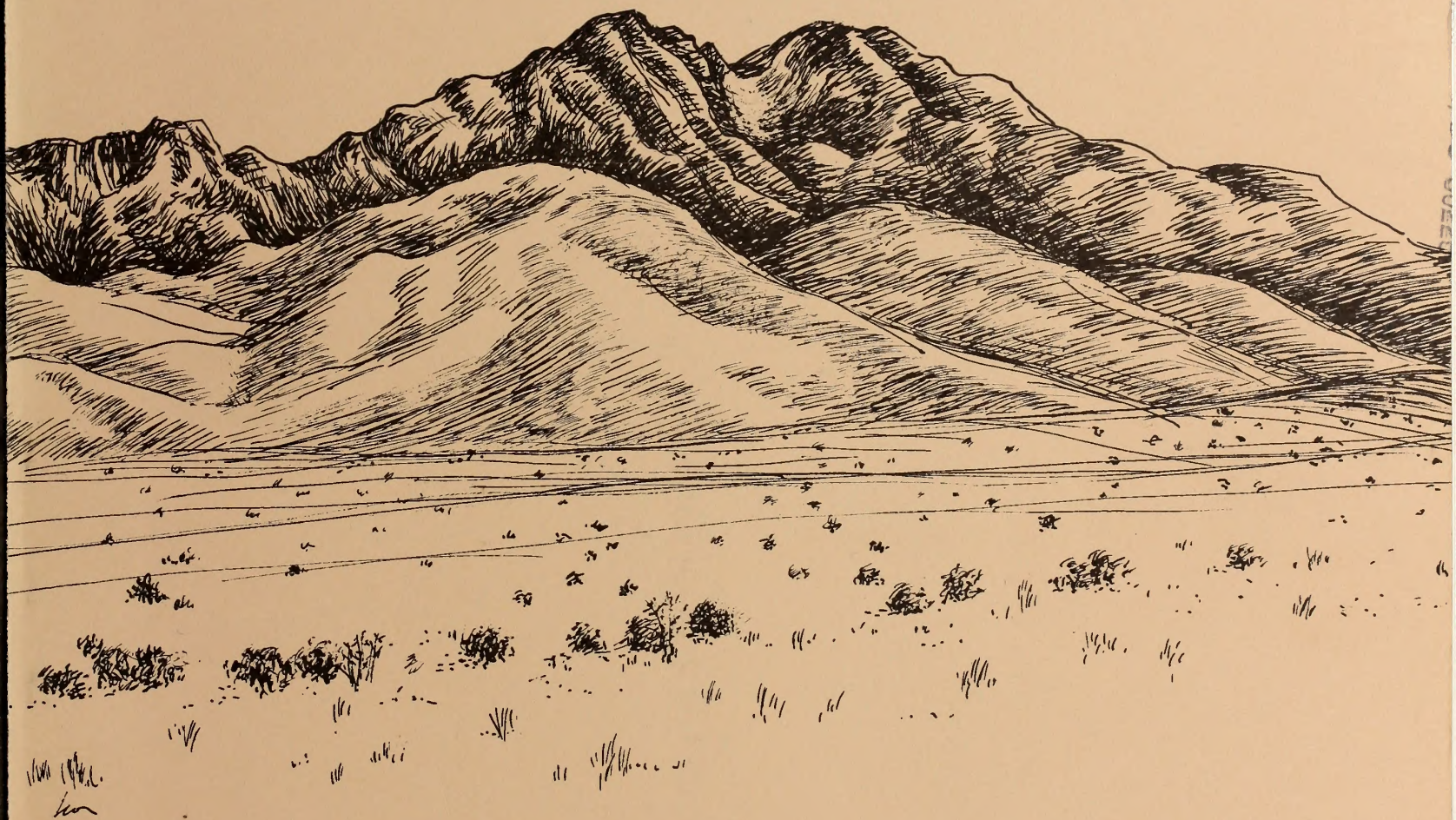
NEW MEXICO STATEWIDE WILDERNESS STUDY

VOLUME 1: DRAFT ENVIRONMENTAL IMPACT STATEMENT



Department of the Interior, Bureau of Land Management
New Mexico State Office, Santa Fe, NM

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DRAFT
ENVIRONMENTAL IMPACT STATEMENT
for the
NEW MEXICO STATEWIDE WILDERNESS STUDY

TYPE OF ACTION: ( ) Administrative (X) Legislative

ABSTRACT: The Bureau of Land Management (BLM) proposes to recommend all or part of 18 Wilderness Study Areas (WSAs) involving approximately 408,000 acres of public land in New Mexico as suitable for wilderness designation. Approximately 378,000 acres and 19 WSAs are proposed to be recommended as nonsuitable for wilderness designation. This document analyzes the environmental consequences of the proposal and four other alternatives; no wilderness, conflict resolution, emphasis on manageability and all wilderness. Implementation of the proposed action would provide long-term maintenance of wilderness values in the areas recommended as suitable. In those areas recommended as nonsuitable for wilderness designation, mineral exploration and development would be allowed.

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COMMENTS HAVE BEEN REQUESTED FROM: SEE CHAPTER 5

DATE FILED WITH EPA:

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TABLE OF CONTENTS
VOL. 1 - DRAFT EIS

TABLE OF CONTENTS
VOL. 1 - DRAFT EIS
(continued)

TABLE OF CONTENTS
VOL. 1 - DRAFT EIS
(continued)

TABLE OF CONTENTS
VOL. 2 - WILDERNESS ANALYSIS REPORTS

TABLE OF CONTENTS
VOL. 2 - WILDERNESS ANALYSIS REPORTS
(continued)

TABLE OF CONTENTS
VOL. 3 - WILDERNESS ANALYSIS REPORTS

LIST OF TABLES

LIST OF TABLES

LIST OF MAPS

SUMMARY

SUMMARY

PURPOSE OF THE STUDY

The purpose of this study is to determine the suitability or nonsuitability of 37 Wilderness Study Areas (WSAs) in New Mexico for recommended inclusion in the National Wilderness Preservation System (NWPS). This study is in response to Section 603 of the Federal Land Policy and Management Act (FLPMA) which directs the Bureau of Land Management (BLM) to inventory, study and report to Congress, through the Secretary of the Interior and the President, those public lands recommended suitable and nonsuitable for wilderness preservation.

SETTING

The 37 WSAs analyzed are located in the BLM Albuquerque, Las Cruces and Roswell Districts. These WSAs are scattered throughout the State and encompass 786,391 acres of public land, as shown on Map 1-1.

ISSUES

Statewide issues and site-specific issues have been identified and are evaluated in this draft Environmental Impact Statement (EIS). The Statewide issues are: wilderness values, exploration and development of mineral resources and livestock grazing.

ALTERNATIVES

Each WSA was evaluated for an All Wilderness Alternative and a No Wilderness Alternative. In some cases, an Amended Boundary Alternative was evaluated when opportunities existed to minimize resource conflicts or improve manageability. From the individual WSAs, a Proposed Action and four alternatives were developed. The Statewide alternatives include: All Wilderness, Emphasis on Manageability, Conflict Resolution and No Wilderness.

STUDY RECOMMENDATIONS

The Proposed Action recommends all or parts of 18 WSAs, totalling 407,919 acres, as suitable for wilderness designation. This action also recommends 19 WSAs (378,472 acres) as nonsuitable for wilderness designation.

MAJOR ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

WILDERNESS VALUES

Proposed Action

The landscapes which would be preserved under the Proposed Action include lava flows, forested mountains, river canyons and the more typical desert mountains and lowlands of the southwest. The suitable acreage represents approximately 3 percent of the BLM-administered lands in New Mexico and less than 1 percent of the total land area in New Mexico.

The outstanding opportunities for solitude and primitive recreation in the areas recommended suitable for wilderness designation would be maintained. Examples of these opportunities include rock-climbing on Cabezon Peak and the Organ Mountains, floatboating the Chama and Gila Rivers, backpacking in the high mountains of the Sierra Ladrones and Continental Divide WSAs or in the relatively undisturbed and expansive stretch of Chihuahuan Desert in the West Potrillo/Mount Riley WSAs, and hiking and photography on the stark and pristine lava flows.

The special features of the WSAs which would be maintained or enhanced include: Bat Cave, an archaeological resource site; raptor nesting sites; bighorn sheep, including an area for potential reintroduction of bighorn sheep; studies of melanistic species in the lava flows; undisturbed mountain lion habitat; and the scenic qualities of these remaining roadless and natural areas of New Mexico. Ecosystems not currently represented in the NWPS would be added to the system, and approximately 50 percent of the existing solitude and primitive recreation opportunities within a day's driving time (5 hours) of the Standard Metropolitan Statistical Areas (SMSAs) would be maintained. The ecosystems within the Chihuahuan Desert Province, Colorado Plateau Province and Mexican Highlands Shrub Steppe Province would be the first of their type to be included in the National Wilderness Preservation System (NWPS) if this alternative were implemented.

Naturalness, solitude and primitive recreation opportunities would be diminished on the 313,859 acres recommended nonsuitable for wilderness designation under this alternative. This would be due to resource use and development, including road building; construction of range facilities, including fences, pipelines, water holding facilities, and access roads; and recreational off-road vehicle (ORV) use.

The 10,751-acre Oak Juniper Woodland Scrub Ecosystem in the Mexican Highlands Shrub Steppe Province would not be added to the NWPS. This ecosystem is within the Alamo Hueco WSA and is unique in that it is not nationally represented in any other area currently designated as wilderness or under wilderness review by BLM or any other agency.

There are no impacts expected under this alternative on 64,613 acres recommended nonsuitable for wilderness designation due to low resource development potential or existing management restrictions. This includes the entire acreage within the Sabinoso, Blue Creek, Cedar Mountains, Cowboy Spring, and Las Uvas Mountains WSAs, as well as the 1,280-acre Tinajas Area of Critical Environmental Concern (ACEC) within the Presilla WSA.

All Wilderness

There would be twice as much land maintained in a natural condition under the All Wilderness Alternative than under the Proposed Action. The WSA acreage represents approximately 6 percent of the BLM-administered land in New Mexico and 1 percent of the total land area in New Mexico.

All of the outstanding solitude and primitive recreation opportunities provided by these WSAs would be maintained. This would provide additional areas and acres within 5 hours drive of the SMSAs where a wilderness experience could be achieved. The 10,751-acre Oak Juniper Woodland Scrub

Ecosystem in the Mexican Highlands Shrub Steppe Province would also be added to the NWPS. The Alamo Hueco WSA is the only WSA in New Mexico which contains this ecotype. This ecosystem is unique in that it is not nationally represented in any other area currently designated as wilderness or under wilderness review by BLM or any other agency.

Emphasis or Manageability

The primary difference between the Emphasis on Manageability Alternative and the All Wilderness Alternative is the consideration given to long-term wilderness management. Only those areas which could reasonably be maintained as wilderness over the long-term are recommended as suitable for wilderness designation under the manageability alternative. This would represent an approximate 143,000 acre increase in suitable lands over the Proposed Action. The solitude and primitive recreation opportunities within 5 hours drive of the SMSAs, as well as the ecosystem acres to be represented in the NWPS would be 35 percent greater than the Proposed Action.

Conflict Resolution

The Conflict Resolution Alternative represents a 30 percent reduction from the Proposed Action in the number of areas and acres recommended suitable for wilderness designation. The lands which would be recommended for designation as wilderness under this alternative represent 2 percent of the area administered by the BLM in New Mexico and less than ½ of 1 percent of the total land area in the State.

Primitive recreation opportunities maintained would be 20 percent less than under the Proposed Action. Examples of the primitive recreation opportunities in which the quality of the experience would be diminished due to resource use and development in nonsuitable areas include: Rock-climbing in the Organ Mountains WSA, backpacking in the pristine high mountains of the Sierra Ladrones and Continental Divide WSAs, hiking and photography on the stark lava flows of the Jornada del Muerto WSA, and big game hunting in the Sierra Ladrones WSA.

Special features in the areas recommended nonsuitable for wilderness designation could be impaired due to resource use and development. The special features include raptor nesting sites, the potential reintroduction of bighorn sheep in the Sierra Ladrones WSA, mountain lions in the Continental Divide and Sierra Ladrone WSAs, and the 163-acre enclave of western ponderosa forest within the Organ Mountains WSA.

As in the Proposed Action, the Oak Juniper Woodland Scrub Ecosystem within the Alamo Hueco WSA would not be represented in the NWPS. In addition, the Mountain Mahogany Oak Scrub Ecosystem in the Chihuahuan Desert Province would not be represented in the NWPS.

No Wilderness

Under the No Wilderness Alternative, the natural landscape in 27 WSAs, totalling 657,513 acres, would be diminished due to resource use and development. The modifications to the natural environment would result from mineral exploration and development, including road construction in areas with

a moderate or high potential for the occurrence of such commodities; construction of fences, water holding facilities, and roads in support of livestock operations; and the continued use of 390 miles of existing vehicle ways and the establishment of new vehicle ways over the long-term.

Solitude and primitive recreation opportunities would also be impaired due to resource use and development. In addition to the opportunities identified under the Proposed Action, the quality of the following outstanding opportunities would be impaired under the No Wilderness Alternative: Rock-climbing on Cabezon Peak and the Organ Mountains; backpacking in the pristine high mountains of the Sierra Ladrones and Continental Divide WSAs or in the relatively undisturbed and expansive stretch of Chihuahuan Desert in the West Potrillo/Mount Riley WSAs; hiking and photography on the stark lava flows in the Jornada del Muerto WSA; and big game hunting in the Ignacio Chavez, Sierra de Las Canas, and Sierra Ladrones WSAs.

Special features in the WSAs with a moderate and high potential for resource use and development could be impaired over the long-term. These special features include raptor nesting sites, bighorn sheep in the Big Hatchet Mountains WSA, the potential reintroduction of bighorn sheep in the Sierra Ladrones WSA, mountain lions in the Continental Divide and Sierra Ladrones WSAs, and a 163-acre enclave of western ponderosa forest within the Organ Mountains WSA.

Potential expansion and diversification of the NWPS would not occur under this alternative. The potential for adding up to 20 new ecosystems to the NWPS would be foregone because these ecosystems do not occur in any other area being studied for wilderness or in any areas which are designated wilderness. New wilderness areas within 5 hours drive of the SMSAs would not be added to the NWPS. Increased demand for wilderness-related solitude and primitive recreation opportunities would have to be provided by the existing designated wilderness areas in the region. Over the long-term, any increase in demand would have to be regulated to prevent overuse of the existing designated wilderness areas or degradation of this existing resource would occur.

There are no impacts expected on 128,818 acres recommended nonsuitable for wilderness designation due to low resource development potential or existing management restrictions. The areas with low resource development potential include: Sabinoso, Aden Lava Flow, Blue Creek, Cedar Mountains, Cowboy Spring, Las Uvas Mountains and the Carrizozo Lava Flow/Little Black Peak WSAs, and the river canyons in the Rio Chama WSA and Gila Lower Box WSA. Restrictions on surface disturbance apply to the following areas; The 1,280-acre Tinajas ACEC in the Presilla WSA; the 4,008-acre Research Natural Area in the Aden Lava Flow WSA; and the 5,032 acres segregated from the 1872 Mining Laws in the Horse Mountain WSA.

EXPLORATION AND DEVELOPMENT OF MINERAL RESOURCES

Proposed Action

Under the Proposed Action, less than 5 percent of the lands in New Mexico classified as having a moderate or high potential for various energy and mineral resources would be precluded from exploration and possible

development. Because this percentage is considered low, no significant Statewide impacts are anticipated; however, more than 5 percent of the tin, cobalt and nickel in New Mexico would be affected. Due to the very limited distribution of these commodities in New Mexico, these commodities were not amenable to being addressed in relation to the percentage of lands classified as having moderate or high potential.

Of the 24,000 acres of lands classified as having a moderate potential for tin, 14,700 acres within the Continental Divide WSA would be precluded from further exploration and possible development.

Approximately 8,100 acres of lands classified as having moderate potential for cobalt and nickel occur entirely within the Sierra Ladrones WSA. Since the only other known occurrences in New Mexico for these commodities exist in the Luis Lopes and Blackhawk Mining Districts, wilderness designation of the Sierra Ladrones WSA could have a significant impact on production of cobalt if an economic deposit exists in the WSA.

Alternatives

Impacts to mineral exploration and possible development from the All Wilderness Alternative would be the same as the Proposed Action except that 7 percent of New Mexico's barite resources would be precluded from exploration and possible development. Impacts to minerals under the Manageability Alternative are similar to the Proposed Action. Impacts under the Conflict Resolution Alternative are insignificant, and no impacts were identified under the No Wilderness Alternative.

LIVESTOCK GRAZING

Proposed Action

Under the Proposed Action, less than 1 percent of the 64 million acres of land in New Mexico used for livestock grazing would be impacted. Because this percentage is considered low, no significant Statewide impacts are anticipated. The biggest impact would be inconvenience to the livestock operator because vehicle use on 153 miles of ways would be eliminated or sharply curtailed. Of this amount, it is estimated that one-third (approximately 51 miles) of these ways are specifically used by livestock operators to drive vehicles to range developments, to distribute salt or feed supplement, or to check livestock distribution and condition.

Proposals for range developments generally occur in allotments which overlap WSA boundaries. These proposals would probably be considered for implementation in those portions of allotments immediately outside the WSA boundaries. Since these developments were designed to redistribute livestock rather than increase Animal Unit Months (AUMs), no impacts to livestock numbers would occur.

Over the long-term, pressures for use of public lands will increase, including those WSAs not designated as wilderness. On those 378,472 acres which are not recommended suitable for wilderness, other types of impacts are expected to occur. For most of this acreage, ORV use and mineral exploration, including roadbuilding are anticipated. These activities would be expected to

result in increased vandalism to range developments, harassment to and theft of livestock, gates left open allowing livestock to wander, littering and indiscriminant dumping. Surface disturbance would also tend to increase erosion rates, resulting in increased sedimentation and a need for more frequent maintenance of stock tanks. Where surface disturbance is extensive (such as that from mineral development) the loss of forage could affect AUMs.

Alternatives

Under the other alternatives, the impacts would be similar to the Proposed Action, and vary only in proportion to the acreages of lands recommended as suitable or nonsuitable for wilderness designation.

CHAPTER 1
Purpose & Need

CHAPTER 1

PURPOSE AND NEED

INTRODUCTION

The New Mexico BLM Draft Statewide Wilderness Environmental Impact Statement (EIS) addresses 37 Wilderness Study Areas (WSAs) totalling 786,391 acres. These WSAs are located throughout the State of New Mexico as shown on Map 1-1 and Map A in the envelope on the inside back cover. Table 1-1 lists the WSAs and their acreages by BLM District.

PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The Federal Land Policy and Management Act of 1976 (FLPMA) directs BLM to manage the public lands and their resources under principles of multiple-use and sustained yield. In FLPMA, wilderness values are identified as part of the spectrum of public land resource values and uses to be considered in BLM's planning, inventory and management activities. Section 603 of FLPMA specifically directs the BLM to carry out a wilderness review of roadless islands and roadless areas of 5,000 acres or more and to report to the President through the Secretary of the Interior, recommendations as to the suitability or nonsuitability of each such area or island for preservation as wilderness. The President will then make recommendations to Congress. Areas can be designated as wilderness or released from further wilderness review only by an Act of Congress. The purpose of this EIS is to comply with Section 603 of FLPMA.

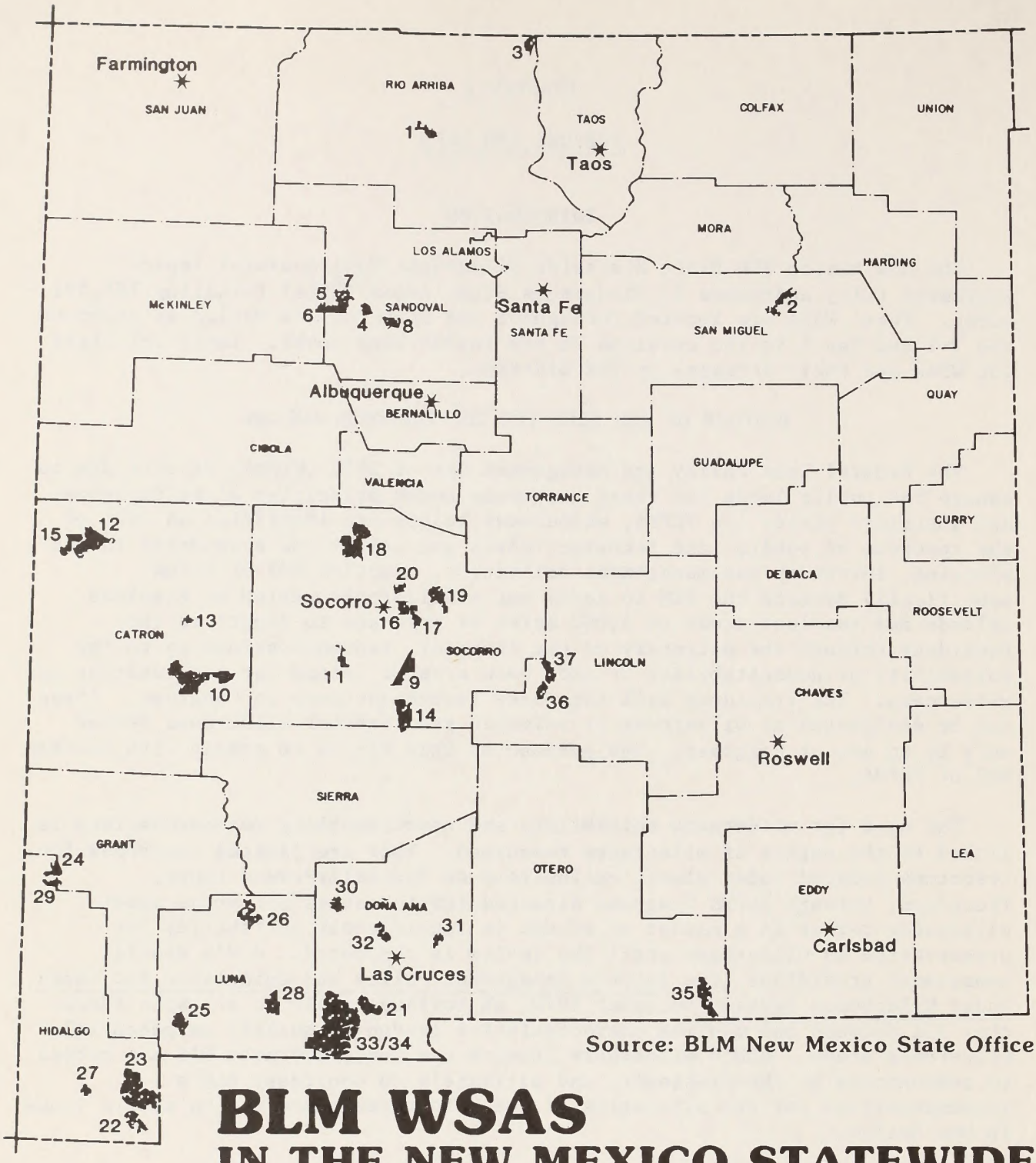
The need for wilderness suitability and nonsuitability recommendations is linked to the nature of wilderness resources. They are limited, nonrenewable resources located today almost exclusively on Federally-owned lands. Therefore, through FLPMA Congress directed BLM to manage all areas under wilderness review in a manner so as not to impair their suitability for preservation as wilderness until the review is completed. BLM's special management provisions (the Interim Management Policy and Guidelines for Lands Under Wilderness Review, December 1979, as revised) apply to all WSAs since they all possess the minimum characteristics needed to qualify as potential wilderness areas. BLM's wilderness studies and the wilderness EIS are needed to communicate to the President, and ultimately to Congress, BLM's recommendations for the allocation of the wilderness resources on public lands in New Mexico.

THE BLM WILDERNESS REVIEW

The BLM wilderness review consists of three phases: (1) inventory, (2) study, and (3) reporting. This EIS is part of the study phase. Table 1-2 describes some of the components of these three phases.

INVENTORY

The 37 WSAs addressed in this study were identified using the wilderness inventory procedures described in the BLM's Wilderness Inventory Handbook of September 27, 1978. The results of the intensive wilderness inventory were



Source: BLM New Mexico State Office

BLM WSAs
IN THE NEW MEXICO STATEWIDE WILDERNESS STUDY MAY, 1985

ALBUQUERQUE DISTRICT
1. Rio Chama
2. Sabinoso
3. San Antonio
4. Cabezon
5. Empedrado
6. Ignacio Chavez
7. La Lena
8. Ojito

LAS CRUCES DISTRICT
9. Antelope
10. Continental Divide
11. Devil's Backbone
12. Eagle Peak
13. Horse Mountain
14. Jornada del Muerto
15. Mesita Blanca
16. Presilla
17. Sierra de las Canas
18. Sierra Ladrones
19. Stallion
20. Veranito
21. Aden Lava Flow
22. Alamo Hueco Mountains
23. Big Hatchet Mountains
24. Blue Creek
25. Cedar Mountains
26. Cooke's Range
27. Cowboy Spring
28. Florida Mountains
29. Gila Lower Box
30. Las Uvas Mountains
31. Organ Mountains
32. Robledo Mountains
33. West Potrillo &
34. Mt. Riley
35. Brokeoff Mountains

ROSWELL DISTRICT
36. Carrizozo Lava Flow &
37. Little Black Peak

MAP 1-1

TABLE 1-1

WSAs IN THE NEW MEXICO STATEWIDE STUDY

District	WSA Acreage
ALBUQUERQUE DISTRICT	
1. Rio Chama	11,985
2. Sabinoso	15,760
3. San Antonio	7,050
4. Cabezon	8,118
5. Empedrado	9,410
6. Ignacio Chavez	9,961
7. La Lena	10,310
8. Ojito	11,919
LAS CRUCES DISTRICT	
9. Antelope	20,710
10. Continental Divide	68,761
11. Devil's Backbone	8,904
12. Eagle Peak	32,748
13. Horse Mountain	5,032
14. Jornada del Muerto	31,147
15. Mesita Blanca	16,429
16. Presilla	8,680
17. Sierra de las Canas	12,838
18. Sierra Ladrones	42,688
19. Stallion	24,238
20. Veranito	7,206
21. Aden Lava Flow	23,857
22. Alamo Hueco Mountains	10,796
23. Big Hatchet Mountains	58,014
24. Blue Creek	14,896
25. Cedar Mountains	14,911
26. Cooke's Range	19,608
27. Cowboy Spring	6,699
28. Florida Mountains	22,336
29. Gila Lower Box	8,555
30. Las Uvas Mountains	11,067
31. Organ Mountains	7,144
32. Robledo Mountains	12,811
33. West Potrillo Mountains [a/]	155,105
34. Mount Riley [a/]	
35. Brokeoff Mountains	31,386
ROSWELL DISTRICT	
36. Carrizozo Lava Flow [a/]	25,312
37. Little Black Peak [a/]	
ACREAGE TOTALS	786,391

[a/] WSAs 33 and 34 and 36 and 37 are adjacent to each other and are being studied jointly.

TABLE 1-2

WILDERNESS REVIEW PROCESS

PHASE	STEP	PURPOSE OF STEP	PURPOSE OF PUBLIC PARTICIPATION	COMPLETION DATE
Inventory	Inventory (completed by each District)	To identify lands with wilderness characteristics: -Roadless -5000 acres -Natural -Outstanding opportuninity for solitude or primitive and unconfined recreation	To provide additional inventory information and comment on whether specific areas have wilderness characteristics	Completed August 1980
Study	District Environmental Assessments (completed by each District)	To determine the impacts of designation or nondesignation on a site specific basis.	To comment on site specific impacts identified in the draft environmental assessments, including boundary adjustments.	Completed August 1984
	Statewide EIS scoping (completed by New Mexico State Office)	To identify the issues and criteria for evaluating alternatives that will be included in the statewide Wilderness EIS.	To comment on the alternatives, criteria and scope of the EIS.	Completed September 1984
	Draft EIS (completed by New Mexico State Office)	To evaluate impacts of alternatives and select a preferred alternative.	To comment on the cumulative statewide impacts and alternatives identified in the EIS. There is a 90-day public comment period including public hearings.	Comments due August 1985
Reporting	Final EIS and Wilderness Study Reports (Secretary of the Interior).	To submit Wilderness recommendations to the President.	The Final EIS will be distributed to the public for their information. The Wilderness Study Reports, containing the Secretary's recommendations, will be prepared 30-days following EIS filing.	Before November 1991
	Presidential Recommendations (President)	To submit Wilderness recommendations to the U.S. Congress.	No formal BLM public participation period. Public comment to elected public officials.	Before November 1993
	Final Wilderness Legislation (U.S. Congress)	To designate areas as Wildernss or remove them from the Wilderness review process.	No formal BLM public participation period. Public comment to elected public officials.	No designated completion date.

announced on November 15, 1980. Copies of the Wilderness Study Area Decisions, New Mexico BLM Intensive Wilderness Inventory are available at all BLM offices in New Mexico.

In order to qualify for WSA status, an area was required to contain the following wilderness characteristics described in the Wilderness Act of 1964: (1) at least 5,000 acres or more of contiguous public land or be of a size to make practical its preservation and use in an unimpaired condition; (2) generally appear to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; and (3) outstanding opportunities for solitude or a primitive and unconfined type of recreation. In addition, areas qualifying for Wilderness Study Area status may contain supplemental values which include ecological, geological, or other features of scientific, educational, scenic, or historic value. The BLM wilderness inventory determined that the WSAs in Table 1-1 contain these minimum wilderness characteristics.

STUDY

The primary goal of the BLM wilderness study process is to recommend for wilderness designation those areas where wilderness is determined to be the most appropriate use of the land and its resources.

It is the policy of the BLM that each WSA be studied through the BLM planning system to analyze all values, resources, potential conflicts, and land uses. The findings of the study, including those derived from public participation, determine whether an area will be recommended suitable or nonsuitable for designation as wilderness. In practice, determining an area's "suitability or nonsuitability . . . for preservation as wilderness," in the words of FLPMA, means determining whether the area is more suitable for wilderness designation or more suitable for other uses.

REPORTING

The reporting phase consists of actually forwarding, or reporting, suitable and nonsuitable recommendations through the Secretary of the Interior and the President to Congress. Mineral surveys required by the Wilderness Act of 1964, Environmental Impact Statements, and other data will be submitted with the recommendations.

THE BLM NEW MEXICO WILDERNESS STUDY PLANNING PROCESS

In New Mexico, 37 WSAs are being studied simultaneously as part of a Statewide planning process (see Map 1-1). In accordance with BLM planning regulations, the Category III Management Framework Plan (MFP) Amendment process is being followed. The process provides for site-specific analysis through preparation of WSA-specific Wilderness Analysis Reports (WARs) and District Environmental Assessments (EAs) which summarize the WARs. Information presented in these documents form the data base for the Statewide Wilderness EIS. (The WARs are appended to this EIS as Volumes 2 and 3.)

Public participation has played an important role throughout the wilderness review process (see Table 1-2). Public involvement occurred throughout the inventory process and informal public scoping meetings were

held in conjunction with preparation of the WARs. Prior to preparation of the draft EIS, public scoping meetings were held in Taos, Santa Fe, Albuquerque, Socorro, Las Cruces, and Roswell New Mexico as well as El Paso, Texas. The results of these scoping meetings and other public participation are summarized in Chapter 5, Consultation and Coordination.

This draft EIS along with its appended WARs provides two different levels of analysis. The first level is the site-specific analysis for the individual WSAs discussed in detail in the WARs. In addition to summarizing the significant site-specific impacts, the draft EIS provides the second level of analysis consisting of an evaluation of the potential Statewide impacts of the alternatives.

This draft EIS also includes the recommendations of the BLM New Mexico State Director. These recommendations are based upon the District and Area Manager's recommendations which appeared in the District EAs, and any new information, including public comment. The State Director's recommendations also take into account the BLM Wilderness Study Criterion which requires consideration of the extent to which wilderness designation of each area under study would contribute to expanding the diversity of the NWPS.

After receiving public comment on the draft EIS and subsequent revisions, a final EIS and individual Wilderness Study Reports will be prepared. Recommendations will be made through the Secretary of the Interior to the President, followed by Congressional action. The District final EA, the final Statewide EIS, and subsequent decisions in conjunction with Congressional actions will serve to amend current BLM land use plans.

PLANNING ISSUE AND CRITERIA

The planning issue for the New Mexico Statewide Wilderness Study is: Which wilderness study areas or portions of wilderness study areas, if any, within New Mexico are suitable to be recommended to Congress for wilderness designation?

To be recommended as suitable for wilderness designation, an area should possess wilderness values and multiple resource benefits capable of balancing the benefits of other resource values and uses which could be foregone due to wilderness designation. In addition, an area recommended as suitable for wilderness designation must be capable of being managed as wilderness over the long-term.

In addressing the planning issue, this EIS and its site-specific WARs consider the following:

- The wilderness and multiple resource values of each WSA.
- The manageability of the area as wilderness over the long-term.
- The mineral and energy resource values present in the WSA.
- The impacts to other resource values and uses which could be either foregone or adversely affected as a result of wilderness designation.

- The effect on wilderness values if the area is not designated wilderness.

- The public comments from interested and affected people at all levels - local, state, regional, and national.

- The local social and economic effects wilderness designation and nondesignation would create.

