features resulting from trail rehabilitation will be made to blend in with the environment by native plantings, choice of materials, natural weathering and accumulations of lichens and mosses. New trail segments will be carefully placed to localize soil compaction from use and to minimize erosion.

Rehabilitation of trail adjoining known archeological sites, if necessary, will not involve removal of cultural materials but will include preservation actions such as installation of pads of culturally sterile earth to decrease foot traffic compaction. Relocation and construction of new trails and boundary fences will be preceded by archeological field investigations and compliance with Executive Order 11593 obtained.

Reconditioning of Bear Gulch dam by veneering with native rock, will minimize its intrusion upon the natural scene. The project design for completion of the CCC veneering project will be reviewed by an historic architect to assure compliance with historic preservation regulations. The rocks to be used were cut by the CCC so no new material will be needed for completion. Monitoring the water quality of the reservoir will determine if controls are necessary to inhibit algal or bacteria blooms, disagreeable ordors and coloration and whether the reservoir waters meet EPA standards for non-contact recreation. According to these standards, the average fecal coliform concentration for any 30-day period shall not exceed 1000/100 ml nor shall more than ten percent of samples collected during any 30-day period exceed 2000/100 ml. This action will assure compliance with Executive Order 11752, "Prevention, control, and abatement of environmental pollution at Federal facilities".

Control of beechy ground squirrels will have noticeable physical effects upon the monument. Their present burrowing activities, accompanied by soil erosion, adversely affects adjacent road shoulders, trails, campsites and roadside boulder delineators. These pose hazardous situations for visitors in the form of falls and twisted ankles, plus the physical deterioration of roadways, trails, camp and picnic sites. Without control, potentials for disease and pestilence appears to be significant. If this condition remains unchecked, maximum deterioration could result in total closure of the park to public use and enjoyment.

The recommended program of zinc phosphide treated grain will be coordinated with the similar program established by Monterey and San Benito County Agricultural Commission. Safeguards will be provided to wildlife and the environment in accordance with Executive Orders 11643 and 11870. Secondary poisoning to predators will be precluded, preventing further decline to their population.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

Some adverse effects of this proposal are unavoidable but must be dealt with in order to effect the greatest good for both the monument and its visitors.

Any burning within the monument will destroy plants, animals that are unable to escape, and temporarily some wildlife habitat and food. Burned areas will be distracting to visitors until regrowth occurs, and smoke during the burning will be annoying.

Revegetation of internal firebreaks will make it difficult to control any fire inside the monument, except for natural geographic barriers and protection by existing roads and trails.

New trails will allow visitor access to areas which are not now available, thereby making their presence in the monument more obvious. Construction will also increase visitor capacity and use impacts. Standardizing and stabilizing routes through the caves will benefit the Bear Gulch caves but reduce the wild aspect of the Balconies caves. The cement work used to enhance safety in the Balconies will also reduce their natural appearance.

Building wet or dry retaining walls to reduce shortcutting will result in visual scarring and make the trail highly visible for five to ten years. At the end of this time, weathering, lichen patches, and moss colonies will have begun to camouflage the retaining walls. It will take much longer, however, to achieve aesthetic blending with the surrounding area.

Retention of Bear Gulch dam will continue to provide a visitor attraction that causes heavy impact in its immediate area. Siltation will eventually cause eutrophication of the reservoir water, the water will become increasingly nutrient-rich and low in dissolved oxygen and phasing out of the reservoir will take a long period of time. Presence of the dam and reservoir prevents study of the area's original state and its natural conditions.

THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

It is conceivable that present trends of population growth, real estate development, and industrialization will proliferate so rapidly that Pinnacles National Monument will become an island unique to its surrounding area. That being the case, it is imperative we salvage and maintain this area's natural ecosystems, specifically the biotic communities and the wildlife therein. Not only will this assemblage provide an accurate, living view into the historic past, but also it could harbor information vital to the management of man's ecosystems and his battle against self-destruction through environmental pollution.

The legislation that established Pinnacles as a national monument recognized its natural significance. These unique characteristics will perpetuate only with a positive protective management program. Exploitation and development of the resources would produce maximum economic yields, thereby attaining short-term local benefits at the expense of long-term productivity. Implementation of the proposed plan insures that valuable resources will continue to be available in conformance with the establishing legislation.

Implementation of the natural resources management plan ultimately proposes to maintain, perpetuate and enhance long-term productivity of the monument, for man's continued use. Research programs will formulate the basis for future decisions concerning the beneficial maintenance and restoration of the park. The management actions strive to stabilize the environment in a productive capacity and conserve resources for future availability.

Man has need of a quite place for spiritual regeneration. Our first consideration must be the ultimate effects of our actions. Such a philosophy should underlie every action proposed in this document. If it does not, those of us who are responsible must change the proposal so it does conform, or make a determination such an action can be justified. We cannot escape the occurrence of some adverse effects, but we must do all we can to mitigate these effects and keep them to a minimum.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

None of the proposed actions presents an irreversible or irretrievable commitment of resources. Management practices may be modified as other methods become available, or they may be discontinued; visitor-use features, such as trails, may be returned to a natural state. No archeological site or critical habitat for endangered species will be degraded by the proposed actions.

