

JOSHUA TREE NATIONAL MONUMENT

CLIMBING MANAGEMENT PLAN

1993



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February, 1993

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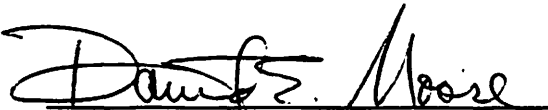
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2-19-93
Date

Preface

Five separate drafts of this plan were circulated within Joshua Tree National Monument between August, 1991 and October, 1992. Comments were received from employees in each division, and were incorporated into this document. In addition, the following individuals provided advice on draft versions of this plan.

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Previous Planning History

Joshua Tree National Monument has never had a formal climbing management plan. Historically, sections of 36 CFR (Code of Federal Regulations) and the Superintendent's Compendium have been used to regulate the activity as needed. Due to the increase in climbing activity at Joshua Tree, a climbing management plan was started in 1990. In 1991, all Western Region parks with climbing activity were directed to formulate comprehensive climbing management plans.

Authorities

Joshua Tree National Monument, encompassing 825,340 acres, was established by Executive Order 2193 (50 Stat. 1760) on August 10, 1936, because its "...lands contain historic and prehistoric structures and have situated thereon various objects of historic and scientific interest..." therefore, "it appears that it would be in the public interest to reserve such lands as a national monument, to be known as the Joshua Tree National Monument.." Public Law 837 of September 25, 1950 removed some lands from the Monument, resulting in the present size of approximately 560,000 acres.

The general statutes that guide National Park Service (NPS) land management are applicable at Joshua Tree National Monument. Among the most important of these statutes are the National Park Service Organic Act (16 U.S.C. sec. 1 et seq.) and the Act of Administration (16 U.S.C. 1a-1). Through the Organic Act, Congress set forth the purposes of the National Park System which are: "To conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such manner and such means as will leave them unimpaired for the enjoyment of future generations..."

On October 20, 1976, Public Law 94-567 designated 429,690 acres as wilderness and 37,550 acres as potential wilderness within the Monument. Designated wilderness is an area "...where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain..." and "...which is protected and managed so as to preserve its natural conditions..." Approximately 80 percent of the Monument is designated as wilderness and management of this area must comply with the Wilderness Act of 1964 and NPS wilderness management policies which state "Wherever a wilderness area is designated within a park, the preservation of wilderness character and resources becomes an additional statutory purpose of the park".

Protection of cultural and historical resources are provided for in part by the Act For The Preservation of American Antiquities of 1906 (34 Stat. 225), the Archaeological Resources Protection Act (ARPA; 16 USC 470) of 1979, and the Historic Sites Act of 1935 (PL 74-292; 49 Stat. 66 USC 461-467). These acts establish national policy for

protection and management of the remains of our recent and ancient cultures.

The Endangered Species Act of 1973 requires federal agencies to ensure that their activities will not jeopardize the existence of any endangered or threatened species.

The National Environmental Policy Act of 1969 is the basic national charter for environmental protection. Among its provisions, this act declares that it is the policy of the federal government to "...preserve important historic, cultural, and natural aspects of our national heritage."

36 CFR contains the following regulations that may be applicable to rock climbing activities at Joshua Tree National Monument:

2.1 Preservation of Natural, Cultural, and Archaeological Resources

(a) (1) (ii) Possession, destroying, injuring, defacing, removing, digging, or disturbing from its natural state any plants or parts of plants is prohibited.

(a) (1) (iv) Possession, destroying, injuring, defacing, removing, digging, or disturbing from its natural state any mineral resource is prohibited.

(a) (5) Walking or climbing, etc., on an archaeological or cultural resource, monument, or statue is prohibited.

(a) (6) Possessing, disturbing, etc., a structure, or cultural or archaeological resource is prohibited.

2.12 Audio Disturbances

(a) (3) Operating a motor or engine without a permit in undeveloped areas is prohibited.

