

mountain lion management plan
and environmental assessment

CARLSBAD CAVERNS
NATIONAL PARK/NEW MEXICO
GUADALUPE MOUNTAINS
NATIONAL PARK/TEXAS

U.S. DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE



MOUNTAIN LION MANAGEMENT PLAN
AND ENVIRONMENTAL ASSESSMENT

for

CARLSBAD CAVERNS NATIONAL PARK, NEW MEXICO
GUADALUPE MOUNTAINS NATIONAL PARK, TEXAS

April 1986

National Park Service
U. S. Department of the Interior

TABLE OF CONTENTS

	<u>Page</u>
I. Description of the Area	1
Map: Figure 1. Regional Map Illustrating Proximity of Sheep Pastures Near National Parks	2
II. Need for the Proposal	
A. Statement of the Problem	3
B. The Mountain Lion Population (Summary)	4
1. Population Density	4
2. Food Habits	5
3. Home Ranges	5
4. Movement and Dispersal	5
III. Lion Management Plan	9
Proposed Actions	9
1. Maintain Existing NPS Protection of Mountain Lions Within the National Parks	9
2. Continue Monitoring Lion Population	9
3. Establish a Deer and Elk Monitoring Program	10
4. Develop an Interagency Mountain Lion Task Force	10
IV. Environmental Assessment of Proposed Action(s) and Alternatives Considered	11
V. Consultation and Coordination	20
Appendices	22
A. Literature Cited	A1
B. Summary of Laws, Regulations, and Policies Affecting the Lion Management Plan at Carlsbad Caverns and Guadalupe Mountains National Parks	B1
C. Other Considerations Relating to Current Land Management Practices on USFS and BLM Lands Adjoining the Parks	C1

I. DESCRIPTION OF THE AREA

Carlsbad Caverns and Guadalupe Mountains National Parks are located on the Capitan Reef formation (Guadalupe Escarpment) in southeastern New Mexico and southwestern Texas, respectively (Figure 1). The existence of the reef creates elevational variances from 3600 feet above sea level in Carlsbad Caverns National Park to the 8750 foot level on Guadalupe Peak in Guadalupe Mountains National Park.

The topography has created wide variations in temperatures, soils, moisture, and sunlight. These factors have resulted in vegetation communities ranging from desert communities represented by creosote brush, yucca, lechugilla, and scattered grasses to relict coniferous forest represented by ponderosa pine, Douglas-fir, and aspens. The current mountain lion problem centers in lands adjacent to the northern boundaries of the parks. This area reflects the above vegetation gradient with desert vegetation dominating the Carlsbad Caverns National Park area and mixed pinyon-juniper/grassland communities found in the northern boundary of the Guadalupe Mountains National Park.

Following the Civil War, cattle and sheep ranching dominated the Pecos River drainage. By the late 1880's the ranching industry had peaked and began a steady decline towards present levels. The lowering of livestock prices and the decreasing ability of the range to support huge livestock herds are most often offered as the reasons for this decline (Jenkins 1974).

Nearly all the land immediately north of Carlsbad Caverns and Guadalupe Mountains National Parks is subject to grazing use by ranchers holding permits from the State of New Mexico, the U. S. Forest Service, or the Bureau of Land Management. Ironically, this rough, hilly country was historically considered less desirable range than the once grassy plains and valleys which have since become heavily overgrazed. While some horses and goats occupy this range, sheep and cattle continue to be the dominant livestock species. Some areas of good forage do still exist; the Bureau of Land Management and U. S. Forest Service range managers generally classify the problem area as poor to moderate for normal livestock grazing use.