ALTERNATIVES TO THE PROPOSED ACTION

RESEARCH

The only alternative considered for the research proposals was no action. Not knowing what or how much of something is present would deny management the information necessary to make intelligent decisions regarding animal and plant life. To follow through with proposed projects without research could lead to irreparable damage.

MANAGEMENT

Prescribed burning. Alternatives considered for the prescribed burning program were no action, continue suppression activities, begin a let-burn policy without study and establish a natural let-burn fire zone. No action is inconsistent with Park Service directives to maintain the area and protect the visitor. To continue fire suppression would cause the ecosystems to further degenerate.

There would be loss of wildlife due to lack of food, eventual loss of communities through change of plant composition, and a dangerous accumulation of dense fuel material. To allow fires to burn without study and coordination is preferable to the other two alternatives, but it is only a partial answer. Without study and monitoring, negative and destructive effects could occur. A natural fire zone would be a controlled area where natural fires would remain unsuppressed. This let-burn zone should be an experimental program for prescribed burning in the rest of the park. Suppression action will be needed in the event that a natural fire endangers the surrounding park area outside the natural fire zone.

No formal fire protection agreement with other agencies can cause ill feeling and lack of organization due to conflicting philosophies concerning fire by concerned agencies.

Revegetate firebreaks. No action and maintenance of firebreaks were considered for the revegetation project. Both would continue unnatural influences in the area, and are improper because of the lack of need for firebreaks. With no action the breaks would be eroded, preventing natural revegetation, and would continue to separate various portions of the monument into small ecosystem that are far less efficient than an unbroken single unit. Recovery would take 25 to 100 years and irreparable ecological damage could occur before then.

Repair trails. The trail improvement alternatives are no action, maintain existing trails, control erosion with no additional emplacements such as retaining walls, steps or rails and rehabilitate existing trails with no new trail construction. No action would mean continued deterioration to the natural area and hazardous hiking for visitors. Maintenance of existing trails would not alleviate shortcutting, trail erosion and visitor safety. To control erosion would both benefit the surrounding area and the visitor. Erosion is both a natural occurrence and man-made.

There are areas where additional emplacements are necessary to prevent natural erosion by wind and water and man-made erosion by shortcutting. If erosion was controlled without steps and rails to delineate the trail for hikers, shortcutting would continue and erosion would follow. Erosion control without additional emplacements would mean fighting a never ending battle. Rehabilitation of existing trails means restoration back to its former state, which would mean working backwards with no improvement. It has already been seen that the present and former state of the trails are inadequate for both the park and its visitors. No new trail construction would deny visitors access to additional areas.

Cave trail improvement alternatives are no action, close caves, delineate trails with no safety features and build paved and lighted trails. No action would continue the existing hazardous situation, and might in the future necessitate the other alternative--that of closing the caves.

Denying public access to the caves is contrary to the idea of national parks and visitor use. Delineation of trails without safety features would be detrimental to the natural caves as well as the visitor. Leveled trails, rails, steps and walls are necessary to protect the visitor from potential falls, getting lost and inflicting damage to the caves. To build paved and lighted trails would greatly distract from the natural appearance of the caves. It would be much more expensive than the proposed improvements, visitor safety would definitely be maintained but the natural experience would be removed.

Survey and fence monument boundaries. For the boundary survey, no action was considered. This would make fencing impossible, and would continue boundary problems with neighbors. This would allow the trespass grazing and hunting to continue unchecked, with subsequent damage to the monument. Fencing only part of the boundary would only solve part of the problem. Posting would help remove trespass hunting, but it would not help the trespass grazing.

Repair and recondition Bear Gulch dam. Alternatives considered were no action and removal. The no action alternative would mean the continued existence of a bare concrete scar in the middle of a natural area; there would not be periodic maintenance checks to assure structural stability; the eutrophication process will continue and accelerate due to external influences; algal blooms will discolor the water and bacteria action will release odors. This would perpetuate a constant threat to public health and public safety.

Bear Gulch dam is presently being included on the List of Classified Structures (LCS). Actions towards removal should not be undertaken until its eligibility has been determined and it has been recorded according to specifications established by the Historic Preservation Act of 1966 and Executive Order 11593. Upon compliance with these regulations and approval of the Regional Director, removal of the dam may be considered.

Removal of the dam would eliminate this unnatural structure and body of water. This would entail draining of the reservoir, removal of the concrete and rocks, and restoration of the leached area.

Draining of the reservoir will cause the water to flow through the caves and downstream, and a bed of accumulated sediment will remain behind the dam. Removal and deposition of the rocks and concrete from the dam will be the most difficult aspect of this operation. Some blasting may be necessary and heavy machinery required to carry out the rocks and concrete debris.

This alternative may reduce or eliminate the aquatic vegetation and wildlife now existing in and around the reservoir. Aquatic

life downstream may also be affected by the increased water level and increased concentration of sediment.

The bed of sediment will remain in place until the first large storm. Water flow will cause channeling and erosion of the bed.. Layers of sediment will begin its downstream trip and intermittent transport to sea. It will take several large storms and an unknown number of years to move all the sediment downstream. This sudden introduction of sediment into the caves below the dam would possibly render them unusable for a period of time.

