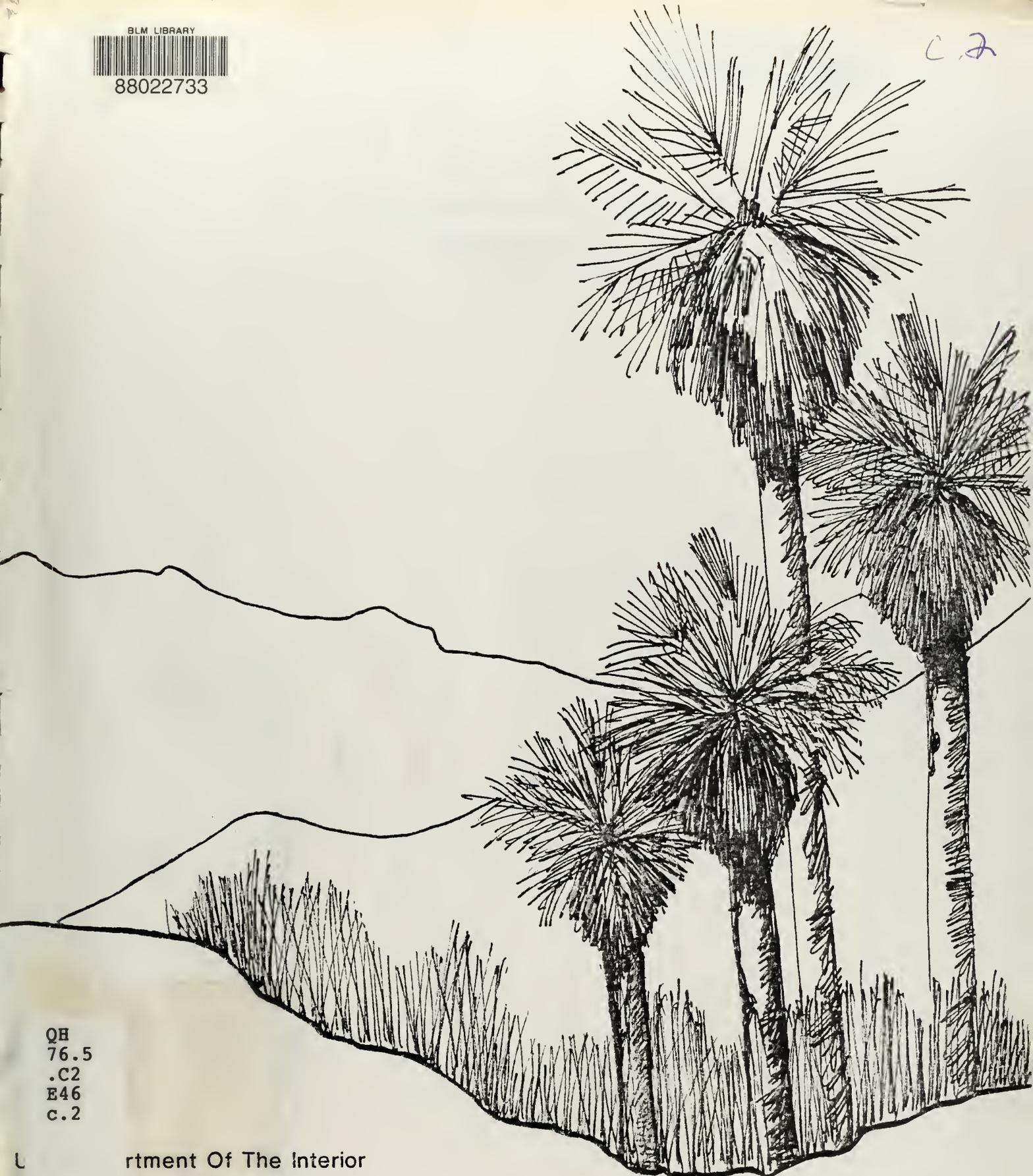


BLM LIBRARY



88022733

C.2



QH  
76.5  
.C2  
E46  
c.2

U  
E  
Department Of The Interior  
Land Management

# CORN SPRINGS A.C.E.C. FINAL MANAGEMENT PLAN AND E.A.R.





# 8428758

88023733

BUREAU OF LAND MANAGEMENT



LIBRARY

AH  
7/0/3  
.C2  
E-40  
C.2

CORN SPRINGS  
AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)  
MANAGEMENT PLAN

June 1981

Prepared by the

United States Department of the Interior  
Bureau of Land Management  
California Desert District  
Indio Resource Area Office

Prepared by:

*Patricia Hauerte Elliott*  
Team Leader, Landscape Architect  
Indio Resource Area

Reviewed by:

*Philip D. Parker*  
Area Manager  
Indio Resource Area

Recommended by:

ACTING

*Bruce Ottenfeld*  
District Manager  
California Desert District

Approved by:

*[Signature]*  
State Director  
California

BLM Library  
Bldg. 50  
Denver Federal Center  
P.O. Box 25047  
Denver, Colorado 80225

100

# THE HISTORY OF THE UNITED STATES

BY

W. H. CHAPMAN

NEW YORK

1850

NEW YORK

TABLE OF CONTENTS

	Page
I. Purpose . . . . .	1
II. Objectives . . . . .	3
III. Summary of Major Actions . . . . .	4
IV. Background and Resource Summary. . . . .	7
V. Use Philosophy and Goals . . . . .	13
VI. Planned Actions. . . . .	15
VII. Monitoring Plans . . . . .	23
VIII. Implementation Plan. . . . .	39
IX. Environmental Assessment Record. . . . .	43
X. Appendices . . . . .	49
A. Maps. . . . .	A-1
B. Details . . . . .	B-1
C. Relationship to the California Desert Conservation Area Plan . . . . .	C-1
D. Analysis of Public Comment. . . . .	D-1
E. References Cited. . . . .	E-1
F. Contributing Staff. . . . .	F-1



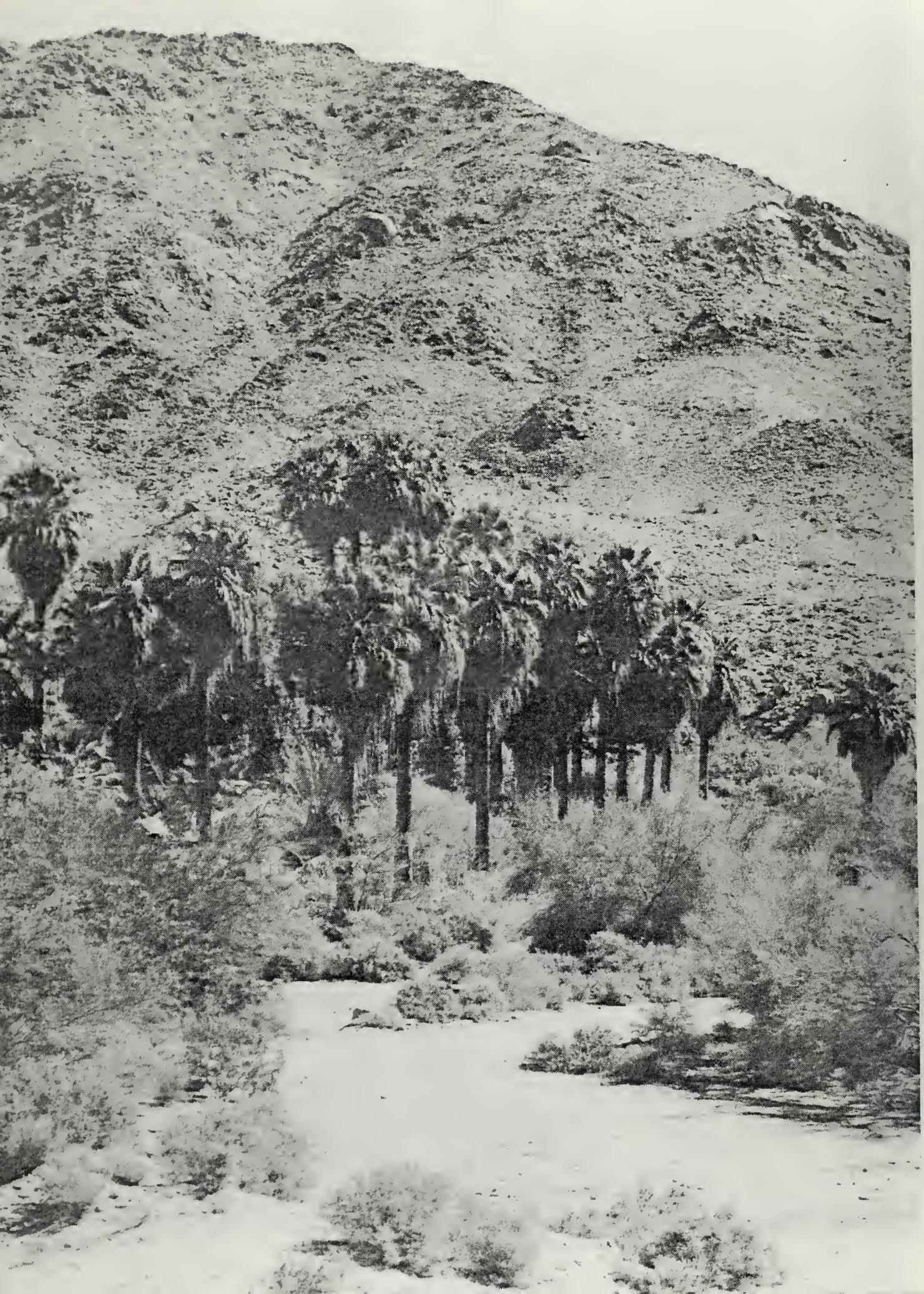
## I. Purpose

The Corn Springs Area of Critical Environmental Concern (ACEC) Management Plan has been prepared in order to give additional protection to a unique assemblage of resource values. The critical resources present are vegetation, wildlife, cultural resources and scenic values, which are potentially threatened by visitor use and resource conflicts. This ACEC is vulnerable to adverse change if a strong program of protective multiple-use management is not implemented. The Corn Springs plan will recommend such a program.

Located in a canyon in the Chuckwalla Mountains, Corn Springs supports a rich stand of riparian vegetation that includes approximately 64 native California fan palms, mesquite, catclaw, desert willow, and smoke trees. Fan palm oases are truly an unusual occurrence, and are found in the United States almost exclusively in California. Corn Springs supports abundant wildlife and is important for migratory birds. It was also an occupation site for prehistoric Native Americans. Impressive petroglyphs consisting of approximately 600 design elements, a series of trail segments with pottery and lithic debitage and bedrock mortars have all been recorded at the site. Vegetation values include five rare plant species listed by the California Native Plant Society which occur within the boundaries of the ACEC. Lastly, the scenic values are spectacular. The lush vegetation at the oasis combined with the rugged colorful surrounding canyon walls rank it as one of the more impressive areas in the CDCA.

The Corn Springs ACEC also contains a popular campground developed by BLM in the '60s. The presence of the campground is a unique opportunity for multiple-use management as mandated to the Bureau. This plan will provide special management attention that will protect the important environmental resources by reducing visitor use conflicts and resource conflicts yet provide a quality recreational experience that is compatible with protection of these values.

The Corn Springs ACEC Management Plan is guided by the recommendations of the California Desert Conservation Area Plan. The actions proposed are compatible with the goals and specific recommendations proposed in the Desert Plan. However, minor changes can be expected with intensive small scale study of an area. These changes and their rationale are presented in Section D of the Appendices (Relationship to the California Desert Conservation Area Plan).



## II. Objectives

The Corn Springs ACEC Activity Plan will:

- A. Provide a strong program of multiple use management which will be centered around the protection of critical resource values present (vegetation, wildlife, cultural resources, scenic values),
- B. Provide for uses which are compatible with the protection of the critical resource values, and
- C. Provide a plan for monitoring the effectiveness of the management program by indicating current conditions on an annual basis and reflecting trends of the resources' condition.



### III. Summary of Major Proposed Actions

Each action is keyed to the critical resource which it benefits. The following codes have been used: WL - Wildlife; V - Vegetation; S - Scenic; CR - Cultural Resources.

- A. Decrease the size of the ACEC from the original designation size of 8.7 sections (5,568 acres) to the proposed size of 4.25 (2,720 acres) to increase manageability. (WL, V, S, CR)
- B. Prohibit vehicle use in the palm grove area. Remove existing facilities in and immediately adjacent to the grove. (WL, V, S)
- C. Create a new loop of camping spurs in the western area of the campground. Improvements will include plantings, rock mound screens, ramadas, picnic tables, firerings, grills and waste cans. (WL, V, S)
- D. Provide a new restroom and water pump near the new loop camping area. (WL, V, S)
- E. Create a group camp area with facilities. (WL, V, S)
- F. Develop rock mound screens around existing camping spurs. (WL, V, S)
- G. Redesign existing ramadas. (WL, V, S)
- H. Define roads with rock barriers. (WL, V, S)
- I. Institute weekly maintenance of campground. (WL, V, S)
- J. Remove all deciduous tamarisk. (WL, V, S)
- K. Remove one evergreen tamarisk initially. Removal of the second tamarisk will be scheduled in phase three if the monitoring program indicates there is sufficient need to remove another tree. Retain the third tamarisk. (WL, V, S)
- L. Install a low barrier with an interpretive sign in front of the petroglyphs adjacent to the road. (CR)
- M. Nominate Corn Springs to the National Register of Historic Places. (CR)

- N. Increase Bureau presence by rangers and other personnel. Institute an education program using the interpretive trail, kiosk, brochures and programs. (WL, V, S, CR)
- O. Remove all unsightly unwanted trespasses within the ACEC. (S)
- P. Sign the quail guzzler to discourage dumping of waste into it. (WL)
- Q. Install four nest boxes in palm grove to encourage cavity nesting birds. (WL)
- R. Install a wildlife drinker one-half mile east of the oasis. (WL)
- S. Install shallow water table monitoring wells. (WL, V, S)
- T. Institute a monitoring program with reports submitted yearly to the California Desert District Office. (WL, V, S, CR)





#### IV. Background and Resource Summary

Corn Springs ACEC is centered around Corn Springs Wash in the western end of the Chuckwalla Mountains. Falling within unsurveyed sections of T. 6 S., R. 16 E. SBBM the ACEC is approximately seven air miles south of Desert Center in eastern Riverside County. (See Maps 1 and 2 for location.)

The spring at the oasis has not been perennially active since the late 1920s, but its location is pinpointed by the palm grove and other common riparian vegetation. The spring is adjacent to a wash which drains the western end of the Chuckwalla Mountains. Since the late '60s, BLM has maintained a 14-unit campground adjacent to the palm grove.

The following background information and resource summaries are provided to give a brief overview of key concerns within the ACEC.

##### A. Access

The Corn Springs ACEC is approximately 9 miles from Interstate 10 by way of the Corn Springs Road. The road, which is the only graded access to the area, is presently maintained by the County of Riverside and continues up the wash past the palm oasis approximately 3 miles to the mining community of Aztec Wells. Aztec Wells is within the ACEC boundary, but is excluded from management attention due to private ownership.

There are several rugged 4-wheel-drive and motorcycle trails that originate at the Corn Springs Road, including one that bisects the Chuckwallas and connects with the Red Cloud Mine Road.

##### B. Present Status and Use

1. Land Status - The Corn Springs ACEC falls within the area designated by BLM as the Chuckwalla Recreation Lands with the exception of 80 acres on each side of a withdrawal for Public Water Reserve (480 acres, July 1972, No. 22). There are between 15 and 25 unpatented mining claims within the ACEC boundaries.

Approximately one-half dozen cabins and trailers, associated with mining activities, appear to be constructed on public lands. Many of these are suspected of being in trespass.

2. Recreation - Corn Springs has long been a popular recreation area for campers. Since the 1960s, BLM has provided a campground with 14 spurs which included ramadas, picnic tables, firerings, grills and waste cans. A group camp area is located in the palm grove area. A hand water pump, 4-unit vault toilet restroom, and informational signs are the only other facilities provided.

Users of Corn Springs are in general non-destructive. The campground shows low amounts of vandalism compared to other facilities of its type. Users enjoy not only camping in or near the lush vegetation, but the opportunity to enjoy rockhounding, bird-watching, hiking, and motorcycle and 4-wheel-drive touring activities.

C. Historical Use

The Corn Springs area has been occupied by a number of miners through the years. Between 1915 and 1932 Gus Lederer, nicknamed the "Mayor of Corn Springs," was a permanent resident and probably its best known occupant. He erected a structure near the palm grove and lived there for many years with a number of burros. He passed his time by prospecting and painting in oil. Gus died in 1932 from a black widow spider bite and is buried at Aztec Well.

Gold was the major mining prospect in the area and accounts for the settlement of Aztec Well. These deposits were small scale and yields were insignificant.

D. Cultural Resources

A major east-west Indian trail runs through Corn Springs. As the only permanent, reliable water source for some distance, Corn Springs was probably visited by a number of groups moving through the area.

The most obvious archaeological resources at Corn Springs are the petroglyphs located on both walls of the wash immediately below the spring. The existence of a large campsite or habitation area with midden has been reported, but there is no evidence to substantiate that thought. However, one bedrock mortar is still present and hunting blinds are known to exist in the area. A series of Indian trails have also been recorded.

It is not possible at present to determine exact dates for the petroglyphs, the ethnographic group by which they were made, or their meaning or purpose. One recurrent theory has been that they were created in hunting places, perhaps by shamans, to insure a successful hunt. A second theory holds that they may have been created by individuals during vision quests. It is possible that the Corn Springs petroglyphs represent a 2,000 year time span supported by the extreme range of differential patination of the elements.

Since aboriginal groups hunted game moving into and away from the spring, it is less likely that the spring itself was used as a habitation site, since the presence of people at the spring would have frightened off the game. Camps would have been established far enough from the spring not to disturb the game.

No intensive survey of the entire ACEC has been carried out, so there may be undiscovered sites present. The presence of bedrock mortars indicate that some plant food processing also took place here.

The rocks on which the petroglyphs have been placed are easily climbable, and this activity may damage the petroglyphs. Graffiti and damage from shooting have also occurred.

#### E. Hydrology

The Corn Springs ACEC is within a watershed drained by Corn Springs wash. Mean annual rainfall measured approximately 10 miles north of Corn Springs is 2.44 inches.

Fluctuations in the spring's level has been watched with tremendous interest by resource specialists. Wildlife and vegetation are extremely dependent on the spring's existence and studies are under way at present to determine what causes fluctuations and what water levels we can expect in the future.

We can hypothesize that groundwater movement may be affected by two or more faults. The presence of an impermeable fault zone at the intersection of at least two faults is probable. A zone of this type would impede the movement of groundwater downstream. Where excess groundwater flows over the impermeable barrier, a spring forms. The Corn Springs/Aztec Well area's unusual subsurface character may well be the explanation for the sporadic flow of the spring. The studies will offer more concrete data.

