Socorro District WILDERNESS

Draft Environmental Assessment

U.S. Department of the Interior
Bureau of Land Management
Socorro District, New Mexico
March 1983

IN REPLY REFER TO

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
District Office
P.O. Box 1219
Socorro, New Mexico 87801

To All Interested Agencies, Officials, Public Groups, and Individuals:

Enclosed is a copy of the Draft Environmental Assessment (EA) for the Bureau of Land Management's (BLM) Wilderness Study Areas (WSAs) in the Socorro District. This EA covers eight WSAs which are located in Socorro and Catron Counties, New Mexico. This Draft EA is being released for public comment simultaneously with other EAs prepared for WSAs in the BLM New Mexico District Offices of Albuquerque, Las Cruces and Roswell.

This Draft EA has been prepared as part of a Statewide BLM Wilderness Study Process. This document provides the first opportunity for public comment on the initial wilderness suitability recommendations of the Area Managers. These recommendations are subject to refinement or change by the District Manager in the Final EA, the BLM New Mexico State Director in the Statewide Draft Environmental Impact Statement (EIS) and the Secretary of the Interior in the Final EIS/Wilderness Study Report. During this portion of the Wilderness Study Process, the Resource Area Managers are asking for comments on their recommendations and alternatives. They are particularly interested in specific information about individual WSAs.

The Socorro District is divided into two Resource Areas, the San Augustine Resource Area and the Jornada Resource Area. Please submit your comments by May 31, 1983 to the appropriate Area Manager.

Paul Tanner
Area Manager
San Augustine Resource Area
P.O. Box 1219
Socorro, NM 87801

Bob Cordell
Area Manager
Jornada Resource Area
P.O. Box 1219
Socorro, NM 87801

Because of the number of WSAs involved throughout the State, a 60-day review is being provided. During this review you are encouraged to contact the Area Managers for additional information. Based on the public comments, the recommendations made by the Area Managers will be re-evaluated and are subject to my concurrence in the Final EA.

Donnie R. Sparks

Donnie R. Sparks
District Manager

Enclosure

WILDERNESS
DRAFT ENVIRONMENTAL ASSESSMENT

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

Socorro District

Socorro, New Mexico 87801

MARCH 1983

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CHAPTER 1

PURPOSE AND NEED

Need for the Proposal

Section 603 of the Federal Land Policy and Management Act (FLPMA) directed the Bureau of Land Management (BLM) to inventory, study, and then report to Congress through the Secretary of the Interior and the President, the public lands suitable for inclusion in the National Wilderness Preservation System.

The BLM New Mexico Wilderness Study Planning Process

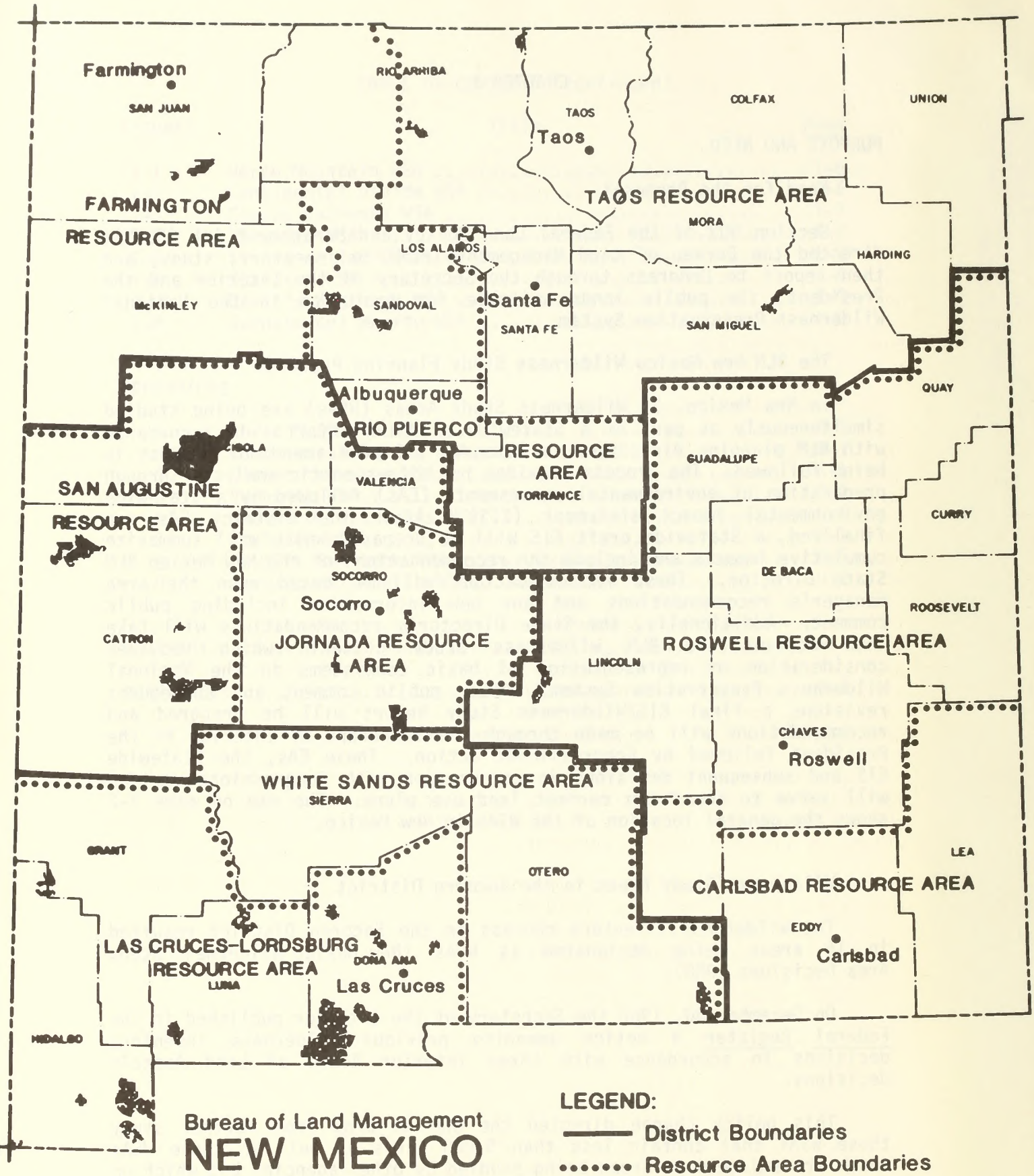
In New Mexico, 33 Wilderness Study Areas (WSAs) are being studied simultaneously as part of a Statewide planning effort. In accordance with BLM planning directives, a category III plan amendment process is being followed. The process provides for site-specific analysis through preparation of environmental assessments (EAs) followed by a Statewide environmental impact statement (EIS). After the district EAs are finalized, a Statewide draft EIS will be prepared which will summarize cumulative impacts and include the recommendations of the New Mexico BLM State Director. These recommendations will be based upon the area manager's recommendations and any new information including public comment. Additionally, the State Director's recommendations will take into account the BLM wilderness study criteria which requires consideration of representation of basic ecosystems in the National Wilderness Preservation System. After public comment and subsequent revisions a Final EIS/Wilderness Study Report will be prepared and recommendations will be made through the Secretary of Interior to the President followed by Congressional action. These EAs, the Statewide EIS and subsequent decisions in conjunction with Congressional action will serve to amend the current land use plans. The map on page 1-2 shows the general location of the WSAs in New Mexico.

Wilderness Study Areas in the Socorro District

The wilderness inventory process in the Socorro District resulted in 15 areas being designated as WSAs (New Mexico Wilderness Study Area Decisions 1980).

On December 30, 1982 the Secretary of the Interior published in the Federal Register a notice amending previous wilderness inventory decisions in accordance with three Interior Board of Land Appeals decisions.

This policy change directed the BLM to drop from further study those WSAs that contain less than 5,000 acres as well as those WSAs which are adjacent to areas being studied by other agencies but which on their own do not possess the mandatory wilderness criteria. The new



Bureau of Land Management

NEW MEXICO WILDERNESS STUDY AREAS 1982

LEGEND:

- District Boundaries
- Resource Area Boundaries
- BLM Wilderness Study Areas

Map 1-1

policy also requires the BLM to remove areas of "split estate" (federally owned surface underlain by non-federally owned subsurface from wilderness study).

In New Mexico, this policy announcement resulted in the elimination of 12 WSAs and changes in the boundaries of 11 WSAs.

In the Socorro District, the new split estate policy resulted in five WSAs being dropped from further study and boundary revisions to exclude split estate in three others. The five WSAs dropped under this policy are: Rimrock (NM020-007), Sand Canyon (NM020-008), Little Rimrock (NM020-009), Pinyon (NM020-010) and Petaca Pinta (NM020-014). Boundaries were adjusted to exclude split estate in the Mesita Blanca, Eagle Peak, and Sierra Ladrones WSAs.

The minor boundary adjustment for Sierra Ladrones (560 acres dropped) does not substantially alter the wilderness characteristics of the WSA. The boundary adjustments for Mesita Blanca (2,985 acres dropped) and Eagle Peak (11,714 acres dropped) are significant enough to necessitate some additional study of the wilderness characteristics of the revised WSAs. For this reason Eagle Peak and Mesita Blanca will be included in a separate, supplemental draft EA to be released at a later date. This supplemental EA will cover New Mexico WSAs which were significantly impacted by the new policy.

The San Augustine Resource Area also contains El Malpais Instant Wilderness Study Area (157,640 acres) which was studied on an accelerated schedule. A separate Draft EIS prepared for the Malpais wilderness proposal was released in August of 1981. The recommendation to Congress for the Malpais wilderness proposal will occur on a separate schedule from the WSAs considered in the statewide EIS.

The remaining eight areas in the District which have been studied for wilderness suitability are summarized in Table 1-1. The results of those studies are contained in the wilderness analysis reports (WARs) which are appended to this document.

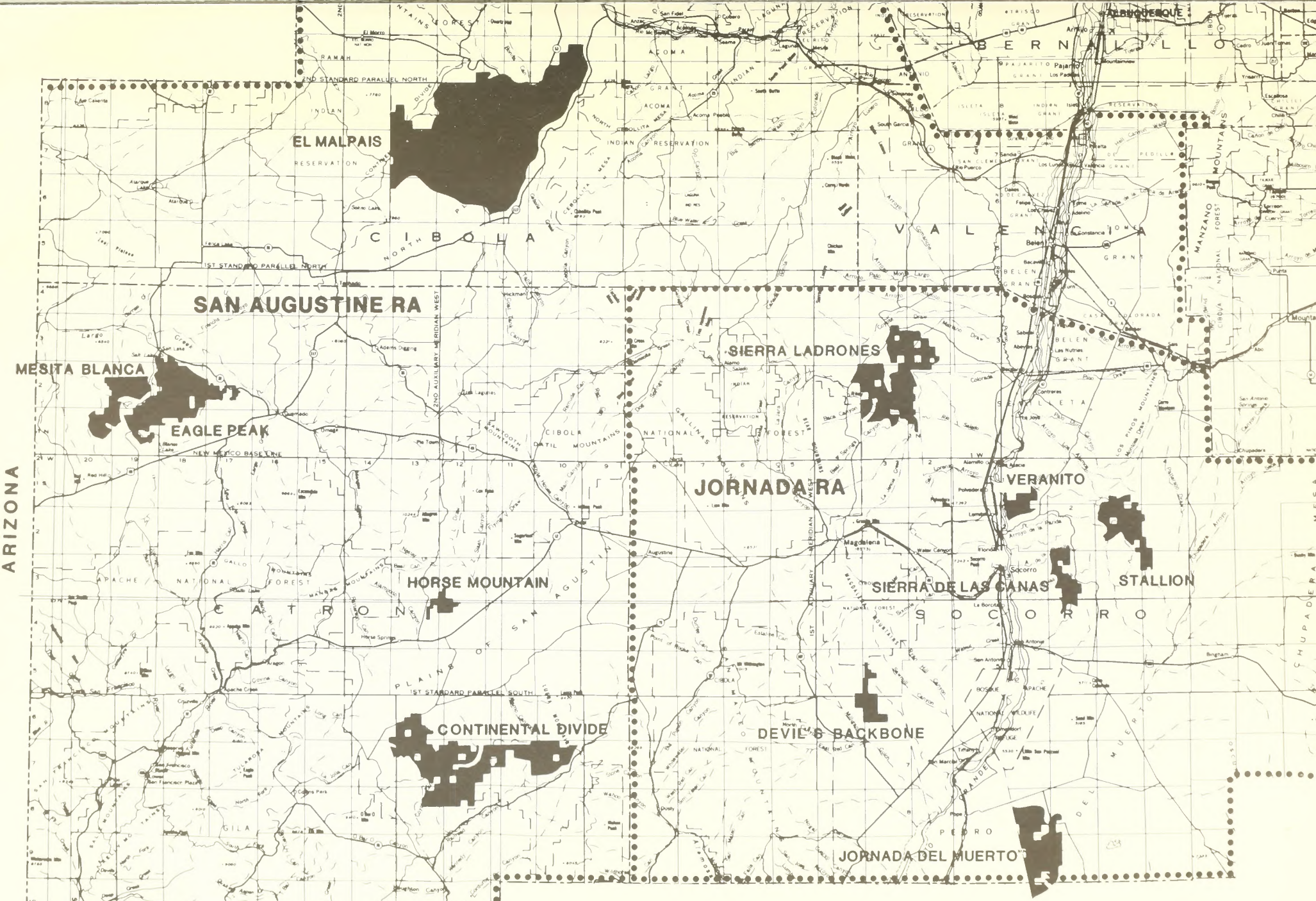
Map 1-2 on page 1-5 shows the general location of the Socorro District Resource Areas and the WSAs.

TABLE 1-1

SOCORRO DISTRICT WILDERNESS STUDY AREAS

WSA Name	WSA Number	Acres
San Augustine Resource Area		
Horse Mountain	NM-020-043	5,032
Continental Divide	NM-020-044/45	68,761
Jornada Resource Area		
Sierra Ladrones	NM-020-016	39,308
Veranito	NM-020-035	7,206
Sierra de las Canas	NM-020-038	12,838
Stallion	NM-020-040	24,238
Devil's Backbone	NM-020-047	8,904
Jornada del Muerto	NM-020-055	31,147
TOTAL		197,434

Figures 1-1 through 1-8 illustrate characteristic landforms in the WSAs.



WILDERNESS STUDY AREAS IN THE SOCORRO DISTRICT

Map 1–2

Figure 1-1. Horse Mountain WSA.

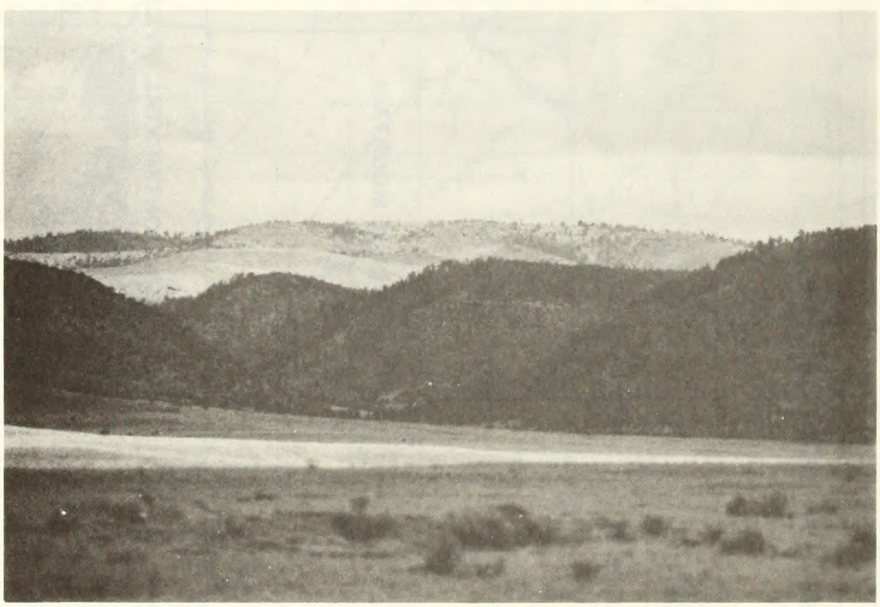


Figure 1-2. Continental Divide WSA.

Figure 1-3. Sierra Ladrones WSA.

Figure 1-4. Veranito WSA.

Figure 1-5. Sierra de las Canas WSA.

Figure 1-6. Stallion WSA.

Figure 1-7. Devil's Backbone WSA.

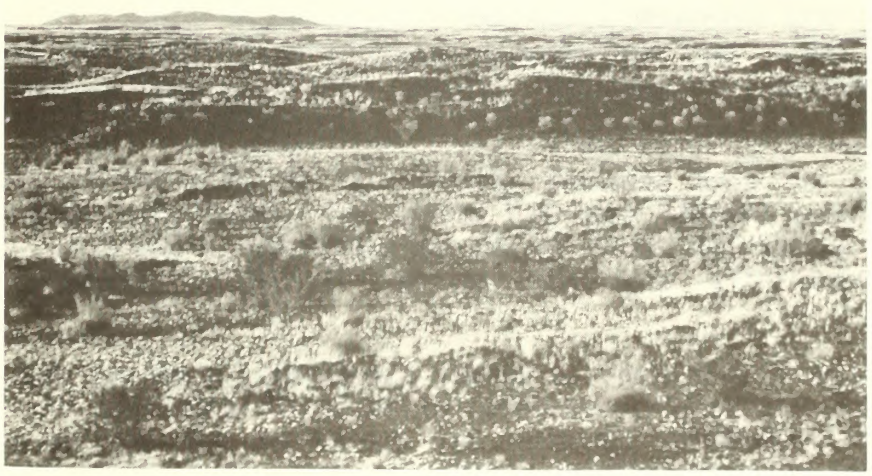


Figure 1-8. Jornada del Muerto WSA.

CHAPTER 2

ALTERNATIVES INCLUDING THE PREFERRED ALTERNATIVE

Alternatives

For each Wilderness Study Area (WSA), an All Wilderness and No Action/No Wilderness Alternative is evaluated. The No Action/No Wilderness Alternative represents management in accordance with the current Bureau of Land Management (BLM) land use plans which would be in effect without wilderness designation.

The current land use plan for the WSAs in the San Augustine Resource Area is the Divide MFP.

The current land use plans in the Jornada Resource Area are the Stallion Management Framework Plan (MFP) which covers the Veranito, Sierra de las Canas, Stallion, Devil's Backbone and Jornada del Muerto WSAs and the Ladrones MFP which covers the Sierra Ladrones WSA.

These documents are available for public review at the Resource Area Offices.

A smaller wilderness alternative is also evaluated where 1) an opportunity exists to reduce conflicts between wilderness and other resource uses or 2) an opportunity exists to improve the long-term manageability of the area as wilderness. Manageability takes into consideration such factors as inholdings, valid existing rights, private subsurface rights, man-made features and identifiable boundaries.

Two of the San Augustine Resource Area's WSAs also include a smaller wilderness alternative. The Horse Mountain WSA (5,032 acres) includes a smaller wilderness alternative of 4,432 acres, and Continental Divide (68,761 acres) includes a smaller wilderness alternative of 27,500.

Two of the WSAs in the Jornada Resource Area include a smaller wilderness alternative. The Sierra Ladrones (39,308 acres) includes a smaller wilderness alternative of 25,724 acres and Sierra de las Canas (12,838 acres) includes a smaller wilderness alternative of 12,798 acres.

These boundary adjustments strive to represent an optimum boundary based upon consideration given to enhancement of wilderness values, the ability of the BLM to manage the area as wilderness and to reduce conflicts with other uses. A larger wilderness alternative was not considered because the scope of this wilderness study is limited to the WSA. However, where wilderness values would be enhanced or wilderness

management substantially improved, private and State inholdings and, in some cases, parcels adjoining the WSA boundary have been identified in the Wilderness Analysis Reports (WARs) for possible acquisition through voluntary exchange.

Preferred Alternative

Alternatives including the Preferred Alternative are included in Table 2-1. The preferred alternative represents the recommendations (which are explained in more detail in the WARs) of the area managers.

TABLE 2-1

SUMMARY OF ALTERNATIVES

WSA	Preferred Alternative	All Wilderness	Smaller Wilderness (Amended Boundary)	No Wilderness (Manage under existing plan)
SAN AUGUSTINE RESOURCE AREA				
Horse Mountain NM-020-043 (5,032 acres)	Recommend 4,432 acres as suitable for Wilderness Designation. Manage the remaining 600 acres in accordance with the Divide MFP.	Recommend 5,032 acres as suitable for Wilderness Designation.	Same as Preferred Alternative.	Manage the entire 5,032 acres as prescribed in the Divide MFP.
Continental Divide NM-020-044 (68,761 acres)	Recommend 27,500 acres as suitable for Wilderness Designation. Manage the remaining 41,261 acres in accordance with the Divide MFP.	Recommend 68,761 acres as suitable for Wilderness Designatinn.	Same as Preferred Alternative.	Manage the entire 68,761 acres as prescribed in the Divide MFP.
JORNADA RESOURCE AREA				
Sierra Ladrones NM-020-016 (39,308 acres)	Recommend 25,724 acres as suitable for Wilderness Designation. Manage the remaining 13,584 acres in accordance with the Ladrones MFP.	Recommend 39,308 acres as suitable for Wilderness Designation.	Same as Preferred Alternative.	Manage the entire 39,308 acres as prescribed in the Ladrones MFP.
Veranito NM-020-035 (7,206 acres)	Recommend 7,206 acres as unsuitable for Wilderness Designation. Manage as prescribed in the Stallion MFP.	Recommend 7,206 acres as suitable for Wilderness Designation.	N/A	Same as Preferred Alternative.
Sierra de las Canas NM-020-038 (12,838 acres)	Recommend 12,798 acres as suitable for Wilderness Designation. Manage the remaining 40 acres in accordance with the Stallion MFP.	Recommend 12,838 acres as suitable for Wilderness Designation.	Same as Preferred Alternative.	Manage the entire 12,838 acres as prescribed in the Stallion MFP.
Stallion NM-020-040 (24,238 acres)	Recommend 24,238 acres as unsuitable for Wilderness Designation. Manage as prescribed in the Stallion MFP.	Recommend 24,238 acres as suitable for Wilderness Designation.	N/A	Same as Preferred Alternative.
Devil's Backbone NM-020-047 (8,904 acres)	Recommend 8,904 acres as unsuitable for Wilderness Designation. Manage as prescribed in the Stallion MFP.	Recommend 8,904 acres as suitable for Wilderness Designation.	N/A	Same as Preferred Alternative.
Jornada del Muerto NM-020-055 (31,147 acres)	Recommend 31,147 acres as unsuitable for Wilderness Designation. Manage as prescribed in the Stallion MFP.	Recommend 31,147 acres as suitable for Wilderness Designation.	N/A	Same as Preferred Alternative.

CHAPTER 3

AFFECTED ENVIRONMENT

Overview of the Socorro District

The Socorro District is located in west-central New Mexico and consists of approximately 2.2 million acres of public land in Socorro, Valencia, Catron and Cibola Counties.

Major Land Uses

Public land in the Socorro District represents a resource base which is utilized in several ways, including: livestock grazing, the exploration for and development of minerals, as a source of fuelwood and other wood products, for scientific research, and for various recreational uses.

Grazing is the predominant land use in all counties. In Cibola and Socorro Counties mining is also a significant economic activity. Among the minerals produced are uranium, barite, fluorite, cinders, sand and gravel. There is no present production of petroleum, natural gas or coal in the District. It is anticipated, however, that coal leasing and development will occur in the western portion of the San Augustine Resource Area in the closing decade of this century.

Scientific activities on public lands in the District include research at archaeological sites and at the National Radio Observatory's Very Large Array, the world's largest radio telescope.

Outdoor recreation in the District includes a wide range of sports and leisure-time activities. General outdoor recreation includes sightseeing, picnicking, camping, backpacking, hiking, horseback riding, sport shooting, four-wheeling, trail-biking, and birdwatching, as well as more specialized activities such as caving, rock climbing, rock hounding, and bird and big game hunting.

Social and Economic Conditions

Introduction

This analysis will focus on Socorro, Cibola, and Catron Counties which would be most affected by wilderness designation. Unless otherwise noted, the following discussions will be based on this three-county area.

This portion of west-central New Mexico is typically rural in nature and generally characterized by sparse population, a largely government supported economy augmented by the agricultural and mining sectors, low incomes, high unemployment and a multi-cultural orientation heavily influenced by a Spanish heritage.

Socorro, Belen, Los Lunas, Grants, and Albuquerque are the major trade and service centers for the region.

Population

The area is predominantly rural with the communities of Grants and Socorro representing the only areas which may be characterized as urban. Catron, Socorro and Cibola Counties have a combined population of approximately 45,800. The area's population experienced a growth rate of 35.5 percent between 1970 and 1980 as compared to the State's 27.8-percent growth rate. The rural character of this area is indicated by an average population density of 2.5 persons per square mile while New Mexico's average density is 10.7 persons per square mile.

Local Attitudes and Perceptions (Life-Styles)

People living in the sparsely populated areas of Catron, Cibola and Socorro Counties are generally ranch oriented. The rural character of the area, with its open spaces, fresh air and solitude, is highly valued, as are the personal freedom and independence it affords. The residents also value the life-style offered by the local communities which is characterized by extensive acquaintances, a lack of urban problems, and a relaxed pace. Additionally, most residents feel the area is a good place to raise children, and they wish to maintain the status-quo.

Many residents feel the greatest threat to their life-styles is government interference. They feel land use decisions should be made locally and they resent interference from outside the area, whether from government agencies or interest groups. This attitude is typified by perceptions of the BLM's wilderness review process which is seen as interfering with ranch operations and as increasing recreational use by "outsiders." This increased recreational use is unwanted, not out of unfriendliness but out of fear of increased problems with vandalism of rangeland improvements and other "people problems."

Socorro (population approximately 7,173) is the focus of much of the social and economic activity of Socorro and Catron Counties. The attitudes and perceptions of the residents of Socorro are in many ways similar to those of the surrounding rural areas. There is, however, a wide range of attitudes in the community due in large part to the faculty and 1,300 students of New Mexico Institute of Mining and Technology. The presence of this highly regarded college and the research community associated with the Very Large Array, Langmuir Laboratory and other research facilities combine with the multicultural character of Socorro to produce a highly diverse community. Much of the support for wilderness designation and environmental issues in general comes from the academic and research community.

Mineral exploration for scientific and development purposes is also highly valued by much of the academic community and by numerous mining claimants in the Socorro area.

Economic Characteristics

Ranching, mining, government services and tourism form the basis of the economy in Catron, Cibola and Socorro Counties. The area is considered economically poor.

Income

In 1981, per capita income for Catron, Cibola and Socorro Counties was $5,798 as compared to $7,878 for the State. This indicates that the area is one of the State's lowest in per capita personal income. It is also low compared to other states in the southwest region (except Utah) and in the United States.

Employment

In 1981, the labor force in Catron, Cibola, and Socorro Counties included 15,655 wage and salaried workers who earned an annual income of $221 million. Based on 1980 figures, employment in the government sector (Federal, State and local) represented 33 percent of the total workforce with retail trade comprising 15 percent, service occupations totaling 11 percent, mining 17 percent and agriculture 4 percent. It is estimated that employment in the mining sector has been reduced by 5 percent since these figures were compiled, due to the depressed condition of the uranium industry.

Estimated unemployment in the statistical area is running at an annual rate of 18.5 percent which is well above the State and National averages of 10.1 percent. Much of this rate is directly attributed to the 20.5 percent unemployment rate in Valencia/Cibola Counties due largely to the depressed uranium industry.

Wilderness Study Areas

Tables 3-1 and 3-2 summarize the affected environment and the existing and potential uses of each of the WSAs.

TABLE 3-1
SUMMARY OF AFFECTED ENVIRONMENT

WSA	Acreage	Land Status	Topography	Geology	Bailey-Kuchler Vegetation Types	Wildlife	T&E Species	Cultural	Wilderness Values	Other
SAN AUGUSTINE RESOURCE AREA										
Horse Mountain										
1) Entire WSA	5,032 acres	5,032 acres of public land; no surface or subsurface inholdings.	Isolated mountain surrounded by San Augustine Plains; Elevations range from 6,950 to 9,450 feet.	Horse Mountain is a dissected strato-volcano of tertiary age.	Upper Gila Mountains Forest Province: 2,462 acres of ponderosa pine/Douglas fir forest; 1,970 acres of pinyon-juniper woodland; 600 acres of grama-galleta steppe.	Two SHS's support 299 wildlife species including 53 reptiles/amphibian species, 175 resident and migratory bird species, and 71 mammal species including mule deer, black bear and mountain lion.	Bald Eagle winter range. Potential habitat for peregrine falcon and bald eagles. Potential for 13 species of T&E plants.	No sites known. Low probability for undiscovered sites.	High degree of naturalness. Forested mountain environment has excellent opportunities for solitude and primitive recreation.	
2) Portion Recommended Suitable	4,432 acres	4,432 acres of public land.	Same as above.	Same as above.	Grama-galleta steppe excluded; others same as above	Same as above.	Same as above.	Same as above.	Same as above. Small size of the Unit is offset by excellent topographic and vegetative screening.	
3) Portion Recommended Unsuitable	600 acres	600 acres of public land.	Smooth plains at base of mountain.	Primarily basin fill.	600 acres of grama-galleta steppe.	One SHS supports 189 wildlife species including 40 reptiles/amphibian species, 101 resident and migratory bird species, and 48 mammal species.	Potential for one species of T&E plant.	Same as above.	This small area is fenced and bisected by a well-used vehicle route and lacks wilderness characteristics.	
Continental Divide										
1) Entire WSA	68,761 acres	68,761 acres public surface; 69,401 acres public subsurface; 3,520 acres of State-owned surface and subsurface; 2,349 acres private surface, 1,640 acres of private subsurface.	Topography ranges from smooth rolling grasslands to rugged canyons and rough hilly country. Elevations range from 6,785 to 9,212 feet.	Pelona Mountain is a composite strato-volcano. Unit is dominated by volcanics underlain at depth by sedimentary formations.	Upper Gila Mountains Forest Province: 4,945 acres of ponderosa pine/Douglas fir; 11,112 acres of pinyon-juniper woodland; and 52,704 acres of grama-galleta steppe.	Three SHS's support approximately 309 wildlife species including 59 reptiles/amphibians species, 175 resident and migratory bird species, and 75 mammal species including mule deer, antelope, mountain lion, and black bear.	Bald Eagle winter range. Potential occurrence of 17 species of T&E plants. Potential for habitat for black-footed ferret, peregrine falcon, and bald eagles.	One National Register site, Bat Cave. Existing information indicates few additional sites but only limited inventory has been conducted.	High degree of naturalness. Excellent opportunities for solitude and primitive recreation.	
2) Portion Recommended Suitable	27,500 acres	27,500 acres public land; 1,280 acres State-owned surface and subsurface; 80 acres of private surface and subsurface.	Primarily rugged canyons and rough-hilly country. Elevations range from 6,785 to 9,212 feet.	Same as above.	4,274 acres of ponderosa pine/Douglas fir; 10,771 acres of pinyon-juniper woodland; and 12,455 acres of grama-galleta steppe.	Retains substantial acreage of all three SHS's.	Same as above.	Bat Cave is located within this portion of the WSA. Few additional sites presently known.	Same as above; the area is primarily a forested mountain environment which screens impacts and other uses.	
3) Portion Recommended Unsuitable	41,261 acres	41,261 acres public land; 2,240 acres State surface and subsurface; 2,200 acres private surface; 80 acres of private subsurface.	Primarily smooth rolling grasslands.	Same as above.	40,249 acres of grama-galleta steppe, 341 acres of pinyon-juniper, 641 acres of Douglas fir/ponderosa pine.	Contains all three SHS's, but is predominantly antelope habitat.	Same as above.	Few sites presently known.	Primarily a smooth rolling grassland. The extreme visibility in this area makes human impacts and uses more noticeable than in the forested portions of the Unit. Outstanding opportunities for solitude; few opportunities for primitive recreation.	

WSA	Acreage	Land Status	Topography	Geology	Bailey-Kuchler Vegetation Types	Wildlife	T&E Species	Cultural	Wilderness Values	Other
JORNADA RESOURCE AREA										
Sierra Ladrones										
1) Entire WSA	39,308 acres	39,308 public, 373 private and 1,960 State acres.	Isolated desert mountain range; topography includes massive rock escarpments, serrated mountain peaks, badlands, box canyons, mesa benchlands, and rolling hills. Elevations range from 5,200 to 9,176 feet.	Extremely complex; transition zone between Rio Grande rift, the southeastern margin of the Colorado Plateau, and the Datil-Mogollon volcanic field.	Colorado Plateau: 34,440 acres of grama-galleta steppe/pinyon-juniper woodland mosaic. Chihuahuan Desert: 2,000 acres of tarbush-creosote bush and 868 acres of riparian. Upper Gila Mountains Forest Province: 2,000 acres.	Two SHS's support approximately 201 wildlife species including 56 mammal species, 51 reptiles and amphibians, and 94 resident and migratory bird species. Representative wildlife includes mule deer, pronghorn, mountain lion, coyote, bobcat, fox, badger, Gambel's and scaled quail, mourning dove and numerous songbirds. Good raptor habitat.	Potential occurrence for 21 T&E plant species.	Seventeen recorded sites ranging from lithic scatters to historic sites. Most of WSA is uninventoried.	High wilderness values have been recognized for many years; mountain core of area is spectacular; naturalness enhanced by dramatic landforms, high topographic diversity, and relatively large size. Solitude and recreation opportunities are outstanding.	Unique geologic features; high scenic values; riparian zones.
2) Portion Recommended Suitable	25,724 acres	25,724 public, 373 private and 1,320 State acres.	Isolated desert mountain range; topography includes massive rock escarpments, serrated mountain peaks, badlands, and rolling hills. Elevations range from 5,200 to 9,176 feet.	Same as above.	Colorado Plateau: 21,324 acres of grama-galleta steppe/pinyon-juniper woodland mosaic. Chihuahuan Desert and Upper Gila Mountains Forest Province same as above less 468 acres of riparian.	Same as above.	Same as above.	Eight recorded sites ranging from lithic scatters to historic sites. Most of WSA is uninventoried.	Same as above except landform diversity reduced to a degree.	Same as above.
3) Portion Recommended Unsuitable	13,584 acres	13,584 public and 640 State acres.	Mesa benchlands, badlands and box canyons. Elevations range from 5,300 to 7,000 feet.	Same as above.	Colorado Plateau: 13,116 acres of grama-galleta steppe/pinyon-juniper woodland mosaic and 468 acres of riparian.	One SHS supports approximately 112 wildlife species including 29 mammal species, 36 reptiles and amphibians, and 47 resident and migratory bird species. Representative wildlife same as above excluding mountain lion.	Potential occurrence for 5 T&E plant species.	Nine recorded sites ranging from lithic scatters to historic sites. Most of WSA is uninventoried.	Naturalness values impaired by rangeland developments in northern portinn of area. Southern portion of area has relatively high naturalness values accentuated by box canyons and badlands topography.	Riparian zone along Rio Salado.
Veranito										
1) Entire WSA (Unsuitable)	7,206 acres	7,206 public acres; no inholdings.	Mesa benchlands cut by arroyos; a series of low lying hills lies on the east. Elevations range from 4,600 to 5,400 feet.	Located within the Socorro trough, a faulted tectonic depression filled with alluvium deposits; the trough is part of the Rio Grande rift.	Chihuahuan Desert: 6,441 acres of tarbush-creosote bush, 350 acres of grama-tobusa and 415 acres of riparian.	Two SHS's support approximately 213 wildlife species including 27 mammal species, 41 reptiles and amphibians, 145 resident and migratory bird species. Representative wildlife includes mule deer, raccoon, coyote, Gambel's and scaled quail, mourning dove and songbirds.	Potential bald eagle, peregrine falcon, and whooping crane habitat due to proximity to Rio Grande; potential for occurrence of four T&E plant species.	Three recorded sites within Unit; potential for unrecorded sites is high.	Naturalness values are not high; solitude opportunities are outstanding; recreation opportunities are considered marginal.	Unit includes approximately 100 acres of cottonwood bosque and 315 acres of saltcedar.

WSA	Acreage	Land Status	Topography	Geology	Bailey-Kuchler Vegetation Types	Wildlife	T&E Species	Cultural	Wilderness Values	Other
Sierra de las Canas										
1) Entire WSA	12,838 acres	12,838 public and 160 private acres.	Rugged desert mountain range; sheer rock escarpments, deep narrow canyons, mountain ridges, mesa tops, broken badlands and isolated desert valleys. Elevations range from 5,100 to 6,200 feet.	Dominated by the fault zone of the Rio Grande rift; forms portion of the highlands east of the Rio Grande and west of the Jornada del Muerto basin.	Colorado Plateau: 6,400 acres of grama-galleta steppe/pinyon-juniper woodland mosaic. Chihuahuan Desert: 5,120 acres of tarbush-creosote bush and 1,318 acres of grama-tobosa.	Five SHS's support approximately 238 wildlife species including 52 mammal species, 53 reptiles and amphibians, and 133 resident and migratory bird species. Representative wildlife includes mule deer, pronghorn, coyote, bobcat, scaled quail and songbirds. Good raptor habitat.	Potential peregrine falcon habitat; potential occurrence for 14 T&E plant species.	Eight recorded sites; petroglyphs in Unit. Most of WSA is uninventoried.	WSA represents one of New Mexico's least disturbed upper Chihuahuan Desert ecosystems; naturalness values are very high. Solitude and primitive recreation opportunities are outstanding; located in close proximity to Socorro.	Fine example of scenic value of low elevation desert mountains.
2) Portion Recommended Suitable	12,798 acres	12,798 public acres; no inholdings.	Same as above.	Same as above.	6,360 acres of of grama-galleta steppe/pinyon-juniper woodland mosaic. Chihuahuan Desert same as above.	Same as above.	Same as above.	Same as above.	Same as above except access corridor provided to private inholding.	Same as above.
3) Portion Recommended Unsuitable	40 acres	40 public acres; no inholdings.	Badlands area.	Same as above.	40 acres of grama-galleta steppe/pinyon-juniper woodland mosaic.	Characterized by one SHS.	Potential occurrence for T&E species reduced by small size of the area.	No recorded sites; area is uninventoried.	Badlands area; no human intrusions.	
Stallion										
1) Entire WSA (Unsuitable)	24,238 acres	24,238 public and 1,280 State acres.	Semi-arid mountainous environment; rock escarpments, badlands, box canyons, rolling pinyon-juniper and grass covered hills. Elevations range from 5,500 to 7,100 feet.	Dominated by the fault zone of the Rio Grande rift; forms portion of the highlands east of the Rio Grande and west of the Jornada del Muerto basin.	Colorado Plateau: 21,238 acres of grama-galleta steppe/pinyon-juniper woodland mosaic. Chihuahuan Desert: 3,000 acres of tarbush-creosote bush.	Three SHS's support approximately 169 wildlife species including 50 mammal species, 28 reptiles and amphibians, and 91 resident and migratory bird species. Representative wildlife includes mule deer, pronghorn, coyote, bobcat, scaled quail and songbirds. Good raptor habitat.	Potential occurrence for 10 T&E plant species.	Four recorded sites ranging from lithic scatters to a historic structure. Potential for unrecorded sites is high. Most of WSA is uninventoried.	WSA is natural in appearance. However, presence of two military structures on highest points in Unit reduce quality of naturalness values. Solitude values are impaired by frequent low level jet overflights by military. Opportunities for primitive recreation exist but not considered outstanding.	Small herd of wild horses in WSA.
Devil's Backbone										
1) Entire WSA (Unsuitable)	8,904 acres	8,904 public acres; no inholdings.	Rugged and broken southern flank of Magdalena mountains; Unit rises precipitously out of surrounding desert grassland; culminates in sharp, knife-like ridges and stark, rocky peaks. Elevations range from 5,400 to 8,100 feet.	Mid-tertiary volcanic rocks associated with cauldrons of the Mogollon-Datil Province	Colorado Plateau: 4,000 acres of grama-galleta steppe/pinyon-juniper woodland mosaic. Chihuahuan Desert: 1,904 acres of grama-tobosa; 2,000 acres of tarbush-creosote bush. Upper Gila Mountains Forest Province: 1,000 acres.	Two SHS's support approximately 194 wildlife species including 50 mammal species, 50 reptiles and amphibians, and 94 resident and migratory bird species. Representative wildlife includes mule deer, pronghorn, coyote, bobcat, fox and possibly mountain lion. Good raptor habitat.	Potential occurrence for 11 T&E plant species.	No recorded sites; no inventory data. Site density projected to be low.	WSA is natural in appearance; naturalness impaired by livestock watering pipeline which hisects Unit east to west. Southern half and extreme northern portion of Unit is highly natural. Opportunities for solitude are outstanding. Recreation opportunities are limited by difficult access and environmental character of the WSA.	
Jornada del Muerto										
1) Entire WSA (Unsuitable)	31,147 acres	31,147 public and 2,560 State acres.	A lava flow characterized by lava tubes, sink holes, pressure ridges, and related volcanic features; most of these structures have been silted in by fine wind blown sand and clay materials. Elevations range from 4,700 to 4,900 feet.	Basalt lava flow located near the geographic center of the Jornada del Muerto basin.	Chihuahuan Desert: 25,000 acres of grama-tobosa; 6,147 acres tarbush-creosote bush.	One SHS supports approximately 93 wildlife species including 24 mammal species, 31 reptiles and amphibians, and 38 resident and migratory bird species. Representative wildlife includes pronghorn, coyote, scaled quail and songbirds.	Potential occurrence for 1 T&E plant specie.	No cultural sites recorded prior to wilderness study; one prehistoric site located during study. No inventory data.	WSA represents fine example of lava-desert grassland; naturalness values are high. Solitude opportunities are exceptional. For the average individual, the Study Unit would likely prove unattractive for backcountry use.	

TABLE 3-2
SUMMARY OF EXISTING AND POTENTIAL USES

WSA	Minerals	Livestock Grazing	Forest Products	Recreation	Wildlife	Other
SAN AUGUSTINE RESOURCE AREA						
Horse Mountain						
1) Entire WSA	Unit has been segregated from the general mining laws since 1970. There are no current mining claims in the Unit. The northern and southern portions of the Unit are leased for oil and gas. Unit may provide an environment for tin, molybdenum, fluorspar, and associated minerals.	The WSA encompasses portions of three allotments.	Potential as fuelwood area reduced by lack of legal access. Ponderosa stands contain approximately 3.7 million board feet of standing timber. These stands have marginal commercial potential. This potential is not as great as timber stands on USFS lands in the area.	Current use is primarily big game hunting. Backcountry recreation use is low. Area offers outstanding potential for all types of backcountry recreation.	Approved HMP designed to improve and protect wildlife habitat. Objectives include the creation of more roosts, water sources and prey species for bald eagles and to produce more forage for elk, mule deer and pronghorn. The WSA has not been identified for reintroduction of any species by NM Department of Game and Fish.	Region is used by USAF for low altitude training flights.
2) Portion Recommended Suitable	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.
3) Portion Recommended Unsuitable	Same as above.	Portions of one allotment affected.	No potential for timber. Very slight potential for fuelwood.	Offers little or no potential for backcountry recreation.	This portion of the Unit was not included in the HMP.	Same as above.
Continental Divide						
1) Entire WSA	Two oil and gas leases cover the eastern portion of the WSA. The northwestern portion of the Unit has been classified as not prospectively valuable for oil and gas. Unit may provide an environment for tin, molybdenum, fluorspar,and associated minerals. There are three current mining claims in the Unit.	The WSA encompasses portions of five allotments.	Contains an estimated 9.1 million board feet of ponderosa pine and 15,000 cords of standing pinyon-juniper. Potential as a fuelwood area reduced by remote location. Potential for timber production reduced by low stand vigors, accessibility problems and the presence of more suitable commercial timber stands on USFS lands in the area.	Current use consists primarily of big game hunting. Low levels of backcountry use. Potential for increased backcountry use due to wilderness designation and proposed Continental Divide National Scenic Trail.	Approved HMP designed to improve and protect wildlife habitat. Objectives include the creation of more roosts, water sources, and prey species for bald eagles and to produce more forage for elk, mule deer and pronghorn. The WSA has not been identified for reintroduction of any species by NM Department of Game and Fish.	Region is used by USAF for low altitude training flights. Nationally significant archaeological research has been conducted and will continue at Rat Cave.
2) Portion Recommended Suitable	Eliminates the majority of the lands which have been classified as prospectively valuable for oil and gas. Also removes three mining claims.	Portions of two allotments.	Same as above.	Deer hunting major current use. Outstanding opportunities for primitive recreation.	Same as above.	Same as above.
3) Portion Recommended Not Suitable	This portion of the WSA has been classified as prospectively valuable for oil and gas. This area contains three mining claims and is presently leased for oil and gas.	Portions of three allotments.	Minimal potential for timber production for fuelwood.	Antelope hunting major current use. Opportunities for primitive recreation exist but are not considered outstanding.	Same as above.	Used by USAF for low altitude training flights.
JORNADA RESOURCE AREA						
Sierra Ladrones						
1) Entire WSA	Six oil and gas leases and approximately 175 mining claims within Unit. Considered to have high potential for mineral development.	Contains all of one and portions of eight grazing allotments.	Contains 35,400 acres of nonproductive forest land. No potential for sawtimber production. Fuelwood production considered marginal due to inaccessibility, low tree density, small tree size and availability of alternate cutting areas.	Current use is moderate. Very high potential for all types of backcountry recreation due to diverse land forms and vegetation, high scenic qualities,proximity to Albuquergue and good access.	The area has been identified for introduction of desert bighorn sheep by NM Department of Game and Fish.	N/A

TABLE 3-2 (Continued)
SUMMARY OF EXISTING AND POTENTIAL USES

WSA	Minerals	Livestock Grazing	Forest Products	Recreation	Wildlife	Other
2) Portion Recommended Suitable	Contains six oil and gas leases and majority of mining claims. Retains area considered to have highest potential for mineral development.	Contains portions of seven grazing allotments.	Contains approximately 24,400 of non-productive forest land. Fuelwood production considered marginal.	Rugged mountain environment offers very high potential for all types of backcountry recreation.	Same as above.	N/A
3) Portion Recommended Unsuitable	Contains land with potential for oil and gas, carbon dioxide, high-calcium limestone, gypsum and manganese.	Contains portions of two grazing allotments and majority of rangeland developments.	Contains approximately 11,000 acres of non-productive forest land. Fuelwood production considered marginal.	Box canyons and badlands offer high potential for backcountry recreation.	The area has not been identified for reintroduction of any species by NM Department of Game and Fish.	N/A
Veranito						
1) Entire WSA (Unsuitable)	No oil and gas leases and mining claims within Unit. Considered to have high potential for geothermal and moderate potential for uranium, sand and gravel.	Contains portions of three grazing allotments.	N/A	Current use is low. Potential for future use is limited except in cottonwood bosque area.	The area has not been identified for reintroduction of any species by NM Department of Game and Fish. Planned actions for the cottonwood bosque area include fencing and prescribed burns.	Portion of WSA located within the WSMR Safety Extension Area.
Sierra de las Canas						
1) Entire WSA	Six oil and gas leases and approximately 20 mining claims within Unit. Considered to have moderate potential for geothermal, copper, barite, fluorite, lead, and zinc.	Contains portions of five grazing allotments.	N/A	Current use is low. High potential for all types of backcountry recreation due to proximity to Socorro and the Rio Grande Valley.	The area has not been identified for reintroduction of any species by NM Department of Game and Fish.	WSA is located entirely within the WSMR Safety Extension Area.
2) Portion Recommended Suitable	Same as above.	Same as above.	N/A	Same as above.	Same as above.	Same as above.
3) Portion Recommended Unsuitable	Potential for mineral development reduced by small size of the area.	A portion of one grazing allotment.	N/A	Potential for backcountry recreation reduced by small size of the area.	Same as above.	Provides access corridor to private inholding.
Stallion						
1) Entire WSA (Unsuitable)	Seventeen oil and gas leases within Unit. No mining claims. Considered to have moderate potential for copper and limestone.	Contains portions of four grazing allotments.	Contains approximately 23,000 acres of non-productive forest land. No potential for saw-timber production. Fuelwood production considered marginal due to inaccessibility, low tree density, small tree size and availability of alternate cutting areas.	Current use is very low. Some big game hunting occurs during deer season. Potential use is limited by poor access.	The area has not been identified for reintroduction of any species by the NM Department of Game and Fish.	WSA is located entirely within the WSMR Safety Extension Area.
Devil's Backbone						
1) Entire WSA	Four oil and gas leases within Unit. No mining claims. Considered to have low mineral development potential.	Contains portions of four grazing allotments.	N/A	Current use is very low. Some big game hunting occurs during deer season. Potential use is limited by relatively unspectacular environment and poor access.	The area has not been identified for reintroduction of any species by the NM Department of Game and Fish. The WSA will be managed in accordance with the Nogal Canyon Habitat Management Plan.	N/A
Jornada del Muerto						
1) Entire WSA	Six oil and gas leases within Unit. No mining claims. Considered to have low mineral development potential.	Contains portions of three grazing allotments.	N/A	Current use is very low. Potential use is limited by relatively unspectacular environment and poor access.	The area has not been identified for reintroduction of any species by the NM Department of Game and Fish.	WSA is located entirely within WSMR Aerohee 350 Safety Evacuation Zone.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

Summary of Impacts

Table 4-1, at the end of this chapter, includes a summary of environmental consequences described in more detail in the Wilderness Analysis Reports (WARs). If any of these areas are designated as wilderness, wilderness management plans will be prepared. These plans will provide the opportunity to incorporate measures designed to mitigate adverse environmental impacts.

Social and Economic Impacts

Based on available information, including a comparison with two recently designated U.S. Forest Service wilderness areas in the region (Withington and Apache Kid), wilderness designation would have little short-term impact on the population, income and employment of Catron, Cibola or Socorro Counties.

Local Attitudes and Perceptions

Wilderness designation would not change the general attitudes or values of local residents, but it would affect their attitudes toward the BLM, the Federal Government, and how some ranchers view the future of their operation. Most livestock operators fear that drastic changes, such as cuts in animal unit months (AUMs) or policy modifications that prevent rangeland improvements, construction and maintenance, would be forthcoming as administrative changes occur. Ranchers are also concerned about the changes in ranch loan and sale values that would occur as a result of wilderness designation. If designation occurs, many ranchers feel their operation would be less viable than it was before designation.

Economic Conditions

As mentioned earlier, wilderness designation is not expected to produce short-term impacts to economic conditions in Catron, Cibola and Socorro Counties. It is expected that wilderness designation would produce the following long-term impacts.

Minerals

The All Wilderness alternative would be expected to produce significant impacts to mineral development in one WSA, Sierra Ladrones, which was identified as having a high favorability for economic mineral deposits. These impacts would be reduced by the Preferred Alternative which recommends a smaller wilderness alternative for Sierra Ladrones.

Long-term costs of energy and mineral development foregone by wilderness designation are not possible to predict at this time since they depend on the nature of possible deposits and future market conditions.

Livestock Grazing

There would be no impacts to current levels of authorized livestock use as the result of guidelines contained in the BLM Wilderness Management Policy. While future stocking levels would be set by range management policy, some limitations on new rangeland improvements could be expected under the Wilderness Management Policy. Wilderness management could also result in some additional maintenance and construction costs for rangeland improvements which might be authorized in designated wilderness areas.

Loan values of AUMs inside wilderness areas may be discounted by lending institutions. A BLM grazing permit has value for borrowing money and adding value to the base property at the time of sale. The market value of an AUM as of September 21, 1982 was approximately $1,200. Normally, when a loan is made, the Federal Land Bank will loan approximately 65 to 70 percent of the market value per AUM. According to the Federal Land Bank, AUMs that lie within the wilderness boundary would have a loan value of approximately 50 to 60 percent of the AUM market value.

Those operators who may require additional operating capital for their operation could experience an unfavorable economic effect on the AUMs that occur within the wilderness boundary since the loan value would not be as high as those AUMs that are located outside the wilderness boundary.

Wilderness

The value of wilderness to the public must be examined in the context of the philosophic and legislative intent behind the Wilderness Act. The Act makes it clear that it is "the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." It is further stated that the wilderness resource "shall be devoted to the public purposes of recreation, scenic, scientific, educational, conservation and historical use."

Wilderness designation may enhance the preservation value of wilderness. The preservation value of wilderness includes - option, existence, and bequest values of the general public. The option value is defined as the willingness to pay for the opportunity to have access to wilderness areas for recreation use in the future. The existence value is defined as the amount of money people are willing to pay for the knowledge that natural habitat for plants, fish, and wildlife are protected in wilderness areas. The bequest value is defined as the willingness to pay for the satisfaction derived from endowing future generations with wilderness resources (Walsh et al. 1981).