- The resource-related plans and policies of local and state governments, Indian Tribes and other government agencies.

FORMULATION OF STATEWIDE ALTERNATIVES

Through BLM's scoping, criteria were developed to provide a full spectrum of alternatives (see Chapter 5). A basic objective of each Statewide alternative to be analyzed is to establish an appropriate allocation of resources consistent with the principles of multiple-use and sustained yield. Each alternative provides a different view of what is appropriate. It should be emphasized that by providing a full spectrum of alternatives the decisionmaker is not constrained from selecting a combination of alternatives. These alternatives and the proposed action are described in more detail in Chapter 2.

INTERRELATIONSHIP WITH OTHER PROJECTS

OTHER BLM WSAs IN NEW MEXICO

As a result of accelerated schedules or wilderness studies combined with other agencies, some of the New Mexico BLM WSAs are being studied outside of the Statewide study. These WSAs are listed below along with their status. (The location of these areas along with the other WSAs are shown on Map A in the envelope attached to the inside back cover of this volume.)

Ah-shi-sle-pah WSA (NM-010-009), San Juan County, NM: 6,563 acres

The Ah-shi-sle-pah WSA was studied along with the Bisti and De-na-zin WSAs in accelerated study. A draft EIS was released in November 1982, and legislation was enacted in October 1984, which designated the Bisti and De-na-zin areas as wilderness. The Ah-shi-sle-pah WSA was not released by this legislation from WSA status; however, in conjunction with provisions in the legislation, the Navajo Tribe has selected a significant amount of land within the WSA as part of the Navajo-Hopi Resettlement Act. After the selection process is complete and ownership of lands is transferred, it is expected that the remainder of the Ah-shi-sle-pah WSA will lack adequate size and mandatory wilderness characteristics to remain a WSA.

Peloncillo Mountains WSA (AZ-040-60), Hidalgo County, NM: 11,299 acres

The Peloncillo Mountains WSA is located in New Mexico and Arizona. Approximately 4,061 acres are located in New Mexico. The WSA is being studied along with other Arizona WSAs by the Safford (Arizona) District. A draft EIS was released in June 1983 and a final EIS is expected to be released in late 1985.

Culp Canyon WSA (NM-030-152), Otero County, NM: 10,937 acres

Wilderness study of the Culp Canyon WSA has been deferred because it is located in the Army-controlled McGregor Range. Currently, legislation is being proposed to renew the withdrawal of McGregor Range for military uses.

El Malpais Instant Study Area (ISA), Cibola County, NM: 157,640 acres

A draft EIS was released in August 1981 for El Malpais ISA. Completion of the study awaits consummation of the Navajo Land Exchange and a subsurface exchange.

Guadalupe Canyon ISA, Hidalgo County, NM: 3,691 acres

The Guadalupe Canyon ISA is being studied by BLM jointly with the Coronado National Forest as part of the Forest Service study of the Bunk Robinson Rare II WSA. A draft EIS is expected to be released by the Coronado National Forest in mid-1985.

Mathers ISA, Chaves County, NM: 362 acres

Although the Mathers ISA contains only 362 acres, wilderness study was required because of its natural area designation. An Environmental Assessment/Suitability Report was released for public comment by BLM in March 1979. This area has been recommended as nonsuitable for wilderness designation. Currently, legislative action on this recommendation is pending.

ADMINISTRATIVE APPEALS AND LITIGATION

All appeals to the Interior Board of Land Appeals over the November 1980 wilderness inventory decisions in New Mexico have been resolved. A lawsuit, Sierra Club vs. Watt is pending. The New Mexico WSAs could be affected by the outcome of this lawsuit if split estate lands (lands with Federal surface ownership and non-Federal subsurface ownership) as well as lands of less than 5,000 acres contiguous to existing wilderness are reinstated for wilderness study. (Such increases would not significantly change the environmental analysis, the Proposed Action or the alternatives.) If split estate is reinstated, the following WSAs would increase in acreage.

Area Name	Potential Acreage Increase
Aden Lava Flow	1,430 acres
Alamo Hueco Mountains	5,716 acres
Big Hatchet Mountains	7,858 acres
Brokeoff Mountains	220 acres
Eagle Peak	11,212 acres
Mesita Blanca	2,985 acres
Organ Mountains	139 acres
Robledo Mountains	135 acres
Sierra Ladrones	3,408 acres
West Potrillo Mountains	2,000 acres

CHAPTER 2
Alternatives Including The Proposed Action

CHAPTER 2

ALTERNATIVES INCLUDING THE PROPOSED ACTION

INTRODUCTION

There are two sets of alternatives analyzed in this EIS. The first includes the WSA-specific alternatives evaluated in the Wilderness Analysis Reports (WARs). These WARs are the WSA-specific evaluations which are appended to this EIS. The WARs evaluate an All Wilderness Alternative and a No Wilderness Alternative for each WSA. For some WSAs, an Amended Boundary Alternative was also evaluated when opportunities existed to minimize resource conflicts or improve manageability. (The Amended Boundary Alternative recommends some acreage of the WSA as suitable and the remainder as nonsuitable for wilderness.)

ALTERNATIVES EVALUATED IN THE STATEWIDE EIS

This EIS addresses 37 WSAs containing 786,391 acres of public land. Each WSA is individually evaluated in the WARs for All Wilderness, No Wilderness and (in some cases) an Amended Boundary. When these three options are considered for all 37 WSAs, over 3,500 alternatives are mathematically possible. Therefore, a range of alternatives was selected for analysis. The full spectrum of alternatives evaluated for wilderness range from 0, 37, 52, 70 and 100 percent of the WSAs acreage. A description of the alternatives, including the Proposed Action, is provided in Table 2-1. Acreage differences are displayed in Table 2-2. The management theme of each alternative is described in the following narrative.

ALL WILDERNESS

All 37 WSAs, totalling 786,391 acres of public land, would be recommended suitable as wilderness under this alternative. Management emphasis would be placed on preserving and improving the wilderness values. Resource use and development would be permitted to the extent compatible with wilderness management. (The WARs provide specific management actions for each alternative.)

EMPHASIS ON MANAGEABILITY

The primary difference between this alternative and the All Wilderness Alternative is the consideration given to long-term wilderness management. All or portions of 27 WSAs, totalling 550,985 acres of public land, would be recommended for wilderness designation under this alternative. The areas recommended suitable are the ones BLM reasonably believes can be managed as wilderness over the long-term. Management emphasis would be placed on preserving and improving wilderness values, while allowing other resource use and development outside the areas designated as wilderness. (The WARs provide the site-specific analyses on wilderness manageability, which is the basis of this alternative.)

TABLE 2-1
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

	All Wilderness	Emphasis on Manageability	Proposed Action	Conflict Resolution	No Wilderness
Number of areas managed as wilderness	37	27	18	13	0
Number of acres managed as wilderness	786,391	550,985	407,919	292,857	0
Number of acres managed without wilderness protection	0	235,416	378,472	493,534	786,391
Number of acres classified as having a moderate or high economic favorability for the following commodities would be closed to exploration and development[1/]					
Oil and Gas	95,400	74,800	74,800	33,700	0
Uranium	75,000	20,300	20,300	10,300	0
Copper	71,200	56,900	31,200	17,400	0
Lead	41,200	23,300	21,800	17,400	0
Silver	61,800	47,500	21,800	17,400	0
Zinc	41,200	23,300	21,800	17,400	0
Number of acres of inholdings on contiguous lands which attempts would be made to acquire	97,340	62,580	50,355	38,796	0
Number of miles of vehicle ways which would be closed to casual vehicle use and restricted to necessary vehicle use by permit	390	230	153	102	0

NOTE: [1/] Some of this acreage overlaps for more than one commodity.

TABLE 2-2
WSAs BY ACREAGE AND ALTERNATIVE

	All Wilderness	Emphasis on Manageability	Proposed Actions	Conflict Resolution	No Wilderness
ALBUQUERQUE DISTRICT					
1. Rio Chama	11,985	5,232	5,232	5,232	0
2. Sabinoso	15,760	0	0	0	0
3. San Antonio	7,050	7,050	0	0	0
4. Cabezon	8,118	7,984	7,984	7,984	0
5. Empedrado	9,410	0	0	0	0
6. Ignacio Chavez	9,961	8,780	8,780	8,780	0
7. La Lena	10,310	0	0	0	0
8. Ojito	11,919	11,297	11,297	11,297	0
LAS CRUCES DISTRICT					
9. Antelope	20,710	9,892	9,892	0	0
10. Continental Divide	68,761	35,635	35,635	0	0
11. Devil's Backbone	8,904	0	0	0	0
12. Eagle Peak	32,748	0	0	0	0
13. Horse Mountain	5,032	4,432	4,432	4,432	0
14. Jornada del Muerto	31,147	31,147	31,147	0	0
15. Mesita Blanca	16,429	16,429	0	0	0
16. Presilla	8,680	0	0	0	0
17. Sierra de las Canas	12,838	12,798	12,798	12,798	0
18. Sierra Ladrones	42,688	31,244	31,244	0	0
19. Stallion	24,238	24,238	0	0	0
20. Veranito	7,206	7,206	0	0	0
21. Aden Lava Flow	23,857	23,857	23,857	23,857	0
22. Alamo Hueco Mtns.	10,796	0	0	0	0
23. Big Hatchet Mtns.	58,014	41,293	41,293	41,293	0
24. Blue Creek	14,896	0	0	0	0
25. Cedar Mtns.	14,911	14,911	0	0	0
26. Cooke Range	19,608	0	0	0	0
27. Cowboy Spring	6,699	6,699	0	0	0
28. Florida Mtns.	22,336	22,336	0	0	0
29. Gila Lower Box	8,555	5,835	5,835	5,835	0
30. Las Uvas	11,067	0	0	0	0
31. Organ Mtns.	7,144	7,144	7,144	0	0
32. Robledo Mtns.	12,811	12,811	0	0	0
33. West Potrillo [a/]	155,105	147,100	147,100	147,100	0
34. Mt. Riley [a/]					
35. Brokeoffs	31,386	31,386	0	0	0
ROSWELL DISTRICT					
36. Carrizozo Lava Flow[a/]	25,312	24,249	24,249	24,249	0
37. Little Black Peak [a/]					
ACREAGE TOTALS	786,391	550,985	407,919	292,857	0
PERCENT OF TOTAL ACRES	100	70	52	37	0
PERCENT OF NO. OF WSAs	100	73	49	35	0

NOTE: [a/] WSAs 33 and 34 and 36 and 37 are adjacent to each other and are being studied jointly.

PROPOSED ACTION

The Proposed Action recommends all or part of 18 WSAs, totalling 407,919 acres of public land, for wilderness designation. This alternative recommends for wilderness designation those areas where, in the opinion of the State Director, the quality of wilderness values is capable of balancing the values of existing and potential resources which could be foregone as a result of wilderness designation. Also, this alternative recommends for wilderness designation, those areas which BLM reasonably believes can be managed as wilderness over the long-term. In areas not designated as wilderness, the goal would be to continue resource management under existing land use plans. A total of 378,472 acres would be recommended nonsuitable for wilderness designation and managed under existing land use plans.

CONFLICT RESOLUTION

If this alternative were implemented, all or portions of 13 WSAs, totalling 292,857 acres of public land, would be designated as wilderness. Primary emphasis would be placed on making public land and resources available for use and development, while also protecting a portion of the high quality wilderness values. All areas identified for wilderness designation under this alternative have high quality wilderness values, low resource conflicts with wilderness designation and are capable of being managed as wilderness over the long-term. A total of 493,535 acres of public land would be recommended nonsuitable for wilderness designation and managed under existing land use plans.

NO WILDERNESS

All of the WSAs would be released from further wilderness review and managed under existing land use plans. Primary emphasis would be placed on making public land and resources available for use and development.

COMPARISON OF STATEWIDE IMPACTS

Table 2-3 provides a summary of Statewide impacts by alternative.

TABLE 2-3

SUMMARY COMPARISON OF STATEWIDE IMPACTS

STATEWIDE ISSUES	Alternatives				
	ALL WILDERNESS	EMPHASIS ON MANAGEABILITY	PROPOSED ACTION	CONFLICT RESOLUTION	NO WILDERNESS
Wilderness Values	Naturalness and solitude and primitive recreation opportunities maintained on all of the acreage possessing these wilderness values. Closure of 390 miles of existing vehicle ways would improve naturalness and solitude opportunities. NWPS expanded to include 20 new ecosystems not now represented.	Naturalness and solitude and primitive recreation opportunities maintained on 70% of the acreage possessing these wilderness values. Closure of 230 miles of existing vehicle ways would improve naturalness and solitude opportunities. NWPS expanded to include 18 new ecosystems not now represented. Resource use and development will impair wilderness values on 192,403 acres recommended nonsuitable for wilderness. There are no impacts expected on 43,003 acres in 3 WSA's and 1 ACEC recommended nonsuitable for wilderness due to low resource development potential or existing management restrictions.	Naturalness and solitude and primitive recreation opportunities maintained on 52% of the acreage possessing these wilderness values. Closure of 153 miles of existing vehicle ways would improve naturalness and solitude opportunity. NWPS expanded to include 18 new ecosystems not now represented. Resource use and development will impair wilderness values on 313,859 acres recommended nonsuitable for wilderness. There are no impacts expected on 64,613 acres in 5 WSA's and 1 ACEC recommended nonsuitable for wilderness due to low resource development potential or existing management restrictions.	Naturalness and solitude and primitive recreation opportunities maintained on 37% of the acreage possessing these wilderness values. Closure of 102 miles existing vehicle ways would improve naturalness and solitude opportunities. NWPS expanded to include 17 new ecosystems not now represented. Resource use and development will impair wilderness values on 428,921 acres recommended nonsuitable for wilderness. There are no impacts expected on the 5 WSA's and 1 ACEC described in the proposed action.	Naturalness and solitude and primitive recreation opportunities would be diminished on 84% of the acreage possessing these wilderness values. This would occur over the long-term due to resource use and development. None of the southwest desert ecosystems occurring in New Mexico would be added to the NWPS. There are no impacts expected on 128,818 acres in 10 WSA's and 1 ACEC recommended nonsuitable for wilderness due to low resource development potential or existing management restrictions.
Minerals	Same as the proposed action except that 7% of the lands in New Mexico classified as having a moderate or high potential for barite would be affected. This could result in local impacts from precluding development of local mines.	Same as the proposed action.	For most minerals, because less than 5% of the lands in New Mexico classified as having moderate or high potential would be affected, no significant impacts are projected. However, because a significant portion of lands having potential for tin, cobalt and nickel would be affected, Statewide impacts are possible.	No significant impacts.	No impact.
Livestock Grazing	Same as the proposed action except that less than 1.3 per cent of lands used for livestock grazing in New Mexico are involved.	Same as the proposed action for 550,985 acres recommended as suitable for wilderness. Same as the no wilderness alternative for the 235,406 acres recommended nonsuitable.	Inconvenience to livestock operators from vehicle restrictions will result on 407,919 acres. Because this represents less than 1% of the lands used for livestock grazing in New Mexico and wilderness designation allows continued use of livestock grazing, no significant impacts are expected for the 378,472 acres recommended non suitable. Impacts would be similar to the no wilderness alternative.	Same as the proposed action for 292,857 acres recommended as suitable for the 493,534 acres recommended nonsuitable impacts would be the same as the no wilderness alternative.	Vehicle restrictions would not be implemented. This along with the expected increase in public pressure is projected to result in increased vandalism to livestock developments and harassment of livestock.

CHAPTER 3
Affected Environment

CHAPTER 3

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the affected environment by:

1) Summarizing the individual WSAs. These summaries are based upon the information contained in the appended Wilderness Analysis Reports (WARs).

2) Describing the existing environment for those resources considered significant from a Statewide perspective.

As described in Chapter 5, under the heading Results of Scoping, the Statewide issues identified for analysis are: wilderness values, mineral resources and livestock grazing.

SUMMARY OF THE INDIVIDUAL WSAs

This section briefly describes each WSA and its wilderness values and special features. The number appearing with the title of the WSA corresponds to Map 1-1. More detail about the individual WSAs is included in the appended WARs.

ALBUQUERQUE DISTRICT

1. Rio Chama (11,985 acres)

The Rio Chama WSA is located in Rio Arriba County, approximately 3.5 air miles south of El Vado, New Mexico. The WSA lies adjacent to the northern boundary of the Forest Service Chama River Canyon Wilderness. The WSA is composed of a combination of gently rolling grass and sagebrush plains bordered by dense stands of ponderosa pine and the northern portions of Gallina Peak. The unit is bisected on a north-south line by the Chama River which meanders through a 900 foot deep canyon. The WSA ranges in elevation from 6,600 feet to 7,500 feet.

The presence of man-made intrusions beyond the canyon rims detract from the naturalness of the area. The Rio Chama Canyon provides the most distinctive indications of naturalness throughout the WSA. Visible impacts outside the canyon include range improvements, seedings, vehicular routes and private homes. Opportunities for solitude are best in the Chama River Canyon. The opportunities for solitude are somewhat diminished in those areas beyond the canyon rims due to daily ranching operations. There are outstanding recreation opportunities for hiking, camping, fishing, rafting and photography. Special features of the Rio Chama WSA include the Chama River, a state designated "Scenic and Pastoral River" and high scenic values.

2. Sabinoso (15,760 acres)

The Sabinoso WSA is located in San Miguel County, approximately 8 air miles northeast of Trujillo, New Mexico, 20 air miles northwest of Conchas Reservoir and 1 mile due west of Sabinoso, New Mexico.

The WSA is composed of a series of high, narrow mesas surrounded by steep side slopes and canyons. Elevations in the WSA range from 4,500 feet to 6,000 feet. The rugged country of the WSA primarily supports pinyon-juniper woodlands, with a perennial warm season grass savanna along the smoother mesa tops. The WSA has been largely uninfluenced by human activities. Man's evidence of intrusions, mainly trails and range improvements, have been limited by the rugged terrain and access. Outstanding opportunities for solitude are provided by the rugged topography, vegetation, and isolation. Current recreational use is low because of the area's remoteness, limited access, and lack of water. Potential outstanding recreational opportunities include hiking, backpacking, camping, horseback riding, and hunting. Special features in the WSA consist of geologic displays in the exposed canyon walls and scenic vistas of the surrounding landscape from atop the mesas.

3. San Antonio (7,050 acres)

The San Antonio WSA is located in Rio Arriba County, northwest of San Antonio Mountain, approximately 6 miles southwest of Antonito, Colorado, and 12 miles north of Tres Piedras, New Mexico.

The San Antonio WSA is composed of broad, gently rolling sagebrush and grass plains bisected north to south by the 200-foot-deep Rio San Antonio Canyon. The WSA ranges in elevation from 7,900 feet to 8,835 feet. Approximately 95 percent of the WSA is covered by a variety of grasses and sagebrush-type vegetation. The San Antonio WSA is natural in its general appearance. Visually the Rio San Antonio Canyon along with the riparian vegetation contrasts with the vast open expanses above the canyon rims where outside influences of human activities are more visible due to the lack of topographic and vegetative screening. Due to its size, general lack of screening from vegetation and terrain, the opportunities for solitude in this WSA are marginally outstanding. Opportunities for primitive recreation activities are limited due to its small size and landscape features.

4. Cabezon (8,118 acres)

The Cabezon WSA is located in Sandoval County, approximately 15 air miles west of San Ysidro, New Mexico. Cabezon Peak, which rises to an elevation of 7,785 feet, is a spectacular example of a volcanic neck. The relief is moderate throughout most of the WSA and results from the incision of numerous arroyos into the flatlying sandstone beds that surround Cabezon Peak. Areas of high relief are restricted to the upper slopes of the peak, where nearly vertical cliffs predominate. Cabezon Peak is, in itself, a unique geological feature.

The WSA has a high degree of naturalness. The Peak provides outstanding opportunities for solitude and for primitive recreation activities such as backpacking, rock climbing, photography and sightseeing.

5. Empédrado (9,410 acres)

The Empedrado WSA is located in Sandoval County, approximately 4 miles northwest of the village of Guadalupe, New Mexico. Elevations range from 6,000 feet to 6,552 feet.

The Empedrado WSA is sparsely impacted by the actions of man, and all existing intrusions are generally screened by the surrounding vegetation and/or topography. The broken terrain of the WSA combined with the pinyon-juniper vegetation cover provides opportunities for solitude. However, the narrow portion in the northern two-thirds of the WSA limits the opportunities to experience solitude. The Empedrado WSA contains some opportunities for primitive recreation activities such as hunting, sightseeing, and hiking. Overall, opportunities for primitive recreation are rated as less than outstanding.

Special features include good wildlife diversity due to the riparian vegetation along the Chico Arroyo. Also several cultural sites, including petroglyphs, have been noted in the WSA. Empedrado's visual resources in the southern portion are considered an integral part of the viewshed in the general region.

6. Ignacio Chavez (9,961 acres)

The Ignacio Chavez WSA is located in McKinley and Sandoval Counties, approximately 6 miles west of the village of Guadalupe, New Mexico. Elevations range from approximately 6,000 to 7,730 feet. The dominate vegetative type in the WSA is pinyon-juniper.

Overall, the Ignacio Chavez WSA generally appears natural. The expansive topographic diversity and generous vegetation screening throughout a majority of the WSA provides outstanding opportunities for a user to experience solitude. This variation in terrain and vegetation provide outstanding opportunities for such primitive recreation activities as hiking, climbing, hunting, camping, and sightseeing. Visual appeal and the diversity of landforms and vegetation are perhaps the most outstanding special features of the Ignacio Chavez WSA. Wildlife is another special feature of the WSA due to one of the most diverse and productive wildlife habitats in northwest New Mexico.

7. La Lena (10,310 acres)

The La Lena WSA is located in Sandoval County, approximately 7 miles north of the village of Guadalupe, New Mexico. The WSA consists of broken terrain with steep sided mesas cut by a network of arroyos. Approximately 400 feet of relief occurs in the WSA. Vegetation includes a variety of grasses, cacti, and pinyon-juniper trees.

The La Lena WSA generally appears to be natural. Small sandstone eroded canyons and meandering arroyos provide the topographic relief to screen users and provide opportunities for solitude. Though the topographic relief of La Lena offers recreational opportunities, the WSA is characterized as having less than outstanding primitive recreation opportunities. The WSA contains special values such as cultural and wildlife resources.

8. Ojito (11,919 acres)

The Ojito WSA is located in Sandoval County, approximately 5 miles southwest of the village of San Ysidro. The WSA consists of steep and rocky terrain interspersed with several steep canyons and pockets of badlands

topography. Elevations range from 5,650 feet to 6,260 feet. Vegetation is primarily shrubs and grasses, with sparse stands of pinyon-juniper woodlands scattered throughout the WSA.

Outstanding opportunities for solitude are found throughout the WSA due to its size and topographic screening provided by the rough terrain and sandy arroyos. The Ojito WSA also offers a wide diversity of outstanding primitive recreation opportunities for sightseeing, camping, hiking and climbing. Special features of the WSA include cultural sites, paleontologic resources, striking visual features, and rare plants.

LAS CRUCES DISTRICT

9. Antelope (20,710 acres)

The Antelope WSA is located approximately 6 miles southeast of San Antonio, New Mexico, in Socorro County. It is bound on the west by the Bosque del Apache National Wildlife Refuge and on the east by the White Sands Military Reservation. The WSA is characterized by rolling desert prairie with little or no topographic relief. Vegetation consists of seven major types: broom dalea, sand sagebrush, creosote, mesquite, mid-grass, yucca, and shortgrass. The expansive desert environment and low visitor use compensate for lack of screening and offer opportunities for solitude. Primitive recreation opportunities are not outstanding. Other than providing habitat for pronghorn and raptors, there are no special features of scientific or educational interest.

10. Continental Divide (68,761 acres)

The Continental Divide WSA is located in Catron County, south of the Plains of San Augustin, approximately 29 air miles south of Datil, New Mexico. The WSA is characterized by smooth rolling grasslands, rugged, rough canyons, and hill country. Vegetation consists of three major types: ponderosa-pinyon, blue grama grassland, and pinyon-juniper. The remote location and topographic variations of the WSA offer outstanding opportunities for solitude and primitive recreation. Special features include wildlife, cultural, and scenic values.

11. Devil's Backbone (8,904 acres)

The Devil's Backbone WSA lies in central Socorro County, approximately 15 air miles southwest of Socorro, New Mexico. The WSA rises precipitously out of the surrounding desert grassland and is characterized by sharp, knife-like ridges and stark, rocky peaks. Vegetation consists of three major types: desert grassland, pinyon-juniper, and ponderosa pine-Douglas fir. The WSAs topographic diversity and geographic setting provide outstanding opportunities for solitude; however, it is not a typical primitive recreation area. No special features occur in the WSA.

12. Eagle Peak (32,748 acres)

The Eagle Peak WSA is located in Catron County in west-central New Mexico, approximately 6 air miles west of Quemado. The WSA is characterized by rolling topography broken by sandstone and basalt mesas and canyons.

Volcanic features include large cinder cones and associated lava flows. Vegetation consists of three major types: pinyon-juniper, grassland, and Russian thistle-alkali sacaton. The WSA provides opportunities for solitude. Opportunities for primitive recreation are considered outstanding. Special features include archaic sites and geologic features, primarily volcanics.

13. Horse Mountain (5,032 acres)

The Horse Mountain WSA lies in Catron County in west-central New Mexico, approximately 25 air miles from Datil, New Mexico. The WSA is an isolated mountain surrounded by the Plains of San Augustin and characterized by steep slopes on all aspects. Vegetation consists of two major types: ponderosa-pinyon and grass-snakeweed. The WSA provides excellent opportunities for solitude and primitive recreation. Special features include wildlife and scenic values.

14. Jornada del Muerto (31,147 acres)

The Jornada del Muerto WSA lies in south-central New Mexico in Socorro and Sierra Counties, approximately 45 air miles south-southeast of Socorro, New Mexico. The WSA is characterized by lava tubes, sink holes, pressure ridges, and related volcanic features, most of which have been silted in by fine wind blown sand. Vegetation consists primarily of the short grass type.

The WSA provides exceptional opportunities for solitude and average opportunities for primitive and unconfined recreation.

15. Mesita Blanca (16,429 acres)

The Mesita Blanca WSA lies in Catron County in west-central New Mexico, approximately 20 air miles west of Quemado, New Mexico. The WSA is characterized by rolling grassland broken by isolated sandstone and basalt mesas which are characterized by vertical cliffs and broken topography. Vegetation consists of three major types: blue grama-snakeweed, alkali sacaton-Russian thistle, and pinyon-juniper. The WSA provides outstanding opportunities for solitude. Special features are limited to geologic and cultural values.

16. Presilla (8,680 acres)

The Presilla WSA lies east of the Rio Grande in Socorro County, 2 miles east of Socorro, New Mexico. The WSA is characterized by mesa benchlands cut by large arroyos, rugged limestone and sandstone hills with scattered coppice dunes. Vegetation consists of three major types: creosote, desert shrub, and pinyon-juniper. The WSA provides opportunities for solitude and primitive recreation. A special feature in the WSA is the Arroyo del Tajo pictographs.

17. Sierra de las Canas (12,838 acres)

The Sierra de las Canas WSA lies in central New Mexico in Socorro County, approximately 7 air miles east of Socorro, New Mexico. The WSA is characterized by sheer rock escarpments, deep narrow canyons, mountain ridges and mesas, broken badlands, and isolated desert valleys. Vegetation consists

of four major types: desert shrub, pinyon-juniper, creosote, and wasteland. The WSA provides outstanding opportunities for solitude and primitive recreation. Special features include outstanding scenic values.

18. Sierra Ladrones (42,688 acres)

The Sierra Ladrones WSA lies in west-central New Mexico in Socorro County, approximately 15 air miles northwest of Socorro, New Mexico. The WSA is characterized by massive rock escarpments, serrated peaks, badlands, box canyons, mesa benchlands, and rolling hills. Vegetation consists of three major types: pinyon-juniper, desert shrub, and conifer. The WSA offers outstanding opportunities for solitude and primitive recreation.

The WSA contains special geological, ecological, and scenic features. Geological features include the northernmost known exposures of lower Mississippian rocks in New Mexico. The ecological features consist of three major ecoregions of scientific value.

19. Stallion (24,238 acres)

The Stallion WSA lies in central New Mexico in Socorro County, approximately 14 air miles east-northeast of Socorro, New Mexico. The WSA is characterized by rock escarpments, badlands, box canyons, and rolling pinyon-juniper and grass covered hills. Vegetation consists of four major types: pinyon-juniper, desert shrub, grassland, and wasteland. Opportunities for solitude are considered outstanding. Special features are limited to a small herd of wild and free-roaming horses.

20. Veranito (7,206 acres)

The Veranito WSA lies immediately east of the floodplain of the Rio Grande in Socorro County, approximately 4 miles north-northeast of Socorro, New Mexico. The WSA is characterized by mesa benchlands cut by arroyos and a series of low lying hills. Vegetation consists of four types: creosote, desert grassland, riparian, and mesquite. The WSA offers outstanding opportunities for solitude. Special features include a significant Piro Indian pueblo, an unusual petroglyph site, and a cottonwood bosque.

21. Aden Lava Flow (23,857 acres)

The Aden Lava Flow WSA is located in the southwest quarter of Dona Ana County, 21 miles southwest of Las Cruces, New Mexico. The WSA is characterized by coppice sand dunes, volcanic craters, and basalt flows. Vegetation consists of three major types: grass-mixed desert shrub, mesquite, and creosote. Two melanistic species are found in the WSA along with numerous species of bats, raptors, and wide-ranging carnivores.

The imprints of man in the WSA are minimal, consisting of fences and two-track vehicle trails. Opportunities for solitude are enhanced by the varied and rugged interior relief and by the large size and blocked-up configuration of the WSA. The WSA contains several special ecological and geological features. A portion of the area was designated a Research Natural Area (RNA) in 1978.

22. Alamo Hueco Mountains (10,796 acres)

The Alamo Hueco Mountains WSA is located in southeastern Hidalgo County in the "boot heel" part of the State of New Mexico. The WSA is approximately 70 miles south-southeast of Lordsburg, New Mexico. The WSA is characterized by highly eroded volcanic mountains, mesas, vertical cliffs, and long sinuous canyons. Vegetation is primarily juniper-oak brush. A variety of nongame and game animals, birds, reptiles, and amphibians have been recorded in the WSA. Opportunities for solitude are primarily a result of the rugged topography, with outstanding opportunities for primitive and unconfined recreation such as hiking, nontechnical rock climbing, backpacking, hunting, photography, and sightseeing. These opportunities are limited only by the land ownership patterns surrounding the WSA. The WSA contains special ecological, cultural, and scenic features. The WSA also contains the most significant known prehistoric cultural resources of all the WSAs in the Las Cruces/Lordsburg Resource Area. Caves within the WSA have been identified as eligible for the National Register of Historic Places as an archaeological district.

23. Big Hatchet Mountains (58,014 acres)

The Big Hatchet Mountains WSA is located in southeastern Hidalgo County in the "boot heel" part of the State of New Mexico. The WSA is approximately 50 miles south-southeast of Lordsburg, New Mexico. The Big Hatchet Mountains are characterized by very rugged and steep terrain. Vegetation consists of six major types: pinyon-juniper-mixed mountain shrub, creosote, mixed desert shrub, tobosa-tarbush, tobosa, and mesquite. Limestone formations found in the WSA have many caves which shelter a variety of wildlife ranging from mountain lions to various species of bats. Desert bighorn sheep are the most significant wildlife feature of the WSA. The Sonora mountain kingsnake is also found in the WSA. The large size of the WSA and generally well blocked-up configuration provide outstanding opportunities for solitude, allowing visitors to disperse and avoid the sights and sounds of others. Primitive recreation opportunities within the WSA include hiking, backpacking, horseback riding, mountain climbing, and sightseeing. The WSA also contains special ecological and scenic features. The ecological features include both vegetation and wildlife values of scientific and educational interest.

24. Blue Creek (14,896 acres)

The Blue Creek WSA is located 6 miles northwest of Redrock, New Mexico, north of the Gila River. The WSA is dominated by Black Mountain which is composed of black basalt. Vegetation consists of three major types: juniper-mixed mountain shrub, creosote, and deciduous trees. The WSA is not an exceptionally valuable wildlife area, although a few mule deer and javelina are found in the area. Due to the area's large size and topographic diversity, opportunities for solitude and primitive and unconfined recreation are considered outstanding. The WSA provides habitat for the night-blooming cereus, an ecological feature of scientific value.

25. Cedar Mountains (14,911 acres)

The Cedar Mountains WSA is located in southwestern Luna County, approximately 20 miles southwest of Deming, New Mexico. The WSA is characterized by a southeast trending ridge with scattered peaks and rolling

hills. Drainages are steep and rocky at their origins along the mountain ridge. Vegetation consists of three major types: mixed mountain shrub, creosote, and tobosa. It is not a unique area for wildlife since it is quite similar to other desert ranges. Mule deer and javelina are found in low numbers in the area.

The WSA contains outstanding opportunities for solitude due to the numerous small canyons which provide topographic screening in the mountainous portion of the WSA.