Additionally, the Superintendent's Compendium (January, 1992) contains the following with regard to climbing activities:

1.5 Closures and Public Use Limits

A) It is prohibited to initiate or terminate a climb in an occupied campsite unless given permission by the occupant of that site.

B) The possession of a power drill in an undeveloped area is prohibited.

C) As of 1 February, 1993, no new bolts, or replacement of old, will be permitted within Congressionally designated wilderness areas of Joshua Tree

National Monument. This will remain in effect until scheduled studies are completed, and the issue is re-examined within the proposed wilderness management plan.

2.1 Preservation of Natural, Cultural, and Archaeological Resources

A) The use of any power drilling device for the purpose of placing bolts or other climbing equipment is prohibited, unless authorized by the Joshua Tree National Monument Superintendent.

B) The placing of bolts or other climbing equipment, or physically climbing within 50 feet of any prehistoric or historic rock art site is prohibited.

C) The use of glue, epoxy, cement, or any other adhesive to attach or reinforce hand and/or footholds is prohibited.

Policies and Guidelines

The Management Policies of the United States Department of the Interior (DOI) states "The National Park Service will encourage recreational activities that are consistent with applicable legislation, that promote visitor enjoyment of park resources through a direct association or relation to those resources, and that are also consistent with the protection of resources. Recreational activities that may be allowed include, but are not limited to... mountain and rock climbing..." (Chapter 8 pg.6; March, 1988).

The DOI Management Policies also covers management of recreational use: "The National Park Service will manage recreational activities so as to provide for public enjoyment, ensure public safety, protect park resources, and minimize conflicts with other visitor activities and park uses. Each park will develop and implement visitor use management plans and take management actions, as appropriate, to ensure that recreational uses and activities within the park are consistent with its authorizing legislation or proclamation and are not in derogation of the values and purposes for which the park was established" (Chapter 8 pg.6; March, 1988).

National Park Service documents including NPS 77 (Natural Resources Management Guidelines [1991]), and NPS 28 (Cultural Resources Management Guidelines [1988]) provide specific direction on the management of resources. While management of recreation is not directly addressed, NPS 77 does provide direction on Backcountry Recreation Management (Chapter 3).

According to NPS 77, backcountry is defined as "...primitive, undeveloped portions of parks". By this definition, most climbing activity outside boundaries of campgrounds and picnic areas would be considered backcountry recreation. The Park Service's stated objectives in the management of backcountry recreation are:

- 1) Protection of both natural and cultural park resources and natural processes, including prohibition of consumptive uses of park resources except where authorized by law or regulation,
- 2) Protection of unique or important backcountry recreational opportunities by avoiding inadvertent changes in the recreational experience,
- 3) Provision of a varied spectrum of backcountry recreational uses as appropriate in the diverse NPS areas, and
- 4) Avoidance of unacceptable levels of danger to the welfare and safety of the public, including recreational participants.

NPS 77 also states that "Limitations imposed on recreational uses should be the minimum necessary required to achieve these objectives. Where practicable, any restrictions should be based on the results of research."

Critical Resources

Joshua Tree National Monument was set aside to protect many diverse resources. The physical environment of air, geology and water provide the foundation for a variety of complex ecosystems found within the park. These rich natural resources have supported human uses for thousands of years. The remains of ancient people as well as more recent dwellers represent significant cultural resources that provide us with a glimpse of our own origins. Concerns about each of these resources are detailed below:

1) Plants

The increase in climber traffic has produced significant trampling of plants at the base of some rock formations, particularly Echo Rock, Short Wall, and Pixie Rock. This damage primarily affects shrubby perennials, that flourish because of the water runoff from rock formations. These areas have also been subjected to damage caused by trees and bushes being purposefully pruned or damaged to access climbs.

Very small and specially adapted plants are also encountered in cracks and crevices on the cliff faces. These plants may easily be pulled out by climbers in their efforts to gain a handhold, foothold, or protection placement.

