

9/24/88

El Malpais National Monument

Lava Tube System
Resource Inventory

CAVE MANAGEMENT RECOMMENDATIONS

by

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INTRODUCTION

The position of a consultant in the planning of a new National Monument is a formidable one. This is the case because the planning and management personnel of the National Park Service (NPS) possess unusually high skill levels coupled with considerable land and people management expertise. Furthermore, NPS planners/managers are imbued with a strong management philosophy that has been under continuous development for over a century.

On the other hand, an agency hires a consultant because it requires expert advise from an independent source. In preparing the cave management recommendations contained herein, therefore, this consultant has assumed that the independence of his approach was considered an important asset by the NPS. The importance of an independent assessment of public access to El Malpais' extensive cave resources is further suggested by the following:

- 1) The establishment of the National Monument was strongly opposed by several national conservation groups; the reasons for this

opposition were centered on the inherent differences in NPS and Bureau of Land Management (BLM) management.

- 2) El Malpais is one of the few NPS units in many years to be created from lands transferred from another federal land management agency (BLM)); for this reason, NPS management of El Malpais will, in much more than a figurative sense, be ON TRIAL for the next five to ten years in this monument. The primary trial question will be whether the non-management approach of El Malpais by the BLM was preferable to the hyper-intense management that sometimes characterizes units of the NPS.
- 3) The management of El Malpais National Monument is likely to positively or negatively

influence the future establishment of other NPS units in New Mexico and the Southwest; in no event will the management of El Malpais result in a neutral assessment by national conservation groups and many elements of the general public; if the future growth of the NPS system in the Southwest is considered important, it may be crucial that the NPS management of El Malpais be creatively addressed, especially relative to the issues of cave and wilderness access.

The above assessments are, of course, the judgements of this consultant. However, the consultant is personally familiar with them because he played an early role in the National Monument's establishment. At that time (fall, 1985), representatives of the Sierra Club and Wilderness Society forcefully tried to dissuade him from working for the establishment of an NPS unit at El Malpais because the representatives felt the NPS would "overdevelop" the area. His response was that, with proper management, the NPS could provide for intensive public use while concomitantly

preserving the majority of the resource as wilderness and backcountry. The consultant's position has not changed; but neither has that of the Sierra Club and Wilderness Society. The question will, however, be definitively answered in the forthcoming preferred planning alternative of the NPS.

The above issues are being addressed herein because of the intimate linkages between them and the issue of cave access management.

CAVE ACCESS MANAGEMENT APPROACH

I

The primary management task of the consultant's contract was to address the critical issue of recommending which specific caves should be open to the public and under what conditions. This question, however, begs a more important question that might be termed a "management foundation" question: what is the mission of El Malpais National Monument and, therefore, what land/people management approach should guide the consultant in developing his cave management recommendations?

This question is climactic for the most fundamental reason: THE MISSION OF THE NEW MONUMENT IN COMBINATION WITH THE ADOPTED LAND/PEOPLE MANAGEMENT APPROACH WILL A PRIORI DEFINE AND DELIMIT THE ANSWERS POSSIBLE FOR ANY GIVEN LAND/PEOPLE MANAGEMENT QUESTION. This is to say nothing less than that mission interpretation and the adopted land/people management approach will largely shape the planning and management of El Malpais National Monument!

A likely response to the above assessment is that the mission of the new monument and the resulting management approach are defined in the enabling legislation and numerous NPS planning/management policy directives. However, this is only generally true.

El Malpais is defined in the enabling legislation as primarily a "natural area" with two objectives: 1) to preserve the Monument's natural and scenic resources while 2) providing for the enjoyment of those resources by visitors in a manner that leaves them "unimpaired" for future generations. This is the Congressionally mandated mission. However, the enabling legislation does not answer how the National Monument should be specifically managed to effect these ends.

Therefore, this consultant interprets the management flexibility imparted by the Congress and NPS management directives as broad policy statements intended to guide NPS management but not hamstringing it. The bottom line is that the staff of the National Monument has been directed to protect El Malpais while concomitantly providing for its development and use. Therefore, the primary management question is how to achieve the protection objective while simultaneously achieving the use objective.

This last question, protecting a resource while providing for its use, is not only the most fundamental of NPS management questions; it is the most fundamental human ecology question facing

humankind as a species. Upon its answer hinges the future of our planet and species. In a similar manner, the future of El Malpais National Monument hinges on how protection and use are balanced.

For this reason, it is critical that the land/people management "approach" to the planning of the National Monument's future NOT be presupposed or assumed. In the following, an attempt, necessarily brief, will be made to suggest the requirements of an natural ecosystem approach to the management of El Malpais National Monument. What is most important for the purposes of this report is that this approach is the basis upon which the consultant has based his planning recommendations.

II

The easiest way to protect a resource is to close it to visitor use. Conversely, the most efficient way to provide for the use of a resource by visitors is to hire development-oriented planners/engineers to design access highways, overlooks, towers, lodges, shopping malls and summer home subdivisions and to hire construction companies to modify the natural environment per the design developed by the planners and engineers. Neither of these approaches to the protection-use dichotomy is appropriate for El Malpais. The proper approach lies between the extremes.

What is the proper approach? The long-term management of a natural area such as El Malpais is impossible outside the framework of what might be termed "ecosystem management". This is because

natural areas are neither static places on a map nor unchanging artifacts of evolution. Rather, they are continually changing, developing, evolving systems of life. Although they can be characterized as being in equilibrium (i.e., homeostasis) with the climate and geology of their earth foundation, the equilibrium being referred to is dynamic as opposed to static. In this respect, it is similar to the physiological equilibrium that makes possible the maintenance of life in a human body: although the body can be described as supporting an equilibrium state, that state is certainly not static. Indeed, if the body were incapable of responding to perturbation (e.g., rapid growth from birth to adolescence; aging; a bacterial infection, etc.), physiological homeostasis would be a meaningless term for there would be no physiology to maintain. As living organisms, we are constantly changing; from the moment of our conception unto death, our bodies are adjusting to perturbation. Never are they static. And so it is with natural ecosystems.

Ecosystem equilibrium has meaning only if it is understood to be dynamic. This dynamic capacity of ecosystems to respond to external perturbation is termed "resilience":

Few systems which have persisted for extensive periods exist in a state of delicate balance, poised precariously in some equilibrium state. The ones

which are do not last, for all systems experience unexpected traumas and shocks over their period of existence. The ones which survive are explicitly those which have been able to absorb these stresses. THEY EXHIBIT AN INTERNAL RESILIENCE (emphasis mine).