The economic value of the wilderness resource and the previously mentioned public purposes and values is difficult to quantify. It is known, however, that the population of New Mexico and other western states is expected to increase as migration from other parts of the United States continues to occur. This will produce an increased demand for resources which can be expected to reduce the amount of remaining natural areas in the State and region.

Recreation use information in National Forest areas indicates that recreational use in many wilderness areas has increased at a greater rate than use in non-wilderness areas. This reduced supply and increasing demand suggests that the value of the wilderness is increasing faster than our capability to quantify wilderness values in economic terms.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Alternative	Acreage	Minerals	Livestock Grazing	Forest Products	Recreation	Wildlife	Cultural	Wilderness Values	Other
SAN AUGUSTINE RESOURCE AREA									
Horse Mountain									
All Wilderness	5,032 acres	No significant impact to energy minerals because of low favorability for their occurrence. Unit is favorable for base and precious metals, designation would restrict exploration and prevent development of those minerals present.	No significant impact.	No impact to commercial production because stands have low commercial potential and there are extensive commercial stands on USFS lands in the region.	Restriction of vehicular access would limit hunting. Present low levels of backcountry use would increase.	No significant impacts will result from restrictions on wildlife management actions designed to improve habitat by vegetative manipulation and two additional water sources. Reduced vehicular access would reduce human impacts on wildlife.	No known impact.	Would be maintained through wilderness management.	
Partial Wilderness (amended boundary)	4,432 acres recommended suitable 600 acres recommended non-suitable	Same as above.	Same as above.	Same as above.	Same as above.	Same as above for suitable recommendation. Lands recommended unsuitable have not been identified for management action to improve wildlife habitat.	Same as above.	Same as above.	
No Action/No Wilderness revert to existing plan	5,032 acres	Unit would remain segregated from mining laws. This precludes the filing of mining claims but not mineral leases.	No significant impact.	No impact to commercial timber production.	No impact.	No impacts to implementation of wildlife habitat management plan.	Same as above.	Planned management actions including livestock and wildlife waters, vegetative manipulation and fences would reduce the degree of naturalness.	
Continental Divide									
All Wilderness	68,761 acres	No significant impact to energy minerals because of low favorability for their occurrence. Exploration for and development of possible deposits of tin, molybdenum and fluorspar, all critical minerals, would be foregone.	No impact to current levels of authorized use. Limitations on new rangeland developments and vehicular access would result in significant impacts.	No impact to commercial timber production because stands have low commercial potential and there are extensive commercial stands on USFS lands in the region.	Restrictions on vehicular access would limit recreational uses, particularly hunting. Present low levels of backcountry use would increase.	No significant impacts will result from restrictions on wildlife management actions designed to improve habitat by vegetative manipulation and nine additional waters. Reduced vehicular access would reduce human impacts on wildlife.	Potential for vandalism at Bat Cave increased by increased visitation as a result of wilderness designation. Would enhance scientific value of sites by preserving the natural environmental context. May subject surface artifacts to increased disturbance and removal. Research efforts may be limited to preserve wilderness values.	Would be maintained through wilderness management.	
Partial Wilderness (amended boundary)	27,500 acres recommended suitable 41,261 acres recommended non-suitable	No impact to existing leases and mining claims and lands classified as prospectively valuable for oil and gas. Other impacts remain the same as the All Wilderness alternative.	Same as above for the portion recommended suitable. No impact for the portion recommended non-suitable.	Same as above.	Same as above except for antelope hunting which would not be affected by this proposal.	No impacts to development of six of nine proposed wildlife waters which fall outside the amended boundary. Lands outside the suitable recommendation are primarily antelope habitat.	Same as above for Bat Cave and known prehistoric sites in the area recommended as suitable.	Wilderness values on 27,500 acres would be maintained through wilderness management. Natural values on the remaining 41,261 acres could be reduced by measures to improve range condition and wildlife habitat.	
No Action/No Wilderness revert to current plan	68,761 acres	No significant impact.	No significant impact.	No impact to commercial timber production.	No impact.	No impacts to implementation of wildlife management plans.	Gradual alteration of the area would result in loss of some scientific information. No impact to research methods.	Continued vehicular access and planned management actions including livestock and wildlife waters, vegetative manipulations and fences would increase human impacts in the area and reduce the natural qualities of the Unit.	

Alternative	Acreage	Minerals	Livestock Grazing	Forest Products	Recreation	Wildlife	Cultural	Wilderness Values	Other
JORNADA RESOURCE AREA									
Sierra Ladrones									
All Wilderness	39,308 acres	Little or no impact to oil and gas development. Wilderness designation would restrict mineral exploration/development in an area that may have a high potential for the occurrence of copper and uranium as well as other economically recoverable strategic metals.	No impact to current levels of authorized use. Limitations on new rangeland developments and vehicular access would result in moderate impacts.	Little impact due to inaccessibility, low tree density, small tree size and the availability of alternate cutting areas.	Restrictions on vehicular access would impact deer hunters. An increase in visitation to the WSA from Albuquerque would be anticipated. A high quality recreational environment would be permanently preserved.	Wildlife habitat, including potential habitat for desert bighorn, would be permanently preserved. The natural distribution and abundance of wildlife species would be maintained. Minimal impact to wildlife management actions including additional wildlife waters and vegetative manipulation.	Would preserve scientific and educational values of cultural sites by maintaining the natural environmental context. Restrictions on vehicular access would reduce potential for vandalism. Increased visitor use could result in higher incidence of casual surface collection of artifacts.	High wilderness values would be maintained.	
Partial Wilderness (Amend Boundary)	25,724 acres	Amended boundary would remove lands having potential for oil and gas, carbon dioxide, high-calcium limestone, gypsum and manganese. Impacts to other minerals would remain the same as the All Wilderness alternative.	No impact to current levels of authorized use. Area recommended unsuitable contains the majority of existing and potential rangeland developments. The impacts to livestock grazing would, therefore, be reduced by this alternative.	Area recommended suitable is inaccessible to vehicles and would produce no impacts. The area recommended unsuitable would make approximately 11,000 acres of marginal pinyon-juniper woodlands available for fuelwood.	Same as above for area recommended suitable. For area recommended unsuitable there would be no significant impact to vehicle dependent recreation. Primitive recreation opportunities would be reduced if mineral exploration/development occurs.	Area recommended suitable has high diversity and distribution of wildlife species and contains potential habitat for desert bighorn. Area recommended unsuitable is utilized by raptors, mule deer and antelope. More intensive wildlife habitat management actions could be applied on unsuitable area.	Same as above for area recommended suitable. Area recommended unsuitable contains numernus cultural sites that would be subject to potential vandalism as a result of continued vehicular access.	Core area with highest wilderness values would be permanently preserved. Area recommended as unsuitable would be impacted by additional rangeland developments and possible mineral exploration/development.	
No Wilderness (Manage Under Existing Plan)	39,308 acres	Mineral development would occur if economic deposits are found to exist.	No significant impact; however, if mineral exploratinn/development occurs, current levels of authorized use could be reduced.	No significant impact.	Construction of new vehicle routes would open the WSA to increased motorized recreational activities. Deer hunting access would be improved and the scenic qualities of the WSA would be available to viewing by a greater number of persons. If mineral exploration/development occurs, primitive recreation opportunities would be severely reduced.	A wider range of wildlife management actions could be implemented. If mineral exploration/development occurs, wildlife values could be significantly impacted.	Cultural sites would be subject to potential vandalism as a result of continued vehicular access. If intensive mineral exploration/development occurs, cultural sites could be significantly impacted.	Naturalness and solitude values would be significantly impacted if intensive mineral exploration/development were to occur in the core area.	
Veranito									
All Wilderness	7,206 acres	Significant impacts due to WSA's high potential for the discovery of geothermal resources.	No impact to current levels of authorized use. Limitations on new rangeland developments and vehicular access would result in no significant impacts.	N/A	No significant impact.	No significant impact.	Would preserve scientific and educational values of cultural sites by maintaining the natural environmental context. Restrictions on vehicular access would reduce potential for vandalism. Increased visitor use could result in higher incidence of casual surface collection of artifacts.	Marginal wilderness values would be maintained.	Would limit the military's freedom of action in a portion of the WSMR Safety Extension Area. Impacts are expected tn be low.
No Wilderness (Manage Under Existing Plan)	7,206 acres	Geothermal development would occur if economical resources are found to exist.	No significant impact; however, if mineral exploration/development occurs, current levels of authorized use could be reduced.	N/A	No significant impact.	No significant impact.	Continued vehicular access would result in potential vandalism of sites. If mineral exploration/development occurs, cultural sites could be significantly impacted.	No significant impact.	No impact to WSMR.

TABLE 4-1 (continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Alternative	Acreage	Minerals	Livestock Grazing	Timber Harvest	Recreation	Wildlife	Cultural	Wilderness Values	Other
Sierra de las Canas									
All Wilderness	12,838 acres	Minimal to moderate impacts due to moderate potential for discovery of geothermal resources. Little or no impact to other minerals due to low favorability for economic concentrations.	No impact to current levels of authorized use. Limitations on new rangeland developments and vehicular access would result in no significant impacts.	N/A	A high quality recreational environment would be permanently preserved.	Wildlife habitat would be permanently preserved. The natural distribution and abundance of wildlife species would be maintained. Minimal impact to wildlife management actions including additional wildlife waters and vegetative manipulation.	Would preserve scientific and educational values of cultural sites by maintaining the natural environmental context. Restrictions on vehicular access would reduce potential for vandalism. Increased visitor use could result in a higher incidence of casual surface collection of artifacts.	High wilderness values would be maintained.	Would limit the military's freedom of action in a portion of the WSMR Safety Extension Area. Impacts are expected to be low.
Partial Wilderness (Amend Boundary)	12,798 acres	Same as above except 40 acres would be released for mineral exploration/development.	Same as above for portion recommended as suitable. Impacts reduced by providing access to private inholding.	N/A	The removal of 40 acres would not alter the impacts described above.	The removal of 40 acres would not alter the impacts described above.	Same as above for portion recommended suitable. Unsuitable area would be subject to potential vandalism if a vehicle route was constructed.	Same as above for portion recommended suitable. Construction of a vehicle route on unsuitable area would reduce the degree of naturalness.	Same as above for portion recommended suitable. The removal of 40 acres would not alter the impacts described above.
No Wilderness (Manage Under Existing Plan)	12,838 acres	Development of geothermal and possibly other minerals would occur if economical resources are found to exist.	No impact to current levels of authorized use and new rangeland developments. If mineral exploration/development occurs, current levels of authorized use could be reduced.	N/A	New vehicle routes would open the WSA to motorized recreational activities. Deer hunting access would be improved and the scenic qualities of the Unit would be available to viewing by a greater number of persons. If mineral exploration/development occurs, primitive recreation opportunities would be reduced.	A wider range of wildlife management actions could be implemented. If mineral exploration/development occurs, wildlife values could be impacted.	New vehicle routes could result in potential vandalism of sites. If mineral exploration/development occurs, cultural sites could be significantly impacted.	New vehicle routes, livestock management actions and possible mineral exploration/development would significantly reduce naturalness and solitude values.	No impact to WSMR.
Stallion									
All Wilderness	24,238 acres	Little or no impacts due to low favorability for the occurrence of minerals.	No impact to current levels of authorized use. Limitations on new rangeland developments and vehicular access would result in moderate impacts.	Little impact due to inaccessibility, low tree density, small tree size and the availability of alternate cutting areas.	Restrictions on vehicular access would impact recreation, primarily deer hunting. Visitor use would not be expected to increase substantially over existing levels.	No significant impact.	Would preserve scientific and educational values of cultural sites by maintaining the natural environmental context. Restrictions on vehicular access would reduce potential for vandalism. Increased visitor use could result in a higher incidence of casual surface collection of artifacts.	Marginal wilderness values would be maintained.	Would limit the military's freedom of action in a portion of the WSMR Safety Extension Area. Impacts are expected to be high.
No Wilderness (Manage Under Existing Plan)	24,238 acres	No impact.	No impact to current levels of authorized use, new rangeland developments and vehicular access.	No significant impact.	Vehicle related recreation activities would continue. Recreational opportunities available to backcountry users would be reduced.	No significant impact.	Continued vehicular access would result in potential vandalism of sites.	Continued vehicular access and livestock management actions would reduce naturalness and solitude values.	No impact to WSMR.
Devil's Backbone									
All Wilderness	8,904 acres	Little or no impact due to low favorability for the occurrence of minerals.	No impact to current levels of authorized use. Limitations on new rangeland developments and vehicular access would result in low to moderate impacts.	N/A	Restrictions on vehicular access would impact recreation, primarily deer hunting. Visitor use would not be expected to increase substantially over existing levels.	No significant impact.	No significant impact.	Wilderness values would be maintained.	
No Wilderness (Manage Under Existing Plan)	8,904 acres	No impact.	No impact to current levels of authorized use, new rangeland developments and vehicular access.	N/A	Continued vehicular access would impair primitive recreation opportunities.	No significant impact.	No significant impact.	Continued vehicular access and livestock management actions would reduce naturalness and solitude.	

TABLE 4-1 (continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Alternative	Acreage	Minerals	Livestock Grazing	Timber Harvest	Recreation	Wildlife	Cultural	Wilderness Values	Other
Jornada del Muerto									
All Wilderness	31,147 acres	Little or no impact due to low favorability for the occurrence of minerals.	No impact to current levels of authorized use. Limitations on new rangeland developments and vehicular access would result in no significant impacts.	N/A	Restrictions on vehicular access would have minimum impact on recreation activities. Preservation of a desert-lava grassland would broaden primitive recreation opportunities in New Mexico. Visitor use would not be expected to increase substantially over existing levels.	No significant impact.	No significant impact.	Wilderness values would be maintained.	Would limit the military's freedom of action in a portion of the WSMR Aerobee 350 Safety Evacuation Zone. Impacts are expected to be high.
No Wilderness (Manage Under Existing Plan)	31,147 acres	No impact.	No impact to current levels of authorized use, new rangeland developments and vehicular access.	N/A	No impact to current low levels of use.	No significant impact.	No significant impact.	Significant alteration of the environment is unlikely to occur.	No impact to WSMR.

CHAPTER 5

CONSULTATION AND COORDINATION

Purpose of Scoping

The Council of Environmental Quality (CEQ) Regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA) provide for an early and open process to determine the scope of issues to be addressed and to identify the significant issues. This process is termed "scoping."

In addition, scoping requires the lead agency to inform and involve affected Federal, State and local agencies, Indian tribes and other interested persons.

The process is designed to identify and emphasize the significant issues and eliminate from detailed consideration those that are either not significant or have been covered by earlier environmental review. This process effects a more concise document.

Scoping Activities

The following section summarizes the consultation, coordination and scoping activities undertaken by the San Augustine and Jornada Resource Areas. During the study phase of the wilderness review process, various Federal, State and local agencies, interest groups and individuals were contacted. Throughout all phases of the study an extensive mailing list was continuously developed and utilized to ensure that all interested parties would be kept informed of the study. The following public meetings and open houses were held to obtain public input.

The San Augustine Resource Area (SARA)

February 3, 1981 - The scoping process for the SARA wilderness studies was initiated with a mass mailing which announced the beginning of the study phase of the wilderness review process and requested public input.

March 30, 1981 - A public meeting was held in Socorro, New Mexico. Although this meeting had been announced in the newspaper and a second mass mailing, only one person attended. This individual supported wilderness designation and wished to be kept informed of the studies.

March 31, 1981 - Thirteen members of the public attended a meeting in Albuquerque. Minerals industry representatives were concerned that wilderness designation would hinder exploration and development efforts. Preservationists present pointed out that Bureau of Land Management (BLM) wilderness areas would add a wider range of recreational opportunities and ecosystems to the wilderness preservation system.

April 2, 1981 - Seven area ranchers attended a public meeting in Grants. "People problems" in the Malpais area was the dominant concern.

It was pointed out that the BLM should not encourage use through wilderness designation if the BLM did not have adequate funds to supervise that use.

March 4, 1981 - Forty-six members of the public attended an open house in Albuquerque which initiated the District's wilderness studies. The initial wilderness studies had been completed by the SARA in 1981 so many of the comments concerned the preliminary study findings. Concern was expressed regarding the Amended Boundary alternative for Continental Divide. Several individuals opposed decreasing the size of the area.

March 2, 1982 - Fifteen members of the public attended an open house in Socorro. The amended boundary proposed for Continental Divide was again the issue of most concern for the SARA Wilderness Study Areas (WSAs).

The Jornada Resource Area (JRA)

Three scoping meetings were held prior to the initiation of the Statewide wilderness study process. Sierra Ladrones and Petaca Pinta were the only WSAs being studied for wilderness at that time. When it was decided to include all the WSAs in the Statewide study, additional meetings were held to obtain public input on all the WSAs in the Resource Area.

July 14, 1981 - Twenty-five people including representatives of 14 interest groups, attended a public meeting in Albuquerque. The majority of the participants supported wilderness designation of the Sierra Ladrones and Petaca Pinta. The diversity of the WSAs and their cultural, geological and biological values were noted as reasons for support.

July 28, 1981 - Fourteen members of the public attended a meeting in Belen. They were generally opposed to wilderness designation of Sierra Ladrones and Petaca Pinta because of impacts to livestock grazing and mineral development.

July 30, 1981 - Thirty-nine members of the public attended a meeting in Socorro. Those opposed to wilderness designation cited impacts to livestock grazing, mineral development and trapping, and questioned the need for additional wilderness. Supporters of wilderness designation felt that there would not be impacts to grazing and mining and that the Sierra Ladrones and Petaca Pinta WSAs were natural, offered outstanding opportunities for solitude, and high geological, cultural and biological values.

March 4, 1982 - Forty-six members of the public attended an open house in Albuquerque which initiated the District's comprehensive wilderness studies. The majority of the comments concerned the Sierra Ladrones and Petaca Pinta WSAs. Support was expressed for designation of these areas. Interest was also high for the Sierra de las Canas and Jornada del Muerto WSAs.

March 2, 1982 - Fifteen members of the public attended an open house in Socorro. Few comments, pro or con, were received on any Jornada WSAs other than Sierra Ladrones and Petaca Pinta. These areas were strongly supported for wilderness designation.

Public announcements, attendance lists and summaries of meetings, and written comments are on file at the Socorro District Office.

Team Organization

This document was prepared by a team of BLM professionals with a variety of skills and expertise. Writers, support personnel, and reviewers are listed in Table 5-1.

TABLE 5-1

LIST OF PREPARERS OF
WILDERNESS ANALYSIS REPORTS
AND ENVIRONMENTAL ASSESSMENT

Name	EA/WAR Responsibility	Education	Experience
SAN AUGUSTINE RESOURCE AREA			
Paul W. Tanner	Area Manager	B.S. Forestry Management B.S. Forest Recreation Stephen F. Austin State University	BLM - 3 yrs. Area Manager 4 yrs. Realty/ATROW Specialist 2 yrs. Natural Resource Specialist Surface Protection Private Industry - 2 yrs. Project Forester
Bob Prickett	Lead	B.A. Asian Studies M.A. Recreation Management University of Oklahoma	BLM - 3 yrs. Outdoor Recreation Planner/Wilderness Coordinator BIA - 3 yrs. Recreation Specialist U.S. Army - 2 yrs. Intelligence Analyst
Debra Agnolet	Geology, Topography	B.A. Geology Montclair State College	BLM - 2 yrs. Area Geologist 5 yrs. Instructor Science and Mathematics
Bill Kight	Cultural Resources	B.S. Archaeology Eastern New Mexico University	BLM - 3 yrs. Area Archaeologist 1 yr. Archaeological and Museum Consultant
Steve Knisely	Forestry	B.S. Forest Management Northern Arizona University	BLM - 2 yrs. Area Forester Peace Corps - 2 yrs. Tropical Forestry
Wayne Ludington	Wildlife	B.S. Wildlife Management New Mexico State University	BLM - 4 3/4 yrs. Wildlife Management Biologist
Carol Marchio	Soils	B.S. Resource Management M.S. Land Use Planning University of Wisconsin	BLM - 5 yrs. Soil Scientist
Laird McIntosh	Vegetation	B.S. Biology M.S. Botany Fort Hays State University	BLM - 1 yr. District Botanist 2 yrs. Range Conservationist USFS - 1 yr. Range Conservationist
Tom Sidwell	Livestock Grazing	B.S. Range Management New Mexico State University	BLM - 3 yrs. Supervisory Range Conservationist 3 yrs. Range Conservationist BIA - 1 yr. Range Conservationist Self Employed - 6 yrs. Farm/Ranch Operations and Contractor
JORNADA RESOURCE AREA			
Bob Cordell	Area Manager	B.S. Range Management University of Arizona	BLM - 1 3/4 yrs. Area Manager 2 yrs. Realty Specialist 2 yrs. Supervisory Realty Specialist 4 yrs. Range Conservationist

TABLE 5-1 (continued)

LIST OF PREPARERS OF
WILDERNESS ANALYSIS REPORTS
AND ENVIRONMENTAL ASSESSMENT

Name	EA/WAR Responsibility	Education	Experience
Mike Pool	Lead	B.S. Wildlife Management New Mexico State University	BLM - 1 yr. NRS/Supervisory NPS 2 yrs. Supervisory Environmental Specialist 2 yrs. Realty Specialist 1½ yrs. Range Conservationist
Wesley Anderson	Wildlife	B.S. Wildlife Management New Mexico State University	BLM - 2 yrs. Wildlife Management Biologist
Kent Carlton	Technical Coordinator/ Recreation/Wilderness	B.S. Philosophy and Psychology University of North Carolina; Graduate Candidate (M.P.A.) Public Administration - University of New Mexico	BLM - 3 yrs. Wilderness Specialist NPS - 2 yrs. Park Ranger USFS - 2 yrs. Supervisory Forest Technician
Clem Chastain	Soils	B.S. Agronomy and Soils Oklahoma State University	BLM - 6 yrs. Soil Scientist SCS - 15 yrs. Soil Scientist Corps Eng. - 5 yrs. Lab Technician
Bernadine Creager	Lands/Realty Actions	Business College	BLM - 3 yrs. Realty Specialist Private Industry - 20 yrs. Secretary and Bookkeeper
Sam DesGeorges	Livestock Grazing/Vegetation	B.S. Wildlife Management New Mexico State University	BLM - 3 yrs. Range Conservationist
Powell King	Topography/Geology/Minerals	B.S. Mining Engineering New Mexico Institute of Mining and Technology	BLM - 2 yrs. Mining Engineer 1½ yrs. Realty Assistant
Larry Livingston	Livestock Grazing/Vegetation	B.S. Range Management Arizona State University	BLM - 4 yrs. Range Conservationist SCS - 1 yr. Range Conservationist
Robert Marchio	Livestock Grazing/Wild Horses Vegetation/Timber Harvest	B.S. Forest and Resource Management University of California at Berkeley	BLM - 7 yrs. Range Conservationist USFS - ½ yr. Forestry Technician
Paul Podborny	Livestock Grazing/Vegetation	B.S. Wildlife Ecology M.S. Range Management University of Arizona	BLM - 4½ yrs. Range Conservationist
Pat Sallani	Cultural Resources	B.A. Anthropology University of Nevada Las Vegas	BLM - 2 yrs. Archaeologist Private Contracting - 3 yrs. Archaeologist

TABLE 5-1 (continued)

LIST OF PREPARERS OF
WILDERNESS ANALYSIS REPORTS
AND ENVIRONMENTAL ASSESSMENT

Name	EA/WAR Responsibility	Education	Experience
Ron Sheppard	Livestock Grazing/Vegetation	B.S. Wildlife Management New Mexico State University	BLM - 5½ yrs. Range Conservationist
DISTRICT OFFICE			
Jane Farmer	Writer-Editor/ADP Coordinator	B.A. Business Oklahoma State University	BLM - 5 yrs. Writer/Editor ½ yr. Office Manager ½ yr. Range Clerk SCS - 4½ yrs. Secretary
John Gilmore	Water/Air Quality	B.S. Geology New Mexico State University	BLM - 2 yrs. District Hydrologist Private Industry - 1 yr. Well Site Geologist
Jon Hertz	Lands and Other Land Uses	B.A. Geography Arizona State University	BLM - 3½ yrs. Realty Specialist 3 yrs. Range Technician
Bill Jonas	Geology/Minerals	B.S. Geology B.A. Anthropology University of Maryland	BLM - ½ yr. District Geologist/State Minerals Appraiser 2 yrs. Minerals Appraiser USGS - ½ yr. Geologist
Brian Mills	Wildlife	B.S. Wildlife Biology Oklahoma State University	BLM - 6 yrs. Wildlife Management Biologist

Other Contributors

Dan Wood - Wilderness Specialist
Joe Sovcik - Environmental Coordinator
Donnie Soarks - District Manager
Ed Roberts - Associate District Manager
Joel Farrell - Chief, Division of Resource Management
Jerry Wall - Soil Scientist
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Murray Dale Norbeck - Public Information Specialist
Barbara Gutierrez - Office Manager
Loretta Appel - Typist
Kim Sadosuk - Typist
Nell Vallejos - Typist

San Augustine Resource Area

Wilderness Analysis Reports

WILDERNESS ANALYSIS REPORT
HORSE MOUNTAIN WILDERNESS STUDY AREA
NM 020-043

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Socorro District
San Augustine Resource Area
Socorro, NM 87801

December, 1982

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I. GENERAL DESCRIPTION

A. Location

This 5,032-acre Wilderness Study Area (WSA) is located in Catron County in west-central New Mexico approximately 25 air miles southwest of Datil.

Applicable USGS Topographic Maps:

Names	Wallace Mesa	(7½ minute)
	Mangas Mountain	(7½ minute)
	Horse Mountain West	(7½ minute)
	Horse Mountain East	(7½ minute)

B. Climate and Topography

Horse Mountain enjoys a generally mild, semi-arid climate. Precipitation is normally received during the warmer 6 months of the year. Half of the annual average precipitation falls from July through September. This is mostly from brief, but often heavy, thunderstorms. Winter is usually the driest season. Annual precipitation averages about 14 inches over the entire Unit, with the lower portions averaging 12 to 13 inches and higher portions 16 inches. Average annual snowfall in the area is 2 to 3 feet in most localities.

Temperatures in the summer average in the 80s during the days and in the 40s at night. Winter temperatures normally range from the 40s during daylight hours to the low teens during the night. Subzero nighttime temperatures are not uncommon in the higher elevations. Mean annual maximum and minimum temperatures for the area are 63 and 26 degrees F., respectively. The growing season lasts nearly 90 days in those elevations above 7,000 feet.

The prevailing winds over the Unit are from the southwest. Spring and summer winds of high intensity are common.

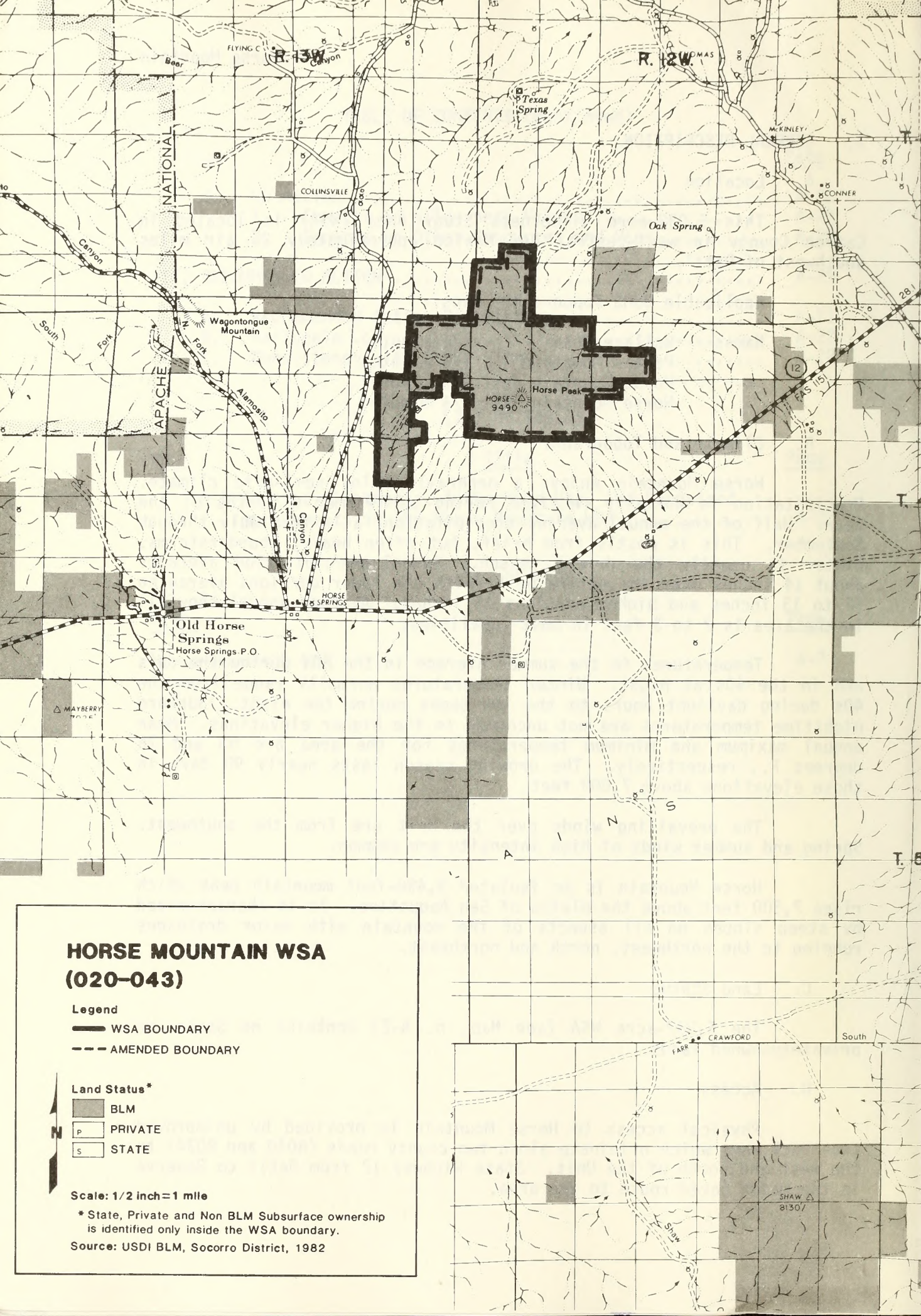
Horse Mountain is an isolated 9,490-foot mountain peak which rises 2,500 feet above the plains of San Augustine. It is characterized by steep slopes on all aspects of the mountain with major drainages running to the northwest, north and northeast.

C. Land Status

The 5,032-acre WSA (see Map, p. A-2) contains no State- or privately-owned lands.

D. Access

Physical access to Horse Mountain is provided by unimproved two-track ways which originate along two county roads (B040 and B034) to the west and north of the Unit. State Highway 12 from Datil to Reserve is the major paved route to the area.



HORSE MOUNTAIN WSA (020–043)

Legend

WSA BOUNDARY

AMENDED BOUNDARY

Land Status*

BLM

PRIVATE

STATE

N

Scale: 1/2 inch=1 mile

* State, Private and Non BLM Subsurface ownership is identified only inside the WSA boundary.

Source: USDI BLM, Socorro District, 1982

The easiest access to the WSA is from the west along a route which crosses State land.

There presently is no legal access into the Unit as all of the access routes cross State or private land. The acquisition of an easement would be required to ensure legal access into the Unit.

II. EXISTING RESOURCES

A. Geology

The Horse Mountain WSA is located within the Datil-Mogollon Volcanic Plateau. This area is transitional between the Basin and Range Province and the Colorado Plateau. The major geologic feature of the WSA is Horse Mountain, a composite strato-volcano of basaltic-andesitic composition. Horse Mountain is one of a series of Tertiary volcanic features which surround the southwestern portion of the San Augustine Plains.

Rocks exposed within the WSA are volcanic and sedimentary in nature. Andesitic to basaltic flows of late Tertiary age have intruded and capped older rhyolitic tuffs and volcanioclastics of the Mid-Tertiary Datil Formation. Some Quaternary basin fill forms the surface of the southwestern "dog leg" of the WSA.

A small uplift of Triassic and Permian rocks occur outside the WSA 2 miles south of Horse Peak. These rocks suggest that Triassic and Permian, sandstones and limestones extend beneath the volcanic pile forming Horse Mountain. Data from a deep well drilled near the center of the San Augustine Plains indicates that the Mesozoic and Paleozoic rocks unconformably overlie Precambian gneiss at depth.

B. Water

1. Surface Water

The WSA is located within the San Augustine Plains, a closed basin, with interior surface water drainage.

No permanent streams or surface water bodies exist within the WSA boundaries. The many alluvial arroyos and canyons which drain Horse Mountain contain runoff during the more intense storms but it soon disappears into alluvial fans and fill of surrounding lowlands. No information on surface water quality is available at this time.

2. Groundwater

Wells in the Horse Mountain area range in depth to water from 18 to 200 feet, but most are less than 100 feet to water. The general direction of groundwater movement is southeast and southwest but volcanic and structural features present make local interpretations of movement difficult. Most runoff runs down mountain canyons until it reaches the fracture zones in igneous rocks of the Datil Formation and the overlying Quaternary age alluvial deposits which are the principal

aquifers in the WSA. Analysis results from a number of wells in the Horse Mountain area indicate water of suitable chemical quality for livestock purposes. Instantaneous flow rates for these wells range from 1 to 6 gallons per minute.

C. Soils

Soils in the Unit have textures that range from cobbly loams to clays and are shallow over basalt or tuff. Approximately 30 percent of the soil mapping unit is rock outcrop. The rock outcrop unit occurs on steep woodland side slopes and ridges. It has potential erosion problems associated with slopes of 25 to 60 percent. This erosion potential is reduced somewhat by cobbles and stones on the surface.

D. Vegetation - Threatened or Endangered (T&E)

The characteristic vegetation in the Horse Mountain WSA will be described using Standard Habitat Site (SHS) terminology. SHS's are a vegetation classification system based on the dominant vegetation species and land form, used by the BLM Wildlife Management Program to describe the general characteristics of a given habitat. Animals which may commonly be found in each habitat will also be listed in this section. The following SHS's are present within the Horse Mountain Unit.

Ponderosa/Pinyon/Mountain (3,982 Acres)

This SHS has mature ponderosa in the higher elevations with a mixture of pinyon on the drier slopes. The ponderosa stands are fairly extensive throughout the Unit, occurring generally in open semi-pure compositions. Some Douglas fir is mixed with the ponderosa, especially on the wetter north-facing slopes. The understory consists of mountain mahogany, oak, and rubber rabbitbrush.

Animals that can commonly be found in this SHS include mule deer, burros, gray foxes, golden eagles, turkey vultures, red-tailed hawks, and great horned owls. Other animals that can occasionally be found include elk, black bears, mountain lions, bobcats, and bald eagles.

Blue Grama/Snakeweed/Hill (1,050 Acres)

Found primarily on lower hills next to mountains, the primary plant species within this SHS are broom snakeweed and blue grama, although fringed sage, winterfat, and squirreltail are also present. Common animal species in the SHS include coyotes, kit foxes, pronghorn antelope, striped skunks, jack rabbits, prairie dogs, and desert cottontails.

The WSA contains habitat which offers potential for the occurrence of 13 species of T&E plants. A list of these potentially occurring plants is available on request from the Socorro District Office.

E. Wildlife - T&E

Horse Mountain supports approximately 299 wildlife species. These include 53 reptiles/amphibians, 71 mammal species and 175 resident and migratory bird species.

A description of characteristic wildlife species present in the WSA is included in the SHS discussion in the Vegetation section above. In addition to the characteristic wildlife species present, the Unit has been identified by the U.S. Fish and Wildlife Service as providing potential habitat for bald eagles and peregrine falcon, both Federally endangered species.

The impacts of wilderness or non-wilderness were analysed in a biological assessment covering bald eagles and peregrine falcons. It was determined that neither course of action would have significant beneficial or adverse impacts on these species.

F. Visual

Horse Mountain is characterized by abrupt elevation differences, dense and varied conifer forest vegetation, and a wide variety of shapes, colors, and textures, which are often spectacular in seasonal combination.

These scenic qualities, and Horse Mountain's proximity to State Highway 12 have resulted in a Class II Visual Resource Management (VRM) rating for the Unit.

In addition to the scenic qualities within the Unit, numerous vantage points up to 2,500 feet above the surrounding landscape offer sweeping vistas. Features over a hundred miles away can be seen on a clear day.

G. Cultural

There are no documented archaeological sites within the Horse Mountain WSA. Based on limited field surveys, the potential for the existence of sites is considered to be low.

H. Air

Air quality is considered to be excellent since no sources for air pollution exist in the vicinity. Some temporary deterioration of air quality occurs in the spring when gusty, southwestern winds cause dust to blow.

III. EXISTING AND POTENTIAL USES

A. Mineral Development

1. Leasable

No oil and gas exploration wells have been drilled within the WSA. The closest exploration well to the WSA was a 12,284-foot dry

wildcat well, approximately 18 miles east of Horse Peak. This well, and outcrops at the southern base of Horse Mountain, suggest that a sequence of possible petroleum source and reservoir rocks, Cretaceous, Permian, and Mississippian in age, lie at depth below the volcanics comprising Horse Mountain. Within the region a few oil and gas wells have tested this sequence with negative results.

The U.S. Geological Survey (USGS) has classified the area containing Horse Mountain as being prospectively valuable for oil and gas. Despite this classification, due to the local volcanic activity and the poor results of oil and gas wildcats in the region, it is doubtful that economic oil and gas resources are present beneath the WSA.

The northern and southwestern extensions of the WSA are non-competitively leased for Oil and Gas. No other leases or lease applications are on record.

The majority of the WSA could probably be leased non-competitively, but it is doubtful that any serious future exploration would occur within the WSA unless some encouraging wells were drilled within the region.

Although low, some anomalous heat flow is indicated within the vicinity of the WSA. This is common to the region as a whole, due to the abundant Tertiary to Ouaternary volcanics. Much more significant anomalies exist near more populated areas in the region.

2. Locatable

Although no direct evidence of base or precious metal mineralization has been identified within or near the Horse Mountain WSA, the geologic environment is favorable for their existence. The rhyolite flow outcropping around the periphery of Horse Mountain is a portion of the Datil Formation which hosts tin mineralization 35 miles south of the WSA. Outcrops of uplifted Permian limestones at the southern foot of Horse Mountain indicate that rhyolite may have interacted with limestone at depth. Limestone/rhyolite interactions are classic geologic environments associated with base and precious metal deposition. Thus, the geologic environment is favorable for base and precious metal mineralization.

There has been very little recorded exploration for locatable minerals in the vicinity of the WSA. The Unit has been segregated from the general mining laws since 1970 and no claim locations within the WSA have been filed with the BLM.

If economic conditions encourage the development of more domestic sources of base metals, areas such as Horse Mountain could become targets for deep exploration. Even if geochemical anomalies are not surfically present, the shallow limestones at the base of Horse Mountain would be likely targets for the search of mineralized rhyolite/limestone interactions.

The Tertiary volcanic sediments along the periphery of Horse Mountain are a potential environment for uranium and thorium deposits. Despite this potential, regional information suggests there is low favorability for discovery.

3. Saleable

Numerous outcrops of basalt and rhyolite (including pumiceous tuffs) occur within the WSA. The rock is of sufficient quantity and quality to be used as construction aggregate or for decreative purposes.

No material sales or free use permits have been issued within the WSA. High quality construction aggregates exist outside of the WSA near State Highway 12 in the form of gravels and limestones. It is doubtful that any demand for common variety minerals would be directed at the WSA.

B. Watershed

Horse Mountain is contained within the Horse Springs watershed. No areas in the WSA have been classified as having critical erosion problems. There have been no projects for land treatments or erosion control in the WSA. Runoff in the WSA averages 0.5 to 1 inch per year with erosion amounts of 0.2 to 0.5 acre-feet per square mile per year.

C. Livestock Grazing

The boundary of the WSA encompasses portions of three allotments. The ranches' authorized use in the WSA and associated rangeland improvements are shown on Table 1.

Table 1

BLM Grazing Allotments, Authorized Use, and Rangeland Improvements in the Horse Mountain WSA

Allotment	Authorized Use (Federal)	Rangeland Improvements
Wally Kubina	480 AUMs; 40 CYL*	3 miles of boundary fence. 3 earthen pit tanks.
Abe Sanchez	168 AUMs; 14 CYL*	1 windmill; 1.5 miles of boundary fence.
Hodges	24 AUMs; 2 CYL	.25 mile of boundary fence.

*Cattle yearlong.

The Kubina, Sanchez, and Hodges allotments utilize a year-round calf operation.

Much of the WSA is rarely grazed by livestock due primarily to the lack of permanent water. The lower elevations of the WSA on the Kubina allotment are grazed year-round by livestock. Any livestock grazing that takes place in the higher elevations of the WSA usually occurs during the frost-free period or when snow is not present.

Rangeland improvements within the WSA consist of 4.75 miles of boundary fences and one windmill.

The day-to-day ranch operations in the WSA consist of checking on the livestock condition, forage conditions, salt and protein supplementation, livestock water availability, and performing normal maintenance on boundary fences and the windmill. Ranch operations and the maintenance of the few rangeland improvements in the Unit are normally done with motorized equipment using pickup trucks and such things as a drill rig to pull a windmill.

Potential livestock grazing in the WSA would increase with additional rangeland improvements needed to intensify grazing management. Intensified grazing management would improve ecological range condition in the WSA by increasing density and production of desirable climax species.

D. Timber Harvest

There currently is no authorized use of the woodland resources on Horse Mountain.

There are roughly 2,462 acres of ponderosa pine stands in the Unit. Assuming an average of 1,518 board feet per acre, there is a total of approximately 3.7 million board feet standing timber in the area. Stocking of ponderosa pine in the Horse Mountain Unit is the highest in the District, but still is low for the potential of the site.

The pinyon-juniper stands are of low volume per acre making them marginally useful as sources of firewood, posts, Christmas trees and other woodland products.

Past use of the area has consisted of two timber sales and a small amount of fuelwood harvesting (5 permits for 30 cords of dead and down pinyon-juniper). The timber sales, which ended in 1960, covered 275 acres and removed approximately 200,000 board feet of timber.

Future commercial use of the forest lands on Horse Mountain would require intensive timber management including selective cutting to take out the mature decadent trees. Sanitation harvesting and other silvicultural prescriptions, primarily controlled and natural fires, would be important applications to the ponderosa stands to promote regeneration opportunities if the commercial potential of the stands is to be maintained or improved, and utilized.

The present stand conditions represent a declining trend in the succession of a ponderosa pine forest. If no management is applied to these stands, most of the ponderosa stands in the Unit would be eliminated over the next 200 years as a result of past harvesting methods, a general lack of reproduction, grazing pressure, lack of wildfires, low stand vigor, and an ever-increasing encroachment of the pinyon-juniper.

E. Recreation

Horse Mountain is an isolated mountain peak and the view from the summit offers a spectacular 360-degree panorama. There are also isolated outcrops of volcanic rock which provide localized areas of geologic interest. Opportunities for recreation consist of deer hunting, various kinds of sightseeing, nature photography, hiking, camping and off-road vehicle use.

The Unit has been withdrawn since 1970 from appropriation under the general mining laws. This classification was designed to protect high recreational values in the Unit.

Current use is limited primarily to big game hunting based on the moderate deer population. Bear and mountain lion are also present in the Unit and are occasionally hunted. Other recreational uses in the area are presently limited by the low levels of public knowledge of the area, the distance from population centers, and the lack of legal access.

F. Education/Research

The WSA is not currently being used for any research or education projects. The isolated mountain does create an "island ecosystem" with diverse wildlife habitat and population characteristics, which could be the subject of research.

These same characteristics also result in opportunities for environmental education. The distance from population centers, however, reduces the potential for actual use of the area for environmental education.

G. Native American

There are no known current or potential Native American religious sites within the WSA.

H. Realty Actions

No applications for rights-of-way or easements have been issued nor are any pending in the Unit.

The lands within the WSA have been segregated since 1970 from appropriation under the general mining laws (NM 9688 Group II, published in Vol. 35, No. 154, of the Federal Register on August 8, 1970). This classification precludes the filing mining claims but does not affect mineral leasing.

I. Wildlife

Existing use is discussed in Section II.E. A wildlife habitat management plan (HMP) has been developed for Horse Mountain in cooperation with the New Mexico Department of Game and Fish(NMDG&F). It is designed to improve and protect habitat for bald eagles, mule deer, pronghorn antelope, elk, Merriam's turkey, tassel-eared squirrels, harlequin quail and cavity nesting birds. The objectives of the plan are to create more roosts, water sources and prey species for bald eagles and to produce more forage for elk, mile deer and pronghorn. Actions proposed in the plan include prescribed burning (interseeding with 40-percent grass, 30-percent forbs and 30-percent browse) construction of two wildlife waters and fencing off some reservoirs. When implemented these action will increase the potential of the area as wildlife habitat.

The area has not been identified by the NMDG&F for the reintroduction of any species.

IV. WILDERNESS CRITERIA

A. Evaluation of Wilderness Values

1. Quality of Mandatory Wilderness Characteristics

a. Naturalness

Horse Mountain contains relatively little evidence of human use. The human impacts which exist in the Unit consist of rangeland improvements (3 stock tanks, 1 windmill, 4.75 miles of fencing), approximately 7 miles of vehicle routes, and the evidence of past logging operations which cover about 275 acres. The old logging access routes, which are the most noticeable of these impacts, would generally return to a natural condition under wilderness management. Because of good logging practices and the 20 years that have elapsed since operations ceased, the past logging does not significantly reduce the apparent naturalness of the Unit.

Approximately 600 acres in the southwestern portion of the WSA are open grassland. This area is adjacent to a county road, fence line and ranch house, and is crossed by an access route to the Kubina Ranch headquarters. These impacts are not well-screened by topography or vegetation and are considered to reduce the apparent naturalness of this portion of the WSA.

The forested, mountainous portion of the Unit has been only lightly grazed and the few human impacts present are well screened by topography and vegetation. These factors have combined to produce a high degree of naturalness in this portion of the WSA.

b. Solitude

Horse Mountain rises over 2,500 feet above the plains of San Augustine. This elevation difference enhances the feeling

of remoteness from the few human activities outside the Unit which are visible from the mountain.

The only significant impact on solitude from activities occurring outside the Unit results from military training flights over the Unit. These low altitude overflights are intermittent and the impacts are of short duration.

In the WSA itself, the rugged topography with its numerous forested ridges and valleys provides outstanding opportunities for solitude which might not otherwise be so abundant in a Unit of this size.

c. Recreation

The rugged mountain environment, with its ponderosa pine forest and numerous small meadows, provides an outstanding setting for hiking, camping, photography and other forms of backcountry recreation. Deer hunting accounts for most of the current recreational use in the Unit with other uses limited by the lack of legal access and limited public knowledge of the area. Horse Mountain also provides opportunities for zoological sightseeing based on large raptors, deer, black bear and mountain lion and other wildlife species.

The numerous scenic vistas, forested mountain environment and interesting geologic features on Horse Mountain result in hiking and camping opportunities which are considered equal to any in the region. These opportunities are limited only by the lack of recreational water sources.

2. Special Features

Wildlife and scenic values are significant special features of Horse Mountain. Wildlife values include habitat for large raptors such as golden eagles, wintering bald eagles, prairie and possibly peregrine falcons. The forested mountain environment also supports deer, elk, mountain lion, black bear and Javalina.

Scenic values are derived from the more than 2,500-foot difference in elevation between the summit of Horse Mountain and the surrounding San Augustine Plains. This results in vistas which can extend for over 100 miles on a clear day. Scenic values are also enhanced by the mixed ponderosa and oak stands and interesting geological features found on the mountain.

3. Multiple Resource Benefits

Horse Mountain contains a wealth of natural values as a result of its relatively undisturbed character. Congressional designation as wilderness would carry the weight of law and would provide a greater degree of long-term protection for these natural values than would the administrative designations available to the BLM.

A more detailed discussion of multiple resource benefits may be found under the impacts of the All Wilderness alternative.

4. Diversity

a. Ecosystems Present

Ecosystem and landform diversity was classified using the Bailey-Kuchler system to identify the potential natural vegetation expected to occur in WSAs in the State. Further comparison at the regional and national level will occur in the Statewide EIS and wilderness study report.

The Bailey-Kuchler system classifies the Horse Mountain WSA as being within the Upper Gila Mountains Forest Province.

Using the Bailey-Kuchler classification system, inventory data indicates 2,462 acres of ponderosa pine/Douglas fir forest, 1,970 acres of pinyon-juniper woodland and 600 acres of grama galleta steppe.

b. Distance to Population Center

The Unit is within five hours' driving time of Albuquerque, New Mexico.

B. Manageability

To be recommended for wilderness designation, Horse Mountain must be capable of being effectively managed as wilderness. Manageability is a judgment made by the BLM after considering such factors as: private and State inholdings, valid existing rights, topography, and the overall land ownership pattern.

The "topographic island" character of Horse Mountain presents few problems for wilderness management. The absence of inholdings or private mineral rights within the Unit adds to the BLM's ability to manage the WSA as wilderness. The WSA has been segregated from appropriation under the mining laws since 1970 so there are no mining claims to complicate wilderness management.

The northern and southern portions of the WSA have been non-competitively leased for oil and gas. These leases are post-Federal Land Policy and Management Act (FLPMA) and carry stipulations to protect wilderness values. Because of these stipulations and the low probability that they will be developed, these leases are not expected to complicate wilderness management.

Valid existing rights in the Unit include "grandfathered" livestock operations which are compatible with wilderness designation. Required access for maintenance of existing stock tanks and fences and necessary ranch operations is not expected to create problems for wilderness management.

The BLM does not presently have legal access into Horse Mountain. This has not resulted in problems to date, as the landowners have not restricted access into the Unit. To avoid potential access

problems the BLM will acquire an easement (when funding permits) along a route which crosses State land into the Unit.

The isolated mountain character of Horse Mountain results in a Unit with basically good physiographic integrity. This configuration would be enhanced by a boundary adjustment which would place the boundary along an existing vehicle route at the base of the mountain. This would eliminate approximately 600 acres of open rangeland from the southwestern portion of the Unit. This area is impacted by an access route to a ranch house and is adjacent to a fence line, county road, and ranch house. These impacts significantly reduce the naturalness of this portion of the Unit. While this boundary adjustment would result in a Unit under 5,000 acres, it would improve the naturalness of the WSA as well as provide a more definable boundary. The remaining 4,432 acres could be managed to preserve the quality of the wilderness characteristics.

Manageability of the Unit would also be enhanced by the future acquisition, through voluntary exchange, of portions of Horse Mountain which are outside the WSA boundaries. This would include up to 2,800 acres of State lands adjacent to the WSA boundaries and would result in virtually the entire mountain being managed as wilderness.

V. PUBLIC INVOLVEMENT OVERVIEW

This report was prepared after considering public input obtained from a variety of sources including mass mailings, public meetings and open houses, and personal contacts. These efforts began during the wilderness inventory phase and will continue during the preparation of the Statewide wilderness EIS.

Opposition to wilderness designation of Horse Mountain during the inventory phase came from livestock interest groups and many citizens of Catron County. Reasons for this opposition have included the following: The area doesn't appear natural due to the presence of rangeland improvements and past logging; any additional wilderness in Catron County will impede economic progress in this underdeveloped area; and the small size of the Unit reduces its value as wilderness.

Support for wilderness designation has come from recreational users and those interested in preserving the natural values of the area. Reasons cited have included the biological diversity present in this "island" ecosystem; the outstanding scenic and recreational qualities; and the lack of resource conflicts or values foregone by wilderness designation.

VI. ALTERNATIVES AND IMPACTS

This section will discuss three alternatives: All Wilderness, Amended Boundary (Partial Wilderness) and No Action (No Wilderness).

A. All Wilderness

This alternative would recommend the entire 5,032-acre WSA as suitable for wilderness designation.

1. Impacts to Minerals

The exploration, development and production of minerals actually present in the Unit would be impacted by wilderness designation. The nature of the impacts will vary with the category of minerals.

a. Leasable

Under existing laws, designation as wilderness would preclude the issuance of new mineral leases after January 1, 1984.

Because of the low favorability for economic occurrences of oil, gas and geothermal resources in the WSA, wilderness designation is not expected to result in significant impacts to these resources.

b. Locatable

Although no direct evidence of base or precious metal mineralization has been identified within or near Horse Mountain, the geologic environment is favorable for their discovery. If economic conditions encourage the development of domestic sources of base metals, Horse Mountain would probably become a target for exploration.

As a result of the WSA being segregated from appropriation under the general mining laws and low levels of interest, no mining claims exist in the WSA. If no valid claims exist as of December 31, 1983, or designation (whichever comes later) the exploration, development and production of those minerals actually present in the WSA would be foregone by wilderness designation.

c. Saleable

No permits to remove materials such as sand and gravel or cinders will be issued in designated wilderness areas.