Two plants that grow within present and potential climbing areas at Joshua Tree NM are proposed for Federal listing as endangered species. At present, neither has been officially placed on the Endangered Species List, but are to be protected as if they were. These plants are: Foxtail Cactus (*Coryphantha vivipara alversonii*) and Rock Pennyroyal (*Monardella robisonii*). Although only these two species are considered

potentials for the Endangered Species List, all plants are protected within the Monument. Park Service policy and philosophy require that all species be protected and considered equally valuable. Most species of plants at Joshua Tree have never been adequately studied, and it is rare that any desert species is known beyond the level of alpha taxonomy. Life history, genetics, distribution patterns, important ecological associations, and wider significance are unknown for the majority of these organisms.

2) Wildlife

Animals are affected by human presence in a variety of ways. Most wild animals avoid humans and may flee from areas where humans are present. In some instances, the animals merely wait for the people to leave before returning. Many animal species however, are extremely wary of humans and may entirely abandon territories or even active nests where human disturbance is present.

Human impacts can cause direct behavior changes, such as flight, to more subtle, longer-term effects such as altering their productivity. In the extreme case, humans can cause the death of individuals directly (i.e. poaching), or indirectly (i.e. denying access to a water source).

In evaluating the effects of climbing on wildlife, all of these possibilities must be considered. At Joshua Tree, little is known about ecological associations, home ranges, movement patterns, and the physiology of most animal species.

The Monument hosts two animals that are currently listed on either the Federal or State Threatened and Endangered (T&E) Species lists. The Desert Tortoise (*Gopherus agassizi*) is widespread throughout the park and is on the Federal Endangered Species List. The Desert Bighorn (*Ovis canadensis*) is also found throughout the Monument and is a threatened species in California. Of the two, the Bighorn is more likely to be impacted by climbers, as it frequents rocky terrain.

It should be noted however, that the largest number of animals in the Monument are small, inconspicuous species whose names would be unfamiliar to most people. Whether common or rare, these animals are absolutely protected by the Park Service, and will be the natural features most precious to us in centuries to come.

At present, a number of areas are closed to the public for overnight use in an effort to provide wildlife with an undisturbed chance to visit water holes and move about freely. These areas include the entire Wonderland of Rocks and Queen Mountain (a total of about 15,000 acres) - both popular climbing areas.

As recently as July, 1992, a number of individual climbs were closed to protect nesting birds. Once a nest site was identified, the immediate area was signed to

inform the public that climbing was not allowed in this area. These most recent closures were very successful.

3) Cultural Resources

Joshua Tree has a very long history of human habitation, dating back to about 7,000 years ago at sites in the Pinto Basin. At present, there are over 1,000 known historic and prehistoric cultural sites within the Monument's boundaries and most are located near present or potential climbing areas. These include campsites, rockshelters, villages, bedrock grinding features, caches, burials, rockart, quarries, trails, lithic and ceramic scatters, rock cairns and alignments, historic roads, camps, homesteads, mines, and mills.

Presently, there are three areas closed to climbing to protect these cultural resources. The entire section around Key's Ranch has been closed to the public since 1969 to protect this valuable historic site. The section around the ranch is signed and fenced, but park visitors still regularly enter the area.

In 1989, four rock climbs were found to have been established very near to a significant pictograph and petroglyph site in the Barker Dam area. It was decided that these climbs impinged upon the rock art site and the climbing community voluntarily removed all signs of their presence from the area. The remaining site was identified in 1991 and consists of a pictograph that had gone undetected for years. Both rock art sites are clearly signed now.

4) Geological Resources

Rock formations of monzogranite, an igneous rock, draw climbers to Joshua Tree National Monument. The quality of rock varies greatly throughout the park, with the rock around Jumbo Rocks and White Tank Campgrounds being the poorest quality for climbing.