Clark, W.C. and Holling, C.S.
"Toward a Science of Ecological Management"
Unifying Concepts in Ecology, 1978
Biological Science Publishing,
San Francisco

The above "resiliency" principle of ecosystem management suggests that the proper approach to the management of El Malpais will NOT involve the adoption of a "museum mentality" in which resource management is a passive function that simply protects. The resilience principle suggests that a degree of disturbance is, in a very real sense, necessary to the health of a natural ecosystem. This means that the ecosystem manager's role should be one of protecting the resource while concomitantly allowing for and, under certain conditions, even encouraging, disturbance compatible with a given system's evolutionary development.

Further, if a natural ecosystem management approach deserves the appellation, it will recognize that the management of people is not a separate function but rather is integral to natural ecosystem management. Why an ACTIVE approach to both the protection of natural ecosystems and to the management of people visiting those systems is necessary can be briefly suggested:

The over protection of natural ecosystems from wild fire from the turn of the century through the early 1980's resulted in massive fuel loading across millions of forested acres of the West. Until today an ecosystem manager must, at least if he is to avoid catastrophic fires, actively direct the prescribed burning of his resource in a slow, methodical manner (usually termed prescribed burning) that will require up to one-half century to return to its pre-civilization condition. Only in this way can the resource be transitioned from a sleeping fire bomb into a healthy pre-19th century "fire disturbance dependent" ecosystem while simultaneously remaining beautiful, productive, green. The alternative is landscape-large fires of terrific intensity which often return a system to the earliest stages of secondary succession; such fires also identify the land manager as a passive caretaker.

The above example is meant to suggest that ecosystem management is not caretaker management. It is not static or passive management. It is ACTIVE management. Unlike active timber, grazing, or even wildlife management, however, its objective is not to grow timber, cows, or raise wildlife; its objective is to maintain and, where necessary, enhance selected natural ecosystems in a world dominated by species Homo sapiens sapiens and his works. Although the fact is rarely acknowledged, this objective is a far more difficult undertaking than is growing timber or cows or wildlife. And for good reason: whereas a timber, grazing, or wildlife manager must be expert in a single management

field, the ecosystem manager must be a "jack-of-all-trades" ecologist with a functional knowledge of everything from wild fire dynamics to human ecology.

III

This consultant recommends that the NPS adopt an ecosystem approach to the management of El Malpais' cave systems. If this is to be achieved, the National Monument must be viewed as as a complete and interconnected land system rather than an assemblage of isolated resources. Relative to cave management, an ecosystem approach will necessitate that the cave management function have inseparable linkages to wilderness, backcountry, intensive visitor use, and overall National Monument management. In other words, if an ecosystem approach be adopted, cave management decisions will not be isolated from intensive visitor use decisions, wilderness and backcountry management decisions, and overall National Monument management.

The above ecosystem management recommendation has complicated rather than simplified the completion of this contract. The easiest way to fulfill the contract requirements would have been to simply state which caves should be closed to the public, which should be open and to present reasons why. However, whereas such an approach would fulfill the requirements of the contract and would be readily understandable, such an autecological (analytic) approach would be incomplete. This is because land management is

at its heart a synecological (synthetic) function. Further, whereas autecological management works for sustained yield management of selected resources (timber, grazing, wildlife, etc.), it is more often than not anathema to the management of synecological (interconnected or community) concepts such as that of a "natural area" or a wilderness.

Visitor Use Management Philosophy

Ecosystem management is at its heart a synecological (community) approach to land management; that is, it is oriented toward the management of the resource as a whole rather than toward any single part of that resource. In the context of El Malpais National Monument, this means that visitor use must be a subset of resource protection rather than vice versa. In a National Monument dedicated to the protection of a precious natural resource, this is probably the only valid approach PROVIDING the natural area manager places visitor use in proper ecosystem perspective.

Visitor use is not only a legitimate function within natural areas such as El Malpais, it is a Congressionally mandated function. For this reason, visitor use tends to be the issue that the back of natural ecosystem approaches to land management. This is because species Homo sapiens sapiens is too often viewed by natural area managers as an alien addition to natural ecosystems. That is, people are considered to be the "enemy" from which the ecosystem manager must protect his resource.

It is for this reason that this report will briefly consider how visitor use might be integrated into a natural ecosystem approach to National Monument management.

Although the typical view of the natural area manager of humankind as the "enemy" of his resource is more than understandable, given the realities of the late twentieth century, in point of fact, it is a fallacious conclusion. For the "man is enemy" view must uncritically presuppose that: 1) people fell out of heaven equipped with the accoutrement and mentality necessary for civilization; or 2) that humans are aliens who evolved on some world other than earth. Both presuppositions are at best spurious.

If species Homo sapiens sapiens evolved into people from less glamorous forms of life or even if humankind is a part of the Creation of God, humankind has decidedly "natural" origins. For the natural area manager, this means that what is unnatural about species Homo sapiens sapiens is NOT human biology nor the level of human social organization termed hunter/gatherer.

If Man qua Man is, biologically speaking, a natural organism and the hunter/gatherer social systems are natural levels of human social organization, what is less than natural about species Homo sapiens sapiens? The answer is higher levels of human social organization that are collectively termed "civilization". The reason for the "unnaturalness" of civilization is its decidedly artificial ability to concentrate tremendous numbers of humans into

small geographic units coupled with its devastating impact upon most other life forms on the planet.

If the above approach be adopted, it means that the natural area manager's "enemy" is shifted from species Homo sapiens sapiens and individuals of that species to the higher levels of human social organization (i.e., civilization), the artifice of that civilization (both physical and psychological), and the environmental consequences of civilization's artifice upon the face of the land. In a land unit in which resource protection AND visitor use are mandated in tandem by federal law, this is a critical management distinction that can legitimately allow for both missions without contradiction. On the other hand, however, the distinction would also tend to strongly suggest that "civilized development" within the unit should be strictly delimited.

The natural human origins versus civilization distinction further suggests that the natural ecosystem manager must become appreciative of the intimate, three million year old relationship of people to natural areas. Also, that he must actively strive to incorporate human use into natural area management. Also, it will suggest that he should utilize human ecology, anthropology, and archeology to develop the only ecologically valid yardstick of how much human use should be permitted in wilderness -- namely, impact consistent with that produced by humans at the hunter/gather level of human social organization.