Since high quality construction aggregates exist outside the WSA and closer to State Highway 12, it is doubtful that any demand would occur for common variety minerals inside the WSA.

For this reason, designation of Horse Mountain as wilderness would not significantly impact saleable minerals.

If the area is recommended as suitable for wilderness designation, mineral surveys will be conducted by the USGS and U.S. Bureau of Mines to augment current information. These additional mineral surveys would be considered before a final decision on wilderness designation is made by Congress.

2. Impacts to Other Resources and Uses

a. Livestock Grazing

The WSA currently supports 672 AUMs; these grazing levels will not be impacted by wilderness designation. Grazing is a permissible and compatible activity in wilderness; however, limitations on vehicular access, types of construction materials and location of developments would be imposed to protect wilderness characteristics.

It is difficult to assess how these limitations will affect grazing management in the WSA because the nature and location of future rangeland improvements are not known. However, based on such factors as the existing ecological range condition, present livestock distribution problems and the potential of the range sites, it is anticipated that few additional rangeland improvements will be needed to improve grazing management in the WSA. For this reason it is felt that wilderness designation will not have significant impacts on livestock grazing the WSA.

It should also be noted that in many cases wilderness designation would limit but not preclude range management actions and that impacts will result from limitations on design and placement rather than the prohibition of new rangeland improvements.

Wilderness designation would result in the development and implementation of allotment management plans (AMPs)for the Kubina, Sanchez and Hodges allotments. These AMPs will specify the nature and type of motorized access, timetables for cyclic maintenance needs, types of construction materials and other measures necessary to support livestock grazing while protecting wilderness values.

Much of this Unit is presently worked by horseback because of the relatively small size and the rugged terrain of the area. For this reason, restrictions on casual vehicular access would not create serious impacts to livestock operations. Maintenance of existing rangeland developments and necessary vehicular access would be allowed subject to the limitations mentioned above.

Wilderness designation could also increase conflicts between livestock operators and recreationists.

If the area were to experience an increase in visitor use as a result of designation, it could result in increased vandalism and littering at major entry points into the Unit. These potential problems in areas adjacent to the designated wilderness would be offset to some degree by the elimination of vehicular use inside the designated area. This could reduce vandalism of rangeland improvements, littering, and other problems resulting from vehicle-dependent recreational and other uses.

b. Forestry

Forest resources, including an estimated 3.7 million board feet of ponderosa pine would not be developed commercially. The loss of this timber to commercial markets is not considered to be significant because of low standing volumes and the presence of extensive timber stands with higher commercial value on U.S. Forest Service lands in the area.

Because of relatively low volumes per acre, the pinyon-juniper woodlands on Horse Mountain are only marginally useful as sources of firewood, fence posts, or Christmas trees.

Wilderness designation would limit but not preclude the use of prescribed burning to promote regeneration of presently declining ponderosa stands.

c. Watershed

Wilderness designation would produce no impacts to watershed management in the Unit. The WSA has not been identified as requiring any land treatments to reduce erosion.

In the long run, wilderness management would be expected to protect watershed values by reducing surface disturbance and preserving the natural ground cover in the Unit.

d. Recreation

Vehicle-dependent recreational uses would be impacted by this alternative.

With the exceptions of trapping and deer hunting, recreational use is low in the Horse Mountain WSA. Present uses would continue under wilderness management but use patterns would be altered by the elimination of vehicular access inside the Unit.

Wilderness designation would have the potential for increasing visitation to the area. It is not anticipated that this increased backcountry use will impact the opportunities for solitude or primitive recreation in the Unit as a whole. There could, however, be localized impacts in some of the meadows below the summit of Horse Mountain. Wilderness management would require careful monitoring to ensure that these localized impacts do not degrade wilderness values.

By preserving the natural values and solitude which exist in the WSA, wilderness designation would also ensure that outstanding opportunities for primitive recreation now present in the area would continue to be available to meet future needs.

e. Wildlife

Wilderness designation would limit, but not preclude management actions prescribed in the Horse Mountain HMP designed to

restore wildlife populations and to their former levels through such things as vegetative manipulation and the construction of additional water sources.

Prescribed burning to reintroduce fire as a component of the natural ecosystem would be allowed under wilderness management. The prescribed burning would also accomplish most of the vegetative manipulations called for in the HMP. Two additional wildlife water sources and the seeding of additional browse species have been planned for Horse Mountain. These waters and the fences necessary to protect them for wildlife use as well as limited seeding would be allowed under wilderness management. They would, however, be subject to limitations on design, placement and methods of installation and application necessary to protect wilderness values.

Impacts of wilderness designation on wildlife would result primarily from the elimination of vehicular access into the Unit. This would reduce harassment, poaching, and hunting of game species. These reduced human impacts would complement the objectives of the HMP and would result in a more rapid increase in wildlife populations than would occur under non-wilderness management.

Over the long term, wilderness management would serve to protect natural values, including the natural distribution and abundance of wildlife species in the Unit. This is especially true for those species that are dependent on an undisturbed setting during critical times in their life cycles such as nesting birds, roosting bald eagles and wintering mule deer.

Wilderness management will require careful monitoring to ensure that wildlife is not impacted by increased human presence as a result of wilderness designation.

In time, the gradual increase in human impacts on the lands surrounding the WSA would serve to increase the value of the undisturbed wilderness area for wildlife habitat.

f. Cultural

There are no known archaeological sites in the WSA. For this reason, wilderness designation would have no known impact on cultural resource values on Horse Mountain.

g. Wilderness

Wilderness designation of the entire 5,032-acre WSA would end prospecting and mineral development except on valid mining claims and leases, prohibit the filing of new claims and issuing of mineral leases, and restrict most motorized vehicle and equipment operation. Furthermore, the building of roads, structures, and installations would also be prohibited, along with commercial enterprises and range, wildlife, or recreation projects not complementary to wilderness resources.

Prohibiting these land uses would ensure the preservation of Horse Mountain's existing natural character and would maintain the opportunities for solitude and primitive recreation which exist in the challenging and interesting terrain of this mountainous WSA. Moreover, the diverse wildlife habitat and species, as well as the scenic qualities and vegetation present in the Unit, would be preserved or allowed to evolve in a natural environment for enjoyment and study by present and future generations.

B. Amended Boundary

A boundary adjustment would improve the natural qualities and manageability of the Horse Mountain WSA. The proposal would place the boundary of the Unit along a vehicle route at the base of the mountain (see Map, p. 2). This would eliminate approximately 600 acres of open grassland from the WSA. These open lands lack the wilderness character of the mountainous portion of the Unit. They are crossed by an access route to a ranch headquarters and are adjacent to a fence line and county road and headquarters. These impacts reduce the natural qualities of the area and significantly impact opportunities for solitude. These lands do not offer outstanding opportunities for primitive recreation.

1. Impacts to Minerals

This alternative would eliminate impacts to 600 acres of lands which are presently leased for oil and gas. For the lands inside the amended boundary impacts would be identical to those identified under the All Wilderness alternative.

2. Impacts to Other Resources and Uses

a. Livestock Operations

The impacts to livestock operations inside the amended unit would be the same as those described for the All Wilderness alternative. This boundary amendment would eliminate restrictions on vehicular access to the Kubina Ranch Headquarters and would eliminate 600 acres of his 7,599-acre operation from the wilderness proposal.

This proposal also has the potential to increase conflicts between livestock operators and recreationists as a result of increased visitation to the area. The portions of livestock operations outside the wilderness proposal would have no restrictions on vehicular travel and could experience increased levels of recreational use as visitors use existing vehicle routes to get closer to the wilderness boundary.

b. Forestry

The amended unit contains all of the forested lands in the WSA. For this reason the impacts to forest products would be the same as those described in the All Wilderness alternative.

c. Watershed

The lands excluded under this alternative would remain open to vehicular access. Over time this continued access would result in additional vehicle scars and increased potential for erosion.

d. Recreation

Impacts to recreational uses would be identical to those described in the All Wilderness alternative. The lands excluded from the Unit by this proposal have little, if any, recreational potential.

e. Wildlife

The amended unit would contain all of the Ponderosa-Pinyon SHS. This proposal would exclude approximately 600 acres of the Blue Grama-Snakeweed SHS from wilderness management. This acreage is a small portion of the total Blue-Grama Snakeweed SHS outside the WSA in the region surrounding the base of Horse Mountain. Non-wilderness management of the lands excluded from the suitable recommendation under this alternative would have no significant impact on the habitat of antelope, coyotes, kit foxes and other species. These lands were not included in the HMP for Horse Mountain so there will not be a reduction in impacts to wildlife management.

The impacts to wildlife and wildlife habitat management inside the amended boundary would be the same as the All Wilderness alternative.

f. Cultural

The impacts to cultural resources would be the same as the All Wilderness alternative. As there are no known sites, there will be no identifiable impacts.

g. Wilderness

The 4,432 acres recommended as suitable for wilderness designation by this alternative possess the wilderness characteristics of naturalness, outstanding opportunities for solitude and primitive recreation. These lands have a mountainous forested character and are of sufficient size to make practicable their preservation and use in an unimpaired condition. In addition to these mandatory wilderness characteristics, the area contains diverse wildlife habitat and species, and high scenic qualities.

The impacts to these wilderness values will be identical to those discussed under the All Wilderness alternative.

The 600 acres recommended as unsuitable for wilderness designation by this alternative appear generally natural but lack the opportunities for solitude or primitive recreation possessed by the larger unit.

The impacts to these lands will be identical to those discussed under the No Wilderness/No Action alternative.

C. No Action

This alternative would be to take no new action and manage Horse Mountain according to the existing land use plan. The main thrust of management under the existing plan is to provide for livestock grazing, wildlife habitat management and to preserve existing recreational and scenic qualities. Horse Mountain would remain segregated from the mining laws under the existing plan. This segregation, however, is part of an agency designation and it is not certain how long it will remain in effect.

1. Impacts to Wilderness Values

In order to assess the impacts of non-wilderness management, certain assumptions are necessary.

The most probable use of the area if it is not designated as wilderness would be continued livestock grazing.

While Horse Mountain would remain segregated from the mining laws under the current plan, it is not certain how long this agency designation will remain in force. It is assumed that under non-wilderness management the area would be open to the filing of mining claims at some point in time.

Over time, continued unrestricted vehicular access into the area could be expected to gradually impact natural values. These impacts would include new vehicle routes to hunting, fuelwood or mineral exploration areas, additional range and wildlife improvements and possibly firewood cutting. The existing vehicle routes in the WSA would become more noticeable from continued use.

Management actions calling for varying degrees of vegetative manipulation, water developments and rangeland improvements have been identified by the wildlife, range, forestry and watershed programs. The individual projects, designed to improve livestock and wildlife habitat would not significantly affect wilderness values. In time, the cumulative effect of these projects, however, would reduce the natural qualities of the area.

2. Impacts to Other Resources and Uses

Livestock Grazing

The No Action alternative would not impact range livestock operations in the WSA.

Forestry

Forest resources would be managed according to the prescriptions contained in the Divide Management Framework Plan (MFP)

and the Pelona and Horse Mountain Fire Management Plan. No commercial timber harvesting activities are planned in these documents nor are any anticipated at this time. If demand is found to exist, the area could have marginal potential as a commercial fuelwood sale area.

The main thrust of forest management in this area will be to control pinyon-juniper and to reestablish fire as a component in the ecology of ponderosa pine succession.

Watershed

Continued vehicular access could result in additional ruts which would increase the potential for erosion.

Recreation

Present hunter use patterns would continue. Opportunities for primitive recreation may be reduced by impacts of continued motorized access and increasing levels of human activity resulting from possible mineral exploration and fuelwood sales.

Wildlife

Management actions specified in the Horse Mountain HMP would not have to conform to wilderness management stipulations. This would allow a greater degree of flexibility in construction and placement of wildlife waters, fencing and vegetative manipulation. These management actions could, in the long run, produce a more diverse habitat than the operation of natural processes which would occur under wilderness management. Continued vehicular access would result in no change to hunter use patterns and possible harassment and poaching of wildlife.

Over time, non-wilderness management would result in the gradual alteration of the area as a result of continued, unrestricted vehicular access and possible woodcutting and mineral exploration activities. This would impact wildlife species by disrupting mule deer fawning grounds as well as roosting and nesting areas of numerous bird species.

Cultural

Because no sites have been identified, it is not anticipated that non-wilderness management would impact cultural resources in this unit.

VII. RECOMMENDED ACTION

A. Recommended Action Description

Horse Mountain WSA is recommended as suitable for inclusion in the National Wilderness Preservation System as proposed in the Amended Boundary alternative (4,432 acres suitable and 600 acres unsuitable).

B. Rationale

Horse Mountain is being recommended as suitable for wilderness designation with amended boundaries because the core area was found to have high wilderness values and few conflicts with other resource uses or private rights.

The boundary adjustment will result in more readily identifiable unit boundaries and will improve the overall natural qualities of the Unit by removing lands with marginal natural qualities, and little solitude or opportunities for primitive recreation.

The wilderness characteristics of the lands recommended as suitable are enhanced by the outstanding scenic qualities and diverse wildlife habitat present on Horse Mountain.

The topography and vegetation of the Unit and the absence of conflicting land uses or private rights will allow the BLM to manage the area to ensure its preservation and use as wilderness in an unimpaired condition.

C. Consistency with Other Plans

The recommended action for the Horse Mountain WSA does not conflict with any decisions in the Divide Planning Area MFP or with any known plans of State and local Governments or other agencies.

Continuing coordination and consultation with other agencies will take place prior to and during the course of the EIS. At this time, however, wilderness designation for Horse Mountain does not appear to conflict with the formal plans of any other agency.

WILDERNESS ANALYSIS REPORT
CONTINENTAL DIVIDE WILDERNESS STUDY AREA
NM 020-044

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Socorro District
San Augustine Resource Area
Socorro, NM 87801

December, 1982

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I. GENERAL DESCRIPTION

A. Location

Continental Divide is a 68,761-acre Wilderness Study Area (WSA) located in west-central New Mexico. It lies in Catron County, south of the Plains of San Augustine, approximately 29 air miles south of Datil. The Unit name is derived from the fact that the area is bisected by the Continental Divide.

Applicable USGS Topographic Maps:

Name	Scale
John Kerr Peak	7½ minute
Rael Spring	7½ minute
Pelona 4NW (Blueline only)	7½ minute
Pelona 4NE (Blueline only)	7½ minute
O BAR O Canyon East	7½ minute
Leura Mountains, West	7½ minute
Leura Mountains, Northwest	7½ minute
C-N Lake	7½ minute

B. Climate and Topography

The Unit enjoys a generally mild semi-arid climate. Precipitation is normally received during the warmer 6 months of the year. Half of the annual average precipitation falls from July through September. This is mostly from brief, but often heavy thunderstorms. Winter is usually the driest season. Annual precipitation averages about 14 inches over the entire Unit, with the lower portions averaging 12 to 13 inches and higher portions 16 inches. Average annual snowfall is 2 to 3 feet in most localities.

Temperatures in the summer average in the 80s during the days and in the 40s at night. Winter temperatures normally range from the 40s during daylight hours to the low teens for the nighttime. Temperatures as low as -28 have been recorded. Mean annual maximum and minimum temperatures for the area are 63 and 26 degrees F., respectively. The maximum and minimum temperatures for the area are 63 and 26 degrees F., respectively. The freeze-free season lasts nearly 90 days in those elevations above 7,000 feet.

The prevailing winds over the Unit are from the southwest. Spring and summer winds of high intensity are common.

Pelona Mountain, at 9,212 feet, is the highest point in the WSA. Elevation differences range up to 2,400 feet with the lowest elevations (6,785 feet) occurring on the western edge of the Unit. The Continental Divide runs east-west through the WSA.

Pelona Mountain has three major drainages: Railroad Canyon drains to the south; Cottonwood Canyon courses west; and Shaw Canyon drains to the north. The northwestern portion of the WSA is characterized by rugged canyons and rough, hilly country. To the south and east of Pelona Mountain stretch extensive, rolling short grasslands.

C. Land Status (see Map, p. B-3)

WSA

Public surface	68,761 acres
Public subsurface	69,401 acres

Inholdings

Private surface	2,349 acres
Private subsurface	1,640 acres
State surface	3,520 acres
State subsurface	3,520 acres

D. Access

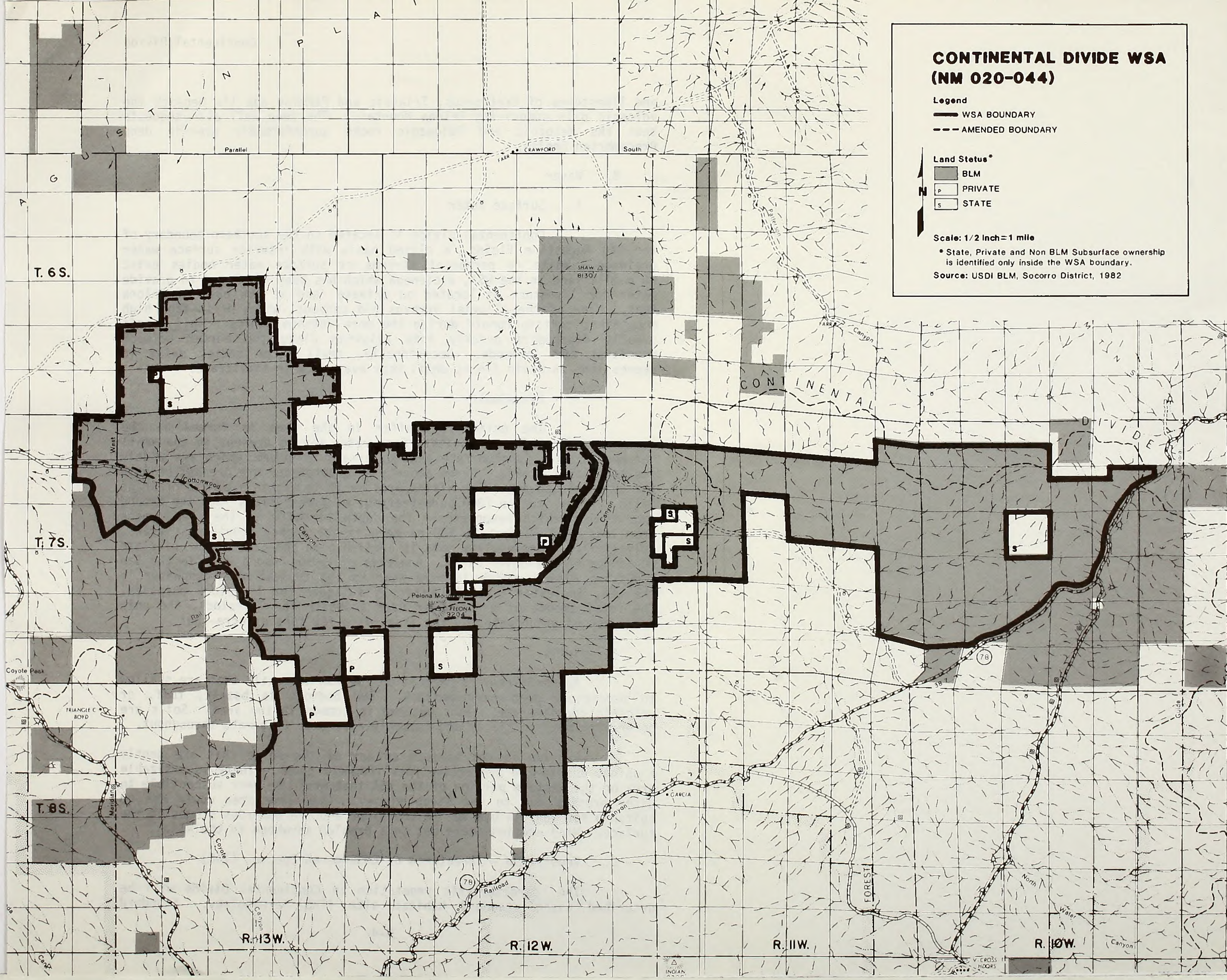
The Unit may be reached by State Highway 78 and from State Highway 12 via County Roads B019 and C016. From these maintained roads it is necessary to take unmaintained two-track ways into the WSA. Major access routes are through Shaw Canyon in the north, Cottonwood and West Canyons in the west, and through the Adobe Ranch into the southern and western portions of the Unit. All these routes cross private land.

The acquisition of an easement across these private lands would be required to ensure legal access into the Unit. Access from the north has been restricted by the landowner.

II. EXISTING RESOURCES

A. Geology

The Continental Divide WSA is located within the Datil-Mogollon Volcanic Plateau. This area is transitional between the Basin and Range Province and the Colorado Plateau. The major geologic feature encompassed by the Study Area is Pelona Mountain, a composite strato-volcano of basaltic to andesitic composition. Pelona Mountain is one of a series of Tertiary volcanic features which surround the southwestern portion of the San Augustine Plains. (Although oriented southwest-northeast, the San Augustine Plains has many features typical of a classic block-faulted, Basin and Range valley). Apart from some minor Quaternary alluvium, the rocks exposed within the WSA are confined to rhyolitic and andesitic flows and tuffs of the Mid-Tertiary Datil Formation, unnamed late Tertiary andesitic to basaltic flows, and volcanic sandstones and conglomerates of the Early Quaternary Gila Conglomerate. Outcrops along Rail and Cottonwood Canyons exemplify the sequential nature of these rock formations. A small uplift at the foot of Horse Mountain to the northwest of the WSA and a deep well drilled near the center of the San Augustine Plains, suggests that sandstones



CONTINENTAL DIVIDE WSA
(NM 020-044)
Legend
WSA BOUNDARY
AMENDED BOUNDARY
Land Status*
BLM
PRIVATE
STATE
Scale: 1/2 inch=1 mile
* State, Private and Non BLM Subsurface ownership is identified only inside the WSA boundary.
Source: USDI BLM, Socorro District, 1982
T. 6 S.
T. 7 S.
T. 8 S.
R. 13 W.
R. 12 W.
R. 11 W.
R. 10 W.
CONTINENTAL DIVIDE
Pelona Mountain
Coyote Peak
CRAWFORD
GARCIA
Parallel
South

and limestones of Cretaceous, Triassic and Permian age lie beneath the volcanic pile comprising Pelona Mountain. The deep well also suggests that the Mesozoic and Paleozoic rocks unconformably overlie deep Precambrian Gneiss.

B. Water

1. Surface Water

Continental Divide is located on the southern boundary of the San Augustine Plains, a closed basin with interior surface water drainage. While no permanent streams or surface water bodies exist on public land in the WSA, a cienega which has been developed to provide water for livestock is located on private land at the base of Pelona Peak. Many of the alluvial arroyos and canyons, which drain from high mountains, contain runoff during the more intense storms. This runoff usually disappears quickly into alluvium along the border between mountains and lowlands. Occasionally, small water bodies exist in depressions in basin floors until they evaporate or infiltrate.

2. Groundwater

The principal aquifer in the area is formed by the Quaternary age bolson deposits. Some water may be present in the small patches of Gila Conglomerate and Quaternary Alluvium, which are widely scattered in the area. Large amounts of groundwater are present beneath the adjacent San Augustine Plains area as it is within a closed drainage basin. Precipitation (800 acre-feet/sq. mi./year) sinks into the ground except that which evaporates. The depth to water in the area ranges from less than 50 feet to 500 or more in the higher mountainous areas. Only limited water quality data is available in the area as no wells are monitored on a regular basis. Analysis of water from a well in the San Augustine Plains, which is very near to and typical of groundwater in the WSA, indicates that the water is suitable for livestock purposes. The total amount of groundwater used annually for livestock, the only known use of groundwater in the area, is a few tens of acre-feet.

C. Soils

Approximately 75 percent of the WSA has soils that are shallow to moderately deep over bedrock. The bedrock is basalt, tuff, or volcanic conglomerate. Rock outcrop is common in the area. Soils are generally loamy to clayey and commonly have rock fragments throughout.

Erosion is not serious on any of the soils that are gently sloping, due to the protective rock fragment cover. There is a sizable area on the western portion of the WSA that would be very susceptible to water erosion due to the steep slopes. This same area would not be suitable for vehicle use due to the slope and the numerous stones on the surface. Wind erosion would not be a problem anywhere in the WSA.

D. Vegetation - Threatened or Endangered Species (T&E)

The characteristic vegetation in Continental Divide will be described using standard habitat site (SHS) terminology. Standard

habitat sites are a vegetation classification system based on the combination of the dominant vegetation species and landform, used by the Bureau of Land Management (BLM) Wildlife Management Program to describe the general characteristics of a given habitat. Animals which may be commonly found in each habitat will also be listed in this section. In the Continental Divide WSA the following SHS's are present.

Ponderosa/Pinyon Mountain (4,945 acres)

The Ponderosa/Pinyon Mountain SHS in the Unit is dominated by ponderosa pine. There are a few areas of Douglas fir which are usually in north-facing drainages or on north-facing slopes in the higher elevations. Limber pine is scattered at the highest elevations. The coniferous forest type is usually found at the higher elevations in the Unit on the north- and west-facing slopes with a mixture of pinyon pine, alligator juniper and one-seed juniper also occurring on southern and eastern slopes. This type has an understory of gray oak, Gambel's oak, mountain mahogany, snow berry, wax current, and buck brush, some traces of elderberry and wild rose are also found in drainage bottoms. Cool-season grasses found in this SHS are Junegrass, fringed brome, mutton grass, Arizona fescue, pine dropseed, and timber oat grass. Of these grasses, mountain muhly, muttongrass, and Junegrass are the most common. Pinyon pine is found throughout the understory of the type, occurring generally as young saplings. Frequency of its occurrence is high in the large transition zones between this and the other types. Animals that can be found in this SHS in Continental Divide include mule deer, wintering elk, gray foxes, golden eagles, turkey vultures, red-tailed hawks, and great horned owls. Other animals that can occasionally be found include black bear, mountain lions, bobcats, and bald eagles.

The Blue Grama/Snakeweed Hill (52,704 acres)

This SHS is found principally on the southern and eastern portions of the Unit plus a large area on the high plateau in the center of the Unit spreading northwest and southwest from Pelona Mountain. The grassland is dominated by blue grama. Wolftail is associated with blue grama over most of the Unit. Other grasses found in lesser amounts are squirreltail, needle and thread, and black grama. The most common shrubs found mainly in the swales and drainages of this type are broom snakeweed, Apache-plume, rubber rabbitbrush, four-wing saltbush and winterfat. Common animals in this SHS include black-tailed jackrabbit, coyotes, kit foxes, pronghorn antelope, red-tailed hawks and golden eagles.

Pinyon/Juniper, Hill (11,112 acres)

The Pinyon-Juniper Hill SHS lies usually just below the Coniferous Forest type in elevation and intermingles with the Coniferous Forest type in a transition zone. This type predominates on southern and eastern slopes and ridge tops where soils are shallow and undeveloped. It is characterized by an overstory of chiefly pinyon pine, alligator juniper and one-seed juniper. The major understory species associated with the pinyon-juniper include mountain mahogany, oak, rubber rabbitbrush, globemallow, blue grama and sunflower. The

most common grass is blue grama with side-oats grama and western wheatgrass found in the better sites. In addition to mule deer the SHS provides a seasonal use area for wintering elk on Pelona Mountain. Other mammals common to this SHS include, desert cottontails, cliff chipmunks, porcupines, rock squirrels, bobcats and mountain lions.

Bird species common to this SHS include the fly catcher, vireo's, sparrow, nighthawk, warbler, raven, flicker and woodpecker.

No T&E plant species have been recorded from this area. The Unit does contain habitat which offers potential for the occurrence of 17 species of T&E plants. A list of these potentially occurring plants is available on request from the Socorro District Office.

E. Wildlife - T&E

Continental Divide supports approximately 309 wildlife species. These include 59 reptiles/amphibians, 75 mammal species and 175 resident and migratory bird species. A complete list of wildlife species for Continental Divide is available from the Socorro District Office.

A description of characteristic wildlife species present in the WSA is included in the SHS discussion in the Vegetation section above. In addition to the characteristic wildlife species present, the Unit has been identified by the U. S. Fish and Wildlife Service as providing potential habitat for bald eagles, peregrine falcons and black-footed ferrets; all Federally endangered species. Wintering bald eagles are known to occur in the Unit.

The impacts of wilderness designation or non-designation were analyzed in a biological assesment covering bald eagles, peregrine falcons and black-footed ferrets. It was determined that neither course of action would have significant beneficial or adverse impacts on these species.

F. Visual

Continental Divide contains two basic visual landscapes: a vast expanse of rolling grasslands and a forested environment characterized by steep canyons and broad ridges. They have been rated as Visual Resource Management (VRM) Classes IV and II, respectively.

The area west and northwest of Pelona Mountain is a rugged landscape which exhibits the diversity of color, vegetation, relief, shape and geology common to the pine-forested mountains of the region. Numerous vantage points which exist along ridges and other high points in this portion of the WSA offer spectacular vistas. Views from the 1,200-foot escarpment along the western edge of the Unit extend across the San Augustine Plains and encompass much of west-central New Mexico.

The vast expanse of smooth rolling hills which extend to the east and south of Pelona Mountain also creates a dramatic visual landscape. These bare rolling hills of pastel browns, greens and

yellows are backdropped by blue mountains and extend for several hundred square miles with few human structures in evidence except for occasional fences, roads and windmills.

G. Cultural

The only cultural resource inventory data for the WSA, aside from project-specific inventories, comes from a 3-week reconnaissance in the spring of 1979. A total of 11 sites were discovered: nine historic homesteads or associated historic features, one historic grave and one prehistoric site. Bat Cave (on the National Register of Historic Places), when excavated in the late 1940s, was reported to contain the earliest occurrence of maize in North America. This conclusion has been questioned by some researchers. It is hoped that testing at Bat Cave by the University of Michigan (summer of 1981) will resolve the question of such early dates.

H. Air

No sources for air pollution exist in the vicinity. Some temporary deterioration of air quality occurs in the spring when gusty southwest winds cause dust to blow.

III. EXISTING AND POTENTIAL USES

A. Mineral Development

1. Leasable

The U.S. Geological Survey (USGS) has classified the northern and southern fringes and the eastern extension of the WSA as being prospectively valuable for oil and gas. Despite this classification, due to the local volcanic activity and poor results of oil and gas wildcats in the region, it is doubtful that economic oil and gas resources are present beneath the WSA.

The eastern portion of the WSA that lies within T. 7 S., R. 10 W., NMPM, is entirely leased for oil and gas. The two noncompetitive leases which encompass this portion of the WSA were recently issued.

No oil and gas exploration wells have been drilled within the WSA. The closest exploration well to the WSA was a 12,284-foot dry wildcat well within the San Augustine Plains, approximately 35 miles northeast of Pelona Peak. This dry well suggests that a sequence of possible petroleum source and reservoir rocks, Cretaceous, Permian and Mississippian in age, lie below the volcanics comprising Pelona Mountain. Within this region a few oil and gas wells have tested this sequence with negative results. The majority of the WSA could probably be leased noncompetitively, but it is doubtful that any future exploration would occur within the WSA unless some encouraging wells were drilled within the region.

Geothermal anomalies associated with Pelona Mountain are not of enough significance to attract any serious attention. Much more significant anomalies exist near more populated areas.

2. Locatable

Although no occurrences of base metal mineralization have been identified within the WSA, the geologic environment is favorable for tin deposits. The rhyolitic flow unit of the Datil Formation, which either outcrops on or underlies most of the WSA, is the host rock for tin deposits within the Taylor Creek Mining District. The northernmost extent of known significant tin mineralization is along Squaw Creek, approximately 12 miles southeast of Pelona Peak. Anomalously high tin values have been reported in a stream sediment sample 6 miles east of Pelona Peak. This anomalous sample was taken within 2 miles of the WSA's border and from a stream whose origin is within the WSA. Thus economic tin mineralization is favorable within the Continental Divide WSA.

Other base metal and precious metal mineralization could exist but no direct or strong indirect evidence exists to support this inference. In general, the geologic environment has low favorability for economic precious or base metal (other than tin) mineralization.

Uranium and thorium mineralization is often associated with volcanic deposits. Despite this relationship, regional information suggests a low favorability for the discovery of economic uranium or thorium deposits.

There has been very little recorded exploration for locatable minerals within the WSA. Four mining claims were located and drilled by Noranda Exploration Inc., but were abandoned as of December 1981. These four claims were located within the southernmost portion of the WSA's eastern extension. It is assumed that these claims were located in hopes of discovering tin or most likely uranium mineralization within the Gila conglomerate.

Presently, three claims, located in August 1981 lie within the central portion of the WSA. No evidence of discovery was noted during a recent cursory examination of the claims. It is assumed that these claims are locations for precious metals. If economic conditions encouraged the exploration and possible development of known tin deposits within the Taylor Creek District, peripheral areas, such as Pelona Mountain, would become of great interest. Under such a situation, the Pelona Mountain area would be subject to geochemical sampling, wholesale claiming, and eventually, test boring. The possibility exists that a large, low-grade tin deposit could be developed.

3. Saleable

Numerous outcrops of basalt and rhyolite (including pumiceous tuffs) occur within the WSA. The rock is of sufficient quantity and quality to be used as construction aggregate or for decorative purposes.

No material sales or free use permits have been issued within the WSA. Considering the sparse population of the vicinity, as well as the lack of nearby public roads, it is doubtful that any demand would exist for the common variety materials within the WSA.

B. Watershed

The Continental Divide WSA contains two watersheds: North Divide and South Divide. All lands in the watersheds are classified as productive acres. There have been no projects for land treatment or erosion control except for a prescribed burn in November 1981, a small (5 acres) tree-planting project near the head of Cottonwood Canyon and snag felling of timber. No areas within the WSA are in the severe erosion classification.

Runoff over the area averages one inch per year with erosion amounts of 0.2 to 0.5 acre-feet per square mile per year.

C. Livestock Grazing

The boundary of the WSA encompasses portions of five allotments. The ranches' authorized use and associated rangeland improvements in the WSA are shown on Table 1.

Table 1

BLM Grazing Allotments, Authorized Use, and Rangeland Improvements in the Continental Divide WSA

Allotment	Authorized Use (Federal)	Rangeland Improvements
"Y" Ranch	2,076 AUMs; 173 CYL*	3 mi interior fence; 9 mi boundary fence; 6 pit tanks
Farr Cattle Co.	5,892 AUMs; 491 CYL	11 pit tanks; 1.5 mi fence 19 mi boundary fence
Jim Boyd	912 AUMs; 76 CYL	6 mi boundary fence; 2 pit tanks
Adobe Ranch	3,540 AUMs; 295 CYL	10 mi interior fence; 9 pit tanks; 1 windmill; .5 mi pipeline
Sunbelt Ranch Inc.	336 AUMs; 28 CYL	2 mi boundary fence

*Cattle yearlong.

The "Y" Ranch and Sunbelt Ranch, Inc. graze yearlings in the WSA from approximately April 15 until October 15. Farr Cattle Co. grazes cows/calves in the WSA from April 15 until October 15. The beginning and ending dates of the above grazing periods may vary depending on weather conditions such as the presence or absence of snow.

The Jim Boyd and Adobe Ranch allotments graze the WSA with a cow/calf operation. Grazing use varies during the year based upon availability of forage and the type of grazing system in use on the allotment.

The day-to-day ranch operations in the WSA consist of such things as checking on the livestock condition, forage condition, supplementing salt and/or protein, livestock water availability, breaking ice on livestock waters, and performing normal maintenance on fences, pit tanks, windmills, and pipelines. Pickup trucks are used for most of the daily ranch operations in the WSA. Normal maintenance of various rangeland improvements would be performed using motorized vehicles such as a pickup truck, bulldozer to clean the pit tanks, and a drill rig to pull a windmill.

Potential livestock grazing in the WSA would increase with additional rangeland improvements needed to intensify grazing management. Intensifying grazing management would improve the ecological range condition in the WSA by increasing the density and production of desirable browse species.

D. Timber Harvest

Forest resources in the WSA consist of an estimated 9.1 million board feet of ponderosa pine and 15,070 cords of pinyon-juniper firewood. Presently, there is no authorized use of the forest resources in this Unit.

Past use of the area included three timber sales. The last sale was held in 1960. These sales removed a total of approximately 4.5 million board feet of timber from 2,500 acres. Many of the cut trees were left in place when it was realized that the operation had become uneconomical. Small sales of Christmas trees took place in the area north of Pelona Peak. Very little of the pinyon-juniper type has been utilized for wood products.

Future commercial use of the forest lands on Pelona Mountain would be the utilization of the timber stands by selective cutting to clean out the mature decadent age classes. Sanitation harvesting and other silvicultural prescriptions, primarily controlled burns and natural fires, would be important applications for the commercial ponderosa stands to promote regeneration opportunities if the stands are to be maintained or improved, and utilized. The present stand conditions represent a declining trend in the succession of a ponderosa forest. If no management is applied to these stands, most of the ponderosa stands in the Unit would be eliminated over the next 200 years as a result of past harvesting methods, a general lack of reproduction, grazing pressure, lack of wild fires, low stand vigor, and an ever increasing encroachment of the pinyon-juniper type.

The importance of the commercial timber resources on Pelona Mountain is potentially significant, both for its diversity and its volume. Presently, however, the site for ponderosa is marginal, access is difficult, and harvesting feasibility is questionable. The impact of

the timber in the WSA, if offered to the local economy, would be insignificant compared to the volumes that come from the Gila National Forest lands. This significance could increase in the future, however, as wood demands escalate.

E. Recreation

Current recreational use is limited primarily to big game hunting for deer, antelope and occasionally elk, bear and lion and occasional backpackers and sightseers. Off-road vehicle (ORV) use associated with hunting and possibly some exploring are the only recreational ORV uses known to occur. Bat Cave is an archaeological site of such significance that it draws sightseers and interested groups. Other recreational uses in the area are presently limited by the low levels of public knowledge of the area, the distance from population centers, and the lack of legal access.

The area offers a high potential for backpacking, hiking, camping, horse packing, nature photography and study, and varied forms of sightseeing.

The Continental Divide crosses Pelona Mountain and presently attracts a few hikers following the route of the Continental Divide National Scenic Trail (CDNST). Should the CDNST actually be routed through the Unit, use would undoubtedly increase. Future use on trail segments across the Unit would probably be less than 100 hikers a year.

F. Education/Research

As discussed earlier, Bat Cave has been the site of important research into the early domestication of maize in North America. It represents one of the most significant opportunities for archaeological research in the Southwest.

Opportunities for environmental education exist based on the diversity and abundance of wildlife, vegetation, geology and cultural resources present in the Unit. The distance from population centers, however, will probably limit the direct use of the area for environmental education.

G. Native American

There are no known current or potential native American religious sites within the WSA.

H. Realty Actions

No applications for rights-of-way or easements have been received, nor are any public lands withdrawn within the WSA.

I. Wildlife

Existing use is discussed in Section II. A wildlife habitat management plan (HMP), currently being developed for the area, is

designed to improve and protect habitat for bald eagles, mule deer, pronghorn antelope, elk, Merriam's turkeys, tassel-eared squirrels, harlequin quail and cavity nesting birds. The objectives of the plan are to create more roosts, water sources and prey species for bald eagles and to produce more forage for elk, mule deer and pronghorn. Actions proposed in the plan include prescribed burning, interseeding with 40-percent grass, 30-percent forbs, and 30-percent browse, construction of nine wildlife waters, and fencing off some reservoirs from livestock use. When implemented, it will increase the potential of the area as wildlife habitat.

The area has not been identified by the New Mexico Department of Game and Fish (NMDG&F) for the reintroduction of any species.

IV. WILDERNESS CRITERIA

A. Evaluation of Wilderness Values

1. Quality of Mandatory Wilderness Characteristics

a. Naturalness

The Continental Divide WSA appears generally natural. The feeling of naturalness in the Unit is enhanced by its large size and topographic variation. Ponderosa pine and pinyon-juniper woodlands cover much of the northwestern third of the Unit and provide a high degree of vegetative screening. These factors reduce the impacts of rangeland improvements, vehicle routes and evidence of past logging in the Unit.

This 68,761-acre WSA contains approximately 45 miles of vehicle routes which vary in nature from washed out logging roads to regularly used ranch access routes. Most of the logging roads have not been regularly used since logging operations ceased in 1960; some of these roads are returning to their former condition. Others have become access routes for ranch operations and have been maintained by the passage of vehicles. Other routes in the Unit have been created to provide access to rangeland improvements and pastures on both public and private land.

Other impacts in the area include approximately 30 stock tanks and 50 miles of fencing. The impact of these rangeland improvements upon the naturalness of the WSA varies with the type of terrain in which they are found. In the rolling, grassy areas of the Unit the lack of vegetative screening extends the visual impacts of rangeland improvements over a wider area. Portions of the WSA north and west of Pelona Mountain are forested and many rangeland improvements are not generally noticeable. Some impacts, however, are apparent because of the visibility afforded by ridgelines and other topographic features.

Human impacts in the forested areas west and north of Pelona Mountain include old logging roads, and downed timber and stumps left from past logging activity which covered approximately 2,500 acres. The logging operation apparently abruptly ended as many trees

were cut and never removed. The impacts of these past human activities are becoming less evident, through natural processes, with the passage of time and do not significantly affect the naturalness of the Unit.

The cumulative effects of these impacts are a consideration when determining the suitability of the area for wilderness recommendation. As discussed earlier, the large size, topographic and vegetative screening present in the WSA mitigate the human impacts and the Unit appears generally natural.

b. Solitude

The remote location and topographic variation in Continental Divide offer outstanding opportunities for solitude.

These opportunities are reduced slightly in the rolling grassland sections of the Unit where the open character of the landscape and the lack of vegetative screening would increase the area affected by other human activities. Human activities in the area would consist primarily of motorized access in support of allowed ranch operations and hunters during hunting season. These impacts on solitude are mitigated by the large size of the area and the low to non-existent levels of visitor use other than seasonal hunting.

Portions of the WSA north and west of Pelona Mountain are forested and this vegetative screening would provide a high degree of solitude. There are existing ranch operations requiring motorized access in this area also but the topographic and vegetative screening present would reduce the significance of their impacts.

c. Recreation

Primitive recreation opportunities are highest in the forested, mountainous area in the northwestern portion of the WSA. These opportunities include hunting, various kinds of sightseeing, hiking and camping. Deer and antelope hunting account for most of the current recreational use in the Unit. The varied topography, vegetation and wildlife and the scenic vistas found in the area provide good sightseeing opportunities. Hiking and camping opportunities are also considered good in the forested parts of the Unit. These opportunities would be enhanced in the future if the proposed CDNST is routed through the Unit.

These recreational activities are presently limited by the lack of recreational water sources, distance from population centers, low levels of public knowledge of the area, and the lack of legal access.

2. Special Features

Wildlife, archaeological, and scenic values are Continental Divide's most significant special features. The remote, undeveloped character of the region and the diverse vegetation and

landforms result in a wide variety of wildlife in the area. The southern and eastern portions of the Unit provide excellent antelope habitat. Forested portions of the Unit support a moderate mule deer population as well as mountain lion, black bear, turkey and wintering elk. Eagles, including at least four wintering bald eagles, are also found in the Unit.

Archaeological sites are not thought to be numerous in the area, but this may be the result of the low level of inventory. Known archaeological sites include the highly significant Bat Cave and a multi-room masonry structure of unknown origins. Bat Cave is on the National Register of Historic Places. Earlier people, living in the cave on the shores of the extinct Lake Augustin, developed what is believed by some to be the earliest domesticated maize in North America.

The numerous vantage points provided by the mountainous and rolling character of the Unit and the open character of the surrounding landscape result in outstanding scenic vistas. These vistas include the expanse of the San Augustine Plains to the west and north, and mountains including the San Mateos, Black Range and the Gila and Aldo Leopold Wilderness Areas to the east and south.

3. Multiple Resource Benefits

Continental Divide contains a wealth of natural values as a result of its relatively undisturbed character. Congressional designation as wilderness would provide a greater degree of long-term protection for these natural values than would the administrative designations available to the BLM.

A more detailed discussion of multiple resource benefits may be found under the impacts of the All Wilderness alternative.

4. Diversity

a. Ecosystems Present

Ecosystem/landform diversity was classified, using the Bailey-Kuchler system, to identify the potential natural vegetation expected to occur in designated wilderness areas and WSAs in the State. Further comparison at the regional and national levels will occur in preparation of the environmental impact statement (EIS) and wilderness study report.

The Bailey-Kuchler system classifies the Continental Divide WSA as being within the Upper Gila Mountains Forest Province.

Using the Bailey-Kuchler classification system, inventory data indicates 4,945 acres of ponderosa pine/Douglas fir forest, 11,112 acres of pinyon-juniper woodland and 52,704 acres of grama-galleta steppe.

b. Distance to Population Center

The Unit is within five hour's driving time of Albuquerque, New Mexico.

B. Manageability

To be recommended as suitable, Continental Divide must be capable of being effectively managed as wilderness. To determine manageability the BLM must consider such factors as private inholdings, State lands, valid existing rights, mineral leases, rights-of-way, topography, and the overall pattern of land status.

Manageability of the WSA as wilderness is reduced by private and State inholdings, poorly defined boundaries in the rolling grassland sections of the Unit, "cherry-stemmed" roads, and valid existing rights.

Surface inholdings in the Unit total 3,520 acres of State land and 2,349 acres of private land. Non-Federal subsurface rights total 3,520 acres of State owned minerals and 1,640 acres of privately-owned minerals. Reasonable access will be granted by the BLM to the owners of these inholdings.

The surface inholdings in the Unit contain rangeland developments including stock tanks, windmills, fences and vehicle routes. Neither the Interim Management Policy nor the Wilderness Management Policy apply to these improvements on private and State land. This could result in some non-compatible uses occurring within the area. While these non-compatible uses would not be occurring in the designated wilderness area, they would impact the overall naturalness of the area.

A private inholding north of Pelona Mountain is expected to present the most significant management problems. It is located at the base of Pelona Mountain and contains the largest body of water in the WSA, as well as a cabin. The presence of these features will require special management attention to avoid conflicts between recreational users and the landowner.

Not enough is known of the mineral potential of this area to fully assess the management problems presented by the subsurface inholdings. The presence of these private mineral rights in an area believed to have some degree of mineral potential does create a possibility of incompatible uses occurring within the area.

The awkward configuration of the eastern portion of the Unit and the lack of identifiable boundaries along that portion of the Unit also present management problems. The vast rolling grasslands in the area would require fencing or a system of signs and markers to define the wilderness boundaries. The lack of topographic barriers to vehicular travel in this area combined with poorly defined natural boundaries is expected to create trespass problems resulting from existing use patterns. These existing use patterns consist primarily of hunters driving to hunting camps within the Unit. Public education and increased levels of patrolling could be expected to reduce, but not eliminate, these problems.

Two roads which are "cherry-stemmed" into the western and northern portions of the Unit compound the problem of regulating vehicular access. The first enters the northern part of the Unit from Shaw Canyon and provides access to a private inholding containing a cabin owned and used by the Farr Ranch. This road is used primarily for ranch operations and by hunters during hunting season. A second road, "cherry-stemmed" up Cottonwood Canyon, provides access to the western portion of the Unit for ranch operators, BLM personnel and hunters.

A boundary adjustment would improve the manageability of the Unit. This change, which would eliminate the "cherry-stems", the majority of inholdings and improve the natural boundaries of the Unit, is detailed in the Amended Boundary section.

V. PUBLIC INVOLVEMENT OVERVIEW

This report was prepared after considering public input obtained from a variety of sources including mass mailings, public meetings and open houses, and personal contacts. These efforts began during the wilderness inventory phase and will continue during the preparation of the Statewide wilderness EIS.

Continental Divide was one of New Mexico's ten most discussed areas during the intensive wilderness inventory phase of the wilderness review process. The large size of the Unit and the presence of extensive grasslands which were felt to be underrepresented in the National Wilderness Preservation System were stressed in public support for recommending the entire WSA as wilderness. It was also pointed out that the area appears natural, offers outstanding opportunities for solitude and primitive recreation and contains supplemental values.

Opponents of wilderness designation for Continental Divide included many Catron County residents and segments of the mineral and livestock industries. Prominent reasons included the effects of excluding the area from possible future mineral exploration and development, the presence of human impacts, limitations on ranch operations, and the feeling that additional wilderness would conflict with future development in the least developed of New Mexico's Counties.

A complete record of mailings, meetings and open houses and copies of public responses is on file in the Socorro District Office.

VI. ALTERNATIVES AND IMPACTS

This section will discuss three alternatives: All Wilderness, Amended Boundary, (partial wilderness), and No Action (no wilderness), for Continental Divide. The impacts of the alternatives will also be discussed.

A. All Wilderness

This alternative would recommend the entire 68,761-acre WSA as suitable for wilderness designation.

1. Impacts to Minerals

There is a possibility of critical mineral resources occurring in the Unit. Critical minerals are those minerals listed in the National Defense Stockpile Inventory of Strategic and Critical Minerals. Continental Divide overlies geologic structures which may provide an environment for tin, molybdenum, fluorspar and associated minerals. Tin is believed to occur in the Unit in unknown quantities and quality; however, there are no known occurrences of fluorspar, molybdenum or associated minerals in the Unit.

If the area is recommended as suitable for wilderness designation, additional mineral surveys will be conducted by USGS and the U.S. Bureau of Mines to augment current information. These mineral surveys would provide additional information concerning the possible occurrence of critical mineral resources in the Unit. This additional information on critical minerals would be considered before a final decision on wilderness designation is made by Congress.

The exploration development and production of those minerals actually present in the Unit would be impacted by wilderness designation. The nature of the impacts will vary with the category of minerals.

Leasable

Under existing laws, designation as wilderness would preclude the issuance of new mineral leases as of January 1, 1984.

Development of the existing leases in the WSA is not considered likely even without wilderness designation. For this reason the restrictions imposed by wilderness are not expected to produce significant impacts to the leaseholders.

The WSA has a low favorability for the discovery of oil and gas or for development of geothermal resources. Because of the low favorability for economic occurrences of oil, gas, or geothermal resources, wilderness designation is not expected to result in significant impacts to these resources.

Locatable

Claim staking, prospecting, exploration, development, and patenting of mining claims will be allowed until midnight, December 31, 1983, or upon wilderness designation, whichever occurs later. These activities will require a plan of operation approved by the BLM. In approving plans of operation the BLM must protect the rights of the operator while minimizing impacts on the wilderness resource.

After December 31, 1983, or designation, development work, extraction and patenting will be allowed to continue only on valid claims located before that date. No new prospecting and exploration under the mining laws will be allowed.

There are three known mining claims in the WSA. If a valid discovery is made on any of those claims prior to midnight December 31, 1983, it may be developed. If no discovery is made, wilderness designation will preclude further development of the claims. In Continental Divide it is presumed that the existing claims are for precious metals.

Saleable

No permits to remove materials such as sand and gravel or cinders will be used in designated wilderness areas.

Continental Divide contains numerous sources for common variety materials suitable for construction aggregate as for decorative purposes. The lack of nearby population centers, public roads or other local sources of demand and the many alternate sources available for these materials would indicate that wilderness designation would produce no significant impacts to saleable minerals.

2. Impacts to Other Resources and Uses

a. Livestock Operations

The Unit presently supports 12,754 AUMs; these existing levels of livestock operations as well as necessary vehicular access and the maintenance of "grandfathered" rangeland improvements are valid existing rights and would continue under wilderness management. Grazing is a permissible and compatible activity in wilderness; however, limitations on vehicular access, types of construction materials, and location of developments are necessary to protect wilderness characteristics.

It is difficult to assess how these limitations will affect grazing management in the WSA because the nature and location of future rangeland improvements are not known. However, based on such factors as existing ecological range conditions, present livestock distribution problems, and the potential of the range sites, it is anticipated that several additional rangeland improvements could be needed to improve grazing management in the WSA. For this reason it is felt that wilderness designation will have significant impacts on livestock grazing in the WSA.

It should also be noted that in many cases wilderness designation would limit but not preclude range management actions and that impacts will result from limitations on design and placement rather than the prohibition of new rangeland improvements.

Wilderness designation would result in the modification of the experimental stewardship program for the "Y" Ranch and the development and implementation of Allotment Management Plans (AMPs) for the Farr, Adobe, Sunbelt and Boyd allotments.

These AMPs will specify the nature and type of motorized access, timetables for cyclic maintenance needs, types of construction materials and other measures necessary to support livestock grazing while protecting wilderness values.

Wilderness designation could also increase conflicts between livestock operators and recreationists. If the area experiences an increase in visitor use as a result of designation, it could result in increased vandalism and littering in areas adjacent to major entry points into the Unit. These increased problems outside the wilderness would be offset is some degree by the restriction of vehicular use inside the designated wilderness area. This could reduce vandalism of rangeland improvements and other problems resulting from vehicle-dependent recreational and other uses.

b. Forestry

Forest resources, consisting of 9.1 million board feet of ponderosa pine and pinyon-juniper woodlands estimated to contain 15,000 cords of firewood and fence posts, would not be commerically developed. The loss of timber potential in the Unit would not significantly affect timber production in the region. This is because of other more suitable commercial timber stands on U.S. Forest Service lands in the area and because past logging has removed most of the stands with commercial potential from the Unit.