The climbing method that creates the most controversy is bolting. The placing of permanent expansion bolts in the rock to facilitate climbs has been practiced at Joshua Tree and elsewhere since technical climbing was introduced. Top roping and clean climbing can provide protection for most climbs. The development of "sport climbing" and the desire to lead face routes necessitates the use of bolts. Local climbers are now making a serious effort to camouflage bolt hangers and are also substituting rock colored chains and/or webbing for the brightly colored webbing historically found at rappel stations. This is being done to lessen any visual impacts associated with climbing.

Also of concern is the alteration of the rock through practices not condoned, nor practiced by the majority of the climbing community. These procedures include chiseling hand and footholds, gluing on additional hand and footholds, and reinforcing holds with glue or adhesives. While these practices are not at all common, they have happened at Joshua Tree NM, and historically have been interpreted to be a violation of the CFR. The Superintendent's Compendium now clearly prohibits this activity.

Carbonate of magnesia (gymnastic chalk) is used by the majority of climbers to reduce sweat on the hands and provide a better grip on the rock. Some types of rock, such as sandstone, provide a distinct contrast to the standard white color of chalk, and this could be construed as unsightly. The rock in the Monument tends to be a lighter color, and in most areas the chalk blends in fairly well. Since most of the rock in the park does not overhang, the majority of chalk washes off during light rains.

The Monument is unique with sparse vegetation and open space. Park visitors can walk virtually anywhere, without the need for established paths, thus at times creating an unsightly network of "social trails." These trails can affect drainage patterns, lead to widespread plant damage, disturbance and destruction of cultural resources. Consequently, the location and layout of parking areas and access from the road is of great importance. In the past, the use of split rail fencing and trail markers have helped to consolidate these trails.

At the base of some rock formations such as Echo Rock, Short Wall, and Pixie Rock, soil has become compacted from heavy visitor use.

5) Wilderness Resources

As cited earlier, designated wilderness comprises the largest portion of land classification in the Monument. This is fitting, given the stated purpose for having originally set these lands aside. Management objectives for much of the Monument are in concert with the intent as well as the letter of the Wilderness Act.

Wilderness is synonymous with naturalness. To a biologist, naturalness is synonymous with concepts like integrity of natural processes that shape and mold the living and non-living components into the diversity of ecotypes we see. However, to a manager, wilderness is also synonymous with people. Wilderness was created specifically for use by people. This apparent conflict is similar to the National Park Service mandates for both protecting resources and making them available for park visitors. However, in wilderness the conflict is less contradictory than it is for management of other park lands.

While it is less contradictory, the balance of use and protection of wilderness is debated routinely. Debates are often polarized between human-use and ecological opinions of how to best manage wilderness. However, there are some well accepted tenets that provide managers with some direction while working out the best policies for a specific wilderness unit.

First and foremost is the ecological notion that wilderness systems must rely on natural processes for development and perpetuation of the system. We learned a long time ago how alteration of processes such as natural fires can have long-term and catastrophic influences on natural systems. This is why most of Joshua Tree's wilderness is zoned for natural fires (areas where lightning strike-fires may be allowed to run their natural course as long as human safety is not compromised).

On the recreation side, wilderness is a perceptual state of naturalness where the "hand of man" does not spoil the natural scene. From this perspective, managers must be careful to limit developments within wilderness. Ideally, all developments such as trails must have the visual quality of naturalness. For example, game trails are natural and human-made trails in wilderness are best designed to favor this natural appearance, as opposed to walk-ways. Additionally, any development should have the ability to be recovered by natural processes if human-use is discontinued. If we build a trail into an area that is popular today, the lack of use in the future should allow natural forces to reclaim the disturbance.

Joshua Tree's wilderness, as well as other natural zones, are under an unprecedented siege from threats to its integrity. When first created, the Monument's boundary was an imaginary line in a virtual continuum of unaltered desert. Today, that boundary is more readily visible created by the contrast of land development along much of the boundary. However, visibility alone is not the threat. These developments, such as urban interfaces and highways, have bisected the historical routes of travel for many animals, as well as the genetic linkages for plants and wildlife. Air pollution such as ozone is known to be affecting Monument vegetation. Air pollution fall-out such as heavy metals have altered fragile micro-communities such as the ephemeral rock pools created by infrequent rains.