This last issue has other important consequences: the use of the hunter/gatherer level of human social organization as a yardstick to objectively gauge how much visitor use impact can be permitted in wilderness can also be utilized to assist with the development of a "wilderness experience" yardstick. For more than any other, it is the hunter/gatherer level of human social organization that wilderness users are, despite the high tech backpack equipment that typically accompany them, emulating.

Thus, when the wilderness user speaks of solitude, he/she is expressing a desire to experience a taste of the world lived by hunter/gatherer peoples. And not only in terms of environmental naturalness; also in terms of human population densities. This aspect of the ecosystem approach being here recommended is likely to be the closest an ecosystem oriented manager is ever to come to an objective measure of solitude and the related human experience aspects of wilderness.

All of the above equates with a dynamic, creative attempt to balance human use with the dynamic maintenance requirements of natural ecosystems. That this balancing act is critical is undeniable: except in the rarest of instances, natural area management is predicated upon giving human visitors the opportunity to experience lands "untrammelled by Man"! This does not, of course, mean that he must accomodate unlimited numbers of visitors; that is virtually never the intent of the enabling legislation that creates most natural areas. What it does mean is that ACTIVE

people management is a critical part of any ecosystem approach to natural area management. The cave management recommendations that follow will present examples of active visitor use management.

CAVE MANAGEMENT RECOMMENDATIONS El Malpais National Monument

In the following, a brief summary of the consequences of an ecosystem management approach will be outlined. Because the consultant views cave management as necessarily related to the larger issue of the management of the National Monument as a unit, he will not restrict his recommendations to the caves themselves; this is because he recommends that the management of individual caves be directed and shaped by the general management of the National Monument as a unit. However, because his resource inventory is restricted to the the Ice Caves USGS quadrangle, his recommendations will be restricted to the geographic area delimited by this quadrangle.

RESOURCE CLOSURES

Resource closures are viewed by this consultant as a sign that active people management has failed. In instances of clear failure, closures must, of course, be instituted. However, at this point in the management of El Malpais National Monument, few cave closure recommendations are believed to be necessary and then only because a sensitive resource is easily accessible and too well known. For this consultant, the closure of a resource should be

effected only when nothing else works and sufficient scientific data exists to justify the closure. Although the consultant has unhesitatingly recommended closure in cases where warranted (e.g., Jornada bat cave) and will do so in several instances in this report, his normal management approach is to utilize management finesse in the form of "active people management" to achieve resource protection objectives.

The reasons the consultant takes this position are straightforward: visitors do not come to a resource like El Malpais to spend an hour reading lists of places they are prohibited from visiting. Indeed, he could write a lengthy treatise detailing that, at least for a great many people, natural and wilderness areas are attractive precisely because these environments represent one of the few remaining places on the planet where an individual can be confronted by real freedom. Freedom to appreciate, enjoy, be challenged by; even by freedom so potent it is capable of taking the visitor's life.

This is to say that wilderness and individual freedom are closely linked. And it is the precise reason why this consultant will recommend cave (or resource) closures only in those instances where the closure is imperative for resource management purposes.

Specific Cave Closure Recommendation:

El Caulderon Bat Cave

other names: usually referred to as simply Bat Cave;
Sandia Grotto name for cave is Trucketts

legal description: T. 9 N.; R. 11 W., Section 33, the southeast corner of the southwest corner.

resource description: for cave resource, see resource inventory. This cave supports a small colony of Mexican freetail bats (Tadarida braziliensis mexicanus) believed to number up to 50,000 (?) individuals. This colony is known to have been dramatically larger, possibly as large as two to three million individuals (verbal communication with Dr. Alton Lindsey) until guano mining severely disrupted the colony in the early 1950's. Independent confirmation that this cave was once considerably larger is suggested by the guano lines on the cave walls which are four and more feet above floor level.

Since the guano mining, the bat colony has been further disrupted by curious visitors entering the cave, apparently to witness a bat colony in its habitat. Assuming the El Caulderon bat cave is a maternal colony, such visitor activity during late Spring would be damaging in the extreme to the recovery (and even continued existence) of the bat population.

management recommendation: immediate closure of this cave to all visitor entry for the period extending from April 1 through November 1. THIS RECOMMENDATION DOES NOT INCLUDE THE PROHIBITION OF VISITORS VIEWING THE BAT FLIGHT FROM OUTSIDE THE CAVE. Visitor viewing of the Tadarida flight at a reasonable distance from the cave entrance (50 feet) can and should be continued. What is

required is the denial of underground access to the cave of all visitors (and this includes park staff) for reasons of resource sensitivity and safety. The only exception to this prohibition should be researchers and a restricted number of students entering for study purposes.

Last, the cave should be evaluated for population, colony type, and resource significance by a mammologist at the earliest possible time.

justification: this cave is located on a jeep trail specifically developed for the exploitation of this cave. Even more disturbing, local persons are aware of the cave and its bat population and these persons enter the cave with sufficient frequency to prove damaging to the Tadarida colony.

When a sensitive resource is both readily accessible and its existence is known to be threatened by human induced disturbance, there is no responsible alternative to a closure recommendation. This conclusion is further reinforced by the consultant's conclusion that in the case of a significant Tadarida colony, public closure during the entire period of Tadarida residency is warranted even in the most remote and little known sites.

VISITOR SAFETY CLOSURES

The consultant is recommending few cave closures for reasons of visitor safety/danger. This is not because El Malpais' caves

can be considered utterly safe for public use. The fact is that rock fall from the ceilings (and to a lesser degree from the walls) of the caves is an omnipresent possibility in virtually all El Malpais caves. Indeed, if a safety specialist were looking for reasons to close every cave in the National Monument, he would rarely have to look further than the issue of rock fall.

Although the frequency of rock fall from cave ceilings is NOT high, rock fall can, does and, most assuredly, will occur in the future. Thus, although the likelihood of a visitor being injured or killed by a rock fall is low, it must be recognized by management that completely protecting visitors from rock fall is impossible. This is especially true for the backcountry caves.