The loss of firewood potential in the Unit would not be a major impact on the region because of the remote location of the Unit and the presence of other pinyon-juniper woodlands closer to population centers.

c. Watershed

Watershed management actions to reduce erosion by treatment measures would also be impacted by wilderness designation. Specific measures limited by wilderness management would be pinyon-juniper removal designed to increase ground cover. This would not be a significant impact because prescribed and natural burning would generally be allowed and could accomplish much of the desired reduction in pinyon-juniper cover.

In the long run, wilderness management would be expected to protect watershed values by reducing surface disturbance and preserving the natural ground cover in the Unit.

d. Recreation

Recreation activities which require motorized vehicles would be impacted by this alternative. In the Continental Divide Unit, deer and antelope hunters would be most significantly affected. There are two large antelope hunt units and several hunting camps within the WSA. The present hunter use patterns would be altered under wilderness management. Presently there is little recreational use, besides hunting, in the Unit. This level of use could increase in

the future as a result of wilderness designation and if the proposed Continental Divide National Scenic Trail is routed through the Unit. It is not anticipated that facilities to support trail use would be adversely affected by wilderness designation.

Wilderness designation will have the potential for increasing visitation to the area. It is not anticipated that this increased backcountry use will impact the opportunities for solitude or primitive recreation in the Unit as a whole. There could, however, be localized impacts in areas such as Cottonwood or Rail Canyons which are major access points into the Unit. Localized impacts in the interior of this unit would be minimal due to the large size of the area and the numerous points of interest which would tend to disperse recreational impacts.

By preserving the solitude and natural values in Continental Divide, wilderness designation would ensure that outstanding opportunities for primitive recreation now present in the area will continue to be available to meet future needs.

e. Wildlife

Wilderness designation would limit, but not preclude management actions, prescribed in the Pelona Mountain HMP, designed to improve big game and other species habitat through such things as vegetative manipulation and the construction of additional water sources.

Prescribed burning to reintroduce fire as a component of the natural ecosystem would be allowed under wilderness management. The prescribed burning would also accomplish most of the vegetative manipulations called for in the HMP. Nine additional wildlife water sources have been planned for Continental Divide. These waters and the fences necessary to protect them for wildlife use as well as the seeding of browse species would be allowed under wilderness management. They would, however, be subject to limitations on design, placement and methods of installation and application necessary to protect wilderness values.

Short-term impacts of wilderness designation on wildlife would result primarily from the elimination of vehicular access into the Unit. This would reduce harassment, poaching and hunting of game species. These reduced human impacts would compliment the objective of the HMP and would result in a more rapid increase in wildlife populations than would occur under non-wilderness management.

Over the long term, wilderness management would serve to protect natural values including the natural distribution and abundance of wildlife species in the Unit. This is especially true for those species that are dependent on an undisturbed setting during critical times in their life cycles such as nesting birds, roosting bald eagles and wintering mule deer.

Wilderness management will, however, require careful monitoring to ensure that wildlife is not impacted by increased human presence as a result of wilderness designation.

f. Cultural

Increased back country use as a result of wilderness designation could result in increased surface collection of artifacts. This possible increase in surface collection would be offset by the elimination of vehicular access which would reduce the chance of professional pothunting.

Bat Cave, the most significant site known to occur in the Unit, is on the periphery of the WSA. The road which provides access to within 50 yards of the site would not be affected by wilderness designation. This continued access could result in an increase in visitation and the likelihood of vandalism as a result of wilderness designation. Wilderness management will require careful visitor use management to ensure that sensitive archaeological resources are not subjected to increased impacts from activity.

Wilderness designation would complicate but not necessarily preclude archaeological stabilization, excavation and research. These activities may be permitted on a case-by-case basis where the project will not degrade the overall wilderness character of the Unit and when such activity is needed to preserve the particular resource.

Wilderness designation would also enhance scientific and educational values by preserving the natural setting of the archaeological resources.

g. Wilderness

Wilderness designation of the entire 68,761-acre WSA would end prospecting and mineral development except on valid mining claims and leases, prohibit the filing of new claims and issuing of mineral leases, and restrict most motorized vehicle and equipment operation. Furthermore, the building of roads, structures, and installations would also be prohibited, along with commercial enterprises and range, wildlife, or recreation projects not complementary to wilderness resources.

Prohibiting these land uses would ensure the preservation of Continental Divide's existing natural character and would maintain the opportunities for solitude which exist throughout the WSA. Outstanding opportunities for primitive recreation which are found in the rugged and varied terrain north and west of Pelona Mountain would also be preserved. Moreover, the diverse wildlife habitat and vegetation, as well as the scenic and cultural resources present in the Unit would be preserved or allowed to evolve in a natural environment for enjoyment and study by present and future generations.

B. Amended Boundary

A boundary adjustment proposed for Continental Divide (see Map, p. 3) would exclude much of the open, rolling grassland and recommend the mountainous forested portions of the Unit north and west of Pelona Mountain as suitable for wilderness designation. This alternative would result in approximately 27,500 acres of the original 68,761-acre WSA being recommended as suitable for wilderness designation.

The proposed boundary change would place portions of the eastern boundary along the Shaw Canyon Road to the point where the road enters private land. The boundary would follow property lines to exclude the inholding from the suitable recommendation. It would then run along the Continental Divide to the summit of Pelona Mountain to join and follow an existing fence line which would then form the southern boundary of the Unit. The "cherry-stemmed" road up Cottonwood Canyon would form a portion of the southwestern boundary of the Unit. This boundary would extend to the northwestern corner of State Section 16, T. 7 S., R. 13 W., exclude that section, and follow an old firebreak which would also serve as southwestern portions of the boundary.

Using the roads up Shaw and Cottonwood Canyons as boundaries would not only eliminate these "cherry-stemmed" roads from the Unit, but also provide easily identifiable boundaries for these portions of the Unit. This would reduce the management problems resulting from a lack of easily identifiable boundaries in the rolling grasslands south and east of Pelona Mountain.

This amended boundary would also reduce management problems associated with State and private inholdings.

Privately-owned inholdings would be reduced from 2,349 acres to 80 acres and State trust lands in the Unit would be reduced from 3,520 acres to 1,280 acres. This would also reduce non-Federal mineral rights from 1,640 acres of private minerals to 80 and State-owned minerals would be reduced to 1,280 acres. The reduction of the inholdings would also reduce valid existing rights associated with these lands.

This amended Unit would contain the area of the WSA found to have the highest potential for primitive recreation and would be representative of all the major ecotypes found in the original Unit. Using the Bailey-Kuchler classification system, the amended Unit would contain 4,274 acres of the original 4,945 acres of Douglas fir/ponderosa pine ecotype, and 10,771 of the original 11,112 acres of pinyon-juniper ecotype. The grama-galleta steppe represented in the Unit would be reduced from 52,704 acres to 12,455 acres. This would be a significant reduction in the amount of antelope habitat represented in the Unit but other large mammal and raptor habitat would not be significantly reduced.

1. Impacts to Minerals

This smaller wilderness proposal would eliminate the majority of the area classified as prospectively valuable for oil and gas leaving only about six sections of "prospectively valuable" oil and gas lands in the proposal. It would also eliminate the majority of the lands which have been leased for oil and gas and at least three mining claims.

The amended boundary would not significantly reduce the possibility for the occurrence of tin or critical associated minerals in the Unit. The impacts to mineral resources and uses inside the area recommended as suitable would be the same as those discussed under the All Wilderness alternative.

2. Impacts to Other Resources and Uses

a. Livestock Operations

The impacts on livestock operations inside the amended Unit would be the same as described for the All Wilderness alternative. This amended boundary would, however, eliminate direct impacts to three livestock operations (Sunbelt, Adobe and Boyd) and reduce the impacts to two other operations (Farr and Fred George, Inc.).

This partial proposal also has the potential to increase visitation to the area and conflicts between livestock operators and recreationists. The portions of these operations outside the wilderness proposal would have no restrictions on vehicular travel and could experience increased levels of recreational use as visitors use existing vehicle routes to get closer to the amended wilderness boundaries.

b. Forestry

The amended Unit would eliminate approximately 871 acres of ponderosa stands and 441 acres of pinyon-juniper woodlands from the suitable recommendation.

The forested lands excluded under this proposal could potentially increase the lands available for fuelwood harvesting in the region but would represent an extremely small percentage of the total available supplies.

c. Watershed

Watershed management actions to reduce erosion by treatment measures would remain impacted by this amended proposal. This is because the areas identified in the Divide Management Framework Plan (MFP) for treatment fall within the amended boundary.

d. Recreation

The amended Unit contains the portions of the WSA judged to have the most varied and interesting terrain and the highest potential for primitive recreation.

For the area within the boundary the impacts would be the same as those described in the All Wilderness alternative. The amended boundary would eliminate impacts to antelope hunting and reduce impacts to deer hunting by reducing the area that would be closed to motorized access.

Much of the Continental Divide would be eliminated from the suitable recommendation under this alternative. Non-wilderness management along this portion of the CDNST could result in impacts from possible future mineral activity and motorized uses. These impacts would reduce solitude and natural values along this segment of the CDNST.

e. Wildlife

The amended Unit would contain 4,274 acres of Ponderosa Pinyon SHS, 10,761 acres of the Pinyon-Juniper Hill SHS and 12,455 acres of the Blue Grama/Snakeweed SHS. This would exclude 40,249 acres of good antelope habitat from the suitable recommendation.

Possible limitations on wildlife habitat management actions would be reduced under this alternative. Six of the nine wildlife water catchments proposed in the Pelona HMP would fall outside the amended boundary. Impacts to proposed vegetative manipulations would also be reduced by the smaller wilderness recommendation.

The impacts to wildlife inside the amended boundary would be the same as the All Wilderness alternative.

f. Cultural

Impacts to known cultural resources would be the same as those identified under the All Wilderness alternative.

g. Wilderness

The 27,500 acres recommended as suitable for wilderness designation by this alternative possess the wilderness characteristics of naturalness, outstanding opportunities for solitude and primitive recreation. In addition to the mandatory wilderness characteristics, the area contains diverse wildlife habitat and vegetative as well as scenic and cultural resources.

The impacts to these wilderness values will be identical to those discussed under the All Wilderness alternative.

The 41,261 acres recommended as unsuitable for wilderness designation by this alternative possess the wilderness characteristics of naturalness and opportunities for solitude. These rolling grasslands also represent good antelope habitat and an expansive visual landscape.

The impacts to these wilderness values will be identical to those discussed under the No Action/No Wilderness alternative.

C. No Action

This alternative is essentially a no wilderness alternative and represents management according to the prescriptions contained in the Divide MFP.

1. Impacts to Wilderness Values

The most probable uses of the area if it is not designated as wilderness would be continued livestock grazing and probable future mineral exploration. Actual mineral development might occur if deposits were found and future market conditions were attractive.

The degree to which mineral exploration and development might occur in the area is not possible to predict at this time. Some general statements about the impacts of minerals exploration and developments are, however, possible. If significant levels of mineral exploration and development occur, they could result in the disruption of the habitat of bald eagles and other large raptors, antelope, deer, mountain lion, black bear and wintering elk. Impacts to visual resources and a reduction of the opportunities for solitude could also be expected to occur.

Over time, continued unrestricted vehicular access into the area could be expected to gradually impact natural values. These impacts would occur as new routes were created to hunting areas, rangeland improvements or to support mineral exploration.

Management actions calling for varying degrees of vegetative manipulation, water developments and rangeland improvements have been identified by the wildlife, range, forestry and watershed programs. The individual projects designed to improve both livestock and wildlife habitat and reduce erosion would not significantly affect wilderness values. The cumulative effect of these projects, however, would impact wilderness characteristics.

2. Impacts to Other Resources and Uses

a. Livestock Grazing

The No Action alternative would have no impacts to livestock operations in the WSA.

b. Forestry

Forest resources would be managed according to the prescriptions contained in the Divide MFP and the Pelona and Horse Mountain Fire Management Plan. No commercial timber harvesting activities are planned in these documents nor are any anticipated at this time. If demand is found to exist, the area could be used as a commercial fuelwood sale area.

The main thrust of forest management in this area will be to control pinyon-juniper and to re-establish fire as an integral component in the ecology of ponderosa pine succession.

c. Watershed

Watershed management actions, including prescribed burning to reduce pinyon-juniper and increase ground cover, would be conducted as prescribed in the Divide MFP.

Continued vehicular access, over time, could result in additional ruts and create the potential for reduced watershed quality.

d. Recreation

Present hunter use patterns would continue. There would be no constraints to possible developments associated with the CDNST. Opportunities for primitive recreation may be reduced in time by impacts of vehicular use in support of livestock grazing, hunting and mineral exploration.

e. Wildlife

If non-wilderness management results in significant increases in human activity in the area as a result of mineral exploration or fuelwood harvesting, it could impact wildlife habitat by disrupting fawning grounds, roosting and nesting areas. Management actions proposed in the Pelona HMP would not be limited under this alternative. These management actions could, in the long run, produce a more diverse habitat than the operation of natural processes which would occur under wilderness management.

f. Cultural

There would be no impacts to current research efforts at Bat Cave or to possible future efforts at other sites. Continued vehicular access would create a greater potential for archaeological vandalism than would the elimination of vehicular access under wilderness management. This greater potential for vandalism would be offset to a degree by the higher levels of BLM patrolling and monitoring that will be possible using vehicles.

If non-wilderness management results in the alteration of the natural context of archaeological sites, it could

reduce the scientific potential of these sites. This reduction would result from the loss of information concerning how earlier people related to their surrounding environment.

VI. RECOMMENDED ACTION

A. Recommended Action Description

The recommended action for the Continental Divide WSA is the partial wilderness alternative. Of the original 68,761-acre WSA, 27,500 acres are recommended, as suitable for wilderness designation.

B. Rationale

This alternative was decided upon because it produced more manageable boundaries, reduced inholdings, eliminated cherry-stemmed roads, and reduced impacts to livestock operations and other resource programs while retaining all the ecotypes represented in the original unit.

The lands recommended as suitable by this alternative have high wilderness values including naturalness, solitude and primitive recreation opportunities. These values are enhanced by the diverse landforms, vegetation wildlife habitat and scenic values present. These values and the low levels of resource conflicts in the portion of the WSA recommended suitable indicate that the Unit is suitable for wilderness designation and can be managed to preserve its wilderness character.

C. Consistency with Other Plans

The NMDG&F has indicated that wilderness designation would conflict with vehicular access in support of antelope hunting in two of their antelope hunt units, the Adobe and Farr Ranches. Two other State agencies, the Department of Agriculture and the Planning Division of the Department of Finance and Administration, have commented on the wilderness issue in the Divide Planning Area but revealed no conflict in plans.

Continuing coordination and consultation with other agencies will take place prior to and during the course of the EIS. At this time, however, wilderness designation for Continental Divide as amended, would appear to have only minimal conflict with the present hunter use patterns rather than the formal plans of the NMDG&F.

Jornada Resource Area

Wilderness Analysis Reports

WILDERNESS ANALYSIS REPORT
SIERRA LADRONES WILDERNESS STUDY AREA
NM 020-016

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Socorro District
Jornada Resource Area
Socorro, NM 87801

December, 1982

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I. GENERAL DESCRIPTION

A. Location

The Sierra Ladrones (Mountain of Thieves) Wilderness Study Area (WSA) is located in west-central New Mexico, Socorro County. The Study Unit is situated 15 air miles northwest of the community of Socorro.

Applicable USGS Topographic Map:

Name: Riley (15")

B. Climate and Topography

The climate of the WSA is characteristic of southwestern desert mountains. Considerable variation in temperature and precipitation is present within the Study Unit. Maximum summer temperatures in the lower elevations surrounding the mountain peaks range from 90 to 100+ degrees fahrenheit. In contrast, temperatures in the higher elevations typically are 10 to 15 degrees cooler, ranging from 75 to 90. Winter daytime temperatures tend to be mild on low elevation lands, 35 to 50 degrees. In the higher elevations, diurnal temperatures range from 20 to 40 degrees with nighttime lows atop the peaks often falling well below zero. Spring and fall temperatures tend to be mild.

Precipitation, like air temperature, is strongly influenced by elevation. Generally, elevation increases along with average annual precipitation. Because of the cloud gathering effect of the mountains, low elevation lands surrounding the WSA tend to receive more precipitation than nearby lands of similar elevation, 12 inches per year as opposed to 10. Correspondingly, the highest elevations in the WSA receive a projected average of 16 to 20 inches of precipitation per year.

Over half the area's annual rainfall is received during the summer thunderstorm season (July through September). A third of the year's precipitation usually falls during the winter months (December through March). The remaining moisture, normally 10 percent or less, is received in the spring and fall months.

The Sierra Ladrones WSA rises precipitously out of the Rio Grande Valley on the east and from mesa grassland and pinyon-juniper woodland on the north, west and south. Elevations range from 5,200 to 9,176 feet with a maximum relief of 3,976 feet.

The Study Unit is approximately ten miles long from north to south and eight miles wide east to west. The core peaks of the range are extremely rugged. The northern end of the WSA terminates with abrupt escarpments which give way to several large canyons. The southern end of the Study Unit gradually loses altitude from the main peaks with a long narrow ridge eventually tapering down to the box canyons of the Rio Salado.

On the east, the mountains break into a series of rocky canyons which give this exposure the appearance of an enormous pile of boulders.

The western and southern portions of the WSA are characterized by rocky cliffs, mesa rimrock, badlands and steep slopes cut by numerous box canyons and ravines.

C. Land Status

The Study Unit includes 39,308 acres of public land and mineral estate administered by the Bureau of Land Management (BLM) (see Map, p. C-3). Private inholdings within the Study Unit total 373 acres, whereas State inholdings consist of 1,960 acres. No portion of the WSA has been withdrawn from public land or mineral entry laws. No rights-of-way are present.

D. Access

Primary legal access to the WSA is provided by Interstate 25 at Bernardo and thence west via County Road 12. Legal access is also provided by U.S. Highway 60 at Magdalena and thence north via County Road 67.

II. EXISTING RESOURCES

A. Geology

Sierra Ladrones WSA lies across a zone of transition between the northwestern flank of the Rio Grande rift and the southeastern margin of the Colorado Plateau. The Ladrones Mountains appear to represent a resistant prong of the Colorado Plateau block that juts into the western side of the rift. The Study Unit is also located on the northeastern periphery of the Datil-Mogollon volcanic field.

Structural features present within the WSA include anticlines, synclines and numerous faults, flexure and shear zones. Major faults include the north-trending Jeter, Silver Creek and La Jencia Creek "domino faults" in the eastern part of the WSA, the north-trending Ladrone fault which runs through the central part of the WSA, and the northeast-trending Cerro Colorado fault zone which intersects the southeast tip of the Study Unit. Other major structures are the Rio Salado flexure zone which trends northwest through the southern part of the WSA, the Carbon Springs flexure which trends north-south through the western part of the Study Unit, and the Alamito shear zone trending northeast through the northern part of the WSA.

Rocks exposed in the Study Unit range in age from Precambrian to Quaternary. Precambrian rocks consist of a 1.6-billion-year-old terrain of metamorphased sediments, meta-volcanics and granites, which is intruded by the 1.3-billion year old Ladron pluton. Paleozoic formations present include Pennsylvanian-Mississippian age rocks, and the Permian age Abo, Yeso, Glorieta sandstone and San Andres limestone

SIERRA LADRONES WSA (NM 020-016)

Legend

- WSA BOUNDARY
- AMENDED BOUNDARY

Land Status*

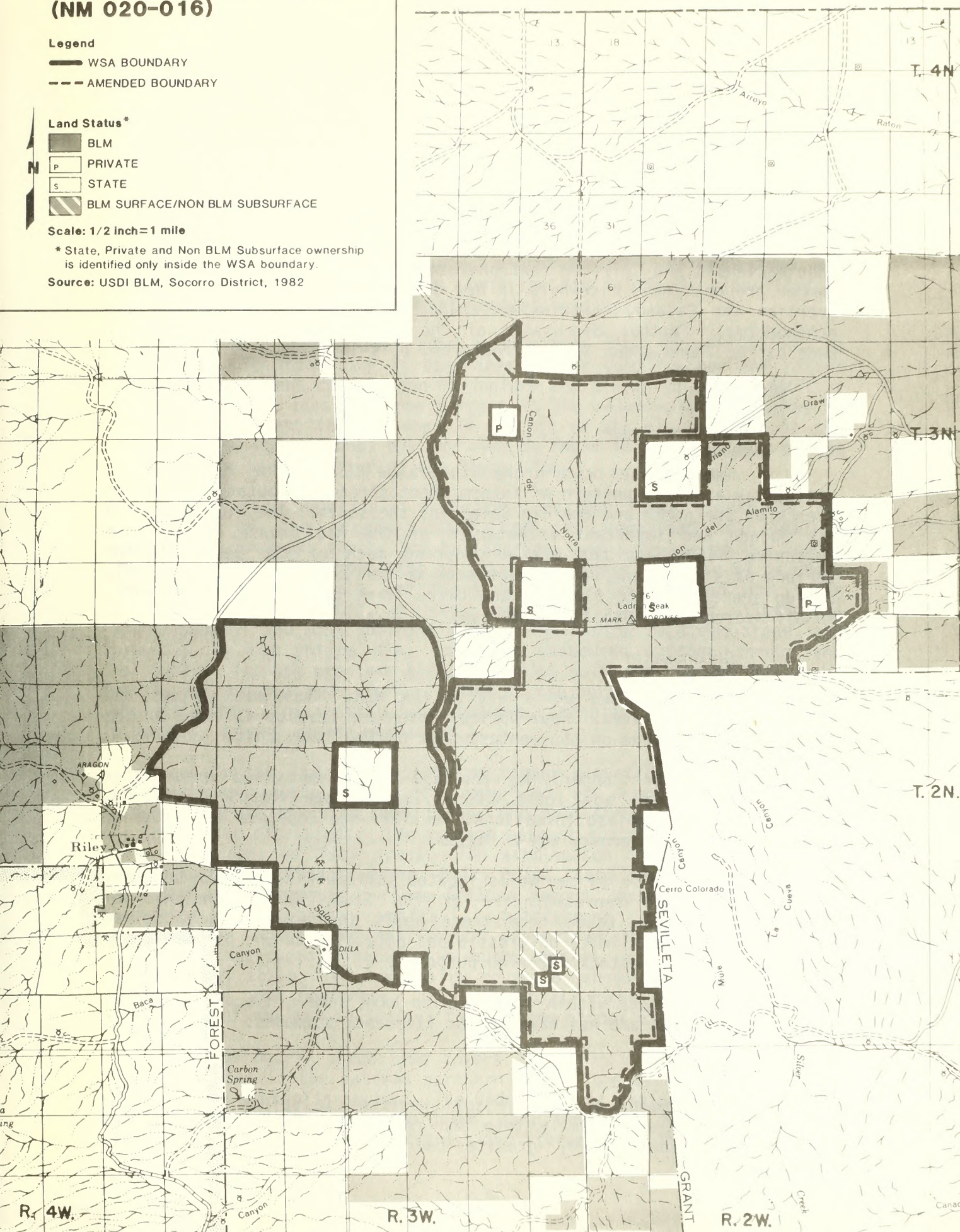
- BLM
- P PRIVATE
- S STATE
- BLM SURFACE/NON BLM SUBSURFACE

N

Scale: 1/2 inch=1 mile

* State, Private and Non BLM Subsurface ownership is identified only inside the WSA boundary.

Source: USDI BLM, Socorro District, 1982



formations. The Mesozoic Era contains Triassic and Cretaceous age rocks. The Cenozoic Era includes the Tertiary age Baca, Datil-Mogollon and Popotosa formations, basaltic dikes and sills, and Quaternary age Sierra Ladrones formation, travertine deposits and surficial deposits.

Paleontology

The Caloso member of the Kelly limestone, found along a prominent hogback on the western side of the Study Unit, contains fossils of the Kinderhook fauna. Two brachipods, Dielasma chouteauvensis and Spirifer centronatus, which are common in the Caloso member are not found elsewhere in New Mexico. The Ladron member, which overlies the Caloso, contains an abundance of corals, brachipods and echinoderms. Further discussion of the significance of these fossil beds can be found under Special Features, p. C-15.

B. Water

Surface Water

The WSA lies within the Rio Grande Basin. The Study Unit is drained by a radial pattern of intermittent streams tributary to the Rio Puerco on the north and the Rio Salado on the south. The Rio Puerco and Rio Salado are important tributaries of the Rio Grande. Each have extensive watersheds but are dry during much of the year. During periods of significant rainfall or snow meltoff, the Rio Puerco and Rio Salado are subject to flooding and carry large quantities of sediment. Runoff averages 0.1-0.5 inches per year.

Groundwater

There are two wells within the WSA. Numerous springs and seeps occur in the area. Four springs have been developed, three on the northern side and one on the western side of the Study Unit.

Formations underlying the WSA known to yield groundwater include Precambrian age rocks, Pennsylvanian age Madera limestone, Permian age Abo and Yeso formations, Tertiary age Popotosa and Santa Fe formations, and Quaternary age alluvium.

Groundwater in two wells located just outside the WSA boundary are considered as representative of the Study Unit. Analysis of groundwater samples taken from these wells indicates high dissolved solids and marginal limits of gross alpha natural uranium, but the water is suitable for livestock watering purposes.

Two springs within the WSA also have some gross alpha natural uranium but levels are not harmful for livestock purposes.

C. Soils

Development of typical soil horizons is seldom found within the WSA. Soils are usually thin and rocky, with gravelly loams and sandy loams underlain by granite bedrock. The only areas with

appreciable soil depth occur in the lower canyon bottoms, valleys, portions of the mesa benchland on the west, and along the Rio Salado. Rock outcrops, some of which are massive, cover approximately 40 percent of the land surface of the mountain core area. Soil parent materials are composed predominantly of sandstone, shale, granite, basalt and limestone. Gypsum is present in the southwestern portion of the WSA.

D. Vegetation

The Sierra Ladrones WSA includes three major vegetative types. They are, in order of dominance, pinyon-juniper, desert shrub and conifer. In addition, the area along the Rio Salado is classified as wasteland with less than 2-percent vegetative cover.

The pinyon-juniper type covers more than 90 percent of the Study Unit. The overstory is dominated by one-seed juniper and pinyon pine. The percent composition of juniper and pinyon in this vegetative type varies from less than one percent in the relatively flat areas to the north and west to more than 15 percent on the steep slopes in the center of the WSA. Gambel oak may also be found in the overstory on the steep slopes in the center of the Study Unit.

In the relatively flat areas at the lower elevations the understory of the pinyon-juniper type is comprised of numerous warm-season grasses, shrubs and half-shrubs, and a few perennial forbs. The average percent composition of grasses in these areas is 84 percent. The most common grasses are black and blue grama, sand and spike dropseed, alkali sacaton, galleta, ring muhly, burrograss, fluffgrass and threeawn. The most dominant shrub or half-shrub in these areas, and probably in the entire WSA, is broom snakeweed. Other shrubs and half-shrubs include creosote bush, four-wing saltbush, feather pea-bush, cholla and prickly pear cactus. Some of the perennial forbs present in the understory are prickly-leaf dogweed, ironplant goldenweed, plains blackfoot, plains zinnia and aster.

On the steep slopes at the higher elevations, the understory of the pinyon-juniper type is comprised of warm- and cool-season grasses. There are also more shrubs and half-shrubs in the understory at the higher elevations. The average percent composition of grasses is only 72 percent in these areas. The warm-season grasses include black and blue grama, sideoats grama, hairy grama, sand dropseed and galleta. The cool-season grasses include Arizona fescue, mountain brome, mutton bluegrass, Junegrass, wolftail, bottlebrush squirreltail, and needlegrass. Shrubs and half-shrubs present at the higher elevations are broom snakeweed, feather pea-bush, cholla, prickly pear cactus, Datil yucca, shrub live oak, hairy mountain-mahogany, skunkbush sumac, Apache-plume and beargrass. Few perennial forbs are found in the understory of the pinyon-juniper type at the higher elevations.

The desert shrub type covers less than 5 percent of the WSA, and is located in the extreme northern end of the area. The overstory is dominated by cholla cactus. The understory is dominated by perennial grasses such as black and blue grama, sand and spike dropseed, galleta, ring muhly, burrograss, fluffgrass and threeawn. The major shrub or

half-shrub present in the understory is broom snakeweed. The major perennial forb is globemallow.

The conifer type also covers less than 5 percent of the Study Unit. This type is restricted to the upper ends of the main canyons, such as Canon del Alamito and Canon del Norte. The overstory is dominated by ponderosa pine with some Douglas fir and aspen present in isolated spots. The understory is similar to that found in the pinyon-juniper type at the higher elevations.

Threatened or Endangered (T&E) Plant Species

The U.S. Fish and Wildlife Service (FWS) has not listed any T&E plant species that may occur in the WSA. The Study Unit does contain habitat which offers potential for the occurrence of ten Federally listed and eleven State listed species of T&E plants. A list of these potentially occurring plants is available on request from the Socorro District Office (DO).

E. Wildlife

Two Standard Habitat Sites (SHS's) have been identified within the WSA. The habitat sites are based on the combination of dominant vegetation and landform. These SHS's support 201 wildlife species, which include 56 mammal species, 51 reptiles and amphibians, and 94 resident and migratory bird species. A complete list of wildlife species to be found within the WSA is on file in the Socorro DO.

Mule deer and cougar are the only big game species that occur in the Study Unit's mountainous core. Pronghorn antelope have been observed on the western mesa benchland and in the southern portion of the WSA.

In the past, the mountain core of the WSA supported a moderate deer population that has since been depleted. Several factors could be responsible for the decline, some of which are disease, overharvest, poaching, predator loss and drought. Abundant food is available and water sources, while not abundant, are believed adequate.

The most common predator is the coyote. The rocky slopes and bluffs also provide habitat for bobcat and gray fox. Badgers, desert cottontails, black-tailed jackrabbits, white-throated woodrats, deermice, ground squirrels and several species of bats also occur in the Study Unit.

The massive rock escarpments, canyons and rock outcrops should be attractive to birds of prey. However, raptor density appears to be low. Birds which are commonly sighted in the WSA include horned larks, pinyon jays, western bluebirds, ravens, mourning dove, and Gambels and scaled quail.

Reptiles likely to be encountered are the collared lizard, eastern fence lizard, bullsnake and western diamond-backed rattlesnake.

Threatened or Endangered Wildlife Species

The FWS has not listed any T&E wildlife species that may occur in the WSA.

F. Visual

The Study Unit is dominated by the granitic core of the Sierra Ladrones. The dramatic uplift of the mountain range, especially when viewed from the north, is inherently scenic. The panoramic view from the top of Ladron Mountain can be spectacular, especially during the morning or evening hours of the day.

The WSA's greatest scenic asset, however, is its landscape diversity which ranges from a spectacular mountain core to mesa grasslands, box canyons, rimrock, badlands, desert and the floodplain of the Rio Salado.

The Study Unit is visible from a distance of nearly one hundred miles in some directions. The Sierra Ladrones stand as one of New Mexico's outstanding visual landmarks.

G. Cultural

A Special Project Cultural Resources Inventory (Class I) for the Sierra Ladrones WSA was completed by BLM in 1981. The cultural resource information compiled was based upon a comprehensive literature and records search. The following data was extracted from this report and historical documents. The full text of the report is available for inspection at the Socorro DO.

The Study Unit is unusually rich in cultural resources, both historic and prehistoric. Although less than 3 percent of the WSA has been intensively inventoried, 17 sites have been recorded within the area. Recorded sites range from possible paleo/archaic lithic scatters to historic structures from the 1930's.

The name "Mountain of Thieves" is derived from use of the Sierra Ladrones, apparently by both Navajo and Apache bands, as a stronghold to raid Spanish and later Mexican and American settlements along the Rio Grande as far north as Albuquerque in the seventeenth, eighteenth, and nineteenth centuries. Although the Indians undoubtedly viewed their raids from a different perspective, to the Spanish and later Mexican and American colonists, the removal of livestock from ranches constituted depredations by "thieves". Since the Navajo and Apache themselves usually viewed these raids as primarily "economic" in nature, a form of tribute for past injustices as opposed to warfare, the Spanish name for the Sierra Ladrones becomes understandable.

Warfare between the Spanish, Mexicans, and Americans and the Indians did take place in the Sierra Ladrones; however, documentation is very scarce. It is known the last U.S. Cavalry-Apache engagement within the southern portion of the WSA occurred in 1881. The combatants were Company K of the 9th U.S. Cavalry Regiment commanded by Colonel Parker

and a small band of Warm Springs Apaches under Nana. Parker's command was but a small contingent of a much larger U.S. military force which was pursuing Nana and his warriors, which numbered no more than 30 men. However, Nana ambushed Parker and his men in the Salado Box, killing three soldiers and wounding a number of others. There were no Apache casualties.

Nana's engagement with Colonel Parker in the Salado Box is but an example of the history of the Sierra Ladrones WSA. Legends of conquistadors, buried Civil War cannons, lost treasure, lost bandit gold, lost mines, desperado hideouts, as well as stories of more recent moonshine-still hideaways abound in the Study Unit. Given its geographic proximity to the Rio Grande Valley and New Mexico population centers on the one hand and its isolation and ruggedness on the other, these stories have been encouraged and given some credibility by the environment of the area. But like Nana's raid, which is history, a number of the legends probably have some historical basis.

The prehistoric cultural resources of the WSA are likely more significant, especially from a scientific standpoint, than are its historic resources. Most of the known cultural sites within the WSA are prehistoric, and it is anticipated further inventory will broaden the gap in favor of prehistoric sites even further.

Existing data indicated the Study Unit has been utilized by humans for at least the past 10,000 years. Further, since recent data suggests paleo-Indian sites are likely to be found in high diversity mountain environments such as the core mountain area of the WSA, it is likely the WSA possesses cultural resources which extend even further into the past.

Because of the complexity of the prehistoric archaeology of the Sierra Ladrones WSA, it is not possible within the scope of this report to give even a detailed summary of the area's prehistory. However, due to its pivotal geographic location, a-typical prehistoric cultural resources (especially for the Mogollon-Anasazi cultures) are anticipated from this area.

No concerns have been expressed by the Native American groups contacted for this Study Unit.

H. Air

The air quality of the WSA is excellent. It is generally affected only by the occurrence of wind blown sand during the spring.

III. EXISTING AND POTENTIAL USES

A. Mineral Development

The information in the following section is mostly abstracted from a draft report prepared by the New Mexico Bureau of Mines and Mineral Resources (NMBM&MR), entitled "Preliminary Evaluation of the

Mineral Resource Potential of the Sierra Ladrones Wilderness Study Area." A copy of the report is available for inspection at the Socorro DO.

1. Leasable

a. Oil and Gas

Six non-competitive oil and gas leases have been issued or are pending within the WSA. All leases are recently issued or filed and subject to Interim Management Policy (IMP) and Guidelines For Lands Under Wilderness Review (BLM 1979). No exploration or development for oil and gas has occurred in the Study Unit to date.

The southwestern portion (approximately 3,000 acres) of the Study Unit is considered to have potential for the discovery of oil and gas. The NMBM&MR has determined that this portion of the WSA has a Class III rating, in a system in which Class I is most favorable and Class IV is least favorable for discovery of oil and gas. Available information indicates a high probability for the generation of petroleum and natural gas in Pennsylvanian rocks under this portion of the Study Unit, but the existence of traps and reservoirs has not been proven. The probability for discovery of oil and gas reservoirs is judged to be moderate to low. The rest of the Study Unit is not considered favorable for the discovery of oil and gas.

b. Geothermal

There are no geothermal leases within the boundaries of the Study Unit. The east flank of the WSA overlies the western flank of a deep sill-like magma body, and seismic information indicates magma intrusion at a depth of about 5 kilometers below the northeastern portion of the Study Unit. Deep geothermal reservoirs of this nature have not yet produced commercial energy, and would test the limits of current technology. The probability for discovery of a commercial geothermal energy source within the WSA is judged to be low to very low.

c. Carbon Dioxide

There has been no activity associated with the exploration or development of carbon dioxide within the Study Unit. The conditions which form deposits of carbon dioxide are not well understood, but are believed to be related to thermal action when limestones are intruded by igneous rocks. If this theory is correct, the WSA may have potential for carbon dioxide production. Small igneous bodies are known to occur in the western part of the Study Unit, and probably cut the Madera limestone in the subsurface; but only minor amounts of thermal action are likely. The probability for discovery of commercial volumes of carbon dioxide is judged to be very low.

d. Coal

There has not been any coal related activity within the Study Unit, but minor coal production has occurred several miles

south and east of the WSA prior to 1940. The coal beds are generally less than a foot thick, have very little lateral extent, are generally poor in quality, and do not extend into the Study Unit. It has been suggested (Chapin et al. 1979) that this minor coal resource could be used to fire a cement plant using locally available travertine, gypsum, shale and water.

2. Locatable

At present, there are approximately 175 mining claims located within the Study Unit. The claims are staked on occurrences of manganese, uranium, copper, silver, barite and gypsum. Of these claims, only one predates the enactment of the Federal Land Policy and Management Act. The WSA has potential for the occurrence of the following locatable minerals:

a. Supergene Uranium/Copper

During the mid-1950's, approximately 6,000 tons of uranium ore was produced from the Jeter deposit located approximately one-quarter mile from the east boundary of the WSA. Occurrences of secondary copper minerals associated with uranium minerals have been verified along a 5-mile long section of the Jeter fault. The area has been prospected by means of shallow surface excavations and drilling during the mid-1950's and early-1970's, but the depressed condition of the uranium market in recent years has precluded additional exploration or development. The probability for the discovery of additional small Jeter-type deposits is considered to be very high, and the probability for discovery of large, commercially significant deposits is judged to be moderate.

b. Stratiform Copper Sulfide/Uranium

There are indications that the Precambrian metamorphic rocks in the mountainous core of the WSA may contain significant deposits of copper sulfide and uranium minerals, possibly associated with cobalt and nickel which are both strategic metals. Copper occurrences are reported to be scattered throughout the metamorphic terrain, and evidence implies that mineralization occurring along the Jeter fault is a result of metals being leached from the metamorphic rocks and re-deposited along the fault. Analysis of samples from a prospect in metamorphic rocks, and trace element analysis of the Jeter ore body tend to support this theory. The probability for discovery of commercial deposits of this type is considered to be high, and the probability for discovery of giant deposits (value in excess of 1 billion dollars) is judged to be low.

c. Silver/Base Metal/Barite Veins

Numerous northwestern and northeastern-trending fractures in Precambrian rocks on the northeastern flank of the Ladron Mountains are occupied by a complex network of siliceous and carbonate veins. Siliceous veins are known to contain minor amounts of lead-zinc-copper sulfides, moderate amounts of barite, economic

concentrations of silver and sub-economic gold values. Carbonate veins carry economic grades of silver and some barite. The veins are mostly thin, discontinuous, and probably die out with depth. In addition, veins of mineable width and grade do not occur at the surface. For these reasons, the veins are considered to be non-commercial, and have no economic potential.

d. Lead/Zinc/Barite in Paleozoic Limestones

An area favorable for Mississippi Valley-type lead-zinc-barite deposits in limestone has been tentatively outlined on the basis of hydrothermally silicified limestones and silicified fault breccia along the Ladron fault, about one mile west of Ladron Peak. These silicified zones are mostly barren of mineralization at the surface, but may be associated with Mississippi Valley-type replacement deposits at depth. The probability for the discovery of such deposits is judged to be fair to poor.

e. Manganese

Two areas favorable for the discovery of manganese deposits have been identified within the Study Unit. One area represents a swath along the Carbon Springs fault zone where it is covered by a travertine cap rock. The Black Mask mine, which produced 566 metric tons of ore during 1952-55, is located in this area. This swath is considered to have high probability for discovery of similar small, high-grade bodies of ore, but low to very low probability for discovery of large, commercially significant deposits.

The second area, located in the south-central portion of the Study Unit, represents the shallow subsurface and above surface projection of a late Cenozoic unconformity where the upper Madera limestone is overlain by limestone-cobble conglomerate of the Sierra Ladrones formation. Deposits adjacent to this unconformity have produced very minor amounts of low-grade manganese. It is likely that similar deposits could be found in the area, but they would be of too low a grade to be profitably mined, and are not considered to be an economical resource.

f. High Calcium Limestone

The travertine caprock in the northwestern portion of the Study Unit, and the Madera limestone in the central portion of the WSA, represent a large reserve of cement and chemical grade lime. The travertine deposit totals approximately 225 million metric tons of which 150 million tons falls within the WSA, and the Madera limestone is estimated to total 25-50 million metric tons within the Study Unit. The principal obstacle to development of these deposits is transportation, since the nearest rail head is 20 miles away, over marginal roads. However, if the population in central New Mexico continues to grow, there may be sufficient demand for cement to exploit this resource. It has been suggested (Chapin et al. 1979) that coal from the Riley-Puertecito area could be used to fire a cement plant in the vicinity of Riley, utilizing locally derived limestone as raw material.

g. Gypsum

Within and adjacent to the WSA, gypsum beds crop out near the top of the Yeso formation and near the base of the Glorieta sandstone. It has been estimated that 194,000 metric tons of near-surface gypsum occur within the WSA. However, this gypsum is remote from principal construction markets, has poor access, and is unfavorable for mining because of thick overburden, interbedding with clostic and carbonate units, and structural complexity. The only use for gypsum under foreseeable economic conditions would be as a soil conditioner in the Riley area. If a cement plant were constructed in the vicinity of Riley, then the gypsum would find a ready market as retarder for portland cement.

h. Gold

Bedrock unconformities mantled by riverine or shoreline conglomerates are well known sites for discovery of placer gold deposits. Thin quartz pebble conglomerates containing subeconomic concentrations of gold are known to occur at the base of the Kelly formation where it rests unconformably on Precambrian rocks near Cerro Colorado. Based on this information, the economic potential of placer gold deposits in the WSA is judged to be low.

i. Tungsten/Bismuth/Fluorite

There is a possibility that deposits of tungsten-bismuth-fluorite exist within the Study Unit. Samples taken from a plug-like body of coarse grained granite contained minor amounts of fluorite. In addition, stream sediments emanating from this area southwest of Ladron Peak contain anamolous values of tungsten and bismuth. This information suggests that a greisen or vein-type tungsten-bismuth-tin(?) deposit is possible within the area. This potential is highly speculative, and the favorable area needs additional study to verify this possibility.

3. Saleable

No material sales have been conducted within the WSA, and no future sales are anticipated. The Study Unit contains deposits of rock, mainly limestone, suitable for crushed stone, and may contain some deposits of sand and gravel. However, poor access, distance to markets and the existence of more readily available materials in other areas probably precludes the development of saleable materials within the WSA.

B. Watershed

The southern two-thirds of the WSA is located in the Rio Salado Watershed and the northern third in the Rio Puerco Watershed. Both watersheds in the Study Unit are characterized by thin, rocky, well-drained soils with sandy gravelly loam textures underlain by granite.

The Rio Salado and Rio Puerco have extensive watersheds but are dry during most of the year. Due to the thin rocky soil, there is rapid runoff and little groundwater storage. Erosion currently is light to moderate but the potential for accelerated erosion is high.

C. Livestock Grazing

One grazing allotment lies entirely and eight allotments partially within the Study Unit. The names and acreage percentages of each allotment which lies within the WSA include: Cerro Colorado (100), Ojo Saladito (24), Riley (6), Negro (42), La Jencia Ranch (56), West Ladron (69), and the Rio Salado West (10). All nine allotments are run as cow-calf operations.

Existing rangeland developments within the WSA include 42 miles of two-track vehicle route, and 45 miles of barbed wire fencing, 10 miles of which are along the boundary of the Study Unit. There are also 8 miles of buried water pipeline which supply water to six livestock drinking troughs and three wildlife water troughs; nine earthen stock tanks, of which four have watershed exclosures; four spring developments which include livestock drinking troughs; two wells with windmills, one of which is abandoned; one corral; and eight-tenths of a mile of maintained livestock trail. In addition, a corridor which leads to a windmill, storage tank, livestock drinking trough and corral is surrounded by the WSA.

Allottees periodically inspect and maintain as necessary most developments using motor vehicles. Fence inspection and maintenance is sometimes performed on horseback.

D. Timber Harvest

Approximately 90 percent (35,400 acres) of Sierra Ladrones WSA is classified as non-productive forest land (New Mexico Forest Inventory 1975). One-seed juniper is the dominant tree species with pinyon pine representing only a minor component. Scattered stands of ponderosa pine are found within drainages at the higher elevations. The higher elevations also include some Douglas fir and aspen.

Information on stand parameters has never been collected, but certain generalizations can be made from field observation. The stunted nature of the vast majority of juniper is indicative of a very low site quality. Wide tree spacing and the estimated 5-percent crown closure result in a low level of stocking that precludes economic harvesting of the woodland resource. Poor conformation, inherent in understocked stands, also limits the usefulness of the product. Age class is unknown but is certain to be unbalanced due to the preponderance of overmature individuals and a lack of regeneration.

The potential for sawtimber production on a sustained yield basis does not exist within the Study Unit. Production of posts and poles is probably of marginal value due to the poor conformation of the juniper. At present, fuelwood production is considered marginal due to

the lack of physical access to the majority of forested lands and the availability of alternate cutting areas (i.e., Forest Service administered land).

E. Recreation

Existing recreational use of the WSA is moderate. Recreational activities suitable to the Study Unit include day hiking, horseback riding, backpacking, technical rock climbing, natural history activities (e.g., birdwatching), environmental exploration, rock hunting, landscape and nature photography.

Although water is scarce in the WSA, this has not hindered backcountry use (e.g., backpacking) and is not expected to do so in the future for those accustomed to and/or appreciative of desert mountain recreational activities. However, the lack of water within the range is expected to hold this type of use by the public to moderate levels.

Peripheral use (i.e., automobile touring) and short day hikes along the WSA's northern and western peripheries, can be expected to increase due to ease of access and proximity to Socorro, Belen and Albuquerque.

F. Education/Research

The Sierra Ladrones WSA is not currently utilized for any known educational or research purpose. Environmental education and research potential for the WSA, however, is considered significant for cultural, natural ecosystem, paleontological and geologic studies.

G. Wildlife

The New Mexico Department of Game and Fish has identified the WSA and adjacent Sevilleta National Wildlife Refuge lands as possessing high potential for the introduction of desert bighorn sheep. Habitat conditions are deemed excellent with the possible exception of the need to improve water sources within the mountain range.

IV. WILDERNESS CRITERIA

A. Evaluation of Wilderness Values

1. Quality of Mandatory Wilderness Characteristics

a. Naturalness

The Sierra Ladrones WSA generally appears natural. The eastern mountain core and southwestern corner of the WSA are highly natural in appearance and affected primarily by the forces of nature. The naturalness of the Study Unit is further enhanced by its dramatic topographic relief, diversity of landforms, and relatively large size.

The WSA is impacted by 42 miles of vehicle routes which vary from jeep trails to two-track ranch access routes. Other intrusions consist of numerous rangeland development structures. A concentration of rangeland developments is located on the northwestern shoulder of the WSA which include water pipelines, stock tanks and related developments. This concentration has reduced the generally high quality of the entire WSA's naturalness values.

Seventeen mining prospects and six old mines are also present in the WSA. These are, for the most part, historic mining impacts which are relatively small in size and unobtrusive in appearance. No active mining is taking place in the Study Unit at present.

Although human intrusions are present in the mountain core and in the southwestern corner of the WSA, the rugged topography moderates the significance of these intrusions to a considerable degree. In all cases, the intrusions can be accommodated within the parameters set forth in the Wilderness Act. In a small number of instances, it would be desirable to take rehabilitation actions to speed up natural successional processes.

b. Solitude

The Sierra Ladrones WSA is a rugged mountain, canyon, grass and desert land of unusual topographic diversity. Its high mountain peaks, isolated canyons, and inaccessible badlands provide the visitor with outstanding solitude opportunities.

c. Primitive/Unconfined Recreation

The Study Unit provides visitors with outstanding primitive recreational opportunities for day hiking, backpacking, technical rock climbing, horseback riding, nature and landscape photography, nature study, and environmental exploration. The proximity and ease of access of the WSA to Albuquerque, Belen and Socorro further enhance the value of these opportunities to the general public.

The WSA is also recreationally important because it is well suited to fall, winter and spring use. It is during these seasons the Study Unit is most attractive for recreational pursuits.

2. Special Features

The Sierra Ladrones WSA contains the northernmost known exposures of lower Mississippian rocks in New Mexico. These rocks have been studied and described in detail by Augustus K. Armstrong in the New Mexico Bureau of Mines and Mineral Resources Memoir 5, "The Mississippian of West-Central New Mexico." Exposures of these rocks in west-central New Mexico are limited largely to the Magdalena, Lemitar and Ladron Mountains. From a regional viewpoint, the Mississippian strata of this region fill a gap between those of southern New Mexico, described by Ladon and Bowsher (1949), and those of northern New Mexico, described by Armstrong (1955). The exposures are of special interest to

those wanting to become familiar with the lithology and paleontology of the Mississippian. In the Sierra Ladrones these rocks are well exposed and abundant in fossils. The excellent descriptions and illustrations of these rocks and fossils by Armstrong make the area valuable for educational purposes.

The scenic values of the Sierra Ladrones WSA are significant both when viewed from a distance (e.g., Interstate 25) and from within the WSA proper. The range of topographic relief and the landform diversity within the WSA create a southwestern scenic resource of considerable importance.

The ecological values of the WSA are also high. The Study Unit lies near the junction of three major ecoregions and includes such a wide range of landform and life zone diversity that the ecological resources of the area can be considered scientifically valuable.

3. Multiple Resource Benefits

The Study Unit contains a variety of natural resource values as a result of its undisturbed character. Designation of the WSA as wilderness would provide a greater degree of long-term protection for these values than would administrative designations available to the BLM.

A more detailed discussion of multiple resource benefits may be found under the impacts of the All Wilderness alternative.

4. Diversity

a. Ecosystems Present

The Bailey-Kuchler Ecoregion Classification System has been used to ensure consistency between documents. It should be noted that different classification systems measure vegetation using different parameters and will result in varying acreage figures.

The Sierra Ladrones WSA includes three provinces as identified by the Bailey-Kuchler Ecoregion Classification System: The Chihuahuan Desert Province, the Colorado Plateau Province, and the Upper Gila Mountains Forest Province. Two sections of two provinces are represented within the Study Unit: The Tarbush-Creosote Bush (2,000 acres) of the Chihuahuan Desert Province and the Grama-Galleta Steppe/Juniper-Pinyon Woodland Mosaic (34,440 acres) of the Colorado, Plateau Province. The Upper Gila Mountains Forest Province consists of 2,000 acres. In addition, scattered riparian ecosystems, probably with strong Chihuahuan Desert associations, are also present comprising approximately 868 acres. Further, the likelihood that local variations of the above ecosystems are present within the WSA is high due to edaphic, structural, and geographic factors which create an unusual range of microenvironments and ecotones.

b. Distance from Population Centers

Two cities identified in the 1980 census as Standard Metropolitan Statistical Areas (SMSAs) are located within less than five hours' driving time of the WSA. Albuquerque, New Mexico lies within two hours' and El Paso, Texas within four hours' driving time of the Study Unit.

B. Manageability

To be recommended for wilderness designation, the Sierra Ladrones WSA must be capable of being effectively managed as wilderness. Manageability is a judgment made by the BLM after considering such factors as private and State inholdings, valid existing rights, topography and overall land ownership pattern.

Inholdings within the WSA include 1,960 acres of State land and 373 acres of private land. Acquisition of these inholdings, through voluntary exchange, would enhance manageability.

Valid existing rights in the Study Unit consist of grandfathered livestock operations and include necessary vehicle access for maintenance of existing rangeland developments. Reasonable access is also guaranteed to State and private inholdings. These access needs are not expected to result in significant management problems.

The majority of mining claims within the WSA are clustered in the northeastern portion of the Study Unit. The impact these claims may have on wilderness management is difficult to predict at this time. No mining activity of consequence has occurred in the WSA in the past 20 years. Although a Mining Plan was filed with BLM for initiating mineral exploration on one claim in 1980, no further action was taken by the claimant. Accurate assessment of this manageability issue must await further mineral inventory data and evaluation.

Six oil and gas leases have been issued or are pending within the Study Unit but all are subject to the IMP wilderness protection stipulations.

The awkward configuration and lack of identifiable boundaries in the western portion of the WSA presents management problems. The flat mesa grassland in the northwestern portion of the Study Unit would require fencing or a system of signs and markers to define the wilderness boundaries. The lack of topographic barriers to vehicular travel combined with poorly defined natural boundaries could lead to vehicle trespass problems.