26. Cooke's Range (19,608 acres)

The Cooke's Range WSA is located in Luna County, approximately 15 miles north of Deming, New Mexico. The WSA includes portions of the north and east slopes of Cooke's Peak, ridges running from the peak and steep walled canyons. Vegetation consists of four major types: pinyon-juniper-mixed mountain shrub, creosote, tobosa, and mixed desert shrub. The WSA supports a diverse wildlife community with over 70 avifauna species, some mule deer, and unusual reptiles. Opportunities for solitude in the south and southwest portions of the WSA are not outstanding due to lack of topographic screening. The WSA offers a variety of primitive recreation opportunities; these are enhanced by the size of the WSA and diversity of vegetation and topography. The WSA contains special ecological, cultural, and scenic features. Ecological features include both vegetation and wildlife values of scientific and educational interest. The cultural and historical features of the WSA are among the most significant in the Las Cruces District.

27. Cowboy Spring (6,699 acres)

The Cowboy Spring WSA is located in Hidalgo County, New Mexico, in the east half of the Animas Mountains. The WSA is approximately 50 miles due south of Lordsburg, New Mexico. The WSA is characterized by rugged canyons and rough hill country, with Cowboy Rim being the dominant feature. The vegetation consists of three major types: juniper-mixed mountain shrub, grass, and mixed mountain shrub. The proximity of three wildlife habitat sites creates an ecotone effect in which a diverse wildlife community is found. The WSA offers outstanding opportunities for solitude and primitive and unconfined recreation. The rugged topography, isolation, and lack of legal access preclude the use of vehicles. The WSA contains special ecological and cultural features of scientific and educational value. The ecological features include both vegetation and wildlife values, while the cultural values consist of three prehistoric sites of potential scientific and educational value.

28. Florida Mountains (22,336 acres)

The Florida Mountains WSA lies in the southeast quadrant of Luna County, approximately 10 miles southeast of Deming, New Mexico. The WSA is characterized by a north-south trending mountain range with steep canyons and near vertical cliffs. Vegetation consists of five major types: grass-mixed desert shrub, snakeweed-mixed desert shrub-grass, creosote-grass, snakeweed-mesquite-yucca-other shrubs and trees, and other shrubs and trees-mixed desert shrub. The WSA supports a diverse wildlife community with the most notable species being a large herd of introduced exotics, the Persian

ibex. Portions of the WSA provide outstanding opportunities for solitude; these are somewhat diminished along the east side and southern portion of the WSA. The WSA offers a variety of outstanding primitive recreational opportunities. Special features of the WSA are limited to ecological features and scenic quality.

29. Gila Lower Box (8,555 acres)

The Gila Lower Box WSA is located 23 miles northwest of Lordsburg and 4 miles southeast of Virden, New Mexico. The dominant feature is the Gila Lower Box Canyon with numerous side canyons and rolling hills. Vegetation consists of four major types: grass, creosote, mixed desert shrub, and deciduous trees. The WSA is well-known for its diverse wildlife community with 265 species of birds, 67 mammal species, and 12 amphibian and 54 reptile species recorded. The WSA offers outstanding opportunities for solitude and for primitive and unconfined recreation.

The WSA contains special ecological, cultural, geological, and scenic features. Ecological features include both vegetation and wildlife values of scientific and educational interest. Cultural features include several large petroglyph panels and a number of rock shelters and structures.

30. Las Uvas Mountains (11,067 acres)

The Las Uvas Mountains WSA is located in northwestern Dona Ana County, approximately 30 miles northwest of Las Cruces and 7 miles south of Hatch, New Mexico. The WSA is characterized by bedded volcanic rock with gentle slopes and cliffs and numerous mesas, buttes, and deep canyons. Vegetation consists of two major types: grass and creosote. The variation of vegetation in the WSA allows for more diversity in the wildlife community than would be otherwise expected. Common wildlife species include mule deer, golden eagles, banded rock rattlesnakes, and rock squirrels. The WSA provides outstanding opportunities for solitude, but does not offer a wide diversity of high quality primitive recreation opportunities.

31. Organ Mountains (7,144 acres)

The Organ Mountains WSA lies in eastern Dona Ana County, approximately 15 miles east-northeast of Las Cruces, New Mexico. The WSA is characterized by extremely rugged terrain with a multitude of steep-sided crevices, canyons, and spires. The spires are the most striking visual features of the WSA. Vegetation consists of three major types: ponderosa pine, pinyon-juniper mixed mountain shrub, and mixed desert shrub. The WSA has a varied wildlife community largely attributable to elevation and vegetation differences, and to a lesser extent, the presence of special habitat features. The WSA provides outstanding opportunities for solitude. Opportunities for primitive and unconfined types of recreation are enhanced by size, boundary configuration, and topographic relief.

The WSA contains special ecological and scenic features. Ecological features include both vegetation and wildlife values of scientific and educational interest, and scenic values.

32. Robledo Mountains (12,811 acres)

The Robledo Mountains WSA is located in central Dona Ana County and is approximately 8 miles northwest of Las Cruces, New Mexico, on the west bank of the Rio Grande. The WSA is characterized by rugged, steep canyons and southward dipping cuestas. Vegetation consists of three major types: grass-mixed desert shrub, creosote, and mixed desert shrub. There are several special habitat features that enhance the value of the WSA for wildlife. The nearness of the Rio Grande is also significant for wildlife in the WSA. The rugged topography of the WSA provides outstanding opportunities for solitude. Primitive recreation opportunities are not considered outstanding.

The WSA contains special ecological and cultural features of scientific and educational interest. The ecological features include both vegetation and wildlife, while the cultural features consist of 20 known historic and prehistoric sites.

33/34. West Potrillo Mountains and Mount Riley (155,105 acres)

The West Potrillo Mountains and Mount Riley WSAs are located in southwestern Dona Ana County. A small part of the West Potrillo Mountains WSA extends west into Luna County. The WSAs are approximately 30 miles southwest of Las Cruces, New Mexico. A combined description is appropriate since both areas have strong similarities in resource values and uses. The WSAs are characterized by a wide variety of terrain including over 48 cinder cones with sand dunes, playas, and intrusive peaks with prominent talus slopes and alluvial fans. Vegetation consists of five major types: creosote, creosote-mixed desert shrub, creosote-mixed desert shrub-grass, mesquite, and mixed desert shrub-tobosa. The combination of varied wildlife habitat sites and the size of the WSAs create enough diversity so that there are a number of different wildlife species.

Cumulative impacts of man's imprints within the West Potrillo Mountains WSA do not greatly affect the quality of overall naturalness. Both WSAs generally appear to have been affected primarily by the forces of nature. Both WSAs provide outstanding opportunities for solitude. The West Potrillo Mountains WSA also offers outstanding opportunities for primitive recreation.

The WSAs contain special ecological and cultural features of scientific and educational value. Ecological features include both vegetation and wildlife values, while cultural features include Classic Mimbres and El Paso phase sites.

35. Brokeoff Mountains (31,386 acres)

The Brokeoff Mountains WSA is located in the southeastern corner of Otero County, just north of and contiguous to Guadalupe Mountains National Park. The WSA is characterized by one dominant north-south ridge and two canyons, 500-600 feet deep. Vegetation consists of two major types: grass and desert shrub. Outstanding opportunities for solitude and primitive and unconfined recreation are enhanced by the WSAs size, boundary configuration, and rugged topography.

36/37. Carrizozo Lava Flow and Little Black Peak (25,312 acres)

Both WSAs are located in Lincoln County, 4 miles west of Carrizozo, New Mexico. The WSAs comprise about the northern third of the Carrizozo Malpais, which is believed to be one of the most recent lava flows in the continental United States. U.S. Highway 380 forms the central common boundary between both WSAs. A combined description is appropriate since both areas have strong similarities in resource values and uses. Vegetation consists of desert shrubs and grasses with a scattered overstory of juniper trees.

Evidences of man are very limited within the WSAs. The intricately dissected and jumbled surface of the lava flow provides an outstanding opportunity for solitude. There are abundant opportunities for primitive and unconfined types of recreation such as hiking, hunting, nature study, spelunking, photography and sightseeing.

Special features include an Upper Sonoran vegetative community which has greater diversity of species than found in surrounding areas, the presence of 12 melanistic (abnormally dark) species of animals, unusual geological features such as caves and volcanic structures and scenic qualities of the recent lava flow.

THE AFFECTED ENVIRONMENT STATEWIDE

The remainder of this chapter provides cumulative information on the affected environment as it relates to those issues which are of statewide importance (wilderness diversity, mineral resources and livestock grazing). The level of detail in the following discussion is in proportion to the significance of the impact and the importance of the issue as it relates to the decisionmaking process.

DIVERSITY IN THE NATIONAL WILDERNESS PRESERVATION SYSTEM (NWPS)

The three factors to be addressed are: 1) expanding the diversity of natural systems and features, as represented by ecosystems and landforms, 2) assessing the opportunities for solitude or primitive recreation within a days driving time (5 hours) of major population centers, and 3) balancing the geographic distribution of wilderness areas.

ECOSYSTEM/LANDFORM DIVERSITY

The interrelationship of vegetation and topography form the basis for evaluating ecosystem diversity. The Bailey-Kuchler landform and potential natural vegetation system was used for this evaluation (Bailey 1980; Kuchler 1966).

The Bailey-Kuchler system uses elevation, rainfall, and temperature to describe potential natural vegetation by physiographic province. Table 3-1 displays the acreage of vegetative types represented in the WSAs. The existing and potential ecosystem representations are shown in Table 3-2. The following narrative describes the physiographic provinces in which the WSAs occur, with Map 3-1 delineating the provinces.

TABLE 3-1
ECOSYSTEMS AND LANDFORMS REPRESENTED IN THE
WSAs

Wilderness Study Areas by Province	ACRES OF VEGETATION REPRESENTED					
	Mountain Mahogany Oak Scrub	Grama Tobosa Shrub Steppe	Trans-Pecos Shrub Savanna	Creosote Bush	Mesquite Acacia Savanna	Western Ponderosa Forest
CHIHUAHUAN DESERT PROVINCE						
Antelope		20,710				
Devil's Backbone		3,904				
Jornada del Muerto		31,147				
Presilla		8,680				
Sierra de Las Canas		8,350				
Stallion		3,000				
Veranito		7,206				
Aden Lava Flow		18,717		1,261	3,879	
Blue Creek	7,276			7,620		
Cedar Mountains	6,109	1,206		7,599		
Cooke's Range	13,899	879	1,762	3,068		
Florida Mountains		20,731	316		1,289	
Gila Lower Box		2,138	2,583	3,380	454	
Las Uvas Mountains		9,276		1,791		
Organ Mountains	3,362		3,619			163
Robledo Mountains		8,925	1,198	2,688		
West Potrillo Mountains and Mount Riley		5,229	61,172	52,539	36,165	
Brokeoff Mountains		27,206	4,180			

NOTE: Devil's Backbone, Sierra de Las Canas and the Stallion WSAs are each included in more than one province.
SOURCE: BLM WARs, 1985.

TABLE 3-1
ECOSYSTEMS AND LANDFORMS REPRESENTED IN THE
WSAs
(continued)

Wilderness Study Areas by Province	ACRES OF VEGETATION REPRESENTED				
	Ponderosa Pine and Douglas Fir Forest	Pinyon-Juniper Woodland	Great Basin Sagebrush	Grama-Galleta Steppe	Juniper Mixed Shrub
ROCKY MOUNTAIN FOREST PROVINCE					
Rio Chama	1,285	1,000	9,700		
San Antonio		352	6,698		
COLORADO PLATEAU PROVINCE					
Sabinoso		6,700		9,060	
Cabezon		5,657		2,461	
Empedrado		7,146		2,264	
Ignacio Chavez	12	7,367		2,582	
La Lena		5,961	880	3,469	
Ojito		6,264		5,655	
Eagle Peak		21,176		11,572	
Mesita Blanca		5,787		10,642	
Sierra de Las Canas		4,488			
Sierra Ladrones	2,000			2,868	
Stallion		21,238			
Carrizozo Lava/FLow					
Little Black Peak					25,312

NOTE: Sierra de Las Canas, Sierra Ladrones and the Stallion WSAs are each included in more than one province.

TABLE 3-1
ECOSYSTEMS AND LANDFORMS REPRESENTED IN THE
WSAs
(concluded)

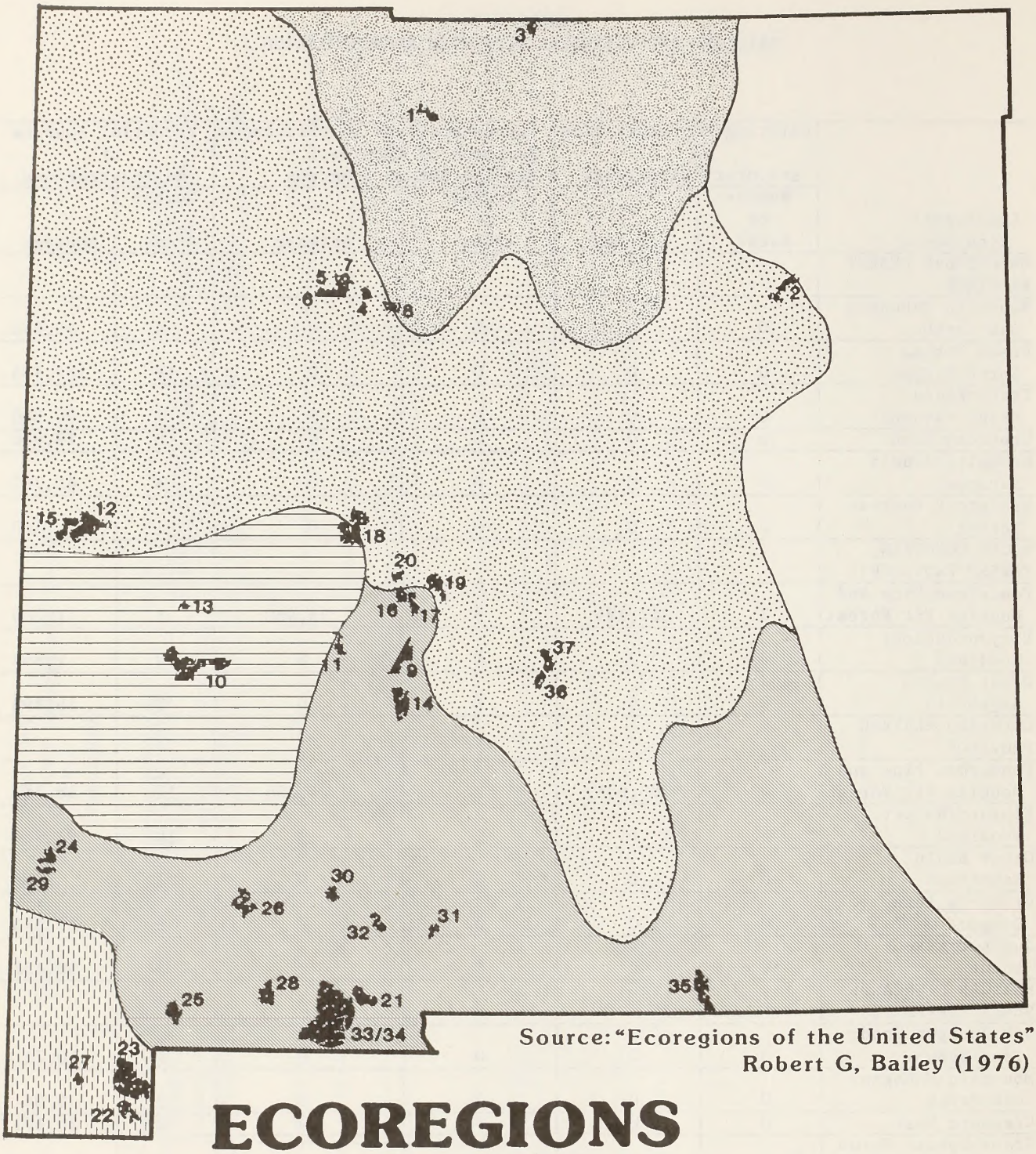
Wilderness Study Areas by Province	ACRES OF VEGETATION REPRESENTED								
	Ponderosa Pine and Douglas Fir Forest	Pinyon-Juniper Woodland	Oak Juniper Woodland Scrub	Mountain Mahogany Oak Scrub	Creosote Bush	Grama-Tobosa Shrub Steppe	Grama-Galleta Steppe	Mesquite Acacia Savanna	Trans Pecos Shrub Savanna
MEXICAN HIGHLANDS SHRUB STEPPE PROVINCE									
Alamo Hueco Mountains			10,751		25				20
Big Hatchet Mountains				28,752	26,166	2,758		22	316
Cowboy Spring				6,289		410			
UPPER GILA MOUNTAINS FOREST PROVINCE									
Continental Divide	4,945	11,112					52,704		
Horse Mountain	2,462	1,970					600		
Sierra Ladrones		37,820							
Devil's Backbone		1,000					4,000		

NOTE: Sierra Ladrones and the Devil's Backbone WSAs are each included in more than one province.

TABLE 3-2
EXISTING AND POTENTIAL ECOSYSTEM REPRESENTATION

Landforms/ Ecosystems	Existing Representation in Statutory Wilderness		Representations in Wilderness Endorsed By President - Pending Before Congress		Potential Sources of Representations	
	Number of Areas	Acreage	Number of Areas	Acreage	Number of Areas	Acreage
CHIHUAHUAN DESERT PROVINCE						
Mountain Mahogany Oak Scrub	0	0	0	0	4	30,643
Grama Tobosa Shrub Steppe	0	0	0	0	16	177,754
Trans-Pecos Shrub Savanna	0	0	0	0	7	74,830
Creosote Bush	0	0	0	0	8	79,946
Mesquite Acacia Savanna	0	0	0	0	4	41,787
Western Ponderosa Forest	0	0	0	0	1	163
ROCKY MOUNTAIN FOREST PROVINCE						
Ponderosa Pine and Douglas Fir Forest	3	62,196	3	33,480	1	1,285
Pinyon-Juniper Woodland	0	0	0	0	2	1,352
Great Basin Sagebrush	0	0	0	0	2	16,398
COLORADO PLATEAU PROVINCE						
Ponderosa Pine and Douglas Fir Forest	4	89,636	2	74,856	12	38,700
Pinyon-Juniper Woodland	0	0	0	0	10	91,784
Great Basin Sagebrush	0	0	0	0	1	880
Grama-Galleta Steppe	0	0	0	0	9	50,573
Juniper-mixed Shrub	0	0	0	0	3	30,432
MEXICAN HIGHLANDS SHRUB STEPPE						
Oak Juniper Woodland Scrub	0	0	0	0	1	10,751
Mountain Mahogany Oak Scrub	0	0	0	0	2	35,041
Creosote Bush	0	0	0	0	2	26,191
Grama-Tobosa Shrub Steppe	0	0	0	0	2	3,168
Mesquite Acacia Savanna	0	0	0	0	1	22
Trans-Pecos Shrub Savanna	0	0	0	0	2	336
UPPER GILA MOUNTAIN FOREST PROVINCE						
Ponderosa Pine and Douglas Fir Forest	5	231,657	4	41,010	6	35,097
Pinyon-Juniper Woodland	0	0	0	0	4	51,902
Grama-Galleta Steppe	0	0	0	0	3	57,304

SOURCE: Profile 2, BLM Files (1981).



Source: "Ecoregions of the United States"
Robert G, Bailey (1976)

ECOREGIONS
OF NEW MEXICO

LEGEND:

- Chihuahuan Desert Province
- Colorado Plateau Province
- Rocky Mountain Forest Province
- Mexican Highlands Shrub Steppe Province
- Upper Gila Mountains Forest Province
- 25 WSA's

MAP 3-1

Chihuahuan Desert Province

The province is mostly desert. It is characterized by undulating plains with elevations near 4,000 feet, from which somewhat isolated mountains rise 2,000 to 5,000 feet. Few perennial streams occur, with washes containing water only after a rain. Spring and early summer are extremely dry, with summer rains usually beginning in July and continuing through October. Summers are long and hot. Winters are short but may include brief periods when temperatures fall below freezing.

Colorado Plateau Province

The province consists of tablelands having moderate to considerable relief. The tops of the plateau range in elevation from 5,000 to 7,000 feet. Local relief is from 500 to more than 3,000 feet in some of the deeper canyons that dissect these surfaces. In some sections, volcanic mountains rise 1,000 to 3,000 feet above the plateau surface. Stream valleys are narrow and widely spaced. Due to the generally high altitude, the winters are cold. Summer days are hot, but nights are cool. Summer rains are thunderstorms but ordinary rains come in winter.

Rocky Mountain Forest Province

The province is dominated by rugged glaciated mountains, with elevations reaching 14,000 feet. Local relief is between 3,000 feet and 7,000 feet. Intermontane depressions with floors less than 6,000 feet occur in several areas within the province. The climate is semiarid, with precipitation occurring primarily in the winter. In the highest mountains, a considerable part of the annual precipitation is snow.

Mexican Highlands Shrub Steppe Province

The province includes grassy high plains and mountains. The plains range in elevation from about 4,000 feet to more than 7,000 feet. Interspersed throughout this province are isolated hills and mountains, some of which reach elevations in excess of 9,000 feet. The climate is semiarid, with most of the precipitation coming in the form of thunderstorms during the summer months. Average temperatures are moderate due to the high elevations, but summer days are hot.

Upper Gila Mountains Forest Province

This province consists of steep foothills and mountains, but includes some deeply dissected high plateaus. Elevations range from 4,500 feet to 10,000 feet, with some of the mountain peaks rising to 12,600 feet. Relief is greater than 3,000 feet in most areas. Average annual precipitation ranges from 10 to 35 inches depending on the elevation. Thunderstorms occur during the summer, with winter precipitation coming as snow.

SOLITUDE OR PRIMITIVE RECREATION OPPORTUNITIES

The WSAs are within a days driving time (5 hours) of six Standard Metropolitan Statistical Areas (SMSAs) within three states - Santa Fe, Albuquerque and Las Cruces, New Mexico; El Paso and Lubbock, Texas; and

Tucson, Arizona. Several designated and potential wilderness areas are within a days driving time of the SMSAs. Table 3-3 identifies the approximate driving time from the SMSAs to each WSA. Table 3-4 identifies the number of areas and their total acreage providing solitude or primitive recreation opportunities within a days driving time of the SMSAs.

In New Mexico, 91 percent of the opportunities for solitude or primitive recreation in designated wilderness areas are available on lands administered by the U.S. Forest Service (USFS). The National Park Service (NPS) and the Bureau of Land Management (BLM) administer 6 percent of the designated wilderness areas. Each of these agencies manages their wilderness areas to provide for solitude or primitive recreation opportunities. The remaining 3 percent of the wilderness acreage is administered by the U.S. Fish and Wildlife Service (USFWS), whose primary mission is wildlife conservation.

The majority of the existing wilderness recreation and solitude opportunities are located within areas in the Rocky Mountain Forest Province or the Upper Gila Mountains Forest Province. Both of these regions receive a large amount of their precipitation as winter snow, which restricts most uses primarily to the late spring, summer and early fall months. The BLM WSAs, because of their lower elevation and milder winters, have a potential use season that would include more of the spring, fall and winter. Approximately 90 percent of the BLM WSAs are in provinces which have milder winters and, therefore, potentially longer seasons of use.

BALANCING THE GEOGRAPHIC DISTRIBUTION OF WILDERNESS

Designated and administratively-endorsed wilderness areas are distributed throughout New Mexico (see Map A). The four agencies (BLM, NPS, USFWS and USFS) which manage wilderness areas have administrative responsibility for approximately 22.6 million acres in New Mexico. Approximately 1.5 million acres (7 percent) in New Mexico administered by these agencies have been designated as wilderness. Another 1 million acres (5 percent) are under study for potential wilderness designation.

TABLE 3-3
DRIVING TIME TO WSAs FOR
SOLITUDE OR PRIMITIVE RECREATION OPPORTUNITIES

Wilderness Study Areas	Approximate Driving Time in Hours From the Standard Metropolitan Statistical Areas					
	Albuquerque New Mexico	Las Cruces New Mexico	Santa Fe New Mexico	Tucson Arizona	El Paso Texas	Lubbock Texas
ALBUQUERQUE DISTRICT						
Rio Chama	3	-	2	-	-	-
Sabinoso	3	-	3	-	-	-
San Antonio	4	-	3	-	-	-
Cabezon	1	-	2	-	-	-
Empedrado	1	-	2	-	-	-
Ignacio Chavez	1	-	2	-	-	-
La Lena	1	-	2	-	-	-
Ojito	1	-	2	-	-	-
LAS CRUCES DISTRICT						
Antelope	2	3	3	-	4	-
Continental Divide	3	4	5	-	-	-
Devil's Backbone	3	3	4	-	4	-
Eagle Peak	5	-	-	-	-	-
Horse Mountain	5	-	-	-	-	-
Jornada del Muerto	3	3	4	-	4	-
Mesita Blanca	5	-	-	-	-	-
Presilla	2	3	3	-	4	-
Sierra de Las Canas	2	3½	3	-	4½	-
Sierra Ladrones	2	4	3	-	5	-
Stallion	4	4	5	-	5	-
Veranito	2	3	3	-	4	-
Aden Lava Flow	5	1	-	-	1	-
Alamo Hueco Mountains	-	3	-	4	4	-
Big Hatchet Mountains	-	3	-	4	4	-
Blue Creek	-	3	-	-	4	-
Cedar Mountains	-	3	-	4	4	-
Cooke's Range	5	2	-	5	3	-
Cowboy Springs	-	4	-	5	5	-
Florida Mountains	-	1½	-	4½	2½	-
Gila Lower Box	-	3	-	4	4	-
Las Uvas Mountains	3	1	4	5	2	-
Organ Mountains	4½	½	-	-	1½	-
Robledo Mountains	3	1	4	5	2	-
West Potrillo/Mount Riley	5	1	-	-	1	-
Brokeoff Mountains	-	4	-	-	3	-
ROSWELL DISTRICT						
Carrizozo Lava Flow/ Little Black Peak	5	5	-	-	4	5

NOTE: (-) Indicates a driving time greater than 5 hours.
SOURCE: BLM WARs, 1985.

TABLE 3-4
PROXIMITY OF WSAs TO POPULATION CENTERS

Population Centers [a] Within Five Hours Drive [b] of Existing and Potential Wilderness Areas [c]	Existing Wilderness		Administratively Endorsed for Wilderness		All Other Study Areas	
	Number of Areas	Acres	Number of Areas	Acres	Number of Areas	Acres
NEW MEXICO						
- Albuquerque	29	2,535,819	0	0	83	1,870,348
- Las Cruces	24	1,503,201	3	91,040	60	1,187,588
- Santa Fe	39	3,373,350	0	0	73	1,611,494
ARIZONA						
- Tucson	22	2,006,765	13	1,514,638	103	2,843,819
TEXAS						
- El Paso	13	1,086,879	4	264,098	57	1,152,958
- Lubbock	4	124,304	0	0	3	47,570

NOTE: [a] Standard Metropolitan Statistical Areas with Populations Over 50,000.
[b] For Purposes of Analysis 5 Hours Drive is Equal to 225 Miles.
[c] All Agencies.

EXISTING ENERGY AND MINERAL RESOURCES

INTRODUCTION

This section describes the geologic environment which hosts the 37 WSAs presently being considered for wilderness designation. Emphasis is placed on the known and potential mineral resources associated with the WSAs. In order to put the known and potential mineral resources of the WSAs into a Statewide perspective, the mineral resources of New Mexico are briefly discussed as well as New Mexico's past and present contribution to the national supply of these mineral resources.

REGIONAL GEOLOGIC SETTING

New Mexico encompasses four major geographic provinces; the Basin and Range, Colorado Plateau, Great Plains, and Southern Rocky Mountain provinces (see Map 3-2). Each of these provinces are characterized by fairly distinct sets of geologic features.

The Basin and Range province represents the expression of mid to late Tertiary faulting, which produced generally north-south trending, block faulted mountain ranges and basins. The Basin and Range province hosts the largest reserves of base and precious metals of any geographic province in the United States. Approximately 83 percent of our anticipated U.S. copper resources lie within the Basin and Range (Brobst and Pratt, 1973). The Cordilleran foldbelt, Datil-Mogollon volcanic field and Rio Grande Rift subprovinces lie within the Basin and Range province of New Mexico.

The Cordilleran foldbelt is a late Mesozoic to early Tertiary compressional feature which contains thrust faulted and intruded Paleozoic and Mesozoic sedimentary rocks. The Aden Lava Flow, Alamo Hueco Mountains, Big Hatchet Mountains, Cedar Mountains, Cowboy Spring, Florida Mountains and West Potrillo Mountains/Mount Riley WSAs all lie on uplifted blocks or lava flows within or along the margin of the Cordilleran foldbelt (Corbitt and Woodward, 1973).

The Rio Grande Rift is a late Tertiary to early Quaternary extensional feature which approximately bisects New Mexico north to south. The Aden Lava Flow, Robledo Mountains, Las Uvas Mountains, Organ Mountains, Jornado del Muerto, Antelope, Devil's Backbone, Presilla, Sierra de las Canas, Veranito, Stallion, Sierra Ladrones, San Antonio and West Potrillo Mountains/Mount Riley WSAs all lie along or close to the Rio Grande rift zone.

The Datil-Mogollon volcanic field is a relatively uneroded Tertiary volcanic transitional zone between the Basin and Range province and the Colorado Plateau province. Cooke's Range WSA, a southern extension of the Black Range, and Blue Creek and Gila Lower Box WSAs lie along the southern margin of the Datil-Mogollon volcanic field. Horse Mountain and Continental Divide WSAs are located on large extinct stratovolcanoes within the northern portion of the Datil-Mogollon volcanic field, on opposing sides of a large, anomalous, east-to-west trending down faulted basin. Mesita Blanca and Eagle Peak WSAs lie along the northern margin of the Datil-Mogollon volcanic field and are underlain by partially basalt capped Mesozoic sediments typical of the Colorado Plateau.

Colorado Plateau Province

Southern Rocky Mt Province

Jemez Volcanic Province

Southern Rocky Mt Province

Basin and Range Province

Great Plains Province

Datil-Mogollon Volcanic Field

Physiographic Map of New Mexico

MAP 3-2

BUREAU OF LAND MANAGEMENT WILDERNESS STUDY AREA

IGNEOUS AND METAMORPHIC ROCKS AT THE SURFACE

SEDIMENTARY ROCKS AT THE SURFACE

N

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
SANTA FE, NEW MEXICO

10 0 10 20 30 40 Miles

May 1985
This plot produced using
MOSS Digital Graphics.

Adapted from Ryder (1983)

The Carrizozo Lava Flow/Little Black Peak and the Brokeoff Mountains WSAs lie within the eastern most portion of the Basin and Range province.

The Colorado Plateau province represents a large intracratonic basin with a thick, relatively flat lying section of continental and marine Paleozoic and Mesozoic sedimentary rocks. It is predominately characterized by mesas, plains, and canyon lands. The most significant feature of the southern most portion of the Colorado Plateau province is the San Juan Basin. The major portion of the San Juan Basin lies in northwestern New Mexico. The San Juan Basin hosts nationally important reserves of oil/gas, uranium and coal. The Ojito, Empedrado, Cabezon, Ignacio Chavez, La Lena and Rio Chama WSAs lie along the eastern margin of the San Juan Basin.

The Great Plains province in New Mexico is generally surfaced in Cenozoic continental sediments. Thick sections of Mesozoic and Paleozoic sedimentary rocks lie within the subsurface of the Great Plains. The Permian Basin in southeastern New Mexico is a significant oil and gas production area. Surficial late Cenozoic volcanic deposits occur within the northeastern most portion of New Mexico's Great Plains. The Sabinoso WSA lies within the north central part of New Mexico's Great Plains just south of these late Cenozoic volcanic deposits.

The Southern Rocky Mountain province projects into the north central portion of New Mexico. The Rocky Mountains are characterized by folded, thrusted, intruded and uplifted Paleozoic sedimentary and Precambrian crystalline rocks. The Rocky Mountains are the result of late Mesozoic through Tertiary tectonic activity known as the Laramide Orogeny. Although none of the WSAs understudy lie within this province, the San Antonio WSA lies along the interface of the Rio Grande Rift zone and the Southern Rocky Mountain province.

Specific geologic descriptions of each WSA are included within the appended WARs.

ENERGY AND MINERAL RESOURCE PRODUCTION IN NEW MEXICO

New Mexico's diverse geologic environments host a wide variety of mineral resources. New Mexico presently holds the U.S. production record for uranium. New Mexico also ranks fourth and seventh in oil and gas production, respectively (NMOGA, 1983). Although New Mexico has the eighth largest coal resources in the U.S. (Brobst and Pratt, 1973), New Mexico presently ranks twelfth in U.S. coal production.

New Mexico at various times has been one of the Nation's top five producers of beryllium concentrates, carbon dioxide, copper, fluorspar, helium, iceland spar (optical calcite), lithium minerals, manganese concentrates, sheet mica, molybdenum, perlite, potash, pumice, tantalum concentrates, tin, vanadium ore and zinc (Geller, et al, 1983). As of 1965, over 2.5 million tons of copper, 1.3 million tons of zinc, 75 million ounces of silver, 2.25 million ounces of gold and 337 thousand tons of lead were produced from New Mexico's mines (Geller, et al, 1983).