All land lying within 1/4 mile of Corn Springs was withdrawn from entry by Executive Order (April 17, 1926) (480 acres, Public Water Reserve No. 22). Along with the land, the water necessary to accomplish the purposes of the reservation is reserved. The area within the reserve cannot be settled or sold but the spring can be developed for public use as a watering source for human and animal use.

#### F. Scenic Values

The method by which the Bureau assesses scenic quality is through the Visual Resource Management (VRM) System. This system assigns a numerical rating to the components that contribute to the visual quality of an area. Scenic quality, sensitivity of the area to change as perceived by users and distance from key observation points are the factors used to determine the evaluation.

Corn Springs received the highest rating within this system, Scenic Quality Class A and VRM Class II. This was a reflection of the lush, unique vegetation of the oasis, coupled with the rugged red-hued rocky canyon hills.

Although the presence of the campground facilities and residences at Aztec Wells diminish the visual quality, it does not totally negate the scenic values.

G. Vegetation

A grove of approximately 64 California native fan palms (Washingtonia filifera) is the most dominant feature within the ACEC. Other vegetation around the palm grove consists of mesquite (Prosopis glandulosa), arrowweed (Pluchea sericea), salt-bush (Atriplex polycarpa), and other desert perennials usually found where the water table is fairly high.

Five rare plant species occur within the revised proposed ACEC boundaries. Three of these species have been named candidates for listing as endangered or threatened by the U. S. Fish and Wildlife Service (1980). These include California Snake-bush (Colubrina californica), Foxtail Cactus (Coryphantha vivipara var. alversonii), and California Ditaxis (Ditaxis californica). Two of the rare plant species within the ACEC are listed as rare in California by the California Native Plant Society. These are Cove's Cassia (Cassia covesii) and spearleaf (Matelea parvifolia).

Tamarisk trees and shrubs contribute a major part of the vegetation at Corn Springs. Tamarisks are not a native species to this continent. Deciduous tamarisk have spread at an alarming rate across the Western United States and are causing problems because of their extravagant water use in regions where the water supply is critical to the survival of native vegetation.

Both the deciduous and evergreen tamarisk may threaten the grove in more than their consumptive water use. Tamarisk can displace native vegetation through lowering of the water table. Their leaves accumulate salt on the outer surfaces and when the leaves fall, they deposit not simply leaf litter but a layer of salt on the ground. Also when the tamarisk transpire, they literally rain saltwater. This is effective in inhibiting growth of other plants. These salts are leached into the soil and may inhibit germination. It should be noted that tamarisk are usually surrounded by barren soil indicating their effectiveness in preventing other plants from living in their shadow.

After heavy rains in 1976 leached salt from the soil, many palm seeds germinated in the grove. Most of these seedlings died, however, as the soil surface dried. Although it is uncertain what role tamarisk may have had in the failure of these palms, tamarisk are known to accelerate groundwater depletion and increase soil salinity, both conditions can be detrimental to plant growth.

Fan palms have a life expectancy of approximately 100-200 years. Although the age of palms is extremely difficult to determine, it appears that many of the palms at Corn Springs are reaching a mature age. It has been reported that ideal conditions for germination of palm seedlings need occur only once every 100 years in order to maintain a palm grove. However, a palm's successful growth to maturity may be hindered by any conditions which limit water availability.

Although ACEC management plans cannot ensure an ideal environment for palm survival because of uncontrollable climatic conditions, the proposed actions are designed to check as many conditions as possible which are considered man-induced and deleterious to the success of fan palms.

The presence of campers within the moist grove increases soil compaction and trampling of seedlings. This also decreases the chances for regeneration. Erosion potential is increased in compacted areas creating an unhealthy situation for the palm grove.

#### H. Wildlife

Palm groves and desert wash communities are some of the most productive areas in the California Desert supporting more species and individuals than adjacent desert scrub communities. Breeding bird surveys have shown desert washes supporting seven times the number of species and over 45 times the number of individuals.

A winter bird survey done at Corn Springs in 1979 concluded that at least 31 species of birds wintered here in concentrations of nearly 1200/100 acres. Of areas surveyed, this figure was surpassed only by the Chuckwalla Valley dune thicket. A spring survey in 1979 revealed six species of birds breeding at Corn Springs (25 territorial males). The oasis size was identified as the limiting factor in the number of successful breeding territories. The availability of surface water in the grove attracted 43 different species of visitors and transients.

In addition, Corn Springs has supported successful breeding pairs of Elf Owls. An Elf Owl was located at Corn Springs on March 18, 1972, with a pair present there later the same year. A pair was present and successfully nested in 1973. There were no reports of Elf Owls at Corn Springs during 1974, although at least one individual was present in 1975 and 1976. Elf Owls have not been observed at Corn Springs since 1976.

Elf Owls are now listed by the State of California as endangered. Sightings in California are at the western edge of this species' range. The Elf Owl at one time probably inhabited the entire length of the Colorado River utilizing riparian woodland and mesquite brushland. It is also likely that this species was found at suitable oases throughout the California desert. Now, due largely to habitat destruction along the Colorado River, it is unlikely there are any remaining breeding pairs in California. Recreational use of oases including Cottonwood Springs and Corn Springs has also reduced the viability of these areas to support Elf Owls. Without an area like the Colorado River from which Elf Owls can radiate the chances of a pair utilizing Corn Springs are diminished. However, management of the grove for the maintenance of existing birds including Screech Owls will help ensure that the grove remains available for Elf Owls.

A Palm borer (Dinapate wrightii), the largest member of its beetle family, is also found here. This beetle is rare in the California desert due to its specificity to its host plant (Washingtonia filifera).

Other species recorded at Corn Springs include antelope ground squirrels (Ammospermophilus leucurus), desert cottontails (Sylvilagus auduboni), coyote (Canis latrans), and gray fox (Urocyon cinereoargenteus). Bighorn sheep (Ovis canadensis nelsoni) utilize this portion of the Chuckwallas and there were sightings at Chuckwalla big game guzzler #5 located about two airline miles southeast of Corn Springs. Mule deer signs have also been observed in the wash within a mile of the palm grove.

V. Use Philosophy and Goals

The protection of the sensitive resource values is the primary goal of this management plan. This protection, however, is not at the expense of the other uses of the area.

Recreation, which includes camping, picnicking, hiking, off-road vehicle touring on existing roads, birdwatching and rockhounding are uses which exist now in the area and are compatible with the goals for the ACEC. Research and educational activities (classes and tours) can also continue in harmony with the goal of protection of the area's critical resource values.

Mining is not compatible with the goals and should be discouraged but cannot be prohibited. The proposed decreased boundary size will eliminate any areas which could conceivably have mining value. Cross country off-road vehicle touring is also incompatible and will be controlled by management actions within the ACEC boundaries.

The facilities at Corn Springs will be redesigned to minimize impacts to wildlife, vegetation, cultural resources and scenic values yet at the same time provide for a quality recreational experience for users. The uses defined as compatible can take place without degradation of the sensitive values.

Education of users on the necessity for protection of these valuable resources will be an important key to the success of this plan. Through increased Bureau presence and interpretive aids the plan can be understood and accepted.



## VI. Planned Action

The following management actions will be implemented to protect the key resource values of Corn Springs while providing for quality recreational use. (See Map 3 for layouts.)

- A. Goal: Increase manageability of the ACEC area by decreasing the size of the area under intensive management.

Action: Initiate an amendment to the Desert Plan to decrease the size of the Corn Springs ACEC from 8.7 sections (5,568 acres) to 4.25 sections (2,720 acres). (See Map 2.)

Discussion: The original designation boundary included areas which did not contain critical resource concerns and were included as a buffer for the key areas. It is not necessary to include these areas since the critical concerns can be protected in an area about half the size of the original boundary. All critical resource values that warranted the protective ACEC designation are included within the proposed revised boundaries.

Implementation: A yearly amendment process is proposed whereby desired changes to the Desert Plan can be systematically analyzed at one time to insure that they are appropriate. The revised boundary changes to Corn Springs ACEC should be submitted to the appropriate coordinator with justifications contained in this discussion. The decision on whether the boundary can be appropriately altered can then take place.

- B. Goal: Prohibit vehicles in the palm grove and discourage use of the grove area by removal of existing facilities. Institute an interpretive program to explain why these changes are necessary.

Action: Remove all picnic tables, ramadas, firerings, grills and waste cans from the grove area. Spurs 1, 2, 3, 4, and 5 will be phased out and replaced by ones as defined in Action C. A kiosk will be erected adjacent to the tamarisk to the farthest east, and will be the focus of the interpretive program at Corn Springs. A brochure will be distributed from the kiosk which will narrate a self-guided interpretive trail. (See Map 3 for placement of campground improvements.)

Discussion: Concern over impacts to wildlife and vegetation values are the primary reason for this action. Continual use of the grove disturbs and displaces wildlife from the area. Compaction caused by excessive foot traffic in the moist grove area reduces the chance for seed germination and increases erosion. There is also an increased chance of fire caused by careless campers.

Implementation: The removal of the picnic tables, ramadas, firerings, grills, and waste cans will discourage most people. The kiosk and brochure will inform users of this vehicle closure along with the importance of sensitive use of the grove to protect wildlife and vegetation values. These interpretive aids will also inform users of campground rules, fees, and interesting facts about the area. Increased Bureau presence coupled with the signing and brochure will be the methods used to discourage users from using the grove for the first year. Second phase plans will add rock barriers and road changes to further discourage use.

Spurs 1, 2, 3, 4, and 5 will be phased out in a four-year program beginning after additional facilities have been added. This phasing program will also aid in acceptance of the changes.

- C. Goal: Provide a new camping area to replace spaces lost when facilities were removed from the grove area.

Action: Create a new loop road with seven additional camping spaces in the western area of the campground. Plant 100 mesquite and create rock mounds in order to make the new spurs desirable for campers. Provide facilities including ramadas, picnic tables, firerings, grills and waste cans. (See Map 3 for layout.)

Discussion: In order to discourage people from using the grove area, additional well-designed facilities will have to be provided to accommodate their use. The planting of the mesquite and rock mounds will create an area that will have some sense of spatial modulation and will have a greater chance for acceptance.

Implementation: Commencement of this action will not begin until phase two, when the road for the new loop and spurs will be graded. Rock mounds will come next and be followed by the mesquite plantings. The mesquite will require watering three times a week to insure their success. Special methods of planting have been explored to ease shock. In phase three, ramadas, picnic tables, firerings, grills, and waste cans will be installed and mark the opening of the new loop area.

- D. Goal: Encourage campers to use new loop camping area.

Action: Provide a new restroom and water pump near the new loop area.

Discussion: It is not reasonable to think that campers will use the new loop without the proximity to a restroom. The placement of a restroom near the new spurs will concentrate use away from the grove area.

Implementation: Install a cinder-block 4-unit vault toilet facility. Plans are on hand for this project slated for phase two. Install a hand water pump with reservoir.

- E. Goal: Create an area for group camping to accommodate the recreationist who originally used the grove facilities.

Action: Develop a group camp area as defined on Map 3 with clusters of picnic tables, firerings, and grills. Provide ramadas and waste cans.

Discussion: Through field observation and survey, it has been determined that a group area is necessary. The grove area originally provided this area, therefore a new site was selected.

Implementation: As defined on Map 3, the group camp area will contain 4 picnic tables, 4 ramadas, 2 firerings, 4 grills, and 4 waste cans. These improvements are slated for phase one.

- F. Goal: Create more pleasant campground spaces by increasing privacy at each site through spatial modulation.

Action: Develop rock mounds around spurs as shown on Map 3. These sites are in need of screening to encourage people to use them.

Discussion: Use of native rock as screening will provide the privacy needed yet repeat the elements of the landscape character (form, line, color, texture).

Implementation: This action is slated for the second phase. A source of rock will have to be found on BLM land and then an EAR will be done on the quarry site prior to removal. Rocks will be placed as per Map 3.

- G. Goal: Improve ramadas to be more effective in controlling sun and wind and to be visually pleasing.

Action: Redesign ramadas. Replace existing ones with newly designed structures.

Discussion: Existing ramadas do not effectively screen wind and sun and are unattractive.

Implementation: Install 7 new ramadas in addition to the group camp and new loop ramadas at locations designated on Map 3 (as shown on ramada design sheet). This improvement is slated for phase two. Install all new ramadas (4 group camps, 7 new loop spurs) with newly designed structures.

- H. Goal: Keep people on roads in campground. Prohibit parking outside of defined spurs and roads.

Action: Define roads with rock barriers. This will encourage people to stay on existing circulation ways. (See Map 3 for revised road layouts.)

Discussion: Users at present drive on poorly defined ways in the campground. This makes for an unattractive messy campground and increases overall compaction as vehicles wander off the designated routes. The increased compaction is unhealthy for vegetation because runoff is increased and erosion potential increases.

Implementation: This action is slated for the second phase at the same time as the spur rock mounds' installation. The rock will be taken from the same quarry as discussed in F. The same EAR will cover the amount of rock needed for both removals.

- I. Goal: Maintain campground regularly. Keep trash and litter picked up. Keep restroom clean. Water new vegetation.

Action: Institute weekly maintenance of the campground. Once the full-time maintenance worker for the Resource Area is hired this task will be under control.

Discussion: At present, the campground is maintained by the District maintenance worker who is spread thin. Maintenance is suffering.

Implementation: Trash should be picked up at least once a week. Toilets should have chemicals added regularly and pumped out at least once a year. Vegetation, where it is hazardous to users, should be cleaned out (ex. visibility or fire hazard). This will be under the direction of the maintenance supervisor. New tamarisk will be removed regularly. Newly planted vegetation will require watering at least three times a week. This action will commence with the hiring of the maintenance worker.

- J. Goal: Remove all deciduous tamarisk.

Action: By mechanical means, remove all deciduous tamarisk.

Discussion: Deciduous tamarisk are a noxious weed in the campground. Their high water consumption, salt leaf litter, and saltwater rain are a threat to native vegetation in the grove. Their rapid spread in the Western United States at a frightening rate is cause for alarm.

Implementation: Cut all deciduous tamarisk down. Regularly maintain area to keep it free of new shoots. This action is slated for phase one.

- K. Goal: Remove evergreen tamarisk that are a threat to the grove's continued existence.

Action: Remove one tree initially by mechanical means. The second tamarisk will be slated for removal in phase three if monitoring indicates there is sufficient benefit and need to justify. The third tamarisk will remain permanently.

Discussion: Tamarisk are extremely water consumptive and can be a threat to native vegetation. Under a tamarisk, the soil is usually barren, a reflection of its effectiveness in reducing growth of other plants in its shadow. The salty leaf litter and saltwater transpiration make what little water is available inadequate for establishment of new plants. Evergreen tamarisk are, however, not quite as noxious as deciduous due to the fact that they can only reproduce vegetatively and not by seed. For this reason, the plan proposes to eliminate the two trees in direct competition with the grove and retain the third for interpretive purposes. The last tamarisk will be used as a backdrop for the interpretive kiosk and will provide shade away from the palm grove. This will hopefully concentrate interpretive use in a less vulnerable area.

Implementation: Cut down one evergreen tamarisk in phase one. Remove the second tamarisk in phase three if monitoring indicates a need. Tamarisks' location are shown on Map 3. All wood will be left for campers.

- L. Goal: Protect petroglyphs from vandalism.

Action: Install a low barrier with interpretive sign in front of the petroglyphs adjacent to the road.

Discussion: This low "symbolic" barrier and interpretive sign will hopefully discourage climbing on the petroglyphs. Climbing can wear down images. The barrier will not physically keep anyone off who really wishes to climb them, because a barrier that would accomplish that would be too large and visually displeasing. The interpretive sign will inform users of the significance of the petroglyphs and why it is important not to climb on them. A warning of penalties associated with defacing the site will be included.

Implementation: With funding already on hand for fencing of archaeological sites, this action will be completed in phase one. The low barrier and sign will be designed and installed with the assistance of the Indio Archaeologist. The effects of this action will be closely tracked under the monitoring program to determine how successful the barrier and sign are in protecting the petroglyphs.

- M. Goal: Provide additional protection for Corn Springs' archaeological sites.

Action: Nominate Corn Springs to the National Register of Historic Places.

Discussion: National Register designation will give Corn Springs additional protection through documentation and recognition of the cultural resource values.

Implementation: Complete necessary paperwork and mapping necessary to submit for the National Register designation. The Indio Resource Area Archaeologist will complete this task in phase one.

- N. Goal: Increase Bureau presence to decrease chances of vandalism, unlawful shooting, compliance with campground rules and to gain increased acceptance of the proposed actions by use of interpretive aids and site visits.

Action: Increase ranger and Bureau personnel site visits. These visits will insure that campground rules are enforced. Users will be informed through personal contacts and interpretive aids such as the kiosk, brochure, trail and programs that will explain the reasons for change, why it is necessary, the resource values present, and their significance.

Discussion: Increased contact with users will reduce vandalism and increase the chance of user acceptance to campground changes and regulations.

Implementation: At least two visits each week by Bureau personnel should be scheduled in phase one. Installation of an interpretive kiosk (see detail p. B-2), brochure, and trail will take place in phase one (See Map 3 for layout of trail and kiosk).

- O. Goal: Eliminate all unsightly unwanted trespasses on BLM land.

Action: Prepare a preliminary report on all trespasses within the ACEC by 1982. This report will define where trespasses occur and what action is needed.

Discussion: A number of trailers and structures are thought to be in trespass on BLM land. Many of these are associated with inactive or invalid mining operations. The report will determine if action to remove them is appropriate.

Implementation: Scheduled for phase two, the lands report will disclose the status of apparent trespasses and actions needed. Remove the silt measuring device in the wash adjacent to the petroglyphs in phase one.

P. Goal: Keep quail guzzler free from contaminants.

Action: Sign quail guzzler to inform users of its purpose. Explain on the sign that the guzzler is not the place to dump waste water or sewage.

Discussion: In the past, campers have mistakenly dumped waste water in the guzzler. This creates an obvious hazard for the wildlife.

Implementation: The guzzler sign will be installed in phase one. The sign is in stock at present.

Q. Goal: Encourage breeding of cavity nesting birds.

Action: Install four nest boxes in the palm grove to encourage cavity breeding birds to nest.

Discussion: Elf Owls and Screech Owls are cavity nesting birds. These boxes will encourage them to stay and breed at the oasis.

Implementation: Install nest boxes during phase one. Monitor boxes and remove starlings if found.

R. Goal: Provide wildlife an opportunity to water away from the high use areas adjacent to the palm grove.

Action: Install a wildlife drinker one-half mile east of the oasis. This will provide wildlife with an alternate source of water away from the campground.