In the instance of those caves likely to be chosen for intensive visitor use, it will be possible to substantially reduce rock fall danger; however, it is most doubtful that the danger can be absolutely eliminated even in these caves.

management recommendation: though risk levels are low, the omnipresence of the rock fall danger should be incorporated into NPS management. Certainly, backcountry and wilderness users should be warned beforehand of the danger and frankly advised that there is no way the NPS can assure their safety; therefore, if backcountry and wilderness users, if they enter caves at all, must enter them at their own risk.

In intensive use areas, the rock fall danger can be greatly lessened by restricting the number of caves available for intensive use. In addition, the ceilings of proposed intensive use caves should be professionally evaluated by a geologist and visitor use facilities designed around his/her safety recommendations.

justification: rock fall is a low risk but omnipresent danger for anyone entering El Malpais' caves. The danger should be acknowledged by the NPS. The above recommendation is an attempt to appropriately address the issue.

Visitor Injury Danger from Falls

In addition to the rock fall danger, a second omnipresent risk factor is the extremely broken, jagged, and sometimes razor sharp rock floors that typify El Malpais' caves. This is an environment that inherently carries high risk to visitors of injury from falls. Although this danger can be eliminated in intensive use areas, it must be assumed for backcountry/wilderness cave use. This is still another reason to make all backcountry/wilderness use a "enter at your own risk" situation.

Year-Round Hypothermia Danger Associated with Cave Use

The above danger is made especially critical as a consequence of the extreme low temperatures of El Malpais' caves. For example, the consultant encountered in early July, 1988 temperatures of 36 degrees in caves up to one mile in length with 30 foot high ceilings and 40 foot wide passages. Becoming disabled in a cold

cave such as this in summertime (when visitors would likely not be wearing proper clothing) could quickly induce severe hypothermia risk to an injured person even if accompanied by friends and/or associates. Cave users should be warned of the year-round hypothermia risk associated with the use of El Malpais caves.

Cave Specific Management Recommendation:

La Manchia Cave

other names: Ice Chute Cave

legal description: T. 9 N.; R. 12 W., Section 25, the northeast corner of the northwest corner.

resource description: please see inventory report. This is one of El Malpais most spectacular and massive ice caves. It is also, for the unwary, one of its most dangerous.

Most El Malpais' ice caves present no special cave risks beyond a heightened hypothermia risk in the event of disabling injury. However, the entrance to La Manchia is a steep ice chute that drops at an initial angle of 65 degrees a total distance of 56 feet. A visitor could fall into this cave with considerable ease, especially during the summer months when he/she would not be expecting slippery ice at the cave entrance. Anyone falling into this cave would be certain to sustain serious or fatal injuries.

management recommendation: this cave should be closed to visitor entry. Selective entry could be allowed on a permit basis to persons with sufficient experience and ability to use a rope for

support while they gradually lower themselves into the cave. Such use would not be detrimental so long as visitor use was infrequent and special care was taken NOT to trample the fragile vegetation at cave entrance.

Crampon (or similar ice assist) use in this cave should be prohibited to prevent ice scarring.

INTENSIVE USE AREAS

This consultant will recommend few caves for intensive visitor use. Further, the caves recommended for intensive use will be concentrated in the vicinity of the existing commercial facilities near Bandera Crater and on the cave systems associated with Lava Crater and El Cauldron. This recommendation is made for the following reasons:

- 1) to geographically concentrate intensive use areas for purposes of cave resource protection; this approach is standard operating procedure in all NPS units in which the consultant has worked or visited;
- 2) to reduce the exposure of visitors to the cave rock fall danger in intensive use areas; the rock fall danger was discussed above; reducing exposure by restricting the number of intensive use caves appears wise for reasons of safety;

- 3) to geographically concentrate intensive use areas for purposes of development economics; intensive use concentration appears wise in the fiscal environment in which the NPS must operate;
- 4) to expedite the federal acquisition of the Candelaria and related properties; the 1969 NPS study of El Malpais stated in no uncertain terms that the Candelaria property was essential to the viability of the National Monument; this consultant agrees with this assessment; however, unless park planning verifies the centrality of the Candelaria property to the development of the National Monument, especially given the fiscal environment of the late 1980's, it is likely its acquisition will be delayed;
- 5) to geographically concentrate intensive cave use areas for purposes of cultural resource protection and to reduce Native American concerns that the National Monument will adversely effect past and present religious practices; following the furor and chaos created by this consultant's locating an Anasazi pottery cache in a cave, it seems prudent to carefully delimit intensive use areas to as small a geographic area as is possible;

- 6) to retain or even enhance the El Malpais wilderness boundary recommended by BLM in 1981 so as to prove false the claim by the Sierra Club/Wilderness Society that the NPS always "overdevelops" its land resources; whereas this claim is believed to be overstated by this consultant, as previously suggested, extreme care should be exercised in the development of this National Monument relative to balancing intensive use, backcountry, and wilderness;
- 7) to facilitate the retention of El Malpais as a "blank place on the map"; this unique resource has survived for nearly nine decades into the 20th century as an unknown land; in a field sense, it has remained a place of deep mystery and wonder-filled enchantment despite the march of civilization across virtually every other corner of America; this rare aspect of El Malpais should not be destroyed by turning the National Monument into a known quantity; many of those portions of El Malpais possessing outstanding cave resources should be managed in a manner that retains this rare "place of mystery" mystique.

The above are reasons for restricting intensive use areas to a geographically small portion of the National Monument. However, the small area recommended for intensive use -- the Candelaria and adjacent properties -- possesses superb cave resources, outstanding surface features, and beautiful scenic views. These features include the existing commercial ice cave, Dripping Lava cave, Lichen cave, Bandera Crater, Lava Crater, Candelaria ridge, and much more. Thus although this recommended intensive use area represents but a small portion of El Malpais, it is an unusually rich portion.

Specific Cave Management Recommendation:

Dripping Lava Cave

other names: ?

legal description: T. 9 N.; R. 12 W.; Section 25, the northeast corner of the northwest corner.

resource description: Dripping Lava Cave is a large lava tube on the Lava Crater tube system. Length is 1,200 feet. Cave height is as high as 75 feet from floor to ceiling; cave width is as much as 50 feet. This is by any lava cave standard an impressive resource and decidedly representative of El Malpais largest lava tubes. In addition, the cave is also a perennial ice cave (also see cave system inventory report).

management recommendation: Dripping Lava cave is, given existing knowledge, the best candidate for El Malpais' intensive

use "show cave". Although the cave would require minor development for purposes of visitor access and safety and the cave ceiling should be safety evaluated by a geologist, no better large cave exists in El Malpais for intensive use development within close proximity to the commercial ice cave.