The above statistics clearly indicate that New Mexico has been a leading domestic source of a diverse range of mineral commodities. Tables A-1 through

A-3 in Appendix A exhibit New Mexico's recent standing in domestic mineral production. These tables also provide some indication of the national significance of the mineral resources which are potentially impacted under the proposed alternatives. Due to the recent depressed conditions experienced by New Mexico's mineral industries, especially in the uranium and base metal operations, the production figures in Appendix A are not wholly representative of New Mexico's national importance in respect to potential mineral resources.

POTENTIAL MINERAL RESOURCES IN NEW MEXICO

The past mineral production history of New Mexico supports the observation that very significant areas of economic mineral potential presently exist in New Mexico. Maps 3-3 through 3-7 illustrate the Statewide potential for the various commodities potentially impacted under the proposed alternatives. Unfortunately, since Maps 3-3 through 3-7 were developed primarily by other authors for Statewide purposes, the broad mineral classification systems of these maps do not necessarily correlate to the site-specific system used by the BLM in evaluating mineral potential in the individuals WSAs.

MINERAL RESOURCE POTENTIAL OF THE WSAs

As part of the Wilderness study process, preliminary mineral resource assessments were prepared by or for the BLM for each WSA. The New Mexico Bureau of Mines and Mineral Resources (NMBMMR) prepared a rigorous, in-depth analysis of the mineral potential of the Sierra Ladrones WSA. The NMBMMR supported their literature search and analysis with some field examinations. Geo-explorers, Inc. of Denver prepared preliminary mineral resource assessments for the WSAs in the Socorro, Roswell and Rio Puerco Resource Areas under contract with the BLM. These assessments were basically literature searches and involved only cursory field examination. Resource Area geologists in the White Sands, Las Cruces/Lordsburg, and Taos Resource Areas prepared mineral assessments with the aid of some previously prepared planning inventories and assessments. Results of these mineral resource assessments are condensed in each of the appended WARs. The mineral potential classification system utilized in the WARs is described below:

Classification of Mineral Resources

Often, public attention is focused on current economic availability of known energy or nonenergy mineral deposits. However, long-term planning must include some indication of the potential for discovering mineral resources in areas that currently have no known mineral deposits or whose known deposits are now considered uneconomic. New geologic data, technological advances, and changes in economic conditions can generate interest in areas that have previously been considered unfavorable.

The classification system used for the BLM WARs is based on geologic knowledge of the mineral resources of an area and the area's potential for hosting mineral resources. "Mineral Resources", as used in this classification system, are defined as concentrations of naturally occurring solids, liquids, or gases, either known or surmised to exist, that are, or could become, economic mineral deposits.

Coal Resources of New Mexico

MAP 3-3

N

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
SANTA FE, NEW MEXICO

10 0 10 20 30 40 Miles

BUREAU OF LAND MANAGEMENT WILDERNESS STUDY AREA

POTENTIALLY VALUABLE SURFACE MINEABLE COAL WITH LESS THAN 250' OVERBURDEN

COAL RESOURCES LESS THAN 3000' DEEP

COAL RESOURCES OVER 3000' DEEP

May 1985
This plat produced using
MOSS Digital Graphics.

Modified from Energy Resources
Map of New Mexico, 1981: USGS & NMBMMR

Geothermal Resources of New Mexico

MAP 3-4

BUREAU OF LAND MANAGEMENT WILDERNESS STUDY AREA

AREAS PRESENTLY IDENTIFIED AS MOST FAVORABLE FOR THE DISCOVERY AND DEVELOPMENT OF LOW TEMPERATURE GEOTHERMAL RESOURCES

ADDITIONAL AREAS WHICH MAY ALSO BE SUITABLE FOR ECONOMIC GEOTHERMAL RESOURCES

N

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
SANTA FE, NEW MEXICO

10 0 10 20 30 40 Miles

May 1985
This plot produced using
MOSS Digital Graphics.

Adapted from J.F. Callender,
W.R Seager, C.A. Swanberg (1983)

San Juan
Petroleum
Province

Southeast
Petroleum
Province

Generalized Oil and Gas Resource Potential of New Mexico

MAP 3-5

BUREAU OF LAND MANAGEMENT WILDERNESS STUDY AREA

PETROLEUM PROVINCES: PRODUCING AREAS WITH KNOWN POTENTIAL

AREAS WHICH HAVE A HIGH POTENTIAL FOR HOSTING OIL AND GAS RESOURCES

AREAS WHICH HAVE A MODERATE POTENTIAL FOR HOSTING OIL AND GAS RESOURCES

AREAS WHICH HAVE A LOW TO ZERO POTENTIAL FOR HOSTING OIL AND GAS RESOURCES

Modified from Foster (1974)

N

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
SANTA FE, NEW MEXICO

10 0 10 20 30 40 Miles

May 1985
This plot produced using
MOSS Digital Graphics.

MAP 3-6

Uranium and Thorium* Resources of New Mexico

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
SANTA FE, NEW MEXICO

N

10 0 10 20 30 40 Miles

BUREAU OF LAND MANAGEMENT WILDERNESS STUDY AREA

GRANTS URANIUM DISTRICT: HIGHEST URANIUM PRODUCTION IN THE UNITED STATES

MULTIPLE URANIUM OCCURRENCE AREA

\+ UP TO 2D,DDD LBS. URANIUM OXIDE PRODUCED

● 2D,DDD TO 2DD,DDD LBS. URANIUM OXIDE PRODUCED

Modified from McLemore (1983)

*Small percentages of recoverable Molybdenum and Vanadium ore are often associated with sedimentary Uranium deposits within the San Juan Basin.

May 1985
This plot produced using
MOSS Digital Graphics.

Metallic Mineral Resource Areas in New Mexico*

MAP 3-7

BUREAU OF LAND MANAGEMENT WILDERNESS STUDY AREA

AREAS OF PAST OR PRESENT KNOWN OR POTENTIAL MINING ACTIVITY FOR METAL OR NON-METAL COMMODITIES, AS WELL AS REGIONS THAT HAVE BEEN EXPLORED FOR THEM. THE LIMITS INCLUDE MINED AND PROSPECTED AREAS AS WELL AS AREAS BASED ON THE PROJECTION OF GEOLOGIC DATA.

N

10 0 10 20 30 40 Miles

*This Map Includes Associated Minerals such as Borite and Fluorite, but it does not include Uranium Resources.

Modified from Hutchins (1983), New Mexico Metal Resources Map; NMBMMR (1958), Mineral and Water Resources of New Mexico; USGS, et al (1965)

May 1985
This plot produced using MOSS Digital Graphics.

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
SANTA FE, NEW MEXICO

The classification of mineral resources as high, moderate, low or no potential is based on the following factors:

High - High potential for the presence of mineral resources is indicated by one or more of the following types of supporting evidence: 1) location in or adjacent to a known mining district or known leasing area; 2) past or present production; 3) presence of existing mines or deposits; 4) strong geologic similarity to known mineral deposits; and 5) positive indications from drilling, geophysical, or geochemical surveys, or other investigative techniques used in the exploration of involved lands or adjacent or nearby lands.

Moderate - Moderate potential for the presence or discovery of mineral resources is indicated by one or more of the following types of evidence: 1) reported mineral occurrences; 2) some geologic similarity to known mineral deposits; and 3) encouraging indications from exploration. In the case of saleable mineral commodities, the area has moderate potential only if the commodity is potentially marketable.

Low - Low potential for the presence or discovery of mineral resources exists when: 1) exploration has revealed no significant geologic evidence of mineral deposits; 2) no known occurrences; and 3) the geologic environment has little similarity to other known mineral hosting environments or, in the case of saleable minerals, when known deposits have little or no potential for marketability.

No Potential - Either the geologic environment or present or anticipated economic conditions, or both, do not support the possibility of discovering mineral resources.

Tables 3-5 through 3-7 summarize the mineral potential classifications of each of the 37 WSAs being considered for wilderness designation. The acreages associated with areas of high to moderate mineral potential in each WSA are exhibited by commodity in Appendix A.

TABLE 3-5
ENERGY MINERAL POTENTIAL BY WSA

	Coal	Geothermal	Oil and Gas	Uranium
Rio Chama	L		L	L
Sabinoso			L	L
San Antonio			L	L
Cabezon		L	M	L
Empedrado	H-M		H-M	L
Ignacio Chavez	H		H-M	L
La Lena	H-M		H-M	L
Ojito		M-L	M	M
Antelope	L	L	L	
Continental Divide			L	L
Devil's Backbone		L	L	L
Eagle Peak	L		L	M
Horse Mountain			L	L
Jornada del Muerto		L	M	
Mesita Blanca	L		L	M
Presilla		M-L	L	M-L
Sierra de las Canas		M	L	L
Sierra Ladrones		L	L	H-M
Stallion		L	L	L
Veranito		H-M	L	M-L
Aden Lava Flow		L	L	
Alamo Hueco Mountains		L	L	
Big Hatchet Mountains			M-L	
Blue Creek		L		
Cedar Mountains			L	
Cooke's Range				
Cowboy Spring			L	
Florida Mountains			L	
Gila Lower Box		L	L	
Las Uvas Mountains		L		
Organ Mountains		L		
Robledo Mountains		M	L	
West Potrillo Mtns. and Mt. Riley		L	M-L	
Brokeoff Mountains			L	
Little Black Peak and Carrizozo Lava Flow		L	L	L

L - Low
M - Moderate
H - High
Blank - No Potential

NOTE: Ranges indicate 2 or 3 different potentials within each WSA boundary.
SOURCE: BLM WARs, 1985.

TABLE 3-6
METAL POTENTIAL BY WSA

	Bismuth	Cobalt	Copper	Gold	Iron	Lead	Manganese	Molybdenum	Nickel	Silver	Tin	Tungsten	Zinc
Rio Chama			L			L		L					L
Sabinoso													
San Antonio			L			L		L					L
Cabezon													
Empedrado													
Ignacio Chavez													
La Lena													
Ojito													
Antelope			L	L		L		L		L	L		L
Continental Divide			L	L		L		L		L	M-L	L	L
Devil's Backbone			M	M		M	L	M		M		M	M
Eagle Peak													
Horse Mountain			M	M		M		M		M	L	M	M
Jornada del Muerto													
Mesita Blanca													
Presilla			M-L			M-L				M-L			M-L
Sierra de las Canas			M			M				M			M
Sierra Ladrones	L	M	M-L	L		M-L	L		M	M-L		L	M-L
Stallion			M			L				M			L
Veranito			L			L	L			L			L
Aden Lava Flow													
Alamo Hueco Mtns.							L						
Big Hatchet Mtns.			M	L		M				M			M
Blue Creek							L						
Cedar Mountains			L	L			L			L			L
Cooke's Range			H-L	H-L		H-L		H-L		H-L			H-L
Cowboy Spring			L	L		L		L		L			L
Florida Mountains			H-L	H-L		H-L	M	H-L		H-L			H-L
Gila Lower Box							L						
Las Uvas Mountains													
Organ Mountains			H-M	H-M		H-M		H-M		H-M		M	H-M
Robledo Mountains					L		L						
West Potrillo Mtns. and Mt. Riley			L	L		L		L		L			L
Brokeoff Mountains													
Little Black Peak & Carrizozo Lava Flow			L	L	L	L		L		L			L

L - Low
M - Moderate
H - High
Blank - No Potential

SOURCE: BLM WARs, 1985.

TABLE 3-7
INDUSTRIAL MINERALS POTENTIAL BY WSA

	Aggregates												
	Cinders/ Scoria	Crushed Rock	Sand & Gravel	Barite	Building Stone	Fluorspar	Gypsum	High Calcium Limestone	High Magnesium Dolomite	Humates	Kaolin	Salt	Zeolites
Rio Chama		L	L										
Sabinoso		L	L										
San Antonio													
Cabezon													
Empedrado										H-M			
Ignacio Chavez										H			
La Lena										H-M			
Ojito			H										
Antelope													
Continental Divide													
Devil's Backbone				M		M					L		
Eagle Peak	M-L		M-L										
Horse Mountain													
Jornada del Muerto													
Mesita Blanca	H-L		M-L										
Presilla			M-L	M-L		M-L							
Sierra de las Canas				M		M	L	L					
Sierra Ladrones				M-L		L	L	M					
Stallion				L		L	L	L					
Veranito			M	L		L					L		
Aden Lava Flow					H-L								L
Alamo Hueco Mtns.													
Big Hatchet Mtns.						L	M	L					
Blue Creek													
Cedar Mtns.													
Cooke's Range					L	L							
Cowboy Spring						L							
Florida Mtns.				L		M-L			L				
Gila Lower Box													L
Las Uvas Mtns.													L
Organ Mountains						H							
Robledo Mountains			L		H			H	M				
West Potrillo Mtns. and Mt. Riley	H-L												
Brokeoff Mountains		L			L							L	
Little Black Peak & Carrizozo Lava Flow	L			L		L	L						

L - Low
M - Moderate
H - High
Blank - No Potential

SOURCE: BLM WARs, 1985.

LIVESTOCK GRAZING

A major public use of most WSAs is by ranchers involved in livestock production. The exact number of animal unit months (AUMs) of forage is not available because allotment boundaries do not coincide with WSA boundaries. An estimate of AUMs is provided instead, by using the average of 9 acres per AUM. This figure is an average, giving full consideration to the fact that carrying capacities do vary between WSAs. Other factors considered include, percent slope, precipitation and forage production. Furthermore, this figure is given so as to be able to estimate the impacts of wilderness designation to livestock grazing in Chapter 4. See the following table for acres of grazing and AUMs.

TABLE 3-8
GRAZING ACREAGES AND AUMs IN NEW MEXICO

	Acres	AUMs
New Mexico[a/]	64 million [b/]	7.1 million
BLM	13 million	1.5 million [c/]
WSAs	.79 million	.09 million

[a/] Include private, state, Federal and Indian grazing lands (not irrigated).
[b/] SOURCE: New Mexico Soil and Water Conservation Plan, March 1982.
[c/] SOURCE: Public Land Statistics, 1983.

The allotment numbers, their forage allocations and the periods of livestock use for each of the WSAs are shown in the individual WARs. The classes of livestock using WSAs are primarily cattle with some sheep and a few horses.

Most WSAs contain range developments such as fences, pipelines and water holding facilities. Existing and proposed range developments for each WSA are shown on Table 3-9.

Road development within the WSAs is essentially nonexistent due to the nature of the areas along with the criteria for establishing WSA boundaries. However, a total of 390 miles of primitive, unmaintained vehicle ways exist in the WSAs. Most are used by hunters, off-road enthusiasts, miners and woodhaulers. Approximately 130 miles of these ways are used by livestock operators to check livestock, to distribute salt and feed supplement and to inspect or maintain range developments. Operators haul water for livestock use only in the San Antonio (seasonal use) and Robledo Mountains (year round use) WSAs.

Range developments have been proposed for grazing allotments and portions of these allotments overlap portions of the WSAs. Factors to determine implementation of range development proposals vary as do their priorities. Therefore, the mere fact that developments are proposed does not imply they would be constructed.

TABLE 3-9

EXISTING AND PROPOSED RANGE DEVELOPMENTS FOR WSAs RECOMMENDED SUITABLE

WSA	All Wilderness												Emphasis On Manageability											
	Season of Use*	Ways (mi)	Tanks	Fence (mi)	Pipeline	Troughs	Storage Tanks	Windmill	Corrals	Springs	Wells		Ways (mi)	Tanks	Fence (mi)	Pipeline	Troughs	Storage Tanks	Windmill	Corrals	Springs	Wells		
Rio Chama	S	22	4										6	4										
Sabinoso	B	7	17																					
San Antonio	S	8	1			1**							8	1			1**							
Cabezon	B	3	7	6									3	7	6									
Empedrado	Y	2	7	(1) 2		1			1	1														
Ignacio Chavez	Y	7	5	17						(2)	1		7	5	17						(2)	1		
La Lena	B	8	5	4.8																				
Ojito	B		13	14		1	1	1			1							1				1		
Antelope	Y	2		2	4.8	4							2		2	4.8	4							
Continental Divide	Y	45	28	50	.5								33	17	25	.5								
Devil's Backbone	Y	5	1	7	2.8	2																		
Eagle Peak	Y	45	8	3.8	3	4	2	1																
Horse Mtn.	Y	7	3	(1.3) 4.8	(1) .5	(2)		1		(1)			6	3	(1.3) 4.8	(1) .5	(2)		1		(1)			
Jornada del Muerto	Y			29.5																				
Mesita Blanca	Y	20	5	16	6	4							20	5	16	6	4							
Presilla	Y	10		7.3																				
Sierra de las Canas	Y			18.8											18.8									
Sierra Ladrones	Y	35	14	50.5	12.5	11				3			15	9	37	12.5	11				3			
Stallion	Y	20	5	22	2.2	4		1					20	5	22	2.2	4		1					
Veranito	Y	5	1	16.8	3.1								5	1	16.8	3.1								
Aden Lava Flow	Y	6	1	5	(5)	(4)							6	1	5	(5)	(4)							
Alamo Hueco Mtns.	Y	6	1	25																				
Big Hatchet Mtns.	Y	8	5	9		1	1						7	5	9		1	1						
Blue Creek	Y	6	(2) 2	5	2	1	1	1	2															
Cedar Mtns	Y	10	2	.8	(.5)								10	2	.8	(.5)								
Cooke's Rge	Y	8		3.8		2				3														
Cowboy Spg.	Y	1											1											
Florida Mtns.	Y	7		5.5	(.2)	4				8			7		5.5	(.2)	4				8			
Gila Lower Box	Y	1	(1)		(1)	(1)							1	(1)		(1)	(1)							
Las Uvas	Y	3	6	1.5																				
Organ Mtns.	Y	1	3	3.5						4			1	3	3.5						4			
Robledo Mtns.	Y	2	1	1.8		1**							2	1	1.8		1**							
West Potrillo/ Mt. Riley	Y	72	6	8									66	6	8									
Brokeoff Mtns.	Y	4	(5)				(1)						4	(5)				(1)						
Carrizozo Lava Flow	Y	4																						
Little Black Peak	Y																							
TOTAL (PROPOSED)			(8)	(2.3)	(7.7)	(7)	(1)			(3)				(6)	(1.3)	(7.7)	(7)	(1)			(3)			
TOTAL (EXISTING)		390	151	341.2	37.4	41	5	5	3	19	2		230	75	199	29.6	30	2	2		15	2		

WSA	Proposed Action												Conflict Resolution											
	Ways (mi)	Tanks	Fence (mi)	Pipeline	Troughs	Storage Tanks	Windmill	Corrals	Springs	Wells			Ways (mi)	Tanks	Fence (mi)	Pipeline	Troughs	Storage Tanks	Windmill	Corrals	Springs	Wells		
Rio Chama	6	4											6	4										
Sabinoso																								
San Antonio																								
Cabezon	3	7	6										3	7	6									
Empedrado																								
Ignacio Chavez	7	5	17						(2)	1			7	5	17							(2)	1	
La Lena																								
Ojito						1				1								1				1		
Antelope	2		2	4.8	4																			
Continental Divide	33	17	25	.5																				
Devil's Backbone																								
Eagle Peak																								
Horse Mtn.	6	3	(1.3) 4.8	(1) .5	(2)		1		(1)				6	3	(1.3) 4.8	(1) .5	(2)		1		(1)			
Jornada del Muerto																								
Mesita Blanca																								
Presilla																								
Sierra de las Canas			18.8												18.8									
Sierra Ladrones	15	9	37	12.5	11				3						37	12.5								
Stallion																								
Veranito																								
Aden Lava Flow	6	1	5	(5)	(4)								6	1	5	(5)	(4)							
Alamo Hueco Mtns.																								
Big Hatchet Mtns.	7	5	9		1	1							7	5	9		1	1						
Blue Creek																								
Cedar Mtns																								
Cooke's Rge																								
Cowboy Spg.																								
Florida Mtns.																								
Gila Lower Box	1	(1)		(1)	(1)								1	(1)		(1)	(1)							
Las Uvas																								
Organ Mtns.	1	3	3.5						4															
Robledo Mtns.																								
West Potrillo/ Mt. Riley	66	6	8										66	6	8									
Brokeoff Mtns.																								
Carrizozo Lava Flow																								
Little Black Peak																								
TOTAL (PROPOSED)		(1)	(1.3)	(7)	(7)				(3)					(1)	(1.3)	(7)	(7)				(3)			
TOTAL (EXISTING)	153	60	136.1	18.3	16	2	1		7	2			102	31	105.6	13	1	2	1			2		

**Water hauled to these troughs
*Season of Use Y - Yearlong, S - Seasonal, B - Both Seasonal & Yearlong

NOTE: Numbers in parentheses show developments that are proposed. These proposals are for allotments which include portions of the WSAs.

CHAPTER 4
Environmental Consequences

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter provides a discussion of environmental consequences for two levels of analysis. The first level of analysis consists of a summary of the environmental consequences by WSA, summarized from the WARs. A similar summary was used in the District's Final EAs, which were reviewed by the public along with the WARs.

The second level of analysis consists of the evaluation of Statewide environmental issues. These issues were developed as a result of the scoping process (see Chapter 5). The Statewide issues analyzed in this section are: Impacts to Wilderness Values, Impacts to Mineral Exploration and Development and Impacts to Livestock Grazing.

ASSUMPTIONS AND ANALYSIS GUIDELINES FOR STATEWIDE IMPACT ANALYSIS

Impact analyses was based upon the following assumptions and analysis guidelines:

- Each environmental component's analysis will be commensurate with the degree of expected impact.

- All figures used are approximate, and based on the best information currently available.

- In WSAs released from wilderness review by Congress, BLM will use existing planning documents, consistent with applicable laws and regulations, as the basis for managing the area.

- Wilderness boundaries will not be located closer than 50 feet from the centerline of an existing road.

- BLM will have adequate funds and personnel to manage areas designated wilderness.

- The adverse, short-term/long-term impacts, and irreversible/irretrievable commitments of each resource are considered and discussed where appropriate.

- The short-term is defined as the 10 year period following a Congressional decision on a WSA, long-term as the time period after those 10 years.

- Current trends in population and demand for resources will continue at the same rate of increase (or decrease) in the future, unless specifically stated otherwise.

- For analysis purposes, where mineral potential is classified as high, both exploration and possible development are anticipated. Where moderate, exploration is anticipated but development is less likely. Where low, exploration is anticipated only where an interest has been indicated.

- A wilderness management plan will be prepared for each designated wilderness area.

- Each designated wilderness area would be managed in accordance with the BLM Wilderness Management Policy. A copy of this policy can be obtained through any BLM office.

SUMMARY OF IMPACTS BY WSA

Table 4-1 presents a summary of major impacts by WSA based upon information and analysis which appears in the WARs.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action) [a]	No Wilderness
	------WILDERNESS VALUES------		
Albuquerque District			
Rio Chama	11,985 acres recommended suitable. Floatboating, hiking, camping, fishing, hunting and solitude opportunities maintained. Fisheries and riparian habitat studies continued. Habitat for potential introduction of river otter and sage grouse maintained. Extensive signing and monitoring would be needed to control ORV use outside of river canyon.	5,232 acres recommended suitable and 6,753 acres recommended nonsuitable for wilderness designation. Floatboating and fishing opportunities maintained. Hiking, camping and hunting opportunities reduced; however, high quality values in river canyon maintained. Habitat for potential introduction of river otter maintained. ORV use would impair wilderness values, including sage grouse habitat, in nonsuitable portion.	11,985 acres recommended nonsuitable. No anticipated impacts in river canyon (5,232 acres) due to low resource development potential. ORV use would impair wilderness values, including sage grouse habitat, in nonsuitable portion.

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Sabinoso	15,760 acres recommended suitable. Hiking, camping, horseback riding, hunting and solitude opportunities maintained. Opportunities are limited due to current lack of legal access.	Not applicable [b]	15,760 acres recommended nonsuitable. No anticipated impacts to wilderness values due to low potential for resource development and lack of legal access.

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
San Antonio	7,050 acres recommended suitable. Hiking, hunting and solitude opportunities maintained.	Not applicable	7,050 acres recommended nonsuitable. ORV use associated with hunting allowed to continue. Naturalness and solitude opportunities diminished due to ORV use.

NOTE: [a] The Proposed Action is indicated for each WSA.
[b] Not applicable: An amended boundary was not analyzed for the indicated WSAs.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
		------WILDERNESS VALUES------	
Cabezon	8,118 acres recommended suitable. Climbing, hunting and solitude opportunities maintained. Special features include perching and nesting sites for birds of prey, Native American religious sites and geologic study.	7,984 acres recommended suitable and 134 acres recommended nonsuitable for wilderness designation. Climbing and hunting opportunities maintained. Special features include perching and nesting sites for birds of prey, Native American religious sites, and geologic study. Naturalness of 134 acres recommended nonsuitable would be impaired due to right-of-way construction.	8,118 acres recommended nonsuitable. Road building associated with mineral exploration would impair wilderness values over the long-term. ORV use would increase due to road building.
		------OIL AND GAS EXPLORATION------	
	Exploration and possible oil and gas development would be precluded on 8,114 acres classified as having a moderate potential.	Exploration and possible oil and gas development would be precluded on 7,984 acres classified as having a moderate potential.	No impact
		------RIGHTS-OF-WAY------	
	Would result in rerouting of proposed power lines and anticipated pipelines away from an existing corridor.	No impact would occur as future power lines and pipelines could be constructed adjacent to an existing corridor.	No impact

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
		------WILDERNESS VALUES------	
Empedrado	9,410 acres recommended suitable. Hiking, camping, hunting, sightseeing and solitude opportunities maintained. Special features include Native American religious sites.	Not applicable	9,410 acres recommended nonsuitable. Road building associated with mineral exploration would impair wilderness values over the long-term. ORV use would increase due to road building.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------EXPLORATION AND DEVELOPMENT FOR OIL AND GAS AND COAL------		
Empedrado (cont.)	Exploration and development would be foregone on approximately 9,000 acres which are classified as having a moderate or high potential for oil and gas and on approximately 2,800 acres which have been classified as having a moderate or high potential for coal.	Not applicable	No impact

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
Ignacio Chavez	9,961 acres recommended suitable. Special features to be maintained include critical winter range for mule deer and elk and habitat for turkey, black bear and golden eagles.	8,780 acres recommended suitable and 1,181 acres recommended nonsuitable for wilderness designation. Highest quality wilderness values maintained. Nonsuitable portion contains two large retention dams.	9,961 acres recommended nonsuitable. Road building associated with mineral exploration and development would impair wilderness values. ORV use would increase due to road building.
	------EXPLORATION AND DEVELOPMENT FOR OIL AND GAS AND COAL------		
	Exploration and development would be precluded throughout the WSA because the entire area is classified as having a moderate or high potential for oil and gas. Development of coal resources including a possible strip mine, would be precluded on approximately 6,000 acres classified as having a high potential for coal.	Same as all wilderness except that 1,181 acres of lands having high or moderate potential for oil and gas would be available for exploration and development.	No impact

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
La Lena	10,310 acres recommended suitable. Hiking, camping ing, rockhounding, horseback riding, photography, sightseeing and solitude opportunities maintained. Special features include golden eagle and great horned owl nesting sites and paleontological resources.	Not applicable	10,310 acres recommended nonsuitable. Road building associated with mineral exploration would impair wilderness values over the long-term. ORV use would increase due to road building.
	------EXPLORATION AND DEVELOPMENT FOR OIL AND GAS AND COAL------		
	Exploration and development for oil and gas would be precluded throughout the WSA. The entire WSA is classified as having a moderate or high potential for oil and gas. Exploration and development for coal would also be precluded on approximately 5,000 acres which are classified as having a moderate or high potential.	Not applicable	No impact

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
Ojito	11,919 acres recommended suitable. Sightseeing, horseback riding, photography, hiking, camping, hunting, and solitude opportunities maintained. Special features include Native American religious sites, environmental studies and paleontological resources.	11,297 acres recommended suitable and 622 acres recommended nonsuitable for wilderness. Highest quality wilderness values maintained. Road building associated with mineral exploration would impair wilderness values over the long-term in nonsuitable portion. ORV use will increase.	11,919 acres recommended nonsuitable. Road building associated with mineral exploration, as well as increased ORV use, including competitive events, would impair wilderness values over the long-term.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------EXPLORATION AND DEVELOPMENT FOR OIL AND GAS, URANIUM AND GEOTHERMAL RESOURCES------		
Ojito (cont.)	Almost the entire WSA is classified as having a moderate potential for oil and gas and uranium. Exploration and possible development of these commodities would be precluded along with 1,096 acres which are classified as having a moderate potential for geothermal development.	Same as the All Wilderness Alternative except for 134 acres which would be available for mineral exploration and development.	No impact
	------UTILITY RIGHTS-OF-WAY------		
	Proposed power lines and future pipelines would have to be rerouted away from an existing corridor.	No impact, as proposed power lines and future pipelines could be routed along an existing utility corridor.	No impact

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
Las Cruces District			
Antelope	20,710 acres recommended suitable. Solitude opportunities maintained.	9,892 acres recommended suitable and 10,818 acres recommended nonsuitable for wilderness designation. Area of highest quality solitude opportunities and naturalness maintained. Increased ORV use in nonsuitable portion would impair wilderness values over long-term.	20,710 acres recommended nonsuitable. Over the long-term, range management activities and additional ORV use would increase throughout the area, resulting in impairment of naturalness and solitude opportunities.