Discussion: Use in the campground obviously displaces some wildlife use. Since it is impossible to remove all users from the area, an alternate water source will be provided for wildlife drinking.

Implementation: Slated for phase one, the wildlife drinker will drain water from the spring area to the drinker by way of PVC pipe.

S. Goal: Try to determine what causes water level fluctuations at the spring.

Action: Install shallow monitoring wells to record trends in water table fluctuations.

Discussion: The fluctuating water table has long been a mystery to observers. At times the water pours from the ground, flooding the grove and creating a lush, almost tropical environment. However, the spring has not flowed perennially since the 1920s and it is suspected that fault activity may be the reason for the sudden starting and stopping of the spring's flow.

Implementation: The monitoring wells will be installed and a monitoring program begun in phase one.

- T. Goal: Determine effect of management actions on Corn Springs ACEC.

Action: Institute a yearly monitoring plan beginning in June 1981.

Discussion: It is very important that the effects of the actions proposed in this ACEC plan are carefully analyzed each year by the specialist. If certain actions are ineffective, they should be eliminated or modified. If additional actions are required, they should be instituted.

Implementation: As defined in the monitoring plan section of this report, resources will be evaluated yearly according to the system defined. A report will be submitted in June to the California Desert District Coordinator for review.

VII. Monitoring Plans

The monitoring of the resources' improvement or decline will be the key to successful management of the Corn Springs ACEC. A report will be prepared yearly in June and submitted to the California Desert District Office ACEC Coordinator. This report will use the numerical ratings defined in each resource section to evaluate its improving or declining state. Reports will reflect (a) trends, (b) effectiveness of management of the area, and (c) current condition.

The status of the ACEC will be compared against the status of the area in June 1981.

The following are rating systems for each critical resource:

WILDLIFE MONITORING

The following actions will be scheduled to monitor the effect of the management plan on wildlife resource values:

1. A winter and spring bird survey of the established study plot (p. 28) should be conducted annually. The area should be surveyed using the spot map technique described in American Birds, December 1972, and compared against the winter and spring baseline bird surveys (p. 25 and 26).
2. Nest boxes should be inspected (visual) at three-week intervals during the breeding season to determine if they are being utilized. If starlings are present, the nest and eggs should be removed.
3. Photographic plots of the grove will be established by June 1981. These plots will be the same as those used by the vegetation monitoring staff. The plots will help to establish the vegetation trends in the area.
4. The following rating system will be used to quantify the assessment of the wildlife resource:

Value

10 - No Human Influence



4 - Current Status (See Baseline Conditions Bird Surveys, p. 25 and 26)

Unacceptable Level (Below 4)

1 - Catastrophic Loss of Grove

Assign 1/2 point for every three breeding pairs found above baseline survey numbers.

Deduct 1/2 point for every three breeding pairs found below baseline survey numbers.

Assign 1/2 point for each new breeding bird species recorded above baseline survey numbers.

Deduct 1/2 point for every previously recorded breeding species not recorded on a subsequent survey.

Assign 1 point for surface water availability.

Assign 1 point for successful Elf Owl return and successful breeding.

BASELINE SPRING BIRD SURVEY

DESERT OASIS WOODLAND - Location: California; Riverside County, Corn Springs Oasis, about 9 mi. SW of Chuckwalla Road offramp on Interstate 10 near Desert Center. The study plot is located in NE1/4, NE1/4, Sec. 29, and the NW1/4, NW1/4, Sec. 28, T. 6 S., R. 16 E., San Bernardino Base and Meridian. Chuckwalla Mountains Quadrangle, USGS; 33° 38' N, 115° 19' W. Continuity: Established January 1978. Size: 5.8 ha = 14.6 acres (rectangular 273 m x 210 m, surveyed). Description of Plot: See AB ( ). Weather: Temperatures during the study period ranged from 32° F. to 79° F. with a daily mean of 67° F. Light breezes and clear to partly cloudy skies were recorded. Coverage: April 23, 24; May 9, 10, 11, 23, 24, 25. Total: 12 trips, 4 between 1730 and 2200 hours and 8 between 0615 and 1030 hours. The night visits averaged 173 minutes each and the day trips 201 minutes each. Total man-hours: 38. Census: House Finch, 13 (220, 89); Gambel's Quail, 4 (68, 27); Verdin, 3.5 (59, 24); Costa's Hummingbird, 2.5 (42, 17); Hooded Oriole, 1 (17, 7); Scott's Oriole, 1 (17, 7). Total: 6 species; 25 territorial males (432/km<sup>2</sup>, 171/100 acres). Visitors: Red-tailed Hawk, White-winged Dove, Mourning Dove, Screech Owl, Great Horned Owl, Poorwill, Lesser Nighthawk, Ladder-backed Woodpecker, Western Kingbird, Ash-throated Flycatcher, Say's Phoebe, Rock Wren, Mockingbird, Black-tailed Gnatcatcher, Phainopepla Loggerhead Shrike, Lesser Goldfinch. Remarks: 8 nests were located: House Finch, 4; Verdin, 1 with 3 eggs; Costa's Hummingbird, 1 with 2 eggs; Hooded Oriole, 1; Scott's Oriole, 1. The oasis habitat covers only 0.5 acres of the total 14.6 acre plot. The oasis size is restrictive on the numbers of successful breeding territories established. However, the availability of surface water attracted 43 different species of visitors and transients. This study was sponsored by the Bureau of Land Management, California Desert Plan Program.

RICHARD W. KOOPMAN  
45-421 Sunset Lane, #2  
Palm Desert, California 92260

## BASELINE WINTER BIRD SURVEY

DESERT OASIS WOODLAND - Location: California; Riverside County, Corn Springs Oasis, about 9 mi. SW of Chuckwalla Road offramp on Interstate 10 near Desert Center. The study plot is located in NE1/4, NE1/4, Sec. 29, and the NW1/4, NW1/4, Sec. 28, T. 6 S., R. 16 E., San Bernardino Base and Meridian. Chuckwalla Mountains Quadrangle, USGS; 33° 38' N, 115° 19' W. Continuity: New. Size: 5.8 ha = 14.6 acres (rectangular 273 x 210 meters, surveyed). Description of Plot: A unique and isolated Colorado Desert Fan Palm Oasis situated on a slight bench above a desert wash. The native Fan Palms located at the oasis are at the easternmost range of their distribution in the California deserts. Vegetation: The distribution of plant species within the study area is considerably variable and influenced by major washes on the periphery, a portion of a small public campground within the boundaries of the plot and the availability of seep water at the oasis. Fifteen 0.1 acre (0.04 ha) circular plots were made to determine percent cover, species composition, and numbers of shrubs and trees. The substratum was composed of 20.2% small rocks (less than 5 cm), 8.8% large rocks (greater than 5 cm), 25.8% bare ground, and 45.2% litter. The shrub cover of 40% was made up of 21.7% Mesquite (Prosopis glandulosa var. torreyana), 18.2% Palo Verde (Cercidum floridum), 18.1% Allscale (Atriplex polycarpa), 11.4% Arrowweed (Pluchea sericea), 6.5% Catclaw (Acacia greggi), 4.4% each of Cheesebush (Hymenoclea salsola) and Abrojo (Condaliopsis lycioides), 3.1% Cat-tail (Typha domingensis), 3.1% Sweetbush (Bebbia juncea), 2.8% Desert Lavender (Hyptis emoryi), 2.1% Brandegea (Brandegea bigelovii), 1.3% Desert Tobacco (Nicotiana trigonophylla), 0.8% each of Palmate-leaved Gourd (Cucurbita palmata) and Brittlebush (Encelia farinosa), and 0.5% Saltgrass (Distichlis spicata). The tree cover of 7% was made up of 45.1% Tamarisk (Tamarix ramosissima), 38% Fan Palm (Washingtonia filifera), and 16.9% Ironwood (Olneya tesota). There are 2020 shrubs/ha (818/acre), of which 52.1% were Arrowweed, 23.9% Cat-tails, 6.8% Allscale, 3.3% Burrobush (Ambrosia dumosa), 2% Cheesebush, 1.5% Creosote Bush (Larrea tridentata), 1.2% Mesquite, 1.1% each of Desert Tobacco, Palo Verde, and Catclaw, and less than 1% each of 19 other perennial species located in the study plots. There are 202 trees/ha (82/acre), of which 49.6% are Tamarisk, 48.8% Fan Palm, and 1.6% Ironwood. Nomenclature of plant species follows P. A. Munz, A Flora of Southern California (1974). Elevation: 1600-1640 ft. (480-492 m); nearest mountain slopes are directly North, South, and West of the plot. Edge: The plot is bounded on the North, East, and South sides by desert wash and associated wash edge species (i.e., Mesquite, Catclaw, Palo Verde, etc.). Topography: Slightly sloping bench. Water: There are several springs and seeps in the center of the study plot which have a permanent

surface flow. There is also a "guzzler" located in the camp-ground on the North border of the study plot. Weather: Temperatures during the study period ranged from 39° F. to 66° F. with a daily mean of 50° F. There was some precipitation and strong winds recorded. Coverage: Jan. 15, 23, 24, 31; Feb. 1, 7, 8, 13, 14, 15. Total: 13 trips, 5 from 1630-2200 and 8 between 0645 and 1130. The night trips averaged 186 minutes each and the day trips 211 minutes each. Total man-hours: 44. Count: White-crowned Sparrow, 55 (916, 371); Ruby-crowned Kinglet, 45 (748, 303); Verdin, 30 (511, 201); Gambel's Quail, 11 (176, 71); House Finch, 7 (111, 45); Black-tailed Gnatcatcher, 4 (69, 28); Phainopepla, 4; Yellow-rumped Warbler, 3 (42, 17); Common Flicker, 2 (36, 14); Rock Wren, 2; Ladder-backed Woodpecker, 2; Cedar Waxwing, 1 (17, 7); American Robin, 1; Hermit Thrush, 1; Red-tailed Hawk, 1; Savannah Sparrow, 1; House Wren, 1; Common Raven, 1; Chirping Sparrow, 1; Song Sparrow, 1; Costa's Hummingbird, 1; Varied Thrush, 1; Say's Phoebe +; Loggerhead Shrike +; Great Horned Owl +; Red-winged Blackbird +; Lesser Goldfinch +; Lincoln's Sparrow +. Total: 31 Species, 173 (2906/km<sup>2</sup>, 1176/100 acres). Remarks: The presence of surface water at the oasis has an influence on bird densities in this area of the desert. The oasis not only provides a source of drinking water, but it also influences the variety and amount of vegetation able to withstand the stress of growing in this otherwise inhospitable environment. An average of 1.6 Antelope Ground Squirrels (Ammospermophilus leucurus) were seen per census (250/km<sup>2</sup>, 107/100 acres). Three Desert Cottontails (Sylvilagus audubonni), 3 Coyotes (Canis latrans), and 1 Gray Fox (Urocyon cinereoargenteus) were recorded on the counts. I wish to thank Paul Romero for his assistance in the bird counts. This study was sponsored by the Bureau of Land Management, California Desert Plan Program.

RICHARD W. KOOPMAN  
45-421 Sunset Lane, #2  
Palm Desert, California 92260



## CULTURAL RESOURCES

The following actions will be scheduled to monitor the effect of the management plan on the cultural resource values:

Ratings are to be done yearly on:

- 1) Petroglyphs
- 2) Trails
- 3) Other Features Found in the Inventory

A complete rating system will be established after the inventory is complete in June 1981. An overall rating for all features will be compiled by averaging the individual feature numbers. The following is a tentative rating system:

- 10 - Pristine Conditions of Feature. No noticeable evidence of degradation, damage, or destruction.
- ↑
- 5 - Feature is Half Gone From What was Originally There (From photos on file at the San Diego Museum of Man, dated 1930s.)
- ↓
- Unacceptable Level (Below 5)
- 1 - Feature is Obliterated

The present condition will be documented through photographs keyed to a map. The photographic record of June 1981 will be compared with the current condition photograph record taken each June.

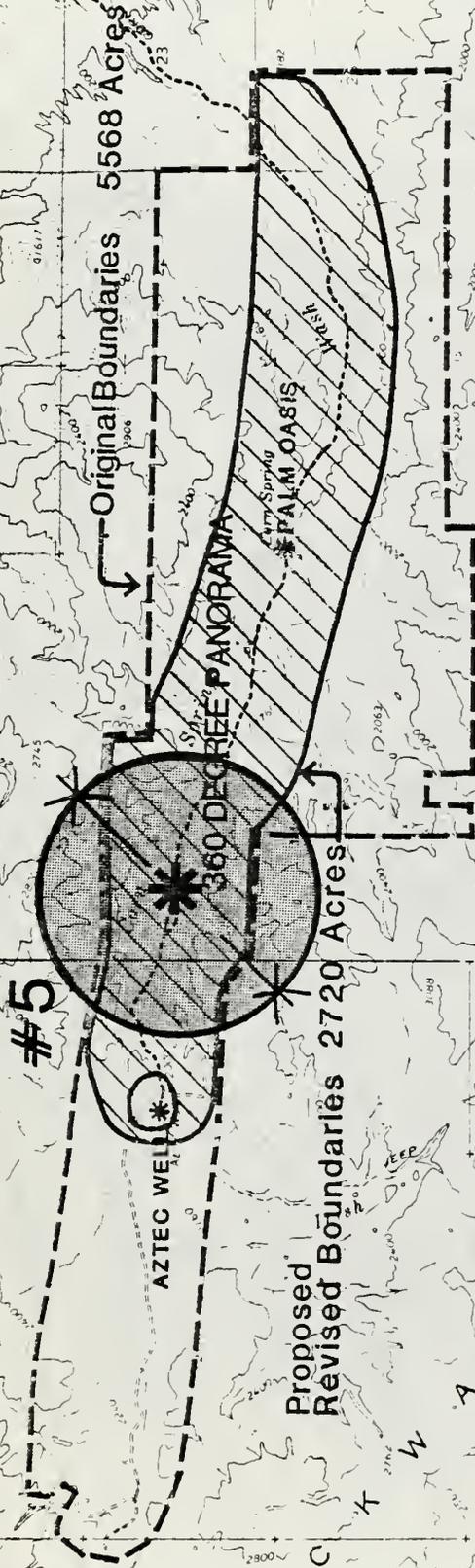
A count can be taken of the number of elements that have been damaged by human or natural causes during the year. It should also be possible over a period of two or three years to determine what activity is causing the greatest amount of damage to the cultural resources at Corn Springs. Once the levels of degradation are determined and the types of activities causing the greatest problems are known, new management recommendations may need to be drawn up to increase protection.

VISUAL

Photographs of the existing condition will be taken in June 1981 at five critical observation points as defined in the attached maps. The relative state of each of the viewpoints will be evaluated and recorded on a VRM contrast rating form. The baseline for evaluation is a hypothetical viewshed with existing contrasts compared to an untouched environment. Every June, photos from the same location should be retaken and analyzed against the June 1981 environment. Suggestions for improvement of management activity should be included in the annual report.

		Contrast* Rating Score
10 - Excellent Improvement - Area is pristine (untouched). All features totally compatible with the environment.		decrease of 16
9 - Strong Improvements		decrease of 10 - 15
8 - Moderate Improvements		decrease of 5 - 9
7 - Weak Improvements		decrease of 1 - 4
6 - June 1981 Status - No Change		0
5 - Small Decline		increase of 1 - 4
4 - Moderate Decline		increase of 5 - 9
3 - Severe Decline	UNACCEPTABLE	increase of 10 - 15
2 - Very Severe Decline		increase of 16 - 19
1 - Declined to a point where values are no longer present.		increase of 20+

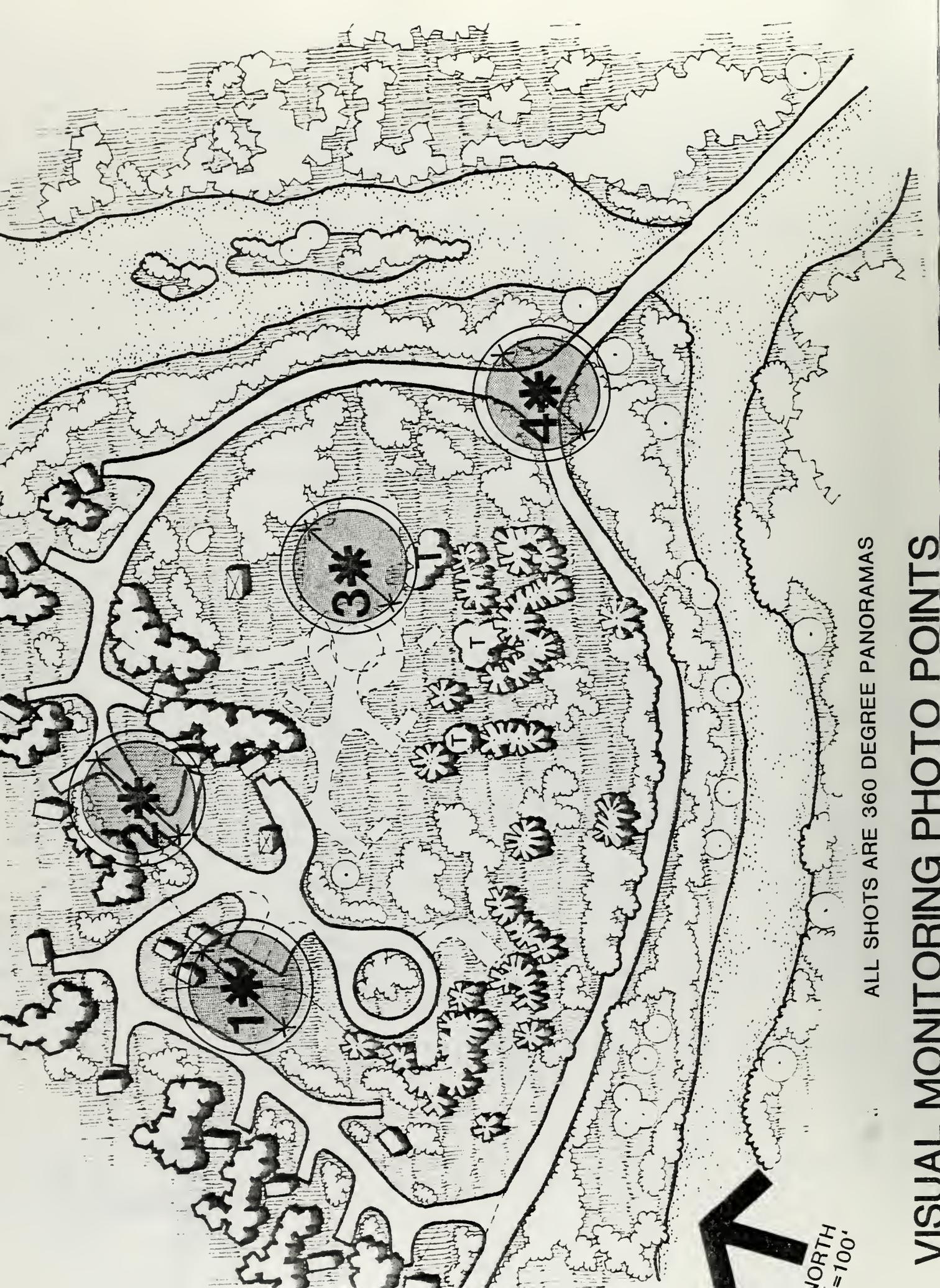
\*Use VRM Contrast Rating Form (8400-4). Scores are increases or decreases from June 1981.