Beechy ground squirrels. No action and reduction of available artificial food supply were the two alternatives considered. No action would lead to continued or even an increase in the already abnormally high population of squirrels. There would be continual and accelerated potentials for epidemic, physical deterioration to heavy public use portions of the monument and hazardous conditions for the park visitor. Reduction of available food would entail animal proofing garbage cans and particularly a means of public education which would eliminate the inevitable temptation of feeding these rodents. To date all efforts to reduce visitor feeding, the primary cause of squirrel population increase, has had little results. If a reduction program were to prove successful it could bring about minimal reduction in squirrel density. Without adequate predation, a significant decrease in population is further limited. This supplemental action would largely depend upon the actions of other adjacent landowners and ranchers.

CONSULTATION AND COORDINATION

Several sources were consulted for their knowledge of various subjects during the preparation of the natural resources management plan. The following persons made the greatest contributions during preparation: Dr. Vincent Matthews of the University of Northern Colorado, Greeley, Colorado, in historical and physical geology, and William H. Brooks, consulting plant ecologist, Pima College, Tucson, Arizona, in plant ecology and soils. The work of park biologist Peter S. Bennett was also referred to concerning the general ecology of the monument.

Informational copies of the plan and environmental assessment will be sent to the following organizations and their comments will be requested. All letters of comment will be reviewed by the Superintendent for implementation. Copies of the assessment and public comments will be available at the monument and at the National Park Service, Western Regional Office, San Francisco.

Air Quality Control Board
Department of Agriculture

Soil Conservation Service
Department of the Interior
Bureau of Land Management
Fish and Wildlife Service
Geological Survey
Environmental Protection Agency, Region IX
State of California Resources Agency
California Department of Fish and Game
California Division of Forestry
State Historic Preservation Officer
Association of Monterey Bay Area Governments
San Benito County Board of Supervisors
Audubon Society, Monterey Peninsula
Pinnacles Land and Cattle Company
Salinas Chamber of Commerce
San Benito Chamber of Commerce
Sierra Club, Ventana Chapter
Southwest Parks and Monuments Association
Sportsman's Council of Central California

MANAGEMENT PROGRAM

The management program that is appended to the plan is the action document that is designed to implement the plan. The management program consists of:

A List of Natural Resources Projects on which recently completed, currently active, and proposed natural resource activities are summarized.

Natural Resources Project Statements that will serve as "blueprints" for proposed actions.

A Natural Resources Project Programming Sheet on which each project will be listed and shown in relation to park priority, funding, and manpower requirements, and a time sequence for the five-year period.

While the natural resources management plan is concerned with a proposed long-term action program, the management program deals with the next five years only. The program presented here begins with Fiscal Year 1976. Each subsequent year, the management program will be revised and updated for a new five-year period as work is completed and new projects are proposed.

LIST OF NATURAL RESOURCES PROJECTS

Reference Number	Project Title	Status of Project
RM-1	Fire protection agreements	2 years to completion
RM-2	Prescribed burning program	continuous
RM-3	Firebreak revegetation	2 years to completion
RM-4	Balconies Caves trail improvement	3 years to completion
RM-5	Bear Gulch caves trail improvement	5 years to completion
RM-6	Frog Canyon trail construction	2 years to completion
RM-7	Frog Canyon - Chalone Peak connection	1 year to completion
RM-8	Northern area wilderness trail	4 years to completion
RM-9	Trail stabilization and maintenance	3 years to completion
RM-10	Boundary survey	2 years to completion
RM-11	Boundary fencing	1 year to completion
RM-12	Bear Gulch dam repair	4 years to completion
RM-13	Beechy ground squirrel control	continuous
N-1	Plant inventory	2 years to completion
N-2	Entomological inventory	5 years to completion
N-3	Limnological inventory	3 years to completion
N-4	Mammal inventory	4 years to completion
N-5	Endangered species study	2 years to completion
N-6	Fire research	3 years to completion

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Fire protection agreements, involving California Division of Forestry (CDF) and monument neighbors (PINN-RM-1).

3. STATEMENT OF THE PROBLEM: With the anticipation of prescribed and controlled burning, agreements must be made describing the responsibilities of various agencies and individuals in relation to fire protection. The present agreement with the CDF is inadequate, and no agreements with monument neighbors exist.

4. WHAT HAS BEEN DONE: There is an agreement with the CDF but it does not delineate the responsibilities of each party, and no agreement with neighbors has been made.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A meeting with monument neighbors will be held to establish an agreement so responsibility can be assumed if a controlled burn escapes onto adjacent property. Also a more defined agreement will be developed with the CDF.

6. LENGTH OF TIME NEEDED: Two years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: If a controlled fire should cross monument boundaries, problems could develop with the CDF and neighbors.

8. WHAT ARE THE ALTERNATIVES: No action.

9. PERSONNEL: Monument staff.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services		1,000	1,000		
Other than personal services		—	—		
GRAND TOTAL		1,000	1,000		
Funds available in park base		1,000	1,000		
Funds requested from Regional Office		—	—		

On Form	Date Submitted

11. REFERENCES AND CONTACTS:

12. DATE OF SUBMISSION: August 30, 1974.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Prescribed burning program (PINN-RM-2).