In addition, this cave lies but four hundred yards north of Lava Crater, which is suitable for development as a scenic vista and interpretative trail destination.

Cave Specific Management Recommendation:

Anasazi Sinks

other names: ?

legal description: T. 9 N.; R. 11 W.; Section 33, the southeast corner of the southeast corner of the northwest corner.

resource description: the Anasazi Sinks are two spectacular, interconnected collapse structures on the El Caluderon lava tube system. Sink depth is up to 60 vertical feet for both structures. The sinks are connected by a cave bridge structure approximately 40 feet in length. Like Dripping Lava cave, the Anasazi Sinks are believed suitable for intensive visitor use development.

The Anasazi sinks are equalled by only one other sink structure in El Malpais. So long as visitors simply view the sinks from the rim, no resource values will be compromised. If consideration is given to constructing a stairway into one of sinks

in order to allow visitors access to the floor of the sinks (which at present can only be entered technically with ropes), careful study of the impact of this action on the resource would be required.

General Management Recommendation:

One-Way Scenic Loop Drive from the (existing) Candelaria Trading Post (area) to Lava Crater/Dripping Lava Cave to El Caulderon and Caulderon Bat Cave to the Anasazi Sinks and Return

Loop Drive Routing: please see attached map #1.

Loop Drive Route Description: El Malpais National Monument requires a short loop drive (or alternative) whereby most visitors can conveniently and quickly experience a representative sampling of the National Monument. Further, the representative resources should be as spectacular as is possible within the framework permitted by the management objective of concentrating intensive visitor use in a small geographic area(s).

In an attempt to adhere to these parameters, the consultant recommends that consideration be given to routing a loop drive from Candelaria's trading post (also, please see Map #1):

- 1) east along the existing 4x4 road and the edge of the lava to the vicinity of Dripping Lava cave;
- 2) thence south and west along the north flank of Lava Crater and through the saddle to the existing 4x4 road;

- 3) proceed on this road south southeast to an intersection with the Cerro de Jaspe road
(PLEASE NOTE: if the loop drive is to remain entirely within the National Monument, a short stretch of road will require rerouting);
- 4) proceed north on the Cerro de Jaspe road to El Caulderon.
- 5) turn south on the existing 4x4 road toward the monument boundary.
- 6) near the monument boundary, turn east;
approximately one-half mile of new road will be required to access the Caulderon Bat cave and to link up with an existing 4x4 access road to this cave.
- 7) proceed east, north, and west from Caulderon Bat cave on the existing bat cave access road to the Anasazi sinks.

PLEASE NOTE: at the Anasazi Sinks, Highway 52 is only five hundred yards (or approximately one-third mile) to the north. However, it is here assumed that a loop drive is most desireable for interpretative, resource, and management purposes:

- 8) a new 1/4 mile segment of road will turn west here
and link up with the existing road in the northwest corner of Section 32.

- 9) thence west northwest on this existing road to the northwest corner of Section 30.
- 10) a new one mile section of road would be routed west along the north side of La Tetra (Cerro Candelaria), across a (small) aa lava flow, along the south side of Candelaria Ridge and link with the initial portion of the Drive.
- 11) the loop drive would return visitors to what is today the area of Candelaria's trading post.

The above fifteen (15) mile loop drive would provide El Malpais visitors with a quick, beautiful, and even exciting introduction to the new National Monument. If the loop drive road were a low speed limit, "one-way" paved road, it could be delicately routed through the resource in a manner that need not create landscape scars while providing convenient access to thousands of visitors in a manner in keeping with the area's enchantment and mystery.

Another big plus for the loop drive routing is that it could be constructed in two segments: the first from Candelaria's trading post to the Anasazi Sinks; the second from the Anasazi Sinks back to the trading post area. In the interim between the two construction phases, a dirt link road with State Highway 53 could be utilized to exit the partially constructed loop drive.

General Management Recommendation:

That portion of the National Monument Termed East of Rendija in this Report should be included within the El Malpais Wilderness; Management of East of Rendija should reflect Wilderness rather than an Intensive Use Management Orientation.

East of Rendija is a spectacular portion of the Bandera lava tube system. It is located a little over one mile immediately east of Cerro Rendija in T. 8 N., R. 12 W. The consultant is aware that the NPS is strongly considering that portion of the Bandera cave system named "East of Rendija" for development as a second intensive visitor use area. Access will be provided by a loop road around Cerro Rendija.

The consultant must readily admit that this portion of El Malpais is spectacular and very special; a park planner has described "Four Window Cave", which is but one spectacular cave located in the area, as the "Old Faithful" of El Malpais. There is truth to this statement. Nonetheless, the consultant must recommend against the intensive development of East of Rendija.

As suggested above, El Malpais has survived as a land of mystery and enchantment for nearly nine decades into the 20th century. This is no small achievement for any land resource in America; it is nothing less than incredible for a resource lying adjacent to the most traveled east-west Interstate highway in the United States and within a one hour drive of New Mexico's largest city!

Aldo Leopold once said that he would hate to grow up in an America "with no blank places on the map". But this is precisely the America our children are inheriting! We live in a land delimited by concrete, rigidly defined by property boundaries, and protected by increasing numbers of policeman. We live in a land without land-secrets. We live in a land incapable of striking us with wonder. In a land that is being systematically reduced to a known quantity. Why? Too much of our way of life is conveyor belt banal; too much of it is too easily available; too much is too convenient to too many.

Intensive visitor use developments in the East of Rendija portion of El Malpais would continue this inexorable trend toward the calculated impoverishment of our nation. Although it is true that more people would see East of Rendija if developed, this consultant does not believe that "quantity of visitors" should be the ultimate yardstick by which a National Monument's visitation should be measured. He would rather identify "quality of visitor experience" as that yardstick! Further, he would raise the question, why must the "Old Faithfuls" of the late 20th century share the fate that has befallen the "Old Faithfuls" of the 19th?

Consider, for example, that when Yellowstone's Old Faithful became situated in the heart of the park's "intensive use area", it was the 1880's and traveling to Yellowstone National Park by any means was a once in a life-time experience if one was lucky and

one's last life experience if not. Today, all has changed: accessing the park is now convenient, Old Faithful is circumscribed by pavement, and the NPS is a crowd control manager. Something precious has also been lost: the distinction between the urban areas where the tourists live and the natural wonder they travel a thousand or three thousand miles to witness. In short, Yellowstone's Old Faithful, a world known natural wonder, has been reduced to a banal crowd pleaser.