A boundary adjustment would improve the manageability of the Study Unit. This change would eliminate the western portion of the WSA, which in addition to having poorly defined boundaries on the north, would also eliminate 3 miles of cherry-stemmed road and the majority of rangeland developments within the Study Unit. This boundary adjustment is discussed under the Amended Boundary alternative on p. C-22.

The potential for controlling vehicular access to the WSA's eastern half is excellent.

V. PUBLIC INVOLVEMENT OVERVIEW

Public involvement in the wilderness inventory and study process has generally indicated strong support for designation of a Sierra Ladrones Wilderness Area or an alternative designation including primitive area status. This support has a history dating at least to the late-sixties. Although the support tends to be centered in Albuquerque and Santa Fe, it is Statewide in scope.

The most commonly cited reasons in support of designation included the WSA's outstanding natural and solitude values, its recreation potential and proximity to Albuquerque, Belen and Socorro, combined with high scenic, wildlife and ecological values.

Opposition to wilderness designation has been intense from local mining interests who feel designation would adversely impact mineral prospecting and development. Most area grazing allottees are also opposed to wilderness designation. They feel designation would adversely affect livestock operations on those portions of their respective allotments located within the WSA.

VI. ALTERNATIVES AND IMPACTS

This section will discuss three alternatives (management options) that could be applied to the WSA. These alternatives include: All Wilderness, Amended Boundary, and No Action (No Wilderness).

A. All Wilderness

This alternative would recommend the entire 39,308-acre WSA for inclusion in the National Wilderness Preservation System. If designated, the area would be managed pursuant to the guidelines and mandates of the Wilderness Act of 1964 and the Final Wilderness Management Policy published in the Federal Register September 24, 1981 (Vol. 46, No. 185).

1. Impacts to Minerals

If the WSA is recommended as suitable for wilderness designation, a U.S. Geological Survey and U.S. Bureau of Mines mineral-energy survey would be conducted to supplement current data regarding the mineral-energy occurrence potential for the area.

Leasable

a. Oil and Gas

Approximately 8 percent of the WSA has moderate to low potential for economically recoverable oil and gas reserves, and the remaining lands are not considered favorable for discovery of these

resources. Therefore, denying exploration/development would likely have little or no impact on oil and gas development in the Study Unit.

Designating the WSA a wilderness would likely preclude any serious oil and gas exploration/development within the Study Unit. However, since the area believed to have potential for oil and gas is a narrow strip adjacent to the southwestern boundary of the Study Unit, much of the area's oil and gas reserves, if present, could be tapped through the use of slant drilling techniques or by drainage.

b. Geothermal

The Study Unit has low to very low potential for the development of geothermal resources. Wilderness designation would have little or no impact on geothermal resource development.

c. Carbon Dioxide

The WSA has very low potential for discovery of commercial deposits of carbon dioxide. Wilderness designation would have little or no impact on development of this resource.

d. Coal

Coal deposits of the Riley-Puertecito area do not extend into the Study Unit. Denying coal leasing within the WSA would have no impact on development of these deposits.

Locatable

Copper, uranium, manganese, silver, fluorite, barite, gypsum and high calcium limestone are known to occur in the Study Unit, and the potential exists for occurrences of gold, lead, zinc, cobalt, nickel and tungsten. High economic potential exists for copper and uranium, and the other commodities, except gypsum, are possibly economically recoverable resources. In addition, manganese, cobalt, nickel and tungsten are strategic metals for which the United States is heavily dependent on imports. During a period of national emergency or a cutoff of supplies, these metals would probably be mined without consideration of economics. Should significant deposits of any of these minerals exist, wilderness designation would prevent large scale development of these resources. Valid existing rights would be recognized on claims existing at the time of designation, but presently existing claims cover only small portions of the areas favorable for mineral resources.

Saleable

The WSA contains deposits of rock suitable for crushed stone, and may contain deposits of sand and gravel. However, poor access, distance to markets and more readily available materials in other areas probably precludes development of saleable materials within the Study Unit. Therefore, wilderness designation would have little or no impact on development of these resources.

2. Impacts to Other Resources and Uses

Livestock Grazing

Domestic livestock grazing is a permissible and compatible resource use within wilderness. However, wilderness designation would have an impact on grazing use by narrowing the range of management options available to allottees and the BLM. For example, the installation of new rangeland development structures would be restricted by wilderness designation to those improvements which would primarily benefit the natural rangeland values of the wilderness resource. This would impose limitations on vehicular access, and may increase the costs in constructing or maintaining new rangeland developments since visual impacts would be considered in their location and design. Under wilderness designation, more emphasis would be placed on using natural materials (e.g., wood and native rock as opposed to steel and concrete) in replacing deteriorated developments or constructing new developments. The use of such materials would be preferred, providing that unreasonable, additional construction or maintenance costs are not imposed upon the allottee.

It is difficult to assess how the above limitations would affect livestock grazing in the WSA because the nature and location of future rangeland developments are not known. However, given the existing ecological range condition, present livestock distribution patterns and the potential production of range sites in the WSA, it is anticipated that impacts to grazing management would be moderate.

Wilderness designation would not result in the reduction of existing livestock stocking levels to improve wilderness values. Existing rangeland developments would not be removed so long as they are necessary to ranch operations. Vehicle routes necessary to maintain existing developments would remain open to use by area allottees only.

Timber Harvest

Wilderness designation would remove approximately 35,400 acres of pinyon-juniper woodland from utilization as fuelwood for both domestic and commercial use. However, inaccessibility, low tree density, small tree size and the availability of alternate cutting areas have precluded the use of these resources. Denying fuelwood cutting within the WSA would likely have little impact in the region.

Wildlife

The designation of the entire Study Unit would permanently preserve 39,308 acres of desert and mountain wildlife habitat. The natural distribution and abundance of wildlife would be maintained.

Designation of the Sierra Ladrones WSA as wilderness would result in the imposition of restrictions regarding the placement of wildlife waters and vegetative manipulation projects for improving wildlife habitat. However, wilderness status would not totally preclude

the establishment of wildlife water sources. A small number of wildlife drinkers could be placed in the wilderness, provided they enhanced the natural values of the area, were substantially unnoticeable, and did not require routine access and maintenance with motorized vehicles.

Small scale vegetative manipulation projects would not be precluded by wilderness designation. For example, seeding portions of the WSA in native browse species (e.g., mountain mahogany) to improve deer habitat could be undertaken.

The impact of wilderness designation on wildlife management activities in the WSA is anticipated to be low.

Most of the WSA is closed to off-road vehicle (ORV) entry. Illegal ORV use is believed to be low in the Study Unit. However, its impact to wildlife, especially big game, may be significant due to poaching activities which sometimes occur in conjunction with illegal ORV use. Wilderness designation would result in the physical closure of the jeep trails utilized to access the WSA. This management action, combined with higher levels of patrol and enforcement, and increased public awareness that the area is closed to vehicle use would serve to make the ORV closure more effective.

Soils/Watershed

Designation would maintain or enhance the existing soil and watershed conditions by precluding surface disturbance and preserving the natural ground cover of the Study Unit. The area is considered fragile in terms of soil and watershed values due to its severe topography which is dominated by rock escarpments, very steep slopes, and shallow soils with associated rapid water runoff and high potential for erosion.

Cultural Resources

Effectively closing the WSA to vehicular entry would reduce the potential for the occurrence of serious and/or commercial vandalism of cultural sites within the area. On the other hand, increased visitor use could result in a higher incidence of casual surface collection by visitors.

Wilderness designation would restrict but not preclude archaeological stabilization, excavation, and research within the WSA. These activities may be permitted on a case-by-case basis where the project could be adequately justified and would not significantly degrade the wilderness resource of the area.

The inclusion of the WSA in the National Wilderness Preservation System would enhance the scientific and educational values of cultural sites within the Study Unit by preserving a relatively undisturbed environment from which the human ecology of the WSA during previous occupational periods could be more accurately reconstructed.

Scenic Values

The scenic values of the Study Unit would be permanently preserved by wilderness designation.

Recreation

The WSA is capable of providing visitors with high quality, readily accessible, primitive recreational experiences ranging from hiking, horseback riding, and backpacking to hunting. Wilderness designation would maintain the natural environment which makes possible these human activities in an undisturbed state.

Vehicular associated recreational activities would be prohibited. The WSA, although generally very rugged, could be (and is) utilized by ORVs. However, numerous alternative areas exist for motorized recreational activities in the surrounding locale.

An increase in visitation to the WSA from Albuquerque and possibly El Paso would be anticipated if the area is designated a wilderness. Because no baseline data is available, quantitatively assessing this impact is impossible. It seems safe to assume, however, that visitor increase would be low to moderate.

B. Amended Boundary

The Amended Boundary alternative would exclude the entire western portion (13,584 acres) of the WSA from further wilderness consideration (see Map, p. C-3). This alternative would result in 25,724 Federally-owned acres of the original 39,308-acre WSA being recommended as suitable for wilderness designation. Inholdings within the Amended Unit would include 373 acres of private surface estate and 1,320 acres of State administered surface.

The proposed wilderness boundary change would utilize existing vehicle routes, legal subdivision lines, and topographic features.

1. Impacts to Minerals

Leasable

a. Oil and Gas, Carbon Dioxide

The Amended Boundary alternative would remove the area having potential for oil, gas and carbon dioxide from further wilderness consideration, and would leave these resources open to leasing, exploration and development.

b. Geothermal

The impacts to geothermal resources under this alternative are the same as under the All Wilderness alternative.

Locatable

This alternative would remove the areas favorable for high-calcium limestone, gypsum and manganese from further wilderness consideration. The impacts to other locatable mineral resources would be the same as under the All Wilderness alternative.

Saleable

Impacts to saleable materials under this alternative would be the same as under the All Wilderness alternative, that is little or no impact.

2. Impacts to Other Resources and Uses

Wilderness Values

The deletion of the western portion of the WSA would generally enhance the wilderness values of the area. This portion of the Study Unit includes the majority of rangeland developments. This alternative would, however, delete the Study Unit's finest representation of mesa benchlands, badlands, and box canyons.

Livestock Grazing

This alternative would eliminate two livestock operations and the majority of rangeland developments present within the WSA. This would greatly reduce motor vehicle use necessary to maintain the developments. The impacts to the remaining livestock operations would be the same as under the All Wilderness alternative.

Timber Harvest

The Amended Boundary alternative would make available approximately 11,000 acres of marginal pinyon-juniper woodland for utilization as fuelwood. Impacts to these resources within the Amended Unit would be the same as under the All Wilderness alternative.

Wildlife

The Amended Boundary alternative would remove from wilderness consideration wildlife habitat utilized by mule deer, antelope, and possibly raptors. Designation of the remaining 25,724 acres would permanently preserve the core mountain range where a higher distribution and diversity of wildlife species exists.

Soils/Watershed

This alternative would exclude approximately 8,000 acres of badlands dominated by unstable, erodable soils sensitive to disturbance. The impacts to soils and watershed values within the Amended Unit would be the same as under the All Wilderness alternative.

Cultural Resources

This alternative would remove from wilderness consideration several archaeological sites including possible paleo-Indian sites that may be of considerable significance. Because ORV access to the sites is possible, a greater likelihood exists that serious disturbance could occur under this alternative.

Scenic Values

The most scenic portions of the WSA are included in the Amended Unit which would be permanently preserved. However, this alternative would remove from further wilderness consideration box canyons, badlands, eroded rock formations, extensive areas of rimrock and mesa benchlands which provide an impressive contrast to the granitic upthrust of the WSA's mountainous core.

Recreation

The portion of the WSA with the highest potential for primitive recreation is included in the Amended Unit. The impacts to recreation within the Amended Unit would be identical to the All Wilderness alternative.

This alternative would reduce the environmental diversity of the WSA and the spectrum of primitive recreational opportunities.

C. No Action

This alternative would return the Sierra Ladrones WSA to undesignated multiple-use management. The Ladrones Management Framework decision to complete a wilderness study of the Sierra Ladrones has been implemented. The major thrust of undesignated multiple-use management for the WSA would be the development of rangeland resources, mineral exploration and development, and other traditional multiple uses of the public lands.

1. Impacts to Wilderness Values

Addressing the impact of non-wilderness designation upon the Sierra Ladrones WSA is difficult with only the existing information. To adequately assess an impact, the manner, degree, and extent of the environmental action being proposed must be known. Although possible mineral development clearly constitutes the most probable and significant threat to the wilderness values of the WSA, the impact could range from no development to small scale subsurface mineral operations to a large scale open pit or strip mine or mines.

In an attempt to assess the impact of non-designation upon the wilderness values, it will be assumed that a moderately large near-surface mineral deposit worth hundreds of millions of dollars will be located within the mountain core and that extensive exploration activity will occur elsewhere within the WSA. It must be kept in mind that impacts could be considerably reduced or increased by many

magnitudes relative to the scenario presented if no economically recoverable mineralization is present or if a substantially larger mineral deposit and associated mineral development occurs.

The highest mineral development potential is located in the core mountain area of the WSA, generally above 6,500 feet in elevation. If returned to undesignated multiple-use management and a major near-surface mineral deposit is developed in the core area, the high wilderness values of the Sierra Ladrones would be lost. Although wilderness values are present in other portions of the WSA, they are given context and significance due to their intricate topographic and ecologic relationships to the core mountain area.

In addition to possible mineral development, if the WSA is not designated a wilderness, it is likely the Study Unit would be impacted by the installation of one or more water pipeline projects for range management purposes with the establishment of attendant vehicle access routes for pipeline maintenance.

2. Impacts to Other Resources and Uses

Minerals/Energy

The No Action alternative would have no impact on mineral and energy resources. Mineral activity would probably continue to occur at historical levels, under the laws and regulations relating to mineral appropriation on the public lands.

Livestock Grazing

If the entire WSA is released from further wilderness consideration and returned to undesignated multiple-use management, intensive management techniques could be applied and new rangeland development structures installed, such as water pipeline projects. The WSA would be released from the restrictions imposed by the IMP.

Timber Harvest

The No Action alternative would have no impact on timber harvest within the WSA.

Wildlife

This alternative would allow a wider range of wildlife management actions such as vegetative manipulation projects and installing wildlife water catchments. The result would be the enhancement of certain wildlife species.

Without the effective closure of the WSA to ORV entry, the potential loss of deer to poaching would continue.

If significant mineral development occurs within the core of the WSA, the opportunity to introduce desert bighorn sheep would likely be foreclosed. This big game species is sensitive to environmental disturbance, particularly when the disturbance is sustained and takes place on a massive scale. The impact to other wildlife species would be less severe, but it is likely mineral development would have an undesirable impact upon all wildlife species.

Soils/Watershed

Continued low levels of ORV use would result in vehicle scars and rutting.

If large scale mineral exploration and development occurs, disturbance to soil and watershed values could be severe resulting in increased rapid water runoff and erosion.

Cultural Resources

If returned to undesignated multiple-use management, the cultural values of the WSA could be adversely impacted if ORV use occurs in the large canyons accessible to vehicles and along which many cultural sites occur. However, because a majority of the Study Unit has not been field inventoried, it is not possible to definitively assess the significance such disturbance may have on cultural values.

Under this alternative, vehicle access to cultural sites would routinely continue. This would be beneficial to archaeological research, investigations, excavation, and stabilization projects.

The cultural values of the WSA would be significantly impacted if intensive near-surface mineral development were to occur. The intensity of human use of the WSA for other purposes (e.g., recreation prospecting) could increase dramatically. The likelihood these activities would result in significant disturbance to the cultural values of the WSA is high.

Scenic Values

The WSA is considered to possess high scenic values. Under this alternative, the maintenance of these values would not be assured due to possible mineral exploration and development.

If significant near-surface mineral development occurs in the core of the WSA, scenic values would be severely impacted.

Recreation

The construction of new vehicle access routes within the Study Unit, which can be assumed if this alternative is adopted, would open the WSA to increased motorized recreational activities. Deer hunting access would be improved and the scenic qualities of the WSA would become available to a greater number of persons.

If intensive mineral exploration and development occurs, primitive recreation opportunities would be severely reduced.

VII. RECOMMENDED ACTION

A. Recommended Action Description

Wilderness Study Area Unit NM-020-016 Sierra Ladrones is recommended as suitable for inclusion in the National Wilderness Preservation System as proposed in the Amended Boundary alternative (25,724 acres suitable and 13,584 acres unsuitable).

B. Rationale

The Amended Boundary alternative was selected because eliminating the impacted western portion of the Study Unit leaves a highly natural core area with significant wilderness values. This alternative would also produce more easily identifiable boundaries.

This was a difficult decision given the possible conflict with mineral resources. The core area of the WSA is being recommended as suitable because it possesses very high wilderness values and has a long history of public support for a protective designation. Additional factors in this recommendation include the Study Unit's high recreation potential, good access and proximity to Albuquerque and Interstate 25.

C. Consistency with Other Plans

The Amended Boundary alternative would not conflict with any known county, State or Federal land-use plans.

The U.S. Army Corps of Engineers is studying a site on the Rio Salado for the construction of a flood control and sediment retention reservoir. The site lies approximately one quarter mile east of the southeastern corner of the WSA below La Jencia Creek. If constructed, the reservoir would back silt into the Salado Box and all canyons and arroyos tributary to the Rio Salado lying along the WSA's southern boundary.

The Corps of Engineers has not decided whether to recommend the retention reservoir for construction. Given this situation, it is difficult to assess the impacts to wilderness values if the reservoir is constructed or the impacts to watershed values if wilderness designation precludes construction.

WILDERNESS ANALYSIS REPORT
VERANITO WILDERNESS STUDY AREA
NM 020-035

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Socorro District
Jornada Resource Area
Socorro, NM 87801

December, 1982

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LIST OF MAPS

I. GENERAL DESCRIPTION

A. Location

The Veranito Wilderness Study Area (WSA) lies immediately east of the floodplain of the Rio Grande and 4 miles north, northeast of the community of Socorro within Socorro County, New Mexico.

Applicable USGS Topographic Maps:

Names: Lemitar (7½")
Mesa del Yeso (7½")

B. Climate and Topography

The WSA is located within the Chihuahuan Desert. Maximum summer temperatures range from 90 to 100+ degrees fahrenheit. Winter temperatures are generally mild during daylight hours, 40 to 50 degrees, and moderately cold at night, 15 to 30 degrees fahrenheit. Spring and fall temperatures tend to be mild. The spring season typically is accompanied by winds ranging from 10 to 40 miles per hour.

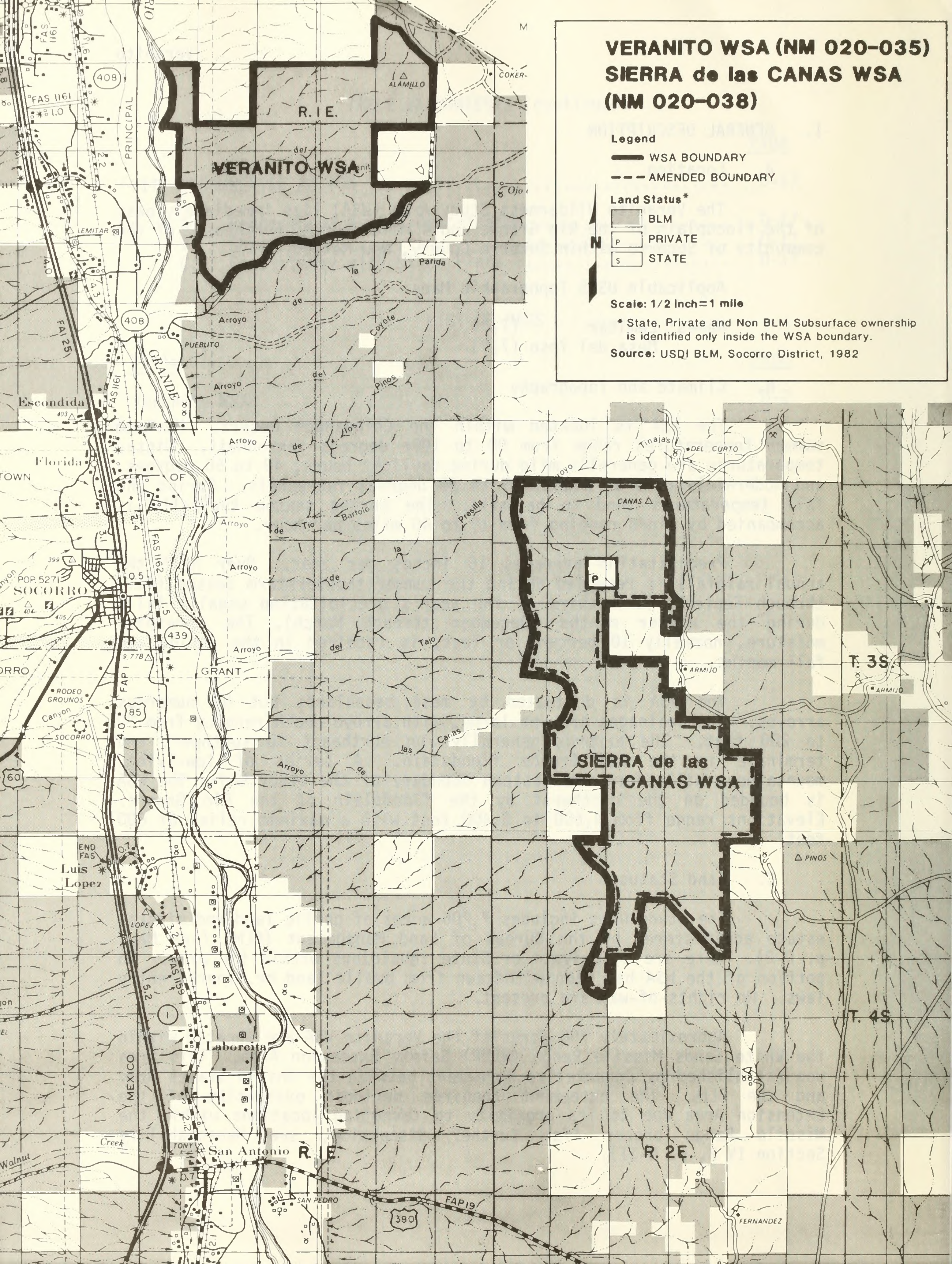
Precipitation averages 10 inches per year. Over half the annual rainfall is received during the summer thunderstorm season (July through September). A third of the year's precipitation usually falls during the winter months (December through March). The remaining moisture, normally 10 percent or less, is received in the spring and fall months.

The WSA is dominated by mesa benchlands cut by numerous arroyos. The drainages are not large, with arroyo depth ranging from 20 to 200 feet. The arroyos generally run northeast to southwest and terminate in the Rio Grande floodplain. A series of low-lying, mountainous hills form the eastern boundary of the Study Unit. The WSA is bounded on the northwest by the floodplain of the Rio Grande. Elevations range from 4,600 to 5,400 feet with a maximum relief of 800 feet.

C. Land Status

The Study Unit includes 7,206 acres of public land and mineral estate administered by the Bureau of Land Management (BLM) (see Map, p. D-2). There are no private or State inholdings within the area. No portion of the WSA has been withdrawn from public land or mineral entry laws. No rights-of-way are present.

Approximately 796 acres of the Veranito WSA are located within the White Sands Missile Range (WSMR) Safety Extension Area. This area was established by Cooperative Agreement between the United States Army and the BLM. The agreement requires periodic evacuation of the Extension Area due to its proximity to targeting locations within the Missile Range proper (for further discussion, see Manageability Section IV B, p. D-11).


VERANITO WSA (NM 020-035)
SIERRA de las CANAS WSA
(NM 020-038)
Legend
WSA BOUNDARY
AMENDED BOUNDARY
Land Status*
BLM
PRIVATE
STATE
N
Scale: 1/2 inch=1 mile
* State, Private and Non BLM Subsurface ownership is identified only inside the WSA boundary.
Source: USDI BLM, Socorro District, 1982
VERANITO WSA
SIERRA de las
CANAS WSA
R. I E.
R. 2E.
T. 3S.
T. 4S.
SOCORRO
POP. 5271
Escondida
Florida
Luis
Lopez
Laborcita
San Antonio
LEMITAR
PUEBLITO
ALAMILLO
CANAS
ARMIJO
PINOS
DEL CURTO
FERNANDEZ
SAN PEDRO
RODEO
GROUNDS
GRANDE
PRINCIPAL
MEXICO
FAS 1161
FAS 1162
FAS 1159
FAP 19
FAI 25
408
439
85
60
380

D. Access

Primary legal access to the WSA is provided by Johnson Hill Road (County Road No. 146). This road is maintained by the County and is suitable for use by two-wheel drive vehicles.

II. EXISTING RESOURCES

A. Geology

Veranito WSA is located within the Socorro trough, a faulted tectonic depression filled with poorly-consolidated valley-fill deposits and forming a part of the Rio Grande rift. Records of past earthquakes and pediment surfaces offset by fault scarps indicate tectonic forces are still active within the rift. Geophysical evidence indicates that a portion of an extensive sill-like magma body, occurring at depths of 18-22 km., underlies the Study Unit.

Surface rocks in the WSA include Mid-Tertiary volcanics of the Datil formation, Late-Tertiary valley-fill sediments of the Santa Fe formation and Quaternary alluvium.

B. Water

Surface Water

The WSA is located within the Rio Grande Basin. There are no permanent streams or surface water bodies within the Study Unit. However, the normally dry arroyos occasionally carry storm runoff to the Rio Grande immediately after rainfall within their respective drainage areas. Periods of flow are short and may be widely spaced in time due to intermittent and sporadic rainfall patterns. Runoff averages 0.1 inches per year.

Groundwater

There are no developed groundwater sources within the Study Unit. Developed sources adjacent to the WSA are used mainly for livestock watering purposes. Groundwater quality is highly variable in the vicinity of the Study Unit as water is drawn from shallow and deep aquifers. Shallow groundwater is often highly mineralized due to seepage of surface water containing high total dissolved solids. Groundwater from deeper bedrock aquifers, usually limestone, is also often high in dissolved solids. Most groundwater is suitable for livestock, and in some areas, for human consumption.

C. Soils

The majority of Veranito WSA consists of rolling ridges with deep gravelly coarse textured soils. Rock outcrops of a hard volcanic tuff occur on many ridge tops. Swales and gently sloping alluvial fans on the east side contain deep loamy soils. Soils along the west boundary of the Study Unit are strongly influenced by the Rio Grande. On the floodplain, soils are stratified alluvial deposits and often have

a high water table and high salt content. Just above the floodplain, there are small areas of deep sandy soils derived from material blown out of the Rio Grande channel and from the Santa Fe formation.

D. Vegetation

The vegetation of the WSA is typical of the upper Chihuahuan Desert at the northern extreme of its range. Four vegetative types have been identified: creosote bush, desert grassland, riparian and mesquite.

Creosote bush dominates the area, with approximately 88 percent of the WSA classified under this vegetative type. Creosote occurs in all of the upland sites in the Study Unit and is usually concentrated on alluvium and desert pavement. Grass species associated with this type include fluffgrass, burrograss, black grama, bush muhly, galleta and spike dropseed. Other plant species include broom snakeweed, prickly leaf dogweed, desert willow, one-seed juniper, mesquite, four-wing saltbush and Apache-plume.

Approximately 350 acres in the northeastern corner of the WSA are classified as desert grassland. The dominant plant species is burrograss which makes up 73 percent of the composition. Other species present are sand dropseed, galleta and broom snakeweed.

The northwestern corner of the Study Unit, which is adjacent to the Rio Grande, includes 415 acres of riparian vegetation. Although the dominant cottonwood is Fremont cottonwood, some narrow-leaf cottonwood is known to occur within the area. Other plant species occurring in this vegetative type include saltcedar, willows, salt grass and Russian olive. Among the annuals present are Russian thistle and tansy mustard, two poisonous plants.

The mesquite vegetation type covers approximately 100 acres and occurs immediately east of the riparian community. This type contains some dense stands of mesquite interspersed with alkali sacaton and thickets of wolfberry.

Threatened or Endangered (T&E) Plant Species

The U.S. Fish and Wildlife Service (FWS) has not listed any T&E plant species that may occur in the WSA. The Study Unit does contain habitat which offers potential for the occurrence of three Federally listed and one State listed species of T&E plants. A list of these potentially occurring plants is available on request from the Socorro District Office (DO).

E. Wildlife

Two Standard Habitat Sites (SHS's) have been identified within the WSA. The habitat sites are based on the combination of dominant vegetation and landform. These SHS's support 213 wildlife species, which include 27 mammal species, 41 reptiles and amphibians, and 145

resident and migratory bird species. A complete list of wildlife species to be found within the WSA is on file in the Socorro DO.

Big game indigenous to the WSA are mule deer. Estimated deer densities are low, less than two deer to the square mile. Highest concentrations are in the riparian zone adjacent to the Rio Grande and in the arroyos.

The most common predator is the coyote. Bobcat and gray fox also inhabit the WSA and raccoon occur in the riparian zone. Porcupine, desert cottontails, black-tailed jackrabbits, white-throated woodrats, deermice and ground squirrels are common.

Typical bird species include dove, quail, red-tailed hawks, sparrowhawks, horned larks, ravens, and numerous songbirds.

Reptiles likely to be encountered are the collared lizard, eastern fence lizard, bullsnake, and western diamond-backed rattlesnake.

Threatened or Endangered Wildlife Species

The FWS furnished the BLM information about three Federally listed endangered animal species, the bald eagle (Haliaeetus leucocephalus), the American peregrine falcon (Falco peregrinus anatum) and the whooping crane (Grus americana), which may occur in the WSA. These species were included in a biological assessment (BLM 1982) which concluded that the Study Unit provides poor quality nesting habitat for bald eagle and peregrine falcon and there are no current or historically occurring eagle or falcon eyries within the WSA. The Study Unit does not provide any potential nesting habitat for the whooping crane.

Potential habitat exists for supporting migrating individuals of all three species due to a sufficient food base and water availability in the Rio Grande Valley.

Designation of Veranito WSA as a wilderness or managing the area for undesignated multiple-use would have no adverse or beneficial affect on the aforementioned species. The biological assessment and related correspondence are on file in the Socorro DO.

F. Visual

The WSA is a series of undulating parallel ridges cut by numerous shallow arroyos interspersed with high hills and a low elevation east-facing escarpment. Topographic relief is not dramatic and the overall landscape character is considered monotonous and unspectacular.

The only exception to the Study Unit's generally low scenic values is the cottonwood bosque riparian area. From mid-spring through late fall, this area's visual resource values are considered high due to the structure, contrast, and inherent beauty provided by a cottonwood forest which borders a stark desert landscape.

G. Cultural

The cultural resource values of the WSA are diverse. They range from early pithouse sites to multi-room pueblos. Presently, only three sites are recorded within the boundaries of the Study Unit. However, many isolated artifacts have been recorded from numerous locations within the area, which suggest the WSA was utilized extensively by Native Americans for subsistence purposes. This conclusion is reinforced by the fact two significant pueblo sites lie within close proximity to the WSA. Further, 89 recorded sites which range temporally from early pithouse (1000 B.C.) to currently occupied historic structures are located within a 10-kilometer radius of the Study Unit. This vast time range suggests the importance of the cultural resources within the region which surrounds Veranito WSA. The probability for the occurrence of unrecorded cultural sites within the Study Unit is high.

No concerns have been expressed by the Native American groups contacted for this Study Unit.

H. Air

The air quality of the WSA is excellent. It is generally affected only by the occurrence of wind blown sand during the spring.

III. EXISTING AND POTENTIAL USES

A. Mineral Development

The information in the following section is mostly abstracted from a draft report prepared by Geoexplorers International Inc., entitled "Geology, Energy and Mineral Resources Assessment in the Socorro Area, New Mexico." This report is available for inspection at the Socorro DO.

1. Leasable

a. Oil and Gas

Four non-competitive oil and gas leases have been issued within the WSA. All leases are recently filed and subject to Interim Management Policy (IMP) and Guidelines for Lands Under Wilderness Review (BLM 1979). No exploration or development for oil and gas has occurred in the Study Unit to date.

The Study Unit is located in a Class IV favorability area, the least favorable classification for discovery of oil and gas. Paleozoic rocks favorable for the generation of oil and gas probably underlie the WSA, but intense faulting precludes significant entrapment of petroleum. The Study Unit is considered to have low potential for the production of these resources.

b. Geothermal

There are no geothermal leases within the boundaries of the Study Unit, and no exploration or development has occurred. The WSA is located in the Socorro Peak Geothermal Leasing Area, and about 2 miles from the Socorro Known Geothermal Resource Area.

Indications are that the WSA is underlain by a deep sill-like magma body, and is within 3 miles of a shallow magma chamber. The Study Unit probably overlies permeable reservoirs and impermeable cap rocks, which suggests that significant volumes of hot fluids may be trapped beneath the ground. For these reasons, the WSA is considered to have high favorability for the discovery of geothermal resources.

2. Locatable

There are no valid mining claims within the Study Unit. The WSA has potential for the occurrence of the following locatable minerals:

a. Uranium

The Popatosa and Santa Fe formations could be hosts for roll-type stratabound uranium deposits because both formations contain uranium-rich volcanic source rocks, permeable horizons and may contain reductants such as organic matter or reducing geothermal fluids. The Study Unit is partly underlain by the Santa Fe formation and may be underlain by the Popatosa formation. The WSA is considered to have a moderate favorability for the discovery of uranium.

b. Manganese, Silver and Kaolin

There are known occurrences of these minerals associated with Datil volcanics in various areas outside of the WSA. The Study Unit is partly underlain by Datil volcanics, but does not have any known mineralization. The favorability for the discovery of these minerals is considered to be low.

c. Gold

The Study Unit contains Tertiary valley-fill sediments and Quaternary alluvium, which may contain placer gold. Veranito WSA is considered to have low favorability for the discovery of such deposits.

3. Saleable

No material sales have been conducted within the WSA, and no future sales are anticipated. The Study Unit does have potential for the development of the following saleable materials:

a. Sand and Gravel

Sand and gravel occur in the Santa Fe formation and Quaternary alluvium underlying the WSA. The presence of extensive deposits, proximity to population centers and ready access suggest that sand and gravel within the Study Unit could be used in local construction projects. The WSA is considered to have moderate favorability for the development of these resources.

b. Crushed Rock

Volcanic rocks of the Datil formation could be used as a source of crushed rock for local construction, but the existence of similar deposits closer to population centers precludes development of this resource for the foreseeable future. The WSA is considered to have low favorability for the development of crushed rock..

B. Watershed

The Veranito WSA is located entirely within the Parida Watershed. The watershed is classified as a moderate erosion area and includes several different land types. Rolling ridges of gravelly soils occupy most of the Study Unit. While sheet and gully erosion undoubtedly contributes sediment directly to the Rio Grande, the actual quantities are not known. There are no water control structures or land treatments within the WSA.

C. Livestock Grazing

The Veranito WSA includes portions of three grazing allotments. The names and acreage percentages of each allotment which lies within the Study Unit include: Veranito (69.8), Pueblito Community (8.7), and Parida (21.5). All three allotments are run as cow-calf operations.

Existing rangeland developments within the Study Unit consist of 8 miles of barbed wire fencing, 10 miles of two-track vehicle route, two earthen reservoirs, and two pipelines. The Veranito Pipeline consists of 3.47 miles of buried plastic pipeline, a buried storage tank, and four drinking troughs. Approximately one-quarter mile of the Alamillo Pipeline is within the WSA boundaries, including one drinking trough.

Allottees periodically inspect and maintain as necessary the earthen reservoirs, fences, pipelines and associated developments through the use of motor vehicles. Vehicle access for maintenance of the Veranito pipeline is generally restricted to arroyos.

D. Recreation

Veranito lies within 15 minutes' driving time of Socorro and is adjacent to the community of Lemitar in the Rio Grande Valley. This portion of the valley is developing rapidly. Existing recreational use of the WSA is low.

The WSA has potential for primitive recreational use. Activities include environmental exploration, horseback riding, day hiking, and hunting.

The recreational use of the Study Unit is expected to increase to a degree in future years due to the WSA's ease of access and proximity to Socorro.

E. Education/Research

Veranito WSA is not currently being utilized for any known educational or research project. Education and research potential for cultural resources and riparian studies may be significant.

F. Realty Actions

Socorro Electric Cooperative, Inc. was granted a right-of-way to construct a wooden pole 14.4-KV powerline to service the Chevron Pumping Station in Section 2, T.2S., R.1E. This right-of-way, in combination with the Johnson Hill Road, defines the southern boundary of the WSA.

G. Wildlife

The cottonwood bosque riparian area of the WSA is included in the Rio Grande Wildlife Habitat Management Plan (1982). Planned actions for the area include fencing and prescribed burns.

The WSA has not been identified by the New Mexico Department of Game and Fish for the reintroduction of any species.

IV. WILDERNESS CRITERIA

A. Evaluation of Wilderness Values

1. Quality of Mandatory Wilderness Characteristics

a. Naturalness

The Study Unit appears primarily affected by the forces of nature; the imprint of man is substantially unnoticeable. All intrusions are derived from livestock grazing use. The quality of the Study Unit's natural appearance is not high. Its relatively small size combined with a Chihuahuan Desert ecosystem, which provides only undulating topographic relief and little vegetative screening, accentuates the human intrusions present within the WSA to an undesirable degree. This is especially true in the case of two-track vehicle routes and the buried water pipelines present in the Study Unit.

b. Solitude

The Study Unit is dominated by numerous arroyos and a hilly terrain that provides outstanding opportunities for solitude.

c. Primitive/Unconfined Recreation

During the wilderness inventory it was determined that the WSA was lacking in outstanding recreational opportunities. The WSA can provide visitors with opportunities to experience a desert environment suited to day hiking, big game (deer) hunting, horseback riding, and environmental exploration. The area is most attractive to these recreational pursuits during the fall, winter, and spring months.

The proximity of the WSA to Socorro and its ease of access is an important recreational asset. In terms of driving time, the Study Unit lies within 15 minutes' of Socorro.

2. Special Features

The WSA's known special features include its cultural resources and its cottonwood bosque.

A significant Piro Indian pueblo is located on the area's boundary and an unusual petroglyph site is present within the WSA. The potential for presently undocumented cultural resource sites is high for the area.

The WSA's cottonwood bosque environment comprises one of the largest publicly-owned tracts of this ecosystem type in the Middle Rio Grande Valley. Due to the rapid development which is occurring throughout the valley and the conversion of most of the valley's once extensive cottonwood stands to the exotic riparian tree species, saltcedar, Veranito's cottonwood bosque takes on an importance which outweighs its relatively small size.

3. Multiple Resource Benefits

The Study Unit contains a variety of natural resource values as a result of its undisturbed character. Designation of the WSA as wilderness would provide a greater degree of long-term protection for these natural values than would administrative designations available to the BLM.

A more detailed discussion of multiple resource benefits may be found under the impacts of the All Wilderness Alternative.

4. Diversity

a. Ecosystems Present

The Bailey-Kuchler Ecoregion Classification System has been used to ensure consistency between documents. It should be noted that different classification systems measure vegetation using different parameters and will result in varying acreage figures.

The Veranito WSA lies entirely within the Chihuahuan Desert Province of the Bailey-Kuchler Ecoregion Classification System. Both sections of the province are represented within the Study Unit: the Grama-Tobosa (350 acres) and Tarbush-Creosote Bush (6,441 acres). In addition, the WSA includes an excellent representation of the Chihuahuan Desert cottonwood-riparian ecosystem (415 acres).

b. Distance from Population Centers

Two cities identified in the 1980 census as Standard Metropolitan Statistical Areas (SMSAs) are located within less than five hours' driving time of the WSA. Albuquerque, New Mexico, lies within two hours' and El Paso, Texas, within four hours' driving time of the Study Unit.

B. Manageability

To be recommended for wilderness designation, the Veranito WSA must be capable of being effectively managed as wilderness. Manageability is a judgment made by the BLM after considering such factors as private and State inholdings, valid existing rights, topography, and the overall land ownership pattern.

Valid existing rights in the Study Unit consist of grandfathered livestock operations. Required access for maintenance of existing rangeland developments could create problems for wilderness management due to the small size and boundary configuration of the WSA.

No mining claims are present within the WSA. Four oil and gas leases have been issued within the Study Unit but all are subject to the IMP wilderness protection stipulations.

A portion of Veranito WSA lies within a Safety Extension Area used primarily as a safety impact zone in support of several missile test programs conducted at WSMR. The Extension Area must be evacuated of all human inhabitants during missile firings. The availability of the Extension Area is required for an indefinite period of time to support future military programs requiring a test range in excess of that provided by the main WSMR. WSMR requires reasonable access to the Extension Area to recover missile debris. However, no impacts of this nature have occurred within the WSA to date.

The presence of a portion of the WSA within the WSMR Safety Extension Area complicates the wilderness manageability of the Study Unit. Ensuring the evacuation of the WSA would require placing appropriate signing along the one vehicle access route available to the public. However, given the proximity of the WSA to Socorro and its limited access opportunities, controlling visitor use in the Study Unit efficiently would not be expected to create serious manageability problems.

The wilderness manageability of the WSA regarding potential trespass vehicle entry is less than desirable. Although unauthorized ORV use could be effectively controlled by the BLM if the Study Unit were deemed suitable for preservation as wilderness, the cost of enforcement would be high per unit land area.

V. PUBLIC INVOLVEMENT OVERVIEW

Public involvement in the wilderness inventory and study process has generally indicated support for designation of Veranito as wilderness. Reasons cited have revolved around the Study Unit's close proximity to Socorro and the Rio Grande Valley.

Opposition to wilderness designation came from area allottees who were contacted early in the wilderness inventory process. Generally, allottees feel wilderness designation would complicate ranch operations and narrow range management opportunities.

WSMR personnel expressed concern that designation of Veranito WSA as wilderness could potentially conflict with military operations within the WSMR Safety Extension Area.

VI. ALTERNATIVES AND IMPACTS

This section will discuss two alternatives (management options) that could be applied to the WSA. These alternatives include: All Wilderness and No Action (No Wilderness).

A. All Wilderness

This alternative would recommend the entire 7,206-acre WSA as suitable for inclusion in the National Wilderness Preservation System. If designated, the area would be managed pursuant to the guidelines and mandates of the Wilderness Act of 1964 and the Final Wilderness Management Policy published in the Federal Register September 24, 1981 (Vol. 46, No. 185).

1. Impacts to Minerals

If the WSA is recommended as suitable for wilderness designation, a U.S. Geological Survey and U.S. Bureau of Mines mineral-energy survey would be conducted to supplement current data regarding the mineral-energy occurrence potential for the area.

Leasable

a. Oil and Gas

The geologic environment of the WSA has a low potential for economically recoverable oil and gas reserves. Therefore, denying exploration/development would likely have little or no impact on oil and gas development in the Study Unit.

Designating the WSA a wilderness would probably preclude any serious exploration or development within the area. However, due to the Study Unit's small size, much of the area's oil and gas, if present, could probably be developed by slant drilling techniques or by drainage.

b. Geothermal

The WSA is considered to have high potential for the discovery of geothermal resources. Wilderness designation would probably preclude exploration or development within the Study Unit. Should significant geothermal resources be present, slant drilling could possibly be used to tap the resource. However, since there are no existing geothermal leases within the WSA, and wilderness designation would prevent future leasing, it would not be legally permissible to develop geothermal resources beneath the WSA, even though it is technologically feasible to do so. Denying geothermal leasing could, therefore, have the effect of precluding any subsequent development of the resource.

Locatable

The WSA has potential for uranium, manganese, silver, kaolin and gold. Based on current information, wilderness designation would have little impact, since most deposits of these minerals tend to be small and uneconomical to mine. Should large deposits of these minerals be found or a significant rise in the price of these commodities occur, wilderness designation would preclude development of these resources.

Saleable

The Study Unit contains deposits of sand and gravel in addition to rock suitable for use as crushed stone. However, the deposits of such materials are widespread in the surrounding areas. Denying material sales within the WSA would have little or no impact on the availability of these materials.

2. Impacts to Other Resources and Uses

Livestock Grazing

Domestic livestock grazing is a permissible and compatible resource use within wilderness. However, wilderness designation would have an impact on grazing use by narrowing the range of management options available to allottees and the BLM. For example, the installation of new rangeland development structures would be restricted by wilderness designation to those improvements which primarily benefit the natural rangeland values of the wilderness resource. This would impose limitations on vehicular access, and may increase the costs in constructing or maintaining new rangeland developments since visual impacts would be considered in their location and design. Under wilderness designation, more emphasis would be placed on using natural materials (e.g., wood and native rock as opposed to

steel and concrete) in replacing deteriorated developments or constructing new developments. The use of such materials would be preferred, providing that unreasonable, additional construction or maintenance costs are not imposed upon the allottee.

It is difficult to assess how the above limitations would affect livestock grazing in the WSA because the nature and location of future rangeland developments are not known. However, given the existing ecological range condition, present livestock distribution patterns and the potential production of range sites in the WSA, it is anticipated that impacts to grazing management would be low.

Wilderness designation would not result in the reduction of existing livestock stocking levels to improve wilderness values. Existing rangeland developments would not be removed so long as they are necessary to ranch operations. Vehicle routes necessary to maintain existing developments would remain open to use by area allottees only.

Wildlife

The designation of the entire Study Unit would permanently preserve 7,206 acres of Chihuahuan Desert wildlife habitat. The natural distribution and abundance of wildlife species would be maintained.

Designation of the WSA as wilderness would result in the imposition of restrictions regarding the placement of wildlife waters and vegetative manipulation projects for improving wildlife habitat. However, wilderness status would not totally preclude the establishment of wildlife water sources. A small number of wildlife drinkers could be placed in the wilderness, provided they enhance the natural values of the area, were substantially unnoticeable, and did not require routine access and maintenance with motorized vehicles.

Small scale vegetative manipulation projects would not be precluded by wilderness designation. For example, seeding portions of the WSA in native browse species (e.g., mountain mahogany) to improve deer habitat could be undertaken.

The impact of wilderness designation on wildlife management activities in the WSA is anticipated to be low.

Soils/Watershed

Designation of the WSA would maintain or enhance existing soil and watershed conditions by precluding surface disturbance and preserving the natural ground cover of the Study Unit.

Cultural Resources

Effectively closing the WSA to vehicular entry would reduce the potential for the occurrence of serious and/or commercial vandalism of cultural sites within the area. On the other hand,

increased visitor use could result in a higher incidence of casual surface collection by visitors.

Wilderness designation would restrict but not preclude archeological stabilization, excavation, and research within the WSA. These activities may be permitted on a case-by-case basis where the project can be adequately justified and will not significantly degrade the wilderness resource of the area.

The inclusion of the WSA in the National Wilderness Preservation System would enhance the scientific and educational values of cultural sites within the area by preserving a relatively undisturbed environment from which the human ecology of the WSA during previous occupational periods could be more accurately reconstructed.

Scenic Values

The scenic values of the Study Unit would be permanently preserved by wilderness designation.

Recreation

The WSA is capable of providing visitors with readily accessible recreational experiences ranging from hiking and horseback riding to hunting. Wilderness designation would maintain the natural environment which makes possible these human activities in an undisturbed state.

Vehicular associated activities would be prohibited. Although presently closed to ORV use, the area could be utilized to a substantial degree by ORVs.

B. No Action

This alternative would return the Veranito WSA to undesignated multiple-use management. The Study Unit would be managed according to the prescriptions contained in the Stallion Management Framework Plan. The major thrust of management for the WSA would be the development of rangeland resources, possible mineral exploration and development, and other traditional multiple uses of the public lands.

1. Impacts to Wilderness Values

The most probable uses of Veranito if not designated wilderness would be continued livestock grazing and limited ORV use. No mineral, oil/gas, or geothermal development of consequence is expected to occur in the area within the foreseeable future. Sand and gravel sales may be conducted along the southwestern periphery of the WSA.

2. Impacts to Other Resources and Uses

Minerals/Energy

The No Action alternative would have no impact on mineral and energy resources. Mineral activity will probably continue to occur

at historical levels, under the laws and regulations relating to mineral appropriation on the public lands.

Livestock Grazing

If the entire WSA is released from further wilderness consideration and returned to undesignated multiple-use management, intensive management techniques could be applied and new rangeland development structures installed, such as water pipeline projects. The WSA would be released from the restrictions imposed by the IMP for lands under wilderness review.

Wildlife

This alternative would allow a wider range of wildlife management actions such as vegetative manipulation projects and installing wildlife water catchments. The result would be the enhancement of certain wildlife species. If mineral exploration occurs and new roads constructed, wildlife values could be impacted.

Soils/Watershed

Continued low levels of ORV use could result in vehicle scars and rutting which would impact the fragile soils in the WSA and increase erosion hazards.

Cultural Resources

If returned to undesignated multiple-use management, the cultural values of the WSA could be adversely impacted if ORV use occurs in the large arroyos and rolling hills accessible to vehicles and along or on which most cultural sites occur. However, because a majority of the WSA has not been inventoried, it is not possible to definitely assess the significance such disturbance may have on cultural values.

Vehicle access to cultural sites would routinely continue if the area is managed under this alternative. This would be beneficial to archaeological research, investigations, excavations and stabilization projects.

Scenic Values

The WSA is not considered to possess high scenic values. No serious impacts to existing values are expected to occur if the WSA is not designated a wilderness.

Recreation

The Study Unit is not considered to possess high recreation values. The WSA is little used by the public and no change is expected in the foreseeable future. Return of the area to undesignated multiple-use management would have few or no impacts upon primitive recreation use.

VII. RECOMMENDED ACTION

A. Recommended Action Description

Wilderness Study Area Unit NM020-035 Veranito is recommended as unsuitable for inclusion in the National Wilderness Preservation System by the Congress.

B. Rationale

Veranito WSA would be difficult to manage as wilderness. The Study Unit would be difficult to effectively close to ORV entry due to its flat to rolling topography and open creosote desert landscape. Existing rangeland developments in the Study Unit, which require routine motorized access for maintenance, would be undesirable from a wilderness management standpoint due to the small size and boundary configuration of the WSA.

In addition, approximately 796 acres of Veranito WSA lies within the WSMR Safety Extension Area. Public use of this portion of the Study Unit, therefore, would require special management (e.g., signing, patrol). Although special management could be effected for the WSA, the extremely marginal character of the Study Unit's wilderness values coupled with the above manageability problems indicate to the BLM that this WSA does not possess sufficient values to warrant wilderness designation.

C. Consistency with Other Plans

The recommended action would not conflict with any known county, State, or Federal land-use plans including known plans of WSMR.

WILDERNESS ANALYSIS REPORT
SIERRA DE LAS CANAS WILDERNESS STUDY AREA
NM 020-038

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Socorro District
Jornada Resource Area
Socorro, NM 87801

December, 1982

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I. GENERAL DESCRIPTION

A. Location

The Sierra de las Canas (Mountains of the Canes) Wilderness Study Area (WSA) is located in central New Mexico, Socorro County. The Study Unit is situated 7 air miles east of the community of Socorro.

Applicable USGS Topographic Maps:

Names:	Bustos Well	(7½")
	Carthage	(15")
	Loma de las Canas	(7½")
	San Antonio	(15")

B. Climate and Topography

The WSA is located within the Chihuahuan Desert. Maximum summer temperatures range from 90 to 100+ degrees fahrenheit. Winter temperatures are generally mild during daylight hours, 40 to 50 degrees, and moderately cold at night, 15 to 30 degrees fahrenheit. Spring and fall temperatures tend to be mild. The spring season typically is accompanied by winds ranging from 10 to 40 miles per hour.