# VISUAL MONITORING PHOTO POINT



NORTH  
1" = 1 MILE



ALL SHOTS ARE 360 DEGREE PANORAMAS

# VISUAL MONITORING PHOTO POINTS

NORTH  
= 100'

## VEGETATION

The monitoring program to study impacts and effectiveness of management actions will include:

1. Prior to, or concurrent with initial implementation of management plan, establish height of present water table, and conduct regular, dated hydrological measurements thereafter.
2. Establish 5 permanent vegetation plots by June 1981 (each 5 meters by 10 meters) within the palm grove (approximate locations are marked on map). Within each survey plot, location and extent of perennial plant species will be sketched, and the percent ground cover of each species will be estimated and recorded. A list of annual plant species within each plot will also be recorded. The number and size class of individual fan palms within each plot will be recorded. Three size classes of palms will be distinguished: a) less than 5 feet in height; b) between 5 feet and 20 feet; and 3) greater than 20 feet. Size classes may or may not directly correspond to age class.
3. Establish 5 permanent photo sites by June 1981 within the vegetation plots to track gross trends in vegetation patterns.
4. Have aerial photo transect taken by June 1981 of entire campground and oasis at altitude of 700 ft. to serve as permanent baseline condition. Line transects may be taken from these photos to determine percent cover of each perennial plant species, and to record number, location, and size of palm trees. Photos can be retaken at intervals and interpreted or overlaid on past photos to detect changes in vegetations' patterns and abundance.
5. Establish a list of all plant species by April 1981 in and around the palm grove, and record date of new appearance or disappearance of any species which may indicate changes in water table depth, soil moisture, soil salinity, etc. Record number of mature and seedling palms every year.
6. By June 1981, survey for and map locations and population sizes of six species of rare, threatened, or endangered plants which occur within boundaries of Corn Springs ACEC. Three of these plant species occur very close to the oasis, and their exact locations should be determined before any extensive management actions are initiated.

7. Use the following system to quantify changes found while monitoring the ACEC:

Value

- 10 - No noticeable disturbance of natural conditions: No non-native plant species present; stand of palms is composed of individuals of various age classes; mature palms reflect adequate soil moisture for continued survival (diameter of live foilage in crown exceeds diameter of dead shag); no evident soil compaction or soil erosion resulting from camping or visitor activities; no damage to or decline of herbaceous plant cover either from direct physical damage or soil compaction due to foot traffic; no damage to native trees or shrubs by camping activities or firewood collection; no vandalism to palm trees.
- 4 - Present Condition
- 3 - Unacceptable Level
- 1 - Complete loss of grove: No successful reproduction of seedling palms; older palms die and are not replaced by younger individuals; introduced (non-native) plants occupy available space and compete with native plants for available water; introduced plants tap a significant portion of the soil moisture such that the water table is lowered below normal seasonal depth; soil compaction occurs in the grove due to camping and recreational activities, and inhibits germination or growth of herbaceous and/or woody plants within oasis; decrease or elimination of phreatophytic (water-loving plants), indicating drop in water table.

NUMERICAL RATING

Planned Management Actions (3 1/2-point increase possible)

- Add: 1 point - Remove 2 (evergreen) tamarisk trees (1/2 point for removal of each tree).
- 1 1/2 points - Remove and continue necessary abatement of (deciduous) saltcedar shrubs.
- 1/2 point - Remove all picnic tables from within palm grove.
- 1/2 point - Remove campsites closest to palm grove (#1, 2, 3, 4, and 5).

Anticipated Impacts of Planned Management

- Add: 1/2 point - Significant increase in percent ground cover of native vegetation in and around grove as compared to cover measured in June 1981.
- 1/4 point (each) - Appearance of native phreatophytic or emergent aquatic plant species not previously recorded in BLM records as of June 1981.

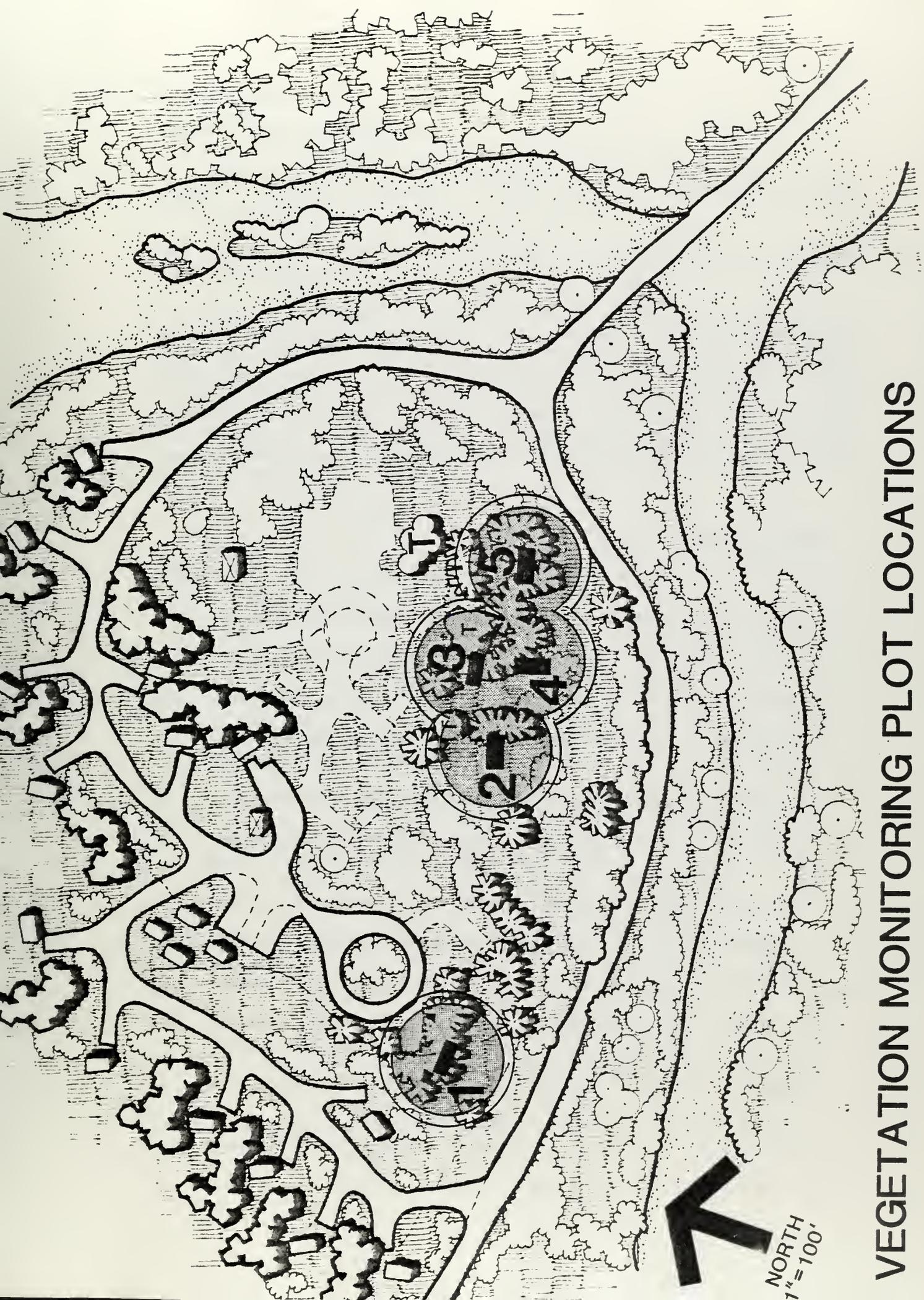
Possible Impacts

- Deduct: 1 point - Significant increase in percent ground cover of saltcedar shrubs as compared to baseline survey of June 1981.
- 1/2 point - Significant decrease in percent ground cover of native vegetation in and around grove as compared to baseline survey of June 1981.
- 1/4 point (each) - Disappearance of native phreatophytic or emergent aquataic plant species previously recorded in BLM records as of June 1981.

It is not necessarily valid to interpret the condition of the palm oasis by the increase or decrease in number of palm trees over a period of 5 or even 10 years. Ideal conditions for germination and success of fan palm seedlings normally need occur only once every 100 years to maintain a healthy palm grove (normal life span of a native fan palm is between 100 and 200 years; Vogl, pers. comm.). Fluctuations in the number of palms during shorter periods may not represent any significant changes in the long-term condition of the grove. For this reason, numbers of palms will not be used in the rating scale to evaluate the condition of the grove.

Some indication of the health of an individual palm, however, can be determined by the proportion of live foliage to dead attached foliage (shag). The diameter of the live foliage will exceed the diameter of the shag near the crown if soil moisture is adequate for continued growth. A "healthy" palm is considered to be one in which the diameter of the fronds is twice the diameter of the shag (Vogl, pers. comm.). This condition of individual palms will be noted during monitoring, but should not be used to assess the long-term status of the entire grove. A combination of the number and condition of individual palms in various size classes may reveal short-term changes in the oasis environment, and this information will be monitored. Care must be taken, however, not to assume that these short-term conditions will predict the future of the fan palms.

Other environmental clues should be used to evaluate the effectiveness of the management actions. Appearance of new native phreatophytes will indicate a rise in the water table (whether induced by man or by climatic conditions). An increase in the ground cover of native vegetation may reflect decreased competition for space and water by non-native plants, or may indicate decreased soil compaction or physical disturbance. These types of shorter-termed environmental changes will be recorded and used in the numerical rating of resource condition.



VEGETATION MONITORING PLOT LOCATIONS



VIII. Implementation Plan

Schedule and Cost Estimates

All items are listed in the priority in which they should be performed. They are referenced to the Goals in the Planned Actions Section (Section VI).

All estimates are for materials only. Labor costs are not figured into estimates.

Asterisks (\*) behind a cost indicate that the project should be coordinated with groups wishing to do volunteer work. Several groups have indicated that they would be interested in assisting the BLM with volunteer projects. Volunteer projects afford us a unique opportunity to not only get projects implemented with little expenditure of labor costs but also to keep the public informed and involved in the management of public lands. Frequent interaction with user groups will also improve the lines of communication enabling BLM to have better indicators of the public's feelings.

Materials Cost

FISCAL YEAR 1981 - FIRST PHASE

1.	Increase BLM presence. 3 WM per year. (Goal N)	No Cost
2.	Install 4 nest boxes. (Goal Q)	\$ 50.00
3.	Sign quail guzzler. Sign on hand. (Goal P)	No Cost
4.	Install water monitoring devices (equipment rental). (Goal S)	2,000.00
5.	Install petroglyph barrier and sign. (Goal L)	2,000.00
6.	Remove picnic tables, ramadas, firerings, grills, and trash cans. (Goal B)	No Cost*
7.	Install the interpretive kiosk. (Goals B and N)	3,000.00
8.	Remove deciduous tamarisks. (Goal J)	No Cost*
9.	Remove 1 evergreen tamarisk. (Goal K)	No Cost*
10.	Nominate for National Register designation. 1 WM. (Goal M)	No Cost
11.	Install wildlife drinker. (Goal R)	200.00*
12.	Install the interpretive trail (10 trail markers @ \$20). (Goals B and N)	200.00*
13.	Install the brochure. (Goals B and N)	2,000.00

	<u>Materials Cost</u>
14. Create a group camp area. Install 4 ramadas and picnic tables, 2 firerings, 4 grills, and 4 trash cans. (Goal E)	\$ 3,000.00*
15. Remove water/silt monitoring device across from petroglyphs. (Goal O)	No Cost*
16. Institute yearly monitoring system beginning in June 1981. 1 WM per year. (Goal T)	No Cost
Total FY 81	\$12,450.00
10% Contingency	1,245.00
	<u>\$13,695.00</u>

FISCAL YEAR 1982 - SECOND PHASE

1. Road Work	No Cost
a) Close certain routes in campground as defined on Map #3. (Goal C)	
b) Create new campground loop and spurs as defined on Map #3. (Goal C)	
2. Create rock barriers around road edges. (Goal H)	No Cost*
3. Create rock mounds around spur areas (new loop and old spurs). (Goal F)	No Cost
4. Plant 100 mesquite in new loop area. Water three times a week. Mesquite to be 15 gal. @ \$30. (Goal C)	3,000.00*
5. Replace old ramadas with new design (7 @ \$300). (Goal G)	2,100.00
6. Prepare preliminary report on all trespasses. 1 WM. (Goal O)	No Cost
7. Construct new 4-unit pit toilet. (Goal D)	25,000.00
8. Install new hand water-pump with reservoir adjacent to restrooms. (Goal D)	20,000.00
Total FY 82	\$50,100.00
10% Contingency	<u>5,010.00</u>
	\$55,110.00

Materials Cost

FISCAL YEAR 1983 - THIRD PHASE

1.	Install 7 ramadas and picnic tables, 7 trash cans, 7 grills, and 7 firerings in the new loop area. Open for camping. (Goal C)	\$ 4,000.00*
2.	Remove second tamarisk (if sufficient need is shown through monitoring of resource values). (Goal K)	No Cost*
3.	Remove spur #1. (Goal B)	No Cost*
	Total FY 83	\$ 4,000.00
	20% Contingency	800.00
		<u>\$ 4,800.00</u>

FISCAL YEAR 1984 - FOURTH PHASE

1.	Remove spur #2. (Goal B)	No Cost*
----	--------------------------	----------

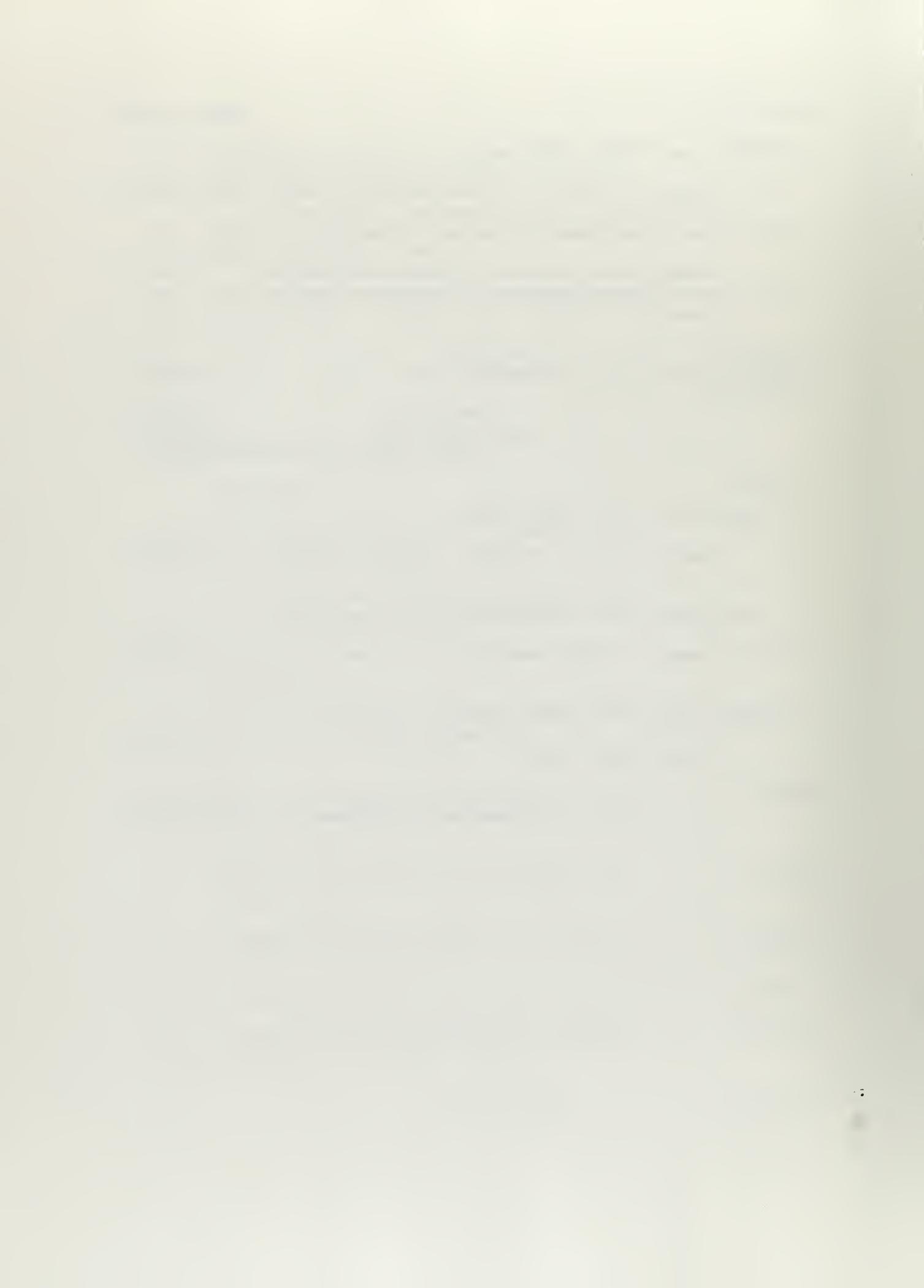
FISCAL YEAR 1985 - FIFTH PHASE

1.	Remove spur #3. (Goal B)	No Cost*
----	--------------------------	----------

FISCAL YEAR 1986 - SIXTH PHASE

1.	Remove spurs #4 and #5. (Goal B)	No Cost*
----	----------------------------------	----------

TOTAL FOR ALL PHASES \$73,605.00



IX. ENVIRONMENTAL ASSESSMENT RECORD

(Minimal Acceptable Documentation)

For

Corn Springs ACEC Management Plan

and Implementation

1. Summary of Major Proposed Actions

Each action is keyed to the critical resource which it benefits. The following codes have been used: WL - Wildlife; V - Vegetation; S - Scenic; CR - Cultural Resources.