In addition to biological threats, a barrage of wilderness-destroying impacts are significantly reducing the visitor's perception of the wilderness quality. Over-flights by commercial, private and military aircraft routinely shatter the natural quiet of the Monument's wilderness. Night sky light pollution, from urban developments, has diminished the quality of star-filled nights in the backcountry. Illegal off-highway vehicle-use continues to scar backcountry areas. The list is quite long.

Other Management Considerations:

1) Social Interactions

As with all user groups, a small percentage of climbers habitually disregard park regulations. Typical violations include: taking dogs into the backcountry, riding bicycles off established roadways, leaving trash, and creating unreasonable noise. Historically climbers have not been a homogeneous group, but peer pressure and/or citations have usually brought most violators into compliance.

Occasionally, style and ethical disputes will arise among climbers. In the past, bolts and even some handholds have been removed from "offending" routes. There have also been conflicts between climbers and other park user groups, with the biggest concerns being the availability of campsites, the visual impact of climbers on the rock¹, and climbing routes located within the boundary of a campsite. The last concern has been addressed in the Superintendent's Compendium.

2) Search and Rescue (SAR)

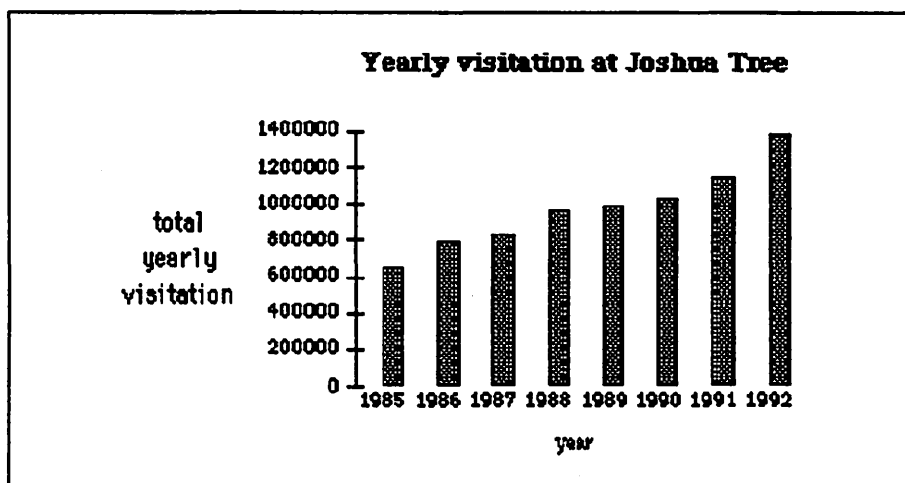
Joshua Tree NM averages about thirty SAR incidents per year, of those, most accidents involve scramblers, not technical climbers. Monument Rangers assist injured visitors and conduct searches for missing persons, hence they must maintain both the medical and technical skills necessary to accomplish these missions.

Budget and staffing restraints in 1985 lead to the development of a volunteer search and rescue team to assist park rangers on SAR incidents. The Monument has bought extra rescue and training equipment for Joshua Tree Search and Rescue (JOSAR) and also provides training for its members.

Visitor Use Analysis

Joshua Tree National Monument currently encompasses approximately 560,000 acres of both Colorado and Mojave Deserts and is located roughly 120 miles east of Los Angeles, California. Over 18 million people live in the greater Los Angeles/San Diego area and the population is expanding rapidly. The most recent visitor survey (April 1991) found that 76% of those polled lived in southern California. Monument visitation has increased dramatically in recent years and is expected to continue. Historically, no figures have been kept as to the numbers of climbers using the park.

¹ The 1991 visitor survey found that 80% of the respondents who observed climbing found it enjoyable to watch.