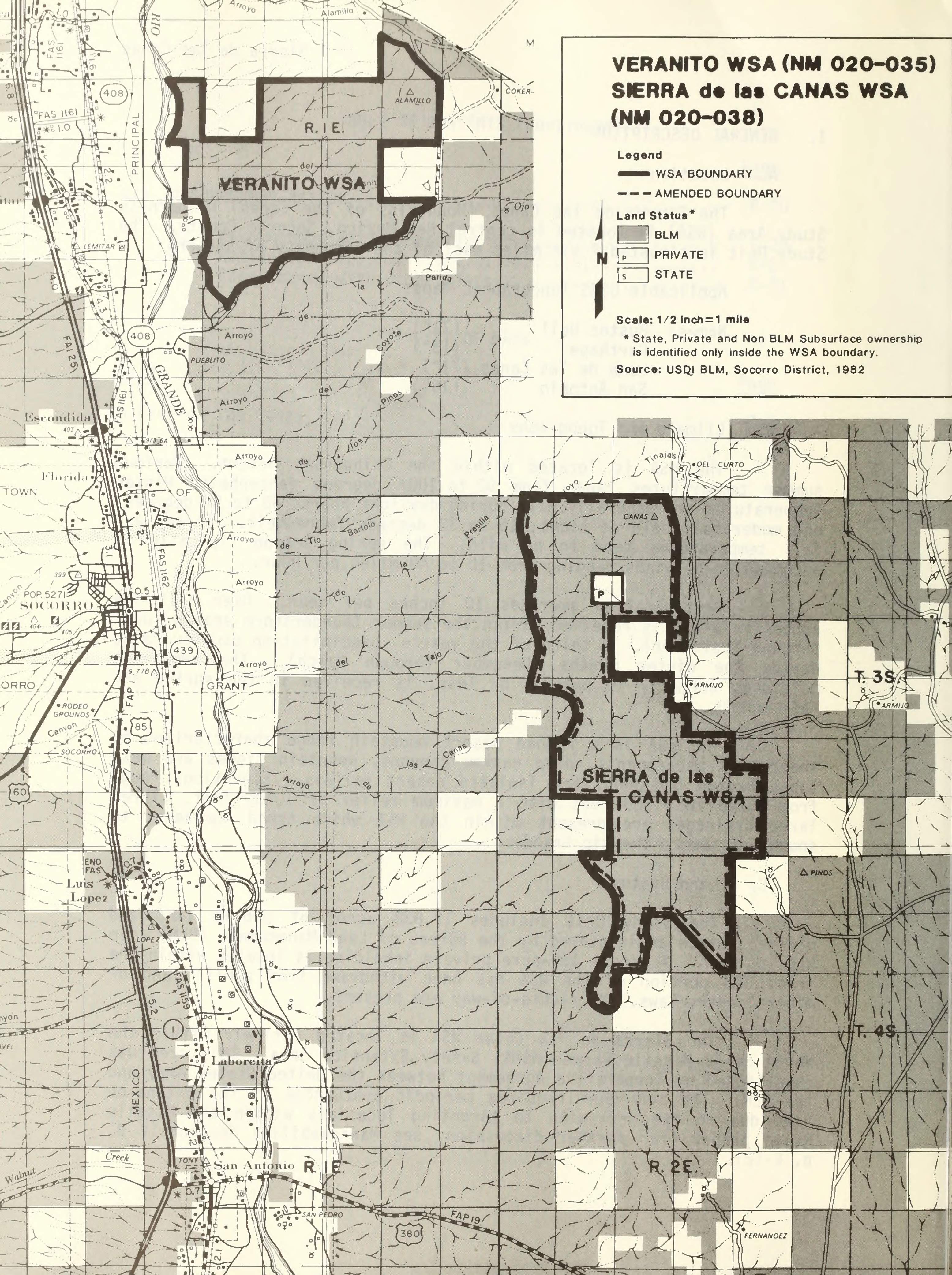
Precipitation averages 10 inches per year. Over half the annual rainfall is received during the summer thunderstorm season (July through September). A third of the year's precipitation usually falls during the winter months (December through March). The remaining moisture, normally 10 percent or less, is received in the spring and fall months.

The WSA is a rugged desert mountain range characterized by sheer rock escarpments, deep narrow canyons, mountain ridges and mesa tops, broken badlands, and isolated desert valleys. Elevations range from 5,100 to 6,200 feet with a maximum relief of 1,100 feet. Three large drainages are present within the WSA which trend northeast to southwest toward the Rio Grande.

C. Land Status

The Study Unit includes 12,838 acres of public land and mineral estate administered by the Bureau of Land Management (BLM) (see Map, p. E-2). A single 160-acre private inholding is located within the area. No portion of the WSA has been withdrawn from public land or mineral entry laws. No rights-of-way are present.

The Sierra de las Canas WSA is located entirely within the White Sands Missile Range (WSMR) Safety Extension Area. This area was established by Cooperative Agreement between the United States Army and the BLM. The agreement requires periodic evacuation of the Extension Area due to its proximity to targeting locations within the Missile Range proper (for further discussion, see Manageability Section IV B, p. E-12).



VERANITO WSA (NM 020-035)
SIERRA de las CANAS WSA
(NM 020-038)
Legend
WSA BOUNDARY
AMENDED BOUNDARY
Land Status*
BLM
PRIVATE
STATE
N
Scale: 1/2 inch=1 mile
* State, Private and Non BLM Subsurface ownership is identified only inside the WSA boundary.
Source: USDI BLM, Socorro District, 1982
VERANITO WSA
SIERRA de las CANAS WSA
R. I E.
R. 2E.
T. 3S.
T. 4S.
SOCORRO
San Antonio

D. Access

Primary legal access to the WSA is provided by Quebradas Road which parallels the west boundary of the Study Unit. This road is maintained by BLM and is suitable for use by two-wheel drive vehicles. There are no vehicle access routes within the WSA.

II. EXISTING RESOURCES

A. Geology

The Sierra de las Canas WSA is located along the complexly faulted western margin of the Loma de las Canas uplift. This series of mountains, hills and cuestas forms the highlands between the Rio Grande rift to the west and the Jornada del Muerto basin to the east. The Loma de las Canas uplift merges into the Joyita-Los Pinos uplifts to the north and the San Pascual platform to the south.

Rock units present in the WSA range in age from Pennsylvanian to Mid-Tertiary. Pennsylvanian sediments of the Sandia and Madera formations crop out in the northern part of the WSA. They consist mainly of sandstones, shales, and limestones deposited in a shallow marine environment. The Permian age Abo, Yeso and San Andres formations are present throughout the WSA. These rocks consist mainly of limestone, shale, sandstone, siltstone and gypsum, and represent a change from terrestrial to lagoonal and shallow marine environments. The siltstone, shale and sandstone of the Triassic age Dockum formation crop out in the eastern portion of the WSA. Volcanic rocks of the Tertiary age Datil formation also occur along the eastern margin of the Study Unit.

Paleontology

No paleontological inventory has been conducted within the WSA. However, the Abo formation is known to contain vertebrate, invertebrate, reptile, amphibian, plant and insect fossils. A paleontological site is located approximately one mile to the west of the Study Unit in geological formations similar to those present within the WSA. This site has been under periodic study by a Smithsonian Institute paleontologist in recent years.

B. Water

Surface Water

The WSA is located within the Rio Grande Basin. There are no permanent streams or surface water bodies within the Study Unit. However, the normally dry arroyos occasionally carry storm runoff to the Rio Grande immediately after rainfall within their respective drainage areas. Periods of flow are short and may be widely spaced in time due to intermittent and sporadic rainfall patterns. Runoff averages 0.1 inches per year.

Groundwater

There are no developed groundwater sources within the Study Unit. Groundwater may be present in the Permian age sandstone and limestone formations that occur in and adjacent to the WSA.

Groundwater in Pueblito Well, which is located 2 miles west of the WSA, is considered as representative of the Study Unit. Analysis of groundwater samples taken from this well indicates high dissolved solids due to mineralization but of suitable chemical quality for livestock purposes.

C. Soils

Approximately 75 percent of the soils within the WSA were developed from sandstone, limestone, or shale. These soils are typically very gravelly and shallow, and located on the upper and steeper slopes. Deep gravelly soils are present on lower slopes and in canyon bottoms.

Ten percent of the soils are gypsum influenced. There are small pockets of shallow soil over gypsum near the head of Arroyo del Tajo as well as small outcrops of rock gypsum on steep slopes throughout the Study Unit.

Fifteen percent of the WSA consists of deep and moderately deep loamy soils. They developed from loamy alluvial deposits and occur in small isolated areas within the Study Unit.

D. Vegetation

The vegetation of the WSA is typical of the upper Chihuahuan Desert at the northern extreme of its range. Four vegetative types have been identified: desert shrub, pinyon-juniper, creosote bush and wasteland.

The desert shrub vegetative type comprises approximately 10 percent of the surface area. The dominant plant species are creosote bush and black grama. Common shrub species are cholla, Datil yucca, prickly pear, desert willow, ocotillo, honey mesquite, one-seed juniper, squawbush, winterfat, broom snakeweed, coldenia and Mormon tea. Grasses are represented by spike dropseed, burrograss, ring muhly, sand muhly, gypgrass, fluffgrass, alkali sacaton, and galleta. Forbs include ironplant golden weed, globemallow, and Eriogonum.

The pinyon-juniper type is an important vegetative component of the WSA covering approximately 35 percent of the surface area. One-seed juniper and pinyon pine dominate; however, numerous plant species are represented in the community. The understory vegetation is dominated by warm-season grasses. The grama grasses are the most prevalent, sometimes constituting as much as 70 percent of the species composition of a vegetative site. Black grama has the highest composition followed by blue grama, side-oats grama, and hairy grama.

Of lesser importance are various warm-season grasses, including purple muhly, galleta, Fendler three-awn, ring muhly, sand dropseed, and spike dropseed. Cool-season grasses present include silver bluestem, Indian ricegrass, wolftail, bottlebrush squirreltail and New Mexican feathergrass. Areas classified as pinyon-juniper that exist on soils with a high gypsum content are dominated by gypgrass.

The shrub component of the pinyon-juniper community includes broom snakeweed, which in places comprises up to 30 percent of the composition. Other shrubs include Datil yucca, mountain mahogany, feather pea-bush, Mormon tea, littleleaf sumac, squawbush, mariola, cholla, and prickly pear. Forbs present include ironplant goldenweed, Rocky Mountain zinnia, globemallow, hog potato, aster, and spectacle pod.

The creosote vegetative type comprises approximately 36 percent of the surface area. The dominant plant species are creosote, fluffgrass, bush muhly and broom snakeweed. Other common shrub species include mesquite, mariola and Mormon tea. Grasses are represented by black grama, galleta, and spike dropseed. Forbs include globemallow, desert holly, Eriogonum and pepperweed.

The Study Unit includes an area classified as wasteland. This area is characterized by extremely sparse vegetative cover which consists primarily of twisted and gnarled junipers, creosote, and widely scattered grasses. Wasteland constitutes approximately 19 percent of the WSA.

Threatened or Endangered (T&E) Plant Species

The U.S. Fish and Wildlife Service (FWS) has not listed any T&E plant species that may occur in the WSA. The Study Unit does contain habitat which offers potential for the occurrence of four Federally listed and ten State listed species of T&E plants. A list of these potentially occurring plants is available on request from the Socorro District Office (DO).

E. Wildlife

Five Standard Habitat Sites (SHS's) have been identified within the WSA. The habitat sites are based on the combination of dominant vegetation and land form. These SHS's support 238 wildlife species, which include 52 mammal species, 53 reptiles and amphibians, and 133 resident and migratory bird species. A complete list of wildlife species to be found within the WSA is on file in the Socorro DO.

Big game species indigenous to the WSA are mule deer and antelope. Mule deer in the Study Unit's core mountain area are abundant relative to the surrounding region. Estimated deer densities for this portion of the WSA are four animals to the square mile. Densities in the remainder of the WSA are one to two deer to the square mile. Antelope are not abundant in the Study Unit.

The most common predator is the coyote. The rocky slopes and bluffs also provide habitat for bobcat and gray fox. Badgers have been sighted in the WSA. Common small mammals include desert cottontails, black-tailed jackrabbits, white-throated woodrats, deermice, and ground squirrels.

The near vertical rock escarpments, box canyons, and numerous exposed rock outcrops are particularly attractive to birds of prey. One golden eagle eyrie is known to be present within the WSA. Other birds which are commonly sighted include red-tailed hawks, sparrowhawks, horned larks, pinyon jays and ravens.

Reptiles likely to be encountered are the collared lizard, eastern fence lizard, bullsnake, and the western diamond-backed rattlesnake.

Threatened or Endangered Wildlife Species

The FWS furnished the BLM information about one Federally listed endangered animal species, the American peregrine falcon (Falco peregrinus anatum), which may occur in the WSA. This species was included in a biological assessment (BLM 1982) which concluded that the Study Unit provides poor quality nesting habitat and there are no current or historically occurring eyries. However, potential habitat exists for supporting migrating individuals because a sufficient prey base and water are available in the Rio Grande Valley. Designation of Sierra de las Canas WSA as a wilderness or managing the area for undesignated multiple-use would have no adverse or beneficial affect on peregrine falcons. The biological assessment and related correspondence are on file in the Socorro DO.

F. Visual

The Study Unit is dominated by near vertical, multi-colored escarpments, twisted and convoluted badlands, narrow box canyons, and other topographic landforms which present considerable visual variety. Vistas of landscapes from high points within the WSA are impressive. The Unit is a desert mountain range with sparse vegetative cover; however, this characteristic accentuates the WSA's rugged starkness, visual immensity, and high solitude and natural values.

G. Cultural

Cultural sites in the WSA range from lithic scatters to at least one petroglyph site to several historic stone structures, one of which is reported to have served as a stage station. Eight sites are currently recorded within the boundaries of the Study Unit. In addition, over one hundred cultural sites have been recorded within a 7-10 kilometer radius of the WSA, with the site types representing a diverse occupational continuum which dates to at least 4000 B.C. The probability for the occurrence of unrecorded sites within the WSA is considered high. However, the occurrence probability is lower than for lands adjacent to the Rio Grande Valley to the west.

No concerns have been expressed by the Native American groups contacted for this Study Unit.

H. Air

The air quality of the WSA is excellent. It is generally affected only by the occurrence of wind blown sand during the spring.

III. EXISTING AND POTENTIAL USES

A. Mineral Development

The information in the following section is primarily abstracted from a draft report prepared by Geoexplorers International Inc., entitled "Geology, Energy and Mineral Resources Assessment in the Socorro Area, New Mexico." This report is available for inspection at the Socorro DO.

1. Leasable

a. Oil and Gas

Six non-competitive oil and gas leases have been issued or are pending within the WSA. All leases are recently issued or filed and subject to Interim Management Policy (IMP) and Guidelines for Lands Under Wilderness Review (BLM 1979). No exploration or development for oil and gas has occurred in the Study Unit to date.

The Study Unit is located in a Class IV favorability area, the least favorable class for discovery of oil and gas. Paleozoic rocks favorable for generation of oil and gas are present within the WSA but intense faulting precludes significant entrapment of petroleum. The Study Unit is considered to have low potential for the production of these resources.

b. Geothermal

There are no geothermal leases within the boundaries of the Study Unit, and no exploration or development has occurred. The WSA is located in the Socorro Peak Geothermal Leasing Area and is within 6 miles of a known shallow magma body. In addition, a warm spring is located on the western boundary of the WSA. For these reasons, the Study Unit is considered to have a moderate favorability for the discovery of geothermal resources.

2. Locatable

At present, there are approximately 20 mining claims located within the Study Unit. The claims are staked on occurrences of uranium, copper, barite or gypsum. No past mining activity of consequence has occurred in the WSA. However, unauthorized assessment work performed during December 1981 did impair wilderness values to a small degree. The work consisted of bulldozing approximately one acre

to expose the underlying rock. The BLM will conduct a validity determination on the claim, and if found to be invalid, it will be subject to contest action.

The WSA has potential for the occurrence of the following locatable minerals:

a. Copper

Copper deposits in Permian redbeds are known to occur in a belt extending from Scholle to Carthage and passing through the Study Unit. Some of the deposits were mined in the past but have been uneconomic in recent years. The redbeds crop out extensively in the WSA and is considered to have a moderate favorability for the occurrence of copper mineralization.

b. Uranium

Uranium is known to occur in Paleozoic limestones and may occur in Late-Tertiary Valley-Fill sediments in the area surrounding the Study Unit. Paleozoic limestones crop out in the WSA but past prospecting has not disclosed any uranium occurrences and Late-Tertiary sediments do not crop out in the Study Unit. The WSA is considered to have low favorability for the discovery of uranium deposits.

c. Gypsum

The Permian age Yeso formation, which contains gypsum, is found throughout the WSA. The deposits are considered to have a low potential for use because of lack of local demand and the availability of more pure deposits in other parts of central New Mexico.

d. Barite/Fluorite/Lead/Zinc

Deposits of these minerals are known to occur along faults within Precambrian rocks and the Madera limestone in the area surrounding the Study Unit. Several occurrences of barite, fluorite, lead and zinc are within a mile of the WSA boundary. The Study Unit has faulted outcrops of Madera limestone and is considered to be moderately favorable for the occurrence of such deposits.

3. Saleable

No material sales have been conducted within the WSA, and no future sales are anticipated. The Study Unit has potential for the development of the following saleable materials:

a. Sand and Gravel

The Study Unit does not contain large deposits of sand and gravel. Some deposits do exist in the larger arroyos, but their small size, lack of demand and difficult access preclude development.

b. Limestone

The WSA is partly underlain by the San Andres limestone which may be of high enough purity for use as agricultural lime or in the manufacture of cement. These deposits are considered to have a moderate favorability for development if local demand for the material occurs.

B. Watershed

The majority of the WSA is located within the Canas Watershed with about 5 percent in the Parida Watershed. The Study Unit is largely a rough, rocky desert shrub terrain typical of the Rio Grande Breaks. Soils are coarse textured, gravelly and range from deep to shallow over bedrock. Most soils have a desert pavement surface. Geologic erosion by wind and water is most active in arroyo channels and alluvial fans. Approximately 25 percent of the WSA falls within the critical erosion class and 75 percent in the moderate erosion class. There are no water control structures or land treatments within the WSA.

C. Livestock Grazing

Five grazing allotments lie partially within the Study Unit. The names and acreage percentages of each allotment which lies within the WSA include: Armijo Community (32), Blackington Mountain (21), Fernandez (2), La Arenosa (4), and Las Canas (25). All five allotments are run as cow-calf operations.

Existing rangeland developments within the Study Unit consist of 8 miles of barbed wire fencing. Maintenance has been performed almost exclusively on horseback in the past. This practice is expected to continue on an as-needed basis.

D. Recreation

The Study Unit is located within 45 minutes' driving time of Socorro and is visible from the community and much of the Middle Rio Grande Valley. Existing recreational use of the WSA is low.

The WSA offers high potential for primitive recreational use. These activities include environmental exploration, horseback riding, day hiking, backpacking, deer hunting, natural history activities (e.g., birdwatching), rock hounding, landscape and nature photography. The primitive recreational opportunities available in the Study Unit are generally of a high quality.

The recreational use of the WSA can be expected to increase in coming years due to its proximity to the Middle Rio Grande Valley, ease of access, and its high natural values.

E. Education/Research

The Study Unit is not currently being utilized for any known educational or research purpose. Education and research potential for

the WSA may be significant for paleontological, cultural, wildlife, and natural ecosystem studies.

F. Wildlife

Wildlife habitat could be improved through vegetative manipulation and added water sources. However, no specific actions are planned for the Study Unit at present. The WSA has not been identified by the New Mexico Department of Game and Fish for reintroduction of any species.

IV. WILDERNESS CRITERIA

A. Evaluation of Wilderness Values

1. Quality of Mandatory Wilderness Characteristics

a. Naturalness

The imprint of man within the Sierra de las Canas WSA is light. Intrusions consist of approximately eight miles of barbed wire fence. There are no vehicle routes, stock tanks, or related intrusions in the area.

Unauthorized assessment work was performed on a mining claim within the WSA. The trespass occurred on the periphery of the Study Unit. It is believed that the area could be reclaimed so that the disturbance would be substantially unnoticeable in a few years.

The WSA is not only virtually free of obvious human impacts, it also represents one of New Mexico's least disturbed upper Chihuahuan Desert ecosystems. Although grazing use within the area has occurred over the past century, the absence of water combined with rugged topography has resulted in the WSA being subjected to only light grazing pressure by livestock.

b. Solitude

The Study Unit is a topographically serrated desert mountain range characterized by near vertical escarpments, steep slopes, and rugged canyons. The flanks of the mountains include broken badlands, arroyos, and desert. The topographic diversity coupled with the severity of much of the WSA's landforms ensure solitude opportunities of the highest quality.

c. Primitive/Unconfined Recreation

This is not a traditional primitive recreation area in that there are few trees, water is scarce, and sand, rocks, and rattlesnakes predominate. Although wildlife, relative to most desert areas, is abundant, it tends to be elusive.

The WSA is scenic and generally perceived as stark, broken, waterless, with no trails, no signs, no facilities, and usually

no people. These factors make the WSA an undesirable recreational setting to many people. It is these very factors, however, which make this WSA highly desirable to many other persons who find areas with these qualities are not normally protected through wilderness designation.

The WSA can provide visitors with the opportunity to experience a near pristine desert mountain environment suited to day hiking, backpacking, big game (deer) hunting, horseback riding, nature and landscape photography, nature study, and environmental exploration. The area is most attractive to these recreational pursuits during the off-season (late fall and winter).

In addition, the proximity of the WSA to Socorro and its relative ease of access is an important recreational asset. In terms of driving time, the Study Unit is close enough not to require lengthy preparation and travel times.

2. Special Features

The WSA represents a fine example of the scenic value of a low elevation desert mountain range. The value of the area's scenic qualities is enhanced by its location. Rising above the eastern breaks of the Rio Grande Valley, the Study Unit is an important part of the visual landscape of the community of Socorro and for travelers along Interstate Highway 25 and U.S. Highway 60. Especially appealing is the scenic quality of the WSA's broken and convoluted western escarpment, which during the late daylight hours, reflects varigated colors tinged with red.

3. Multiple Resource Benefits

The Study Unit contains a variety of natural resource values as a result of its undisturbed character. Designation of the WSA as wilderness would provide a greater degree of long-term protection for these natural values than would administrative designations available to the BLM.

A more detailed discussion of multiple resource benefits may be found under the impacts of the All Wilderness alternative.

4. Diversity

a. Ecosystems Present

The Bailey-Kuchler Ecoregion Classification System has been used to ensure consistency between documents. It should be noted that different classification systems measure vegetation using different parameters and will result in varying acreage figures.

The Sierra de las Canas WSA lies near the northern extreme of the Chihuahuan Desert and close to the southern edge of the Colorado Plateau Provinces as identified in the Bailey-Kuchler Ecoregion

Classification System. Three sections of the two provinces are represented within the WSA: the Grama-Tobosa and Tarbush-Creosote Bush of the Chihuahuan Desert, and the Grama-Galleta Steppe/Juniper-Pinyon Woodland Mosaic of the Colorado Plateau.

Inventory data indicates 6,400 acres of Grama-Galleta Steppe/Juniper-Pinyon Woodland Mosaic, 5,120 acres of Tarbush-Creosote Bush and 1,318 acres of Grama-Tobosa are present within the WSA. However, because of the Study Unit's geographic position between the Chihuahuan Desert and the Colorado Plateau Provinces, the three sections are not clearly distinctive. Instead, the three tend to intergrade into one another to varying degrees. For example, typical Chihuahuan Desert species such as ocotillo and creosote bush occur in association with the Grama-Galleta Steppe/Juniper-Pinyon Woodland Mosaic of the Colorado Plateau.

b. Distance from Population Centers

Two cities identified in the 1980 census as Standard Metropolitan Statistical Areas (SMSAs) are located within less than five hours' driving time of the WSA. Albuquerque, New Mexico lies within two hours' and El Paso, Texas within four hours' driving time of the Study Unit.

B. Manageability

To be recommended for wilderness designation, the Sierra de las Canas WSA must be capable of being effectively managed as wilderness. Manageability is a judgment made by the BLM after considering such factors as private and State inholdings, valid existing rights, topography and the overall land ownership pattern.

Valid existing rights in the Study Unit consist of grandfathered livestock operations. Required access for maintenance of existing fences is not expected to create problems for wilderness management.

The mining claims within the WSA are located in the northern and east-central portion of the Study Unit. The impact these claims may have on wilderness management is difficult to predict at this time. Other than unauthorized assessment work performed on one claim, no mining activity of consequence has occurred in the WSA.

Six oil and gas leases have been issued or are pending within the Study Unit but all are subject to the IMP wilderness protection stipulations.

The Sierra de las Canas WSA lies within a Safety Extension Area used primarily as a safety impact zone in support of several missile test programs conducted at WSMR. The Extension Area must be evacuated of all human inhabitants during missile firings. The availability of the Extension Area is required for an indefinite period of time to support future military programs requiring a test range in excess of that provided by the main WSMR. WSMR requires reasonable

access to the Extension Area to recover missible debris. However, no impacts of this nature have occurred within the WSA to date.

The presence of the WSA within the WSMR Safety Extension Area complicates the wilderness manageability of the Study Unit. Ensuring the evacuation of the WSA would require placing appropriate signing along the two vehicle access routes available to the public. However, given the proximity of the WSA to Socorro and its limited access opportunities, controlling visitor use in the Study Unit efficiently would not be expected to create serious manageability problems.

The manageability of the Study Unit relative to the WSMR Extension Area differs from that of the Stallion and Jornada del Muerto WSA because vehicle access by the public could be effectively controlled and the proximity of Sierra de las Canas to Socorro would reduce response time to manageability problems.

The wilderness management potential of the WSA in terms of effectively precluding vehicular access to the area is excellent. The Study Unit is bounded on the west by a BLM road from which off-road vehicle (ORV) access is prevented by topographic features in all but a few locales. Vehicle use can be easily precluded through management actions in these locations. The northern boundary of the WSA lies on a legal subdivision but the area is roadless and topographically rugged. The southern and eastern portions of the WSA can be accessed by four-wheel drive vehicles in several large arroyo bottoms. However, management actions could effectively close these entry points.

A single 160-acre private inholding which includes a perennial spring is located in the Study Unit. Should the landowner desire to construct a vehicle access route into his property and develop the spring site, the presence of this inholding within a designated wilderness would pose significant manageability problems. A boundary adjustment to exclude this private inholding is discussed under the Amended Boundary alternative on p. E-17.

The acquisition by the BLM of the above 160-acre private inholding, through voluntary exchange, would not only enhance the manageability of the WSA but also assist in maintaining the area's ecosystem and wildlife values.

Other actions to enhance manageability of the WSA would be the future acquisition, through voluntary exchange, of approximately 2,500 acres of State land which lie adjacent to the Study Unit. In addition, a high potential exists for expanding the WSA northward if checkerboarded public lands could be consolidated through the acquisition of State and private lands in future years.

V. PUBLIC INVOLVEMENT OVERVIEW

Public involvement in the wilderness inventory and study process has, with few exceptions, indicated support for designation of the Sierra de las Canas WSA as a wilderness area. Reasons cited have

included the Study Unit's high naturalness values, outstanding solitude values, its proximity to Socorro and the Rio Grande Valley, and high scenic, wildlife, and ecological values. The lack of resource conflicts coupled with the area's manageability as wilderness were also mentioned as reasons for designating the area. A number of public comments urged the BLM to acquire the 160-acre private inholding within the WSA due to its importance to unit ecological and wildlife values.

Opposition to wilderness designation came from area allottees who were contacted early in the wilderness inventory process. Following adjustments to the WSA boundary, all but one allottee appeared satisfied that designation of the involved lands would not significantly hamper or interfere with their respective ranch operations. The single allottee, still hesitant regarding wilderness designation at the time of last contact, expressed a willingness to further discuss the wilderness designation issue, including the possible exchange of his private inholding for suitable public land outside the WSA.

WSMR personnel expressed concern that designation of Sierra de las Canas WSA as wilderness could potentially conflict with military operations within the WSMR Safety Extension Area.

VI. ALTERNATIVES AND IMPACTS

This section will discuss three alternatives (management options) that could be applied to the WSA. These alternatives include: All Wilderness, Amended Boundary, and No Action (No Wilderness).

A. All Wilderness

This alternative would recommend the entire 12,838-acre WSA as suitable for inclusion in the National Wilderness Preservation System. If designated, the area would be managed pursuant to the guidelines and mandates of the Wilderness Act of 1964 and the Final Wilderness Management Policy published in the Federal Register September 24, 1981 (Vol. 46, No. 185).

1. Impacts to Minerals

If the WSA is recommended as suitable for wilderness designation, a U.S. Geological Survey and U.S. Bureau of Mines mineral-energy survey would be conducted to supplement current data regarding the mineral-energy occurrence potential for the area.

Leasable

a. Oil and Gas

The geologic environment of the WSA has a low potential for economically recoverable oil and gas reserves. Therefore, denying exploration/development would likely have little or no impact on oil and gas development in the Study Unit.

Designating the WSA a wilderness would likely preclude any serious oil and gas exploration/development within the area. However, due to the relatively narrow width of this Study Unit, much of the area's oil and gas reserves, if present, could be tapped through use of slant drilling techniques or by drainage.

b. Geothermal

The Sierra de las Canas WSA is prospectively valuable for geothermal resources. Wilderness designation would likely preclude any geothermal development within the area. Should significant geothermal resources be present, because of the narrow width of the WSA, slant drilling techniques or drainage could possibly be used to tap the resource. Denying geothermal leasing/exploration/development within the Study Unit would have little or no impact on geothermal development in the surrounding region.

Locatable

The WSA has potential for copper, uranium, gypsum, barite, fluorite, lead and zinc. Based on current information, wilderness designation would have little impact, since most deposits of these minerals tend to be small and are not economically feasible to mine. Should larger deposits be found, or a significant rise in the price of these commodities occur, wilderness designation would prevent development of these resources.

Saleable

The WSA contains limestone, sand and gravel but inaccessability probably would preclude development.

2. Impacts to Other Resources and Uses

Livestock Grazing

Domestic livestock grazing is a permissible and compatible resource use within wilderness. However, wilderness designation would have an impact on grazing use by narrowing the range of management options available to allottees and the BLM. For example, the installation of new rangeland development structures would be restricted by wilderness designation to those developments which primarily benefit the natural rangeland values of the wilderness resource. This would impose limitations on vehicular access, and may increase the costs in constructing or maintaining new rangeland developments since visual impacts would be considered in their location and design. Under wilderness designation, more emphasis would be placed on using natural materials (e.g., wood and native rock as opposed to steel and concrete) in replacing deteriorated developments or constructing new developments. The use of such materials would be preferred, providing that unreasonable, additional construction or maintenance costs are not imposed upon the allottee.

It is difficult to assess how the above limitations would affect livestock grazing in the WSA because the nature and location of future rangeland developments are not known. However, given the existing ecological range condition, present livestock distribution patterns and the potential production of range sites in the WSA, it is anticipated that impacts to grazing management would be low.

Wilderness designation would not result in the reduction of existing livestock stocking levels to improve wilderness values. Existing rangeland developments would not be removed so long as they are necessary to ranch operations. Virtually all ranching operations occurring within the Study Unit are presently conducted by horseback. Were the area designated a wilderness, ranching operations would continue, with few exceptions, much as they have in the past.

Wildlife

The designation of the entire Study Unit would permanently preserve 12,838 acres of upper Chihuahuan desert wildlife habitat. The natural distribution and abundance of wildlife species would be maintained.

Designation of the Sierra de las Canas WSA as wilderness would result in the imposition of restrictions regarding the placement of wildlife waters and vegetative manipulation projects for improving wildlife habitat. However, wilderness status would not totally preclude the establishment of wildlife water sources. A small number of wildlife drinkers could be placed in the wilderness, provided they enhanced the natural values of the area, were substantially unnoticeable, and did not require routine access and maintenance with motorized vehicles.

Small scale vegetative manipulation projects would not be precluded by wilderness designation. For example, seeding portions of the WSA in native browse species (e.g., mountain mahogany) to improve deer habitat could be undertaken.

The impact of wilderness designation on wildlife management activities in the WSA is anticipated to be low.

The WSA is presently closed to ORV entry. Although illegal use is very light in the WSA, its impacts may be significant. For example, poachers using a 4x4 vehicle for access killed a deer with a small caliber firearm in March 1982. Although wilderness status would not ensure the absolute closure of the WSA to ORV use, it would result in physical closure of the few entry points which vehicles use. This physical closure, combined with higher levels of patrolling and enforcement and increased public awareness that the area is closed, would serve to make the existing ORV closure more effective.

Soils/Watershed

Designation of the WSA would maintain or enhance the existing soil and watershed conditions by precluding surface disturbance and preserving the natural ground cover of the Study Unit. The WSA is

considered fragile in terms of soil and watershed values due to its severe topography which is dominated by rock escarpments, very steep slopes, and shallow soils with associated rapid water runoff and high potential for erosion.

Cultural Resources

Effectively closing the WSA to vehicular entry would reduce the potential for the occurrence of serious and/or commercial vandalism of cultural sites within the area. On the other hand, increased visitor use could result in a higher incidence of casual surface collection by visitors.

Wilderness designation would restrict but not preclude archeological stabilization, excavation, and research within the WSA. These activities may be permitted on a case-by-case basis where the project can be adequately justified and will not significantly degrade the wilderness resource of the area.

The inclusion of the WSA in the National Wilderness Preservation System would enhance the scientific and educational values of cultural sites within the area by preserving a relatively undisturbed environment from which the human ecology of the WSA during previous occupational periods could be more accurately reconstructed.

Scenic Values

The scenic values of the Study Unit would be permanently preserved by wilderness designation.

Recreation

The WSA is capable of providing visitors with high quality, readily accessible primitive recreational experiences ranging from hiking, horseback riding, and backpacking to hunting. Wilderness designation would maintain the natural environment which makes these human activities possible in an undisturbed state.

Vehicular associated recreational activities would be prohibited. The WSA, although generally very rugged, could be (and is) utilized to a degree by ORVs. However, numerous alternative areas exist for motorized recreational activities in the surrounding locale.

An increase in visitation to the WSA from Albuquerque and possibly El Paso would be anticipated if the area is designated a wilderness. Because no baseline data is available, quantitatively assessing this impact is impossible. It seems safe to assume, however, that visitor increase would be low.

B. Amended Boundary

The Amended Boundary alternative would exclude 40 acres of public land from further wilderness consideration (see Map, p. E-2). This would result in 12,798 acres of the original 12,838-acre WSA being

recommended as suitable for wilderness designation. The 40-acre deletion would provide an access corridor into a 160-acre private tract and spring. This would allow the private landowner to construct a vehicle access route into his property and develop the spring site.

This alternative, like the All Wilderness alternative, utilizes existing vehicle routes and legal subdivision lines to identify the boundaries of the proposed wilderness.

1. Impacts to Minerals

The impacts to mineral resources under the Amended Boundary alternative are the same as those described under the All Wilderness alternative.

2. Impacts to Other Resources and Uses

Wilderness

In many respects, the impacts to the wilderness resource would be minor. If constructed, an access route to the private land tract would lie within a badlands environment near the bottom of a canyon. Visual degradation of the WSA would be minimal. Neither would the Study Unit's mandatory wilderness characteristics be severely impacted.

Wildlife

The construction of a vehicle access route to the privately-owned spring site presently used by wildlife, especially mule deer, may result in an increase in big game poaching activity, wildlife displacement and/or a reduction in wildlife density.

Impacts to livestock grazing, soils/watershed, cultural resources, scenic values and recreation under the Amended Boundary alternative would be the same as those described under the All Wilderness alternative.

C. No Action

This alternative would return the Sierra de las Canas WSA to undesignated multiple-use management. The Study Unit would be managed according to the prescriptions contained in the Stallion Management Framework Plan. The major thrust of management for the WSA would be the development of rangeland resources, possible mineral exploration and development, and other traditional multiple uses of the public lands.

1. Impacts to Wilderness Values

In assessing the impact of this alternative on the wilderness resource, certain assumptions must be made since all, or even most factors which will determine future impacts are not known. The assumptions made regarding the potential impact of non-wilderness designation for the WSA are based upon the impacts which have occurred

on lands immediately adjacent to or within five air miles of the Study Unit within the past three years.

If the Sierra de las Canas WSA is not designated a wilderness, it is likely the area will eventually be impacted by the installation of one or more water pipeline projects for range management purposes with the establishment of attendant vehicle access routes for pipeline maintenance.

Two small open pit mines and nearly six miles of bladed access routes and four bladed drill pads are present north and west of the WSA. Although there is little likelihood the Study Unit possesses substantial mineralization, mining activities similar to those which occurred on lands west and north of the area could cause significant impacts to the wilderness values of the Study Unit. Present regulations prohibit undue and unnecessary degradation of lands but do allow environmental disturbance if it is an unavoidable consequence of mining activities.

2. Impacts to Other Resources and Uses

Minerals/Energy

The No Action alternative will have no impact on minerals and energy resources. Mineral activity will probably continue to occur at historical levels, under the laws and regulations relating to mineral appropriation on the public lands.

Livestock Grazing

If the entire WSA is released from further wilderness consideration and returned to undesignated multiple-use management, intensive management techniques could be applied and new range development structures installed, such as water pipeline projects or land treatments. The WSA would be released from the restrictions imposed by the IMP for lands under wilderness review.

Wildlife

This alternative would allow a wider range of wildlife management actions such as vegetative manipulation projects and installing wildlife water catchments. The result would be the enhancement of certain wildlife species.

Without the effective closure of the WSA to ORV entry, the continued loss of deer to poaching would likely continue. If mineral exploration occurs and new roads are constructed, wildlife values could be impacted.

Soils/Watershed

Continued low levels of ORV use could result in vehicle scars and rutting.

If mineral exploration and development occurs, disturbance to soil and watershed values would likely result in increased rapid water runoff and erosion.

Cultural Resources

If returned to undesignated multiple-use management, the cultural values of the WSA could be adversely impacted if ORV use occurs in the large arroyos accessible to vehicles and along which most cultural sites probably occur. However, because a majority of the Study Unit has not been inventoried, it is not possible to definitively assess the significance such disturbance may have on cultural values.

Vehicular access to cultural sites would routinely continue if the area is managed under this alternative. This would be beneficial to archaeological research, investigations, excavation, and stabilization projects.

Scenic Values

The WSA is considered to possess high scenic values. If returned to undesignated multiple-use management, the maintenance of these values could not be assured. Although no serious mining activity is anticipated in the Study Unit, speculation-oriented mining activity could degrade the scenic resource values of the WSA.

Recreation

The primitive recreational values of the WSA would eventually be reduced under this alternative. The attractiveness of the Study Unit is strongly dependent upon its near-pristine environment. The return of the WSA to undesignated multiple-use management may eventually result in speculation-oriented mining activity which could degrade the recreational values of the area. In addition, management actions by the BLM in future years are likely to alter the WSA's existing environment with the installation of rangeland development projects, vehicle access routes, and other intrusions.

New vehicle access routes within the WSA would open the Study Unit to motorized recreational activities. Deer hunting access would be improved and the scenic qualities of the WSA would potentially become available to a greater number of persons.

VII. RECOMMENDED ACTION

A. Recommended Action Description

Wilderness Study Area Unit NM 020-038 Sierra de las Canas is recommended as suitable for inclusion in the National Wilderness Preservation System as proposed in the Amended Boundary alternative (12,798 acres suitable, 40 acres unsuitable).

B. Rationale

The Sierra de las Canas WSA is one of the least disturbed upper Chihuahuan Desert public land tracts in New Mexico. The Study Unit represents many facets of the Chihuahuan Desert near the northern limit of this large North American ecosystem. The ecological value of the WSA is further enhanced by the strong influence of the Colorado Plateau Province on the dominant-desert environment. The natural values of the WSA are exceptional.

Resource conflicts with the recommended action are considered minimal.

The wilderness management potential of the WSA is considered high. The Study Unit lies within the WSMR Safety Extension Area, which means public use of the WSA would require special management. However, a number of factors enhance the manageability of the Study Unit. First, primary access to the WSA is restricted to two vehicle routes. The use of signing and patrol by personnel could be efficiently implemented. Second, the proximity of the Study Unit to Socorro and its ease of access reduces response time to manageability problems to less than one hour. Third, visitor use is not expected to increase dramatically over existing levels.

The designation of the WSA as wilderness would expand the spectrum of primitive recreational opportunities for residents of the region and permanently preserve the scenic values of a desert mountain range visible from much of the Middle Rio Grande Valley and Socorro.

The deletion of 40 acres from the proposed wilderness would have minimal impact on the area's mandatory wilderness characteristics and would improve manageability.

C. Consistency with Other Plans

Except for concerns expressed by WSMR, the Amended Boundary alternative would not conflict with any known county, State, or Federal land-use plans.

WILDERNESS ANALYSIS REPORT
STALLION WILDERNESS STUDY AREA
NM 020-040

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Socorro District
Jornada Resource Area
Socorro, NM 87801

December, 1982

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LIST OF MAPS

I. GENERAL DESCRIPTION

A. Location

The Stallion Wilderness Study Area (WSA) is located in central New Mexico, Socorro County. The Study Unit is situated 14 air miles east, northeast of the community of Socorro.

Applicable USGS Topographic Maps:

Names: Bustos Well (7½")
Sierra de la Cruz (7½")
Sierra Larga North (7½")
Sierra Larga South (7½")

B. Climate and Topography

The WSA is located on the eastern edge of the Chihuahuan Desert. Maximum summer temperatures range from 90 to 100+ degrees fahrenheit. Winter temperatures are generally mild during daylight hours, 40 to 50 degrees, and moderately cold at night, 15 to 30 degrees fahrenheit. Spring and fall temperatures tend to be mild. The spring season typically is accompanied by winds ranging from 10 to 40 miles per hour.

Precipitation averages 12 to 14 inches per year. Over half the annual rainfall is received during the summer thunderstorm season (July through September). A third of the year's precipitation usually falls during the winter months (December through March). The remaining moisture, normally 10 percent or less, is received in the spring and fall months.

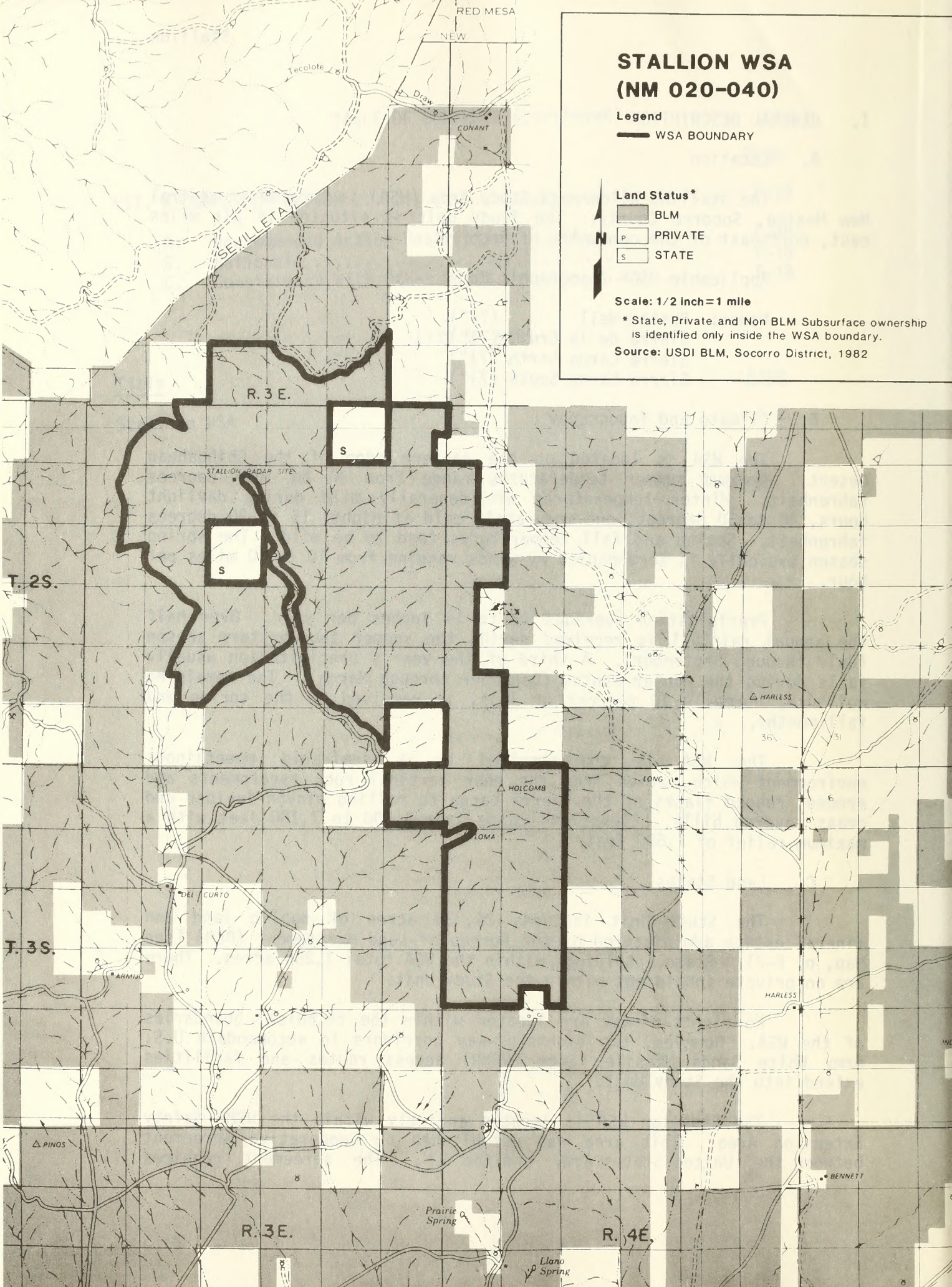
The WSA is characterized by a semi-arid mountainous environment which varies from the near vertical rock escarpments and eroded, rugged flanks of the Sierra Larga to rolling pinyon-juniper and grass covered hills. Elevations range from 5,500 to 7,100 feet with a maximum relief of 1,600 feet.

C. Land Status

The Study Unit includes 24,238 acres of public land and mineral estate administered by the Bureau of Land Management (BLM) (see Map, p. F-2). State inholdings within the WSA total 1,280 acres. There are no private inholdings within the Study Unit.

No rights-of-way are located within the technical boundaries of the WSA. However, two rights-of-way corridors to accommodate U.S. Army White Sands Missile Range (WSMR) access routes and facilities extend into the Study Unit.

The Stallion WSA is located entirely within the WSMR Safety Extension Area. This area was established by Cooperative Agreement between the United States Army and the BLM. The agreement requires



STALLION WSA (NM 020-040)

Legend

WSA BOUNDARY

Land Status*

- BLM
- P PRIVATE
- S STATE

N

Scale: 1/2 inch=1 mile

* State, Private and Non BLM Subsurface ownership is identified only inside the WSA boundary.

Source: USDI BLM, Socorro District, 1982

periodic evacuation of the Extension Area due to its proximity to targeting locations within the Missile Range proper (for further discussion, see Manageability, Section IV B, p. F-12).

D. Access

Primary legal access to the WSA is provided by Interstate 25 then north on County Road 146 and BLM Road 2109.

II. EXISTING RESOURCES

A. Geology

The Stallion WSA is located within the lightly faulted central area of the Jovita uplift. This series of hills, mountains and cuestas forms the highlands between the Rio Grande rift to the west and the Jornada del Muerto basin to the east. The Jovita uplift merges into the Los Pinos uplift and Chupadera platform to the north, and the Loma de las Canas uplift to the south.

Rock units present in the WSA range in age from Permian to Triassic. The Permian age Yeso formation, Glorieta sandstone and San Andres limestone are present throughout the WSA. These rocks consist mainly of limestone, shale, sandstone, siltstone, and gypsum. The siltstone, shale and sandstone of the Triassic age Dockum formation crops out in the southeastern and southwestern portions of the Study Unit.

B. Water

Surface Water

The western portion of the WSA is located in the Rio Grande Basin and the eastern portion lies in the Jornada del Muerto Basin. There are no permanent streams or surface water bodies within the Study Unit. However, the normally dry arroyos occasionally carry storm runoff to the Rio Grande immediately after rainfall within their respective drainage areas. Periods of flow are short and may be widely spaced in time due to intermittent and sporadic rainfall patterns. Runoff averages 0.1 inches per year.

Groundwater

The only developed groundwater source within the WSA is a windmill. No information is available on the water quality of this well. Therefore, information from New Well, which is located just outside the western boundary of the WSA, will be used as representative of the Study Unit. New Well was drilled to a depth of over 500 feet. Analysis of groundwater indicates it is suitable for livestock watering purposes.

C. Soils

The majority of the Stallion WSA is underlain by limestones over sandstones. Approximately 60 percent of the soils occur on limestone. On mesa tops and hills, soils are shallow to moderately deep and gravelly with small inclusions of deep loamy soils in small valleys and swales.

Twenty-five percent of the soils are shallow to moderately deep loamy soils over gypsum. Some of the gypsum areas on the eastern side of the Study Unit fall into the badland type.

The remaining 15 percent of the WSA has moderate to deep loamy soils that occur in the swales and lower areas.

D. Vegetation

The vegetation of the WSA is typical of the upper Chihuahuan Desert at the northern extreme of its range. Four vegetative types have been identified: pinyon-juniper, desert shrub, grassland and wasteland.

The pinyon-juniper type dominates the WSA with 94 percent of the Study Unit classified as this type. One seed-juniper is the aspect vegetation, comprising 3 to 20 percent of the composition. Pinyon, the co-dominant tree species, varies in composition from a trace to 5 percent.

The understory vegetation is dominated by warm-season grasses. The grama grasses are the most prevalent, sometimes making up to 70 percent of the composition on the site. Blue grama and black grama have the highest composition, followed by side oats grama and hairy grama. Of lesser frequency are various other warm-season grasses, including purple muhly, galleta, Fendler three-awn, ring muhly, sand dropseed and spike dropseed.

Cool-season grasses present include silver bluestem, Indian ricegrass, wolftail, bottlebrush squirreltail and New Mexico feathergrass. Some areas classified as pinyon-juniper, that exist on soils with a high gypsum content, are dominated by gypgrass.

Broom snakeweed is the main half-shrub component for the pinyon-juniper type, comprising up to 30 percent of the composition. Other shrubs and half-shrubs present include datil yucca, hairy mountain-mahogany, feather pea-bush, Mormon tea, littleleaf sumac, squawberry, mariola, prickly pear, and ocotillo. In gypsum soils, coldenia is the dominate plant species. Forbs present include ironplant goldenweed, Rocky Mountain zinnia, globemallow, hog potato, aster and spectaclepod.

The grassland type covers 2 percent of the WSA which is represented by two subtypes.

The short grass subtype is located in the northwestern and southeastern portions of the WSA. This subtype is dominated by the grama grasses, and also includes spike and sand dropseeds, burrograss, gypgrass, fluffgrass, ring muhly and bush muhly. Shrubs present are cholla, datil yucca, slender gray sagebrush and Mormon tea. Forbs include ironplant goldenweed, globemallow, desert holly and Russian thistle.

The mid-grass subtype is characterized by alkali sacaton. Giant sacaton also occurs in the overflow drainages of the WSA, representing 26 to 88 percent of the composition. Other grasses present are burrograss, blue grama, galleta, vine-mesquite and mat muhly. Forbs include Russian thistle, desert holly, white horse nettle and threadleaf groundsel. The only shrub of significant composition in this subtype is broom snakeweed. However, traces of one-seed juniper, four-wing saltbush, cholla and Apache-plume are present.

The desert shrub type represents 2 percent of the WSA. This type is located in the southeastern and northwestern portions of the Study Unit. Dominant shrub species are cholla and squawberry. Other shrubs include winterfat, creosote, broom snakeweed, coldenia, slender gray sagebrush and Mormon tea. Grasses are represented by the gramas, spike dropseed, burrograss, ring muhly, sand muhly, gypgrass, fluffgrass, alkali sacaton and galleta. Forbs include ironplant goldenweed, globemallow and Eriogonum.

Approximately 2 percent of the WSA is classified as wasteland. This area is primarily found on the eastern and northwestern flanks of the Sierra Larga, and is characterized by steep slopes and sparse juniper.

Threatened or Endangered (T&E) Plant Species

The U.S. Fish and Wildlife Service (FWS) has not listed any T&E plant species that may occur in the WSA. The Study Unit does contain habitat which offers potential for the occurrence of five Federally listed and five State listed species of T&E plants. A list of these potentially occurring plants is available on request from the Socorro District Office (DO).

E. Wildlife

Three Standard Habitat Sites (SHS's) have been identified within the WSA. The habitat sites are based on the combination of dominant vegetation and landform. The SHS's support 169 wildlife species, which include 50 mammal species, 28 reptiles and amphibians, and 91 resident and migratory bird species. A complete list of wildlife species to be found within the WSA is on file in the Socorro DO.

Big game species indigenous to the WSA are mule deer and antelope. Mule deer in the Study Unit's core mountain area are abundant relative to the surrounding region. Deer densities for this portion of the WSA may range as high as three animals to the square mile. Antelope are not abundant in the WSA.

The most common predator is the coyote. The rocky slopes and bluffs also provide habitat for bobcat and gray fox. Common small mammals include desert cottontails, prairie dogs, black-tailed jackrabbits, white-throated woodrats, deermice, and ground squirrels.

The mountainous topography and numerous rock outcrops are attractive to birds of prey. Commonly sighted birds include red-tailed hawks, sparrowhawks, horned larks, pinyon jays, and ravens.

Reptiles likely to be encountered are the collared lizard, eastern fence lizard, bullsnake, and western diamond-backed rattlesnake.

Threatened or Endangered Wildlife Species

The FWS furnished the BLM information about one Federally listed endangered animal species, the American peregrine falcon (Falco peregrines anatum), which may occur in the WSA. This species was included in a biological assessment (BLM 1982) which revealed that the Study Unit provides poor quality nesting habitat and there are no current or historically occurring eyries. However, potential habitat exists for supporting migrating individuals. Designation of Stallion WSA as a wilderness or managing the area for undesignated multiple-use would have no adverse or beneficial affect on peregrine falcons. The biological assessment and related correspondence are on file in the Socorro DO.