3. STATEMENT OF PROBLEM: Fire has been suppressed in the monument for the past 50 years. As a result, fire-adapted chaparral vegetation has not received the stimulus necessary for adequate reproduction and stability. This suppression has resulted in overmature stands of vegetation, constituting a dense accumulation of fuel. If a natural uncontrolled fire were to occur, it would burn much hotter than normal and may be more damaging than stimulating. The maturity of the vegetation has also placed much deer browse out of reach, resulting in an abnormal food shortage. The overall effect of fire suppression on the monument ecology is not known. Observations so far however, indicate that suppression has reduced the stability of the chaparral as a climax community and a unique ecosystem.

4. WHAT HAS BEEN DONE: To date, fire has been suppressed on all occasions. On December 3-5, 1975 a meeting was held at the monument concerning the fire management program for Pinnacles. Participants included several NPS scientists, representatives from the CDF, BLM, San Benito County Range Improvement Assn., and the San Benito County Farm Advisor. The three year research program (see PINN-N-6) will lay the foundation for the operational prescribed burning program.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Past research on controlled burning in chaparral communities will be analyzed. Plans for additional studies (see PINN-N-6) are underway and small test plots will be burned as part of these studies. The monument will be divided into sectors with natural boundaries capable of limiting the extent of the fires. Agreements will be made with the State Forest Service and Federal Fire Control Agencies for cooperation during burns (see PINN-N-6). The sectors will be burned at various times on a rotation basis.

6. LENGTH OF TIME NEEDED: Three years during the research study (PINN-N-6), then continuing as prescribed.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: The potential for destructive, high temperature fires would remain high due to fuel accumulation, and much of the areas vegetation would remain unavailable to wildlife. Overmature stands of native, fire-adapted species would decline and natural succession would lean towards encroachment of fire intolerant vegetation.

8. WHAT ARE THE ALTERNATIVES:

   a. No action, which would mean continuation of fire suppression.
   b. Establish a let-burn policy without study.

9. PERSONNEL: Monument staff.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence 4th	5th
Personal services	9,000	9,000
Other than personal services	6,000	6,000
GRAND TOTAL	15,000	15,000
Funds available in park base	—	—
Funds requested from Regional Office	15,000	15,000

On Form	Date Submitted
10-237	2/76

11. REFERENCES AND CONTACTS: FES 75-99

12. DATE OF SUBMISSION: February 13, 1976

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Firebreak revegetation (PINN-RM-3).

3. STATEMENT OF THE PROBLEM: Old fire prevention policy within the national parks resulted in firebreaks being bulldozed into the hillsides of the monument. The scars of these firebreaks mar the scene and create erosion problems.

4. WHAT HAS BEEN DONE: No firebreaks have been built in the last four years.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Old firebreaks that are not healing over may require one or more methods for recovery of native ground cover.

   a. Compaction of soil by bulldozers may require plowing.
   b. Prescription burning may be necessary.
   c. As a last resort, fertilization and transplanting may be needed for full recovery.

6. LENGTH OF TIME NEEDED: Two years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Erosion and soil depletion would continue, inhibiting natural vegetation recovery.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Maintain the firebreaks with periodic clearing.

9. PERSONNEL: Monument staff.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services				1,500	1,500
Other than personal services				500	500
GRAND TOTAL				2,000	2,000
Funds available in park base				2,000	2,000
Funds requested from Regional Office				—	—

On Form Date Submitted

11. REFERENCES AND CONTACTS: FES 75-99

12. DATE OF SUBMISSION: February 13, 1976

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region

2. PROJECT NAME AND NUMBER: Balconies caves trail improvement (PINN-RM-4).

3. STATEMENT OF THE PROBLEM: There is no regularly maintained trail through the Balconies caves. In several places a person with adequate light, can miss the turn and fall a considerable distance, with the possibility of serious injuries.

4. WHAT HAS BEEN DONE: A few concrete fillups have been installed to aid ascent.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A trail with the necessary means of ascent and descent will be installed the length of the cave from the former Old Pinnacles area to the junction with the Balconies trail on the west side. Trail work will be kept low key as to facilitate a wilderness experience and yet maintain a safe route. Appropriate warning signs will be installed.

6. LENGTH OF TIME NEEDED: Three years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Visitors may become lost and incur serious injuries. Some will not visit the caves because of the hazards, and a new self-guiding nature trail must be rerouted around the caves.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Close the caves to the public.
   c. Build a paved and lighted trail.

9. PERSONNEL: Monument staff

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services		2,500	2,500	2,500	
Other than personal services		500	500	500	
GRAND TOTAL		3,000	3,000	3,000	
Funds available in park base		3,000	3,000	3,000	
Funds requested from Regional Office		—	—	—	

On Form	Date Submitted

11. REFERENCES AND CONTACTS: FES 75-99

12. DATE OF SUBMISSION: February 13, 1976

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT AND NUMBER: Bear Gulch caves trail improvement (PINN-RM-5).

3. STATEMENT OF THE PROBLEM: Markings on the Bear Gulch caves trail are confusing, causing inadvertent off-trail use. Off-trail travel is dangerous, especially when persons above the caves cause material to fall down to the trail area.