East of Rendiya remains as little known today as it was in the 1880's. Indeed, it is entirely possible that, given the likely use of the area by Native Americans for religious and hunting purposes a century ago, knowledge and use of East of Rendiya may have been far more widespread in the 1880's than it is today.

Today, few persons visit East of Rendiya and those that do so require a guide. Although the Bandera tube system does not not require a guide to locate, most persons visiting the area would not think of going without a guide because of the ease with which the visitor can lose his way in the lava.

One might, at first thought, believe the necessity for a guide is an encumbrance. This is not necessarily the case. This consultant has led Sierra Club groups who were decidedly experienced hikers into East of Rendiya. However, instead of proving a negative factor in their experience, the need for a guide appeared to heighten their perception that this was indeed a "special place", a place where the visitor is encompassed by

underground mystery, lost in quiet peace, and can be a witness to land enchantment.

This consultant is, in short, making a recommendation that East of Rendija not be substantially altered from its present condition. It is a plea to keep the area a blank place on the map by utilizing NPS and local GUIDES as the means to bring the public to the "Old Faithful" of El Malpais!

There can be no doubt that this approach would reduce the number of people who see this Old Faithful. However, in the late 20th century -- at this time of hyper-convenience and mass access -- is this not the time for the NPS to provide visitors with at least the possibility of participating in a genuine adventure? No, not like the potentially life-threatening trip to Yellowstone in the 1880's. Rather one like the following:

My son accompanied me on much of my El Malpais field inventory. When he chanced to meet another thirteen year old boy in Grants, Matt asked if he could invite Josh to spend a day in the field with us. I agreed. Josh accompanied us. Into the caves East of Rendija. At the end of the day, the boy was wonder-filled, literally, and enthusiastically described the experience as one of the best in his life.

The land had impacted -- really impacted -- a thirteen year old whose life-experience had been up to that time delimited by the man-made wonders of Albuquerque and its electronic counterparts. But much of this experience was predicated on the boy's awareness that he was not only in a place of great beauty but one that few people had previously visited. This fact seemed to awake in him sensitivity for realities for which there is little use in the late 20th century: his sense of adventure and his sense of mystery. As a result, this boy's East of Rendija experience will likely remain with him the rest of his life.

Won't it be a pity if he returns to the big caves with his son or daughter in twenty years only to find the caves transformed into a "scenic" shopping center? Wouldn't it be wiser to retain East of Rendija as an experience "never to be forgotten"? Such experiences in our present world are hard to come by.

In addition to retaining East of Rendija as a special NPS management area, the use of at least guides would provide the NPS with the opportunity for Acoma, Zuni, and other Native Americans to serve as tour guides into East of Rendija. Given the former use of the area by Native American peoples, Native American tour guides could considerably enhance the experience of visitors while giving the Native Americans a rich opportunity to help visitors to understand and appreciate American Indian culture and values.

If the East of Rendija area is included in what will eventually become the El Malpais Wilderness, and that is this

consultant's recommendation, the intensive development of this area will have to be scaled back considerably. Most important, the joint NPS/BLM idea to construct a loop road around Cerro Rendija should be dropped. Furthermore, the reason for this recommendation is not only to preserve the "once in a lifetime" quality of East of Rendija, it is to prevent the imperative need for closing Navajo cave (and other ice caves) to the public in the future. However, before the consultant can further addressing the Rendija loop road idea, the Navajo cave situation must be considered.

Specific Cave Management Recommendation:

Navajo Cave

other names: Ice Crystal Cave, Indian Crystal Cave

legal description: T. 8 N.; R 12 W.; Section 23, the
northeast corner of the northwest
corner of the northeast corner.

resource description: this is one of the most spectacular ice caves in El Malpais. Indeed, if a single "walk-in" ice cave had to be identified as the most spectacular, Navajo would be that cave (also see resource inventory). Further, accessing the cave presently requires only a fifteen (15) minute walk from the vehicle parking area. Given these two facts, it is not hard to understand why Navajo -- with the exception of Candelaria's commercial ice cave -- presently receives the highest visitor use of any ice cave in the National Monument. To this fact must then be added one

more: Navajo cave is not an insensitive resource; certainly, it is not a resource that can be recommended for intensive visitor use.

On the other hand, Navajo cave is one of the reasons El Malpais became a National Monument. For the NPS to close this cave would not set a good precedent, especially in the absence of monitoring data in support of such a closure. Therefore, it has been assumed by the consultant that recommending a means of keeping the cave open to the public on a limited basis is the preferred alternative.

management recommendation: this consultant submitted a "preliminary" report to El Malpais Superintendent Doug Eury this past March 27 expressing serious concern that Navajo cave's ice crystal formations were being damaged by the building of fires and the carrying of Coleman lanterns into the cave. The reason for the concern was the fear that prodigious numbers of BTU's were being introduced into what the consultant then believed was a decidedly fragile, cold-dependent hydrological-geological system. At that time, he fully expected that the only recommendation that could be made relative to the public use of this cave was closure.

Since that time, the consultant has seen hundreds of ice caves (most decidedly unspectacular) and reviewed his photographs of Navajo cave's ice crystal formations. Although damage has without question occurred within the past several years (e.g., vandals broke off a decades old wooden ladder protruding out of an ice

filled vertical shaft; ice has been scooped out of the ice crystal wall in two places), the ash deposits on the surface of the ice that the consultant believed had been produced by recent fires were actually produced by someone spreading ash over the ice in order to improve footing for purposes of cave visitation. The Coleman lantern problem remains but this is one that can be readily addressed through education and, as necessary, law enforcement.

In short, the consultant no longer believes the public closure of Navajo cave will necessarily prove imperative. However, this certainly does NOT mean that he can recommend intensive visitor use of the site. The cave is not suitable for such use. One human body is estimated to produce a heat flow of 150,000 gram calories per hour -- the equivalent of a 175 watt light bulb. Needless to say, if thousands of visitors were to introduce thousands of hours of such thermal inputs into Navajo cave's closed hydro-geological system, the result would likely be the melting of the ice crystal formations which most people travel to the cave to witness.