While the majority of climbers now visiting Joshua Tree NM hail from the greater Los Angeles/San Diego area, there are many who have moved to the surrounding Morongo Basin for the express purpose of climbing. These people include professional climbers, teachers, construction workers, and guides who instruct climbing on a full time basis for one of the nearly forty companies issued Commercial Use Licenses and Special Use Permits. In addition, the Monument has become an international destination in the climbing community, with large numbers of Europeans and others enjoying the park.

Regional/National Context

The international climbing magazine, *Vertical*, claims that Joshua Tree is the most popular climbing area in the world and the visitor use survey done in the spring of 1991 shows that at least 37% of the visitors contacted participated in climbing or scrambling.

At present, over 4,000 different climbs have been recorded within the park. These include a wide spectrum of climbing opportunities (faces, overhangs, cracks, etc.) encompassing all levels of difficulty. No other climbing area in the world has this number of established climbs, nor the potential for so many more. It is estimated that the Monument has over 28,000 acres of rock with climbing possibilities.

The weather is an important factor in Joshua Tree's popularity. The relatively mild and stable weather affords a long climbing season - usually eight months per year. This is much longer than many of the nation's other winter climbing areas.

Existing Facilities

No major structures have been built to accommodate climbers, although there was discussion of creating a climber's campground near Sheep Pass. In 1991, the climbing community paid for the installation of three outhouses at popular climbing areas. These were installed by a private contractor, under the supervision of park staff. In 1991/92 a number of trails were delineated with Carsonite markers in an attempt to reduce the number of "social trails" leading from parking areas to popular cliffs. These markers were purchased by the climbing community and installed by park staff. The trails marked as of February, 1993 lead to:

- 1) Hemingway Buttress/DQ Wall
- 2) Houser Buttress
- 3) Peyote Cracks/Baby Apes Wall (2 trails)
- 4) Echo Rock (3 trails)
- 5) The Comic Book
- 6) The Love Nest
- 7) The Headstone
- 8) The Oyster Bar
- 9) Saddle Rock (2 trails)
- 10) The Hall of Horrors

Specific Management Objectives

Preservation of park resources and providing recreational opportunities must both be considered in any management plan. At some point, most recreational activities will negatively impact the park resources, and therefore, may have to be curbed, relocated to other areas within the park, or regulated to maintain park values. The difficult task is to determine when impacts reach an unacceptable level. In order to do this properly, baseline data must be obtained. At Joshua Tree National Monument there is a definite need for studies of the following as they pertain to climbing:

1) Plant study

- A) Determine the location of endangered plant species and ascertain if they are affected by climbing, or could be in the future.
- B) Determine at what point the trampling of vegetation at the base of cliffs becomes unacceptable.
- C) Gather information on how soil compaction affects desert plants at the base of Joshua Tree NM rock formations.

D) Examine plant species unique to rock faces, such as Rock Goldenbush, and determine significance of specimens lost through climbing.

2) Wildlife study

A) Determine if climbing has an impact on the Threatened and Endangered (T&E) animals found within the park, and if it does, where this occurs.

B) Determine which other species are at risk from climbing and evaluate climbing impacts.

3) Cultural Resources Study

A) Identify cultural sites that are, or may be, impacted by climbing activities.

4) Geological study

A) Determine if chalk has any long lasting effects on rock or soil chemistry.

B) Determine at what level alteration of the rock caused by climbing becomes unacceptable.

5) Sociological study

A) Determine the relationships among climbers and other visitor groups.

B) Survey climbers to determine their numbers, which areas are most popular, when they use the Monument, and how many make up a typical group.

C) Determine behavior associated with travel to climbs, waiting for climbs, and expectations of wilderness and social experiences.