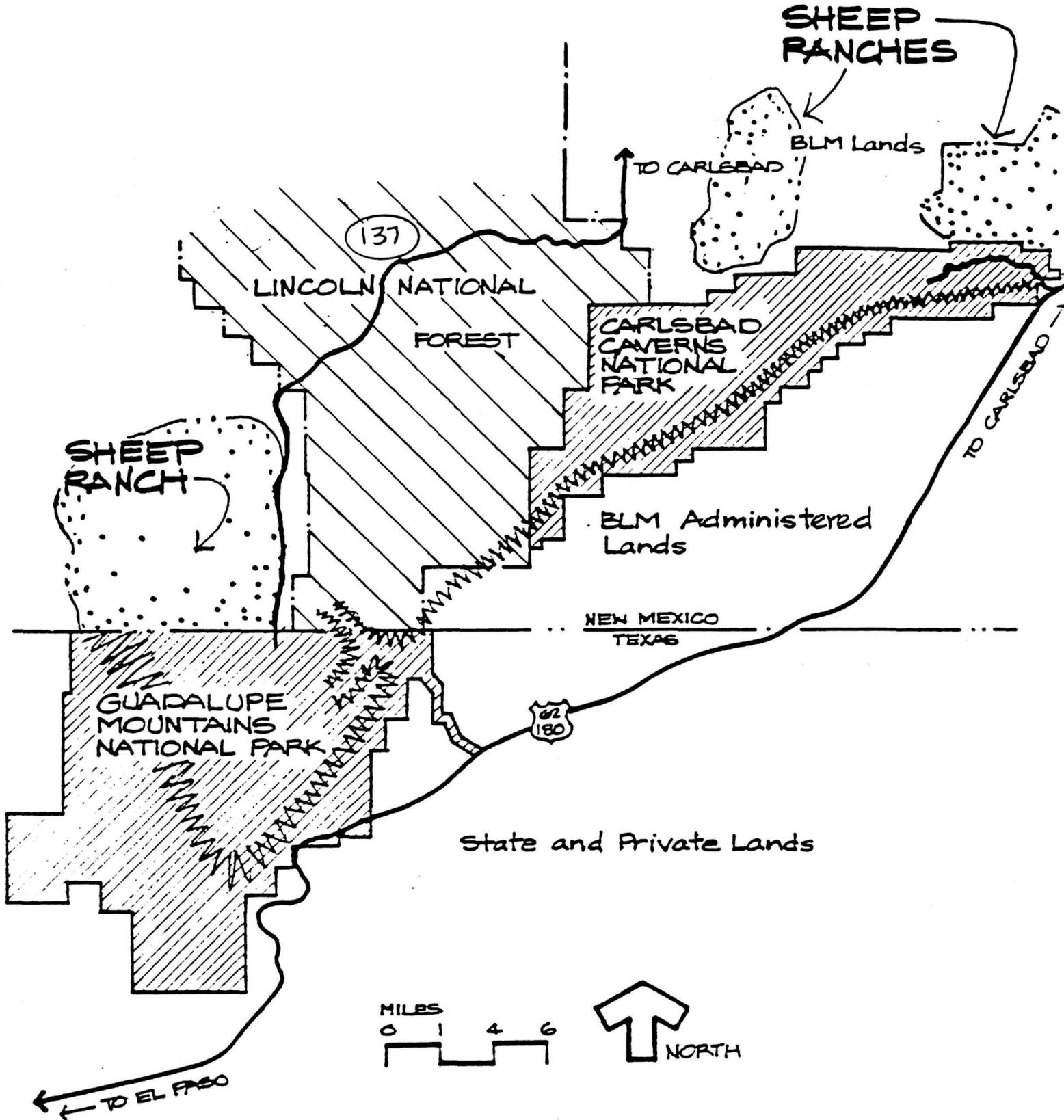


FIGURE 1

LOCATIONS OF SHEEP RANCHES IN PROXIMITY TO THE NATIONAL PARKS

II. NEED FOR THE PROPOSAL

A. Statement of the Problem

While New Mexico and Texas ranchers have been dealing with predation problems long before the establishment of the national parks, it is only within the past five years that three local sheep ranchers have experienced what they consider as unusual numbers of sheep killed by mountain lions. The basis of their concern is that: (1) the regional mountain lion population has experienced a dramatic increase and (2) this increase was caused, or aggravated by, the protection afforded these animals by Carlsbad Caverns and Guadalupe Mountains National Parks, established in 1930 and 1972, respectively. Their contention is that mountain lions protected by the parks are able to launch depredation raids on their livestock, and that the parks' lion population provides continuous recruits in the form of dispersing juveniles which leave the park and subsequently encounter and kill sheep.

The conclusion that the local lion population has "erupted" in the past 5 - 7 years is also postulated by many individuals throughout the region including other stockmen, deer hunters, lion sport hunters, and other people concerned over the plight of ranchers or simply interested in the situation. The number of sheep being killed by mountain lions and declining deer herds in the Guadalupe Mountains are often offered as "proof" of this opinion.

In the spring of 1982 the local sheep ranchers sought relief from their situation by requesting that the New Mexico Department of Game and Fish enter park lands for the purpose of capturing and removing individual problem lions. Animals which could not be practically, or safely relocated would be destroyed. In turn, the New Mexico Department of Game and Fish sought, and was granted, permission by the U. S. Department of the Interior; to carry out this program.

As a State of New Mexico game species, the New Mexico Department of Game and Fish assumes the responsibility for protecting and managing mountain lions on private, state, U. S. Forest Service, and Bureau of Land Management lands. Carlsbad Caverns and Guadalupe Mountains National Parks operate under the edicts of the National Park Service and the specific enabling legislation which provides for the conservation of wildlife species within their boundaries. The mountain lion (*Felis concolor*) is a native predator and, as such, falls under established National Park Service laws and policies relating to wildlife (Appendix B).

In the summer of 1982 the NPS began the development of a management plan and environmental assessment to carry out the lion removal proposal. It was during the early development of this document

that the proposal received national media attention. Letters protesting the plan were filed by individuals and groups from around the U. S. and a lawsuit seeking an injunction against the plan was filed in the Federal District Court of New Mexico. The issue continued in a state of indecision until early 1983 when the State of New Mexico withdrew its original request to enter national park lands.

It was during the development of the original "removal" proposal document that it became evident to park managers that there existed little or no biological data by which the mountain lion population could be assessed and, importantly, the effectiveness of proposed management efforts could be measured. The NPS accordingly initiated a 3-year research project entitled "An Ecological Study of Mountain Lions in the Vicinity of Carlsbad Caverns National Park, New Mexico and Guadalupe Mountains National Park, Texas." The purpose of this study was to collect data on four aspects of the ecology of the mountain lion including: (1) population densities, (2) a determination of lion population characteristics, (3) an analysis of home ranges and movements, and (4) food habits of the local lion population. This research study forms the basis of the management proposals identified in the Mountain Lion Management Plan for Carlsbad Caverns and Guadalupe Mountains National Parks.

Meanwhile, lions on lands adjoining the national parks are subject to continuous pressure from sportsmen, rancher initiated depredation efforts, New Mexico Department of Game and Fish and U. S. Fish and Wildlife Service depredation control efforts, and the effects of illegal hunting and trapping activities. The long-term affect of these activities on the regional ecology, including that within the parks, is currently unknown.

B. The Mountain Lion Population (Summary)

The following information has been summarized from information presented in the 1985 National Park Service research report entitled "Mountain Lions (Felis concolor) in the Vicinity of Carlsbad Caverns National Park, New Mexico and Guadalupe Mountains National Park, Texas."

1. Density. Mountain lions are recognized as one of the most difficult North American wildlife species to census. Density accuracy depends upon the identification of all individuals in the study area and the condition that all individuals within various age classes are detected in the study area. It is also necessary to assume various factors about the habitat occupied by the mountain lions and that physiological functions (fertility, birthrate, etc.) of the local lions are similar to those described in the scientific literature.

Based upon the above assumptions and extrapolations, the lion ecology study estimates a maximum population density within the 400 square mile (mi²) study area over the past three years of approximately 24 adults, 12 juveniles (sub-adults), and 22 kittens for a total of 58 lions.

2. Food Habits. Mule deer remains occurred in 82% of all scats (feces) analyzed during the 3-year research effort and, therefore, constitute the main prey item for the regional mountain lion population. Porcupines were the second (15%) most abundant food item encountered followed by rabbits (7%), domestic sheep (6%), rodents (3%), cattle (2%), and goats (1%). Traces of raccoon, grey fox, aoudad, and elk were found in individual scat samples and are probably not a significant part of the diet of the regional lion population.
3. Home Ranges. Figure 2, page 6, illustrates the relationship of established home ranges with the various administrative units within the study area. The average home range of adult male lions in the study area was 80 square miles. Females occupied an average of 23 square miles. The home ranges of the 22 cats monitored during the study period show a definite affinity for the areas of high relief offered by the Guadalupe Mountains, including the Capitan Reef complex. The extent of an individual mountain lion's home range is determined by available prey species, the existence of suitable cover and shelter, and the social interaction of each cat with other members of the population.

The orientation of home ranges also appears to be strongly influenced by major topographic features. This is especially true with female cats within the Guadalupe Mountains National Park. These cats are likely to move in a general north-south direction within their individual ranges. Northward movement can, and often does, bring cats into contact with neighboring sheep ranches where livestock, and the lion itself, stand a good chance of being killed.

Carlsbad Caverns National Park essentially sits astride an east-west topographic feature, the Capitan Reef. Mountain lions occupying this land characteristically spend more time on one side or the other of Walnut Canyon, the major drainage bisecting the park. Accordingly, they may spend either a disproportionate amount of time outside the park, on potential sheep range, or conversely, on the south side of the drainage which lies within the protective limits of the national park.