- A. Decrease the size of the ACEC from the original designation size of 8.7 sections (5,568 acres) to the proposed size of 4.25 (2,720 acres) to increase manageability. (WL, V, S, CR)
- B. Prohibit vehicle use in the palm grove area. Remove existing facilities in and immediately adjacent to the grove. (WL, V, S)
- C. Create a new loop of camping spurs in the western area of the campground. Improvements will include plantings, rock mound screens, ramadas, picnic tables, firerings, grills and waste cans. (WL, V, S)
- D. Provide a new restroom and water pump near the new camping loop area. (WL, V, S)
- E. Create a group camp area with facilities. (WL, V, S)
- F. Develop rock mound screens around existing camping spurs. (WL, V, S)
- G. Redesign existing ramadas. (WL, V, S)
- H. Define roads with rock barriers. (WL, V, S)
- I. Institute weekly maintenance of campground. (WL, V, S)
- J. Remove all deciduous tamarisk. (WL, V, S)
- K. Remove one evergreen tamarisk initially. Removal of the second tamarisk will be scheduled in phase three if the monitoring program indicates there is sufficient need to remove another tree. Retain the third tamarisk. (WL, V, S)
- L. Install a low barrier with an interpretive sign in front of the petroglyphs adjacent to the road. (CR)
- M. Nominate Corn Springs to the National Register of Historic Places. (CR)

- N. Increase Bureau presence by rangers and other personnel. Institute education program using interpretive trail, kiosk, brochures and programs. (WL, V, S, CR)
- O. Remove all unsightly unwanted trespasses within the ACEC. (S)
- P. Sign the quail guzzler to discourage dumping of waste into it. (WL)
- Q. Install four nest boxes in palm grove to encourage cavity nesting birds. (WL)
- R. Install a wildlife drinker one-half mile east of the oasis. (WL)
- S. Install shallow water table monitoring wells. (WL, V, S)
- T. Institute a monitoring program with reports submitted yearly to the California Desert District Office. (WL, V, S, CR)

Refer to the Planned Actions section of the Corn Springs ACEC Management Plan (Section VI) for a complete description of action.

## 2. Impacts

The intent of the Corn Springs ACEC Management Plan is to provide additional protection to the key resources in the area. Wildlife, Vegetation, Cultural Resource Values, and Scenic Values have been shown to be those critical concerns.

Anticipated impacts as a result of implementation of this plan are minimal vegetative disturbance associated with the new loop of camping spurs and interpretive trail. Tamarisk removal will have a beneficial effect on vegetation and wildlife.

The proposed project will not affect sensitive, rare, threatened, or endangered plants or animals and their habitats. The project is proposed to protect both wildlife and vegetation values. All non-wildlife/vegetation related aspects of the plan have been designed to avoid adverse impacts to wildlife and vegetation.

This action will have no effect on the adjacent wilderness study areas or any floodplain or alluvial valley.

Cultural resource values were considered. No archaeological values will be impacted by the projects due to avoidance of sensitive areas under the direction of the Indio Area Archaeologist. The project is in part a protection plan for cultural resource values and is therefore beneficial.

There will be some minor displacement of recreationists who normally camp in the grove, but new facilities will be provided for their recreational needs. The addition of new facilities at Corn Springs will benefit users.

Scenic quality protection is another facet of the proposal. Projects are aimed at removing visually obtrusive items from the area. All non-visually related proposals have been prepared sensitively and will have no negative visual impacts.

### 3. Mitigating Measures

The following mitigation measure will eliminate any further impacts.

During construction of the new loop camping spurs, a botanist, archaeologist, and landscape architect will be on site to insure that plans are strictly adhered to. A specialist may stop the project at any time if discovery of a sensitive value is found. The project will resume only with the approval of the specialist. If on the advice of the specialist, a mitigation plan approved by the appropriate office will be prepared.

The environmental impacts of the proposed action have been assessed. I conclude that the proposed action is not a major Federal action which would significantly affect the quality of the human environment. Preparation of an environmental impact statement pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, is not required.

Prepared by:

Pamela Thauette Elliott  
Team Leader, Landscape Architect  
Indio Resource Area

5-26-81  
Date

Reviewed by:

Roger D Dohr  
Area Manager  
Indio Resource Area

5-26-81  
Date

Recommended by:

Bruce Ottensfeld  
**ACTING** District Manager  
California Desert District

6/3/81  
Date

Approved by:

[Signature]  
State Director  
California

7/20/81  
Date



X. Appendices

	Page
A. Maps	
1. Regional Location Map (Map 1) . . . . .	A-1
2. ACEC Boundary Map (Map 2) . . . . .	A-3
3. Legend for Campground Map . . . . .	A-4
4. Campground Layout Map (Map 3) . . . . .	A-5
B. Details. . . . .	B-1
1. Kiosk . . . . .	B-2
2. Ramada. . . . .	B-3
3. Picnic Table. . . . .	B-4
4. Tree Planting . . . . .	B-5
5. Fire Pit. . . . .	B-6
6. Road Rock Barriers. . . . .	B-7
7. Typical Camping Spur and Interpretive Trail Marker. . . . .	B-8
8. Camp Stove Detail . . . . .	B-9
9. Picnic Grill. . . . .	B-10
10. Garbage Can Mount . . . . .	B-11
C. Relationship to the California Desert Conservation Area Plan. . . . .	C-1
D. Analysis of Public Comment . . . . .	D-1
E. References Cited . . . . .	E-1
F. Contributing Staff . . . . .	F-1





NORTH  
1" = 5 MILES

RICE ROAD

JOSHUA TREE  
NATIONAL MONUMENT

Eagle Mountain

DESERT LILY  
PRESERVE

PALEN DRY LAKE

Desert Center \*

48 MILES TO INDIO

HAYFIELD DRYLAKE

F-10

40 MILES TO BLYTHE

9 MILES

Corn Springs

Aztec Well

Chuckwalla Mountains

Orcopecie Mountains

MADERA SPRINGS

111

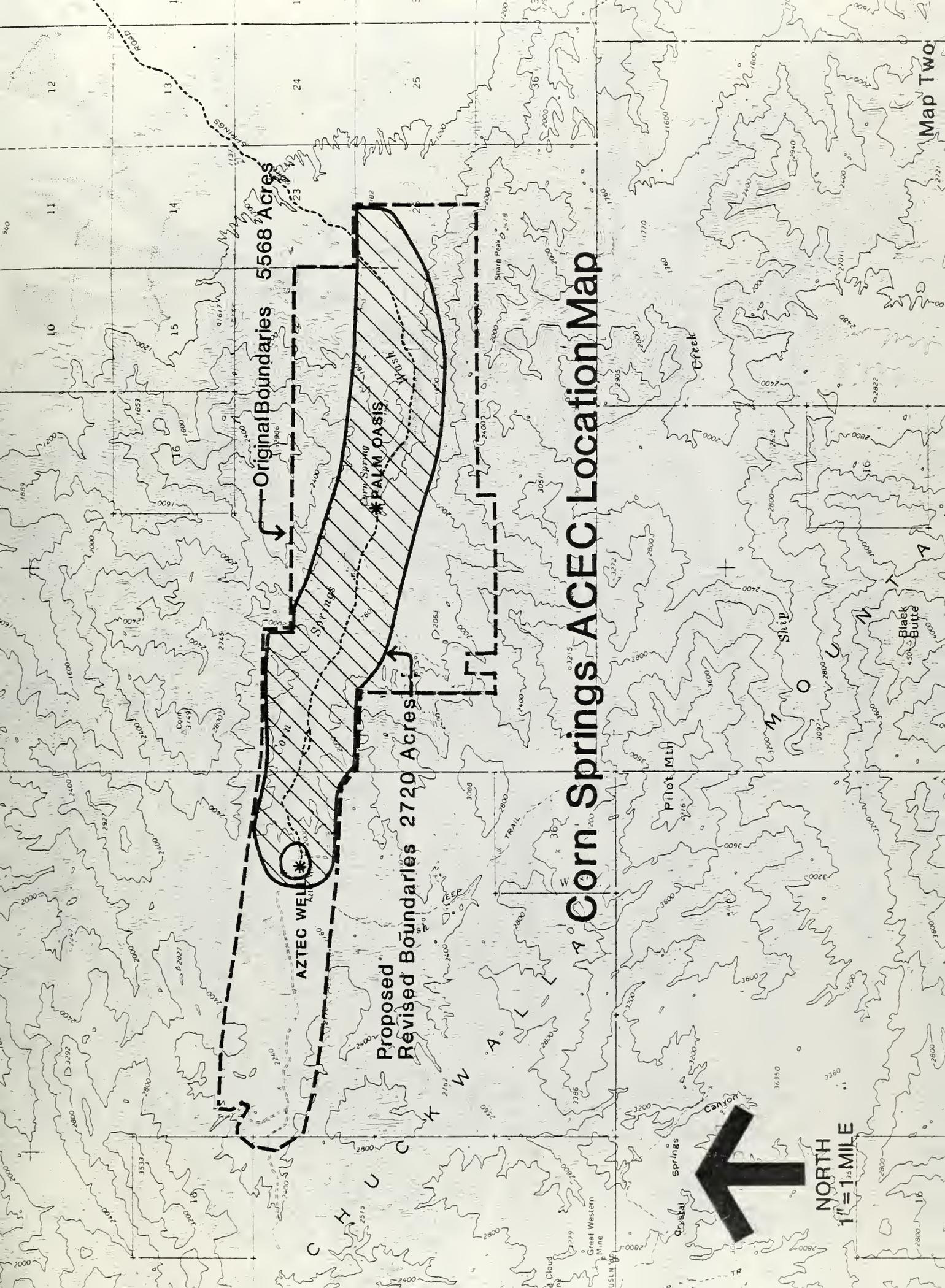
Salton Sea

CHOCOLATE MOUNTAIN  
BOMBING RANGE

REGIONAL LOCATION MAP

Map One





Original Boundaries 5568 Acres

Proposed Revised Boundaries 2720 Acres

AZTEC WELL \*

\* PALM OASIS

# Corn Springs ACEC Location Map

NORTH  
1" = 1 MILE

# LEGEND FOR CAMPGROUND MAP



New Roads and Spurs



Existing Roads and Spurs Slated for Removal



Interpretive Trail with Stops Marked    Handicapped Sections Shown in Smaller Dashed Line



Proposed Rock Mounds



Ramadas



Restrooms



Fan Palms



Tamarisk Slated for Removal

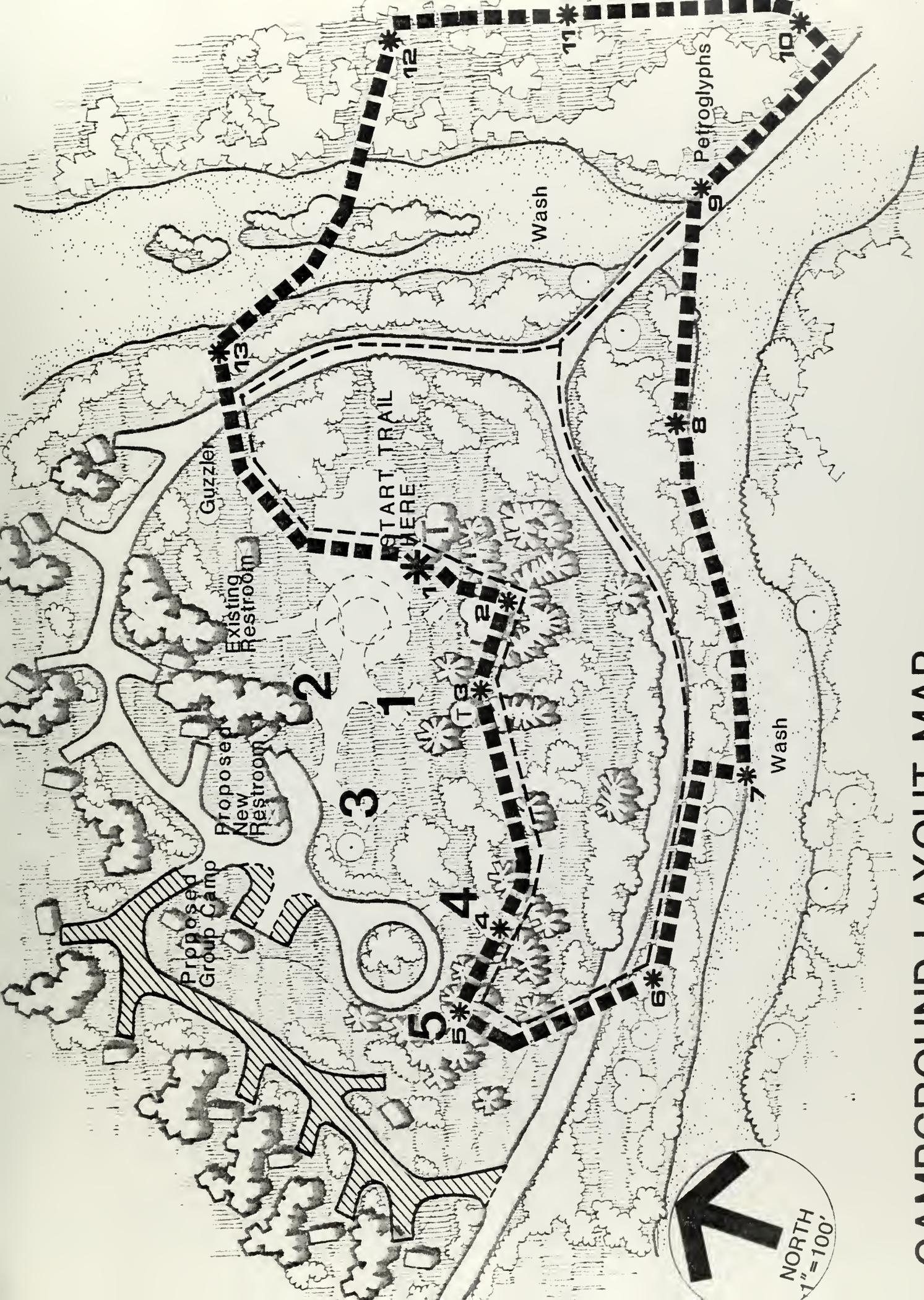
Center Tree's Removal Subject to Second Year Monitoring Findings



Tamarisk to Remain



Other Existing Vegetation



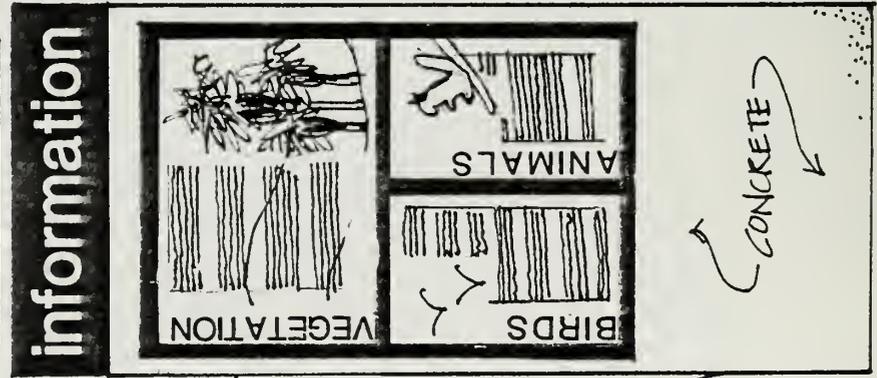
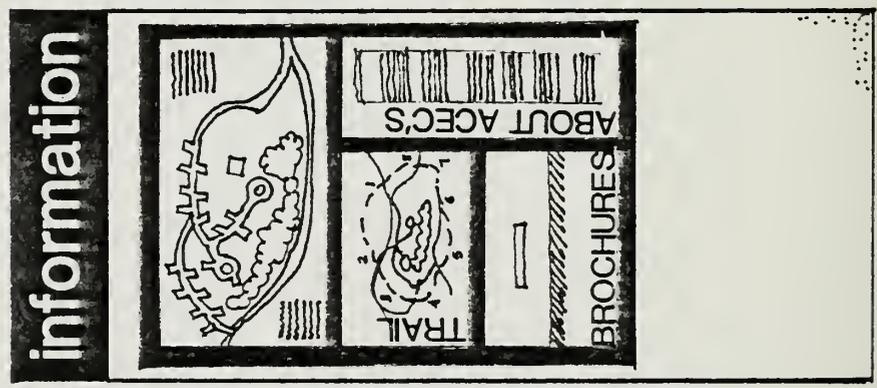
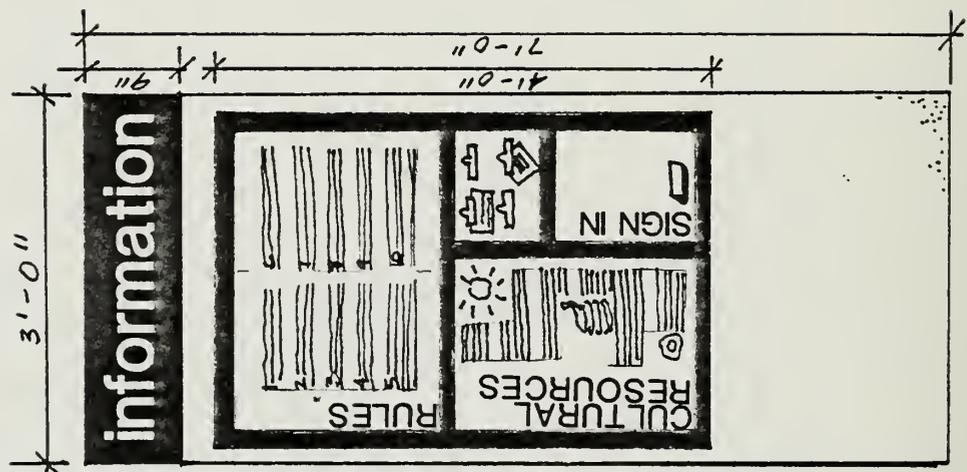
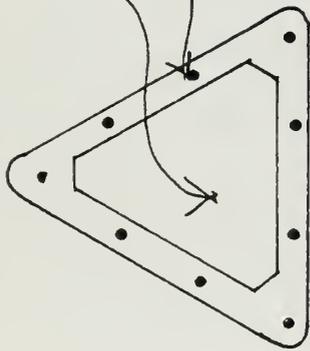
# CAMPGROUND LAYOUT MAP