On the other hand, Navajo cave has received constant (even if low level) visitor use for well over half-a-century. For example, writer J. Frank Dobie mentions visiting this ice cave in his 1920's classic Western book, Apache Gold and Yaqui Silver as part of his investigation of the Lost Adams Diggings. If local people and New Mexico cave enthusiasts know of any El Malpais cave other than the commercial ice cave, it is Navajo cave.

Furthermore, the consultant is convinced that the primary ice formations (i.e., those which are responsible for maintaining the cold necessary for the formation of the secondary formations such as ice crystals) are more massive and, therefore, less fragile, than previously suspected. Indeed, if this were not the case, the this cave's ice formations would NOT have quickly recovered from hundreds of years of use by Native Americans as a water source. That this use of the cave occurred is hardly debatable: the inner entrance to the main ice chamber is covered in the ash of countless fires whereas the reported occurrence of ollas and related pottery vessels (as well as the known occurrence of pottery sherds) also suggests that the cave was utilized as a water source by Native Americans. When to these facts are added:

- 1) the presence of a late 19th or early 20th century wood ladder protruding from an ice filled vertical shaft***, which strongly suggests to the consultant that the shaft has filled with ice within the past fifty to one hundred years;

*** NOTE: it is rumored that this ice filled shaft was drilled by a miner searching for the Lost Adams diggings. However, the tailings from such an activity are absent. Further, although the square shape of the shaft are cited as support for this argument, an identical square shaft filled with ice is located near the entrance to this cave and the consultant has seen similar square "shaft-like" formations in other caves that also lack tailings. It is the judgement of the consultant that the ice filled vertical shaft in Navajo cave may be the entrance to a lower level of the tube system; in other words, that there is a completely ice choked cave lying under Navajo cave.

2) and the reports by locals and its confirmation by photographs that the ice crystal formations of Navajo cave regularly wax and wain, with the primary variable being climatic conditions.

The consultant's conclusion is that Navajo cave is -- to an undetermined but substantial degree -- a resilient resource capable of rebounding from even the severe heat inputs of fires intentionally built to melt ice. If this were not the case, Navajo Cave would not have rebounded in fifty to one hundred years from centuries of use by Native Americans as a water source, much or most of the water of which was obtained through melting the cave's ice.

For the above reasons, the consultant has concluded that although Navajo cave should NOT be considered for ANY type of intensive visitor use, he strongly believes that this is (to an undetermined but substantial degree) a resilient cave resource that can likely sustain low to moderate levels of backcountry and tour guided visitor use without damage to the resource. However, until a monitoring program is instituted and hard data is available on the impact of visitors on this cave, visitor use levels should be held to existing levels. The consultant estimates this use at a maximum of 1,200 visitors per year.

NPS personnel have expressed a (preliminary) judgement that Navajo Cave should be immediately closed to the public for reasons

of resource sensitivity. This consultant does not concur with this conclusion. There are a number of reasons:

- 1) Navajo Cave is a known and visited cave. For the NPS to close the cave to visitor use within less than a year of the establishment of the National Monument would at best be precipitious. The existing visitor use problems with Navajo can be addressed though management actions PROVIDING visitor use levels from April through October do not substantially increase.
- 2) The primary management question that should be addressed for the management of this cave is "how should visitor use levels be controlled?" rather than whether or not the cave should be closed to the public. It is the recommendation of the consultant that the "preferred" method of control be through increasing the difficulty of access to the cave. Increasing access difficulty should take two forms:
 - A) much of the four-wheel drive access road to the cave should be included in the the El Malpais Wilderness. If this action were taken, a new trail could be routed in such a way that the round trip hike to the existing trail head was five (5) miles

(please see Map #1). A five plus mile hike into Navajo would serve to dampen the use of the cave by the public.

B) in addition, the NPS should ENCOURAGE the use of Navajo cave ONLY on a "guided tour" basis; if this management approach were utilized, visitor numbers could be strictly controlled at a specified threshold of, for example, 150 persons per month.

C) although uncontrolled public use would not be expressly prohibited, that use should be indirectly discouraged. This could be accomplished by:

a) intentionally failing to identify the location of this or any ice cave other than the existing commercial ice cave on NPS maps, brochures, etc.

b) removing the rock cairn trail from the existing trail head at the east end of Little-Hole-In-The-Wall so that locating Navajo cave could not be readily effected by persons unfamiliar with the resource.

If the above recommendations were instituted, Navajo cave could remain open to the public while the impact of visitor use on the resource declined.

The above recommendations are an attempt to balance resource protection and public use in a manner that would permit the NPS to effect both. Further, like the East of Rendija portion of the Bandera tube system, the management of Navajo cave in this manner would further build the mystique of El Malpais as a place of mystery, enchantment, specialness.

Management Recommendation:

Rendija Loop Road:

Now to return to the intensive development of Cerro Rendija and East of Rendija areas: if a loop road is placed around Cerro Rendija, most park visitors will pass by the Navajo cave trailhead. If this happens, and as word leaks out of the spectacular nature of Navajo cave, visitor demand to see the cave would result in one of two consequences: public closure of the resource, resource damage, or both.

A loop road would also have other consequences:

- 1) much of the road would be built within what was proposed as wilderness by the BLM in 1981. For the NPS to construct a road in a (previously) proposed wilderness will fulfill the overdevelopment expectations of the Sierra Club/Wilderness Society for an El Malpais managed

by the NPS. In recent months, the consultant has encountered very stiff, determined opposition to NPS management of other outstanding resources in New Mexico from a wide range of persons PRECISELY BECAUSE THESE PERSONS BELIEVE THE NPS CONSISTENTLY OVERDEVELOPS ITS MANAGEMENT UNITS. He, therefore, strongly advises that the NPS not further strengthen this perception by developing a road in a portion of the National Monument previously proposed for wilderness by the BLM. The need for intensive visitor use areas can be adequately addressed by concentrating such development areas on the northwest corner of the National Monument and along State Highway 117 on the east.

- 2) a Rendija loop road area will not only funnel visitors toward Navajo cave, it will concentrate visitors in that portion of the (future) El Malpais Wilderness with the most unique as well as the most fragile resource values. This is to say that Navajo cave is not the only fragile ice cave or sensitive resource in the vicinity of East of Rendija. To concentrate visitors in this portion of the National Monument is to not only invite resource management problems with the

area's caves; it will also result in the certain degradation of one of America's most unique wilderness resources.