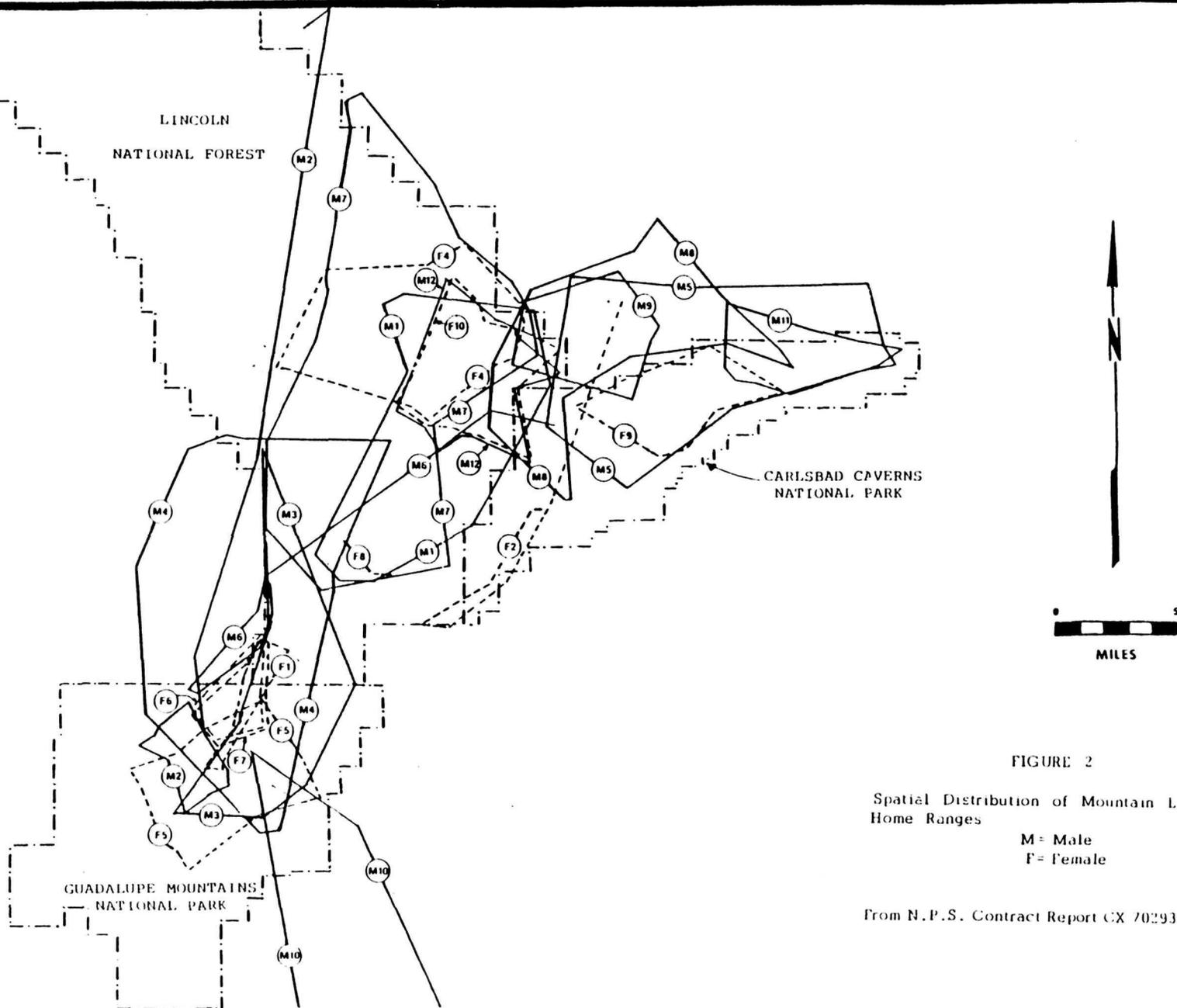


FIGURE 2

Spatial Distribution of Mountain Lion
Home Ranges

M = Male
F = Female

From N.P.S. Contract Report CX 70293001

4. Movement and Dispersal. The mountain lion is capable of moving great distances either during the normal use of its home range or during juvenile dispersal journeys. The movement of lions within the study area varied with sex and age and corresponded directly to the home range size of the individual lion, i.e. if its home range was small, its movement patterns usually involved only short distances. Generally, adult males travel further than females. Females with kittens usually travel only short distances between bedsites. The maximum linear distance traveled between 24-hour locations was 4.8 miles by a young adult male. The greatest 48-hour movement was shown by an adult male; this cat traveled at least 19.4 miles between locations within this period. It should be remembered, however, that actual distance traveled between successive telemetry locations may be much greater than linear distance.

Three dispersals were monitored during the study period and two others occurred just at the conclusion of the study. Four of these cats moved long distances in a short period; the fifth cat moved a relatively short distance. A summary of these dispersal distances is presented in Table 1.

TABLE 1

<u>Part No.</u>	<u>Age & Sex</u>	<u>Capture Site</u>	<u>Dispersal</u>	
			<u>Distance</u>	<u>Location Killed</u>
M-2	12-14 mo, male	Cox Tank, GUMO	30 mi. NE	Rocky Arroyo, NM
M-5	12-14 mo. male	Bear Canyon, CACA	14 mi. E	Dark Canyon, NM
M-6	12 mo. male	Putman Cabin, CACA	14 mi. W	Manzanita Ridge, NM
M-12*	20 mo. male	Dark Canyon, NM	Approx. 40 mi. SW	Patterson Hills, GUMO
F-10	20 mo. female	Dark Canyon, NM	55 mi. S	Near Van Horn, TX
M-10**	3 yr. male	Bell Canyon, GUMO	40 mi. SE into	Delaware Mtns, TX

*Lions still living

**M-10 lion included in dispersal chart because this cat's home range extended out of the study area in a southeasterly direction, along the Delaware Mountains.

Based upon the data included in the research study, it is most probable that as many lions moved into the national parks as disperse from them. Although the study itself was confined to a 400 square mile area, the capacity of mountain lions to move into and out of general locations in search of vacant home range territories is inherent in the species.

III. THE LION MANAGEMENT PLAN

The following management proposals are based upon: (1) a consideration of the legislation and policies historically regulating the management of units of the National Park Service, (2) the biological information gathered from the 3-year lion ecology study, (3) a consideration of the role the two national parks play in the regional social-economic scene, and (4) the willingness of the National Park Service to work as much as possible with its park neighbors and adjoining State and Federal agencies on issues of mutual concern.

Proposed Actions:

1. Maintain Existing NPS Protection of Mountain Lions Within the National Parks

The national parks will continue to abide by existing laws and policies protecting native wildlife species within units of the National Park Service and allow the removal of mountain lions, or any other form of wildlife, only if it threatens public safety, or the animal is a demonstrated threat to the natural resources of the park. Likewise, existing laws prohibiting the molestation of wildlife species and the use of traps or firearms in the national parks will continue to be enforced.