ACTION PLAN

History has proven that Joshua Tree NM is too vast and complex an area to be effectively managed by regulation alone. Land managers must have the cooperation of all user groups to accomplish conservation goals. An open line of communication and an exchange of information between all parties is crucial. The following are guidelines for managing climbing at Joshua Tree National Monument until the studies listed above are completed:

Resource Objectives:

1) Cultural Resources

- A) Protect cultural sites and artifacts that are, or could be, affected by climbing through education, inventory, mitigation, or closures.**
- B) Rock formations of significant historical or geological interest such as Skull Rock, Split Rock, and Arch Rock will be closed to climbing.**
- C) The area around Key's Ranch and private inholdings within the park will remain closed to public visitation. Current areas designated as day use only will remain that way.**

2) Plants

- A) Protect T&E plants that may be located in climbing areas through education, fencing, or closure.**
- B) Stabilize the areas with significant plant damage through education and mitigation (i.e. revegetation, placing downed Joshua Tree logs to delineate areas, fencing, etc.).**

3) Wildlife

- A) Protect T&E species that may be affected by climbing through education, day use areas, seasonal closures, and permanent closures.**
- B) Protect other animals that may be affected by climbing such as birds, bats, reptiles, or pack rats through education, seasonal closures, or permanent closures.**

4) Geological Resources

- A) Bolting will continue to be considered a valid activity at Joshua Tree NM, except within Congressionally designated wilderness areas.**
- B) Power drills may only be used to replace old bolts, provided the following conditions are met:
 - 1) Written permission must be obtained from the Superintendent or his delegate prior to using a power drill and the letter giving permission must be carried with the permittee while replacing bolts.****

2) A list of bolts to be replaced must be submitted to the Superintendent or his delegate prior to replacement.

3) The actual replacement will take place on weekdays to minimize disturbances or conflicts with other users.

4) Power drills may only be used outside of designated wilderness areas.

C) Efforts will be made to limit the total number of bolts through education, peer pressure, and promoting top roping.

D) The use of natural colored bolt hangers and webbing, as well as minimizing visual impacts will be strongly encouraged.

E) The Superintendent's Compendium and 36 CFR provide regulations for defacing rock by chiseling, gluing, etc, and these sort of activities will be curtailed through education, promoting peer pressure, and prosecution, if required.

F) Every effort will be made to minimize social and braided trails through education and trail definition. Parking lot location and road access play a significant role in solving this problem.

5) Wilderness Resources

A) Protect wilderness resources from visual impacts of bolting. Currently few popular climbing areas exist in designated wilderness.

B) This issue will be reconsidered when the wilderness management plan is completed, but for now the no bolting regulation will preserve resources at risk until more information is available from scheduled studies.

Other Management Objectives:

1) Social Impacts

A) Educate climbers about their social impacts on other park visitors through brochures, bulletin boards, personal contacts with staff, and interpretive displays.

B) An open line of communication with the climbing community will be maintained, as well as a spirit of cooperation.

2) Search and Rescue

- A) Continue to educate the public on safe climbing practices.
- B) The Monument staff has not, and will not, maintain or inspect bolts or fixed climbing equipment for safety.
- C) Continue staffing and training to respond to SAR incidents.
- D) Maintain a good working relationship with local law enforcement agencies, California State Office of Emergency Services (OES), local rescue organizations, and the Mountain Rescue Association (MRA) to assist with SAR incidents in the park.

Commercial Activity

In October, 1991, the Protection Division was given the responsibility of managing the Commercial Use License (CUL) and Special Use Permit (SUP) programs at Joshua Tree NM. In the previous ten years, the number of permits issued had remained constant near twenty. At present, there are forty businesses permitted to operate within Joshua Tree, and most are involved in climbing and backpacking. Although no statistics are available, it is widely acknowledged that the number of students receiving rock climbing instruction at Joshua Tree NM has increased significantly, and will probably continue to rise.

A management concern at present is the competition between instructional groups and the general climbing population for popular climbing areas. These areas primarily include: Trashcan Rock (Quail Springs Picnic Area), Pixie Rock, and Short and Feudal Walls (Indian Cove). These concerns are being addressed via the CUL/SUP program, with guides prohibited from using these areas on weekends, holidays, and holiday weeks.