4. WHAT HAS BEEN DONE: The mini folder and the Moses Spring trail guide both have warnings to stay on the trail for their own safety and the safety of others.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN:

   a. Confusing arrows will be removed from the walls.
   b. Trail surfaces will be repaired and brought up to standard.
   c. Retaining and guide walls will be built along trail edges to insure safety.
   d. Appropriate warning signs will be installed.

6. LENGTH OF TIME NEEDED: Five years of intermittent work.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN:

   a. Visitors will continue to stray from the trail.
   b. Continued off-trail use will cause local soil erosion.
   c. Some visitors may become lost.
   d. Off-trail use above the caves may cause rocks to fall through vertical openings in the caves and cause injury to cave visitors.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Close the caves.

9. PERSONNEL: Monument staff.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services	2,500	2,000	2,000	2,000	2,500
Other than personal services	500	500	500	500	500
GRAND TOTAL	3,000	2,500	2,500	2,500	2,500
Funds available in park base	3,000	2,500	2,500	2,500	2,500

Funds requested from Regional Office	—	—	—	—	—

On Form	Date Submitted

11. REFERENCES AND CONTACTS: FES 75-99

12. DATE OF SUBMISSION: February 13, 1976

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Frog Canyon trail construction (PINN-RM-6).

3. STATEMENT OF PROBLEM: The only access to the south end of the monument is Chalone Peak Trail. About one-fourth of the monument land area is therefore inaccessible.

4. WHAT HAS BEEN DONE: Nothing.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The trail will be routed to the saddle between North and South Chalone Peak, with a spur to the top of South Chalone Peak. The main trail will descend into Frog Canyon and continue down to Chalone Creek. It is possible that one or two bridges will be needed.

6. LENGTH OF TIME NEEDED: Two years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: About one-fourth of the monument's land area would be inaccessible to visitors. Hikers would have a damaging effect on the area's vegetation.

8. ALTERNATIVES:

   a. No action.
   b. Prohibit off trail hiking.

9. PERSONNEL:

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services					35,000
Other than personal services					15,000
GRAND TOTAL					50,000
Funds available in park base					—
Funds requested from Regional Office					50,000

On Form Date Submitted

11. REFERENCES AND CONTACTS: FES 75-99

12. DATE OF SUBMISSION: February 13, 1976

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region

2. PROJECT AND NUMBER: Frog Canyon-Chalone Peak trails connection (PINN-RM-7).

3. STATEMENT OF PROBLEM: The loop formed by the proposed Frog Canyon and the present Chalone Peak trails will be at least fifteen miles round trip. This is too time consuming and strenuous for the average visitor.

4. WHAT HAS BEEN DONE: Nothing.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: About one-half mile of trail over relatively easy terrain will be constructed. A bridge may be needed depending upon which side of the stream channel the Frog Canyon trail will be on.

6. LENGTH OF TIME NEEDED: One year.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Many persons would not hike the fifteen mile long Frog Canyon trail. This would prevent visitors from enjoying the less traveled areas.

8. WHAT ARE THE ALTERNATIVES: No action.

9. PERSONNEL: Day labor.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services					7,000
Other than personal services					3,000
GRAND TOTAL					10,000
Funds available in park base					—
Funds requested from Regional Office					10,000

On Form Date Submitted

11. REFERENCES AND CONTACTS: FES 75-99

12. DATE OF SUBMISSION: February 13, 1976

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Northern area wilderness trail construction (PINN-RM-8).

3. STATEMENT OF THE PROBLEM: There is no current established access to the northern section of the monument, which comprises approximately one-third of Pinnacles National Monument.

4. WHAT HAS BEEN DONE: The old route now overgrown with brush, from the Chaparral ranger station to North Chalone Creek and to the Balconies road (trail) has been located.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The existing unused trail will be reopened and maintained as a primitive trail. Trail construction will be needed only when the old trail crosses old roads and firebreaks.

6. LENGTH OF TIME NEEDED: Four years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Visitors would be denied access to one-third of the monument. The management of fires, wilderness, natural resource programs including prescription burning and general protection of the northern portion of the monument would be impeded.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Close the area to the public.

9. PERSONNEL: Day labor.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services		1,000	2,000	2,000	15,000
Other than personal services		—	—	—	7,000
GRAND TOTAL		1,000	2,000	2,000	22,000
Funds available in park base		1,000	2,000	2,000	2,000
Funds requested from Regional Office		—	—	—	20,000

On Form Date Submitted

11. REFERENCES AND CONTACTS: FES 75-99

12. DATE OF SUBMISSION: February 13, 1976

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Trail stabilization and maintenance (PINN-RM-9).

3. STATEMENT OF PROBLEM: Trails are severely deteriorated due to short-cutting and heavy rainfall. Retaining walls are needed to maintain trail width and to restore trails cut by erosion.

4. WHAT HAS BEEN DONE: Chicken wire and barbed wire has been used in shortcuts to eliminate off trail use. Trails have been sloped and drain channels have been provided to slow erosion.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Wet or dry retaining walls will be constructed at serious shortcut and erosional sites. These will be designed to discourage shortcutting and prevent erosion. Hand rails will be provided where necessary and steps will be enlarged. All prominent shortcuts will be obliterated and plantings of native shrubs will be made to screen potential shortcuts.