The National Park Service feels that its 3-year research study has adequately documented the fact that the mountain lion population is a widespread, regional phenomenon with the home ranges of these animals being more or less randomly distributed throughout the study area, and not confined to the national parks. It also appears that: (1) the present number and distribution of the regional lion population are most likely factors of an abundant prey base (deer) rather than protection being afforded these animals by the National Park Service, and (2) the regional lion population is capable of sustaining itself even on lands fully open to both legal and illegal control efforts and that these animals will continue to exist, at more or less their present numbers, as long as their prey base exists and in spite of present control activities. Agencies or individuals wishing to hunt and kill all, or parts of, the lion population have ample opportunity to execute their legal control efforts outside the boundaries of the national parks.

While it is recognized that there may be occasional benefits to local sheep ranchers resulting from the death of individual lions which might retreat to park lands, when chased or as part of their normal home range movement pattern, the National Park Service does not consider this benefit as sufficient rationale for violating existing laws protecting the parks or compromising the historic protection afforded all wildlife species within national park lands.

2. Continue Monitoring of Lion Populations

The parks will continue to monitor the mountain lion population with its boundaries through the collection of information from sightings, deer

kills, scrape-sites and track-tracings, and mortality data. This work will be conducted to both monitor long-term fluctuations of the lion population and to assess the impact of outside control efforts on the ecology of the parks.

3. Establish a Deer and Elk Monitoring Program

The NPS will establish an ungulate (deer and elk) monitoring program in both parks. The current status of deer and elk herds in the national parks is poorly understood beyond the documentation (from pellet-group transects) of general population trends at Carlsbad Caverns National Park and the observation that deer are relatively abundant at Guadalupe Mountains National Park. The commonly held opinion among the local populace that the deer herds are experiencing a general "decline" and that the mountain lion is the principal cause of this problem is like-wise poorly documented. In fact, the contention that the deer herd is experiencing mountain lion induced stress is refuted by the studies presently being conducted by the New Mexico Department of Game and Fish.

Since deer make up the major portion (82%) of the mountain lion diet in the region, it is particularly important that the NPS be able to assess both the population densities of these animals on park lands and the effect these large herbivores have on park vegetation. To a lesser degree, elk also need to be considered in this overall analysis.

It will not be the goal of the NPS to either increase or decrease the deer populations within the park but rather to assure that habitat (vegetation and soil communities) are managed in as near a natural state as possible with the expectation that wildlife populations, including deer, will subsequently shift their population numbers with changes in the condition of these resources.

4. Develop an Interagency Mountain Lion Task Force

The National Park Service will encourage the development of, and participation in, an interagency management team whose function it would be to annually assess the status of the regional mountain lion population and make management recommendations concerning needed control efforts and/or protection measures. It is suggested that this team consist of representatives from the local ranching and sportsmen community, environmental organizations, the New Mexico Department of Game and Fish, the U.S. Forest Service, the Bureau of Land Management, and the National Park Service.

The NPS will also recognize that its involvement in such a cooperative effort would necessarily be limited to the exchange of biological information and that the administrative responsibilities of the agencies participating in the interagency team would remain inviolate.

Appendix C, page C1, also includes a series of management considerations and/or suggestions addressing the mountain lion issue on lands surrounding the parks. Since the NPS has no statutory jurisdiction outside its own boundaries, these alternatives must be addressed only as considerations and are intended to complement the NPS lion management plan.

IV. ENVIRONMENTAL ASSESSMENT OF PROPOSED ACTION(S) AND ALTERNATIVES
CONSIDERED

The following matrices are designed to provide the reader with a method of comparing the environmental impacts of the four management proposals identified in the Mountain Lion Management Plan with the alternatives of "No Action" (maintain the status quo) and other reasonable alternatives to these proposed actions.

ENVIRONMENTAL ASSESSMENT MATRIX

PROPOSED ACTION:

Alternative Action	Proposed Action Elements	Alternative 1	Alternative 2
Impact Categories	1. Maintain Current NPS Protection of Mountain Lions in Both Parks	No Action	Allow Limited Hunts in Parks (Through Modification of Existing Laws)
Lion Population	Resident individuals or lions chased onto national park lands will remain protected under existing laws protecting native wildlife species within the national parks. The regional lion population will continue to be affected by hunting pressures and the effects of animal damage control agents. If regionwide destruction of lions outside the parks continues, the long-term result will be the net decrease of this wildlife species within the parks and on lands surrounding the parks. If depredation control efforts are concentrated within two remaining sheep ranges, regional lion population will stabilize within parks to levels in keeping with natural prey base, i.e. an estimated 2 to 3 adult cats in each park.	<p>This alternative would involve maintaining the status quo concerning all aspects of the problem. No mountain lions would be removed from the parks and neighboring ranchers would continue to attempt to control their losses through their own legal devices, i.e. trapping, shooting, and requesting the assistance of the New Mexico Department of Game and Fish lion hunter. Mountain lions could be pursued, trapped, and killed up to the boundary line of the national parks.</p> <p>The national parks' mountain lion population would be impacted, and predator/prey species within the parks would continue to be influenced by local environmental factors. The lion populations would increase or decrease as deer, rabbit, rodent and other prey populations fluctuate and as they are influenced by outside depredation control measures.</p>	Impacts to lion populations within the parks would be dependent upon intensity of hunts. Concerted hunting pressure over extended periods of time would significantly reduce the resident lion population and, possibly, eliminate it temporarily. However, unless hunting pressure was continuously exerted over the entire region, individual lions would remain in remote areas and would gradually re-populate the region, including the parks. It is, however, highly unlikely that any management activity could <u>totally</u> remove all lions from the region and negate the effects of lions moving into the region from surrounding areas.
Vegetation and Soils Communities	No Impact.	Same as proposed action.	Removal of major predator species could result in increased ungulate herds. These herbivores could then have an adverse effect on forage species through over use. Soil Communities

12

ENVIRONMENTAL ASSESSMENT MATRIX

PROPOSED ACTION:

Alternative Action	Proposed Action Elements	Alternative 1	Alternative 2
Impact Categories	1. Maintain Current NPS Protection of Mountain Lions in Both Parks	No Action	Allow Limited Hunts in Parks (Through Modification of Existing Laws)
Vegetation and Soils Communities (cont.)			would subsequently be impacted through the effects of compaction and erosion.
Wildlife	Deer herds within the national parks would continue to be influenced by the present condition of their range. The influence of management programs on Federal and State lands adjoining the parks (grazing, hunting, mineral exploration) would continue at present levels. The overall condition of the parks' deer herds, including population trends, are currently unknown but deer and elk appear to be in good health in both parks.	Same as proposed action.	If lion removal programs proved successful, the established predator/prey relationship between these species would be skewed. Historically, this situation has resulted in an increase of herbivores beyond the capacity of vegetation communities to sustain them. Subsequent population control factors such as disease, starvation, would most likely reduce herds to ecological carrying capacities. This cycle might extend over a period of one to two decades.
Endangered and Threatened Species	No Impact.	No Impact.	The possible increase of ungulate herds may pose threats to listed plant species through consumption and trampling. Four species, including two cacti, would be impacted.