F. Visual

The scenic quality of the WSA is considered moderate. Land forms range from grassland to rolling pinyon-juniper savannah and forest to steep box canyons and rugged multi-colored badlands.

G. Cultural

Four cultural sites are currently recorded within the WSA. They range from lithic scatters to a historic structure dating from the first quarter of the twentieth century. Seventy additional sites are recorded within a 12-kilometer radius of the Study Unit. The heavy concentration of recorded sites on adjoining lands suggests a high probability for the occurrence of unrecorded sites within the WSA.

No concerns have been expressed by the Native American groups contacted for this Study Unit.

H. Air

The air quality of the WSA is excellent. It is generally affected only by the occurrence of wind blown sand during the spring.

III. EXISTING AND POTENTIAL USES

A. Mineral Development

The information in the following section is primarily abstracted from a draft report prepared by Geoexplorers International

Inc. entitled "Geology, Energy and Mineral Resources Assessment in the Socorro Area, New Mexico." This report is available for inspection at the Socorro DO.

1. Leasable

a. Oil and Gas

Seventeen non-competitive oil and gas leases have been issued or are pending within the WSA. All leases are recently issued or filed and subject to Interim Management Policy (IMP) and Guidelines for Lands Under Wilderness Review (BLM 1979). No exploration or development for oil and gas has occurred in the Study Unit to date.

A small area along the eastern border of the WSA falls within the Chupadera Mesa exploration area, a Class II favorability area, in a system where Class I is most favorable and Class IV least favorable (Foster and Grant 1974). Another small area along the southeastern border of the WSA falls within the Jornada del Muerto exploration area which is given a Class III favorability rating. However, the vast majority of the Study Unit is within a Class IV area, the least favorable rating. Paleozoic rocks favorable for the generation of oil and gas underlie the Study Unit, but faulting probably precludes significant entrapment of petroleum. The WSA is considered to have low potential for the production of these resources.

2. Locatable

There are no valid mining claims within the Study Unit. The WSA has potential for the occurrence of the following locatable minerals:

a. Copper

Copper deposits in Permian redbeds are known to occur in a belt extending from Scholle to Carthage and passing through the Study Unit. Some of the deposits were mined in the past but have been uneconomic in recent years. The redbeds crop out extensively in the WSA. For this reason, the Study Unit is considered to have moderate favorability for the occurrence of copper mineralization.

b. Gypsum

The Permian age Yeso formation, which contains gypsum, is found in the northern and western portions of the WSA. The deposits are considered to have a low potential for use because of lack of local demand and the availability of more pure deposits in other parts of central New Mexico.

c. Uranium

Uranium is known to occur in Paleozoic limestones and may occur in Late-Tertiary valley-fill sediments in the area surrounding the Study Unit. Paleozoic limestones crop out in the WSA

but past prospecting has not disclosed any uranium occurrences. Late-Tertiary sediments do not crop out in the Study Unit. The WSA is considered to have low favorability for discovery of uranium deposits.

d. Barite/Fluorite/Lead/Zinc

Deposits of these minerals are known to occur along faults within Precambrian rocks and the Madera limestone in the area surrounding the Study Unit. The WSA contains Paleozoic limestones, but it is not intensely faulted, and no occurrences of these minerals are known within or near its borders. For these reasons the Study Unit is considered to have low favorability for the occurrence of such deposits.

3. Saleable

No material sales have been conducted within the WSA and no future sales are anticipated. The Study Unit has potential for the development of the following saleable material:

a. Limestone

The WSA is partly underlain by the San Andres limestone, which may be of high enough purity for use as agricultural lime or in the manufacture of cement. These deposits are considered to have a moderate favorability for development if local demand for the material occurs.

B. Watershed

The WSA is located almost entirely in the Loma Watershed except for four sections which lie in the Storm Watershed. The Study Unit is composed of differing land forms which include escarpments, box canyons, rolling foothills, mountains and badlands. The majority of soils are course textured with moderate to slow permeability. Approximately 92 percent of the WSA falls in a slight to moderate erosion class and 8 percent in the critical to severe erosion class. There are no water control structures or land treatments within the WSA.

C. Livestock Grazing

Four grazing allotments lie partially within the Study Unit. The names and acreage percentages of each allotment which lies within the WSA include: Tecolote Draw (25), Bordo Atravesado (34), Sierra Larga (28), and Coyote Spring (12). All four allotments are run as cow-calf operations.

Existing rangeland developments within the WSA include approximately 22 miles of barbed wire fencing, 20 miles of two-track vehicle route, five earthen stock tanks and one windmill.

Allottees periodically inspect and maintain as necessary the developments with the use of motor vehicles. Fence maintenance is sometimes performed on horseback.

D. Timber Harvest

Approximately 94 percent (23,000 acres) of the Stallion WSA is classified as non-productive forest land (New Mexico Forest Inventory 1975). These lands are stocked primarily with juniper, with pinyon pine as a minor component.

Because the area has never been managed for forest products, no information on stand parameters is available. However, field observation provides the basis for the following judgment of the value of forest resources within the WSA.

Site quality is low. This is apparent from the low heights of trees (10 to 18 feet) and the shallow, alkaline soils present. Wide spacing and an estimated 10-percent crown closure indicates that stocking levels are marginal for production of wood products. Poor conformation, inherent in understocked stands, also limits the usefulness of the potential product. Age class structure is unknown but is certain to be unbalanced due to the preponderance of overmature individuals and a lack of regeneration.

The potential for sawtimber production on a sustained yield basis does not exist within the Study Unit. Production of posts and poles is probably of marginal value due to the poor conformation of the juniper. At present, fuelwood production is considered marginal due to the lack of physical access to the majority of forested lands and the availability of alternate cutting areas (i.e., Forest Service administered land).

E. Recreation

The WSA is located within two hours' driving time of Socorro and is visible from town and much of the Rio Grande Valley. Existing recreational use is low, being primarily restricted to deer hunting during the fall.

Potential opportunities for primitive recreational use within the WSA include environmental exploration, horseback riding, day hiking, backpacking, natural history activities such as birdwatching, rock hunting, and landscape-nature photography, and deer hunting.

The recreational use of the WSA is not expected to increase within the foreseeable future.

F. Education/Research

The Study Unit is not currently being utilized for any known educational or research purpose. Educational and research potential for the WSA may be high for cultural resource studies.

G. Wildlife

Wildlife habitat could be improved through vegetative manipulation and added water sources. However, no specific actions are planned for the area at present. The WSA has not been identified by the New Mexico Department of Game and Fish for reintroduction of any species.

H. Wild Horse Management Area

The Bordo Atravesado Wild Horse Management Area lies partially within Stallion WSA. A wild horse herd has been present in this area since at least the early 1950's.

The present herd consists of approximately 64 animals with annual productivity of about 13 percent. The herd has a balanced sex ratio and age structure appears to be normal. Levels of mortality are unknown but appear to be low. Mortality is probably related to decimating factors such as predation, accidents and adverse weather conditions rather than welfare factors (i.e., availability of water).

Management activities have consisted of inventory, round-up and adoption. Management objectives are to maintain and perpetuate a viable herd of 32 wild horses with stable population characteristics, and to protect and enhance the wild free-roaming nature of the animals and retain compatibility with other uses of the range.

IV. WILDERNESS CRITERIA

A. Evaluation of Wilderness Values

1. Quality of Mandatory Wilderness Characteristics

a. Naturalness

The WSA is natural in appearance. Intrusions are limited to five earthenstock tanks, approximately 22 miles of barbed wire fence, one windmill, 30 push pits, and 20 miles of two-track vehicle routes. In addition to these intrusions, however, WSMR has an electronic tracking station and a microwave reflector structure on the highest points in the Sierra Larga. Although technically excluded from the WSA, these intrusions are visible from a number of vantage points within the area.

The naturalness values of the WSA are not considered outstanding. However, there are area-specific exceptions within the Study Unit to this general assessment.

b. Solitude

The WSA is isolated, little visited, difficult to access, and rugged. The area's topographic diversity, vegetational screening, and geographic setting contribute to its outstanding solitude

opportunities. However, the airspace over the WSA is utilized by the military for aerial training maneuvers with high performance jet aircraft. The noise associated with these maneuvers is not conducive to a quality solitude experience.

c. Primitive/Unconfined Recreation

The WSA can provide visitors with opportunities to experience a pinyon-juniper mountain environment suited to day hiking, big game (deer) hunting, horseback riding and environmental exploration. The Study Unit is most attractive to these recreational pursuits during the fall, winter and spring months.

2. Special Features

The Study Unit supports a small herd of wild horses, which in the opinion of many persons, enrich the WSA's cultural and/or faunal resources.

3. Multiple Resource Benefits

The Study Unit contains a variety of natural resource values as a result of its undisturbed character. Designation of the WSA as wilderness would provide a greater degree of long-term protection for these natural values than would administrative designations available to the BLM.

A more detailed discussion of multiple resource benefits may be found under the impacts of the All Wilderness Alternative.

4. Diversity

a. Ecosystems Present

The Bailey-Kuchler Ecoregion Classification System has been used to ensure consistency between documents. It should be noted that different classification systems measure vegetation using different parameters and will result in varying acreage figures.

The Stallion WSA lies near the northern extreme of the Chihuahuan Desert and the southern edge of the Colorado Plateau Provinces as identified in the Bailey-Kuchler Ecoregion Classification System. Two sections of the two provinces are represented within the WSA: The Tarbush-Creosote Bush of the Chihuahuan Desert and the Grama-Galleta Steppe/Juniper-Pinyon Woodland Mosaic of the Colorado Plateau.

Inventory data indicates 3,000 acres of Tarbush-Creosote Bush and 21,238 acres of Grama-Galleta/Juniper-Pinyon Woodland Mosaic are present within the WSA. However, because of the Study Unit's geographic location between the Chihuahuan Desert and Colorado Plateau Provinces, the two sections are not clearly

distinctive. Instead, the two tend to integrate into one another to varying degrees. For example, typical Chihuahuan Desert species such as ocotillo and prickly pear cactus occur in association with the Grama-Galleta/Juniper-Pinyon Woodland Mosaic of the Colorado Plateau.

b. Distance from Population Centers

One city, Albuquerque, New Mexico, identified in the 1980 census as a Standard Metropolitan Statistical Area (SMSA) is located within four hours' driving time of the WSA.

B. Manageability

To be recommended for wilderness designation, the Stallion WSA must be capable of being effectively managed as wilderness. Manageability is a judgment made by the BLM after considering such factors as private and State inholdings, valid existing rights, topography and the overall land ownership pattern.

Valid existing rights in the Study Unit consist of grandfathered livestock operations. Required access for the maintenance of existing rangeland developments is not expected to create problems for wilderness management.

No mining claims are present within the WSA. Seventeen oil and gas leases have been issued or are pending within the Study Unit but all are subject to the IMP wilderness protection stipulations.

The Stallion WSA lies within a Safety Extension Area used primarily as a safety impact zone in support of several missile test programs conducted at WSMR. The Extension Area must be evacuated of all human inhabitants during missile firings. The availability of the Extension Area is required for an indefinite period of time to support future military programs requiring a test range in excess of that provided by the main WSMR. WSMR requires reasonable access to the Extension Area to recover missile debris. However, no impacts of this nature have occurred within the WSA to date.

Two instrumentation sites are technically corridored out of but surrounded by the WSA. Future expansion of existing instrumentation sites or the installation of new sites may be necessary either adjacent to or within the Study Unit.

The presence of the WSA deep within the WSMR Safety Extension Area creates a serious wilderness manageability problem. Ensuring complete evacuation of the Study Unit which is surrounded by numerous access entry points would be difficult or impossible.

Inholdings within the WSA include 1,280 acres of State land. Acquisition of these inholdings, through voluntary exchange, would enhance manageability.

V. PUBLIC INVOLVEMENT OVERVIEW

Public involvement in the wilderness inventory and study process has generally supported wilderness designation of the Stallion WSA. Reasons cited have concentrated on the Study Unit's remoteness coupled with its naturalness and solitude values.

Opposition to designation has been intense from several grazing allottees who feel they would be affected by wilderness status. Resource conflicts with grazing use, lack of wilderness characteristics, and conflicts with the WSMR use of the Safety Extension Area were most often cited as reasons against wilderness designation.

WSMR personnel expressed concern that designation of Stallion WSA as wilderness could potentially conflict with military operations within the WSMR Safety Extension Area.

VI. ALTERNATIVES AND IMPACTS

This section will discuss two alternatives (management options) that could be applied to the WSA. These alternatives include: All Wilderness and No Action (No Wilderness).

A. All Wilderness

This alternative would recommend the entire 24,238-acre WSA for inclusion in the National Wilderness Preservation System. If designated, the area would be managed pursuant to the guidelines and mandates of the Wilderness Act of 1964 and the Final Wilderness Management Policy published in the Federal Register September 24, 1981 (Vol. 46, No. 185).

1. Impacts to Minerals

If the WSA is recommended as suitable for wilderness designation, a U.S. Geological Survey and U.S. Bureau of Mines mineral-energy survey would be conducted to supplement current data regarding the mineral-energy occurrence potential for the area.

Leasable

a. Oil and Gas

The geologic environment of the WSA has a low potential for economically recoverable oil and gas reserves. Therefore, denying exploration/development would likely have little or no impact on oil and gas development in the Study Unit.

Designating the WSA a wilderness would likely preclude any serious oil and gas exploration/development within the Study Unit. If oil and gas should occur, it could probably not be fully extracted from inside the WSA. Some of the area's oil and gas, if present, could be tapped through the use of slant drilling techniques or by drainage.

Locatable

The WSA has potential for copper, uranium, gypsum, barite, fluorite, lead and zinc. Based on current information, wilderness designation would have little impact, since most deposits of these minerals in the area surrounding the WSA tend to be small and are not economically feasible to mine. Should large deposits be found, or a significant rise in the price of these commodities occur, wilderness designation would prevent development of these resources.

Saleable

The WSA contains limestone, but poor access and lack of local demand probably would preclude development.

2. Impacts to Other Resources and Uses

Livestock Grazing

Domestic livestock grazing is a permissible and compatible resource use within wilderness. However, wilderness designation would have an impact on grazing use by narrowing the range of management options available to allottees and the BLM. For example, the installation of new rangeland development structures would be restricted by wilderness designation to those improvements which would primarily benefit the natural rangeland values of the wilderness resource. This would impose limitations on vehicular access, and may increase the costs in constructing or maintaining new rangeland developments since visual impacts would be considered in their location and design. Under wilderness designation, more emphasis would be placed on using natural materials (e.g., wood and native rock as opposed to steel and concrete) in replacing deteriorated developments or constructing new developments. The use of such materials would be preferred, providing that unreasonable, additional construction or maintenance costs are not imposed upon the allottee.

It is difficult to assess how the above limitations would affect livestock grazing in the WSA because the nature and location of future rangeland developments are not known. However, given the existing ecological range condition, present livestock distribution patterns and the potential production of range sites in the WSA, it is anticipated that impacts to grazing management would be moderate.

Wilderness designation would not result in the reduction of existing livestock stocking levels to improve wilderness values. Existing rangeland developments would not be removed so long as they are necessary to ranch operations. Vehicle routes necessary to maintain existing developments would remain open to use by area allottees only.

Timber Harvest

Wilderness designation would remove approximately 23,000 acres of juniper-pinyon woodland from utilization as fuelwood for both domestic and commercial use. However, inaccessibility, low tree

density, small tree size and the availability of alternate cutting areas have precluded the use of this resource. Denying fuelwood cutting within the WSA would likely have little impact in the region.

Wildlife

The designation of the entire Study Unit would permanently preserve 24,238 acres of wildlife habitat. The natural distribution and abundance of wildlife species would be maintained.

Designation of the WSA as wilderness would result in the imposition of restrictions regarding the placement of wildlife waters and vegetative manipulation projects for improving wildlife habitat. However, wilderness status would not totally preclude the establishment of wildlife water sources. A small number of wildlife drinkers could be placed in the wilderness, provided they enhanced the natural values of the area, were substantially unnoticeable, and did not require routine access and maintenance with motorized vehicles.

Small scale vegetative manipulation projects would not be precluded by wilderness designation. For example, seeding portions of the WSA in native browse species (e.g., mountain mahogany) to improve deer habitat could be undertaken.

The impact of wilderness designation on wildlife management activities in the WSA is anticipated to be low.

Soils/Watershed

Designation of the WSA as wilderness would maintain or enhance the existing soil and watershed conditions by precluding significant surface disturbance and preserving the natural ground cover of the Study Unit.

Cultural Resources

Effectively closing the WSA to vehicular entry would reduce the potential for the occurrence of serious and/or commercial vandalism of cultural sites within the area. On the other hand, increased visitor use could result in a higher incidence of casual surface collection by visitors.

Wilderness designation would restrict but not preclude archeological stabilization, excavation, and research within the WSA. These activities may be permitted on a case-by-case basis where the project can be adequately justified and will not significantly degrade the wilderness resource of the area.

The inclusion of the WSA in the National Wilderness Preservation System would enhance the scientific and educational values of cultural sites within the area by preserving a relatively undisturbed environment from which the human ecology of the WSA during previous occupational periods could be more accurately reconstructed.

Scenic Values

The scenic values of the Study Unit would be permanently preserved by wilderness designation.

Recreation

Designation would permanently preserve a desert mountain landscape suitable for primitive recreational uses such as hiking, backpacking, and horseback riding. Vehicle associated recreation use would be precluded but such use is presently low. Wilderness designation would restrict vehicular access to the area by deer hunters during the hunting season. Recreational use is not expected to increase dramatically if the area is designated wilderness.

Wild Horses

Wilderness designation would not significantly impact management of the wild horse herd within the WSA.

B. No Action

This alternative would return the Stallion WSA to undesignated multiple-use management. The Study Unit would be managed according to the prescriptions contained in the Stallion Management Framework Plan. The major thrust of management for the area would be the development of rangeland resources, possible mineral exploration and development, and other traditional multiple uses of the public lands.

1. Impacts to Wilderness Values

Future management actions by the BLM within the Study Unit that are likely to occur include the installation of rangeland developments and watershed control structures. Although such actions, if assessed and mitigated individually, may not significantly impact wilderness values, the cumulative effect of these projects on the wilderness resource would prove significant.

Non-wilderness designation is not expected to result in the development of oil, gas, geothermal, mineral, or other resources within the Study Unit. However, oil, gas, or geothermal exploration could take place within the WSA.

Expansion of the two existing WSMR facilities corridored out of but surrounded by the WSA may occur as well as the construction of new facilities and access roads to support WSMR activities. In addition, an increase in jet aircraft traffic may take place in the future.

2. Impacts to Other Resources and Uses

Minerals/Energy

The No Action Alternative would have no impact on mineral and energy resources. Mineral activity would probably continue to occur

at historic levels, under the laws and regulations relating to mineral appropriation on the public lands.

Livestock Grazing

If the entire WSA is released from further wilderness consideration and returned to undesignated multiple-use management, intensive management techniques could be applied and new rangeland development structures installed, such as water pipeline projects or land treatments. The WSA would be released from the restrictions imposed by the IMP for lands under wilderness review.

Timber Harvest

The No Action Alternative would have no impact on timber harvest within the WSA.

Wildlife

This alternative would allow a wider range of wildlife management actions such as vegetative manipulation projects. If future management actions are balanced, wildlife values would be maintained or enhanced. If mineral exploration occurs and new roads constructed, however, wildlife values could be impacted.

Soils/Watershed

Impacts are anticipated to be minor unless mineral exploration and development occurs. In the latter event, disturbance to soil and watershed values would likely result in increased rapid water runoff and erosion.

Cultural Resources

If returned to undesignated multiple-use management, the cultural values of the WSA could be adversely impacted if ORV use occurs in the large arroyos accessible to vehicles and along which most cultural sites probably occur. However, because a majority of the Study Unit has not been inventoried, it is not possible to definitively assess the significance such disturbance may have on cultural values.

Vehicular access to cultural sites would routinely continue if the area is returned to an undesignated status. This would be beneficial to archaeological research, investigations, excavation, and stabilization projects.

Scenic Values

The WSA is considered to possess moderate scenic values. If returned to undesignated multiple-use management, the maintenance of these values could not be assured.

Recreation

The WSA is not expected to receive high levels of use by recreationists regardless of how it is managed. However, non-designation of the Study Unit would narrow the spectrum of recreational opportunities available to backcountry users.

Wild Horses

The No Action Alternative would have no impact on wild horse management within the WSA.

VII. RECOMMENDED ACTION

A. Recommended Action Description

Wilderness Study Unit NM 020-040 Stallion is recommended as unsuitable for inclusion in the National Wilderness Preservation System.

B. Rationale

The Stallion WSA is located within and near the zone of highest use of the WSMR Safety Extension Area. The WSA's inclusion in a high use portion of the Extension Area creates serious manageability problems. The Extension Area must be evacuated during all missile firings. The remote location of the WSA coupled with numerous access routes which originate from all compass directions further complicate the wilderness manageability of the area.

In addition, the two WSMR support facilities located within the heart of the Study Unit, even though technically corridored out of the area, substantially detract from the quality of the WSA's naturalness values. Solitude values are impaired by relatively routine training flights by high performance jet aircraft.

C. Consistency with Other Plans

The recommended action would not conflict with any known county, State, or Federal land-use plans, including known plans of WSMR.

WILDERNESS ANALYSIS REPORT
DEVIL'S BACKBONE WILDERNESS STUDY AREA
NM 020-047

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Socorro District
Jornada Resource Area
Socorro, NM 87801

December, 1982

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LIST OF MAPS

I. GENERAL DESCRIPTION

A. Location

The Devil's Backbone Wilderness Study Area (WSA) is located in central New Mexico, Socorro County. The Study Unit is situated 15 air miles southwest of the community of Socorro.

Applicable USGS Topographic Maps:

Names: Puertecito Gap (7½")
South Baldy (7½")

B. Climate and Topography

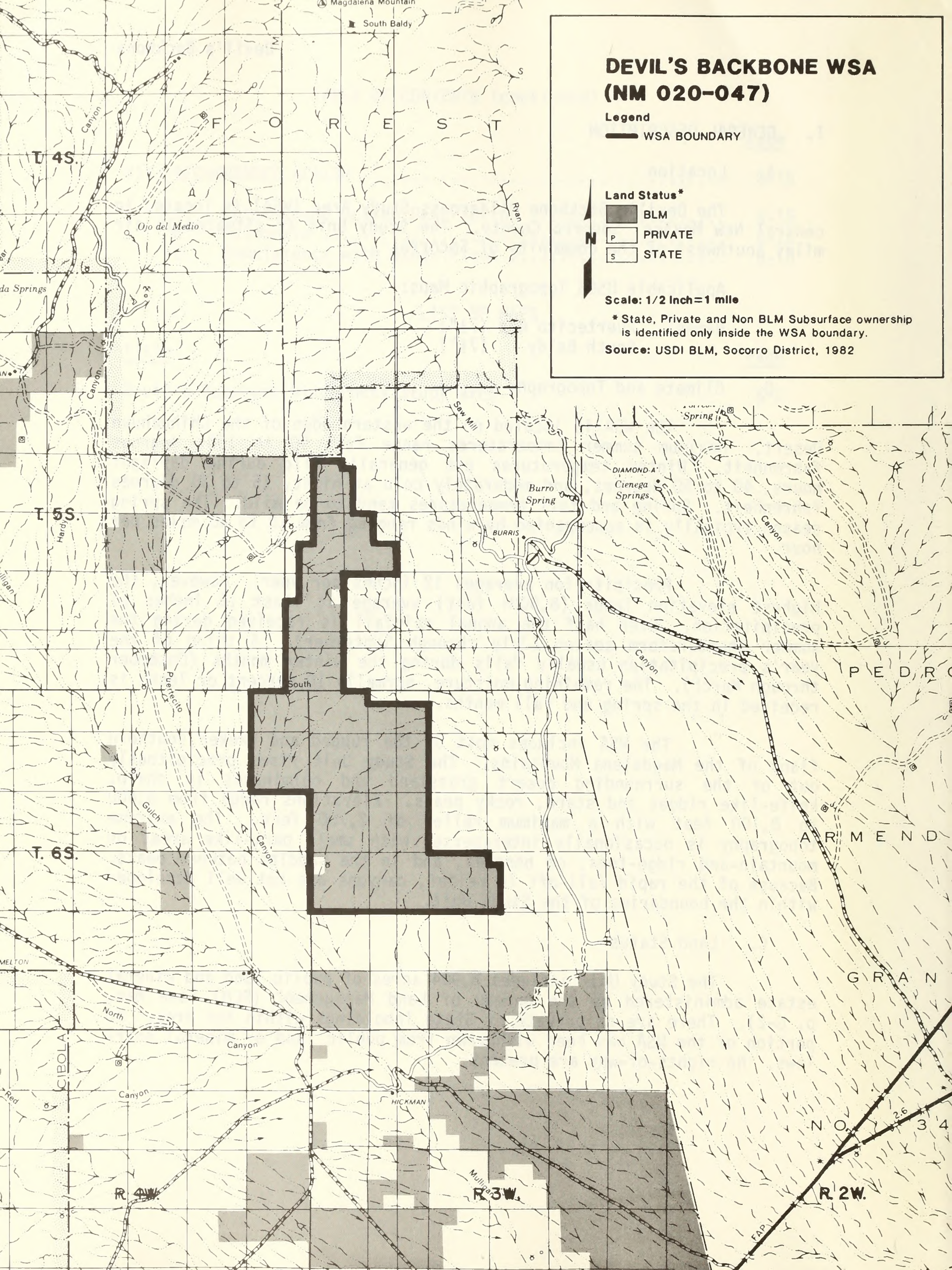
The WSA is located on the western edge of the Chihuahuan Desert. Maximum summer temperatures range from 90 to 100+ degrees fahrenheit. Winter temperatures are generally mild during daylight hours, 40 to 50 degrees, and moderately cold at night, 15 to 30 degrees fahrenheit. Spring and fall temperatures tend to be mild. The spring season typically is accompanied by winds ranging from 10 to 40 miles per hour.

Precipitation averages 12 inches per year. However, the highest elevation lands (8,000+ feet) average at least 16 inches of precipitation. Over half the annual rainfall is received during the summer thunderstorm season (July through September). A third of the year's precipitation usually falls during the winter months (December through March). The remaining moisture, normally 10 percent or less, is received in the spring and fall months.

The WSA includes most of the rugged and broken southern flank of the Magdalena Mountains. The Study Unit rises precipitously out of the surrounding desert grassland and culminates in sharp, knife-like ridges and stark, rocky peaks. Elevations range from 5,400 to 8,100 feet with a maximum relief of 2,700 feet. The extreme topography is occasionally interspersed with small park-like areas on mountain-and ridge-tops, on benches, and in the saddles between peaks. Because of the rapid fall-off in relief, canyons are not well developed within the boundaries of the Study Unit.

C. Land Status

The Study Unit includes 8,904 acres of public land and mineral estate administered by the Bureau of Land Management (BLM) (see Map, p. G-2). There are no private or State inholdings within the area. No portion of the WSA has been withdrawn from public land or mineral entry laws. No rights-of-way are present.


DEVIL'S BACKBONE WSA
(NM 020-047)
Legend
WSA BOUNDARY
Land Status*
BLM
PRIVATE
STATE
N
Scale: 1/2 Inch=1 mile
* State, Private and Non BLM Subsurface ownership is identified only inside the WSA boundary.
Source: USDI BLM, Socorro District, 1982
Magdalena Mountain
South Baldy
F O R E S T
T. 4S.
T. 5S.
T. 6S.
Ojo del Medio
Canyon
Ryan
Saw Mill
Burro Spring
DIAMOND A
Cienega Springs
BURRIS
Spring
Hardy
Puertecito
South
Gulch
Canyon
P E D R O
A R M E N D
G R A N
N O
3 4
MELTON
North
Canyon
Canyon
Red
CIBOLA
HICKMAN
Mulligan
R 4 W.
R 3 W.
R 2 W.
FAP
2.6

D. Access

There is no legal access to the WSA.

II. EXISTING RESOURCES

A. Geology

The geology of the WSA consists of Mid-Tertiary volcanic rocks of the Mogollon-Datil Province. The structure of the Study Unit is influenced by Mid-Tertiary emplacement of plutons, which are subsurface bodies of igneous rock, and cauldrons, which are features resulting from the lowering along steep ring fractures of more or less cylindrical blocks of the earth's crust. The volcanic rocks of the WSA were formed from lavas erupted along the fractures associated with the cauldrons, each of which produced a distinctive type of lava. In addition, lavas of different compositions were erupted during different periods of time. Basaltic rocks were produced from cauldrons active 30-39 million years ago, and rhyolite, quartz latite and basaltic andesite were erupted 20-30 million years ago.

B. Water

Surface Water

The WSA is located in the Rio Grande Basin. There are no permanent streams or surface water bodies within the Study Unit. However, the normally dry arroyos occasionally carry storm runoff to the Rio Grande immediately after rainfall within their respective drainage areas. Periods of flow are short and may be widely spaced in time due to intermittent and sporadic rainfall patterns. Runoff averages 0.1-0.5 inches per year.

Groundwater

There are no developed groundwater sources within the Study Unit. Groundwater in Antelope Well, which is located adjacent to the WSA's southwestern boundary, is considered as representative of the area. Analysis of groundwater samples taken from this well indicates it is suitable water quality for livestock purposes.

C. Soils

Approximately 85 percent of the soils in the WSA are shallow gravelly and stoney loams derived from volcanic material. The remaining 15 percent are deep gravels on low ridges with small areas of deep loams in swale areas. Slopes in the WSA range from 15 to 75 percent. Rock outcrops occur on the ridge tops and along some of the steep side slopes.

D. Vegetation

The Devil's Backbone WSA lies entirely within a grassland vegetative type with plant species composition influenced by elevation. The principal plant species found in the lower elevations include black grama, poverty three-awn, side-oats grama, fluffgrass, burrograss and galleta grass. A minor percentage of the lower elevation plant composition may be attributed to woody vegetation with Apache-plume and four-wing saltbush the primary representatives of this group.

Mid-elevational plant species are primarily blue grama, hairy grama, little blue stem, Arizona fescue, mountain mahogany, shrub live-oak, sotol, and alligator juniper. In addition to the previous species, the highest elevations are characterized by scattered stands of pinyon and ponderosa pine, as well as a few isolated Douglas fir on the highest north-facing slopes.

Threatened or Endangered (T&E) Plant Species

The U.S. Fish and Wildlife Service (FWS) has not listed any T&E plant species that may occur in the WSA. The Study Unit does contain habitat which offers potential for the occurrence of four Federally listed and seven State listed species of T&E plants. A list of these potentially occurring plants is available on request from the Socorro District Office (DO).

E. Wildlife

Two Standard Habitat Sites (SHS's) have been identified within the WSA. The habitat sites are based on the combination of dominant vegetation and landform. The SHS's support 194 wildlife species, which include 50 mammal species, 50 reptiles and amphibians, and 94 resident and migratory bird species. A complete list of wildlife species to be found within the WSA is on file in the Socorro DO.

Big game species indigenous to the WSA are mule deer and antelope. Mule deer in the Study Unit's core mountain area are abundant relative to the surrounding region. Estimated deer densities for this portion of the WSA are three animals to the square mile. Antelope are relatively abundant in the surrounding grassland areas at the base of the mountains along the WSA's periphery.

The most common predator is the coyote. The rocky slopes and bluffs also provide habitat for bobcat and gray fox. Mountain lion may occasionally range into the WSA. Common small mammals include desert cottontails, prairie dogs, black-tailed jackrabbits, white-throated woodrats, deermice and ground squirrels.

The mountainous topography and numerous rock outcrops are attractive to birds of prey. One golden eagle eyrie is known to be present in the WSA. Other birds which are commonly sighted include red-tailed hawks, sparrowhawks, horned larks, pinyon jays and ravens.

Reptiles likely to be encountered are the collared lizard, eastern fence lizard, bullsnake, and the western diamond-backed rattlesnake.

Threatened or Endangered Wildlife Species

The FWS furnished the BLM information about one Federally listed endangered animal species, the American peregrine falcon (Falco peregrinus anatum), which may occur in the WSA. This species was included in a biological assessment (BLM 1982) which concluded that the Study Unit provides poor quality nesting habitat and there are no current or historically occurring eyries. In addition, little potential habitat exists for supporting migrating individuals as the Study Unit lacks a sufficient prey base and available water.

Designation of Devil's Backbone WSA as a wilderness or managing the area for undesignated multiple-use would have no adverse or beneficial affect on peregrine falcons. The biological assessment and related correspondence are on file in the Socorro DO.

F. Visual

The WSA includes the rugged, grass dominated southern flanks of the Magdalena Mountains. Topographic relief is dramatic, landscape diversity is high, and scenic vistas from within the Study Unit are characteristically spectacular, especially during morning and evening hours.

G. Cultural

No cultural sites have been recorded within the WSA. Seven sites have been recorded within a 12-kilometer radius of the Study Unit. These site types vary from lithic scatters to historic habitation sites with temporal spans ranging from 4000 B.C. to 1930's historic structures. Although cultural sites are certain to be present within the WSA, density is anticipated to be low.

No concerns have been expressed by the Native American groups contacted for this Study Unit.

H. Air

The air quality of the WSA is excellent. It is generally affected only by the occurrence of wind blown sand during the spring.

III. EXISTING AND POTENTIAL USES

A. Mineral Development

The information in the following section is mostly abstracted from a draft report prepared by Geoexplorers International Inc., entitled "Geology, Energy and Mineral Resources Assessment in the Armendaris Area, New Mexico." This report is available for inspection at the Socorro DO.

1. Leasable

a. Oil and Gas

Four non-competitive oil and gas leases have been issued within the WSA. All leases are recently issued and subject to Interim Management Policy (IMP) and Guidelines for Lands Under Wilderness Review (BLM 1979). No exploration or development for oil and gas has occurred in the Study Unit to date.

The Study Unit is located in a Class IV favorability area, the least favorable class for discovery of oil and gas. Paleozoic formations underlying the area include adequate source and reservoir rocks, but faulting associated with the cauldron formation and the Rio Grande rift preclude entrapment of oil and gas in significant quantities. The Study Unit is considered to have low potential for the production of these resources.

b. Geothermal

There are no geothermal leases within the boundaries of the Study Unit, and no exploration or development has occurred. The WSA is within the Socorro Peak Geothermal Leasing Area.

Although the WSA has a heat flow which suggests a somewhat anomalous heat source, there is no evidence of underlying magma chambers as in the Socorro Known Geothermal Resource Area to the north. In addition, no warm springs are known to exist in the Study Unit. The area is considered to be unfavorable for discovery of geothermal resources.

2. Locatable

There are no valid claims within the Study Unit. The WSA has potential for the occurrence of the following locatable minerals:

a. Manganese

The volcanic rocks within the WSA are favorable for the occurrence of hydrothermal manganese deposits. One known manganese occurrence is within a mile of the WSA and one is within the WSA, but there has been no production from either location. The Study Unit was intensely prospected during the 1940's and 1950's, and no major deposits were discovered. The WSA is considered to have low favorability for discovery of manganese deposits.

b. Gold

There has been minor gold production to the north and west of the Study Unit from volcanic rocks similar to those in the area. The Study Unit does not contain any known gold occurrences and is considered to have low favorability for discovery of gold deposits.

c. Uranium

The Santa Fe formation could be a host for stratabound uranium deposits because it contains uranium-rich volcanic source rocks, permeable horizons, and may contain reactants such as organic matter. The WSA is partly underlain by Santa Fe formation but it is unlikely to be very thick. The Study Unit is considered to have low favorability for the occurrence of uranium.

d. Kaolin

At Socorro Peak, to the north of the WSA, rhyolite has been hydrothermally altered to kaolin. Hydrothermal alteration of the volcanic rocks within the WSA could have caused kaolinization. The Study Unit is considered to have low favorability for such occurrences.

3. Saleable

No material sales have been conducted within the WSA, and no future sales are anticipated. Potential saleable materials include sand, gravel and crushed rock. However, the lack of local demand, poor access to the Study Unit, and the existence of similar materials in more accessible areas makes development of these resources unlikely.

B. Watershed

The WSA is located within the Puertecito Gap Watershed. It is characterized by a complex of different soils, slopes and exposures. Physiographic features include pediment slopes, rolling hills and mountain slopes. The majority of soils are coarse textured with moderate to slow permeability and high runoff potential. Current erosion conditions for most of the WSA are rated as stable and slight. There are only small areas where erosion is expected to increase. There are no water control structures or land treatments within the WSA.

C. Livestock Grazing

Four grazing allotments lie partially within the Study Unit. The names and acreage percentages of each allotment which lies within the WSA include: the SO Allotment (16.4), VL Allotment (11.5), Antelope Well Allotment (.44), and Puertecito Gap Allotment (41.8). The SO Ranch, VL Ranch and the Antelope Well Allotments are owned and operated collectively by one allottee. The Puertecito Gap Allotment is a separate ranching unit. All four allotments are run as cow-calf operations.

Existing rangeland developments within the WSA include approximately seven miles of barbed wire fencing, five miles of two-track vehicle route, one earthen stock tank, one mile of buried water pipeline, and two drinking troughs.

Allottees periodically inspect and maintain as necessary the developments through the use of motor vehicles with the exception of fence maintenance which is performed primarily by horseback.

D. Recreation

Although the WSA is relatively close to Socorro in terms of air miles, it is an isolated, difficult-to-reach area in terms of on-the-ground access.

Existing recreational use of the Study Unit is low except during the deer hunting season, when moderate use occurs. In addition to deer hunting, existing primitive recreational use is limited to occasional day hikes. Potential primitive recreation opportunities include horseback riding, backpacking, environmental exploration, natural history activities (e.g., birdwatching), landscape and nature photography.

The recreational use of the WSA is not expected to increase within the foreseeable future.

E. Education/Research

The Study Unit is not currently being utilized for any known research or educational purpose.

The WSA lies in an ecotone between various elements of the Chihuahuan Desert, the Colorado Plateau, and the Upper Gila Mountains Forest ecological provinces. Research and environmental education potential for ecosystem studies may be high.

F. Wildlife

The WSA was included in the Nogal Canyon Habitat Management Plan (1981). Five wildlife water catchments (inverted umbrella type) were installed in the Study Unit as proposed by the plan in 1981 and 1982. No additional habitat improvements are planned for the WSA.

The WSA has not been identified by the New Mexico Department of Game and Fish for the reintroduction of any species.

IV. WILDERNESS CRITERIA

A. Evaluation of Wilderness Values

1. Quality of Mandatory Wilderness Characteristics

a. Naturalness

The majority of the WSA is free of human intrusions. However, a water pipeline crosses the northern third of the Study Unit which has adversely affected the naturalness values. Installation of the pipeline resulted in considerable surface disturbance (cuts with a bulldozer are common) which would be difficult to rehabilitate. In addition, a substantially noticeable jeep trail runs south into the WSA for a distance of one mile.

With the exception of the above intrusions, human impacts to the WSA are for the most part insignificant. They include: five wildlife water catchment structures, one earthen stock tank, seven miles of fencing, and three and one-half miles of two-track vehicle routes. The majority of these intrusions are located along the unit's periphery. Except for allotment fencing, the southern half and northern quarter of the WSA are highly natural.

b. Solitude

The WSA is isolated, little visited, difficult to access, and rugged. The Study Unit's topographic diversity and geographic setting provide for outstanding opportunities for solitude.

c. Primitive/Unconfined Recreation

The Devil's Backbone WSA is not a typical primitive recreation area. There are few trees, water is scarce, and rocks, rattlesnakes and grasses predominate. Although wildlife, relative to most desert areas, is abundant, it tends to be elusive.

The scenic values of the Study Unit, especially in terms of scenic vistas from within the area, are appealing. However, being a rugged desert range, the WSA is not often considered recreationally inviting. The only exception is for deer hunting. This situation not withstanding, the WSA can provide visitors with the opportunity to experience a natural desert mountain environment suited to day hiking, backpacking, horseback riding, nature and landscape photography, natural history activities (e.g., birdwatching) and environmental exploration. The area is most attractive to these recreational pursuits during off-season (late fall and winter).

2. Special Features

None

3. Multiple Resource Benefits

The Study Unit contains a variety of natural resource values as a result of its undisturbed character. Designation of the WSA as wilderness would provide a greater degree of long-term protection for these natural values than would administrative designations available to the BLM.

A more detailed discussion of multiple resource benefits may be found under the impacts of the All Wilderness Alternative.

4. Diversity

a. Ecosystems Present

The Bailey-Kuchler Ecoregion Classification System has been used to ensure consistency between documents. It should be noted that different classifications systems measure vegetation using different parameters and will result in varying acreage figures.

The Devil's Backbone WSA lies in an ecotone between various elements of the Chihuahuan Desert, the Colorado Plateau and the Upper Gila Mountains Forest Provinces as identified in the Bailey-Kuchler Ecoregion Classification System. In addition, all three provinces meet near the geographic extremes of their respective ranges in the WSA. The likelihood this integration of major ecosystems may produce unusual ecological associations is high.

Three sections of two provinces are represented within the WSA: the Grama-Tobosa (1,904 acres) and Tarbush-Creosote Bush (2,000 acres) of the Chihuahuan Desert, and the Grama-Galleta Steppe/Juniper-Pinyon Woodland Mosaic (4,000 acres) of the Colorado Plateau. The Upper Gila Mountains Forest Province includes 1,000 acres.

b. Distance from Population Centers

Two cities, Albuquerque, New Mexico and El Paso, Texas, identified in the 1980 census as Standard Metropolitan Statistical Areas (SMSAs), are located within three hours' driving time of the WSA.

B. Manageability

To be recommended for wilderness designation, the Devil's Backbone WSA must be capable of being effectively managed as wilderness. Manageability is a judgment made by the BLM after considering such factors as private and State inholdings, valid existing rights, topography and the overall land ownership pattern.

Valid existing rights in the Study Unit consist of grandfathered livestock operations. Required access for the maintenance of most existing rangeland developments such as stock tanks and fences is not expected to create problems for wilderness management. However, the buried water pipeline which bisects the northern portion of the WSA presents a serious manageability problem. Because of the rugged, rocky terrain of the WSA, the maintenance frequency of this pipeline route is high. A high maintenance frequency which necessitates the use of motor vehicles in a wilderness candidate the size and land status configuration of the WSA encumbers the naturalness values of the area to an undesirable degree.

No mining claims are present within the WSA. Four oil and gas leases have been issued within the Study Unit but all are subject to the IMP wilderness protection stipulations.

The WSA boundary is set entirely on legal subdivision lines and, therefore, is arbitrary from a topographic standpoint. This would not be a liability if the Study Unit included the mountainous southern flank of the Magdalena Mountains in its entirety but this is not the case. If designated wilderness, the Devil's Backbone WSA would require land acquisition to consolidate unit integrity.

V. PUBLIC INVOLVEMENT OVERVIEW

Public involvement in the wilderness inventory and study process has, with few exceptions, indicated support for designation of the Devil's Backbone WSA as a wilderness area. Reasons cited have concentrated on the Study Unit's naturalness and solitude values.

Opposition to designation of the area has been minimal. One grazing allottee submitted a proposed wilderness boundary which would essentially exclude his allotment.

VI. ALTERNATIVES AND IMPACTS

This section will discuss two alternatives (management options) that could be applied to the WSA. These alternatives include: All Wilderness and No Action (No Wilderness).

A. All Wilderness

This alternative would recommend the entire 8,904-acre WSA for inclusion in the National Wilderness Preservation System. If designated, the area would be managed pursuant to the guidelines and mandates of the Wilderness Act of 1964 and the Final Wilderness Management Policy published in the Federal Register September 24, 1981 (Vol. 46, No. 185).

1. Impacts to Minerals

If the WSA is recommended as suitable for wilderness designation, a U.S. Geological Survey and U.S. Bureau of Mines mineral-energy survey would be conducted to supplement current data regarding the mineral-energy occurrence potential for the area.

Leasable

a. Oil and Gas

The geologic environment of the WSA has a low potential for economically recoverable oil and gas reserves. Therefore, denying exploration/development would likely have little or no impact on oil and gas development in the Study Unit.

Designating the WSA a wilderness would likely preclude any serious oil and gas exploration/development within the area. However, due to the relatively narrow width of this Study Unit, much of the area's oil and gas reserves, if present, could be tapped through use of slant drilling techniques or by drainage.

b. Geothermal

The Study Unit has low potential for the development of geothermal resources. Wilderness designation would have little or no impact on geothermal resource development.

Locatable

Manganese is known to occur in the Study Unit, and the potential exists for occurrences of gold, uranium and kaolin. Based on current information, wilderness designation would have little impact, since most of the known deposits of these minerals in areas surrounding the WSA tend to be small and are not economical to mine. Should large deposits be found or a significant rise in the price of these commodities occur, wilderness designation would prevent development of these resources. In addition, manganese is a strategic metal for which the United States is 100-percent dependent on imports. During a period of national emergency or a cutoff of supplies, manganese would probably be mined without consideration of economics.

Saleable

The WSA contains sand, gravel and sources of crushed rock, but inaccessability probably would preclude development.

2. Impacts to Other Resources and Uses

Livestock Grazing

Domestic livestock grazing is a permissible and compatible resource use within wilderness. However, wilderness designation would have an impact on grazing use by narrowing the range of management options available to allottees and the BLM. For example, the installation of new rangeland development structures would be restricted by wilderness designation to those improvements which primarily benefit the natural rangeland values of the wilderness resource. This would impose limitations on vehicular access, and may increase the costs in constructing or maintaining new rangeland developments since visual impacts would be considered in their location and design. Under wilderness designation, more emphasis would be placed on using natural materials (e.g., wood and native rock as opposed to steel and concrete) in replacing deteriorated developments or constructing new developments. The use of such materials would be preferred, providing that unreasonable, additional construction or maintenance costs are not imposed upon the allottee.

It is difficult to assess how the above limitations would affect livestock grazing in the WSA because the nature and location of future rangeland developments are not known. However, given the existing ecological range condition, present livestock distribution patterns and the potential production of range sites in the WSA, it is anticipated that impacts to grazing management would be low to moderate.

Wilderness designation would not result in the reduction of existing livestock stocking levels to improve wilderness values. Existing rangeland developments would not be removed so long as they are necessary to ranch operations. Vehicle routes necessary to maintain existing developments would remain open to use by area allottees only.

Wildlife

The designation of the entire Study Unit would permanently preserve 8,904 acres of wildlife habitat. The natural distribution and abundance of wildlife species would be maintained.

Designation of the WSA as wilderness would result in the imposition of restrictions regarding the placement of wildlife waters and vegetative manipulation projects for improving wildlife habitat. However, wilderness status would not totally preclude the establishment of wildlife water sources. A small number of wildlife drinkers could be placed in the wilderness, provided they enhance the natural values of the area, were substantially unnoticeable, and did not require routine access and maintenance with motorized vehicles.

Small scale vegetative manipulation projects would not be precluded by wilderness designation. For example, seeding portions of the WSA in native browse species (e.g., mountain mahogany) to improve deer habitat could be undertaken.

The impact of wilderness designation on wildlife management activities in the WSA is anticipated to be low.

Soils/Watershed

Designation of the WSA would maintain or enhance the existing soil and watershed conditions by precluding significant surface disturbance and preserving the natural ground cover of the Study Unit.

Cultural Resources

No known cultural sites are documented within the WSA. However, the likelihood sites exist in the Study Unit is high with overall site density projected to be low. The significance of potential sites could range from lithic scatters to paleo-Indian sites. Wilderness designation would protect potential sites within the area as well as the environmental context in which they occur. Because the cultural values of the Study Unit are unknown, however, impacts cannot be further assessed.

Wilderness designation would restrict but not preclude archaeological stabilization, excavation, and research within the WSA. These activities may be permitted on a case-by-case basis where the project can be adequately justified and will not significantly degrade the wilderness resource of the area.

If cultural sites are present in the WSA, the inclusion of the Study Unit in the National Wilderness Preservation System would enhance the scientific and educational values of those sites by preserving a relatively undisturbed environment from which the human ecology of the area during previous occupational periods could be more accurately reconstructed.

Scenic Values

The scenic values of the Study Unit would be permanently preserved by wilderness designation.

Recreation

Designation would permanently preserve a desert mountain landscape suitable for primitive recreational uses such as hiking, backpacking, and horseback riding. Vehicle associated recreation use would be precluded but such use is presently low. Wilderness designation would restrict vehicular access to the area by deer hunters during the hunting season. Recreational use is not expected to increase dramatically if the WSA is designated wilderness.

B. No Action

This alternative would return the Devil's Backbone WSA to undesignated multiple-use management. The Study Unit would be managed according to the prescriptions contained in the Stallion Management Framework Plan. The major thrust of management for the WSA would be the development of rangeland resources, possible mineral exploration and development, and other traditional multiple uses of the public lands.

1. Impacts to Wilderness Values

The most probable uses of the WSA under this alternative, would be continued livestock grazing and occasional recreation use (primarily deer hunting).

Future management actions by the BLM within the Study Unit that are likely to occur include the installation of rangeland developments and watershed control structures. Although such actions, if assessed and mitigated individually, may not significantly impact wilderness values, the cumulative effect of these projects on the wilderness resource would likely prove significant.

Non-wilderness designation is not expected to result in the development of oil, gas, geothermal, mineral, or other resources within the unit. However, oil, gas, or geothermal exploration could take place within the WSA.

2. Impacts to Other Resources and Uses

Minerals/Energy

The No Action alternative will have no impact on minerals and energy resources. Mineral activity will probably continue to occur at historical levels, under the laws and regulations relating to mineral appropriation on the public lands.

Livestock Grazing

If the entire WSA is released from further wilderness consideration and returned to undesignated multiple-use management,

intensive management techniques could be applied and new rangeland development structures installed, such as water pipeline projects or land treatments. The WSA would be released from the restrictions imposed by the IMP for lands under wilderness review.

Wildlife

This alternative would allow a wider range of wildlife management actions such as vegetative manipulation projects. If future management actions are balanced, wildlife values would be maintained or enhanced. If mineral exploration occurs and new roads constructed, wildlife values could be impacted.

Soils/Watershed

Impacts are anticipated to be minor unless mineral exploration and development occurs. In the latter event, disturbance to soil and watershed values would likely result in increased rapid water runoff and erosion.

Cultural Resources

Given existing data, the probability for significant impacts to cultural resources is low.

Scenic Values

The WSA is considered to possess high scenic values. If returned to undesignated multiple-use management, the maintenance of these values could not be assured. Although no serious mining activity is anticipated in the Study Unit, speculation-oriented mining activity could degrade the scenic resource values of the WSA.

Recreation

The WSA is not expected to receive high levels of use by recreationists regardless of how it is managed. However, non-designation of the Study Unit would narrow the spectrum of recreational opportunities available to backcountry users.

VII. RECOMMENDED ACTION

A. Recommended Action Description

Wilderness Study Unit NM 020-047 Devil's Backbone is recommended as unsuitable for inclusion in the National Wilderness Preservation System.

B. Rationale

The Devil's Backbone WSA would be extremely difficult to manage as wilderness. The boundary of the Study Unit is irregular, difficult to locate on the ground, and less than one mile wide near its center. Second, the WSA is effectively divided into two areas by a

water pipeline and an associated vehicle route with a high maintenance frequency that not only reduces area manageability but also the naturalness of the Study Unit. Third, designation of the WSA as wilderness would require the BLM to attempt to acquire, through voluntary exchange, State and private lands since the WSA is not a topographically identifiable land unit with recognizable boundaries.

The other consideration is the likelihood the environment of the WSA would not be substantially altered by reversion to undesignated multiple-use land status.

C. Consistency with Other Plans

The recommended action would not conflict with any known county, State, or Federal land-use plans.

WILDERNESS ANALYSIS REPORT
JORNADA DEL MUERTO WILDERNESS STUDY AREA
NM 020-055

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Socorro District
Jornada Resource Area
Socorro, NM 87801

December, 1982

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I. GENERAL DESCRIPTION

A. Location

The Jornada del Muerto (Journey of Death) Wilderness Study Area (WSA) is located in south-central New Mexico in Socorro and Sierra Counties. The Study Unit is situated 45 air miles south-southeast of the community of Socorro.

Applicable USGS Topographic Maps:

Names: Val Verde (15")
Malpais Well (15")

B. Climate and Topography

The WSA is located within the Chihuahuan Desert. Maximum summer temperatures range from 95 to 105 degrees fahrenheit. Winter temperatures are generally mild during daylight hours, 45 to 60 degrees, and moderately cold at night, 15 to 30 degrees fahrenheit. Spring and fall temperatures tend to be mild. The spring season typically is accompanied by winds ranging from 10 to 50 miles per hour.