6. LENGTH OF TIME NEEDED: Three years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Trails will continue to deteriorate and endanger the average hiker. In some places trails will be closed since it is not possible to reconstruct them with park funds.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Hikers could be accompanied by a ranger.
   c. Damaged trails could be closed.

9. PERSONNEL: Day labor.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services				50,000	
Other than personal services				16,000	
GRAND TOTAL				66,000	
Funds available in park base				—	
Funds requested from Regional Office				66,000	

On Form	Date Submitted
10-238	3/74

11. REFERENCES AND CONTACTS: DES 74-28

12. DATE OF SUBMISSION: August 30, 1974.

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Boundary survey (PINN-RM-10).

3. STATEMENT OF THE PROBLEM: No corners or markers are installed around the monument. As a result, there is no way to place fences to prevent trespass grazing or hunting. Most boundaries are not precisely known.

4. WHAT HAS BEEN DONE: Nothing.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The monument boundary will be surveyed and marked.

6. LENGTH OF TIME NEEDED: Six months.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Trespass hunting and grazing, and disputes over boundaries will continue.

8. WHAT ARE THE ALTERNATIVES: No action.

9. PERSONNEL: Contract.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence 1st	2nd	3rd	4th	5th
Personal services					
Other than personal services	60,000				
GRAND TOTAL	60,000				
Funds available in park base	—				
Funds requested from Regional Office	60,000				

On Form	Date Submitted
10-238	3/74

11. REFERENCES AND CONTACTS: DES 74-28

12. DATE OF SUBMISSION: August 30, 1974.

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Boundary fencing (PINN-RM-11).

3. STATEMENT OF THE PROBLEM: Most of the monument's neighbors are cattle owners. Without fences stock stray into the monument and compete with native herbivores. Hunters and poachers find it easy to hunt in the monument without danger of prosecution since the legal boundary is not marked.

4. WHAT HAS BEEN DONE: Drift fences have been built to curtail livestock trespass and fencing has been placed on the small section of known boundary.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The monument will be fenced with a standard 4 wire stock fence.

6. LENGTH OF TIME NEEDED: One year.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Livestock trespass, poaching, hunting by accident, and bad relations with neighbors would continue.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Fence only the most critical areas.
   c. Post the boundary on steel posts without fencing.

9. PERSONNEL: Contract.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence 1st	2nd	3rd	4th	5th
Personal services					
Other than personal services					217,000
GRAND TOTAL					217,000
Funds available in park base					—
Funds requested from Regional Office					217,000

On Form	Date Submitted
10-238	3/74

11. REFERENCES AND CONTACTS: DES 74-28

12. DATE OF SUBMISSION: August 30, 1974

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT AND NUMBER: Bear Gulch dam repair and reconditioning. (PINN-RM-12).

3. STATEMENT OF THE PROBLEM: Bear Gulch dam was built in the 1930's by the CCC with native rock facing, but was not completed. A strip of bare concrete (approximately 3 feet in height) extends the length of the dam and distracts from its natural setting when viewed from the wilderness. Existing leaks raise question as to the structural soundness of the dam and possible failure during an earthquake.

4. WHAT HAS BEEN DONE: The pieces of native rock for veneering the dam were cut by the CCC in the 1930's and still exist in the park.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: All necessary measures to insure the dams structural soundness will be undertaken. In addition, a cyclic maintenance program will be established and the exposed concrete surface will be veneered with native rock.

6. LENGTH OF TIME NEEDED: Four years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Failure of the dam through neglect and lack of maintenance could cause devastating effects on downstream life and facilities. The presently exposed concrete would continue to distract from the natural scene.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Remove the dam.

9. PERSONNEL: Monument staff.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services		1,000	1,500	2,000	3,000
Other than personal services		500	500	500	1,000
GRAND TOTAL		1,500	2,000	2,500	4,000
Funds available in park base		1,500	2,000	2,500	4,000
Funds requested from Regional Office		—	—	—	—

On Form Date Submitted

11. REFERENCES AND CONTACTS: FES 75-99; Art Smith, retired maintenance foreman and longtime local resident.

12. DATE OF SUBMISSION: February 13, 1977

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Beechy ground squirrel control (PINN-RM-13).

3. STATEMENT OF THE PROBLEM: Beechy ground squirrels have reached abnormally high densities due to artificial food supply and minimal predation. Their burrowing activities in high use areas present hazardous situations for visitors and physical deterioration by erosion to the monument. Also, with increased population there is greater potential for plague epidemic.

4. WHAT HAS BEEN DONE: Regional resource specialist (F. Jacot) reviewed the beechy ground squirrel at Pinnacles on September 23, 1975, followed by a conference with San Benito County Agricultural Commissioner (Edmundson) and Chief ranger (Langford), resulting in approval of an emergency pesticide project.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: During the wet months (November-February), gas cartridges of sulphur will be burried and sealed in the squirrel burrows. Zinc phosphide will be used for treatment during the dry months. There will be continual monitoring of this project, observations of the squirrel population and burrowing damage.