13

ENVIRONMENTAL ASSESSMENT MATRIX

PROPOSED ACTION:

Alternative Action	Proposed Action Elements	Alternative 1	Alternative 2
Impact Categories	1. Maintain Current NPS Protection of Mountain Lions in Both Parks	No Action	Allow Limited Hunts in Parks (Through Modification) of Existing Laws)
Air & Water Quality	No Impact.	No Impact.	No impact from hunting activities. Water quality and quantity may be degraded <u>if</u> ungulate herds increased beyond the limit of individual watersheds ability to sustain them.
Cultural Resources	No Impact.	No Impact.	No Impact.
Socio-Economic	<p>People who feel the lion is a threat to their livestock will view this proposal as an unwarranted threat to their economic well-being. They will resent the position of the NPS and the continued existence of the two national parks. Persons concerned with the integrity of national parks and those believing that mountain lions should not be killed, regardless of the rationale, will be pleased with the NPS decision to continue its policy of protecting native wildlife species.</p> <p>Those people feeling that the NPS should extend a zone of protection onto Federal lands surrounding the parks (buffer zones) will object to the NPS decision to restrict lion management recommendations to the boundaries of the national parks.</p>	<p>Ranchers bordering the parks would lose livestock in proportion to whatever factors currently influence the present lion population to prey on these animals. These ranchers will respond to losses resulting from depredations in their present manner. Whether or not these depredations will continue to such an extent that individual ranchers are put out of business remains to be seen.</p>	<p>Sheep ranchers adjoining the park and those believing the national parks offer undo protection to lions will be pleased with the ability of lion control agents to enter NPS lands to hunt and kill problem animals. Resident animal previously protected by the park will subsequently become susceptible to hunting pressures. An estimated 2 to 3 lions would be killed in each park each year. Depending upon overall hunting pressure exerted throughout the region, hunts within the parks would probably continue indefinitely.</p>

14

ENVIRONMENTAL ASSESSMENT MATRIX

PROPOSED ACTION: Alternatives to the Proposed Action

Page 1 of 2

Alternative Action	Proposed Action Elements	Alternative 1
Impact Categories	2. Continue Monitoring Lion Population Within the Two Parks	No Action
Lion Population	No Impact. Lions will be monitored by methods other than those needed to capture and restrain animals.	Failure to establish a routine of monitoring the parks' lion population will prohibit managers from being able to efficiently protect these animals from threats originating off park lands, and from being able to interpret/identify natural population fluctuations.
Vegetation and Soil Communities	No Impact.	The inability of managers to maintain and protect natural predator/prey relationships could result in an increase in ungulate herds. These herbivores in turn, could increase their numbers beyond the capacity of their rangeland.
15 Wildlife	No Impact.	Same as above.
Endangered & Threatened Species	No Impact.	Impacts to wildlife populations (above) may have long-term consequences on listed plant species by consumption and disturbance of soils communities.
Air & Water Quality	No Impact.	Severe disturbance to vegetation and soil communities brought about by an imbalanced deer herd could have an adverse effect on the quantity and quality of water at backcountry springs in the parks.
Cultural Resources	No Impact.	No Impact.

ENVIRONMENTAL ASSESSMENT MATRIX

PROPOSED ACTION: Alternatives to the Proposed Action

Page 2 of 2

Alternative Action	Proposed Action Elements	Alternative 1
Impact Categories	2. Continue Monitoring Lion Population Within the Two Parks	No Action
Socio-Economic Environment	No Impact. Depredations on sheep ranches adjoining the park would continue at the present levels. Management efforts from other agencies controlling lions on lands outside the park would continue at the discretion of those agencies.	The NPS would fail to recognize the long-term continuous nature of the regional mountain lion "problem" and place itself in position of making management decisions affecting the natural resources of the parks without an adequate data base.

ENVIRONMENTAL ASSESSMENT MATRIX

PROPOSED ACTION: Alternatives to the Proposed Action

Page 1 of 1

Alternative Action	Proposed Action Elements	Alternative
Impact Categories	3. Establish a Deer and Elk Monitoring Program	No Action
Lion Population	No direct impact. Long-term protection and management of park deer herd will insure a natural prey base for the lion population	A lack of reliable information on prey species would leave park managers unable to interpret and understand the natural fluctuations of these ungulates and the subsequent ecological relationships of these changes.
Vegetation and Soil Communities	No Impact.	No Impact.
Wildlife 17	No direct effect to the ungulate herds will result from the study. Data gathered from the monitoring effort will provide park management with information needed to respond to outside threats to the park deer herds.	Park managers will be forced to deal with threats to deer and elk herds (range condition, oil and gas development, hunting pressures, etc.) without a firm data base. Surveys and studies conducted outside the park, by other agencies, would need to suffice.
Endangered & Threatened Species	No Impact.	No Impact.
Air & Water Quality	No direct impact from the monitoring effort. Information gathered as a result of the monitoring project will be used to maintain <u>natural</u> levels of deer population. The proper balance of ungulates and range vegetation will help insure a proper flow regimen for backcountry springs.	No Impact.
Cultural Resources	No Impact.	No Impact.
Socio-Economic Environment	No Impact.	No Impact.

ENVIRONMENTAL ASSESSMENT MATRIX

PROPOSED ACTION: Alternatives to the Proposed Action

Page 1 of 2

Alternative Action	Proposed Action Elements	Alternative
Impact Categories	4. Recommend and Participate in Interagency Task Force Concerning Lion Management	No Action
Lion Population	Interagency management and cooperation should have long-term benefits to all regional land managers (including the ranching sector) through cooperative management efforts, i.e. the task force will be provided with comprehensive information upon which depredation control efforts and management strategies can be based. This effort will insure the most efficient methods of controlling sheep losses while still maintaining the regional lion population.	Each agency will manage the lion population and prey species separately according to its individual management goals. The lion population would subsequently continue to be managed by individual agencies, none of which have sufficient data to access the population status or measure the effect of management efforts.
Vegetation and Soil Communities	No Impact.	No Impact.
Wildlife	No Impact.	No Impact.
Endangered & Threatened Species	No Impact.	No Impact.
Air & Water Quality	No Impact.	No Impact.
Cultural Resources	No Impact.	No Impact.

ENVIRONMENTAL ASSESSMENT MATRIX

PROPOSED ACTION: Alternatives to the Proposed Action

Page 2 of 2

Alternative Action	Proposed Action Elements	Alternative
Impact Categories	4. Recommend and Participate in Interagency Task Force Concerning Lion Management	No Action
Socio-Economic	Persons wishing the continued protection of the mountain lion as a native wildlife species will be pleased by an interagency effort to manage the population based upon comprehensive field information. Those opposed to the killing of mountain lions for any reason what-so-ever will oppose the NPS involvement in any organization which advocates the possible control (killing) of these animals.	The present situation of the four land management agencies (NPS, USFS, BLM, and NMDG&F) trying to manage the regional lion population independent of one another will continue. The long-term result of this situation upon the regional lion population, the regional deer herd, and local livestock operations, is unknown.