- 3) the East of Rendija and adjacent cave resource areas should not be managed as casual visitor use areas. The casual use of these spectacular resources will simply result in their reduction to known quantities in a world brimming over with known quantities. East of Rendija and adjacent areas should be managed in a manner that retains -- rather than destroys -- the inherent mystery and stark sublimity of this volcanic landscape.

The consultant believes these issues can be addressed by:

- 1) rerouting the proposed loop road to the north of Cerro Rendija (please see map #1);
- 2) declaring that the loop road will remain a 4x4/ high clearance vehicle road that will never be paved;
- 3) lengthening the foot trail distance to the western edge of the East of Rendija to no less than two (2) miles one way (please see map #1);

- 4) closing that portion of the existing loop road between the Lava Wall and the existing Little-Hole-in-the-Wall access road (please see map #1).
- 5) if the consultant's recommendation to provide access to East of Rendija primarily with NPS and local guides, the existing rock cairn trail into Big Window Cave should be removed.
- 6) as with Navajo cave, East of Rendija would remain open to backcountry use by the public; however, that use would be cross-country and require higher skill levels than would generally be possessed by typical hikers.

The above recommendations are carefully designed to provide public access to East of Rendija -- but in a manner more in keeping with retaining the wilderness and "land of mystery" values of the area.

Further, and most important, THE NPS WILL NOT BE CREATING THE VERY CONDITIONS THAT WILL MANDATE FORMAL RESOURCE CLOSURES ON THE MONUMENT'S MOST OUTSTANDING CAVE RESOURCES. The creation of such conditions would only foster an increase in the number of policeman required on the staff of the new National Monument and a keen perception of NPS failure by an important segment of that portion of the public concerned with federal land management.

The most likely response to the above proposal is that everyone who visits the National Monument will not be able to see the "Old Faithful" of El Malpais, Four Window Cave. This is true. Everyone will not be able to witness what may be the single most spectacular cave in El Malpais. But this is as it should be. The alternative is turning the East of Rendija area into a "scenic shopping mall" where visitors view resources with as much sensitivity as a shopper on a buying spree: although the buying is exciting at the time, six months later few shoppers remember little other than the bills generated by the day of excitement! El Malpais' East of Rendija area deserves a better fate than this.

Management Recommendation:

Little-Hole-In-The-Wall and Cerro Encierro 4x4 Roads

The NPS planning team is considering excluding the west portion of Little-Hole-In-The-Wall and the 4x4 trail into Big Hole-in-the-Wall from the El Malpais Wilderness and retaining them as 4x4 access into these beautiful portions of the National Monument. Such an approach would provide a rough but passable 4x4 trail BALANCE to the intensive use area on the north on the one hand and to the National Monument's generally unbroken wilderness on the other.

The consultant has three recommendations regarding this proposal:

- 1) the NPS should openly declare that the 4x4 route into Big-Hole-in-the-Wall will never be paved and developed into an intensive use area; to develop an intensive use area in the heart of a wilderness is inappropriate at best.
- 2) the trail approach through Little-Hole should be from the south edge of Little-Hole rather than from the north and through the middle of Little-Hole; this routing will be necessary if the trailhead to Navajo cave and vicinity is to be lengthened and the public perception that Navajo cave is "a long distance" is to be maintained.
- 3) the proposal NOT to close the 4x4 trail into Cerro Encierro will NOT be popular with conservation groups; the consultant recommends that the NPS offer to include Cerro Encierro in the El Malpais Wilderness in return for separating this wilderness from the West Malpais area on the bladed 4x4 road as recommended by the BLM in 1981; if this were effected, the vehicular use of El Malpais National Monument could be totally restricted to periphery areas.

CONCLUSION

The declared objective of this report is to present an approach to the management of El Malpais' caves that is "system" oriented. Such an approach strives to protect and use the caves of El Malpais by ACTIVELY MANAGING WHERE PEOPLE ARE LIKELY TO VISIT while simultaneously striving to balance intensive, 4x4 (backcountry), and wilderness use. A strong effort has been made NOT to resort to resource closures. This is a fully achievable objective in most instances in El Malpais because few visitors will be able to locate any caves the NPS fails to specifically direct them to on trails or by other means.

The consultant has recommended the use of guides in El Malpais rather than the development of self-guiding trails to resources such as Four Window Cave. Although this might be considered an elitist approach by some, its utilization will in fact enrich most visitors experience of these magnificent caves while the increase in visitor control will reduce NPS tort claim exposure.

The consultant has recommended the intensive development of the northwest corner of the National Monument in the form of a fifteen mile loop drive that would open to the public some of El Malpais most outstanding resources.

Four wheel drive access has been recommended in two areas, with enhanced wilderness in the remainder. The consultant believes this approach achieves balance between the protect-use

mandate of the Congress while concomitantly keeping alive the mystery and "unknown land" values of El Malpais.

In a world increasingly delimited by concrete, policeman, and the impoverishment produced by late 20th century social homogenization, retaining most of El Malpais as a "blank place on the map" while at the same time adequately providing for intensive visitor use and even for a taste of 4x4 backcountry type use would constitute quite an NPS management achievement.

Of course, such an approach would not come without a price. THAT PRICE WOULD BE LEAVING THE "OLD FAITHFUL" OF EL MALPAIS AT THE END OF A TWO MILE WALK THAT REQUIRED A GUIDE TO FIND EVEN THEN! Many park planners will cringe at such a proposal. However, if the NPS takes the time to survey an informed public on the issue, the agency will find that the public prefers such an approach to the crowds, noise, and homogenization that would come with funneling visitors into a rare resource such as is the East of Rendija area.

In closing, the consultant wishes to stress that he feels very strongly that an ecosystem approach to land management should guide the development and on-the-ground management of not only the area's caves but the National Monument as a land unit. This approach is, of course, a recommendation against cut-and-paste management whereby, for example, certain high resource value caves are prematurely excised from the overall management scheme through public closure while simultaneously visitors are funneled into nearby portions of the National Monument in intensive numbers.

This kind of management will foster a state in the National Monument whereby policeman are increasingly necessary to effect the enforcement of open-closed resource regulations. Instead of police, the consultant is recommending that visitor use levels in sensitive portions of the National Monument be controlled through planned management actions designed to ACTIVELY manage people over the long term.