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
Continental Divide	68,761 acres recommended suitable. Hiking, backpacking (17 miles of proposed Continental Divide National Scenic Trail passes through the area), hunting, camping, and solitude opportunities maintained. Special features include Bat Cave (a nationally significant archaeological research site) and a diversity of wildlife species, including mule deer, mountain lion, black bear and wintering bald eagles.	35,635 acres recommended suitable and 33,126 acres recommended nonsuitable for wilderness designation. Existing hiking, backpacking, hunting, camping and solitude opportunities provided in in the most rugged portions of the area. Ten miles of proposed Continental Divide National Scenic Trail passes through suitable portion. Bat Cave, included in suitable portion. Road building associated with mineral exploration and increased ORV use would impair the naturalness of the area recommended nonsuitable over the long-term.	68,761 acres recommended nonsuitable. Road building associated with mineral exploration and increased ORV use would impair wilderness values over the long-term.
	------EXPLORATION AND DEVELOPMENT FOR TIN------		
	Exploration and potential development of tin would be precluded on 24,000 acres classified as having a moderate potential for tin.	Exploration and potential development of tin would be precluded on 14,700 acres classified as having a moderate potential for tin.	No Impact

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Devil's Backbone	8,904 acres recommended suitable. Opportunities for solitude maintained.	Not applicable	8,904 acres recommended non-suitable. Road building associated with mineral exploration would impair wilderness values over the long-term. ORV use would increase due to road building.
	------EXPLORATION AND DEVELOPMENT FOR BASE AND PRECIOUS METALS------		
	Exploration and potential development on 8,200 acres of lands classified as having a moderate potential for base and precious metals would be foregone.	Not applicable	No impact

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Eagle Peak	32,748 acres recommended suitable. Opportunities for backpacking, hiking, camping, photography and solitude will be maintained.	Not applicable	32,748 acres recommended nonsuitable. Road building associated with mineral exploration will impair wilderness values over the long-term. ORV use will increase due to road building.
	------EXPLORATION AND DEVELOPMENT FOR URANIUM------		
	Exploration potential development would be precluded on 27,100 acres which are classified as having a moderate potential for uranium.	Not applicable	No impact

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
Horse Mountain	5,032 acres recommended suitable. Hiking, backpacking, camping, hunting, photography and solitude opportunities maintained. Opportunities are limited due to lack of legal access. Special features include wildlife, such as elk, mule deer, pronghorn, antelope and wintering bald eagles.	4,432 acres recommended suitable and 600 acres recommended nonsuitable for wilderness designation. High quality wilderness values maintained. Naturalness of 600 acres impaired to allow vehicle access to West Horse Mountain Ranch Headquarters.	5,032 acres recommended nonsuitable. Existing mineral withdrawal would remain in effect, therefore, impacts to wilderness values are not anticipated. Vehicle access would be allowed to the West Horse Mountain Ranch headquarters.
	------EXPLORATION AND DEVELOPMENT FOR METALS------		
	Exploration and potential development of copper, lead, zinc, tungsten, silver and and gold would be precluded for almost the entire WSA which is classified as having a moderate potential for these metals.	Exploration and possible development of copper, lead, zinc, tungsten, silver and gold would precluded for almost the entire area which is classified as having a moderate potential for these metals.	No impact

Wilderness Study Area	All Wilderness (Proposed Action)	Amended Boundary	No Wilderness
	------WILDERNESS VALUES------		
Jornada del Muerto	31,147 acres recommended suitable. Lava-desert grassland preserved and solitude opportunities maintained.	Not applicable	31,147 acres recommended nonsuitable. Although no actions are planned which would affect the area's wilderness values, long-term nonwilderness management actions such as oil and gas exploration could reduce these values.
	------EXPLORATION AND DEVELOPMENT FOR OIL AND GAS------		
	Exploration and potential development would be foregone on 31,100 acres which have been classified as having a moderate potential for oil and gas.	Not applicable	No impact

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Mesita Blanca	16,429 acres recommended suitable. Solitude opportunities maintained. Special features include archaeological resources (petroglyphs).	Not applicable	16,429 acres recommended nonsuitable. Road building and drilling operations associated with mineral exploration would impair wilderness values over the long-term.
	------EXPLORATION AND DEVELOPMENT FOR URANIUM------		
	Exploration and potential development would be precluded throughout the entire WSA which is classified as having a moderate potential for uranium.	Not applicable	No impact

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Presilla	8,680 acres recommended suitable. Solitude opportunities maintained. Special features include the Tinajas Natural Area of Critical Environmental Concern (pictographs) and geologic study opportunities.	Not applicable	8,680 acres recommended nonsuitable. Road building and drilling operations associated with mineral exploration would impair wilderness values over the long-term. Tinajas Pictographs remain a designated Area of Critical Environmental Concern (1,280 acres).
	------EXPLORATION AND DEVELOPMENT OF BARITE, FLUORSPAR, LEAD, ZINC, COPPER, GEOTHERMAL AND URANIUM------		
	Exploration and potential development would be precluded for the following commodities with the acres of moderate potential shown. Barite, fluorspar, lead and zinc, 4,300 acres; copper, 700 acres; geothermal, 8,700 acres; uranium, 5,500 acres.	Not applicable	No impact

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
Sierra de Las Canas	12,838 acres recommended suitable. Hiking, backpacking, camping, photography and solitude opportunities maintained Special features include a diversity of wildlife species, such as mule deer, pronghorn antelope, bobcat, and raptors.	12,798 acres recommended suitable and 40 acres recommended nonsuitable for wilderness designation. High quality wilderness values would be maintained. Forty acres recommended nonsuitable would provide vehicle access to private inholdings.	12, 838 acres recommended nonsuitable. Mining claim assessment work new vehicle routes to mining claims, rangeland mangement actions, and recreational vehicle use could degrade naturalness over the long-term.
	-------EXPLORATION AND DEVELOPMENT FOR BARITE, FLUORSPAR, LEAD, ZINC,------ COPPER AND GEOTHERMAL RESOURCES		
	Exploration and potential development would be precluded for the following commodities with the approximate acreage of moderate potential shown. Barite, fluorspar, lead, zinc and copper, 12,800 acres and geothermal resources, 12,800 acres.	Same as All Wilderness Alternative.	No impact

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
Sierra Ladrones	42,688 acres recommended suitable. Hiking, backpacking, camping and solitude opportunities would be maintained. Special features include a diversity of wildlife, such as mule deer, mountain lion, coyote, bobcat, fox, badger, and raptors. Potential site for desert bighorn sheep introduction. The area contains a diversity of vegetation which adds to its scenic quality.	31,244 acres recommended suitable and 11,444 acres recommended nonsuitable for wilderness designation. High quality wilderness values in most rugged portion of unit maintained. Mineral exploration and development, including road building, would impair wilderness values in nonsuitable portion over the long-term. ORV use would increase due to road building.	42,688 acres recommended nonsuitable. Mineral exploration and development, including road building, would impair wilderness values over the long-term. ORV use would increase throughout the area due to road building.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------EXPLORATION AND DEVELOPMENT FOR COPPER, COBALT, NICKEL, SILVER------ LEAD, ZINC, BARITE AND URANIUM		
Sierra Ladrones (cont.)	Exploration and potential development would be precluded for the following commodities with the approximate acreage of moderate potential shown: Copper, 10,000 acres; Cobalt, Nickel 8,100 acres; Silver, Lead, Zinc, Barite, 600 acres; Uranium 8,200 acres (moderate) 1,800 acres (high potential)	Exploration and potential development would be precluded for the following commodities with the approximate acreage of moderate potential shown: Copper, 10,000 acres; Cobalt, Nickel, 8,100 acres; Silver, Lead, Zinc, Barite, 600 acres; Uranium 8,200 acres (moderate) 1,800 acres (high potential)	No impact

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
		WILDERNESS VALUES	
Stallion	24,238 acres recommended suitable. Solitude opportunities would be maintained. Special herd of wild and free-roaming horses.	Not applicable	24,238 acres recommended nonsuitable. Road building associated with mineral exploration and expansion of two corridored instrumentation sites associated with White Sands Missile Range would impair wilderness values over long-term. ORV use would increase due to road building.
	------EXPLORATION AND DEVELOPMENT FOR COPPER------		
	Exploration and potential development would be precluded on 24,200 acres which have a moderate potential for copper.	Not applicable	No impact

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Veranito	7,206 acres recommended suitable. Solitude opportunities maintained. Special features include a Piro Indian Pueblo site, an unusual petroglyph and a cottonwood bosque. Potential bald eagle, peregrine falcon and whooping crane habitat due to proximity to Rio Grande.	Not applicable	7,206 acres recommended nonsuitable. Road building associated with mineral exploration would impair wilderness values over the long-term. ORV use would increase due to road building.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------EXPLORATION AND DEVELOPMENT FOR URANIUM AND GEOTHERMAL RESOURCES------		
Veranito (cont.)	Exploration and potential development would be precluded on 4,300 acres which have a moderate potential for uranium and 6,100 acres which have a moderate potential for geothermal development.	Not applicable	No impact

Wilderness Study Area	All Wilderness (Proposed Action)	Amended Boundary	No Wilderness
	------WILDERNESS VALUES------		
Aden Lava Flow	23,857 acres recommended suitable. Solitude opportunities would be maintained. Special features include educational/research opportunities. Studies have been done on carnivores, bats, melanistic species and plant-soils relationships. 4,008 acres currently designated a Research Natural Area.	Not applicable	23,857 acres recommended nonsuitable. No anticipated impacts due to low resource development potential. 4,008 acres would remain as a Research Natural Area.

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Alamo Hueco Mountains	10,796 acres recommended suitable. Hiking, backpacking, camping and solitude opportunities maintained. Special features include a diversity of wildlife, caves which may be eligible for listing on National Register of Historic Places and education/research opportunities. Wildlife includes javelina, deer, mountain lion, desert bighorn sheep, coatimundi and thick-billed kingbird. Gray wolf may pass through the area.	Not applicable	10,796 acres recommended nonsuitable. Maintenance of wilderness values would be dependent upon future land uses of the private lands adjoining the WSA.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
Big Hatchet Mountains	58,014 acres recommended suitable. Hiking, backpacking, horseback riding, mountain climbing, sightseeing and solitude opportunities maintained. Special features include a diversity of wildlife, education/research opportunities for desert bighorn sheep and paleo-environmental studies in dry caves. Wildlife includes mountain lion, raptors, bats mule deer and desert bighorn sheep. Gray wolf may pass through the area.	41,293 acres recommended suitable and 16,721 acres recommended nonsuitable for wilderness designation. Highest quality wilderness values maintained. Road building and pad construction for oil and gas development would impair wilderness values of nonsuitable portion over the long-term. ORV use would increase due to road building.	58,014 acres recommended nonsuitable. Similar impacts as Proposed Action, with oil and gas development having an adverse impact on wilderness values in valley areas (16,721 acres). Protective stipulation on oil and gas leases covering 13,000 acres for protection of bighorn sheep would reduce impacts. ORV use would increase due to road building.
	------EXPLORATION AND DEVELOPMENT FOR OIL AND GAS, LEAD, ZINC, SILVER, COPPER AND GYPSUM------		
	Exploration and potential development would be precluded on 6,700 acres which have a moderate potential for oil and gas, 200 acres which have a moderate potential for lead, zinc, silver and copper and 200 acres which have a moderate potential for gypsum.	Exploration and potential development would be precluded on 100 acres which have a moderate potential for oil and gas, 200 acres which have a moderate potential for lead, zinc, silver and copper and 200 acres which have a moderate potential for gypsum.	No impact
	------DESERT BIGHORN SHEEP HABITAT------		
	Bighorn sheep habitat would be maintained through legislative protection on 44,670 acres of habitat enhancing long-term opportunities to increase herd size.	Bighorn sheep habitat would be maintained on approximately 38,000 acres of habitat through legislative protection.	Through administrative restrictions, bighorn sheep habitat would be maintained.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Blue Creek	14,896 acres recommended suitable. Hiking, backpacking, camping and solitude opportunities maintained. Unit provides habitat for nightblooming cereus, a feature of scientific value.	Not applicable	14,896 acres recommended nonsuitable. No anticipated impacts due to low resource development.

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	-------WILDERNESS VALUES------		
Cedar Mountains	14,911 acres recommended suitable. Opportunities for solitude maintained.	Not applicable	14,911 acres recommended suitable. No anticipated impacts due to low resource development potential.

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	-------WILDERNESS VALUES------		
Cooke's Range	19,608 acres recommended suitable. Rockhounding, hunting, camping, sightseeing and solitude opportunities maintained. Special features include raptors and cultural resources. Golden eagle, red-tailed hawk, great horned owl and prairie falcon nest in or near area. Massacre Peak Petroglyph, Butterfield Trail, Fort Cummings and historic mining town of Cooke's in unit.	Not applicable	19,608 acres recommended nonsuitable. Road building associated with mineral exploration would impair wilderness values over the long-term. ORV use would increase due to road building. Protective stipulation on leasable minerals would reduce impact on raptors.
	------EXPLORATION AND DEVELOPMENT OF METALLIC MINERALS------		
	Exploration and potential development would be precluded for lead, silver, zinc, copper and gold.	Not applicable	No impact

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	-------WILDERNESS VALUES------		
Cowboy Spring	6,699 acres recommended suitable. Hiking, backpacking, camping, hunting and solitude opportunities maintained. Special features include a diverse wildlife, education/research opportunities and cultural resources. Mountain lion, javelina Coues' whitetail deer, golden eagles and Montezuma quail inhabit the area. Montezuma quail inhabit the area. Studies are being conducted on feral hogs, vertebrates and the effects of fire.	Not applicable	6,699 acres recommended non-suitable. No anticipated impacts due to low resource development potential.

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	-------WILDERNESS VALUES------		
Florida Mountains	22,336 acres recommended suitable. Hiking, climbing, rockhounding, hunting and solitude opportunities maintained. Special features include education/research opportunities and habitat for raptors, such as golden eagles, red-tailed hawk, prairie falcons and great horned owl. Past studies conducted on Persian ibex, plant surveys and geology.	Not applicable	22,336 acres recommended non-suitable. Road building associated with mineral exploration would impair wilderness values over the long-term. ORV use would increase due to road building. These activities would degrade naturalness.
	------EXPLORATION AND DEVELOPMENT FOR LEAD, ZINC, COPPER, SILVER,------ GOLD, FLUORSPAR AND MANGANESE		
	Exploration and development would be precluded on 5,100 acres which have a high potential for lead, zinc, copper, silver and gold; 1,000 acres which have a moderate potential for lead, zinc, copper, silver and gold; 400 acres which have a moderate potential for fluorspar; and 1,300 acres which have a moderate potential for manganese.	Not applicable	No impact

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	-------WILDERNESS VALUES------		
Gila Lower Box	8,555 acres recommended suitable. Hiking, backpacking, camping, bird watching, photography, sightseeing, hunting and solitude opportunities maintained. Special features include a diverse wildlife community, the Gila River and cultural resources. Wildlife consists of mule deer, javelina, peregrine falcon, bald eagle, gray hawk, black hawk, Gila woodpecker and zone-tailed hawk. Mogollon-style petroglyphs, rock shelters and rock structures occur in the area.	5,835 acres recommended suitable and 2,720 acres recommended nonsuitable for wilderness designation. High quality wilderness values along river maintained. ORV use would increase in nonsuitable portion, which would adversely impact naturalness and opportunities for solitude.	8,555 acres recommended nonsuitable. Similar impacts to Proposed Action. No anticipated impacts in box due to low resource development potential. ORV use outside of box would impair wilderness values over long-term.

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	-------WILDERNESS VALUES------		
Las Uvas Mountains	11,067 acres recommended suitable. Solitude opportunities maintained.	Not applicable	11,067 acres recommended nonsuitable. No anticipated impacts due to low resource development potential.

Wilderness Study Area	All Wilderness (Proposed Action)	Amended Boundary	No Wilderness
	-------WILDERNESS VALUES------		
Organ Mountains	7,144 acres recommended suitable. Hunting, sightseeing, rock collecting, camping, hiking, rock climbing, horseback riding and solitude opportunities maintained. Baylor Pass National Recreation Trail bisects unit.	Not applicable	7,144 acres recommended nonsuitable. Road building associated with mineral exploration would impair wilderness values over the long-term. ORV use would increase due to road building.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness (Proposed Action)	Amended Boundary	No Wilderness
	------EXPLORATION AND DEVELOPMENT OF BASE AND PRECIOUS METALS AND FLUORSPAR------		
Organ Mountains (cont.)	Exploration and development would be precluded on 200 acres which are classified as having a high potential for lead, silver, copper, zinc, gold and molybdenum and 3,600 acres which are classified as having a moderate potential for these minerals. Exploration and development would also be precluded on 100 acres which are classified as having a high potential for fluorspar.	Not applicable	No impact

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Robledo Mountains	12,811 acres recommended suitable. Solitude opportunities maintained. Special features include 20 known cultural resource sites, such as pit houses, small caves and a pueblo.	Not applicable	12,811 acres recommended nonsuitable. Road building associated with mineral exploration would impair wilderness values over the long-term. ORV use would increase due to road building.
	------EXPLORATION AND DEVELOPMENT FOR MAGNESIUM AND GEOTHERMAL------		
	Exploration and development would be precluded on 200 acres which are classified as having a moderate potential for magnesium, and 1,800 acres which are classified as having a moderate potential for geothermal development.	Not applicable	No impact

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(continued)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
West Potrillo Mountains and Mount Riley	155,105 acres recommended suitable. Hiking, backpacking, camping, sightseeing, hunting, rockhounding and solitude opportunities maintained. Special features include the large size of the area and cultural resources. This is the largest expanse of roadless, undeveloped tract of BLM land in New Mexico. Classic Mimbres sites occur in the unit.	147,100 acres recommended suitable and 8,005 acres recommended nonsuitable for wilderness designation. Highest quality wilderness values maintained. Development of saleable minerals, oil and gas exploration and ORV use would impair wilderness values in nonsuitable portion over the long-term.	155,105 acres recommended nonsuitable. Road building associated with mineral exploration will impair wilderness values over the long-term. ORV use would increase due to road building and presence of existing vehicle trails.
	------EXPLORATION AND DEVELOPMENT FOR OIL AND GAS------		
	Exploration and development for oil and gas would be precluded on 8,000 acres which are classified as having a moderate potential for development.	Exploration and development for oil and gas would be precluded on 8,000 acres which are classified as having a moderate potential for development.	No impact

Wilderness Study Area	All Wilderness	Amended Boundary	No Wilderness (Proposed Action)
	------WILDERNESS VALUES------		
Brokeoff Mountains	31,386 acres recommended suitable. Hiking, backpacking, camping, hunting and solitude opportunities maintained. Special features include raptors.	Not applicable	31,386 acres recommended nonsuitable. Road building associated with oil and gas exploration would impair wilderness values over the long-term. Although the WSA has a low potential for oil and gas, exploration is anticipated because of the general interest in the overall region.

TABLE 4-1
SUMMARY OF ENVIRONMENTAL IMPACTS BY ALTERNATIVE FOR EACH WSA
(concluded)

Wilderness Study Area	All Wilderness	Amended Boundary (Proposed Action)	No Wilderness
	------WILDERNESS VALUES------		
Carrizozo Lava Flow and Little Black Peak	25,312 acres recommended suitable. Hiking, hunting, backpacking, camping, spelunking, photography, sightseeing and solitude opportunities maintained. Special features include an undisturbed Upper Sonoran vegetative community, 12 melanistic animal species, caves, volcanic features and scenic qualities of recent lava flow.	24,249 acres recommended suitable and 1,063 acres recommended nonsuitable for wilderness designation. All of the wilderness values would be maintained.	25,312 acres recommended nonsuitable. Similar impacts to Proposed Action. Other than the highway expansion, no resource development is anticipated.
	------HIGHWAY EXPANSION------		
	Plans to expand U.S. Highway 380 would be precluded, which would result in reduced safety and increased traffic congestion.	No impact on plans to expand U.S. 380. Expansion could offer opportunities to facilitate visitor use by providing suitable areas for parking along highway.	No impact

ANALYSIS OF STATEWIDE ENVIRONMENTAL CONSEQUENCES

The remainder of this chapter addresses the Statewide environmental consequences of the proposed action and alternatives.

PROPOSED ACTION - IMPACTS TO WILDERNESS VALUES

INTRODUCTION

If the Proposed Action alternative were implemented, 18 WSAs totalling 407,919 acres of public land would be recommended as suitable for wilderness designation, with 19 WSAs (378,472 acres) recommended as nonsuitable. Wilderness values which would be preserved by this action, as well as those which would be lost due to resource use and development are described below.

NATURALNESS

The natural landscape of each WSA recommended suitable for wilderness designation would be maintained. The represented landscape include lava flows, forested mountains, rivers and the more typical desert mountains and lowlands of the southwest.

Improvement in the naturalness of the areas would also occur as a result of eliminating or curtailing vehicle use on 153 miles of vehicle ways. Rehabilitation of these vehicle ways would occur slowly through weathering and natural revegetation.

Resource use and development of 313,859 acres recommended nonsuitable for wilderness designation would result in modifications to the existing natural landscape of the areas. Mineral exploration and development, including road construction in areas with a moderate and high potential for the occurrence of such commodities, would result in the removal of vegetation, soil and rocks, thereby affecting naturalness. ORV use on and near these new mining roads, as well as the continued use of 237 miles of vehicle ways would further reduce the naturalness of these areas.

No impacts are expected on 64,613 acres recommended nonsuitable for wilderness designation due to low resource development potential or existing management restrictions. This includes the entire acreage within the Sabinoso, Blue Creek, Cedar Mountains, Cowboy Spring and Las Uvas Mountains WSAs, as well as the 1,280 acre Tinajas Area of Critical Environmental Concern (ACEC) within the Presilla WSA.

OUTSTANDING OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE RECREATION

Under this alternative, outstanding opportunities for solitude and primitive recreation would be maintained within the 407,919 acres of the 18 WSAs recommended suitable for wilderness designation as well as the five areas (totalling 63,333 acres) discussed in the preceding paragraph. The outstanding solitude opportunities in the areas recommended suitable for wilderness designation would be improved through closure of the areas to ORV use, including the closing of 153 miles of existing unimproved vehicle ways.

Approximately 85 percent of the areas recommended suitable for wilderness designation (343,023 acres in 15 WSAs) provide outstanding opportunities for primitive and unconfined recreation. Examples of the outstanding opportunities which would be maintained include:

- Floatboating and fishing in the Rio Chama and Gila Lower Box WSAs.

- Rockclimbing in the Cabezon and Organ Mountains WSAs.

- Backpacking in the high mountains of the Sierra Ladrones and Continental Divide WSAs or in the expanse of Chihuahuan desert in the West Potrillo/Mount Riley WSAs.

- Hiking on the proposed Continental Divide National Scenic Trail in the Continental Divide WSA or on the Baylor Pass National Recreation Trail in the Organ Mountains WSA.

- Hiking and photography on the stark lava flows of the Jornada del Muerto, Aden Lava Flow and the Carrizozo Lava Flow/Little Black Peak WSAs.

- Hunting in the Ignacio Chavez, Sierra de Las Cana, Horse Mountain and Sierra Ladrones WSAs.

- Birdwatching for such species as the Gila woodpecker, bald eagle, zone-tailed hawk and black hawk in the Gila Lower Box WSA.

A complete listing of the outstanding recreation opportunities available in each WSA recommended suitable for wilderness designation in the Proposed Action is shown in Table 4-1. The appended District WARs contain additional information on these opportunities.

Under this alternative, solitude and primitive recreation opportunities would be diminished on the 313,859 acres recommended nonsuitable for wilderness designation. This would result from road building in support of mineral exploration and development, as well as through ORV use. Examples of the primitive recreation opportunities which would be impaired include:

- Hunting in the Cooke's Range, Florida Mountains and Empedrado WSAs.

- Hiking in the La Lena, Eagle Peak and Presilla WSAs.

- Wildlife viewing in the Cooke's Range WSA.

- Natural landscape photography in the Eagle Peak and Florida Mountains WSAs.

SPECIAL FEATURES

Special features such as ecological, geologic and other features of scientific, educational, scenic or historical value contribute to an area's value for wilderness designation. Some of the features included in the suitable areas are:

- Bat cave, an archaeological research site in the Continental Divide WSA.

- Golden eagle, great horned owl, prairie falcon and red-tailed hawk nesting sites in the Cabezon, Ignacio Chavez, Sierra Ladrones and Gila Lower Box WSAs.

- Chama River in the Rio Chama WSA and the Gila River in the Gila Lower Box WSA.

- Bighorn sheep in the Big Hatchet Mountains WSA and the potential reintroduction of bighorn sheep in the Sierra Ladrones WSA.

- Studies on melanistic species in the lava flows of the Aden Lava Flow, Jornada del Muerto and Carrizozo Lava Flow/Little Black Peak WSAs.

- Mountain lions in the Continental Divide, Sierra Ladrones and Big Hatchet Mountains WSAs.

- The relatively undisturbed and expansive stretch of Chihuahuan Desert in the West Potrillo/Mount Riley WSAs.

- The 163 acre enclave of western ponderosa forest within the Organ Mountains WSA.

Wilderness designation would provide these special features with a permanent form of protection not provided by other forms of land management. This protection would preserve and in some cases enhance these special features.

Special features in the areas recommended nonsuitable for wilderness designation could be impacted by eventual resource use and development. These special features include raptor nesting sites in the Cooke's Range, Florida Mountains and La Lena WSAs.

NATIONAL WILDERNESS PRESERVATION SYSTEM (NWPS)

The NWPS would be expanded and diversified through implementation of the Proposed Action. Ecosystems not currently represented would be added to the system and approximately 50 percent of the existing solitude and recreation opportunities within a day's driving time (5 hours) of the Standard Metropolitan Statistical Areas (SMSAs) would be maintained.

The ecosystems and acres to be included in the NWPS are shown on Table 4-2. If this alternative were implemented, the ecosystems within the Chihuahuan Desert Province, Colorado Plateau Province and Mexican Highlands Shrub Steppe Province would be the first of their type to be included in the system. However, 10,751 acres of Oak Juniper Woodland Scrub Ecosystem in the Mexican Highlands Shrub Steppe Province would not be added to the NWPS. This ecosystem is in the Alamo Hueco WSA and is unique in that it is not nationally represented in any other area currently designated as wilderness or under wilderness review by BLM or any other agency.

The number of new wilderness areas and the total acreage added to the NWPS within 5 hours drive of each SMSA is shown on Table 4-3. This would increase the opportunities for recreation and solitude during the spring, fall and winter months, primarily as a result of the milder winters of these desert regions.

TABLE 4-2
ECOSYSTEM ACRES RECOMMENDED SUITABLE FOR WILDERNESS
DESIGNATION BY ALTERNATIVE

Ecosystems by Province	Ecosystem Acres By Alternative			
	All Wilderness Acres	Emphasis on Manageability Acres	Proposed Action Acres	Conflict Resolution Acres
CHIHUAHUAN DESERT PROVINCE				
Mountain Mahogany Oak Scrub	30,643	9,468	3,362	0
Grama Tobosa Shrub Steppe	177,304	143,569	75,295	34,256
Trans-Pecos Shrub Savanna	74,830	68,485	62,791	59,172
Creosote Bush	79,946	61,463	51,176	51,176
Mesquite Acacia Savanna	41,787	41,787	40,498	40,498
Western Ponderosa Forest	163	163	163	0
ROCKY MOUNTAIN FOREST PROVINCE				
Ponderosa Pine and Douglas Fir Forest	1,285	1,285	1,285	1,285
Pinyon-Juniper Woodland	1,352	1,352	1,000	1,000
Great Basin Sagebrush	16,398	9,645	2,947	2,947
COLORADO PLATEAU PROVINCE				
Ponderosa Pine and Douglas Fir Forest	2,012	2,012	2,012	12
Pinyon-Juniper Woodland	91,784	50,370	23,345	23,345
Great Basin Sagebrush	880	0	0	0
Grama Galleta Steppe	50,573	19,834	9,192	9,192
Juniper Mixed Shrub	25,312	24,249	24,249	24,249
MEXICAN HIGHLANDS SHRUB STEPPE PROVINCE				
Oak Juniper Woodland Scrub	10,751	0	0	0
Mountain Mahogany Oak Scrub	35,041	35,041	28,752	28,752
Creosote Bush	26,191	9,445	9,445	9,445
Grama Tobosa Shrub Steppe	3,168	3,168	2,758	2,758
Mesquite Acacia Savanna	22	22	22	22
Trans Pecos Shrub Savanna	336	316	316	316
UPPER GILA MOUNTAINS FOREST PROVINCE				
Ponderosa Pine and Douglas Fir Forest	7,407	7,407	7,407	2,462
Pinyon-Juniper Woodland	51,902	42,014	42,014	1,770
Grama Galleta Steppe	57,304	19,890	19,890	200

NOTE: Except for the Ponderosa Pine and Douglas Fir Forest in the Rocky Mountain Forest Province, Colorado Plateau Province and Upper Gila Mountains Forest Province, none of the ecosystems within the New Mexico WSAs are currently represented in the NWPS.

SOURCE: BLM WARs, 1985.

TABLE 4-3
COMPARISON OF ADDITIONAL WILDERNESS OPPORTUNITIES
WITHIN FIVE HOURS DRIVE OF THE
STANDARD METROPOLITAN STATISTICAL AREAS (SMSAs)

ALTERNATIVES	RECOMMENDED SUITABLE FOR WILDERNESS DESIGNATION BY ALTERNATIVE FOR EACH SMSA											
	Albuquerque, NM		Las Cruces, NM		Santa Fe, NM		Tucson, AZ		El Paso, TX		Lubbock, TX	
	Number of Areas	Acres	Number of Areas	Acres	Number of Areas	Acres	Number of Areas	Acres	Number of Areas	Acres	Number of Areas	Acres
All Wilderness	29	618,798	24	622,357	19	334,992	9	164,797	25	578,558	2	25,312
Emphasis on Manageability	21	428,525	18	465,532	13	205,314	6	103,885	19	454,146	2	24,249
Proposed Action	16	360,791	11	345,945	9	154,009	2	47,128	12	334,559	2	24,249
Conflict Resolution Emphasis	11	245,729	6	230,883	5	46,091	2	47,128	8	255,132	2	24,249

SOURCE: BLM WARs, 1985.

PROPOSED ACTION - IMPACTS TO MINERAL EXPLORATION AND DEVELOPMENT

INTRODUCTION

The impacts of wilderness designation on mineral exploration and development were analyzed for the Proposed Action and each of the alternatives. Impacts associated with restrictions on existing mineral leases and mining claims, as well as withdrawals of potentially economic mineral resources are addressed. Although the acreages of high and moderate potential mineral resource areas identified in the WARs provide a good comparison between alternatives, additional Statewide or regional information is needed to put the impacts into perspective. In order to provide some overall context to the potential effects of the Proposed Action and each of the alternatives, the WSAs were also evaluated in respect to the Statewide mineral resource maps presented in Chapter 3 (see Maps 3-3 through 3-7). This comparison illustrates the potential effect on New Mexico's mineral resources as a whole. (The U.S. demand and production relationships in Appendix A provide additional perspective on impacts to New Mexico's mineral resources.)

IMPACTS TO MINING CLAIMS AND MINERAL LEASES

Under the Proposed Action, 274 mining claims would be subjected to wilderness management. The bulk of these claims lie within the West Potrillo Mountains/Mount Riley, Organ Mountains and Sierra Ladrones WSAs (see Table 4-4). In order to initiate or continue operations on claims subject to wilderness management, mining claimants must have previously completed all discovery work prior to wilderness designation. It is anticipated that mining operations within wilderness areas would be faced with higher operating and development costs in order to minimize damage to wilderness values. Without wilderness designation, only a small percentage of these claims would likely result in any significant mineral production. Implementation of the Proposed Action is likely to result in none of these claims being developed.

Oil and gas leases are not expected to be affected because of the time of wilderness designation only leases with no surface occupancy stipulations would be involved. Also, no geothermal or other mineral leases are encumbered by the Proposed Action. It is expected that virtually all active oil and gas leases as of the date of wilderness designation will stipulate no surface occupancy. No surface occupancy leases are of little value unless they are in close proximity to a WSA boundary which may make directional drilling economically feasible.

The actual impact to mining claims and mineral leases depends directly on the mineral potential of the respective WSA. As noted in Chapter 3, BLM geologists, with the aid of the most current information, classified lands within each WSA in respect to their mineral resource potential. The total acreages of high and moderate mineral resources identified for withdrawal under the Proposed Action are summarized by commodity. Table 4-5 condenses the data in Appendix A and exhibits the relative acreages of potential mineral resources to be withdrawn under the Proposed Action and the alternatives.

In order to assess the significance of the overall impacts of the Proposed Action, as well as the other alternatives, Tables 4-6 through 4-10 were developed. The statistics on these tables are based on the generalized

TABLE 4-4
NUMBER OF MINING CLAIMS IMPACTED BY EACH ALTERNATIVE

WSA	All Wilderness	Emphasis on Manageability	Proposed Action	Conflict Resolution
Rio Chama	0/0	0/0	0/0	0/0
Sabinoso	0/0	*	*	*
San Antonio	0/0	0/0	*	*
Cabezon	0/0	0/0	0/0	0/0
Empedrado	27/0	*	*	*
Ignacio Chavez	0/0	0/0	0/0	0/0
La Lena	199/17	*	*	*
Ojito	0/0	0/0	0/0	0/0
Antelope	0/0	0/0	0/0	*
Continental Divide	0/3	0/0	0/0	*
Devil's Backbone	0/0	*	*	*
Eagle Peak	0/0	*	*	*
Horse Mountain	0/0	0/0	0/0	0/0
Jornada del Muerto	0/0	0/0	0/0	*
Mesita Blanca	0/0	0/0	*	*
Presilla	0/2	*	*	*
Sierra de las Canas	0/10	0/10	0/10	0/10
Sierra Ladrones	0/76	0/76	0/76	*
Stallion	0/0	0/0	*	*
Veranito	0/0	0/0	*	*
Aden Lava Flow	0/0	0/0	0/0	0/0
Alamo Hueco Mountains	0/10	*	*	*
Big Hatchet Mountains	3/0	3/0	3/0	3/0
Blue Creek	0/0	*	*	*
Cedar Mountains	0/0	0/0	*	*
Cooke's Range	8/69	*	*	*
Cowboy Spring	0/0	0/0	*	*
Florida Mountains	68/189	68/189	*	*
Gila Lower Box	0/3	0/3	0/3	0/3
Las Uvas Mountains	0/0	*	*	*
Organ Mountains	47/38	47/38	47/38	*
Robledo Mountains	0/0	0/0	*	*
West Portrillo Mountains and Mount Riley	22/81	16/81	16/81	16/81
Brokeoff Mountains	0/0	0/0	*	*
Carrizozo Lava Flow and Little Black Peak	0/0	0/0	0/0	0/0
TOTAL	374/498	134/397	66/208	19/94

NOTE: X/ Pre-FLPMA Mining Claims
/X Post-FLPMA Mining Claims
* WSA nonsuitable under this alternative
SOURCE: BLM WARs, 1985.

TABLE 4-5
CUMULATIVE IMPACT OF EACH ALTERNATIVE TO AREAS
OF HIGH AND MODERATE MINERAL POTENTIAL

	All Wilderness	Emphasis on Manageability	Proposed Action	Conflict Resolution	No Wilderness
Total acres of proposed wilderness	786,391	550,985	407,919	292,857	0
Energy Resources					
Coal	13,500	5,700	5,700	5,700	0
Geothermal	31,600	22,100	13,100	13,100	0
Oil and Gas	95,400	64,800	64,800	33,700	0
Uranium	75,000	41,000	20,300	10,300	0
Metallic Resources					
Cobalt	8,100	8,100	8,100	0	0
Copper	71,200	56,900	31,200	17,400	0
Gold	23,300	9,700	8,200	4,400	0
Lead	41,200	23,300	21,800	17,400	0
Manganese	1,300	1,300	0	0	0
Molybdenum	23,300	9,700	8,200	4,400	0
Nickel	8,100	8,100	8,100	0	0
Silver	61,800	47,500	21,800	17,400	0
Tin	24,000	14,600	14,600	0	0
Tungsten	17,000	8,200	8,200	4,400	0
Zinc	41,200	23,300	21,800	17,400	0
Non-Metallic Resources					
Barite	25,900	13,400	13,400	600	0
Building Stone	4,800	4,800	3,500	3,500	0
Cinders/Scoria	12,600	11,100	8,800	8,800	0
Fluorspar	25,800	13,300	12,900	12,800	0
Gypsum	200	200	200	200	0
High Calcium Limestone	14,500	9,400	5,700	0	0
High Magnesium Dolomite	200	200	0	0	0
Humates	13,500	5,700	5,700	5,700	0
Sand and Gravel	5,000	1,250	0	0	0

SOURCE: BLM WARs, 1985.

information illustrated on Maps 3-3 through 3-7. Tables 4-6 through 4-10 also note the percentage of mineral resource lands presently encumbered by major Federal withdrawals.

IMPACTS TO ENERGY RESOURCES

Implementation of the Proposed Action would withdraw relatively insignificant coal, oil and gas resources. (See Tables 4-6 through 4-8.) Although no existing geothermal leases would be encumbered, about 1 percent of the most favorable geothermal resource areas would be withdrawn. The Proposed Action will have no significant impact on oil, gas, geothermal or coal resource development.