Commercial Activity Action Plan:

- 1) Disperse groups to minimize resource impacts and conflicts with other users through education and possible regulation.
- 2) Obtain user statistics through the Commercial Use/Special Use programs to gain information on group needs and numbers of participants.
- 3) Educate group instructors in sound environmental practices, in hopes that they will pass the information on to students.
- 4) Encourage groups to continue doing service projects for the Monument.

Monitoring Program

A protocol will be developed for assessing climbing impacts that could be of value to any Park Service unit where climbing occurs. The plan will consider the following topics:

- 1) Effects on vegetation and soils between climbing locations.
- 2) Effects on plants and animals living in the vertical habitat of cliffs or cracks.
- 3) Spatial, temporal and behavioral data on climbers themselves.
- 4) Effects on cultural resources in climbing zones.
- 5) Evaluation of climbing effects cumulatively to date (including a map of climbing areas with ratings of impact).
- 6) A sociological investigation of future trends in climbing.

In many ways, climbers are another vertebrate species in a cliff-using "guild" of plants and animals. Climbers are most abundant in the spring and fall when animals and plants are most active. Prehistoric people lived in and around the rocks; modern people use them recreationally. The well-known contradiction contained in the Organic Act "preserve and protect for the enjoyment of future generations" leads in this case to potential conflicts between recreation and wildlife. The responsibility of management is to reduce conflicts and arrive at an optimal mix of preservation and use.

The study should comprise three areas, which may be viewed as separate projects:

- 1) A biological assessment of behavioral effects on plants and animals caused by climbing.
- 2) A similar assessment of climbing effects on cultural resources.
- 3) A management map showing the extent of changes already created by climbing use.

The first stage of the research will be drafting a protocol. This will outline the resources to be examined, time periods to be studied, statistical design for analysis, and data collection methodology. The protocol will be evaluated by the academic community, the National Park Service Regional Scientist, and committees or scoping sessions where the climbing community would be represented.

For the biological perspective, an experimental design will be created to evaluate climber impacts. This design must be realistic both in terms of subject matter involved and work force required for its completion. The study will consider species/associations of critical importance and use biodiversity indices as indicators to compare climbed and unclimbed areas. Climbers will be studied from a behavioral perspective: most active times, numbers involved, most active areas, and amount of space used by a climbing party. The goal is to integrate the spatial, temporal, and behavioral characteristics of climbers into a model that includes this same data for animal species. The ideal result would be a set of recommendations on managing climbing activity to mitigate the effects on wildlife or plants.

Archaeological evidence indicates that people have been drawn to the same rocky outcrops that climbers now frequent. They were drawn by availability of shelters, sources of water in rock tanks, wind breaks, shade in the summer, heat retention in the winter, rock walls for artistic and religious expression, surfaces for grinding plant foods and sources of minerals. Many of these resources could be damaged by the same sorts of activities that could also affect plants and animals. Footsteps that would destroy plants, for example, might equally well trample pot shards. For this reason, cultural resources should be examined at the same time as the biological resources. It is imperative that cultural resource expertise be brought into the proposal, diverging from biological protocols wherever it is appropriate to do so.

Mapping of existing impacts may be done by Resources Management staff in conjunction with the Protection Division. This is an excellent area for interdivisional cooperation, offering benefits to both. A formalized protocol will be necessary to standardize data collected, streamline training procedures, and control observer bias.

Trends for the future should be addressed by another section of this study dealing with climbing purely from the sociological viewpoint. Although all of these elements are closely related, a sociological study would hopefully offer insights into the future of the sport. Climbing methods and practices are constantly evolving, and some may have significant impact on park resources. "Clean climbing" was fashionable a decade ago, while in some areas today, the trend is to establish predominantly bolt protected routes.

Plan Review and Update

The Joshua Tree Climbing Management Plan will be reviewed on an annual basis and should be updated as information from requested studies arrives. Since Joshua Tree is also in the middle of completing a General Management Plan (GMP), the climbing management plan may need to be revised once that is completed (targeted for early 1994).