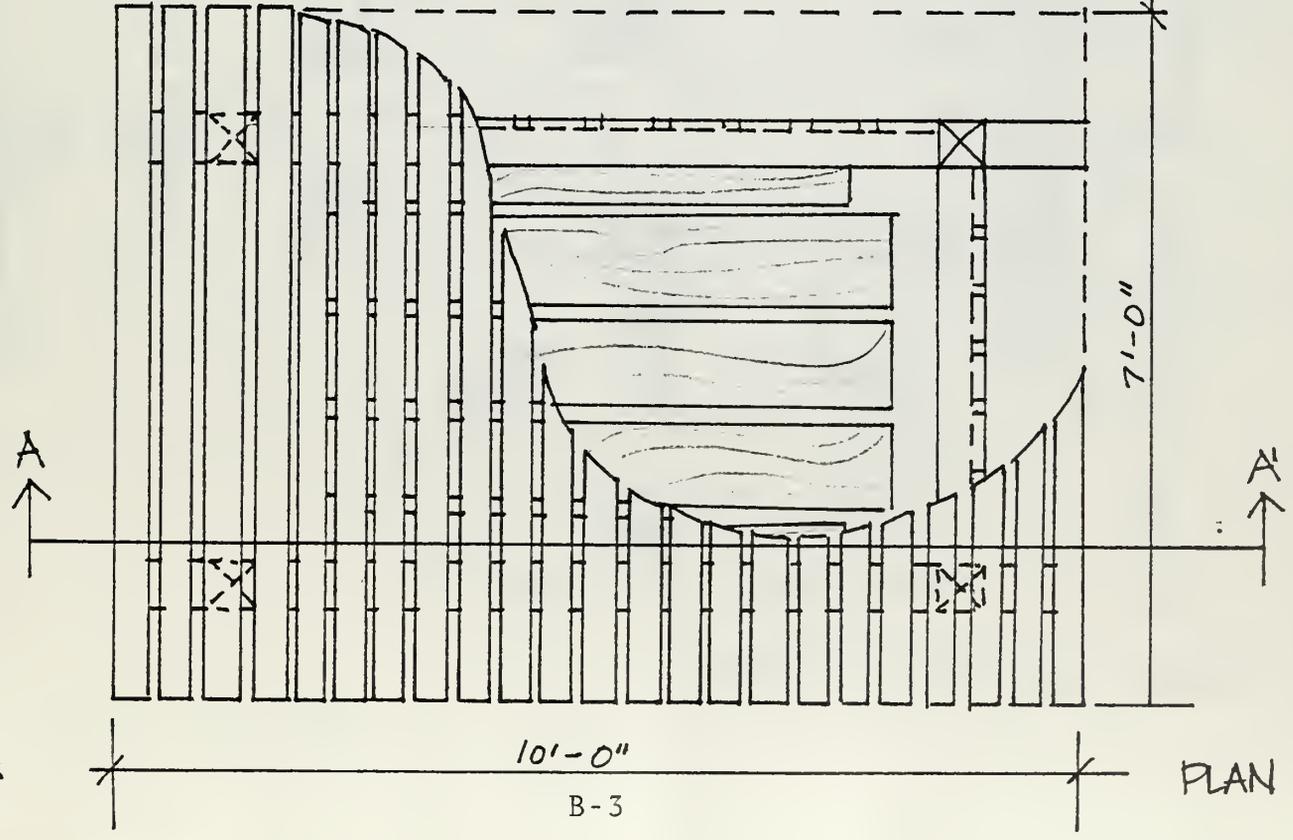
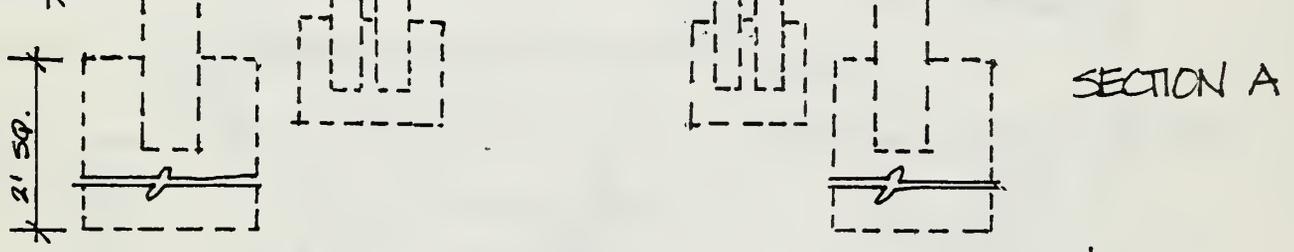
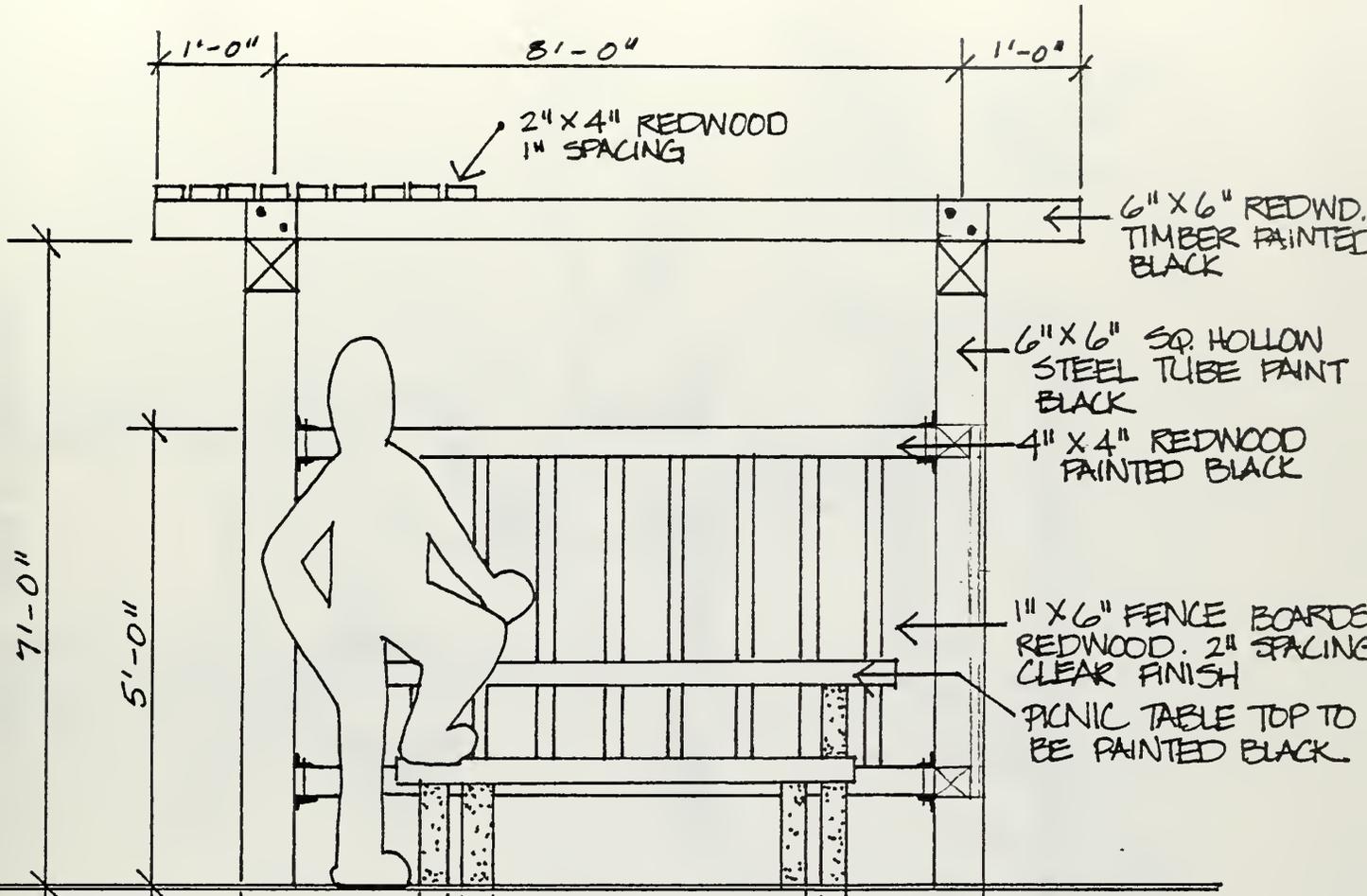


B. Details

GALVANIZED SHEET METAL TOP  
 3" CONCRETE SIDES  
 #3 RE-BARS

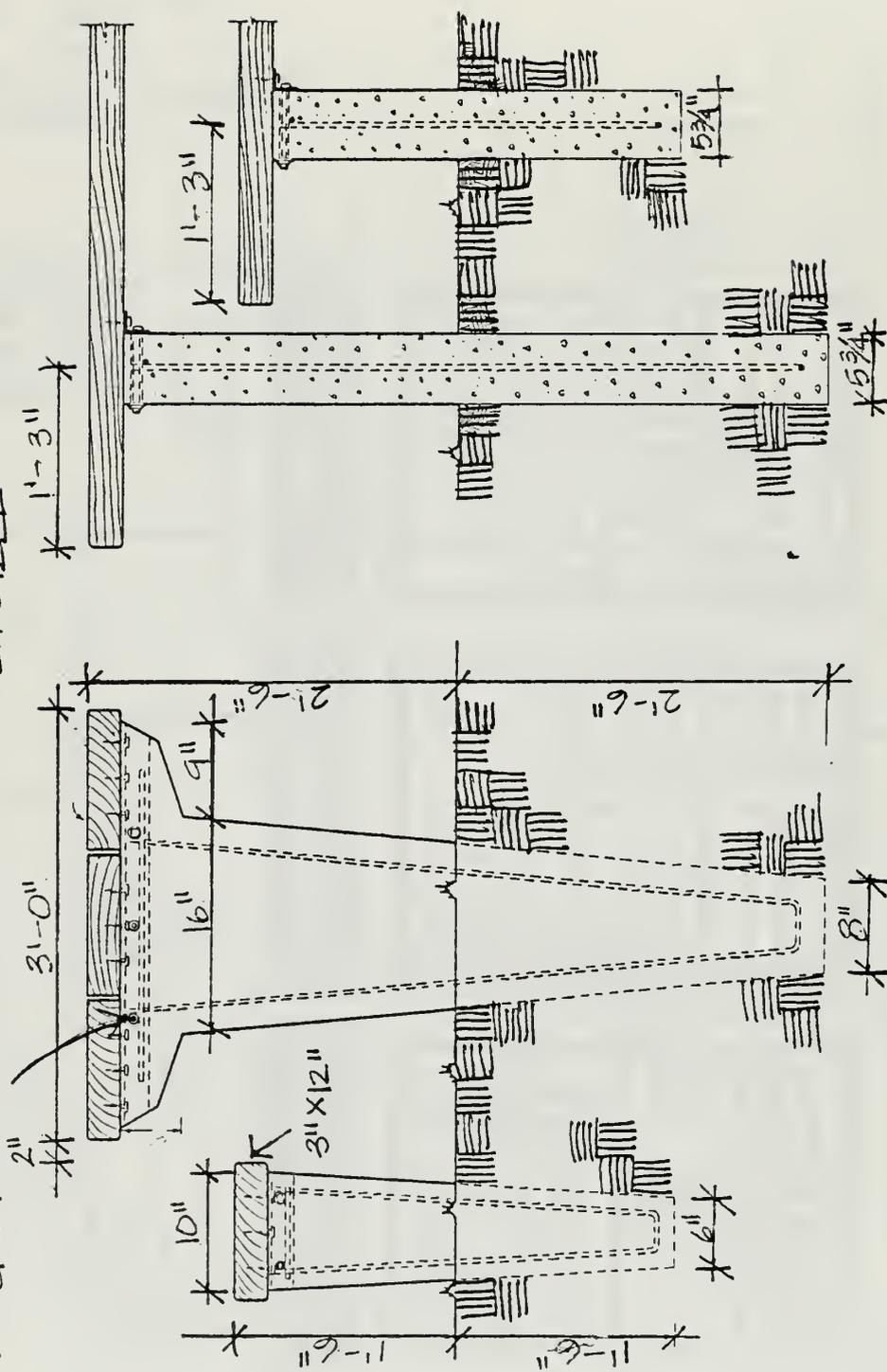


KIOSK DESIGN



RAMADA

1/2" GALV. PIPE SLEEVE WELDED TO REF. STEEL



SIDE SECTION

END ELEVATION



PICNIC TABLE DETAIL

NOTE :

- PLANT IN NOV & DEC
- DON'T FERTILIZE TILL SPRING
- WATER 3 TIMES A WEEK

ELEVATION

3 PIECES OF REINFORCED RUBBER HOSE

DOUBLE STRAND #12 GAUGE TWISTED GAL. ANNEALED STEEL WIRE AS SUPPORTS AT 120° FROM EACH OTHER

FLAG

TURNBUCKLE

3" MULCH

3"-6" SAUCER

TOPSOIL

6" MANURE

← CEDAR STAKE BURIED 2" X 2" X 12"