6. LENGTH OF TIME NEEDED: Continuous.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: The monument terrain will continue to deteriorate from erosion due to burrowing activity. Continued threat of sylvatic plague epidemic will persist if the population is not controlled.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Reduce artificial food source.

9. PERSONNEL: Monument staff.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services	200	400	200	500	200
Other than personal services	300	300		300	
GRAND TOTAL	500	700	200	800	200

Funds available in park base	700	200	800	200
Funds requested from Regional Office	—	—	—	—

On Form Date Submitted

11. REFERENCES AND CONTACTS: 1976 Pesticide Proposals - PINN 01, 02

12. DATE OF SUBMISSION: December 19, 1975

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Plant inventory (PINN-N-1).

3. STATEMENT OF THE PROBLEM: Knowledge about the plant life is not thorough enough to permit proper management and interpretation. The dryer habitat plants, lichens, fungi, mosses and liverworts are the least known of the area.

4. WHAT HAS BEEN DONE: A checklist for most of the vascular plants has been compiled. A program of study of the oak-grass savannah community has been going on for the past seven years. A research project on the chaparral has been conducted and an herbarium has been established.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The cataloging of all plants will be completed, with emphasis given to nonnative. Interrelationships of plants and animals will be studied.

6. LENGTH OF TIME NEEDED: Two years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Management decisions and interpretation would be difficult, based on existing insufficient data.

8. WHAT ARE THE ALTERNATIVES:

   No action.

9. PERSONNEL: University research personnel.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services				—	—
Other than personal services				1,000	1,000
GRAND TOTAL				1,000	1,000
Funds available in park base				—	—
Funds requested from Regional Office				1,000	1,000

On Form Date Submitted

11. REFERENCES AND CONTACTS: DES 74-28

12. DATE OF SUBMISSION: August 30, 1974

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Entomological inventory (PINN-N-2).

3. STATEMENT OF THE PROBLEM: The insects of the monument are not well known, and inhibits effective management and interpretation.

4. WHAT HAS BEEN DONE: Some insects have been collected and identified.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: An extensive insect collection and checklist will be made. Life cycles of lesser known insects and interrelationships with other animals and plants will be studied.

6. LENGTH OF TIME NEEDED: Five years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Some species may be lost due to mismanagement. Certain parasites if not controlled may get out of hand and effect members of the community. Proper management and interpretation would be difficult.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Apply existing research to Pinnacles.

9. PERSONNEL: University research personnel.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services				—	—
Other than personal services				1,000	1,000
GRAND TOTAL				1,000	1,000
Funds available in park base				—	—
Funds requested from Regional Office				1,000	1,000

On Form Date Submitted

11. REFERENCES AND CONTACTS: DES 74-28

12. DATE OF SUBMISSION: August 30, 1974.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Limnological inventory (PINN-N-3).

3. STATEMENT OF THE PROBLEM: Lack of information about fresh water plants and animals makes management and interpretation difficult. Rare or endangered species may be present, requiring effective management actions.

4. WHAT HAS BEEN DONE: A cursory survey has been made.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: An inventory of fresh water species will be made, with attention given to rare, endangered, or doubtful species.

6. LENGTH OF TIME NEEDED: Three years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Rare species could become extinct through mismanagement and interpretation would be based on insufficient data.

8. WHAT ARE THE ALTERNATIVES:

   No action.

9. PERSONNEL: University research personnel.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services				—	—
Other than personal services				1,000	1,000
GRAND TOTAL				1,000	1,000
Funds available in park base				—	—
Funds requested from Regional Office				1,000	1,000

On Form Date Submitted

11. REFERENCES AND CONTACTS: DES 74-28

12. DATE OF SUBMISSION: August 30, 1974.

NATURAL RESOURCE PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Mammal inventory (PINN-N-4).

3. STATEMENT OF THE PROBLEM: Mammals at Pinnacles are not as well known as they should be for proper management and interpretation. Numbers of animals, location, range; and interrelationships should be known. Some animals that were once native are no longer found, and some still in the park are rare, endangered, or of doubtful status.

4. WHAT HAS BEEN DONE: A checklist based on past records has been compiled.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: A survey of population size, location, range, and interrelationships will be made. Rare or doubtful species will be identified. Problem areas will be identified, and recommendation s for future studies will be made.

6. LENGTH OF TIME NEEDED: Four years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Mammals that are rare or endangered could become extinct. Others may proliferate too freely and damage the habitat or could be eliminated through lack of knowledge concerning their habits. Interpretation would continue to be based on incomplete information.

8. WHAT ARE THE ALTERNATIVES:

   a. No action.
   b. Apply existing research on this subject to Pinnacles.

9. PERSONNEL: University research personnel.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services				—	—
Other than personal services				1,000	1,000
GRAND TOTAL				1,000	1,000
Funds available in park base				—	—
Funds requested from Regional Office				1,000	1,000

On Form	Date Submitted

11. REFERENCES AND CONTACTS: DES 74-28

12. DATE OF SUBMISSION: August 30, 1974.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Endangered species study (PINN-N-5).

3. STATEMENT OF THE PROBLEM: The present and past distribution of endangered species within Pinnacles is uncertain. Without research, endangered species that presently inhabit the monument may be lost due to mismanagement. Former endangered native inhabitants may be recovered, pending research on causes of their decline.