The only potentially significant impact to uranium resource development under the Proposed Action is site-specific and associated with the Sierra Ladrones WSA. The northeastern portion of the Sierra Ladrones WSA lies less than one half mile west of the Jeter Uranium Mine. This mine has had the largest New Mexico production of any uranium mine outside of the Grants Uranium District. Economic extensions or sources of the uranium mineralization may lie within the Sierra Ladrones WSA.

The New Mexico Bureau of Mines hypothesizes that a precambrian, nickel-cobalt bearing, copper-uranium deposit within the Sierra Ladrones provided the source of the Jeter Mine's mineralization. Until additional evidence is available, any alternative which recommends the Sierra Ladrones WSA for wilderness designation must be considered to have potentially significant impacts to the development of uranium resources. However, since the Proposed Action would withdraw 1.5 percent of the area in New Mexico associated with past and present production (see Table 4-9), no significant Statewide impact is anticipated.

IMPACTS TO METALLIC RESOURCES

The Proposed Action would withdraw 1.5 to 2.0 percent of New Mexico's bismuth, manganese, lead, tellurium and zinc mineral resource areas and approximately 1 percent of New Mexico's copper, molybdenum and tungsten mineral resource areas. (See Table 4-10.) Due to the very limited distribution of tin, cobalt and nickel, these commodities were not amenable to being addressed on Table 4-10. Since the U.S. has serious supply problems in respect to these relevant commodities, they are addressed below.

Potential tin occurrences in New Mexico are confined to Tertiary vein deposits in Rhyolites of the Taylor Creek Area and lesser significant concentrations in Precambrian pegmatities of the Southern Rocky Mountain Province. The Taylor Creek tin district is one of a very few potentially economic tin resources areas in the U.S. The Continental Divide WSA contains rhyolitic rock units equivalent to the tin host rocks of the Taylor Creek Area immediately south of the WSA. Little is known about the distribution of tin mineralization in the area. Although the Continental Divide WSA is classified as having a moderate potential for tin, the withdrawal of the Continental Divide WSA could have significant impacts to the exploration and development of tin.

TABLE 4-6
IMPACT TO COAL RESOURCES [a]

	Potentially Surface Mineable Coal with Less Than 250' of Overburden	Coal Resources Less Than 3000' Deep	Coal Resources Greater Than 3000' Deep
Lands with coal resource potential in New Mexico (sq. mi.)	890	12,780	1,630
% of all lands in New Mexico	0.7%	10.5%	1.3%
% of coal resource lands presently under Federal withdrawal in New Mexico	1.1%	0.7%	0
% of New Mexico's coal resource lands proposed for withdrawal under the:			
All Wilderness Alternative	0.5%	0.7%	0
Manageability Alternative	0.0%	0.3%	0
Proposed Action	0.0%	0.1%	0
Conflict Resolution Alternative	0.0%	0.1%	0

NOTE: [a] Considers only major Federal withdrawals such as wilderness areas, wildlife refuges, military reservations and national parks.

SOURCE: Mineral potential based on the Energy Resources Map of New Mexico, prepared by NM Bureau of Mines and Mineral Resources and the U.S. Geological Survey (1981).

TABLE 4-7
IMPACT ON GEOTHERMAL RESOURCES

Class 1: Areas presently identified as most favorable for the discovery and development of low temperature geothermal resources.

Class 2: Additional areas which may also be suitable for developing geothermal resources.

	Class 1	Class 2
Lands with geothermal resource potential in New Mexico (sq. miles)	5,228	17,073
% of all lands in New Mexico	4.3%	14.1%
% of geothermal resource [a] lands presently under Federal withdrawal in New Mexico	1.5%	25.4%
% of New Mexico's geothermal resources proposed for withdrawal under the:		
All Wilderness Alternative	1.1%	2.5%
Manageability Alternative	1.1%	2.1%
Proposed Action	0.5%	2.0%
Conflict Resolution Alternative	0.5%	1.6%

NOTE: [a] Considers only major Federal withdrawals such as wilderness areas, wildlife refuges, military reservations and national parks.

SOURCE: Mineral potential based on information by J.F. Callendar, W.R. Seager and C.A. Swanbery (1983).

TABLE 4-8
IMPACT TO OIL AND GAS RESOURCES

	Petroleum Provinces with Known Potential	Areas Outside of Known Petroleum Provinces with High Potential	Areas with Moderate Potential
Lands with oil and gas resource potential in New Mexico (square mi.)	21,251	10,470	25,870
% of all lands in New Mexico	17.5%	8.6%	21.3%
% of oil and gas resource [a] lands presently under Federal withdrawal in New Mexico	0.7%	1.9%	10.4%
% of New Mexico's oil and gas resources proposed for withdrawal under the:			
All Wilderness Alternative	0.1%	1.4%	0.8%
Manageability Alternative	0.05%	1.0%	0.6%
Proposed Action	0.05%	0.6%	0.5%
Conflict Resolution Alternative	0.05%	0.6%	0.3%

NOTE: [a] Considers only major withdrawals such as wilderness areas, wildlife refuges, military reservations and national parks.

SOURCE: Mineral potential based on information derived from Foster (1974).

TABLE 4-9
IMPACT TO URANIUM RESOURCES [a/]

	Areas of Significant Past and Present Production	Areas of Multiple Occurrences
Lands with uranium potential in New Mexico (square miles)	1,950	11,313
% of all lands in New Mexico	1.6%	6.4%
% of uranium lands in New Mexico presently under Federal withdrawal	0	6.4%
% of New Mexico's uranium resources proposed for withdrawal under the:		
All Wilderness Alternative	1.5%	1.4%
Manageability Alternative	1.5%	1.0%
Proposed Action	1.5%	0.7%
Conflict Resolution Alternative	0	0.4%

NOTE: [a/] Includes only major Federal withdrawals such as wilderness areas, wildlife refuges, military reservations, and national parks.

SOURCE: Mineral potential based on information modified from McLemore (1983).

TABLE 4-10
IMPACT TO METALLIC MINERAL RESOURCES (INCLUDING FLUORITE AND BARITE) [a/]

	Ag	Au	Bi	Cu	Fe	Mn	Mo	Pb	Te	V	W	Zn	Fluorite	Barite	TOTAL [b/]
Lands with metallic mineral resource potential in New Mexico (square miles)	4067	3668	797	4590	1047	1011	1220	4023	697	324	1390	2705	2747	1811	6544
% of all lands in New Mexico	3.3	3.0	0.7	3.8	0.9	0.8	1.0	3.3	0.6	0.3	1.1	2.2	2.3	1.5	5.4
Federal metallic resource lands withdrawn from mining (square miles)															
- Military Reservations	162	117	107	490	10	0	107	485	107	18	144	328	461	555	686
- USFS Wilderness Areas	257	248	42	240	3	38	87	244	6	11	42	122	99	64	302
- U.S. Fish and Wildlife Areas	4	0	0	83	0	58	0	72	0	0	0	25	43	80	84
Total Withdrawn	423	365	149	813	13	96	194	801	113	29	186	475	603	699	1072
% of all metallic resource lands under Federal withdrawal	10.4	10.0	18.7	17.7	1.2	9.5	15.9	19.9	16.2	9.0	13.4	17.6	22.0	38.6	16.4
% of New Mexico's metallic mineral resource lands proposed for withdrawal under the:															
All Wilderness Alternative	2.6	2.9	1.5	3.6	1.0	10.6	1.0	4.6	1.7	3.7	1.7	4.2	4.5	6.8	3.0
Manageability Alternative	1.5	1.7	1.5	2.3	1.0	6.0	1.0	3.1	1.7	0	0.9	2.6	2.8	5.4	2.1
Proposed Action	0.3	0.3	1.5	1.1	0	2.0	1.0	1.7	1.7	0	0.9	1.5	1.5	3.3	1.1
Conflict Resolution Alternative	0	0	0	0.3	0	0	0	0.9	0	0	0	0.3	0.3	1.5	0.5

NOTE: [a/] Considers only major Federal mineral resource withdrawals such as wilderness areas, wildlife refuges, military reservations, and national parks.
[b/] Note that several commodities may occur within the same locality.

SOURCE: Mineral potential based on information from Hutchins (1983); New Mexico Metal Resource Map NMBMMR (1958); and Mineral and Water Resources of New Mexico, USGS et al. (1965).

The Sierra Ladrones WSA contains 8,100 acres which are classified as having a moderate potential for nickel-cobalt. Under the Proposed Action withdrawal of the Sierra Ladrones WSA would mean that any opportunity to explore for the hypothesized nickel-cobalt deposits would be foregone. The only known New Mexico occurrences of nickel-cobalt are in the Luis Lopes and Black Hawk Mining Districts. Withdrawal of the Sierra Ladrones area could potentially impact future cobalt-nickel supplies in the U.S.

In order to illustrate the potential economic impacts of withdrawing metallic resources, an estimate was made concerning the value of copper resources withdrawn under the alternatives considered (see Appendix A). The overall present worth of anticipated copper production in New Mexico is estimated to be 1.5 billion dollars. Assuming that all copper resource lands have an equal probability of going into production, it is estimated that 17 million dollars of copper resources would be withdrawn under the Proposed Action. Since a few large operations can fulfill the anticipated demand, and an accurate prediction of which copper resource lands will eventually go into production is not possible, the 17 million dollars must be considered a very rough estimate.

IMPACTS TO NONMETTALIC RESOURCES

Due to the relative abundance and remote locations of the majority of the industrial minerals found in the WSAs only the potential impacts to barite and fluorite resources are identified.

Due to the nonsuitable recommendation of the Robledo Mountains WSA and the amendment of the Sierra Ladrones WSA boundaries, no impact to the development of high-calcium limestones is anticipated.

Table 4-10 indicates that the Proposed Actions would withdraw 1.5 percent and 3.3 percent of New Mexico's fluorite and barite resources, respectively.

Table 4-10 also indicates that substantial acreages of New Mexico's barite and fluorite resources are already under withdrawal. The bulk of these withdrawn mineral resources lie within the boundaries of the White Sands Missile Range.

Although New Mexico's known fluorite deposits form a substantial portion of the U.S. reserve base, presently identified barite resources in New Mexico are not especially impressive. New Mexico's barite deposits tend to occur along the Rio Grande rift zone in small vein and replacement deposits, while more important deposits in Nevada and California occur as massive bedded sedimentary deposits. The Proposed Action may impact local opportunities to develop economic fluorite and barite resources, but no impact of a Statewide or national scale is anticipated.

PROPOSED ACTION - IMPACTS TO LIVESTOCK GRAZING

INTRODUCTION

A discussion on livestock grazing is included in this analysis as a result of Statewide interest generated during the scoping process. Section 4(d)(4)(2) of the Wilderness Act provides for continued livestock grazing where established prior to designating the area as wilderness. The objective of livestock management in wilderness is: "Utilize the forage resource in conformity with established wilderness objectives for each area and the BLM grazing regulations (43 CFR 4100) . . . ." In keeping with the BLM Wilderness Management Policy, livestock use within the WSAs recommended suitable could remain at or near the level occurring at the time of designation. In order to maintain the level of use within the WSAs, the level of use in adjacent nonwilderness areas may also have to be maintained at or near the level occurring at the time of wilderness designation. Due consideration, as in the past, would be given to legal mandates, range condition and the need to prevent range deterioration. Where rangeland conditions permit increases in grazing use, such increases would be limited to levels that do not diminish the wilderness values of a designated area.

Wilderness designation would result in vehicle use being eliminated or curtailed. As discussed in Chapter 3, the use of the existing vehicle ways is predominantly by ORV enthusiasts, hunters and for mineral exploration. Table 3-9 shows the miles of vehicle ways that would be closed for each alternative. Ranchers and operators utilize about 33 percent of these ways on a limited basis. The incidence of rancher/operator use of ways is less in those instances where livestock grazing on allotments is seasonal rather than year long. Table 3-9 shows the seasons of use for the WSAs.

The most serious impact of wilderness designation on livestock grazing would be the inconvenience to livestock operators due to elimination or curtailment of vehicular use on those portions of their allotments within designated wilderness areas. Permits are allowed under the Wilderness Management Policy for use of motor vehicles for construction of new structural rangeland developments or for maintenance of existing facilities where there are no practical alternatives or where emergency situations arise.

The opportunities for construction of future range developments within the WSAs would be affected; however, in most cases the developments could be constructed on those allotments immediately outside the WSA boundaries or these developments could be constructed within the wilderness area subject to the constraints in the BLM Wilderness Management Policy. These constraints relate to design, location and maintenance. They include construction with the use of native/natural materials and preclusion of motorized access for maintenance of new developments. Since these developments are designed to redistribute livestock rather than to increase AUMs, no impacts caused by increases in livestock numbers would occur. Under wilderness management, vandalism to range improvements would decrease significantly primarily because of closure of the area to recreational vehicle use. Similarly, theft and harassment of livestock would decrease. The problem of gates accidentally left open should be eliminated. The occurrence of litter indiscriminately tossed from vehicles and the incidence of unauthorized dumping would also be expected to decrease.

A total of 786,391 acres in 37 WSAs were studied for inclusion in the NWPS. The estimated number of AUMs within the WSAs by alternative are provided in Table 4-11.

TABLE 4-11
NUMBER OF AUMs WITHIN THE WSAs RECOMMENDED SUITABLE

	All Wilderness	Emphasis on Manageability	Proposed Action	Conflict Resolution	No Wilderness
Acres	786,391	550,985	407,919	292,857	0
AUMs	87,376	61,220	45,324	32,553	87,376

There are approximately 64 million acres of private, state and Federal and Indian lands producing approximately 7.1 million AUMs in New Mexico. Of this, about 13 million acres of public land produce about 1.5 million AUMs. Table 4-12 shows the WSA percentage of public grazing land and the percentage of all grazing land in New Mexico by alternative.

TABLE 4-12
PERCENTAGE OF NEW MEXICO GRAZING LAND WITH THE WSAs RECOMMENDED SUITABLE

	All Wilderness	Emphasis on Manageability	Proposed Action	Conflict Resolution	No Wilderness
% BLM	6.0	4.2	3.1	2.2	0
% NM Grazing Land	1.23	.86	.64	.46	0

IMPACTS OF THE PROPOSED ACTION

Use of approximately 153 miles of vehicle ways would be eliminated or curtailed. Of this amount it is estimated that approximately one third or 51 miles are specifically used by livestock operators and ranchers to drive vehicles to range developments, distribute salt or feed supplement or to check livestock distribution and condition. (See Table 3-9 for the miles of vehicle ways for each WSA in this alternative.)

Although specific sites have not yet been identified, the following range developments are proposed for allotments which include portions of WSAs recommended as suitable: 1.3 miles of fence, 1 dirt tank, 7 miles of pipeline and 7 troughs. Wilderness designation would have no impact on these proposals if they were constructed outside the wilderness boundaries. These developments could be constructed within designated wilderness, however, they would be subject to the constraints of the BLM Wilderness Management Policy. These constraints relate to design, location and maintenance. They include construction with the use of native/natural materials and preclusion of motorized access for maintenance of new developments. Such constraints can be expected to increase construction and maintenance costs.

Because of the relatively low number of proposals and the fact that most of these projects could be constructed outside of the area designated as wilderness, no Statewide impacts on proposed range developments are anticipated.

Use of the acreage in those areas recommended nonsuitable for wilderness designation (378,472 acres) would no longer be managed to protect wilderness values. Restrictions on access would be discontinued which would probably result in vandalism to and theft of range developments, harassment and theft of livestock, gates left open, littering, indiscriminate dumping and acceleration of erosion by vehicular use both off and on vehicle routes. Range development proposals could be implemented on the allotments, without wilderness restrictions.

ALL WILDERNESS ALTERNATIVE - IMPACTS TO WILDERNESS VALUES

INTRODUCTION

If the All Wilderness Alternative were implemented, 37 WSAs totalling 786,391 acres of public land would be recommended as suitable for wilderness designation. The wilderness values which would be preserved by this action are described below.

NATURALNESS

The natural landscape of each WSA would be maintained. Except for the Great Plains Province; these natural landscapes are representative of the diverse landforms which occur in New Mexico.

Improvement in the naturalness of the areas would occur as a result of eliminating or curtailing vehicle use on 390 miles of vehicle ways. Rehabilitation of these vehicle ways would occur slowly through weathering and natural revegetation.

OUTSTANDING OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE RECREATION

Each of the WSAs currently provides outstanding opportunities for solitude. These opportunities result from the roadless character, varied landscape and vegetative cover of each WSA. Since the entire area within each WSA is recommended suitable under this alternative, solitude opportunities are maximized. These outstanding solitude opportunities would be further improved through closing the areas to ORV use. A total of 390 miles of existing unimproved vehicle ways would be closed by this action.

A total of 615,111 acres in 27 WSAs provide outstanding opportunities for primitive and unconfined recreation. In addition to the opportunities previously identified under the Proposed Action, the following opportunities would be maintained under the All Wilderness Alternative:

- Backpacking in the Brokeoff Mountain, Florida Mountains and Eagle Peak WSAs.

- Big game hunting in the San Antonio, Cowboy Spring, Florida Mountains and Alamo Hueco WSAs.

- Nature photography in Cooke's Range, La Lena, Alamo Hueco and Florida Mountains WSAs.

- Hiking in the Sabinoso, Presilla, Blue Creek and Cowboy Spring WSAs.

- Wildlife observation in the Alamo Hueco, Cooke's Range, Florida Mountains, Cowboy Spring and San Antonio WSAs.

A complete listing of the outstanding recreation opportunities available in each WSA is shown in Table 4-1. The District WARs contain additional information on these opportunities.

SPECIAL FEATURES

Special features contribute to an area's value for wilderness designation. They include ecological, geologic and other features of scientific, educational, scenic or historical value. In addition to those features previously identified under the Proposed Action, the following special features would be afforded the protection of wilderness designation under the All Wilderness Alternative:

- Tinajas ACEC, a pictograph site in the Presilla WSA.

- Massacre Peak Petroglyph, Butterfield Trail and historic town of Cooke's in the Cooke's Range WSA.

- Golden eagle, great horned owl, prairie falcon and red-tailed hawk nesting sites in the Cooke's Range, Florida Mountain and Brokeoff Mountains WSAs.

- Mountain lions in the Alamo Hueco and Cowboy Spring WSAs.

- Wild and free roaming horses in the Stallion WSA.

Wilderness designation would provide all of the special features identified in Table 4-1 and in the appended WARs with a permanent form of protection not provided by other forms of land management. This protection would preserve, and in some cases enhance, these special features.

NATIONAL WILDERNESS PRESERVATION SYSTEM

The maximum increase in the diversity of the NWPS would occur under this alternative. As in the Proposed Action, new ecosystem representations would be added to the NWPS and additional solitude and recreation opportunities within a 5 hour drive of the SMSAs would be maintained.

The ecosystems and acres to be included in the NWPS are shown on Table 4-2. In addition to the ecosystems included under the Proposed Action, the All Wilderness Alternative would increase the acreage represented in each ecosystem and add 10,751 acres of the Oak Juniper Woodland Scrub Ecosystem in the Mexican Highlands Shrub Steppe Province. This ecosystem is in the Alamo Hueco WSA and is unique in that it is not nationally represented in any other area currently designated as wilderness or under wilderness review by BLM or any other agency.

The number of new wilderness areas within a 5 hour drive of each SMSA and the total acreage added to the system is shown on Table 4-3. As in the Proposed Action, the primary benefit would be in the expanded spring, fall and winter recreational use seasons provided by these desert regions.

ALL WILDERNESS ALTERNATIVE - IMPACT TO MINERAL EXPLORATION AND DEVELOPMENT

IMPACTS TO MINING CLAIMS AND MINERAL LEASES

Under the All Wilderness Alternative, 872 mining claims will be subjected to wilderness management. The majority of these claims lie within the Florida Mountains, La Lena, West Potrillo/Mount Riley, Organ Mountains, Cooke's Range

and Sierra Ladrones WSAs (see Table 4-4). Although the kinds of impacts to operations on mining claims would be similar to those described under the Proposed Action, the overall magnitude of the impacts associated with the All Wilderness Alternative would be increased because almost three times more mining claims would be affected.

Several oil and gas leases and two geothermal leases would be impacted by implementation of the All Wilderness Alternative. Since it is anticipated that virtually all active mineral leases will stipulate no surface occupancy, as of the date of wilderness designation, only leases lying within close proximity to wilderness boundaries could economically be developed.

Table 4-5 summarizes the acreages of high and moderate mineral resource potential, by commodity, identified for withdrawal under the All Wilderness Alternative. The individual acreages of high and moderate mineral resource potential associated with each WSA is summarized in Appendix A.

IMPACTS TO ENERGY RESOURCES

The All Wilderness Alternative would withdraw approximately one half of one percent of New Mexico's areas of potentially surface mineable coal resources (see Table 4-6). The potentially surface mineable coal resources which would be impacted are exclusively associated with the La Lena WSA. Approximately 1 percent of New Mexico's areas most favorable for geothermal development are proposed for withdrawal under this alternative (see Table 4-7). Also, 1.4 percent of New Mexico's areas of high oil and gas potential and one tenth of a percent of areas within known oil and gas producing provinces would be withdrawn (see Table 4-8). Since the highest potential oil, gas and coal lands in New Mexico are only minimally restricted at present, and since geothermal resource development is not anticipated to rapidly increase in the near future, the All Wilderness Alternative would have minimal impacts on coal, geothermal, oil and gas resource development.

Although twice as many acres encompassing areas of multiple uranium occurrences are withdrawn, compared to the Proposed Action, the impact to uranium development under this Alternative would essentially be the same as under the Proposed Action (see Table 4-9). This similar level of significance is identified because the primary impact to uranium development focuses on the elimination of opportunities to explore for and possibly develop economic extensions or sources of the known uranium mineralization bordering the Sierra Ladrones WSA.

IMPACTS TO METALLIC RESOURCES

Impacts to the availability of metallic resources associated with the All Wilderness Alternative are shown on Table 4-10. Under the All Wilderness Alternative, approximately 10 percent of New Mexico's manganese resource areas would be withdrawn. Approximately 3 to 5 percent of New Mexico's copper, gold, lead, silver, vanadium and zinc resource areas would be withdrawn. Impacts to potential bismuth, cobalt, nickel, tellurium and tin resources are identical to those outlined under the Proposed Action. Assuming that all copper resource lands in New Mexico have an equal probability of going into production, it is estimated that the present value of copper resources which would be withdrawn under this alternative is about 56 million dollars.

IMPACTS TO NONMETALLIC RESOURCES

The All Wilderness Alternative would withdraw approximately 7 percent of the barite resource areas and 4.5 percent of the fluorite resource areas in New Mexico (see Table 4-10).

Extensive areas with potentially economic barite and fluorite deposits are presently under Federal withdrawal in New Mexico. Although no significant national impact is foreseen, local impacts are anticipated, as opportunities to develop small mines would be foregone.

ALL WILDERNESS ALTERNATIVE - IMPACTS TO LIVESTOCK GRAZING

Use of approximately 390 miles of vehicle ways would be eliminated or curtailed. Of this amount, it is estimated that approximately one third or 130 miles are specifically used by livestock operators and ranchers to drive to range developments, to distribute salt or feed supplement or to check livestock distribution and condition. (See Table 3-9 for the miles of vehicle ways for each WSA by alternative.) Although specific sites have not yet been identified, the following range developments are proposed for allotments which include portions of WSAs recommended as suitable: 2.3 miles of fence, 8 dirt tanks, 7.7 miles of pipeline and 7 troughs. Wilderness designation would have no impact on these proposals if they were constructed outside the wilderness boundaries. These developments could be constructed within designated wilderness, however, they would be subject to the constraints of the BLM Wilderness Management Policy. These constraints relate to design, location and maintenance. They include construction with the use of native/natural materials and preclusion of motorized access for maintenance of new developments. Such constraints can be expected to increase construction and maintenance costs.

Because of the relatively low number of proposals and the fact that most of these projects could be constructed outside of the area designated as wilderness, no Statewide impacts on proposed range developments are anticipated.

Potential adverse impacts associated with unrestricted access and vehicle use would be avoided on 786,391 acres. Without wilderness designation, increases in vehicle related public use is anticipated. This is expected to result in potential for increased vandalism, harassment and theft of livestock, littering, indiscriminate dumping and increased erosion.

EMPHASIS ON MANAGEABILITY ALTERNATIVE - IMPACTS TO WILDERNESS VALUES

INTRODUCTION

The primary difference between this alternative and the All Wilderness Alternative is the consideration given to long-term wilderness management. Only those areas which could reasonably be maintained as wilderness over the long-term are recommended as suitable for wilderness designation. The wilderness values in 27 areas covering 550,985 acres of public land would be maintained. A total of 235,406 acres of public land would be recommended as nonsuitable for wilderness designation. This nonsuitable acreage consists of 10 WSAs and portions of 15 other WSAs.

NATURALNESS

The natural landscape of the 27 WSAs recommended suitable for wilderness designation would be maintained. Represented landscapes include lava flows, forested mountains, rivers and the more typical desert mountains and lowlands of the southwest.

Improvement in the naturalness of these WSAs would occur as a result of eliminating or curtailing vehicle use on 230 miles of vehicle ways. Rehabilitation of these vehicle ways would occur slowly through weathering and natural revegetation.

Resource use and development of 192,403 acres recommended nonsuitable for wilderness designation would result in modifications to the existing natural landscape of the areas. Mineral exploration and development, including road construction in areas with a moderate and high potential for the occurrence of such commodities, would result in the removal of vegetation, soil and rocks. ORV use on and near these new mining roads, as well as the continued use of 160 miles of vehicle ways would further reduce the apparent naturalness in the areas.

There are no impacts expected on 43,003 acres recommended nonsuitable for wilderness designation due to low resource development potential or existing management restrictions. This acreage includes all of the Sabinoso, Blue Creek and Las Uvas Mountains WSAs, as well as the 1,280 acre Tinajas ACEC within the Presilla WSA.

OUTSTANDING OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE RECREATION

Solitude opportunities would be maintained within the 27 WSAs, totalling 550,985 acres, recommended suitable and within the 3 areas discussed in the preceding paragraph, totalling 41,723 acres with low resource development potential. The outstanding solitude opportunities in the WSAs recommended suitable for wilderness designation would be improved through closure of the areas to ORV use, including the closing of 230 miles of existing unimproved vehicle ways.

A total of 410,494 acres in the 18 WSAs recommended suitable for wilderness designation provide outstanding opportunities for primitive and unconfined recreation. In addition to the opportunities identified under the Proposed Action, the following opportunities would be maintained under the Emphasis On Manageability Alternative:

- Backpacking in the Brokeoff Mountains and Florida Mountains WSAs.

- Big game hunting in the San Antonio, Cowboy Spring and Florida Mountains WSAs.

- Wildlife observation and photography in the Florida Mountains, Cowboy Spring and San Antonio WSAs.

Solitude and primitive recreation opportunities would be diminished on 193,683 acres recommended nonsuitable for wilderness designation, a result of road building in support of mineral exploration and development, as well as through ORV use. Examples of the primitive recreation opportunities which would be impaired include:

- Hunting in the Cooke's Range and Empedrado WSAs.

- Hiking in the La Lena, Eagle Peak and Presilla WSAs.

- Wildlife viewing in the Cooke's Range WSA.

- Natural landscape photography in the Eagle Peak WSA.

SPECIAL FEATURES

Special features are wilderness characteristics which contribute to a WSAs value for wilderness designation. These features include ecological, geologic and other features of scientific, educational, scenic or historical value. In addition to features identified under the Proposed Action, the following special features would be afforded the protection of wilderness designation under the Emphasis On Manageability Alternative:

- Golden eagle, great horned owl, prairie falcon and red-tailed hawk nesting sites in the Florida Mountains and Brokeoff Mountains WSAs.

- Mountain lions in the Cowboy Spring WSA.

- Wild and free roaming horses in the Stallion WSA.

Wilderness designation would provide these special features with a permanent form of protection not provided by other forms of management. This protection would preserve, and in some cases enhance these special features. Special features in the area's recommended nonsuitable for wilderness designation could be impacted by resource use and development. These special features include raptor nesting sites in the Cooke's Range and La Lena WSAs.

NATIONAL WILDERNESS PRESERVATION SYSTEM

The NWPS would be expanded and diversified through implementation of this alternative. As in the Proposed Action, new ecosystem representations would be added to the NWPS and additional solitude and recreation opportunities would be provided within a 5 hour drive of the SMSAs.

The ecosystem and acres to be included in the NWPS under this alternative are shown on Table 4-2. The main benefit over the Proposed Action would be the increased acreage of each ecosystem to be represented in the NWPS. The

10,751 acre Oak Juniper Woodland Scrub Ecosystem in the Mexican Highlands Shrub Steppe Province would not be added to the NWPS. This ecosystem is in the Alamo Hueco WSA and is unique in that it is not nationally represented in any other area currently designated as wilderness or under wilderness review by BLM or any other agency.

The number of new wilderness areas and the total acreage added to the system within 5 hours drive of each SMSA is shown on Table 4-3. Opportunities would be expanded by 20 percent over the Proposed Action. As in the Proposed Action, the primary benefit would be in the expanded spring, fall and winter recreational use seasons provided by these desert regions.

EMPHASIS ON MANAGEABILITY ALTERNATIVE - IMPACTS TO MINERAL EXPLORATION AND DEVELOPMENT

IMPACTS TO MINING CLAIMS AND MINERAL LEASES

Under the Emphasis on Manageability Alternative, 531 mining claims would be subjected to wilderness management. The majority of these claims lie within the Florida Mountains, West Potrillo Mountains/Mount Riley, Organ Mountains and Sierra Ladrones WSAs (see Table 4-4). Although 257 more mining claims would be affected, the types of restrictions and related impacts would be similar to those identified for the Proposed Action. This also applies to mineral leases.

Table 4-5 summarizes the acreages of high and moderate mineral resource potential, by commodity, identified for withdrawal under the Emphasis on Manageability Alternative. The individual acreages of high and moderate mineral resource potential associated with each WSA is summarized in Appendix A.

IMPACTS TO ENERGY RESOURCES

The Emphasis on Manageability Alternative would withdraw only three tenths of a percent of the lands within New Mexico that have coal resources less than 3000' deep (see Table 4-6). Impacts to geothermal resources under this alternative would be similar to impacts under the All Wilderness Alternative, since both alternatives affect the same areas identified as most favorable for geothermal resource development (see Table 4-4 through 4-7). Impacts to oil, gas and uranium resources would be similar as those outlined under the Proposed Action (see Tables 4-8 through 4-9). Thus, overall, no significant Statewide impact is identified.

IMPACTS TO METALLIC RESOURCES

Impacts to the availability of New Mexico's metallic resources associated with the Emphasis on Manageability Alternative are outlined on Table 4-10. Under this alternative, approximately 6 percent of New Mexico's manganese resource areas and approximately 2 to 3 percent of New Mexico's copper, lead and zinc resource areas would be withdrawn. Also, approximately 1.5 percent of New Mexico's bismuth, gold, silver and tellurium resource areas would be withdrawn. Impacts to potential cobalt, nickel and tin resources are identical to those outlined under the Proposed Action. Assuming that all copper resource lands have an equal probability of going into production, it

is estimated that the present value of copper resource to be withdrawn under this alternative is 33 million dollars. Thus, the only Statewide impact to metallic resources would be on exploration and possible development of tin, cobalt and nickel.

IMPACTS TO NONMETALLIC RESOURCES

The Emphasis on Manageability Alternative would withdraw approximately 5 percent of the barite resource areas and 3 percent of the fluorite resource areas in New Mexico (see Table 4-10). Although no significant national impact is foreseen, local impacts would be anticipated, since opportunities to develop small mines would be foregone.

EMPHASIS ON MANAGEABILITY ALTERNATIVE - IMPACTS TO LIVESTOCK GRAZING

Use of approximately 230 miles of vehicle ways would be eliminated or curtailed. Of this amount, it is estimated that approximately one third, or 76 miles, are specifically used by livestock operators and ranchers to drive to range developments, to distribute salt or feed supplement or to check livestock distribution and condition. (See Table 3-9 for the miles of vehicle ways for each WSA under this alternative.)

Although specific sites have not yet been identified, the following range developments are proposed for allotments which include portions of WSAs recommended as suitable: 1.3 miles of fence, 6 dirt tanks, 7.7 miles of pipeline and 7 troughs. Wilderness designation would have no impact on these proposals if they were constructed outside the wilderness boundaries. These developments could be constructed within designated wilderness, however, they would be subject to the constraints of the BLM Wilderness Management Policy. These constraints relate to design, location and maintenance. They include construction with the use of native/natural materials and preclusion of motorized access for maintenance of new developments. Such constraints can be expected to increase construction and maintenance costs.

Because of the relatively low number of proposals and the fact that most of these projects could be constructed outside of the area designated as wilderness, no Statewide impacts on proposed range developments are anticipated.

Use of the acreage in those WSAs recommended nonsuitable for wilderness (472,594 acres) would no longer be managed to protect wilderness values. Restrictions on access would be discontinued, which would probably result in vandalism to and theft of range developments, harassment and theft of livestock, gates left open, littering, indiscriminate dumping and acceleration of erosion by vehicular use both on and off vehicle ways. Range development proposals could be implemented on these allotments within WSA boundaries without the wilderness restrictions.