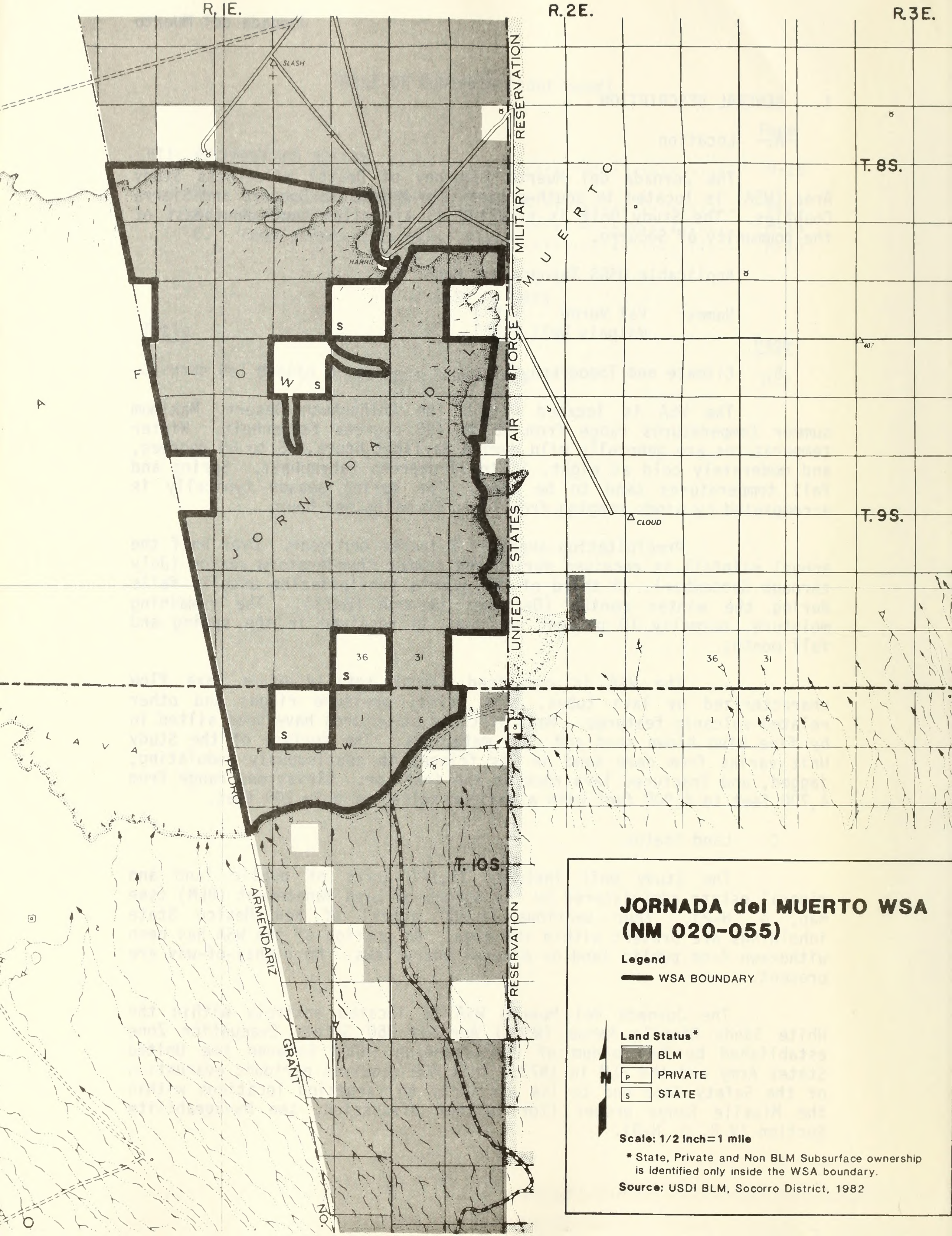
Precipitation averages 8 inches per year. Over half the annual rainfall is received during the summer thunderstorm season (July through September). A third of the year's precipitation usually falls during the winter months (December through March). The remaining moisture, normally 10 percent or less, is received in the spring and fall months.

The WSA is comprised almost totally of a lava flow characterized by lava tubes, sink holes, pressure ridges and other related volcanic features. Many of these structures have been silted in by fine wind blown sand and clay materials. The surface of the Study Unit varies from deep sand on its fringes to continuously undulating, jagged, and fractured lava rock in the interior. Elevations range from 4,700 feet to 4,900 feet with a maximum relief of only 200 feet.

C. Land Status

The Study Unit includes 31,147 acres of public land and mineral estate administered by the Bureau of Land Management (BLM) (see Map, p. H-2). Four sections (2,560 acres) of New Mexico State inholdings are present within the area. No portion of the WSA has been withdrawn from public land or mineral entry laws. No rights-of-way are present.

The Jornada del Muerto WSA is located entirely within the White Sands Missile Range (WSMR) Aerobee 350 Safety Evacuation Zone established by Memorandum of Understanding (MOU) between the United States Army and the BLM in 1973. This MOU requires periodic evacuation of the Safety Zone due to its proximity to targeting locations within the Missile Range proper (for further discussion, see Manageability Section IV B, p. H-9).



JORNADA del MUERTO WSA
(NM 020-055)
Legend
WSA BOUNDARY
Land Status*
BLM
PRIVATE
STATE
N
Scale: 1/2 Inch=1 mile
* State, Private and Non BLM Subsurface ownership is identified only inside the WSA boundary.
Source: USDI BLM, Socorro District, 1982
R. I E.
R. 2 E.
R. 3 E.
T. 8 S.
T. 9 S.
T. 10 S.
UNITED STATES AIR FORCE MILITARY RESERVATION
JORNADA DEL MUERTO
FLOW
LAVA FLOW
PEDRO ARMENDARIZ GRANT NO.
SLASH
HARRIE
CLOUD
36
31
1
6
S

D. Access

Primary legal access to the WSA is provided by U.S. Highway 380 on the north then south on County Roads 2268 and 2322.

II. EXISTING RESOURCES

A. Geology

The geology of the WSA is associated with the Jornada del Muerto syncline and the Tularosa Basin graben. Faulting and folding began in the Early Tertiary with major deformation occurring in Middle Tertiary time. The Study Unit consists of the eastern half of the 0.76-million-year-old Jornada basalt flow. The flow is composed of permeable dark vehicular basalt less than 100 feet thick. The source of the flow, a crater 500 feet high and one mile in diameter, is located one mile west of the WSA, almost in the center of the lava flow. Geologic formations found in the Study Unit include the Quaternary age basalt underlain by Quaternary age alluvium and the Upper Tertiary age Santa Fe formation. Local windblown sand, silt and alluvium partially mantle the surface of the lava flow.

B. Water

Surface Water

The Jornada del Muerto WSA is located within the Jornada del Muerto Basin, a broad aggraded basin having poorly defined drainage except at central areas of subsidence. There are no permanent streams or surface water bodies within the Study Unit.

Groundwater

The only developed groundwater source within the WSA is Baca Well which is suitable for livestock use. The groundwater available in the Study Unit would be found in formations under the Jornada basalt flow. The basalt is underlain by Quaternary age alluvium and riverine gravels up to 100 feet thick, which can yield small to large quantities of water. The alluvium overlies clay, silt, sand and gravels of the Upper Tertiary age Santa Fe formation which is known to yield small to moderate supplies of good quality water.

C. Soils

Approximately 95 percent of the surface area of the WSA is covered by a lava flow. Basalt rock outcrops cover 60 percent of the Study Unit. Soils within the interior of the flow are primarily composed of wind deposited sand and silt materials mixed with lava. Along the edge of the lava flow are mainly deep sandy soils with inclusions of deep loamy and shallow loamy soils over gypsum.

D. Vegetation

The vegetation of the Study Unit is typical of the Chihuahuan Desert. The area is comprised of the short grass type vegetation

dominated by tobosa, black grama and pappusgrass. Other common grass species include galleta, sand dropseed, fluffgrass and various species of three-awns. Four-wing saltbush, creosote bush, Apache-plume, Mormon tea, soap tree yucca, broom snakeweed, cholla, prickly pear, and other cactus species are also commonly encountered.

Threatened or Endangered (T&E) Plant Species

The U.S. Fish and Wildlife Service (FWS) has not listed any T&E plant species that may occur in the WSA. The Study Unit does contain habitat which offers potential for the occurrence of one Federally listed endangered plant species. Additional information on this potentially occurring plant is available on request from the Socorro District Office (DO).

E. Wildlife

One Standard Habitat Site (SHS) has been identified within the WSA. The habitat site is based on the combination of dominant vegetation and land form. The SHS supports 93 wildlife species, which include 24 mammal species, 31 reptiles and amphibians, and 38 resident and migratory bird species. A complete list of wildlife species to be found within the WSA is on file in the Socorro DO.

Big game species indigenous to the WSA are antelope and mule deer. Antelope are relatively abundant in the WSA. Mule deer densities are extremely low.

The most common predator is the coyote. Gray fox and badgers also inhabit the WSA. Common small mammals include desert cottontails, black-tailed jackrabbits, white-throated woodrats and kangaroo rats.

The most common raptor species is Swainson's hawk. Golden eagles, red-tailed hawks and marsh hawks are also frequently sighted.

Dark colored varieties of a number of lizards are known to occur in the lava flow as well as a dark colored variety of western diamond-backed rattlesnake.

Threatened or Endangered Wildlife Species

The FWS furnished the BLM information about one Federally listed endangered animal species, the American peregrine falcon (Falco peregrinus anatum), which may occur in the WSA. This species was included in a biological assessment (BLM 1982) which concluded that the Study Unit provides poor quality nesting habitat and there are no current or historically occurring eyries. In addition, little potential habitat exists for supporting migrating individuals as the Study Unit lacks a sufficient prey base and available water.

Designation of Jornada del Muerto WSA as a wilderness or managing the area for undesignated multiple-use would have no adverse or beneficial affect on peregrine falcons or potential habitat. The biological assessment and related correspondence are on file in the Socorro DO.

F. Visual

The WSA is an expansive desertland environment characterized by little topographic relief but considerable landscape diversity. The Study Unit is a grassland lying in a rugged, broken lava flow in the center of a large desert bolson surrounded by distant mountain ranges.

G. Cultural

The WSA has not been inventoried for cultural resources. Only one cultural site has been recorded within the Study Unit which consists of a small lava shelter, rock room outlines, basalt cairns, and associated artifacts. Additional sites are certain to be present within the Study Unit but predicting site density and significance is impossible without further inventory. A folsom projectile point, historic structures, and other artifacts have been located just outside the WSA. This suggests the cultural resources of the Study Unit could span 10,000 years of human occupation.

No concerns have been expressed by the Native American groups contacted for this Study Unit.

H. Air

The air quality of the WSA is excellent. It is generally affected only by the occurrence of wind blown sand during the spring.

III. EXISTING AND POTENTIAL USES

A. Mineral Development

The information in the following section is primarily abstracted from a draft report prepared by Geoexplorers International, Inc., entitled "Geology, Energy and Mineral Resources Assessment in the Armendaris Area, New Mexico." This report is available for inspection at the Socorro DO.

1. Leasable

a. Oil and Gas

Six non-competitive oil and gas leases have been issued within the WSA. All leases are recently issued and are subject to Interim Management Policy (IMP) and Guidelines for Lands Under Wilderness Review (BLM 1979). No exploration or development for oil and gas has occurred in the Study Unit to date.

There are no known oil and gas reserves within the Study Unit, but the possibility exists that such reserves are present. The WSA is located in the northern half of the Jornada del Muerto Exploration Area which has a Class III favorability rating in a system where Class I is most favorable and Class IV least favorable. Anticlines present on the northern end of the exploration area have been tested with negative results (Foster and Grant 1974).

b. Geothermal

There are no geothermal leases within the boundaries of the Study Unit, and no exploration or development has occurred. The northern half of the WSA is within the Socorro Peak Geothermal Leasing Area.

The potential for undiscovered geothermal resources is difficult to predict due to conflicting evidence. Volcanic activity of the type associated with the Jornada lava flow does not usually produce commercially exploitable geothermal systems. Such lavas erupt from deep seated magma bodies along small, localized fissures and cool rapidly. However, the warm water pumped from Crater Well, which is located 2 miles outside the WSA boundary, indicates abnormal heat flow in the area.

For these reasons, the geothermal potential of the Study Unit cannot be adequately assessed given existing data.

2. Locatable

There are no valid mining claims nor known deposits of locatable minerals within the Study Unit. Gypsum bearing clays occur at the margins of the lava flow but are very impure and unlikely to represent a useful source.

Basalts of the type which comprise the Jornada lava flow rarely have appreciable deposits of metallic or non-metallic minerals. The potential for the development of locatable minerals in the WSA is considered nonexistent.

3. Saleable

No material sales have been conducted within the WSA, and no future sales are anticipated. Lack of demand is undoubtedly due to the extremely isolated location of the lava flow and the existence of similar materials in more accessible areas. If local demand were to develop, the basalt could be used for rip-rap, crushed stone and ornamental rock; but this is unlikely.

B. Watershed

The Jornada del Muerto WSA is located entirely within the Slash Watershed. This Study Unit is in the slight erosion class and has a projected static erosion trend. There are no water control structures nor land treatments within the WSA.

C. Livestock Grazing

Three grazing allotments lie partially within the Study Unit. The names and acreage percentages of each allotment which lies within the WSA include: Malpais (41), Lava Ranch (95), and the Buckhorn Ranch (35). All three allotments are run as cow-calf operations.

Existing rangeland developments with the WSA consist of approximately ten miles of allotment boundary fence, 13 miles of interior fence, 5 miles of two-track vehicle route, one windmill, and 2.5 miles of buried plastic pipeline with three drinking troughs. The latter development is located on the northern periphery of the Study Unit. Rangeland developments on State inholdings within the WSA include one windmill with an earthen stock tank and approximately two miles of buried plastic pipeline with three drinking troughs.

Allottees periodically inspect and maintain as necessary the developments through the use of motor vehicles. Fences are inspected about once a month on horseback and by vehicle.

D. Recreation

The recreational use of the WSA is very low and limited to coyote calling, antelope hunting, and occasional peripherial vehicle sightseeing.

The recreational potential of the Study Unit for typical recreationists is limited. The WSA is not likely to be perceived by most persons as recreationally inviting. For those individuals appreciative of vast, open, expansive landscapes which are challenging, rugged, and remote, primitive recreation opportunities are high for day hiking, horseback riding, natural history activities, landscape and nature (e.g., lava flow geology) photography.

The recreational use of the WSA is not expected to increase substantially within the foreseeable future.

E. Education/Research

The Jornada del Muerto WSA is not currently being utilized for any known educational or research purpose. Due to the scarcity of relatively undisturbed desert grassland environment on public land within New Mexico, the WSA possesses a high research potential for investigations dealing with desert-lava grassland ecosystem functions, such as the relationship of nutrient cycling to system shifts in grass-shrub coverage values.

Environmental education opportunities may be significant for the study of the natural history of desert - lava grassland.

F. Wildlife

Wildlife habitat of the WSA could be improved by providing additional permanent water sources within the lava flow. However, no specific actions are planned for the area at present. The Study Unit has not been identified by the New Mexico Department of Game and Fish for reintroduction of any species.

IV. WILDERNESS CRITERIA

A. Evaluation of Wilderness Values

1. Quality of Mandatory Wilderness Characteristics

a. Naturalness

The imprint of man within the heart of the WSA is light. Intrusions consist of 13 miles of interior fence, one windmill, and approximately five miles of two-track vehicle route. One windmill, an earthen stock tank, two miles of buried water pipeline, three drinking troughs and an associated vehicle access route extends into the northern portion of the Study Unit; however, these intrusions are located on State land or have been corridored out of the WSA. Overall, the naturalness values of the interior of the Study Unit are high.

The periphery of the Study Unit is impacted by 10 miles of fencing and 2.5 miles of buried water pipeline with three drinking troughs. The concentration of rangeland developments along the WSA's periphery detracts from the generally high quality of the area's naturalness values.

b. Solitude

The solitude values of the WSA are outstanding. The area lies in one of the most remote, little visited regions of New Mexico. It is a vast, rugged lava landscape surrounded by grassland desert and distant mountain ranges.

c. Primitive/Unconfined Recreation

The WSA is an atypical wilderness candidate. There are no mountains within the Study Unit, no natural water, no trees, and its scenic beauty requires a trained eye to appreciate. It is rugged and challenging with little to compensate the recreationist except solitude. For those persons who appreciate expansive and isolated desert environments, however, the recreational values of this Study Unit would be considered high. But for the average individual, the WSA would likely prove unattractive for backcountry use.

The Study Unit is well suited to off-season (late fall and winter) recreational use.

2. Special Features

None.

3. Multiple Resource Benefits

The Study Unit contains a variety of natural resource values as a result of its undisturbed character. Designation of the WSA as wilderness would provide a greater degree of long-term protection

for these natural values than would the administration designations available to the BLM.

A more detailed discussion of multiple resource benefits may be found under the impacts of the All Wilderness Alternative.

4. Diversity

a. Ecosystems Present

The Bailey-Kuchler Ecoregion Classification System has been used to ensure consistency between documents. It should be noted that different classification systems measure vegetation using different parameters and will result in varying acreage figures.

The Jornada del Muerto WSA lies entirely within the Chihuahuan Desert Province of the Bailey-Kuchler Ecoregion Classification System. Both sections of the province are represented within the Study Unit: the Grama-Tobosa (25,000 acres) and the Tarbush-Creosote Bush (6,147 acres). The WSA's Chihuahuan Desert associations, however, are strongly influenced by the unique edaphic, hydrological, and structural characteristics of the lava flow. For example, soap tree yucca occur on the periphery of the Unit which approach 30 feet in height.

b. Distance from Population Centers

Two cities, Albuquerque, New Mexico and El Paso, Texas, identified in the 1980 census as Standard Metropolitan Statistical Areas (SMSAs), are located within three hours' driving time of the WSA.

B. Manageability

To be recommended for wilderness designation, the Jornada del Muerto WSA must be capable of being effectively managed as wilderness. Manageability is a judgment made by the BLM after considering such factors as private and State inholdings, valid existing rights, topography and the overall land ownership pattern.

Valid existing rights in the Unit consist of grandfathered livestock operations. Required access for maintenance of existing rangeland developments is not expected to create problems for wilderness management.

No mining claims are present within the WSA. Seven oil and gas leases have been issued within the Study Unit but all are subject to the IMP wilderness protection stipulations.

The WSA lies within the WSMR Aerobee 350 Safety Evacuation Zone that must be evacuated for the safety of area residents. The availability of the Safety Zone is required for an indefinite period of time to support future military programs requiring a test range in

excess of that provided by the main WSMR. WSMR requires reasonable access to the Safety Zone to recover missile debris. One missile impact has occurred in the WSA to date.

The Jornada del Muerto WSA is located adjacent to the WSMR boundary in an area very sensitive to security control in that classified operations are conducted just inside the Missile Range. The security activities can presently be controlled because the use of the WSA is limited to livestock grazing operations. Wilderness designation would increase visitor use to the Study Unit and, therefore, the risks for a security compromise.

The presence of the WSA within the WSMR Aerobee 350 Safety Evacuation Zone creates a serious wilderness manageability problem. Ensuring the evacuation of this remote area would be difficult.

The wilderness management potential of the WSA in terms of effectively precluding vehicular access to the area is excellent. Off-road vehicle use is limited by the rugged nature of the volcanic landscape. Although several jeep trails extend into the area, access to them could be effectively closed to use by the general public.

Inholdings within the WSA include 2,560 acres of State land. Acquisition of these inholdings, through voluntary exchange, would enhance manageability.

V. PUBLIC INVOLVEMENT OVERVIEW

Public involvement in the wilderness inventory and study process has generally indicated support for designation of the Jornada del Muerto WSA as a wilderness area. Reasons cited have emphasized the Study Unit's outstanding solitude, natural, and recreation values.

Opposition has been expressed by area allottees who feel that wilderness designation would adversely impact their ranch operations.

WSMR personnel expressed concern that designation of Jornada del Muerto WSA as wilderness could potentially conflict with military operations within the Aerobee 350 Safety Evacuation Zone.

VI. ALTERNATIVES AND IMPACTS

This section will discuss two alternatives (management options) that could be applied to the WSA. These alternatives include: All Wilderness and No Action (No Wilderness).

A. All Wilderness

This alternative would recommend the entire 31,147-acre WSA as suitable for inclusion in the National Wilderness Preservation System. If designated, the area would be managed pursuant to the guidelines and mandates of the Wilderness Act of 1964 and the Final Wilderness Management Policy published in the Federal Register September 24, 1981 (Vol. 46, No. 185).

1. Impacts to Minerals

If the WSA is recommended as suitable for wilderness designation, a U.S. Geological Survey and U.S. Bureau of Mines mineral-energy survey would be conducted to supplement current data regarding the mineral-energy occurrence potential for the area.

Leasable

a. Oil and Gas

Under existing law, wilderness designation would prohibit issuance of new leases after December 31, 1983. Leases existing prior to December 31, 1983 would remain in effect and open to exploration, development and production under the terms of the lease, subject to reasonable stipulations to prevent undue degradation of the wilderness character of the land.

If the leasing situation remains static between now and the time of designation and no activity takes place on existing leases, the leases would begin to expire in October 1990 and the final lease would expire in June 1992. If this were to happen, no exploration could occur and the existence of oil and gas would have to be proven from information obtained outside the area. If oil and gas did occur, it could probably not be fully extracted from inside the WSA. Some of the Study Unit's oil and gas, if present, could be tapped through the use of slant drilling techniques or by drainage.

The above analysis is a worst-case situation. It is very possible that there are no deposits of oil and gas within the Study Unit. If this is the case, wilderness designation would have no impact.

b. Geothermal

Wilderness designation would have little or no impact on geothermal resource development. There appears to be no interest in the area, and the potential exists for only the most limited use of the resource.

Locatable

Wilderness designation should have no impact on mineral development. There are no known deposits of locatable minerals and the potential for discovery of such deposits is extremely low.

Saleable

Wilderness designation would have little or no impact on the use of saleable materials. There appears to be no interest in the Study Unit, and only limited potential exists for use of basalt. In addition, there are large quantities of similar materials outside of the WSA that could be used if the demand arose.

2. Impacts to Other Resources and Uses

Livestock Grazing

Domestic livestock grazing is a permissible and compatible resource use within wilderness. However, wilderness designation would have an impact on grazing use by narrowing the range of management options available to allottees and the BLM. For example, the installation of new rangeland development structures would be restricted by wilderness designation to those improvements which primarily benefit the natural rangeland values of the wilderness resource. This would impose limitations on vehicular access, and may increase the costs in constructing or maintaining new rangeland developments since visual impacts would be considered in their location and design. Under wilderness designation, more emphasis would be placed on using natural materials (e.g., wood and native rock as opposed to steel and concrete) in replacing deteriorated developments or constructing new developments. The use of such materials would be preferred, providing that unreasonable, additional construction or maintenance costs are not imposed upon the allottee.

It is difficult to assess how the above limitations would affect livestock grazing in the WSA because the nature and location of future rangeland developments are not known. However, given the existing ecological range condition, present livestock distribution patterns and the potential production of range sites in the WSA, it is anticipated that impacts to grazing management would be low.

Wilderness designation would not result in the reduction of existing livestock stocking levels to improve wilderness values. Existing rangeland developments would not be removed so long as they are necessary to ranch operations.

It would be desirable to close to use by the general public three vehicle routes which are presently corridored out of the WSA and to include them if the area is designated as wilderness. One vehicle route would be closed to the general public in each of the three allotments. Vehicle routes necessary to maintain existing rangeland developments would remain open to use by area allottees only.

Wildlife

The designation of the entire Study Unit would permanently preserve 31,147 acres of desert-lava grassland wildlife habitat. The natural distribution and abundance of wildlife species would be maintained.

Designation of the WSA as wilderness would result in the imposition of restrictions regarding the placement of wildlife waters for improving wildlife habitat. However, wilderness status would not totally preclude the establishment of wildlife water sources. A small number of wildlife drinkers could be placed in the wilderness, provided they enhanced the natural values of the area, were substantially unnoticeable, and did not require routine access and maintenance with motorized vehicles.

The impact of wilderness designation on wildlife management activities in the WSA is anticipated to be low.

The elimination of vehicular access by the general public would reduce hunting pressure and the potential for harassment and poaching of wildlife (primarily antelope).

Soils/Watershed

Designation of the WSA would maintain the existing soil and watershed conditions by precluding surface disturbance and preserving the natural ground cover of the Study Unit.

Cultural Resources

Effectively closing the WSA to vehicular entry would reduce the potential for the occurrence of serious and/or commercial vandalism of cultural sites within the area. On the other hand, increased visitor use could result in a higher incidence of casual surface collection by visitors. However, in the absence of a cultural resource inventory of the WSA, the significance of these impacts cannot be adequately addressed.

Wilderness designation would restrict but not preclude archeological stabilization, excavation, and research within the WSA. These activities may be permitted on a case-by-case basis where the project can be adequately justified and will not significantly degrade the wilderness resource of the area.

The inclusion of the Study Unit in the National Wilderness Preservation System would enhance the scientific and educational values of cultural sites within the area by preserving a relatively undisturbed environment from which the human ecology of the WSA during previous occupational periods could be more accurately reconstructed.

Scenic Values

The scenic values of the Study Unit would be permanently preserved by wilderness designation.

Recreation

Designation of the WSA would broaden the spectrum of primitive recreational opportunity in New Mexico by preserving 31,147 acres of desert-lava grassland. Recreational use of the area would not be expected to increase substantially over existing levels within the foreseeable future.

Recreation activities which require motor vehicle use would be precluded from the Study Unit. Coyote and antelope hunters would be most affected; however, utilization of the WSA by hunters is low.

B. No Action

This alternative would return the Jornada del Muerto WSA to undesignated multiple-use management. The Study Unit would be managed according to the prescriptions contained in the Stallion Management Framework Plan. The major thrust of management for the WSA would be development of rangeland resources, possible mineral exploration and development, and other traditional multiple uses of the public lands.

1. Impacts to Wilderness Values

The WSA is one of the least disturbed, publicly-owned desert grassland environments in New Mexico. With the exception of rangeland developments which lie in the northern portion of the area and the three vehicle route corridors which penetrate into the WSA, human impacts are restricted to the periphery of the Study Unit.

If the Unit is not designated a wilderness, the WSA may eventually be impacted by the installation of one or more water pipeline projects for range management purposes with the establishment of attendant vehicle access routes for pipeline maintenance.

Non-wilderness designation is not expected to result in the development of oil, gas, geothermal, mineral, or other resources within the Unit. However, oil, gas, or geothermal exploration could take place within the WSA.

Recommending the Study Unit as unsuitable for wilderness designation will reduce the likelihood a large Chihuahuan desert - lava grassland ecosystem will be included in the National Wilderness Preservation System. Few areas comparable to the Jornada lava flow possess wilderness characteristics and none of these are potentially as large as the Jornada del Muerto WSA.

2. Impacts to Other Resources and Uses

Minerals/Energy

The No Action alternative will have no impact on mineral and energy resources. Mineral activity will probably continue to occur at historical levels, under the laws and regulations relating to mineral appropriation on the public lands.

Livestock Grazing

If the entire WSA is released from further wilderness consideration and returned to undesignated multiple-use management, intensive management techniques could be applied and new rangeland development structures installed, such as water pipeline projects. The WSA would be released from the restrictions imposed by the IMP for lands under wilderness review.

Wildlife

This alternative would allow a wider range of wildlife management actions such as installing wildlife water catchments. The result would be the enhancement of certain wildlife species, especially antelope. If mineral exploration occurs and new roads constructed, wildlife values could be impacted.

Soils/Watershed

No significant impacts to these resources would result from non-designation of the area.

Cultural Resources

Continued vehicular access to the WSA, or an increase in the availability of such access, could result in high levels of cultural resource vandalism. In the absence of a cultural resource inventory of the area, however, the significance of this impact cannot be adequately assessed.

Recreation

The WSA is not expected to receive high levels of use by recreationists regardless of how it is managed. However, non-designation of the Study Unit would narrow the spectrum of recreational opportunities available to backcountry users.

VII. RECOMMENDED ACTION

A. Recommended Action Description

Wilderness Study Area Unit NM 020-055 Jornada del Muerto is recommended as unsuitable for inclusion in the National Wilderness Preservation System.

B. Rationale

The Jornada del Muerto WSA is considered difficult to manage as wilderness because it is immediately adjacent to WSMR and within the Aerobee 350 Safety Evacuation Zone which must be periodically evacuated of all human inhabitants.

The extremely remote location of the WSA would further complicate the wilderness management of the area. BLM personnel would require two to three hours' travel time to access the Study Unit boundary. Monitoring and controlling visitor use of the WSA, especially in light of potential evacuation, would be difficult.

Recreational opportunities within the WSA are very limited. Although the naturalness and solitude values are high, the Study Unit is an unattractive desert environment with no special features.

Despite a potential for being altered in future years, it is believed the environment of the WSA would remain unchanged if returned to undesignated multiple-use management.

C. Consistency with Other Plans

The recommended action would not conflict with any known county, State, or Federal land-use plans including known plans of WSMR.

GLOSSARY

GLOSSARY

ADIT. A nearly horizontal entrance to a mine.

AGGREGATE. A mineral material such as sand, gravel, shells, or broken stone.

ALLOTMENT. An area of land designated and managed for grazing of livestock.

ALLOTMENT MANAGEMENT PLAN (AMP). A documented program which applies to rangeland operations on public land, which is prepared in consultation with the permittee(s) or lessee(s) involved, and which: (1) prescribes the manner in and extent to which livestock operations will be conducted in order to meet the multiple-use, sustained-yield, economic, and other needs and objectives as determined for public land through land use planning; and (2) describes the type, location, ownership, and general specifications for the rangeland developments to be installed and maintained on public land to meet the livestock grazing and other objectives of land management; and (3) contains such other provisions relating to livestock grazing and other objectives as may be prescribed by the authorized officer consistent with applicable law.

ALLUVIAL. Pertaining to alluvium; deposited by a stream or running water.

ALLUVIAL CONE. An alluvial fan with steep slopes.

ALLUVIUM. A general term for clay, silt, sand, gravel, or similar unconsolidated sediments deposited by a stream or other body of running water.

ANDESITE. A volcanic rock composed essentially of andesine and one or more mafic constituents. The mafic constituents may be pyroxene, hornblende, or biotite.

ANIMAL-UNIT MONTH (AUM). The amount of forage consumed by one mature cow (1,000 lb.) or its equivalent for one month.

ANTICLINE. An upfold of stratified rock in which the beds bend downward in opposite directions from the crest.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACEC). Areas within the public land where special management attention is needed to protect and prevent irreparable damage to important historical, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.

ARKOSE. A sandstone containing 25 percent or more of feldspars, usually derived from silicic igneous rocks.

ASPECT SPECIES. A vegetative species that appears to be dominant in the landscape, although it may be only a small percent of the total vegetative composition.

AVIFAUNA. All birds of a given region.

BASALT. A dark to medium-dark colored commonly extrusive mafic igneous rock.

BASIN AND RANGE PHYSIOGRAPHIC PROVINCE. A province in the southwestern United States characterized by a series of tilted fault blocks forming longitudinal ridges or mountains and broad intervening basins.

BATHOLITH. A great mass of intruded igneous rock that extends downward to unknown depth.

BOLSONS. A flat-floored desert valley that drains to a playa.

BUREAU SENSITIVE. Fish, wildlife, and plants which are candidates for Federal listing or species proposed for Federal listing automatically become Bureau Sensitive species.

CALDERA. A large basin-shaped volcanic depression the diameter of which is much greater than the vent.

CARBONACEOUS. 1. Coaly. 2. Pertaining to, or composed largely of, carbon. 3. The carbonaceous sediments include original organic tissues and subsequently produced derivatives of which the composition is chemically organized.

CAULDRON. An inclusive term for all volcanic subsidence structures regardless of shape or size.

CHERRY-STEMMED. An unofficial term used to describe the way an inventory unit boundary is drawn to exclude a road that enters the unit; the resulting boundary resembles a cherry-stem.

CLOSED BASIN. A basin is considered closed with respect to surface flow if its topography prevents the occurrence of visible outflow. It is closed hydrologically if neither surface nor underground outflow can occur.

CONFORMABLE. 1. Strata or groups of strata lying one above another in parallel order are said to be conformable. 2. When beds or strata lie upon one another in unbroken and parallel order, and this arrangement shows that no disturbance or denudation has taken place at the locality while their deposition was going on, they are said to be conformable.

CONGLOMERATES. Clastic sedimentary rock composed of rounded fragments varying from small pebbles to large boulders in a cement of calcareous material such as iron oxide, silica, or hardened clay.

CONTIGUOUS LANDS. As it pertains to Wilderness, lands or legal subdivisions having a common boundary. Lands having only a common corner are not contiguous.

COPPICE DUNES. Sand dunes stabilized around shrubs.

CRITICAL MINERALS. Those minerals that are critical to the economy and security of the Unites States and for which we are now dependent on unreliable foreign sources. These minerals are listed in the National Defense Stockpile Inventory of Strategic and Critical Materials.

CUESTAS. A hill or ridge with a steep face on one side and a gentle slope on the other.

DEFORMATION. Any change in the original form or volume of rock masses produced by tectonic forces; folding, faulting, and solid flow are common modes of deformation.

DIKE. A tabular body of igneous rock that cuts across the structure of adjacent rocks or cuts massive rocks.

DIRT TANK. Usually a permanent earthen structure for holding water temporarily. These are built in high rainfall runoff areas such as an arroyo, canyon, or swale area.

DRAINAGE BASIN. A part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded water.

ECOSYSTEM. An ecological community considered together with the nonliving factors of its environment as a unit.

ECOTONE. A transition area between plant communities which has some of the characteristics of each.

EMBAYMENT. Term describing a continental border area that has sagged concurrently with deposition so that an unusually thick section of sediment results. An embayment is similar to a basin of sedimentation of a geosyncline, and some embayments may be one flank of a larger subsiding feature.

ENDANGERED SPECIES.

Federally listed - Any species of animal or plant in danger of extinction throughout all or a significant portion of its range.

State (Group I) - Species whose prospect of survival or recruitment in the state are in jeopardy in the foreseeable future.

State (Group II) - Species whose prospect of survival or recruitment within the state may become jeopardized in the foreseeable future.

EPHEMERAL STREAMS. A stream or portion of a stream which flows only in direct response to precipitation. Such flow is usually of short duration.

EROSION CONTROL STRUCTURES. Usually one large earthen, rock, wire, cement, etc. structure used to hold large concentrated flows of water and release this water in small non-eroding amounts.

EXTENSION AREA. A test range in excess of that provided by the main White Sands Missile Range (WSMR) required for an indefinite period of time to support future military programs.

EXTRUSIVE ROCK. Rocks derived from magma poured out or ejected at the earth's surface.

FAULT. A fracture in the earth's crust accompanied by a displacement of one side with respect to the other.

FAULT BLOCK. A block of the earth's crust bounded on at least two opposite sides by faults; it may be elevated or depressed relatively to the adjoining region.

FAULT SCARP. The cliff formed by a fault. Most fault scarps have been modified by erosion since the faulting.

FISSURE. 1. An extensive crack, break, or fracture in the rocks. A mere joint or crack persisting only for a few inches or a few feet is not usually termed a fissure by geologists or miners, although in a strict physical sense, it is one. 2. Where there are well-defined boundaries, very slight evidence of ore within such boundaries is sufficient to prove the existence of a lode. Such boundaries constitute the sides of a fissure.

FLPMA. Federal Land Policy and Management Act of 1976, which mandated the BLM Wilderness Review. Often referred to and pronounced "FLIPMA".

FOLD, FLEXURE. A type of fold, in size microscopic to orogenic, in which movement took place normal to the axial line and parallel with the limbs, producing notable shortening.

FORMATION. The primary unit of formal mapping or description. Most formations possess certain distinctive or combinations of distinctive lithic features. Boundaries are not based on time criteria. Formations may be combined into groups or subdivided into members.

GANGUE. The nonvaluable minerals in ore.

GEOPHYSICAL EXPLORATION. The use of geophysical instruments and methods to determine subsurface conditions by analysis of such properties as specific gravity, electrical conductivity, or magnetic susceptibility. This usually has an economic objective, e.g. discovery of fuel or mineral deposits.

GEOTHERMOMETRY. Measurement and study of the earth's heat, usually measured through shallow temperature gradient holes less than 500 feet.

GRABEN. A block generally long compared to its width that has been down thrown along faults relative to the rocks on either side.

GRANDFATHERED. Section 603(c) of FLPMA directs the BLM to manage lands under wilderness review "so as not to impair the suitability of such areas for preservation as wilderness..." However, Section 603(c) also provides a special exception to the "nonimpairment" criteria. Mining, grazing, and mineral leasing uses existing on the date of approval of FLPMA (October 21, 1976) may continue in the same manner and degree as on that date even if these uses impair wilderness values. Such uses are "grandfathered".

HEAT FLOW. Dissipation of heat coming from within the earth by conduction or radiation at the surface; average about 1.2x10-6 cal./cm.2/sec.

HORST. A block of the earth's crust separated by faults from adjacent blocks that have been relatively depressed.

HYDROCARBONS. Any organic compound, gaseous liquid or solid, consisting solely of carbon and hydrogen such as crude oil.

HYDROTHERMAL. Relating to hot water in the formation of minerals by the action of hot solutions rising up through the earth's crust from a cooling magma.

IGNEOUS ROCKS. Rocks formed by solidification of magma.

INHOLDING. Private or state owned land inside the boundary of a wilderness study area but excluded from the wilderness study area.

INITIAL INVENTORY. The first step in the BLM Wilderness Review Process. Inventory units or roadless areas which are obviously unsuitable for wilderness are separated from those which warrant intensive inventory for wilderness characteristics.

INSTANT STUDY AREAS. Section 603 of the Federal Land Policy and Management Act mandated that all primitive or natural areas formally identified prior to November 1, 1975, will be studied for wilderness suitability and recommended to the President by July 1, 1980. There are three such areas in New Mexico.

INTENSIVE INVENTORY. The second major step in the BLM Wilderness Review Process. Roadless areas are carefully inventoried for wilderness characteristics. The result of the intensive inventory is the identification of wilderness study areas.

INTERIOR FENCE. Fences used to divide allotments into pastures or holding areas.

INTRUSION. A feature (land and water form, vegetation, or structure) which is generally considered out of context because of excessive contrast and disharmony with characteristic landscape.

INTRUSIVE ROCK. A rock that consolidated from magma beneath the surface of the earth.

INVENTORY UNIT. Areas or islands of public land indexed for easy reference at the start of the wilderness inventory. These units may or may not be roadless. A roadless determination requires more detailed field work.

LIFE ZONE. Any series of biogeographic zones into which a continent, region, etc., is divided by latitude and altitude on the basis of the characteristic animal and plant life in a zone.

LITHIC. A stone or rock exhibiting modification by humans. It generally applies to projectile points, scrapers, chips, etc., rather than ground stone.

MAGMA. Naturally occurring mobile rock material, generated within the earth and capable of intrusion and extrusion, from which igneous rocks are thought to have been derived through solidification and related processes.

MAGNETIC PROSPECTING/GRAVITY SURVEYS. A technique of applied geophysics; a survey using a magnometer or a gravity meter on the ground or from the air to measure variations in magnetic or gravitational intensity.

MALPAIS. Rough country composed of dark basaltic lava.

MANAGEMENT FRAMEWORK PLAN (MFP). A planning decision document that establishes, for a given planning area, land use allocations, coordination guidelines for multiple use, and management objectives to be achieved for each class of land use or protection. BLM's land use plan. An MFP is prepared in three steps: (1) resource recommendations, (2) impact analysis and alternative development, and (3) decision making.

METAMORPHIC ROCKS. Rocks formed in the solid state in response to changes of temperature, pressure, and chemical environment.

METAMORPHISM. Process by which consolidated rocks are altered in composition, texture, or internal structure by conditions and forces not resulting simply from burial and the weight of subsequently accumulated overburden.

METAVOLCANICS. Partly metamorphosed volcanic rocks.

MINERALIZATION. The process of converting or being converted into a mineral, as a metal into an oxide, sulfide, etc.

OFF-ROAD VEHICLE (ORV). Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other terrain.

OVERSTORY. The upper canopy(s) of plants.

PALEOENVIRONMENTAL STUDIES. Studies using fossilized pollen and other geological and biological remains to determine past climatic conditions.

PARTHENOGENIC. Unisexual reproduction where offspring are produced from unfertilized eggs.

PEDIMENT. A broad gentle sloping bedrock surface that is situated at the foot of a much steeper mountain slope in an an arid or semi-arid region.

PERIPHERAL SPECIES. Species whose normal range is in adjoining states or Mexico and which are at the edge of their range in New Mexico.

PETROGLYPH. A form of rock art manufactured by incising, scratching, or pecking designs into rock surfaces.

PLACER. A place where gold is obtained by washing; an alluvial or glacial deposit, as of sand or gravel, containing particles of gold or other valuable minerals.

PLATFORM. The area of thinner sediments adjoining a geosynclinal wedge of thicker equivalent beds or a basin of thicker equivalent sediments.

PLAYA. The usually dry and nearly level lake plain that occupies the lowest parts of closed depressions.

PLUGS. Volcanic necks consisting of a mass of solidified igneous rock.

PLUTON. In the strictest sense, a body of igneous rock that has formed beneath the surface of the earth by consolidation from magma.

PROVINCE. A large area or region unified in some way and considered as a whole.

PSEUDORIPARIAN AREAS. Intermittent drainages (arroyos) supporting a more varied vegetative composition than the surrounding upland areas.

PSILOMELANE. An ore of manganese.

PUBLIC LAND. Any land and interest in land owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except:

-- lands located on the Outer Continental Shelf

-- lands held for the benefit of Indians, Aleuts, and Eskimos

-- lands in which the United States retains the minerals, but surface is private.

PUMICE. An excessively cellular, glassy lava, generally of the composition of rhyolite.

PYROLUSITE. The principal ore of manganese.

PYROXENE. A group of dark, rock-forming silicate minerals.

RANGE SITE. Is a distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. A range site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differs from that of other range sites in the kind or proportion of species or in total production (SCS 1976).

RANGELAND DEVELOPMENT. Any facility or structure relating to rangelands which is designed to control patterns of use, provide water, and stabilize soil and water conditions.

RAPTORS. Any predatory bird such as a falcon hawk, eagle, or owl that has feet with sharp talons or claws adapted for seizing prey and a hooked beak for tearing flesh.

RARE II. The wilderness inventory on lands administered by the Secretary of Agriculture through the United States Forest Service. The acronym stands for Roadless Area Review and Evaluation, and the "II" signifies that it is the second time the Forest Service has inventoried and evaluated the lands it administers.

RED BEDS. Term applied to red sedimentary rocks which usually are sandstones and shales, though in exceptional cases red limestones have been reported.

RHYOLITE. The extrusive equivalent of granite.

RIFT. Commonly refers to an elongated valley formed by tensional forces beneath the earth's crust.

RIGHT-OF-WAY. An easement or permit which authorizes public land to be used for a specified purpose that generally requires a long narrow strip of land; examples are roads, powerlines, pipelines, etc.

RIPARIAN VEGETATION. Vegetation which occurs in or adjacent to essentially perennial drainage ways or their floodplains.

ROAD. For the purposes of the BLM's wilderness inventory, the following definition has been adopted from the legislative history of FLPMA:

"The word 'roadless' refers to the absence of roads which have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A trail maintained solely by the passage of vehicles does not constitute a road."

To clarify this definition, the following subdefinitions also apply:

"Improved and maintained" - Actions taken physically by man to keep a road open to vehicular traffic. "Improved" does not necessarily mean formal construction. "Maintained" does not necessarily mean annual maintenance.

"Mechanical means" - Use of hand or power machinery or tools.

"Relatively regular and continuous use" - Vehicular use which has occurred and will continue to occur on a relatively regular basis. Examples are: access roads for equipment to maintain a stock water tank or other established water sources, access roads to maintained recreation sites or facilities, or access roads to mining claims.

ROADLESS. Refers to the absence of roads which have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A trail maintained solely by the passage of vehicles does not constitute a road.

ROADLESS AREA. That area which is roadless, as defined above, and is bounded by a road, the edge of a right-of-way, other land ownership, or a significant imprint of man.

SEDIMENTARY ROCKS. Rocks formed by the accumulation of sediment.

SHEAR ZONE. A geologic zone in which shearing has occurred on a large scale so that the rock is crushed and brecciated.

SILICEOUS; SILICIOUS. Of or pertaining to silica; containing silica, or partaking of its nature. Containing abundant quartz.

SILL. A tabular igneous intrusion that parallels the planar structure of the surrounding rock.

SILVICULTURAL. A phase of forestry that deals with the establishment, development, reproduction, and care of forest trees.

SPECIAL CONCERN ELEMENT. Plant species considered rare or endangered by the New Mexico State Heritage Program, but not legislatively protected.

SPLIT ESTATE. Refers to the situation where the subsurface mineral estate is owned or controlled by a party other than the owner of the surface of the same land area.

SOLITUDE. Outstanding opportunities for solitude or primitive and unconfined recreation are wilderness characteristics examined in the intensive wilderness inventory. Factors contributing to opportunities for solitude are vegetative screening, topographic relief, vistas, and physiographic variety. 1. The state of being alone or remote from habitations; isolation. 2. A lonely, unfrequented, or secluded place.

STANDARD METROPOLITAN STATISTICAL AREA (SMSA). A metropolitan area that has a large population nucleus together with adjacent communities which have a high degree of economic and social integration with that nucleus. Each SMSA has one or more central counties containing the area's main population concentration; an urbanized area with at least 50,000 inhabitants.

STEPPE. Arid land usually characterized as being level and without forests; usually in large tracts and in regions of extreme temperature range and loess soil.

STORAGE TANK. A permanent water holding structure used to supply water to troughs, pipelines, etc.

STRATIFORM. Composed of layers.

STRINGER. A narrow vein or irregular filament of mineral occurring in a rock.

SULFIDE. A compound of sulfur with one other more positive element or radical.

SUPERGENE. Applied to ores or ore minerals that have been formed by generally descending water. Ores or minerals formed by downward enrichment.

SUPPLEMENTAL VALUES. Features of ecological, geological, or other scientific, educational, scenic, or historical value that may be present in an inventory unit. These are not necessary criteria for wilderness suitability, as is stated in the Wilderness Act of 1964, but must be assessed during the intensive wilderness inventory.

SUSTAINED YIELD. Management of a biological resource (as timber) such that the portion removed by one harvest is replaced by growth or reproduction before another harvest occurs.

SYNCLINE. A trough of stratified rock in which the beds dip toward each other from either side.

TECTONIC. Relating to the deformation of the earth's crust.

THREATENED SPECIES. Any species likely to become endangered within the forseeable future throughout all or a significant part of its range.

TRAVERTINE. Calcium carbonate deposits commonly associated with hot springs.

TROUGH. An elongate and wide depression with gently sloping borders.

TUFF. A compacted deposit of volcanic ash and dust that may contain sand and clay.

UNALLOTTED FEDERAL LANDS. Federal lands which currently are not committed to livestock grazing use.

UNCONFORMABLE. Having the relation of unconformity to the underlying rocks; not succeeding the underlying strata in immediate order of age and in parallel position.

UNDERSTORY. The plants growing beneath the canopy of other plants.

UPLIFT. Elevation of any extensive part of the earth's surface relative to some other parts.

VEHICLE TRAIL. A two-wheel track created only by the passage of vehicles. A trail is not a road.

VEIN. A tubular body, long in two dimensions and short in the third. An occurrence of ore minerals, usually disseminated throughout gangue, or veinstone.

VESICULAR BASALT. Basalt with abundant vesicles formed as a result of the expansion of gases during the fluid stage of lava.

VISUAL RESOURCE MANAGEMENT (VRM) CLASSES.

ACEC - The ACEC for scenic values consists of a landscape with high scenic values of relative scarcity. Management of the area will protect the visual quality of the landscape.

CLASS II - Changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the landscape. A contrast may be seen but should not attract attention.

CLASS III - Contrasts to the basic elements caused by a management activity may be evident and begin to attract attention in the landscape. The changes, however, should remain subordinate in the existing landscape.

CLASS IV - Contrasts may attract attention and be a dominant feature in the landscape in terms of scale. However, the changes should repeat the basic elements of the landscape.

WATER SPREADER. Usually several small, earthen, rock structures used to slow the water flow and give the runoff a chance to be absorbed by the soils and plants.

WILDERNESS. The definition contained in Section 2(c) of the Wilderness Act of 1964 is as follows: "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized 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. Wilderness is 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 primitive and unconfined type of recreation; (3) has at least 5,000 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 or scientific, educational, scenic, or historical value.

WILDERNESS AREA. An area formally designated by Congress as part of the National Wilderness Preservation System.

WILDERNESS CHARACTERISTICS. Those characteristics of wilderness as described in Section 2(c) of the Wilderness Act. These include size, naturalness, solitude, primitive and unconfined type of recreation, and supplemental values.

WILDERNESS INVENTORY. An evaluation of the public land in the form of a written description and a map showing those lands that meet the wilderness criteria as established under Section 603(a) of FLPMA and Section 2(c) of the Wilderness Act. The lands meeting the criteria will be referred to as Wilderness Study Areas (WSAs). Those lands identified as not meeting wilderness criteria will be released from further wilderness consideration.

WILDERNESS REVIEW. The term used to cover the entire wilderness inventory, study, and reporting phases of the wilderness program of the BLM.

WILDERNESS STUDY. The process of analyzing and planning wilderness preservation opportunities along with other resource opportunities within the BLM's planning system.

WITHDRAWAL. An action that restricts the use of public land and segregates the land from some or all of the public land or mineral laws.

ZEOLITES. A large group of minerals that are characterized by their easy and reversible loss of water. They are used in the base exchange method of water softening and as gas absorbents or drying agents (filters).

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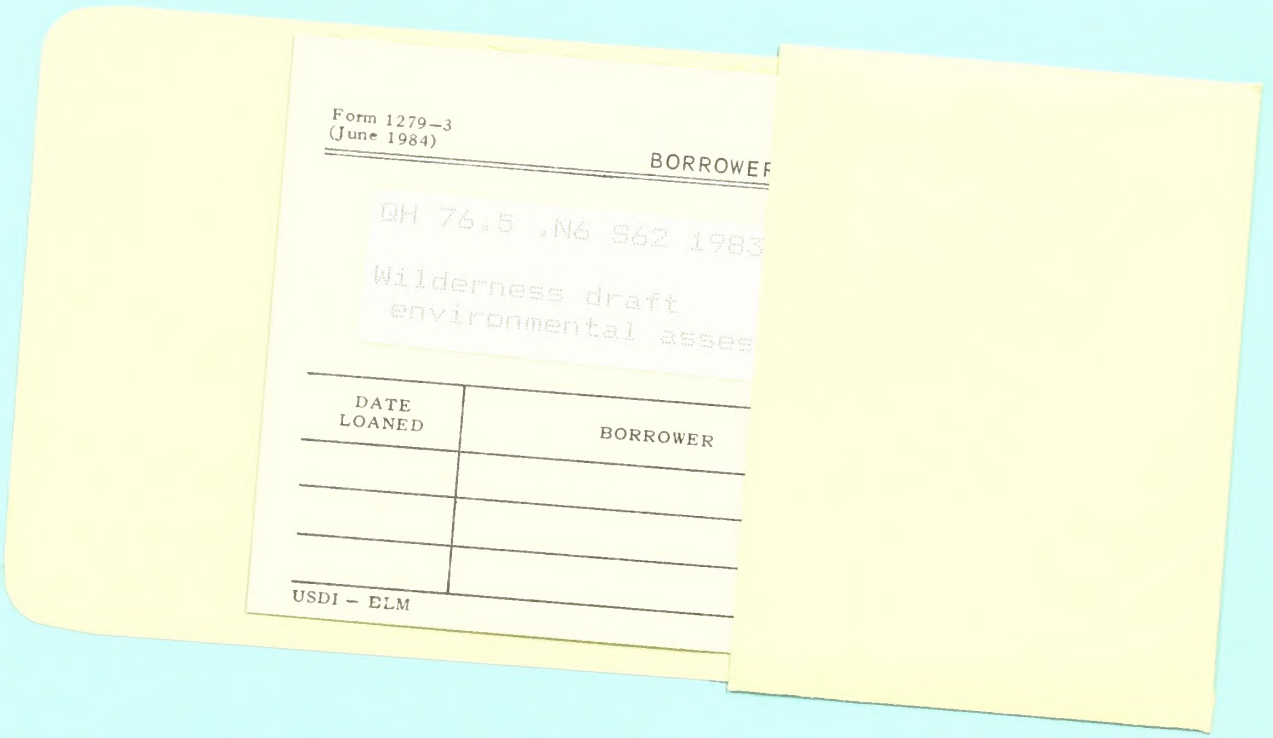

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