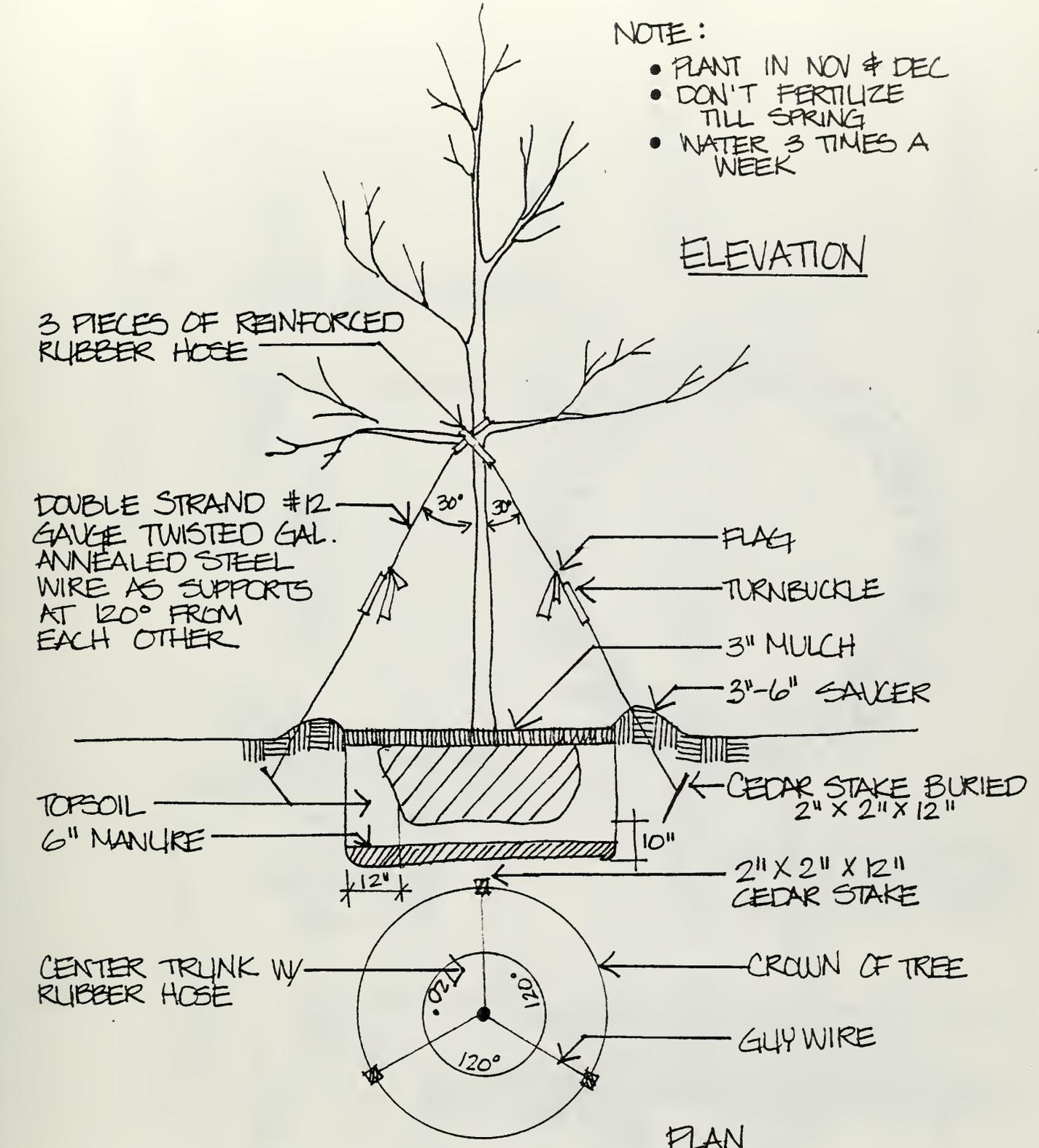
2" X 2" X 12" CEDAR STAKE

CENTER TRUNK W/ RUBBER HOSE

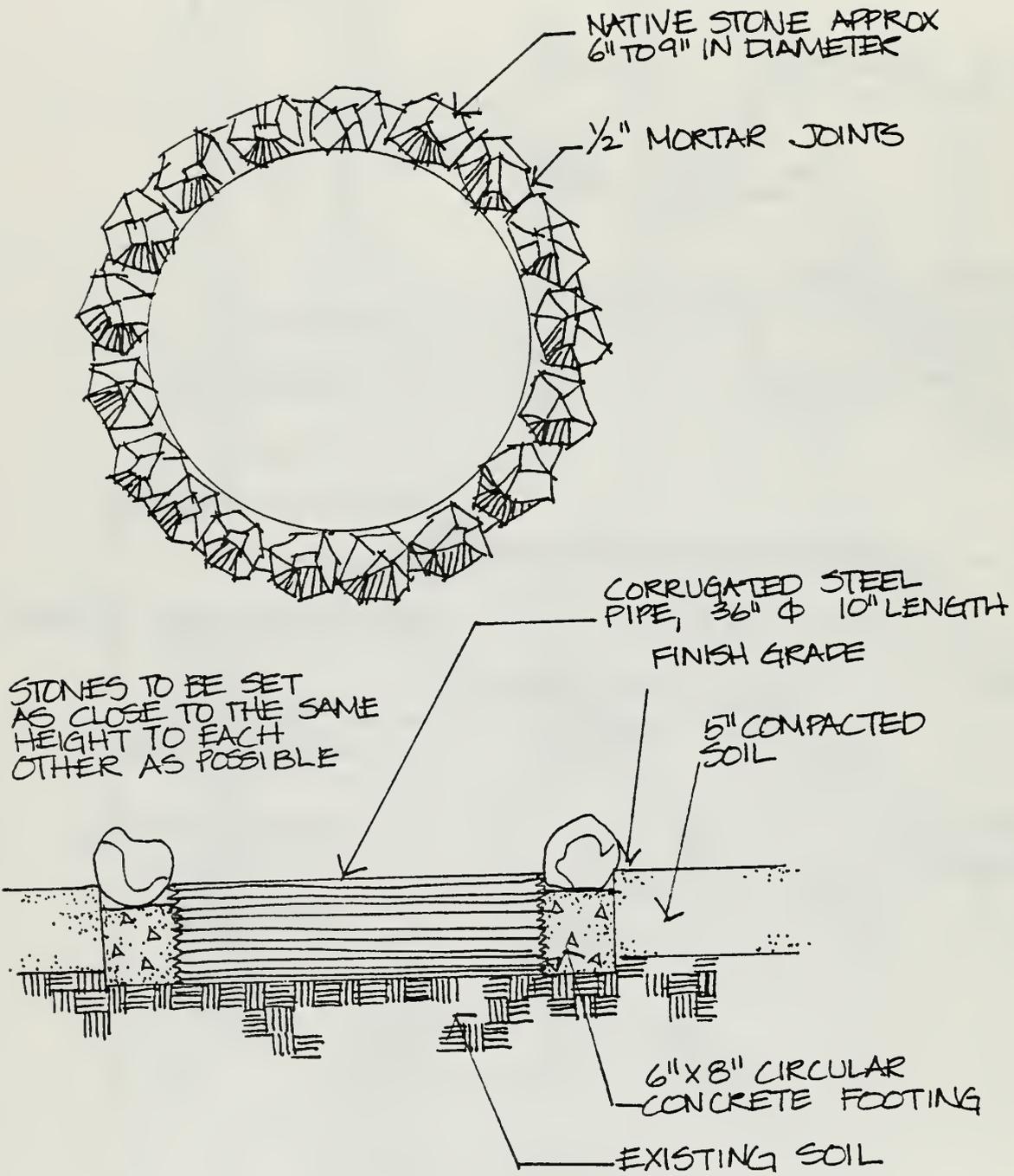
← CROWN OF TREE

← GUY WIRE

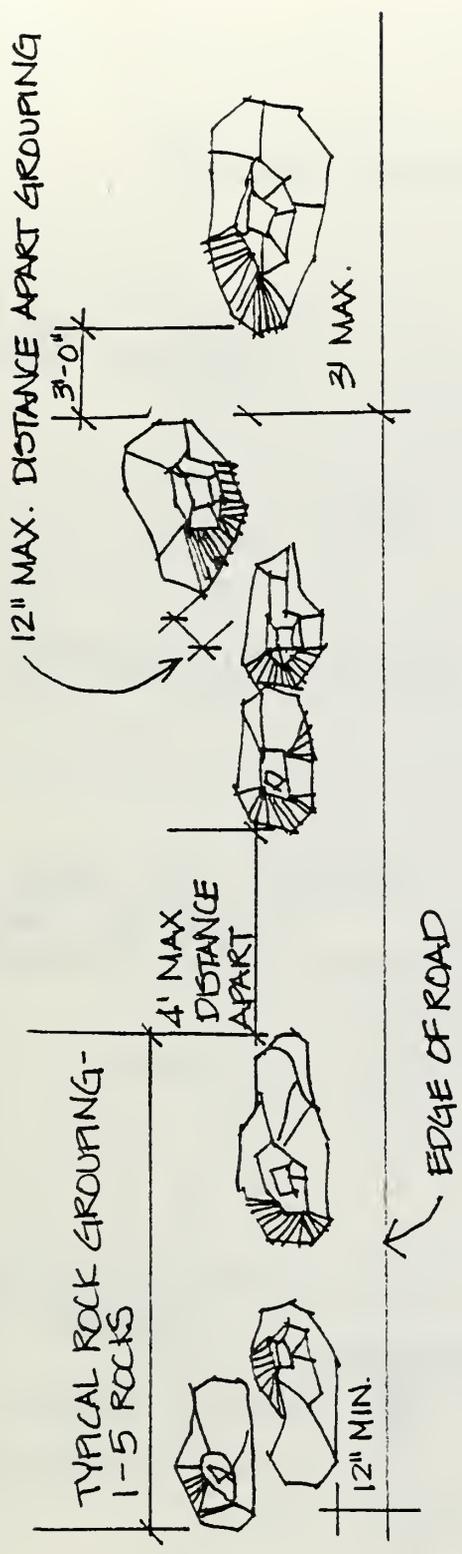
PLAN



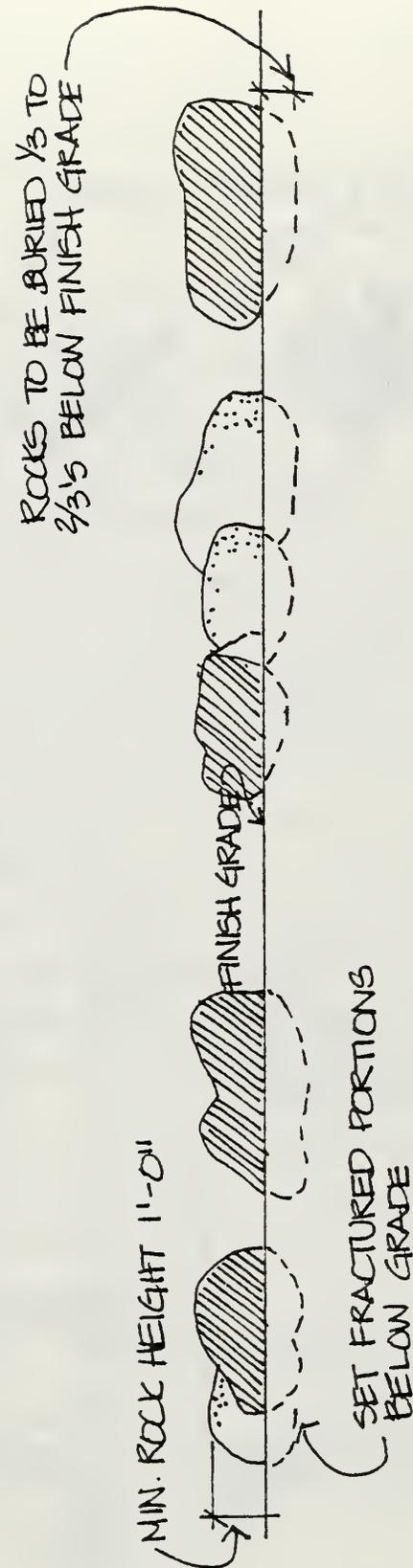
TREE PLANTING DETAIL



FIRE PIT DETAIL

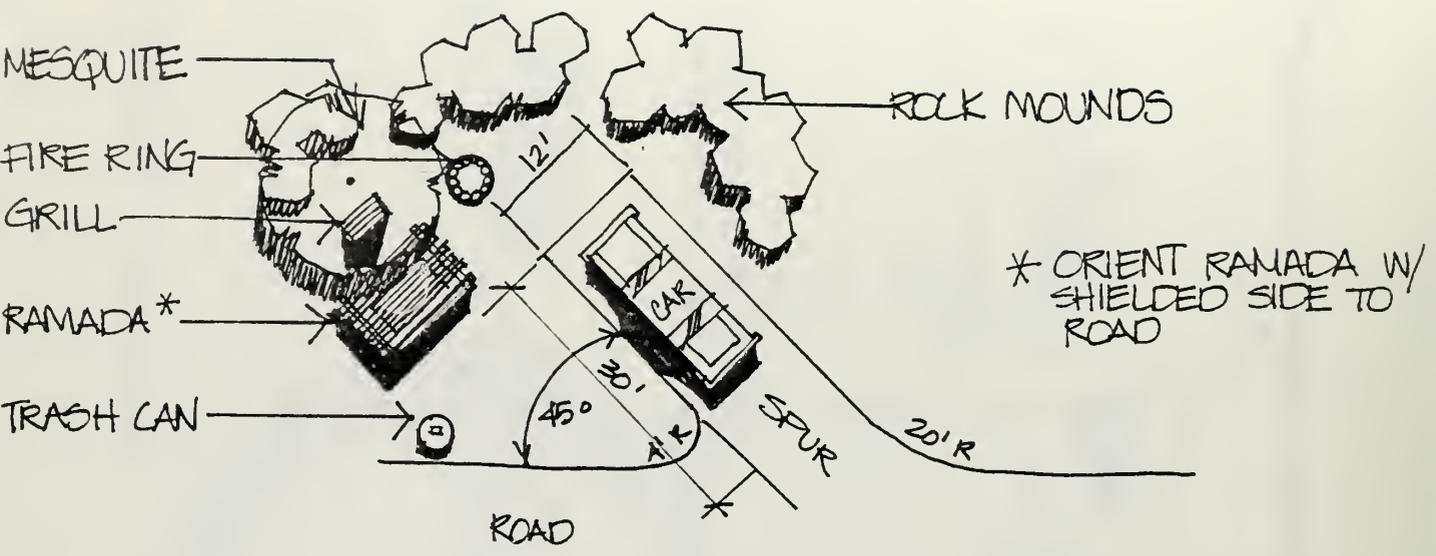


PLAN

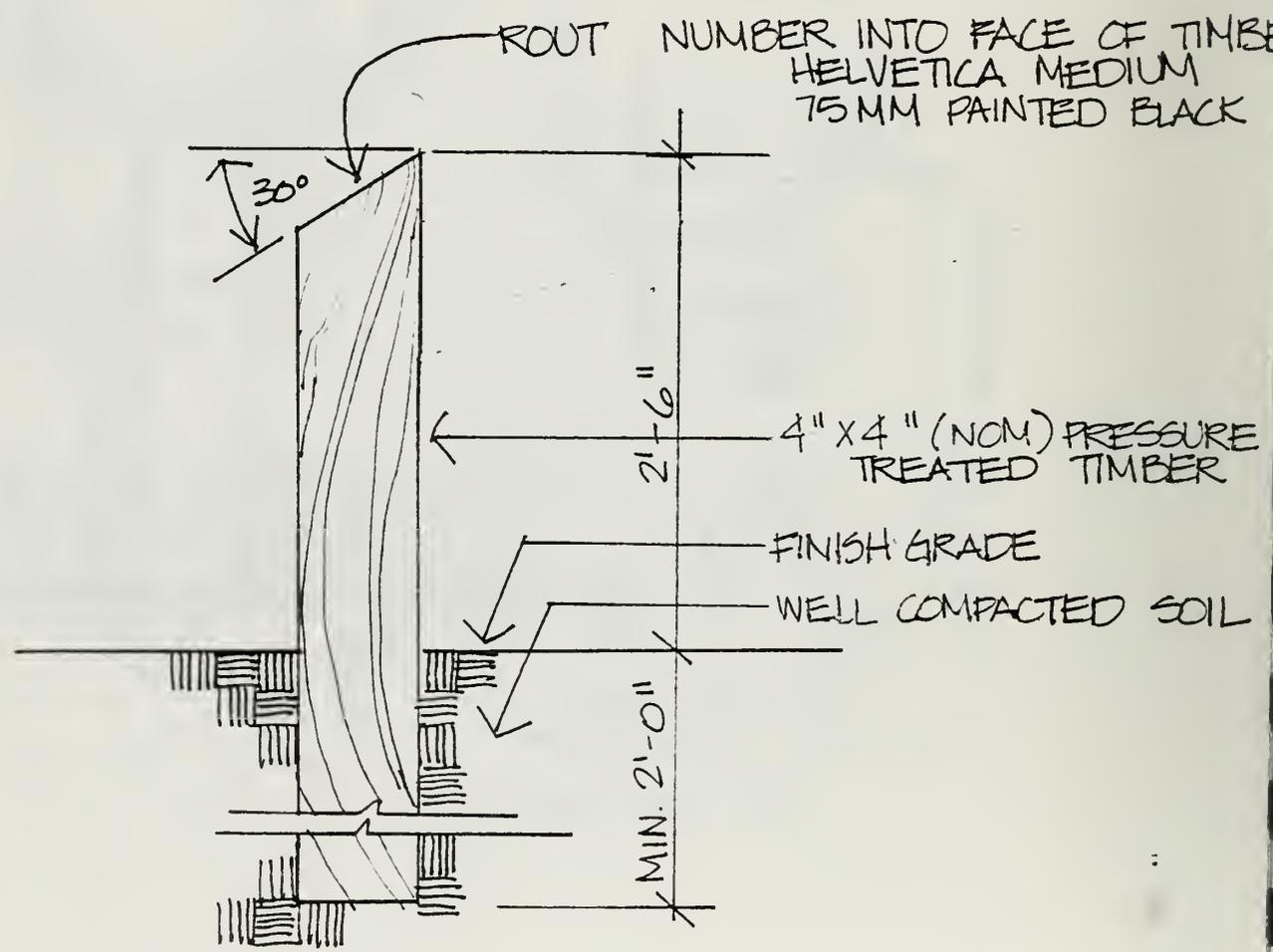


SECTION

ROAD ROCK BARRIERS

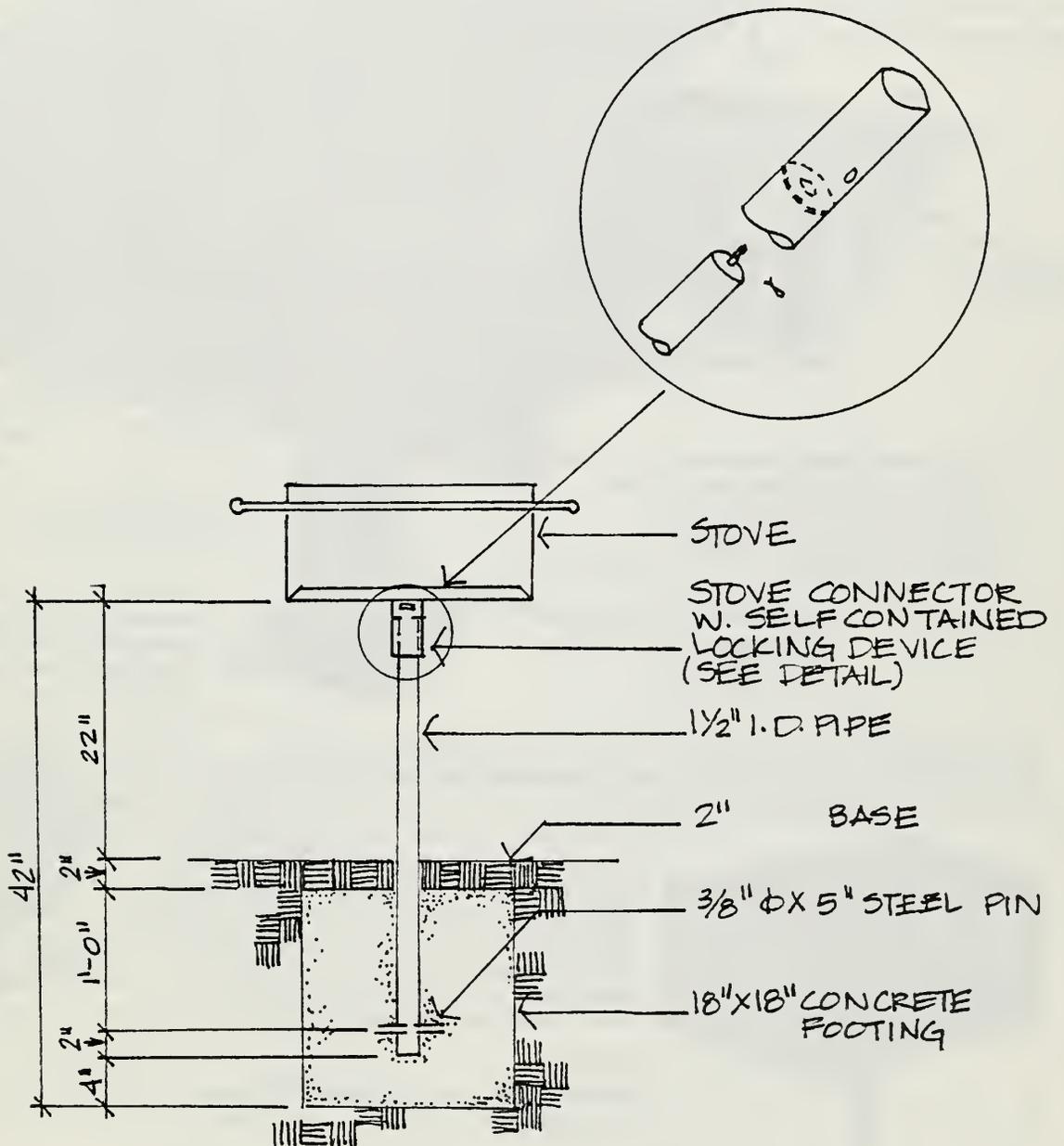


TYPICAL CAMPING SPUR



INTERPRETIVE TRAIL MARKER

LOCKING DEVICE DETAIL



CAMP STOVE DETAIL

# #500 PICNIC SHELTER / GROUP GRILL

Here's the solution to the problem of large groups cooking or barbecuing in your park.

Grill has an overall cooking surface of 1400 sq. inches.

Both top grills are hinged, with large handles for easy access to the unique fire grate below.

Overall unit is  $\frac{3}{16}$ " steel and weighs 445 lbs.

Top hinged grills are half inch rolled steel.

Large utility shelf is 12" x 36".

Good draft openings through fire grate guarantees ideal charcoal fire, and allows spent ashes to fall through into bottom pan.

Fire grates can be set at four different heights for heat control.

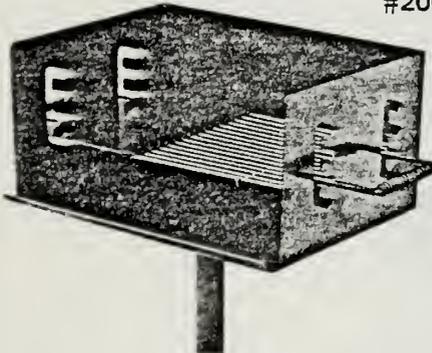
Grate holds four-five bags of charcoal.

Sets on single 6" iron pipe pedestal and bolts into concrete.

Set two of them side by side by your picnic shelter and you'll provide enough cooking surface for 100 people. Family, church and social groups really appreciate it. Grills hold 50-60 pork steaks, chicken halves, etc.

**EXTRA HEAVY DUTY CONSTRUCTION PROVIDES YEARS OF CONTINUOUS SERVICE WITH MINIMUM MAINTENANCE**

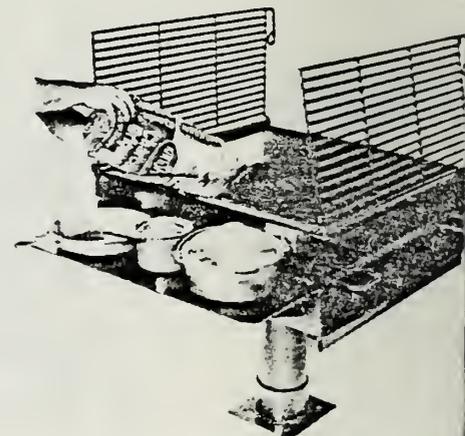
## #200S WAIST-HIGH POST-MOUNTED GRILL



Long lasting steel grill, ideal for campground or picnic area. Grill size is 20" x 14½" x 10" mounted on 36" waist-high post. Durable  $\frac{3}{16}$ " steel construction. Rotates 360°. Four position adjustment of grill height. Grill and firebox are non-removable to resist theft. Paint—heat resistant black enamel.