V. CONSULTATION AND COOPERATION

The park staff has attempted to maintain continuous communications with the various people and groups involved in the mountain lion issue. Methods of communication completed over the past four years include:

- Meetings and correspondence with local ranchers.
- Release of 13 bi-monthly and annual reports summarizing progress on the lion ecology study.
- Meetings and correspondence with the New Mexico Department of Game and Fish, and the Texas Parks and Wildlife Department.
- Responding to problem inquiries by the Sierra Club, Defenders of Wildlife, and the National Parks and Conservation Association.
- Written correspondence and telephone communication with Interior Department offices, including the National Park Service Southwest Regional Office, the National Park Service Washington Office, the National Park Service Field Solicitor, and the Office of the Assistant Secretary.
- Issuing a news release announcing the awarding of the lion ecology contract bid.

Groups and organizations to be sent information copies of the draft Mountain Lion Management Plan includes:

State and Local Institutions

- Texas A-95 Clearinghouse
- New Mexico A-95 Clearinghouse
- Texas Parks and Wildlife Department
- New Mexico Department of Game and Fish
- Environmental Assurance Division
- Carlsbad Chamber of Commerce
- El Paso Chamber of Commerce
- Dell City Chamber of Commerce
- Van Horn Chamber of Commerce
- University of Texas at El Paso
- Texas Tech University
- Texas A&M University
- Sul Ross University

Federal Agencies

- U. S. Forest Service
- Bureau of Land Management
- U. S. Fish and Wildlife Service

Environmental Groups

- Defenders of Wildlife
- Sierra Club
- Audubon Society
- Friends of the Earth
- Wilderness Society
- National Parks and Conservation Association
- New Mexico Wildlife Federation

Other Groups and Organizations

- National Woolgrowers Association - Roswell
- National Cattlemen's Association - Roswell
- Carlsbad Sportsmen Club

Individuals

- All persons, including local sheep ranchers, presently on the NPS mailing list of concerned individuals and organizations regarding the mountain lion issue.

A draft of the Mountain Lion Management Plan for Carlsbad Caverns and Guadalupe Mountains National Parks will be made available for a 45-day public review period prior to finalization of the document. The public review notification will be made through press releases, in area newspapers, including Carlsbad, New Mexico and El Paso, Texas and other area cities. Copies of the document will subsequently be sent to anyone requesting one.

The NPS will also hold a public workshop in the city of Carlsbad (date and time to be announced) to invite public comment on the plan.

Should significant comments be received from the public, these comments will be carefully reviewed by the National Park Service and a decision made as to whether there is a need to modify the draft document and/or proceed with the completion of a full environmental impact statement.

If no significant comments are received from the public or other State and Federal agencies, the draft Mountain Lion Management Plan will be finalized after completing a Finding Of No Significant Impact document as required by the Council of Environmental Quality. The Mountain Lion Management Plan will then be implemented.

APPENDICES

APPENDIX A

Literature Cited

Jenkins, Myra. A Brief History of New Mexico. Univ. of New Mexico Press, 1974. 89 pp.

Smith, Thomas E., et al. 1985 "Mountain Lions (Felis concolor) in the Vicinity of Carlsbad Caverns National Park, New Mexico and Guadalupe Mountains National Park, Texas." An ecological study final report prepared for the National Park Service under Contract CX 702930027. 137 pp.

APPENDIX B

Summary of Laws, Regulations, and Policies Affecting the Lion Management Plan at Carlsbad Caverns and Guadalupe Mountains National Parks

1. Legislation

The following laws pertain to the management of the backcountry resources within both national parks. These laws serve both as constraints in limiting the actions of the National Park Service and as guidelines for managers to determine what is to be accomplished in the parks. These laws include:

The Organic Act of 1916 directs the National Park Service to regulate park use and provide for the enjoyment of the park lands in a manner consistent with the conservation of park scenery, natural and historical objects, and wildlife. In order to fulfill these mandates, all resource planning activities must ensure that public-use facilities do not disrupt or damage resources to a degree whereby their ability to benefit future visitors is reduced; that appropriate nondestructive public use and enjoyment of resources is made possible; and that conscious care and protection is provided to conserve natural and cultural park resources.

Public Law 89-667 (1966) provided for the establishment of Guadalupe Mountains National Park "... in order to preserve in public ownership an area ... possessing outstanding geological values together with scenic and other natural values of great significance"

Presidential Proclamations of October 1923, February 1933 and February 1939 provided for the establishment and subsequent enlargement of Carlsbad Caverns National Park (initially as a national monument) for "... the preservation of their natural state and outstanding scenic features"

The Wilderness Act of 1964 provided for the establishment of a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "Wilderness Areas." A wilderness is defined in the act as "... an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." An area of wilderness is further defined to mean "... an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which: (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primi-

tive and unconfined type of recreation; (3) has at least 5000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of value." In November 1978 Congress established 33,175 acres of Carlsbad Caverns National Park and 46,850 acres of Guadalupe Mountains National Park as wilderness.

The Endangered Species Act of 1973 requires all Federal agencies to consult with the Secretary of the Interior on all projects and programs having potential impact on endangered flora and fauna. The legislation further requires Federal agencies to take "... such action necessary to ensure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species or threatened species or result in the destruction or modification of habitat of such species which is determined ... to be critical."

2. Regulations

Code of Federal Regulations. Title 36. Parks, Forests, and Public Property

Part 2. Resource Protection, Public Use and Recreation

Section 2.1 Preservation of Natural, Cultural and Archeological Resources.

"(a) Except as otherwise provided in this chapter the following is prohibited:

(1) Possessing, destroying, injuring ... or disturbing from its natural state:

(i) Living or dead wildlife or fish, or the parts of products thereof"

Section 2.2 Wildlife Protection

"(a) The following are prohibited:

(1) The taking of wildlife, except by authorized hunting and trapping activities conducted in accordance with paragraph (b) of this section.

(b) Hunting and Trapping

(1) Hunting shall be allowed in park areas when such activity is specifically mandated by Federal statutory law.

(3) Trapping shall be allowed in park areas where such activity is specifically mandated by Federal statutory law."

Section 2.4 Weapons, Traps, and Nets

(a) (1) Except as otherwise provided ... the following are prohibited:

- (i) Possessing a weapon, trap or net.
- (ii) Carrying a weapon, trap or net.
- (iii) Using a weapon, trap or net.