4. WHAT HAS BEEN DONE: The problem has been identified; no action has yet been taken.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN: Research existing endangered species checklists of the Pinnacles area and conduct a survey to determine if checklist species are present or were resident at one time. Determine what factors caused the decline of these species and what measures can be taken to maintain or restore their natural habitat. Study the possibilities for reintroduction of certain species.

6. LENGTH OF TIME NEEDED: Two years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Endangered inhabitants of Pinnacles may be neglected due to insufficient knowledge of these species. Management of critical habitats may not be conducive to maintenance or restoration of these species.

8. WHAT ARE ALTERNATIVES:

No action.

9. PERSONNEL: University personnel.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services					
Other than personal services			2,000	2,000	
GRAND TOTAL			2,000	2,000	
Funds available in park base			—	—	
Funds requested from Regional Office			2,000	2,000	

On Form	Date Submitted

11. REFERENCES AND CONTACTS: FES 75-99

12. DATE OF SUBMISSION: February 15, 1975.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Pinnacles National Monument, Western Region.

2. PROJECT NAME AND NUMBER: Fire Management Research Program (PINN-N-6).

3. STATEMENT OF PROBLEM: Implementation of the prescribed burning program (PINN-RM-2) necessitates further research and monitoring concerning fire behavior and chaparral ecosystems.

4. WHAT HAS BEEN DONE: On December 3-5, 1975, a meeting on the fire management program was held at the monument. Participants included several NPS scientists involved with fire management, and representatives of the California Division of Forestry, Bureau of Land Management, San Benito County Range Improvement Association, and the San Benito County Farm Advisor. Field tours were conducted and discussions held concerning the direction of the preliminary fire management research program.

5. DESCRIPTION OF WORK TO BE UNDERTAKEN:

   a. Consult existing research and similar programs.
   b. Test various prescriptions of weather, fuel and topography.
   c. Continuous monitoring of fire behavior and its effect on the chaparral ecosystem.
   d. Develop a long range plan, detailing the rotating period, optimum burning periods, means of obtaining adequate prescriptions for burning and monitoring of burns.
   e. Detail specific burn sites and time periods where research burns will take place.

6. LENGTH OF TIME NEEDED: Three years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Prescribed fires may be conducted without knowledge of the most effective methodology, thereby increasing potential for detrimental results. Important alternatives involving procedure and recovery may be overlooked due to lack of research and consultation.

8. WHAT ARE ALTERNATIVES: No action.

9. PERSONNEL: Monument and Regional staff, and University personnel.

10. ADMINISTRATION AND LOGISTICS:

Funding	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal services	1,900	9,000	9,000		
Other than personal services	5,100	6,000	6,000		
GRAND TOTAL	7,000	15,000	15,000		

Funds available in park base	—	—	—
Funds requested from Regional Office	7,000	15,000	15,000

On Form	Date Submitted
10-237	6/74

11. REFERENCES AND CONTACTS: FES 75-99

12. DATE OF SUBMISSION: February 15, 1976.

NATURAL RESOURCES PROJECTS PROGRAMMING SHEET

PINNACLES NATIONAL MONUMENT, CALIFORNIA

March 1976

NPS Costs Expressed in $1000

Increase or Package No.	Area Priority	Reference No.	Project Title	Yr. 1 (76) BASE*	Yr. 1 (76) NEW**	Yr. 2 (77) BASE	Yr. 2 (77) NEW	Yr. 3 (78) BASE	Yr. 3 (78) NEW	Yr. 4 (79) BASE	Yr. 4 (79) NEW	Yr. 5 (80) BASE	Yr. 5 (80) NEW	Form No. & Date 10-250	Form No. & Date 10-237	Form No. & Date 10-238	No. of Contract
	1	N-6	Fire research		7.0		15.0		15.0								
119	2	RM-10	Boundary survey		58.0												
	3	RM-5	Bear Gulch caves improvement	3.0		2.5		2.5		2.5		2.5					
	4	RM-13	Beechy ground squirrel control	0.5		0.7		0.2		0.8		0.2					
	5	RM-1	Fire protection agreements			1.0		1.0									
	6	RM-4	Balconies caves trail improvement			3.0		3.0		3.0							
	7	RM-8	Northern area wilderness trail			1.0		2.0		2.0		2.0	20.0				
	8	RM-12	Bear Gulch dam repair and reconditioning			1.5		2.0		2.5		4.0					
005	9	RM-2	Prescribed burning program								15.0		15.0				
134	10	RM-9	Trail stabilization and maintenance								66.0						
120	11	RM-11	Boundary fencing								217.0						
	12	N-5	Endangered species study								2.0		2.0				
	13	N-4	Mammal inventory								1.0		1.0				
	14	N-1	Plant inventory								1.0		1.0				
	15	N-3	Limnological inventory								1.0		1.0				
	16	N-2	Entomological inventory								1.0		1.0				
	17	RM-3	Firebreak revegetation							2.0		2.0					
	18	RM-6	Frog Canyon trail construction										50.0				
	19	RM-7	Frog Canyon - Chalone Peak connection										10.0				

*BASE - Funds Available in Park Base **NEW - Funds Requested from Regional Office

☆GPO 690-873-1976