## #200P

Same as above except unit is portable and comes with 16" x 16" steel base plate.



**IRON  
MOUNTAIN  
FORGE**



LESTERVILLE, MISSOURI 63654

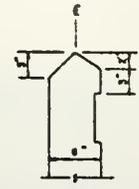
Sales Office

Factory

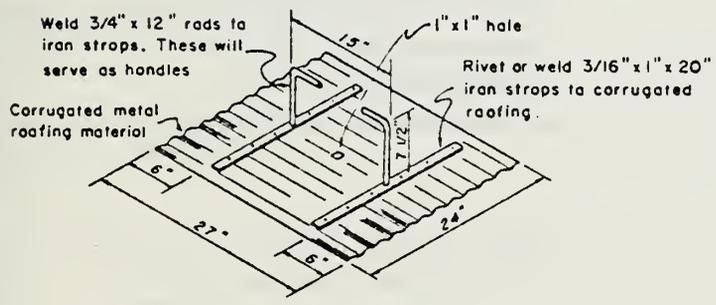
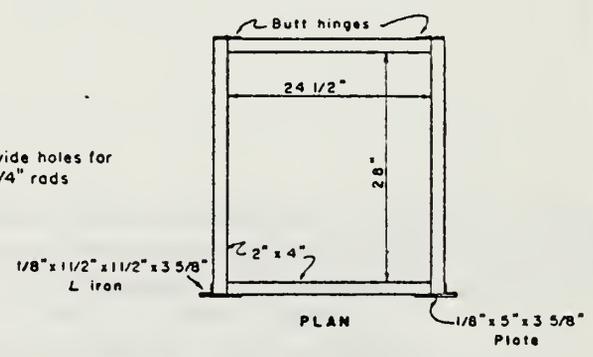
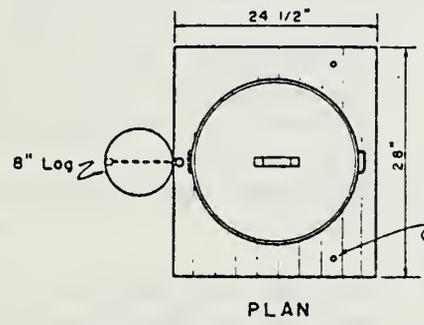
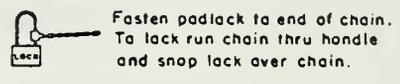
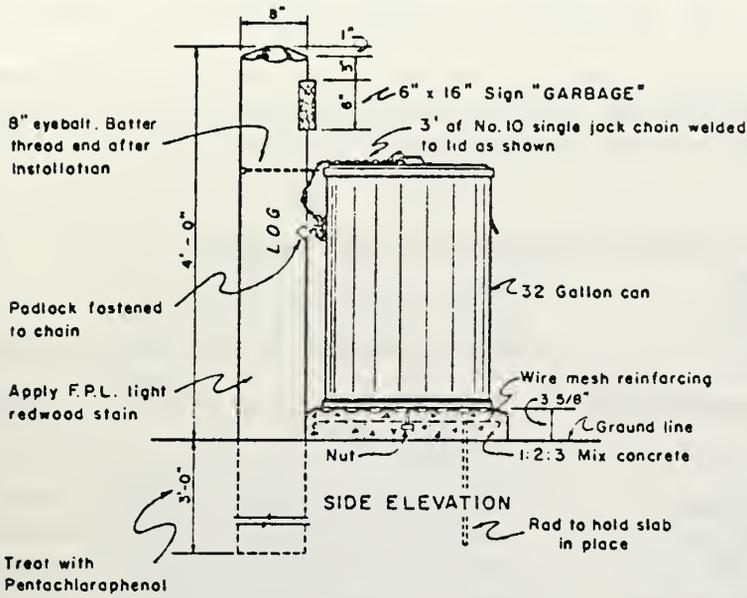
7603 Forsyth Blvd.  
St. Louis, Mo. 63105  
314-721-7861

Lesterville, Mo. 63654  
314-637-2599

# GARBAGE CAN MOUNT

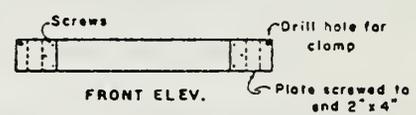


ALTERNATE POST  
8" x 8" square timber or  
concrete post



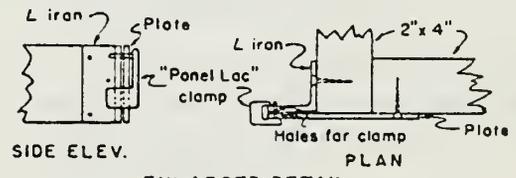
## SURFACE CORRUGATING "TROWEL"

Fill form with concrete. Place corrugated roofing material "trowel" on the concrete and press it in to corrugate the surface of the concrete. Moving it back and forth will smooth the concrete surface. A 3/4" lifting eyebolt can be inserted into the concrete, nut down, through hole in center of "trowel". Remove bolt when slab is in place.



## FORM DETAILS

Forms should be placed on a level surface such as a concrete slab before pouring concrete.



## ENLARGED DETAIL FORM LOCK

OTHER FORM LOCKING METHODS CAN BE USED

"Panel Lac" clamp mfg. by Universal Form Clamp Co., Chicago 51, Illinois (or equal)

C. Relationship to the California Desert Conservation Area Plan.

The management actions proposed in this plan follow for the most part the guidance of the Desert Plan's prescriptions for Corn Springs. There are some exceptions as defined in the charts below:

1. Desert Plan Recommendations That Were Changed in The Corn Springs Plan.

---

Desert Plan Recommendations	Corn Springs Plan Change & Rationale
a. Size of the ACEC - Desert Plan calls for boundary to include 8.7 sections or 5,568 acres.	a. Corn Springs plan proposes to decrease acreage to 4.25 sections or 2,720 acres through an amendment to the Desert Plan. The proposed decrease of approximately one-half was to increase manageability of the key areas. The proposed revised boundary includes all critical resource values that warranted the protective designation.
b. Develop a county ordinance with Riverside County to prohibit discharge of firearms except during appropriate hunting seasons.	b. No ordinance is proposed. No hunting or shooting will be allowed in the campground and for one mile surrounding the area. This restriction will be posted on the information kiosk, brochures and on signs. This, coupled with increased Bureau presence will adequately accomplish the desired goal.

---

2. Recommendations of the Corn Springs Plan That Were Not Proposed in the Desert Plan

---

Corn Springs Plan Recommendations	Rationale for Change from Desert Plan
a. Prohibit vehicle use in the palm grove area. Remove existing facilities in and immediately adjacent to the grove.	a. Needed to protect wildlife and vegetation values. (See Discussion Goal B.)
b. Create a new loop of camping spurs in the western area of the campground. Improvements will include plantings, rock mound screens, ramadas, picnic tables, fire-rings, grills, waste cans, a 4-unit vault toilet and a hand water pump with reservoir.	b. Needed to replace facilities removed from grove and to gain user acceptance of closure. (See Discussion Goals B, C, D and E.)
Create a group camp area with facilities	
c. Develop rock mound screens around existing camping spurs.	c. Needed to encourage campers to use new camping areas away from grove. (See Discussion Goal F.)
d. Nominate Corn Springs to the National Register of Historic Places.	d. Designation will give Corn Springs additional recognition and protection. (See Discussion Goal M.)
e. Remove all unsightly unwanted trespasses within the ACEC.	e. Many of these trespasses detract from the scenic quality of the ACEC. It is necessary that they be removed. (See Discussion Goal O.)
f. Sign the quail guzzler to discourage dumping of waste into it.	f. Needed to protect the guzzler from uninformed campers who have dumped waste water into it in the past. (See Discussion Goal P.)
g. Install four nest boxes in the palm grove to encourage cavity nesting birds.	g. Needed to encourage Elf Owls and screech owls to stay and breed at the oasis. (See Discussion Goal Q.)

---

---

Corn Springs Plan Recommendations

Rationale for Change from Desert Plan

---

h. Install a wildlife drinker one-half mile east of the oasis.

h. Needed to provide wildlife an opportunity to water away from the high use areas adjacent to the palm grove. (See Discussion Goal R.)

i. Install shallow water table monitoring wells.

i. Needed to determine what causes water level fluctuations at the spring. This is very important to successful management since the palm grove is drastically affected by the fluctuations. (See Discussion Goal S.)

---

D. Analysis of Public Comment

The draft plan for the Corn Springs ACEC incorporated comments received during the public input period of the plan for the California Desert Conservation Area (CDCA). The comments were split between desires for extremely protective management of the area (for Elf Owl) and beliefs that the area does not warrant special management.

The CDCA Advisory Committee in their discussion of the ACEC offered a variety of perspectives on management of the area including removal of the campground for wildlife enhancement and retention of the campground as a control to vandalism.

Following preparation of the draft a public meeting was held at Corn Springs on Saturday, April 11, 1981. The purpose of the meeting was to acquaint representatives of a variety of interest groups with the actions proposed for the ACEC. Approximately 35 people were in attendance representing recreation, wildlife, vegetation, Native Americans, cultural resource, and local resident's concerns. Those in attendance were invited due to their comments made on the Desert Plan about Corn Springs or due to their interest in one of the critical resources present in the area.

The majority of the attendees were local users from Eagle Mountain and Desert Center and were totally opposed to any improvements or changes to the campground. However, later correspondence from a representative of the group indicated that their major concerns were the closure of the palm grove area to camping and picnicking and "the unnecessary" expenditures of tax dollars for new ramadas, picnic tables, rock mounds, plantings, additional Bureau presence, and monitoring programs.

Other attendees at the meeting voiced conflicting opinions to the local users. Many were in favor of the grove closure, new ramadas, picnic tables, rock mound plantings, additional Bureau presence, and a strong monitoring program.

In response to the comments at the meeting and from letters received, several changes were made in the final plan. They were:

1. Discourage but not prohibit (as previously proposed) picnicking and camping in the grove. Vehicle use of the grove is still prohibited as in the draft. This measure will be done through rerouting of roads in the campground, by placing rock barriers around edges of roads, by removing existing facilities from the grove, by creating a new group camp area and by creating a new loop of camping spurs that will be pleasant and easily accessed. In order to expect recreationists to use the non-sensitive new camping areas they must be made to be inviting and desirable. This will encourage use of the appropriate areas and discourage use of the grove.

2. Remove only one evergreen tamarisk initially. The second (center tree) is proposed for removal in phase three if monitoring indicates that there is sufficient need to justify the removal. The third tamarisk will remain permanently.
3. Cottonwoods will not be planted as originally planned. Since the third tamarisk will remain there is no need to plant replacement vegetation.

Other comments received that did not affect a change are addressed in the following chart with the rationale for the proposed action:

Public Comment	Action
a. ACEC boundary should be reduced to a size smaller than proposed in the draft.	a. The boundary has been proposed for adjustment to half the size originally designated. The proposed revised boundary is the minimum area necessary to protect the critical resources. Any reduction could result in a loss of resource values.
b. Do not put rock mound barriers or screens, plant additional vegetation, or redesign ramadas.	b. Rock mound screens, plantings around new camping spurs, and the redesign of ramadas are essential to providing a new camping area that will be used and accepted by recreationists. This new area will take use away from the grove which contains many sensitive resources.
c. Do not increase presence of BLM personnel. This is a waste of tax dollars.	c. Increased BLM presence is needed to not only assure that the area is safe for recreationists but also to inform users of the resources in the area.
d. Objection to removal of trespasses within ACEC boundaries.	d. Many trespasses are unsightly and ugly and distract from the scenic quality of the area. The trespasses will be investigated to find the most appropriate course of action. The historical value of the trespasses will be considered.

---

Public Comment

Action

---

e. A monitoring program is not necessary.

e. A monitoring program is essential to the protection of the critical resource values at Corn Springs. The improvement or decline of values is important to track so that adjustments can be made, if necessary, to the management prescription for the area. There are no other government agencies that monitor any of the resources at Corn Springs. This action is not a duplication of services provided by another agency.

f. Move campground 1/4 mile away from palm grove.

f. Use of the grove and the immediately adjacent area has a long historic use that would be impossible to prohibit even if the environmental concerns showed a strong need for this severe an action. The county maintained road which services Aztec Well bisects the ACEC and it is not possible or desirable for BLM to control use of this road. For this reason the campground will have to remain in fairly close proximity to the palm oasis.

---

E. References Cited

Aitchison, S. W.

1977. Some Effects of a Campground on Breeding Birds in Arizona. Contributed paper, Symposium on the Importance, preservation, and Management of the Riparian Habitat. Tucson, Arizona. pp. 175-182.

"Areas of Critical Environmental Concern (ACECs), Policy and Procedures Guidelines.", U. S. Department of the Interior, Bureau of Land Management, June 1980.

California Department of Water Resources

1980. "California Rainfall Summary, Monthly Total Precipitation, 1849-1979."

Daniels, B. E.

1979a. Thirty-first winter bird population study. No. 81. Palo Verde desert wash. Am. Birds 33:42.

Daniels, B. E.

1979b. Thirty-first winter bird population study. No. 82. Ironwood-smoketree desert wash. Am. Birds 33:42.

Daniels, B. E., and J. Boyd

1979a. Forty-second breeding bird census. No. 142. Ironwood-smoketree desert wash. Am. Birds 33:92-93.

Daniels, B. E., and J. Boyd

1979b. Forty-second breeding bird census. 156. Paloverde desert wash. Am. Birds 33:42.

"Final Environmental Impact Statement and Proposed Plan, Appendix Volume C, Appendix IV, Areas of Critical Environmental Concern." U. S. Department of the Interior, Bureau of Land Management, September 1980.

Foster, M., and D. Johnston

1979a. Forty-second breeding bird census. No. 153. Saltbush community. Am. Birds 33:95.

Foster, M., and D. Johnston

1979b. Thirty-first winter bird population study. No. 66. Saltbush community. Am. birds 33:38.

Franzreb, K. E.

1978. Breeding bird densities, species composition, and bird species diversity of the Algodones Dunes. West. Birds 9:9-20.

Heizer, Robert F., and Martin A. Baumhoff

1963. Prehistoric Rock Art of Nevada and Eastern California. University of California Press, Berkeley.

- Heizer, Robert F., and C. W. Clewlow, Jr.  
1973. Prehistoric Rock Art of California. Ramona, California: Balena Press.
- Henderson, R. P.  
1979. Thirty-first winter bird population study. No. 39. Paloverde woodland. Am. Birds 33:29.
- Jennings, C. W.  
1967. Geologic Map of California, Salton Sea Sheet: California Division of Mines and Geology, scale 1:250,000.
- Johnston, D., and M. Foster  
1979a. Forty-second breeding bird census. No. 132. Creosote bush community. Am. birds 33:90.
- Johnston, D., and M. Foster  
1979b. Thirty-first winter bird population study. No. 65. Creosote bush community. Am. Birds 33:38.
- Jones, L.  
1979. Thirty-first winter bird population study. No. 93. Psammophytic scrub, II. Am. Birds 33:46.
- Jones, L., J. Dunn, and I. MacGregor  
1979. Thirty-first winter bird population study. No. 90. Creosote scrub, I. Am. Birds 33:45.
- Jones, L., and T. Clark  
1979. Thirty-first winter bird population study. No. 92. Psammophytic scrub, I. Am. Birds 33:46.
- Jones, L., and K. Garret  
1979. Thirty-first winter bird population study. No. 91. Creosote scrub, II. Am. Birds 33:45-46.
- Kroeber, A. L.  
1925. Handbook of the Indians of California. Reprinted by Dover Publications, Inc., New York.
- Marcus, S. M.  
1980. Mineral Resources Evaluation of the Chuckwalla Mountains G-E-M Resource Area, BLM unpublished draft report.
- Nace, R.  
1964. "Water: Essential Factor of Economic Development." Impact of Science on Society, 14(1):39-55.
- Robinson, T. W.  
1965. Introduction, Spread, and Areal Extent of Saltcedar (Tamarisk) in the Western States. U. S. Geological Survey Professional Paper 491-A, 12 pp.

- Romoli, Douglas  
1978. National Register Nomination for Corn Springs.
- Russi, T.  
1980. Personal communication.
- Sanchez, P. G.  
1975. A Tamarisk Fact Sheet. Desert Bighorn Council 1975 Transactions, p. 12-14.
- Steward, Julian  
1929. Petroglyphs of California and Adjoining States. University of California Publications in Archaeology and American Ethnography 24:2:47-238.
- Tomoff, C. S.  
1977. The spring avifauna of the Colorado Desert of Southeastern California. Unpubl. Rept. U. S. Bureau of Land Management, California Desert District, Riverside, California, Contract No. CA-060-CT7-987.
- Tomoff, C. S.  
1979a. Thirty-first winter bird population study. No. 57. Blue paloverde-ironwood smoketree desert riparian woodland, I. Am. Birds 33:35-36.
- Tomoff, C. S.  
1979b. Thirty-first winter bird population study. No. 58. Blue paloverde-ironwood smoketree desert riparian woodland II. Am. Birds 33:36.
- Tomoff, C. S.  
1979c. Thirty-first winter bird population study. No. 77. Blue paloverde-ironwood mixed shrub and succulent desert wash. Am. Birds 33:41.
- University of California Publications in Archaeology and American Ethnography 24:2:47-238.
- Vogl, R. J. and L. T. McDargue  
1966. Vegetation of California Fan Palm Oases on the San Andreas Fault. Ecology 47:532-540.
- Weinstein, M.  
1978. Impact of off-road vehicles on the avifauna of Afton Canyon, California. U. S. Bureau of Land Management, California Desert Program, Riverside, California. Rept. on Contract CA-060-CT7-2734.

F. Contributing Staff

The following specialists formed the team for the Corn Springs ACEC Management Plan and EAR:

Pamela M. Elliott Landscape Architect/ORP	Team Leader, Recreation Report, Visual Report, Details, Inter- pretive Brochure
Robert F. O'Brien Landscape Architect/ORP	Campground Redesign, Interpre- tive Trail
Faye J. Davis Wildlife Biologist	Wildlife Report
Judyth E. Reed Archaeologist	Cultural Resource Report
Robin L. Kobaly Botanist	Vegetation Report
Mark R. Hatchel Realty Specialist	Lands Report
Duane Winters Hydrologist	Hydrology Report
Matthew W. Shumaker Geologist	Geology Report
Rebecca R. Knehr Indio Area Clerk	Editing and Typing
Roberta L. Grannis Clerk-typist	Typing

Staff memorandums submitted to the Team Leader in the course of preparing the plan and EAR are on file at the Indio Resource Area Office, 3623 H101 Canyon Crest Drive, Riverside, California 92507.