3. NPS Objectives and Policies

The manual entitled Management Policies for the National Park Service (1978) forms the basis for planning activities and the administration of all areas of the national park system including Carlsbad Caverns and Guadalupe Mountains National Parks. The Mountain Lion Management Plan is based on these same policies plus an established set of management objectives which provide a listing of desired conditions or status to be achieved within a park. The objectives give the manager a context for the evaluation of preservation and use of the park area and a framework that enables management to satisfy the specific purposes for which the park(s) were established. National Park Service management objectives for Carlsbad Caverns and Guadalupe Mountains National Parks include:

- Maintain, preserve, and perpetuate the aesthetic setting and the natural/cultural resources of park area.
- Restore conditions conducive to the perpetuation of the natural processes as they functioned before disruption of technological man or competition from non-native plants and animals.
- Restore native plants and animals to their original range.
- Ensure perpetuation of rare and endangered plants and animals and those species endemic to the national park.
- Develop and execute continuing research programs for natural and cultural resources.

Management policies specific to the lion management issue at Carlsbad Caverns and Guadalupe Mountains National Parks include:

MANAGEMENT OF ANIMAL POPULATIONS

- The Service will perpetuate the native animal life of the parks for their essential role in the natural ecosystems. Such management, conformable with general and specific provisions of law and consistent with the following provisions, will strive to maintain the natural abundance, behavior, diversity, and ecological integrity of native animals in natural portions of parks as part of the park ecosystem.

- Native species are those that occur, or occurred due to natural processes on those lands designated as the park. These do not include species that have moved into those areas, directly or indirectly as the result of human activities.
- Native animal life in the National Park System shall be given protection against harvest, removal, destruction, harassment, or harm through human action, except when:
 - hunting and trapping are permitted by law;
 - fishing is permitted by law for either sport or commercial use or is not specifically prohibited;
 - control of specific populations of wildlife is required for the maintenance of a healthy park ecosystem; or
 - removal or control of animals is necessary for human safety and health.
- Natural processes shall be relied upon to regulate populations of native species to the greatest extent possible. Unnatural concentrations of native species, caused by human activities, may be regulated if those activities causing the concentrations cannot be controlled. Non-native species shall not be allowed to displace native species if this displacement can be prevented by management. The necessity and results of regulating animal populations, either native or non-native, shall be documented and evaluated by research studies.

REGULATION OF WILDLIFE POPULATIONS

- Regulation of native animal populations in natural zones shall be permitted to occur by natural means to the greatest extent possible. In parks where hunting is not authorized by law, public hunting on land outside of the park is recognized as a means of controlling wildlife populations that move in and out of park boundaries, Cooperative studies and management plans with States or other Federal agencies will be initiated or continued to facilitate desirable public hunting outside of park boundaries, especially through extended or special seasons established by the States.
- Other control measures to be used as necessary may include: (1) live trapping in the areas for transplanting elsewhere, (2) providing research specimens for National Park Service and cooperating scientists, and (3) direct reduction by Service personnel. It is recognized that it may be necessary, on occasion, to carry on various phases of this program simultaneously. The Service will adjust the use of these control measures to meet varying weather and other relevant conditions, giving highest priority to the opportunities for public hunting outside the parks and live trapping within parks for transplanting purposes.

- The Service will control wildlife populations or individual animals when necessary for visitor safety and health. Where persistent control problems exist, the Service must determine whether or not curtailment or modification of visitor use and other human activities might not be a desirable alternative. Control may include trapping and transplanting or, only when necessary, destruction of offending animals.

APPENDIX C

Other Considerations Relating to Current Land Management Practices on USFS and BLM Lands Adjoining the Parks

1. Increase Presence of a State Lion Hunter in Vicinity of the Parks

This alternative involves increasing the presence of New Mexico Department of Game and Fish lion hunters on local ranches experiencing sheep losses. A logical approach to accomplishing this end would be to station a hunter in the town of Carlsbad. This would allow the control agent to respond more quickly to local depredation problems and offer a better opportunity to control all problems outside the national parks.

An ideal method of implementing this alternative would be to add an additional hunter to the present staff and assign this persons to the southeastern part of the state. Currently, State lion hunters are required to respond to local depredation problems from Albuquerque and Santa Fe, a distance that causes considerable dely in initiating control measures.

Impacts. The State of New Mexico would be required to absorb the cost of adding additional staff members or increasing the workload of the current staff.

A quicker response to local pleas for assistance in handling depredation problems outside the parks would ease the need/pressure to pursue lions into the parks. As a result, park wildlife would respond to natural environmental factors regulating their populations and to possibly impacts resulting from outside predator control efforts. The extent of present control efforts, and those proposed under these alternatives, on the well-being of park wildlife is presently unknown.

Persons wishing to prohibit the taking of lions within Carlsbad Caverns and Guadalupe Mountains National Parks would support the effort to control depredation problems outside the parks. Persons supporting the need to assist ranchers with their sheep losses would view this alternative as a positive effort to assist them without compromising the integrity of the national parks. Those feeling that this alternative avoids the issue of park lions affecting neighboring ranchers will oppose it as not solving the "real" problem.

2. Establish Grazing and Trapping Buffer Zones

This action would involve the establishment of non-use grazing zones on lands outside the national parks. The effect of this alternative would be to move sheep away from the boundaries and establish a "barrier" of traps through which lions would have to pass when leaving the parks. The hoped for result would be the reduction or elimination of sheep depredations.

Grazing. A similar grazing buffer zone was considered during the establishment of both parks as designated wilderness areas. The 1/2-mile zone was proposed based on the concern that sheep ranching itself was impacting the vegetation and soils on lands adjoining the park. The fear was, and still prevails, that this impact may be influencing the well-being of the national parks. The exact ecological associations of impacts on lands outside the parks with park resources has not been documented.

In fact, only two of the original three sheep ranches involved in the present lion problem actually border the parks. The third ranch was located approximately 1/2 mile from the boundary at its nearest point. This rancher has subsequently changed his livestock operation from sheep to cattle.

The other ranchers have tried, in the past, to keep their animals away from the parks in an attempt to cut losses. The techniques used to accomplish this buffer zone, and the resultant success or failure, are not documented in park records. Certainly the effort needed to keep sheep away from the park boundary, without fences, would seem to be considerable. To overcome the problems of maintaining this relatively narrow buffer zone, sheep ranchers may choose to move their animals at least a mile from the parks.

Trapping. At least two of the sheep ranchers in the area have suggested the need for and requested permission to establish traps 1/2 mile inside the parks. They feel that this extra area of trapping would effectively reduce the impact of lions on their stock. One rancher has suggested the trapping zone would need to be established in conjunction with the non-use grazing zone to be totally effective.

The parks have in the recent past experienced problems with occasional traps being placed on park lands. These were removed when located and appropriate administrative action was taken to correct the problem. Heavy trapping continues up to the boundaries of the national parks. The New Mexico Department of Game and Fish also provides some traps for use by ranchers in their lion depredation control efforts.