CONFLICT RESOLUTION ALTERNATIVE - IMPACTS TO WILDERNESS VALUES

INTRODUCTION

If this alternative were implemented 13 WSAs totalling 292,857 acres of public land would be recommended as suitable for wilderness designation and a total of 493,534 acres of public land would be recommended as nonsuitable for wilderness designation. This nonsuitable acreage consists of 24 WSAs and portions of 12 other WSAs.

NATURALNESS

The natural landscape of the areas recommended suitable would be maintained. The represented landscapes include lava flows, river canyons and the more typical desert mountains and lowlands of the southwest.

Improvement in the naturalness of the areas would also occur as a result of eliminating or curtailing vehicle use on 102 miles of vehicle ways. Rehabilitation of these vehicle ways would occur slowly through weathering and natural revegetation.

Resource use and development of 428,921 acres recommended nonsuitable for wilderness designation would result in modifications to the existing natural landscape of the WSAs. Mineral exploration and development, including road construction, in areas with a moderate and high potential for the occurrence of such commodities, would result in the removal of vegetation, soil and rocks. ORV use on and near these new mining roads, as well as the continued use of 288 miles of vehicle ways would further reduce the apparent naturalness in the areas.

No impacts are expected on 64,613 acres recommended nonsuitable for wilderness designation due to low resource development potential or existing management restrictions. This includes the entire acreage within the Sabinoso, Blue Creek, Cedar Mountains, Cowboy Spring and Las Uvas Mountains WSAs, as well as the 1,280 acre Tinajas ACEC within the Presilla WSA.

OUTSTANDING OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE RECREATION

Solitude opportunities would be maintained within the 13 WSAs, totalling 278,813 acres recommended suitable and the 5 areas listed in the preceding paragraph which total 63,333 acres. The outstanding solitude opportunities in the areas recommended suitable for wilderness designation would be improved through closure of the areas to ORV use, including the closure of 102 miles of existing unimproved vehicle ways.

Primitive recreation opportunities would be provided in 12 of the 13 areas recommended suitable for wilderness designation, representing a 20 percent reduction in opportunities provided in comparison to the Proposed Action. Examples of the opportunities which would be maintained include:

- Floatboating and fishing in the Rio Chama and Gila Lower Box WSAs.

- Rockclimbing on Cabezon Peak in the Cabezon WSA.

- Backpacking in the Big Hatchet Mountains or in the expanse of Chihuahuan desert in the West Potrillo/Mount Riley WSAs.

- Hiking and photography on the stark lava flows of the Aden Lava Flow and the Carrizozo Lava Flow/Little Black Peak WSAs.

- Hunting in the Ignacio Chavez, Sierra de Las Canas and Horse Mountain WSAs.

- Birdwatching for such species as the Gila woodpecker, bald eagle, zone-tailed hawk and black hawk in the Gila Lower Box WSA.

Solitude and primitive recreation opportunities would be diminished on 430,201 acres recommended nonsuitable for wilderness designation, a result of road building in support of mineral exploration and development, as well as through ORV use. In addition to opportunities identified under the Proposed Action, the quality of the following opportunities would be impaired under the Conflict Resolution Alternative:

- Rockclimbing in the Organ Mountains WSA.

- Backpacking in the high mountains of the Sierra Ladrones and Continental Divide WSAs.

- Hiking on the Proposed Continental Divide National Scenic Trail in the Continental Divide WSA or on the Baylor Pass National Recreation Trail in the Organ Mountains WSA.

- Hiking and photography on the stark lava flows of the Jornada del Muerto WSA.

- Hunting in the Sierra Ladrones WSA.

SPECIAL FEATURES

Special features are optional wilderness characteristics which contribute to an area's value for wilderness designation. They include ecological, geologic and other features of scientific, educational, scenic or historical value. Some of the features included in the suitable areas are:

- Golden eagle, great horned owl, prairie falcon and red-tailed hawk nesting sites in the Cabezon, Ignacio Chavez and Gila Lower Box WSAs.

- Chama River in the Rio Chama WSA and the Gila River in the Gila Lower Box WSA.

- Bighorn sheep in the Big Hatchet Mountains WSA.

- Studies on melanistic species in the lava flows of the Aden Lava Flow and the Carrizozo Lava Flow/Little Black Peak WSAs.

- Mountain lions in the Big Hatchet Mountains WSA.

- The relatively undisturbed and expansive stretch of Chihuahuan desert in the West Potrillo/Mount Riley WSAs.

Wilderness designation would provide these special features with a permanent form of protection not provided by other forms of management. Which would preserve, and in some cases enhance, these special features.

Special features in the WSAs recommended nonsuitable for wilderness designation could be impacted by resource use and development. In addition to the special features identified under the Proposed Action, the following special features could also be impaired under the Conflict Resolution Alternative:

- Golden eagle, great horned owl, prairie falcon and red-tailed hawk nesting sites in the Sierra Ladrones WSA.

- The potential reintroduction of bighorn sheep in the Sierra Ladrones WSA.

- Studies on melanistic species in the Jornada del Muerto WSA.

- Mountain lions in the Continental Divide and Sierra Ladrones WSAs.

- The 163 acre enclave of western ponderosa forest within the Organ Mountains WSA.

NATIONAL WILDERNESS PRESERVATION SYSTEM

The NWPS would be expanded and diversified through implementation of this alternative. Ecosystems not currently represented would be added to the system and approximately 35 percent of the existing solitude and recreation opportunities within a day's driving time (5 hours) of the SMSAs would be maintained.

The ecosystems and acres which would be included in the NWPS under this alternative are shown on Table 4-2. As in the Proposed Action, an Oak Juniper Woodland Scrub Ecosystem within the Alamo Hueco WSA would not be represented in the NWPS. In addition, the Mountain Mahogany Oak Scrub Ecosystem in the Chihuahuan Desert Province would not be represented in the NWPS.

The number of new wilderness areas and total acreage added to the system within 5 hours drive of each SMSA is shown on Table 4-3. As in the Proposed Action, the primary benefit would be in the expanded spring, fall and winter use seasons provided by these desert regions. Opportunities would however, be reduced by approximately 20 percent in comparison to the Proposed Action.

CONFLICT RESOLUTION ALTERNATIVE - IMPACT TO MINERAL EXPLORATION AND DEVELOPMENT

IMPACTS TO MINING CLAIMS AND MINERAL LEASES

Under the Conflict Resolution Alternative, 113 existing mining claims would be subjected to wilderness management. The types of impacts associated with restrictions to activities on mining claims are similar to those

identified under the All Wilderness Alternative, but the overall magnitude of impacts is proportionately less. Although a few oil and gas leases would be encumbered by this alternative, no other types of mineral leases would be affected.

Table 4-5 summarizes the acreage of high and moderate mineral resource potential, by commodity, identified for withdrawal under the Conflict Resolution Alternative. The individual acreages of high and moderate mineral resource potential associated with each WSA is summarized in Appendix A.

IMPACTS TO ENERGY RESOURCES

Implementation of the Conflict Resolution Alternative would withdraw relatively insignificant areas of coal, oil and gas (see Tables 4-6 through 4-8). Also, since the Sierra Ladrones WSA is recommended nonsuitable under this alternative, insignificant areas of uranium resource potential would be withdrawn (see Table 4-9). Under this alternative, no impacts to energy resources are anticipated.

IMPACTS TO METALLIC RESOURCES

Only nine tenths of one percent of lead resource areas and three tenths of one percent of copper and zinc resource areas of New Mexico would be withdrawn under this alternative. Assuming that all copper resource lands in New Mexico have an equal probability of going into production, it is estimated that the present value of copper resources to be withdrawn under the Conflict Resolution Alternative is 5 million dollars. No significant national or Statewide impact to metallic resources are anticipated under this alternative.

IMPACTS TO NONMETALLIC RESOURCES

The only potential impact to nonmetallic resource development under this alternative is associated with barite resources. Approximately 1.5 percent of New Mexico's barite resources would be withdrawn and little or no impacts are anticipated. No significant Statewide or national impacts to nonmetallic mineral resource development are anticipated under the Conflict Resolution Alternative.

CONFLICT RESOLUTION ALTERNATIVE - IMPACTS TO LIVESTOCK GRAZING

Use of approximately 102 miles of vehicle ways would be eliminated or curtailed. Of this amount, it is estimated that approximately one third, or 34 miles, are specifically used by livestock operators or ranchers to drive to range developments, to distribute salt or feed supplement or to check livestock distribution and condition. (See Table 3-9 for the miles of vehicle ways for each WSA in this alternative.)

Although specific sites have not yet been identified, the following range developments are proposed for allotments which include portions of WSAs recommended as suitable: 1.3 miles of fence, 1 dirt tank, 7 miles of pipeline and 7 troughs. Wilderness designation would have no impact on these proposals if they were constructed outside the wilderness boundaries. These developments could be constructed within designated wilderness, however, they would be subject to the constraints of the BLM Wilderness Management Policy.

These constraints relate to design, location and maintenance. They include construction with the use of native/natural materials and preclusion of motorized access for maintenance of new developments. Such constraints can be expected to increase construction and maintenance costs.

Because of the relatively low number of proposals and the fact that most of these projects could be constructed outside of the area designated as wilderness, no Statewide impacts on proposed range developments are anticipated.

Use of the acreage in those WSAs recommended nonsuitable for wilderness designation (493,534 acres) would no longer be managed to protect wilderness values. Restrictions on access would be discontinued, which would probably result in vandalism to and theft of range developments, harassment and theft of livestock, gates left open, littering, indiscriminate dumping and acceleration of erosion by vehicular use both off and on vehicle routes. Range development proposals could be implemented on these allotments without the wilderness restrictions.

NO WILDERNESS ALTERNATIVE - IMPACTS TO WILDERNESS VALUES

INTRODUCTION

Under this alternative all 37 WSAs, totalling 786,391 acres of public land, would be recommended as nonsuitable for wilderness designation. The wilderness values which would be lost due to resource use and development, as well as those which would be unaffected due to a low potential for resource use and development are described below.

NATURALNESS

Naturalness will be diminished on 657,573 acres of public land in 27 WSAs due to resource use and development. The modifications to the natural environment would result from mineral exploration and development, including road construction in areas with a moderate and high potential for the occurrence of such commodities; construction of fences, water holding facilities, and roads in support of livestock operations; and the continued use of 390 miles of existing vehicle ways and the establishment of new vehicle ways over the long-term.

There are no impacts expected on 128,818 acres recommended nonsuitable for wilderness designation due to low resource development potential or existing management restrictions. The areas with low resource development potential include: Sabinoso, Aden Lava Flow, Blue Creek, Cedar Mountains, Cowboy Spring, Las Uvas Mountains and the Carrizozo Lava Flow/Little Black Peak WSAs, and the river canyons in the Rio Chama and Gila Lower Box WSAs. Restrictions on surface disturbance would apply to the following areas: the 1,280 acre Tinajas ACEC in the Presilla WSA; the 4,008 acre Research Natural Area in the Aden Lava Flow WSA; and the 5,032 acres segregated from the 1872 Mining Laws in the Horse Mountain WSA.

OUTSTANDING OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE RECREATION

Solitude and recreation opportunities will be impaired on 657,573 acres of public land in 27 WSAs due to resource use and development. This would result from road building in support of mineral exploration and development, as well as through ORV use. In addition to the opportunities identified under the Proposed Action, the quality of the following outstanding opportunities would be impaired under the No Wilderness Alternative.

- Rockclimbing in the Cabezon and Organ Mountains WSAs.

- Backpacking in the pristine high mountains of the Sierra Ladrones and Continental Divide WSAs or in the expanse of Chihuahuan Desert in the West Potrillo/Mount Riley WSAs.

- Hiking on a primitive portion of the Continental Divide National Scenic Trail in the Continental Divide WSA or on the Baylor Pass National Recreation Trail in the Organ Mountains WSA.

- Hiking and photography on the stark lava flow in the Jornada del Muerto WSA.

- Hunting in the Ignacio Chavez, Sierra de Las Canas, Horse Mountain and Sierra Ladrones WSAs.

A complete listing of the outstanding recreation opportunities available in each WSA is shown in Table 4-1. The District WARs contain additional information on these foregone opportunities.

SPECIAL FEATURES

Special features are wilderness characteristics which contribute to an area's value for wilderness designation, including ecological, geologic and other features of scientific, educational, scenic or historical value. Some of the special features occurring in the WSAs could be impaired over the long-term as a result of mineral exploration and development, construction of rangeland facilities, and ORV use. In addition to the special features identified under the Proposed Action, the following special features could also be impaired under the No Wilderness Alternative:

- Golden eagle, great horned owl, prairie falcon and red-tailed hawk nesting sites in the Cabezon, Ignacio Chavez and Sierra Ladrones WSAs.

- Bighorn sheep in the Big Hatchet Mountains WSA and the potential reintroduction of bighorn sheep in the Sierra Ladrones WSA.

- Mountain lions in the Continental Divide, Sierra Ladrones and Big Hatchet Mountains WSAs.

- The relatively undisturbed and expansive stretch of Chihuahuan Desert in the West Potrillo/Mount Riley WSAs.

Without restrictions on vehicle use, vandalism to cultural sites is expected to increase; however, cultural resource special features would continue to be protected and managed under the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the Federal Land Policy and Management Act of 1976, the American Indian Religious Freedom Act of 1978, as amended, and the Archaeological Resource Protection Act of 1979. Protection and management of the wild horses in the Stallion WSA would continue to be guided by the Wild Horse and Burro Act of 1971, as amended.

NATIONAL WILDERNESS PRESERVATION SYSTEM

Expansion and diversification of the NWPS would not occur under this alternative. Ecosystems not currently represented in the NWPS would not be added to the system and existing solitude and primitive recreation opportunities provided by the WSAs within 5 hours drive of the SMSAs would not be maintained.

The potential for adding most of the ecosystems represented in the WSAs to the NWPS is present only in the New Mexico WSAs. This is particularly true for the ecosystems in the Chihuahuan Desert Province, Colorado Plateau

Province and Mexican Highlands Shrub Steppe Province. Existing and potential ecosystem representation in the NWPS is shown on Table 3-2. The ecosystems represented in each WSA are shown on Table 3-1.

New wilderness areas within 5 hours drive of the SMSAs would not be added to the NWPS. Increased demand for wilderness-related solitude and primitive recreation opportunities would have to be provided by the existing designated wilderness areas in the region. Over the long-term, any increases in demand would have to be regulated to prevent overuse of the existing designated wilderness areas or degradation of this existing resource would occur.

NO WILDERNESS ALTERNATIVE - IMPACTS TO MINERAL EXPLORATION AND DEVELOPMENT

Implementation of the No Wilderness Alternative will have no impact on the existing availability of New Mexico's known or potential energy and mineral resources.

Wilderness restrictions would not affect exploration and possible development of energy and mineral resources on 786,391 acres. This includes 10,200 acres which have a high potential for coal, 7,000 acres which have a high potential for oil and gas, 1,800 acres which have a high potential for uranium, 8,100 acres which have a moderate potential for cobalt and nickel, 24,000 acres which have a moderate potential for tin, 25,900 acres which have a moderate potential for barite and 25,700 acres which have a moderate potential for fluorspar. A complete list of the mineral potential acres by commodity and WSA is included in Appendix A and the appended WARs.

NO WILDERNESS ALTERNATIVE - IMPACTS TO LIVESTOCK GRAZING

The use of 390 miles of vehicle ways by the public would continue. The range improvements proposed for development within the allotments overlapping the WSAs boundaries could be constructed within the WSA boundaries without wilderness constraints. This includes 2.3 miles of fence, 8 tanks, 7.7 miles of pipeline and 7 troughs. (See Table 3-9.)

Pressures for use of these 786,391 acres of public land is expected to increase. Public interest in minerals (both energy and nonenergy), ORV driving, backpacking, hunting, camping and other outdoor activities would increase, generally focusing on these areas because of those unique qualities which resulted in their consideration as potential wilderness areas. These increases in activity and continued unlimited access would impact the livestock grazing in these areas. Vandalism to and theft of range developments, harassment to and theft of livestock, gates left open allowing livestock to wander, littering and indiscriminate dumping would all be expected to increase. A secondary impact would be acceleration of erosion caused by the expected increase in traffic, causing increased sedimentation in stock tanks, increased soil loss and loss of vegetation.

CHAPTER 5
Consultation & Coordination

CHAPTER 5

CONSULTATION AND COORDINATION

INTRODUCTION

This chapter summarizes the BLM's efforts to obtain input from internal consultation, other government agencies, private industry, special interest groups, and individual members of the public during development of this draft EIS, a process known as scoping. The purpose of scoping was to obtain information to identify the issues, criteria and alternatives to be included in the analysis. The identification of issues began in 1980 when BLM formulated the New Mexico Wilderness Study Area Decisions. Since that time there has been considerable public involvement, particularly during preparation and review of the draft and final District Wilderness Environmental Assessments (EAs) and Wilderness Analysis Reports (WARs).

The issues included in this Draft EIS and the WARs have been identified through the extensive and open review process utilized throughout this wilderness study.

SCOPING ACTIONS

Scoping actions for site-specific concerns are identified in the consultation and coordination portions of the WARs. Public scoping actions for this draft EIS were conducted from July through December, 1984. Major actions included distribution of informational brochures, open house meetings, small group meetings and discussions with representatives of various interest groups and agencies. Other actions to inform the public of review and comment opportunities included issuance of news releases, public service announcements, and radio and TV interviews.

Brochures describing the proposed issues and alternatives for the statewide wilderness EIS were mailed to 3,500 members of the public. The brochures also included invitations to submit written or verbal comments and to attend seven open house meetings. These meetings were held between September 11 and 20, 1984 in Taos, Santa Fe, Albuquerque, Socorro, Las Cruces, and Roswell, New Mexico and El Paso, Texas.

A total of 137 people attended the seven public scoping meetings. The majority of comment at these meetings was general and did not relate specifically to the alternatives and issues to be analyzed. Common general comments were: questions on wilderness analysis and designation procedures; recommendation that all WSAs be designated; recommendations that no WSAs be designated; site-specific interests in designation or nondesignation; and disagreement with the acreage listed in BLM's proposed alternatives.

BLM received 44 written comments in response to requests for input.

SCOPING RESULTS

An analysis of scoping results, including each substantive public comment, is shown in the following table. In summary, overall public response to scoping was positive. Most alternatives and issues suggested by the public were already planned for inclusion in the study. A few were rejected, as shown in the Table 5-1.

TABLE 5-1
SCOPING SUMMARY

Alternatives Raised and Set Aside	Reasons for Not Including this Alternative
Rank WSAs by wilderness values	Consideration was given to ranking the WSAs by the quality of the wilderness values. From such a ranking, various percentage of WSAs could be selected to provide a full spectrum of alternative ranging from 0 percent to 100 percent wilderness. This alternative was not analyzed in detail for the following reasons: a) The BLM wilderness study policy discourages ranking the WSAs. b) Using quality of wilderness values as the sole criteria does not represent a realistic approach, because the decision-maker must take other factors (such as resource conflicts) into consideration.
Expand the WSAs	This was not considered as an alternative because it would require consideration of lands not involved in the inventory and lands not protected by the BLM interim management policy. However, there were cases considered where expanding the boundary would be required for management purposes if the area were to be designated as wilderness. These situations are identified in the WARs and were considered only for a select few situations.
Add "conservation proposal" as another alternative	This alternative was never defined and clarified for BLM, therefore, a decision as to inclusion or deletion could not be made.

Alternatives Selected for Detailed Analysis	Reasons
- All Wilderness - Emphasis on Manageability - Proposed Action - Conflict Resolution - No Wilderness	These five alternatives were selected for detailed analysis for the following reasons: a) They provide a full spectrum of alternatives from - 0 to 100 percent wilderness b) They take into consideration all the factors needed for the decisionmaker. These are: quality of wilderness values, resource conflicts and manageability.

TABLE 5-1
SCOPING SUMMARY
(continued)

Issues Raised and Set Aside	Reasons for Not Conducting a Detailed Analysis
Do not include mineral resources as an issue	Wilderness study policy requires analysis of impacts on known and potential mineral values.
Consider use of areas by disabled citizens	BLM study policy requires analysis of primitive and unconfined recreation. Disabled and senior citizens can and do use wilderness areas. Those requiring special facilities are considered in overall BLM recreation management planning. Many Federal recreation areas have access and special facilities to accommodate those needs.
Impact of designation on spruce budworm control in WSAs	This issue does not apply to BLM NM WSAs, because no stands of spruce occur in any of these areas.
Hold some WSAs for future designation as future demand grows	FLPMA mandates wilderness recommendations be made to the President by 1991.
Impact on BLM budget	This issue is outside the scope of a wilderness study. Budget is not a consideration in recommendations on wilderness suitability.
Impact on low altitude-high speed airspace by military	Wilderness designation does not preclude use of airspace.
Assess Social Economic Impacts	An assessment of social impacts was done by BLM District and included in the District Final EAs. No additional concerns were identified; therefore, social impacts are not addressed on a Statewide basis. Economic impacts are addressed in the WARs and in the Draft EIS by resource wherever such impacts could be identified or quantified.
Legal access should not constrain BLM's recommendations	Legal access will not be used as a justification for recommendations.
Long term wilderness demand should be considered in relation to overcrowded U.S. Forest Service wilderness areas	This issue is not being considered in the Statewide EIS as a separate issue; however, as part of the analysis of wilderness values, it is being considered.

TABLE 5-1
SCOPING SUMMARY
(continued)

Issues Raised and Set Aside	Reasons
Impact on watershed	No impacts were identified on a Statewide basis; however, impacts to these resources are considered in the appropriate WSA-specific analyses.
Impact on airshed	No impacts were identified on a Statewide basis or a WSA-specific basis.
Economic benefits of recreation	The economic benefits of recreation is acknowledged; however, low visitor use and the lack of quantification precludes assigning dollar values.
Economic benefits of option values	Such benefits are acknowledged, but cannot be quantified.
Protection of research values and reservoirs of genetic information	Such benefits are acknowledged as part of wilderness values.
Overuse of existing wilderness	This is not addressed as a separate environmental impact issue; however, in the Statewide EIS it is addressed in the discussion of wilderness values.
Impact on wildlife habitat and threatened or endangered species	These impacts are addressed on a WSA-specific basis. No impacts were identified to T or E species on a WSA basis, therefore, this issue is not being analyzed on a Statewide basis. The U.S. Fish and Wildlife Service has concurred with BLM's finding of no affect on species Federally listed or proposed for listing as threatened or endangered.
Impact on soil erosion	These impacts are addressed on WSA-specific basis. Little or no impacts were identified. Therefore, no Statewide impacts are assessed.
Impacts to cultural resources	Cultural resources have been identified as a special feature in some WSAs; however, no major impacts to cultural resources were identified, amd this issue is not discussed on a Statewide basis.
Impact on forest products (fuelwood emphazed)	These impacts are addressed in the WARs. No major impacts were identified, therefore no Statewide impacts were assessed.
Impact on adjacent land	These impacts are addressed in the WSA-specific wilderness analysis reports.
Impact on water rights	Water rights were considered in the WARs. No major impacts were identified; therefore, this issue is not addressed on a Statewide basis.

TABLE 5-1
SCOPING SUMMARY
(concluded)

Issues Selected for Detailed Analysis	Reasons
Consider conflict management over the long-term - not just current known conflicts.	Both short term and long term conflicts are considered as well as potential conflicts in all analysis.
Impacts to energy and minerals exploration and development	This issue is often a major environmental impact issue in the WARs; therefore, Statewide impacts are of a concern and are identified for detailed analysis.
Impacts to wilderness values	This issue is the major issue relating to the decision to recommend these areas as suitable or nonsuitable for wilderness designation. These WSAs represent the last remaining roadless natural tracts of BLM administered land in New Mexico which meet the criterion for wilderness study.
Impacts to livestock grazing	No major impacts were identified in the WARs; however, because of the public interest in this issue it is being addressed on a Statewide basis.

REVIEW OF THE DRAFT EIS

Comments on the Draft EIS are being requested from Federal, State, local agencies and Indian Tribes and private groups listed in Table 5-2 (it should be noted that this is a representative sample only, and does not constitute the entire mailing list).

TABLE 5-2
DOCUMENT RECIPIENTS

Federal Government

Agencies

Department of Agriculture
- Soil Conservation Services
- Forest Service

Department of Commerce

Department of the Interior
- Bureau of Indian Affairs
- Bureau of Reclamation
- National Park Service
- U.S. Fish and Wildlife Service
  - Office of Ecological Services
- U.S. Geological Survey

Officials

- Senator Pete Domenici
- Senator Jeff Bingaman
- Representative Manuel Lujan, Jr.
- Representative Bill Richardson
- Representative Joe Skeen

Tribal Government

Navajo Nation Chairman
- Peterson Zah
- Torreon Chapter (Navajo)

Jicarilla Apache Tribe
Jemez Pueblo
Zia Pueblo

Local Government

County Commissioners from all Counties which contain WSAs

State Government

State of New Mexico Agencies

A-95 Clearinghouses
Bureau of Mines and Mineral Resources
Commerce and Industry Department

Commerce and Industry Department
- Ecomonic Development Division

Department of Finance and Administration
- Planning Division
  - Coordination/Clearinghouse Bureau
  - Historic Preservation Bureau

Highway Department

State Land Office

Natural Resources Department
- Administrative Services Division
  - Planning Bureau
  - Heritage Section
- Department of Game and Fish
- Soil and Water Conservation

Division Water Resources Division
- State Engineer

State Historic Preservation Officer

Officials

Governor Toney Anaya

Special Interest Groups

National Council of Public Lands Users
National Wildlife Federation
Natural Resources Defense Council
Navajo Medicine Men's Association
New Mexico Archaeological Society
New Mexico Citizens for Clean Air and Water
New Mexico Wilderness Study Committee
Sierra Club
Wildlife Management Institute
Wilderness Society
New Mexico Cattlegrowers
New Mexico Oil and Gas Association

TEAM ORGANIZATION

The Draft EIS was prepared by a team from the New Mexico State Office. The WARs were prepared by teams from the District Offices. Report writers, support personnel and other contributors to the EIS effort are indicated in Table 5-3.

TABLE 5-3
LIST OF PREPARERS STATEWIDE EIS

Name	Responsibility	Education	Experience
Joe Sovcik	EIS Team Leader Overall Coordination	BS Biology	BLM - 6 yrs. Environmental Coordinator EPA - 9 yrs Biologist, Water Resource Planner
Jon Joseph	Asst. Team Leader, Wilderness Evaluation and Coordination	BA Recreation Administration	BLM - 6 yrs. Wilderness Coordinator Recreation Planner
Bill Jonas	Energy and Minerals Evaluation	BS Geology BA Anthropology	BLM - 5 yrs. Geologist USGS - 5 Mos. Geologist
Ralph Sena	Livestock Grazing	Bachelor of University Studies	BLM - 2½ yrs. Natural Resources Specialist 7 yrs Environmental Specialist BOR - 2 yrs Outdoor Recreation Planner
Lee Keesling	Public Involvement	BS Management and Administration MS Recreation	BLM - 7 yrs Public Affairs Specialist 4 yrs Outdoor Recreation Planner
Don Boyer	Editing, Graphics Coordination, Printing	BS Literature MA Education	BLM - 7 yrs. Writer-Editor, 2 yrs. Printing Management Specialist
Esther Sanchez	Word Processor and Formatting		BLM - 5 yrs. Clerk-Typist, 1 yr. Branch Secretary
Ralph Leon	Cartographics	Bachelor of Fine Arts	BLM - 9 yrs. Carto. Tech./ Illustrator
	Quality Control Review		
Ron Fellows	Chief, Branch of Lands and Recreation, BLM New Mexico State Office (NMSO)	Dave Jones	Deputy State Director, Division of Lands and Renewable Resources, BLM, NMSO
John Kenny	Chief, Planning and Environmental Coordination Staff, BLM, NMSO	Dan Wood	Asst. Area Manager, Carlsbad Resource Area
Gary Pavek	Wilderness Specialist, BLM, Washington Office	Hank Wilson	Chief, Mining Law and Saleables, BLM, NMSO
	Other Contributors and Reviewers		
Jerry Townsend Jeff Nighbert Pete VanWyhe	Livestock Grazing Cartographics Cartographics (Denver Service Center)	John Whitney Andy Dimas	Natural Resource Specialist Cartographics
	Support		
Liz Vargas Teresa Leyba	Secretary Clerk-Typist	Clara Martinez	Secretary

TABLE 5-3
ALBUQUERUE DISTRICT WILDERNESS ANALYSIS REPORTS
(continued)

Name	Responsibility	Education	Experience
John Bristol	Albuquerque District WAR Team Leader	BS Landscape Architecture	BLM - 3 yrs., - Outdoor Recreation Planner, 5 yrs., Landscape Architect
Angela Berger	Recreation, Visual	BS Secondary Education MA Recreation	BLM - 5 yrs. Outdoor Recreation Planner 2 yrs. District Wilderness Program Leader, 1 yr. Sup. Multi-Resource Staff (RPRA)
Don Brewer	Threatened and Endangered Species	BS Wildlife Management	BLM - 7 yrs. Wildlife Biologist, 2 yrs. Range Conservationist
Bill Holsheimer	Geology, Minerals	BA Geology	BLM - 13 yrs. Geologist
Tom Mottl	Soil, Watershed	BS Chemistry	BLM - 5 yrs., USGS - 1 yr. Hydrologist
Darrell R. Musick	Forest Products, Range	BS Agricultural Economics	BLM - 11 yrs., NRS - 3 yrs. Economist
Bill Overbaugh	Photography, Recreation, Visual Resources Wilderness Criteria	BS Natural Resources	BLM - 3 yrs. Recreation Technician
Richard Speegle	Recreation	BA Recreation MA Recreation	BLM - 7 yrs. Recreation Planner
Gene Tatum	Livestock Grazing	BS Range Science	BLM - 7 yrs. Recreation Planner
Jim Turner	Minerals	BS Geology	BLM - 6 yrs., Bureau of Reclamation - 4 yrs. Geologist
Dwain Vincent	Air Quality, Ecotypes, Vegetation, Water, Watershed	BS Forestry	BLM - 18 yrs., Range Conservationist

Support Personnel		Contributors and Reviewers	
Paul Applegate	District Manager	Myrna Finke	Visual Information
Herrick Hanks	AM, Rio Puerco RA	Irene Rivera	Clerk Typist
Rich Fagan	Asst. DM, L&RR	M'Lee Beazaley	Secretary
Rich Niemeyer	Area Manger, Taos RA		

TABLE 5-3
LAS CRUCES DISTRICT WILDERNESS ANALYSIS REPORTS
(continued)

Name	Responsibility	Education	Experience
Jeff Jarvis	LCDO WAR Team Leader	BS Natural Resources	BLM - 6 yrs., Outdoor Recreation Planner District Outdoor Recreation Planner NPS - 2 yrs. Park Ranger FWS - 9 mos. Work Coordinator (Youth Program)
Donita Cotter	Technical Coordinator	BS Environmental Science	BLM - 6 yrs. Wilderness Specialist Surface Protection Specialist
Tom Custer	Geology	BS Geology	BLM - 10 yrs., Geologist USFS 1 yr. Geologist
Rena Gutierrez	Writer-Editor	BA Journalism/Mass Communications	BLM - 7 yrs Public Information Aid Clerk Typist Writer-Editor
Kimberly A. Harrison	Editorial Assistant	2 semesters - Biology 1 semester - Art EL Paso Community College 4 yrs.	BLM - 6 yrs. Clerk Typist Planning Clerk (Typing) Editorial Assistant (Typing) Registration Cashier Night Cashier/PBX Operator Accounts Payable File Clerk Secretary II
Larry Eix	Cartographic Technician		BLM - 3 Mos. Cartographic Technician
Isabel Diaz	Cartographic Technician		BLM - 2 yrs Cartographic Technician

Las Cruces/Lordsburg Resource Area

Bruce G. Call	District Soil Scientist	Joseph I. Torrez	Geologist
Steven C. Hamp	District Hydrologist	Linda K. Seibert	Wildlife Biologist
Pete M. Laudeman	District Archaeologist	Gerald Sanchez	District Regional Economist
Beatrice A. Wade	Range Conservationist		

Socorro Resource Area

Wayne Albrecht	Range Conservationist	Carol Marchio	Soil Scientist
Robert Marchio	Range Conservationist	Laird McIntosh	Botanist
Bob Prickett	Outdoor Recreation Planner (Team Leader)	Pete M. Laudeman	District Archaeologist
		Bernadine Creager	Reality Specialist
Larry Livingston	Range Conservationist	Wesley Anderson	Wildlife Biologist

White Sands Resource Area

Konnie Andrews	Geologist	Ben Fish	Outdoor Recreation Planner
Bill Gilbert	Team Leader		
Robert Lawrence	Range Technician	Sandra J. Hayes	Wildlife Biologist
Mike Taylor	Archaeologist	Joe Sanchez	Surface Reclamation Specilist

Contributors and Reviewers

Daniel C. B. Rathbun	District Manager	Harlen Smith	AM, Socorro Resource Area
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Larry Nunez	AM, White Sands RA	Richard Watts	Chief, Division of Resource Management
Marvin James	Chief, Div. of Planning and Environmental Assist.	Bruce Call	District Soil Scientist
Tom Birch	District Range Specialist	Kenneth E. Holmes	District Wildlife Specialist
Stevern C. Hamp	District Hydrologist		
Pete M. Laudeman	District Archaeologist	Mary O'Brien	Community Planner
Juan Padilla	District Realty Spec.	Ed Webb	District Environmental Coordinator
William Tipton	Resource Area Geologist		
Joseph I. Torres	Resource Area, Chief, Lands and Minerals		

TABLE 5-3
ROSWELL DISTRICT WILDERNESS ANALYSIS REPORTS
(concluded)

Name	Assignment	Education	Experience
Mike Bunker	RDO WAR Team Leader Visual Resources, Minerals, Education/ Research, Realty, Wilderness Values	BS Forestry	BLM - 12 yrs Outdoor Recreation Planner Natural Resource Specialist
Mike Howard	Vegetation, Livestock Grazing	BS, MS Wildlife Management	BLM - 4.5 yrs Wildlife Range
Joe Hummel	Recreation, Education/ Research, Realty	BS, Natural Resources	BLM - 4.5 yrs. Outdoor Recreation Planner
Allan Lemley	Geology, Minerals	BS, Geology	BLM - 1 yr. Geologist
Linda Rundell	Wildlife, Cultural	BS, Wildlife Management	BLM - 6 yrs. Outdoor Recreation Planner
Clarence Seagraves	Soil, Water, Air	BS, Agronomy	BLM - SCS 11.5 yrs. Soil Scientist

Support Personnel		Contributors and Reviewers	
Arlene Martinez	Typist	Earl Cunningham	District Manager, Roswell
Angie Medina	Typist	Dick Bastin	Associate DM, Roswell
Linda Rowell	Typist	Phil Kirk	AM, Roswell
Marce' Scott	Typist	Wayne Ludington	Environmental Coordinator

APPENDIX A

Supplemental Mineral Resource Information

APPENDIX A
SUPPLEMENTAL MINERAL RESOURCE INFORMATION

This appendix includes additional information concerning the potential impacts of wilderness designation on mineral resource development. Supply and demand relationships of relevant mineral commodities are summarized to help identify the existing situation. Restrictions associated with the exploration and development of mining claims, mineral leases and private mineral rights under wilderness management are addressed. A site-specific summary of impacts by alternative as well as documentation concerning the estimated value of affected copper resources are also included.