Impacts. The net effect of establishing one or both of the buffer zones is unknown since trapping within the two parks is a violation of Federal regulations. Given available information concerning the distribution and movement of the regional lion population, it is doubtful if the establishment of these buffer zones would have a significant effect on the number and rate of livestock losses currently being experienced.

Additionally, the effect of this proposal on the lion population would appear questionable when considering the movement patterns of the cats and the current number of traps located just outside the parks, i.e., there is already ample opportunity to attempt to capture and kill the regional mountain lion population off NPS lands at this time.

3. Adopt Different Grazing Techniques

Present ranching techniques for most Carlsbad area sheep ranchers involves allowing the animals to roam free in large fenced-in pastures. The sparsity of vegetation necessitates that these pastures be very large. Some consist of several square miles in area. The rancher subsequently manages his animals using various combinations of inspection, doctoring, harvesting, predator control, and fence maintenance.

Most local ranches are family administered operations. While extra hands are occasionally hired, the normal operation requires a rancher to spend his time and effort over a large area. The extent of these pastures and the difficulty of the terrain presents subsequent challenge to anyone trying to be everywhere at once.

The present method of sheep ranching has evolved over historic times. As late as the mid-1940's, shepherders were used to guard and move animals to better forage. Often the herders were accompanied by herd dogs which helped protect and contain the sheep. By the late 1940's, a combination of low wages, ranching economics, the scarcity of people willing to become shepherds, and the observation that free-roaming sheep seemed to do better than herd animals, caused the decline of the herding practice.

There has recently been a resurgence of interest in dogs historically bred to herd and protect sheep. This interest has peaked in European countries where milder conditions and smaller grazing units made a consideration of this herding technique practical. But, according to local ranchers, the idea of adopting a system of using guard dogs is impractical due to the huge areas involved and the need to ensure that the dogs themselves are provided with sufficient food and water. The need to have a herder present to care for the sheep and dogs nullifies the use of dogs solely to guard against mountain lion attacks.

In the summer of 1984 the New Mexico Department of Game and Fish initiated a 1-year study experimenting with the feasibility of using guard dogs on sheep ranches in proximity to the parks. While the final research report has not been submitted to the New Mexico Department of Game and Fish, most locals viewed the experiment as a failure or as having only marginal results.

Impacts. Ranchers feel that, given the available forage and topography of the land, free-roaming sheep cause less impact on rangelands than tightly banded herds. Competition for available forage becomes less intense as sheep pick and choose preferred plant species at a leisurely pace. Conversely, sheep having the time to carefully select forage species will inevitably remove grasses and forbs before being forced to consume less desirable vegetation. Actually, the pressure on native grass species is reduced by the forced movement of sheep bands by herders. This impact on native grass species may become critical in areas of sparse vegetation or during years of drought.

The loss of native vegetation, regardless of the grazing technique causing the impact, will result in the altering of associated wildlife communities adapting to these changes.

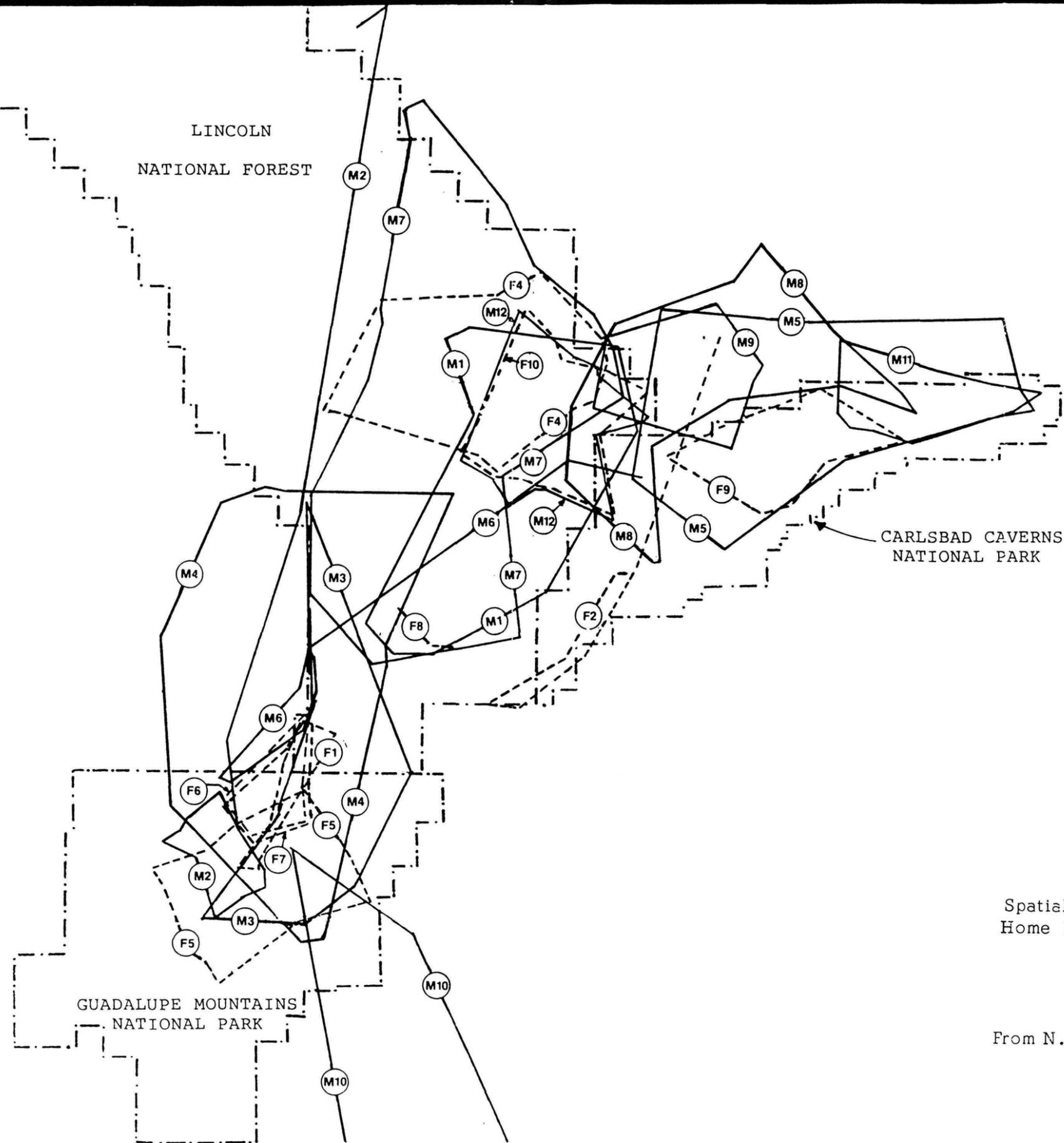


FIGURE 2

Spatial Distribution of Mountain Lion Home Ranges

M= Male
F= Female

From N.P.S. Contract Report CX 702930017