TABLE A-1
DEMAND AND PRODUCTION RELATIONSHIPS, -
ENERGY MINERALS (1983) - QUADRILLION BTU

Commodity	U.S. Consumption	Production	U.S. Exports	New Mexico Production	Supply Problem
Coal	15.877	17.225	1.76	.459	None
Natural Gas	17.535	16.482	.056	.930	Moderate
Petroleum[a/]	30.076	18.392	.00443	.435	High
Uranium	Unknown	10,600	950	3,905[b/]	None

NOTE: [a/] thousand short tons U_3O_8
[b/] 1982

SOURCE: U.S. Dept. of Energy (1984) New Mexico Energy and Minerals Department (1984) and New Mexico Oil and Gas Association (1984).

TABLE A-2
DEMAND AND PRODUCTION RELATIONSHIPS - METALS

Commodity	1990 Probable Demand in U.S.	1990 Production Multiple Year Trend Projections	1990 U.S. Production Estimated by U.S.B.M.	1983 New Mexico Production	Supply Problem
Bismuth[a]	2,940	140	300	0	High
Cobalt[a]	27,600	0	6,000	0	High
Copper[b]	2,500	1,890	2,000	156	Moderate
Gold[c]	4,450	740	2,020	49.3	Moderate
Iron Ore[d]	104	64	85	Withheld[k]	Moderate
Lead[b]	900	878	600	0	None
Manganese[e]	1,780	0	30	0	Moderate
Molybdenum[a]	110,000	180,000	225,000	Withheld	None
Nickel[f]	300	17.5	34.8	0	High
Silver[g]	170.0	41.3	57.0	1.8	Low
Thorium[h]	75	0	70	0	Low
Tin[i]	45,100	90	200	0	High
Tungsten[a]	33,000	8,078	9,000	0	Moderate
Vanadium[i]	12,700	6,300	9,300	0	Moderate
Zinc[j]	1,300	418	7,000	Withheld	Low

NOTE:
[a] thousand pounds
[b] thousand metric tons
[c] thousand troy ounces
[d] million short tons of contained iron
[e] thousand short tons of manganese content
[f] thousand tons
[g] million troy ounces
[h] short tons
[i] metric tons
[j] thousand metric tons recoverable zinc
[k] Production figures are withheld to protect confidential records of private companies.

SOURCE: U.S. Bureau of Mines (1979, 1980) New Mexico Bureau of Mine Inspection (1984).

TABLE A-3
DEMAND AND PRODUCTION RELATIONSHIPS -
INDUSTRIAL MINERALS

Commodity	1990 Probable Demand in U.S.	1990 Production Multiple Year Trend Projections	1990 U.S. Production Estimated by U.S.B.M.	1983 New Mexico Production	Supply Problem
Barite[a/]	3,950	1,897	2,300	0	Low
Cement[b/]	100	96.2	91	Unknown	None
Cinders/ Scoria	Unknown	Unknown	Unknown	452,346 tons	None
Crushed Rock[b/]	1,370	N/A	Equal to Demand	Unknown	None
Dimension[a/] Stone	1,740	500	1,600	Unknown	None
Flourine[a/]	820	137	100	0	High
Gypsum[a/]	28,400	14,600	19,600	2,765	None
Humates[d/]	N/A	N/A	N/A	16,079	None
Lime[a/]	29,300	27,500	27,000	Unknown	None
Salt[a/]	60,200	63,200	55,000	141.7	None
Sand & Gravel[b/]	1,130	1,220	1,130	9.7	None

NOTE: a/ thousand short tons
b/ million short tons
c/ 21-year trend projection
d/ cubic yards
N/A not available
SOURCE: U.S. Bureau of Mines (1979, 1980) New Mexico Bureau of Mine Inspection (1984).

TABLE A-4
IMPACT OF THE PROPOSED ACTION BY WSA

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Energy Resources				
Coal				
	Ignacio Chavez	5,700	0	5,700
Geothermal				
	Ojito	0	300	300
	Sierra de las Canas	0	12,800	12,800
		0	13,100	13,100
Oil and Gas				
	Big Hatchet Mtns.	0	100	100
	Cabezon	0	8,154	8,154
	Ignacio Chavez	500	8,300	8,800
	Jornada del Muerto	0	31,100	31,100
	Ojito	0	10,300	10,300
	West Potrillo Mtns. and Mount Riley	0	8,000	8,000
		500	65,954	66,454
Uranium				
	Ojito	0	10,300	10,300
	Sierra Ladrones	1,800	8,200	10,000
		1,800	18,500	20,300
Metallic Resources				
Cobalt				
	Sierra Ladrones	0	8,100	8,100
Copper				
	Big Hatchet Mtns.	0	200	200
	Horse Mountain	0	4,400	4,400
	Organ Mountains	200	3,600	3,800
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	10,000	10,000
		200	31,000	31,200
Gold				
	Horse Mountain	0	4,400	4,400
	Organ Mountains	200	3,600	3,800
		200	8,000	8,200

TABLE A-4
IMPACT OF THE PROPOSED ACTION BY WSA
(continued)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Lead				
	Big Hatchet Mtns.	0	200	200
	Horse Mountain	0	4,400	4,400
	Organ Mountains	200	3,600	3,800
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		200	21,600	21,800
Molybdenum				
	Horse Mountain	0	4,400	4,400
	Organ Mountains	200	3,600	3,800
		200	8,000	8,200
Nickel				
	Sierra Ladrones	0	8,100	8,100
Silver				
	Big Hatchet Mtns.	0	200	200
	Horse Mountain	0	4,400	4,400
	Organ Mountains	200	3,600	3,800
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		200	21,600	21,800
Tin				
	Continental Divide	0	14,600	14,600
Tungsten				
	Horse Mountain	0	4,400	4,400
	Organ Mountains	0	3,800	3,800
		0	8,200	8,200
Zinc				
	Big Hatchet Mtns.	0	200	200
	Horse Mountain	0	4,400	4,400
	Organ Mountains	200	3,600	3,800
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		200	21,600	21,800

TABLE A-4
IMPACT OF THE PROPOSED ACTION BY WSA
(concluded)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Non-Metallic Resources				
Barite				
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		0	13,400	13,400
Building Stone				
	Aden Lava Flow	1,200	2,300	3,500
Cinders/Scoria				
	West Potrillo Mtns. and Mt. Riley	1,400	7,400	8,800
Fluorspar				
	Organ Mountains	100	0	100
	Sierra de las Canas	0	12,800	12,800
		100	12,800	12,900
Gypsum				
	Big Hatchet Mtns.	0	200	200
High Calcium Limestone				
	Sierra Ladrones	0	5,700	5,700
Humates				
	Ignacio Chavez	5,700	0	5,700

NOTE: All data from BLM WARs, 1985.

TABLE A-5
IMPACT OF THE ALL WILDERNESS ALTERNATIVE BY WSA

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Energy Resources				
Coal				
	Empedrado	2,000	900	2,900
	Ignacio Chavez	5,700	0	5,700
	La Lena	2,500	2,400	4,900
		10,200	3,300	13,500
Geothermal				
	Ojito	0	1,100	1,100
	Presilla	0	8,700	8,700
	Robledo Mtns.	0	1,800	1,800
	Sierra de las Canas	0	12,800	12,800
	Veranito	1,100	6,100	7,200
		1,100	30,500	31,600
Oil and Gas				
	Big Hatchet Mtns.	0	6,700	6,700
	Cabezon	0	8,200	8,200
	Empedrado	400	8,600	9,000
	Ignacio Chavez	600	9,700	10,300
	Jornada del Muerto	0	31,100	31,100
	La Lena	6,000	4,400	10,400
	Ojito	0	11,700	11,700
	West Potrillo Mtns. and Mount Riley	0	8,000	8,000
		7,000	88,400	95,400
Uranium				
	Eagle Peak	0	27,100	27,100
	Mesita Blanca	0	16,400	16,400
	Ojito	0	11,700	11,700
	Presilla	0	5,500	5,500
	Sierra Ladrones	1,800	8,200	10,000
	Veranito	0	4,300	4,300
		1,800	73,200	75,000

TABLE A-5
IMPACT OF THE ALL WILDERNESS ALTERNATIVE BY WSA
(continued)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Metallic Resources				
Cobalt				
	Sierra Ladrones	0	8,100	8,100
Copper				
	Big Hatchet Mtns.	0	200	200
	Cooke's Range	1,100	3,700	4,800
	Devil's Backbone	0	8,200	8,200
	Florida Mtns.	500	1,000	1,500
	Horse Mountain	0	5,000	5,000
	Organ Mountains	200	3,600	3,800
	Presilla	0	700	700
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	10,000	10,000
	Stallion	0	24,200	24,200
		1,800	69,400	71,200
Gold				
	Cooke's Range	1,100	3,700	4,800
	Devil's Backbone	0	8,200	8,200
	Florida Mountains	500	1,000	1,500
	Horse Mountain	0	5,000	5,000
	Organ Mountains	200	3,600	3,800
		1,800	21,500	23,300
Lead				
	Big Hatchet Mtns.	0	200	200
	Cooke's Range	1,100	3,700	4,800
	Devil's Backbone	0	8,200	8,200
	Florida Mountains	500	1,000	1,500
	Horse Mountain	0	5,000	5,000
	Organ Mountains	200	3,600	3,800
	Presilla	0	4,300	4,300
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		1,800	39,400	41,200
Manganese				
	Florida Mountains	0	1,300	1,300

TABLE A-5
IMPACT OF THE ALL WILDERNESS ALTERNATIVE BY WSA
(continued)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Molybdenum				
	Cooke's Range	1,100	3,700	4,800
	Devil's Backbone	0	8,200	8,200
	Florida Mountains	500	1,000	1,500
	Horse Mountain	0	5,000	5,000
	Organ Mountain	200	3,600	3,800
		1,800	21,500	23,300
Nickel				
	Sierra Ladrones	0	8,100	8,100
Silver				
	Big Hatchet Mtns.	0	200	200
	Cooke's Range	1,100	3,700	4,800
	Devil's Backbone	0	8,200	8,200
	Florida Mountains	500	1,000	1,500
	Horse Mountain	0	5,000	5,000
	Organ Mountains	200	3,600	3,800
	Presilla	0	700	700
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
	Stallion	0	24,200	24,200
		1,800	60,000	61,800
Tin				
	Continental Divide	0	24,000	24,000
Tungsten				
	Devil's Backbone	0	8,200	8,200
	Horse Mountain	0	5,000	5,000
	Organ Mountains	0	3,800	3,800
		0	17,000	17,000
Zinc				
	Big Hatchet Mtns.	0	200	200
	Cooke's Range	1,100	3,700	4,800
	Devil's Backbone	0	8,200	8,200
	Florida Mtns.	500	1,000	1,500
	Horse Mountain	0	5,000	5,000
	Organ Mountains	200	3,600	3,800
	Presilla	0	4,300	4,300
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		1,800	39,400	41,200

TABLE A-5
IMPACT OF THE ALL WILDERNESS ALTERNATIVE BY WSA
(continued)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Non-Metallic Resources				
Barite				
	Devil's Backbone	0	8,200	8,200
	Presilla	0	4,300	4,300
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		0	25,900	25,900
Building Stone				
	Aden Lava Flow	1,200	2,300	3,500
	Robledo Mountains	1,300	0	1,300
		2,500	2,300	4,800
Cinders/Scoria				
	Eagle Peak	0	1,500	1,500
	Mesita Blanca	300	2,000	2,300
	West Potrillo Mtns. and Mt. Riley	1,400	7,400	8,800
		1,700	10,900	12,600
Fluorspar				
	Devil's Backbone	0	8,200	8,200
	Florida Mountains	0	400	400
	Organ Mountains	100	0	100
	Presilla	0	4,300	4,300
	Sierra de las Canas	0	12,800	12,800
		100	25,700	25,800
Gypsum				
	Big Hatchet Mtns.	0	200	200
High Calcium Limestone				
	Robledo Mountains	3,700	0	3,700
	Sierra Ladrones	0	10,800	10,800
		3,700	10,800	14,500
High Magnesium Dolomite				
	Robledo Mountains	0	200	200
Humates				
	Empedrado	2,000	900	2,900
	Ignacio Chavez	5,700	0	5,700
	La Lena	2,500	2,400	4,900
		10,200	3,300	13,500

TABLE A-5
IMPACT OF THE ALL WILDERNESS ALTERNATIVE BY WSA
(concluded)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Sand and Gravel				
	Eagle Peak	0	2,500	2,500
	Mesita Blanca	0	800	800
	Ojito	50	0	50
	Presilla	0	1,200	1,200
	Veranito	0	450	450
		50	4,950	5,000

NOTE: All data from BLM WARs, 1985.

TABLE A-6
IMPACT OF THE MANAGEABILITY ALTERNATIVE BY WSA

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Energy Resources				
Coal				
	Ignacio Chavez	5,700	0	5,700
Geothermal				
	Ojito	0	300	300
	Robledo Mountains	0	1,800	1,800
	Sierra de las Canas	0	12,800	12,800
	Veranito	1,100	6,100	7,200
		1,100	21,000	22,100
Oil and Gas				
	Big Hatchet Mtns.	0	100	100
	Cabezon	0	6,500	6,500
	Ignacio Chavez	500	8,300	8,800
	Jornada del Muerto	0	31,100	31,100
	Ojito	0	10,300	10,300
	West Potrillo Mtns. and Mt. Riley	0	8,000	8,000
		500	64,300	64,800
Uranium				
	Mesita Blanca	0	16,400	16,400
	Ojito	0	10,300	10,300
	Sierra Ladrones	1,800	8,200	10,000
	Veranito	0	4,300	4,300
		1,800	39,200	41,000
Metallic Resources				
Cobalt				
	Sierra Ladrones	0	8,100	8,100
Copper	Big Hatchet Mtns.	0	200	200
	Florida Mountains	500	1,000	1,500
	Horse Mountain	0	4,400	4,400
	Organ Mountains	200	3,600	3,800
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	10,000	10,000
	Stallion	0	24,200	24,200
		700	56,200	56,900

TABLE A-6
IMPACT OF THE MANAGEABILITY ALTERNATIVE BY WSA
(continued)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Gold				
	Florida Mountains	500	1,000	1,500
	Horse Mountain	0	4,400	4,400
	Organ Mountain	200	3,600	3,800
		700	9,000	9,700
Lead				
	Big Hatchet Mtns.	0	200	200
	Florida Mountains	500	1,000	1,500
	Horse Mountain	0	4,400	4,400
	Organ Mountain	200	3,600	3,800
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		700	22,600	23,300
Manganese				
	Florida Mountains	0	1,300	1,300
Molybdenum				
	Florida Mountains	500	1,000	1,500
	Horse Mountain	0	4,400	4,400
	Organ Mountain	200	3,600	3,800
		700	9,000	9,700
Nickel				
	Sierra Ladrones	0	8,100	8,100
Silver				
	Big Hatchet Mtns.	0	200	200
	Florida Mountains	500	1,000	1,500
	Horse Mountain	0	4,400	4,400
	Organ Mountains	200	3,600	3,800
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
	Stallion	0	24,200	24,200
		700	46,800	47,500
Tin				
	Continental Divide	0	14,600	14,600
Tungsten				
	Horse Mountain	0	4,400	4,400
	Organ Mountains	0	3,800	3,800
		0	8,200	8,200

TABLE A-6
IMPACT OF THE MANAGEABILITY ALTERNATIVE BY WSA
(continued)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Zinc				
	Big Hatchet Mtns.	0	200	200
	Florida Mtns.	500	1,000	1,500
	Horse Mountain	0	4,400	4,400
	Organ Mountains	200	3,600	3,800
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		700	22,600	23,300
Non-Metallic Resources				
Barite				
	Sierra de las Canas	0	12,800	12,800
	Sierra Ladrones	0	600	600
		0	13,400	13,400
Building Stone				
	Aden Lava Flow	1,200	2,300	3,500
	Robledo Mountains	1,300	0	1,300
		2,500	2,300	4,800
Cinders/Scoria				
	Mesita Blanca	300	2,000	2,300
	West Potrillo Mtns. and Mt. Riley	1,400	7,400	8,800
		1,700	9,400	11,100
Fluorspar				
	Florida Mountains	0	400	400
	Organ Mountains	100	0	100
	Sierra de las Canas	0	12,800	12,800
		100	13,200	13,300
Gypsum				
	Big Hatchet Mtns.	0	200	200
High Calcium Limestone				
	Robledo Mountains	3,700	0	3,700
	Sierra Ladrones	0	5,700	5,700
		3,700	5,700	9,400
High Magnesium Dolomite				
	Robledo Mountains	0	200	200

TABLE A-6
IMPACT OF THE MANAGEABILITY ALTERNATIVE BY WSA
(concluded)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Humates				
	Ignacio Chavez	5,700	0	5,700
Sand and Gravel				
	Mesita Blanca	0	800	800
	Veranito	0	450	450
		0	1,250	1,250

NOTE: All data from BLM WARs, 1985.

TABLE A-7
IMPACT OF THE CONFLICT RESOLUTION ALTERNATIVE BY WSA

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Energy Resources				
Coal				
	Ignacio Chavez	5,700	0	5,700
Geothermal				
	Ojito	0	300	300
	Sierra de las Canas	0	12,800	12,800
		0	13,100	13,100
Oil and Gas				
	Big Hatchet Mtns.	0	100	100
	Cabezon	0	6,500	6,500
	Ignacio Chavez	500	8,300	8,800
	Ojito	0	10,300	10,300
	West Potrillo Mtns. and Mount Riley	0	8,000	8,000
		500	33,200	33,700
Uranium				
	Ojito	0	10,300	10,300
Metallic Resources				
Copper				
	Big Hatchet Mtns.	0	200	200
	Horse Mountain	0	4,400	4,400
	Sierra de las Canas	0	12,800	12,800
		0	17,400	17,400
Gold				
	Horse Mountain	0	4,400	4,400
Lead				
	Big Hatchet Mtns.	0	200	200
	Horse Mountain	0	4,400	4,400
	Sierra de las Canas	0	12,800	12,800
		0	17,400	17,400
Molybdenum				
	Horse Mountain	0	4,400	4,400

TABLE A-7
IMPACT OF THE CONFLICT RESOLUTION ALTERNATIVE BY WSA
(concluded)

Commodity	WSA	Acres of High Mineral Potential	Acres of Moderate Mineral Potential	Total Acres of High and Moderate Potential
Silver				
	Big Hatchet Mtns.	0	200	200
	Horse Mountain	0	4,400	4,400
	Sierra de las Canas	0	12,800	12,800
		0	17,400	17,400
Tungsten				
	Horse Mountain	0	4,400	4,400
Zinc				
	Big Hatchet Mtns.	0	200	200
	Horse Mountain	0	4,400	4,400
	Sierra de las Canas	0	12,800	12,800
		0	17,400	17,400
Non-Metallic Resources				
Barite				
	Sierra Ladrones	0	600	600
Building Stone				
	Aden Lava Flow	1,200	2,300	3,500
Cinders/Scoria				
	West Potrillo Mtns. and Mt. Riley	1,400	7,400	8,800
Fluorspar				
	Sierra de las Canas	0	12,800	12,800
Gypsum				
	Big Hatchet Mtns.	0	200	200
Humates				
	Ignacio Chavez	5,700	0	5,700

NOTE: All data from BLM WARs, 1985.

MINING LAW ADMINISTRATION

No mining claims can be located after wilderness designation unless allowed by the specific authorizing wilderness legislation. Prior to conducting operations on mining claims properly located before wilderness designation, a plan of operation must be filed pursuant to 43 CFR 3809.

Prior to approving plans of operations on claims, or allowing operations to continue that had been approved prior to designation, a validity examination of the unpatented claims must be conducted. The validity examination must confirm that as of the date of wilderness designation a discovery of valuable minerals have been made on the claim(s). The requirement of discovery has been met when minerals have been found of such character that a person of ordinary prudence would be justified in the further expenditure of his labor and means, with a reasonable prospect of success in developing a valuable mine. Any disapproval or denial of a plan of operations by the authorized officer is subject to appeal by the operator under the provisions of 43 CFR 3809.4.

Those activities otherwise generally prohibitied in wilderness, including the use of mechanical transport, motorized equipment, or aircraft, shall be authorized only when there is no reasonable alternative.

The reclamation of the site and other disturbed areas will vary with the location, soil characteristics type of vegetative cover and type and extent of disturbance. As a minimum, all sites will be treated in such a manner that they will not cause accelerated erosion, siltation of streams, a hazard to wilderness visitors or unnecessary or undue degradation of the land. Also, as a minimum, all excavations with vertical cuts in soil will be sloped to a stable angle of repose. Generally, hand-dug pits or shafts with the excavated material still at hand will be refilled. The main objective will be to minimize remaining evidence of human activities. It may not be practical to return an area to its original contour, but it will generally be reasonable to return it to a contour which will appear harmonious with adjacent terrain. An effort will be made when practical and reasonable to put topsoil equal in quality to that which was removed over disturbed soil surfaces to promote natural revegetation or to aid in seeding. Where native seed is available and its use is reasonable, disturbed areas will be seeded to native plant species provided the area originally supported such vegetation. All structures and improvements must be removed when no longer needed for the exploration of future mining.

Mining locations shall be held and used solely for mining. For a valid claim located after the date an area is established as wilderness, the patent conveys title to mineral rights only. All surface rights are reserved to the United States. Except as specifically provided in the Wilderness Act or the Act designating the area as wilderness, no use of the surface of the claim or its resources not reasonably required for carrying on mining or prospecting shall be allowed.

MINERAL MATERIALS

No sales or free use permits for sand/gravel, cinders, crushed rock, humates building stone or any other common variety mineral will be issued from designated wilderness areas.

MINERAL LEASING

No leases will be allowed on designated wilderness unless the authorizing legislation allows it. Operations on leases issued after the enactment of FLPMA include stipulations to protect wilderness values. A standard stipulation was instituted in May 1982 which requires extensive reclamation so that impacts will be substantially unnoticeable in the area as a whole. Stipulations vary on leases issued prior to 1982. No leases have been allowed on WSAs since January 1983 pursuant to restrictions in BLM's budget legislation. These restrictions are expected to continue in future budget authorizations. All pre-FLPMA leases are assumed to be expired prior to designation.

Section 5 of the Wilderness Act ensures that adequate access is provided to private or state lands wholy encompassed by wilderness areas. Access to private or state mineral rights associated with Federal surface designated as wilderness, will depend on the specific language of the instruments which originally conveyed the surface and reserved the mineral rights. It is assumed that if rights to ingress and egress were reserved, the BLM must provide adequate and reasonable access. As of present, surface rights associated with the extralateral subsurface rights of patented claims are unclear.

ESTIMATED VALUE OF IMPACTED COPPER RESOURCES

In order to illustrate the potential economic impacts of withdrawing metallic mineral resources, the following estimates were generated concerning the value of copper resources proposed for withdrawal under each of the alternatives. Copper was chosen to illustrate economic impacts for the following reasons: (1) New Mexico has been a long time producer of copper; (2) abundant information and forecasts are available concerning copper supply and demand; (3) at least 83 percent of the U.S. copper resources and most of the WSAs are located within the Basin and Range Province (Brobst and Pratt, 1973); and (4) copper tends to be in close association with many of the other metals identified above. The estimates of value associated with the proposed alternatives are based on the following assumptions:

1. U.S. demand of 4,600,000 tons of copper in the year 2000.
2. Three percent annual increase in U.S. demand after the year 2000.
3. $0.75/lb is the value of copper.
4. Seventy-five percent of U.S. demand is fulfilled by U.S. producers.
5. Ten percent of U.S. production is attributed to New Mexico.
6. Existing identified reserves will fulfill all New Mexico production until the year 2005.
7. All identified copper bearing mineral resource areas on Map 3-7 have equal probability of supplying copper.
8. All anticipated value of production for 100 years is discounted annually at ten percent, this approximates the value into perpetuity.
9. 1985 constant dollars are used.

Based on the above parameters, the total present worth of copper resources withdrawn under each of the proposed alternatives are as follows:

Alternative	Percent of NM Known Copper Resource Lands	Estimate Present Worth of Copper Resources
All Wilderness Alternative	3.6	$56,000,000
Manageability Alternative	2.3	$33,000,000
Proposed Action	1.1	$17,000,000
Conflict Resolution Alternative	0.3	$ 5,000,000
No Wilderness Alternative		0

Estimated present worth of all copper resources in New Mexico = $1,550,000,000

Since a few large operations can fulfill the above anticipated demand and no one can accurately predict which copper resource lands will go into production, the actual impact could range from 0 to 155 billion dollars.

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; (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 material that is transported and deposited by running water.

ALLUVIAL CONE. An alluvial fan with steep slopes.

ALLUVIUM. Material, including 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 (AU). Considered to be one mature cow (1,000 pounds) or its equivalent based upon average daily forage consumption of 26 pounds of dry matter per day.

ANIMAL UNIT MONTH (AUM). The amount of forage required by an animal unit for one month.

ANTICLINE. An upfold of stratified rock in which the beds bend downward in opposite directions from the crest.

ARCHAIC. That period of human adaptation following the late Pleistocene Paleo-Indian people and prior to the development of sedentary agricultural groups in the Southwest.

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.

BOLSON. A flat-floored desert valley that drains toward a playa or central depression.

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.

CALICHE. A layer in the soil more or less cemented by calcium carbonates ($CaCO_3$), commonly found in arid and semiarid regions.

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, depth of erosion, or connection with the surface.

CHERRY-STEMMED. An unofficial term used to describe the way a wilderness 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 United States and for which we are now dependent on 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.

CULTURAL RESOURCE INVENTORY CLASSES.

Class I - Existing Data Inventory: an inventory study of a defined area designed to provide a narrative overview (cultural resource overview) derived from existing cultural resource information and to provide a compilation of existing cultural resource site record data on which to base the development of the BLM's site record system.

Class II - Sampling Field Inventory: a sample-oriented field inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a portion of a defined area in a manner which will allow an objective estimate of the nature and distribution of cultural resources in the entire defined area. The Class II inventory is a tool utilized in management and planning activities as an accurate predictor of cultural resources in the area of consideration. The primary area of consideration for the implementation of a Class II inventory is a planning unit. The secondary area is a specific project in which an intensive field inventory (Class III) is not practical or necessary.

Class III - Intensive Field Inventory: an intensive field inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a specified area. Normally, upon completion of such inventories in an area, no further cultural resource inventory work is needed. A Class III inventory is appropriate on small project areas, all areas to be disturbed, and primary cultural resource areas.

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 interacting natural system including all the component organisms together with its nonliving environment; a community together with its environment; an ecological system.

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, or cement 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 along which there has been 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. A cliff formed by a fault, usually modified by erosion unless the fault is very recent.

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 the Federal Land Policy and Management Act (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."

HALF-SHRUB. A perennial plant with a woody base whose annually produced stems die back each year.

HEAT FLOW. Dissipation of heat coming from within the earth by conduction or radiation at the surface.

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 BOARD OF LAND APPEALS (IBLA). The IBLA, as a component of the Department of the Interior Office of Hearings and Appeals, is an authorized representative of the Secretary. The purpose of the IBLA is to hear, consider, and determine as fully and finally as might the Secretary, matters within the jurisdiction of the Department involving appeals from decisions rendered by Departmental officials relating to (1) the use and disposition of public lands and their resources and (2) the use and disposition of mineral resources in certain acquired lands of the United States. Special procedures for appeals are contained in 43 Code of Federal Regulations, Part 4, Subpart E.

INTERIOR FENCE. Fences used to divide allotments into pastures or holding areas.

INTRUSION. A feature (landform, 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 ZONES. 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, and chips 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. A MFP is prepared in three steps: (1) resource recommendations, (2) impact analysis and alternative development, and (3) decisionmaking.

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.

PALEO-INDIAN. Cultural remains of human groups which co-existed with Pleistocene megafauna in North America, dating from 15,000 B.C. to approximately 7000 B.C.

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 semiarid region.

PERENNIAL STREAM. A stream or portion of a stream which flows continuously.

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 part of a closed depression.

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.

PROSPECT HOLE. Any shift, pit, drift, drill hole, or ditch made for the purpose of prospecting the mineral-bearing ground.

PROVINCE. A large area or region unified in some way and considered as a whole.

PSEUDORIPARIAN AREAS. Intermittent drainages (arroyos) supporting a more varied vegetation 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 composed 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.

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.

RAPTOR. 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, although in exceptional cases red limestones have been reported.

RHYOLITE. The extrusive equivalent of granite.

RIFT. A rift or rift zone usually refers to a system of fractures (faults) in the earth's crust and the associated valley or depression.

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 purpose of the BLM's wilderness inventory, the following definition has been adopted from the legislative history of the Federal Land Policy and Management Act:

"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. 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.

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 HABITAT SITE. A grouping of habitat sites based on similarity of vegetation and local landform.

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 loose 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.

SYENITE. An igneous rock composed primarily of alkali feldspar together with other minerals, such as hornblende.

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 foreseeable 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 LAND. Federal land which currently is 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.

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. VRM Classes are based on relative visual ratings of inventoried lands. Each class describes the different degree of modification allowed to the basic elements of the landscape. The following are the minimum management objectives for each class.

Class I - Natural ecological changes and very limited management activity are allowed. Any contrast created within the characteristic landscape must not attract attention. This classification is applied to Visual Areas of Critical Environmental Concern, wilderness areas, wild and scenic rivers, and other similar situations.

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 the Federal Land Policy and Management Act 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).

LIST OF CHEMICAL ABBREVIATIONS USED IN THIS DOCUMENT

Ag - Silver
Au - Gold
Bi - Bismuth
Cu - Copper
Fe - Iron
Mn - Manganese
Mo - Molybdenum
Pb - Lead
Te - Tellurium
V - Vanadium
W - Tungsten
Zn - Zinc

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INDEX

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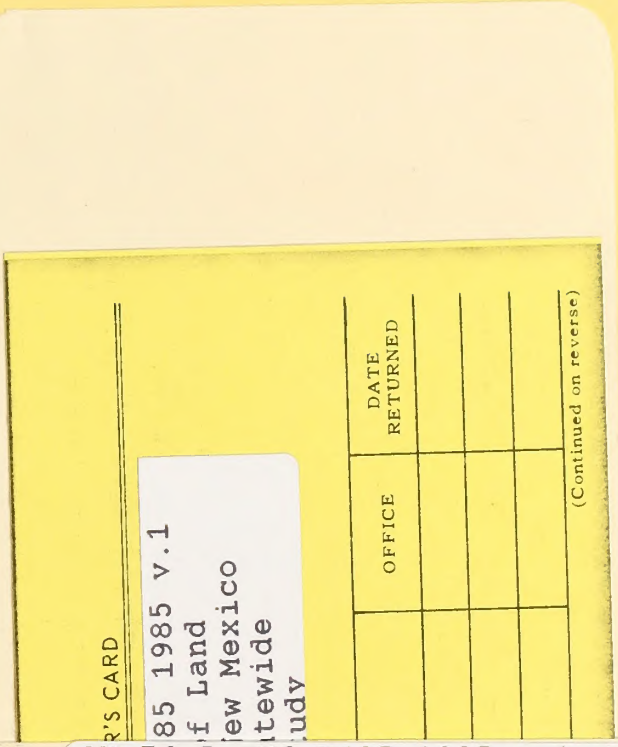

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