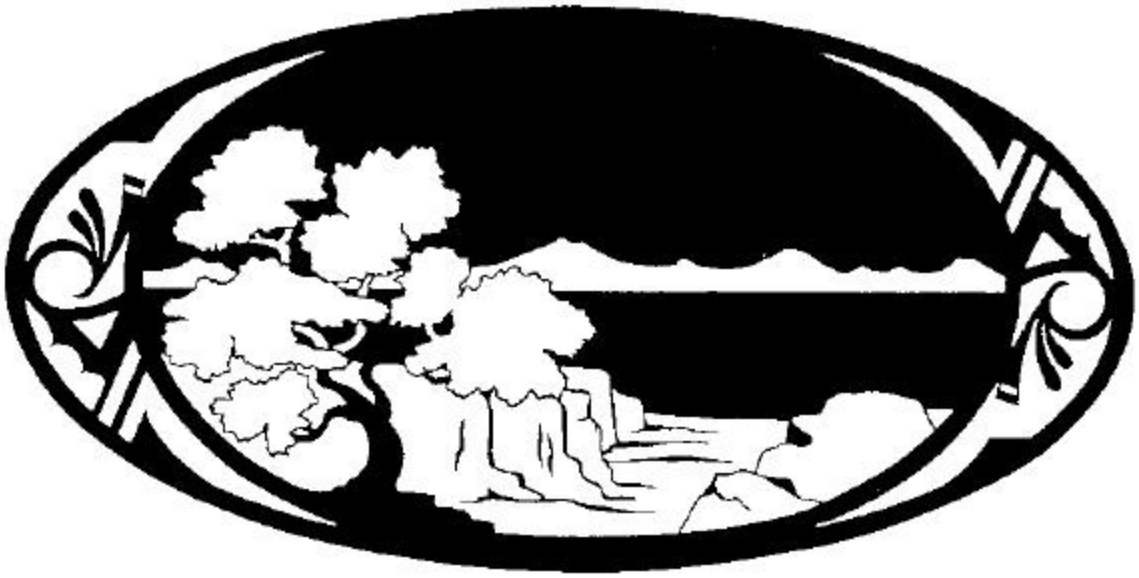
United States Department of the Interior
Bureau of Land Management

Albuquerque Field Office

PROPOSED
EL MALPAIS PLAN
AND
FINAL ENVIRONMENTAL IMPACT STATEMENT
VOLUME II



September 2000

The Bureau of Land Management...
is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the need of the American people. Management is based upon the principles of multiple use and sustained yield, a combination of uses that takes into account the long-term needs of future generations for renewable and non-renewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness, and natural, scenic, scientific, and cultural values.

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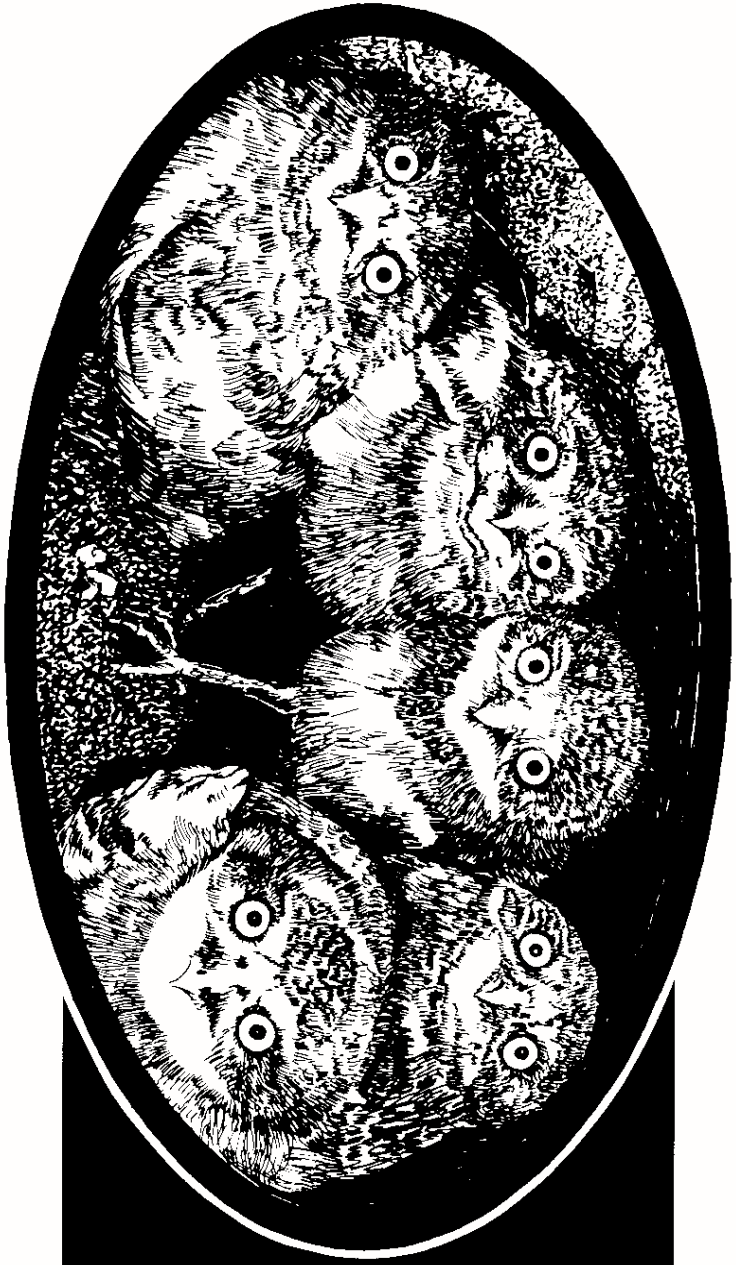

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HIGHLIGHTS OF THE EL MALPAIS LEGISLATION (P.L. 100-225)

APPENDIX A

APPENDIX A

HIGHLIGHTS OF THE EL MALPAIS LEGISLATION (P. L. 100-225)

Title I - National Monument

Establishment of Monument

Section 101 Designates a 114,000-acre National Monument to protect highly significant natural and cultural resources.

Transfer

Section 103 Transfers management of certain lands from the Cibola National Forest to the Department of the Interior to be managed as part of the National Monument.

Management

Section 103 National Monument will be managed according to laws of the National Park System. Management purposes of the monument are to preserve scenery and natural, historic, and cultural resources and to provide public understanding and enjoyment of these resources.

Permits

Section 104 Grazing privileges within the monument will end on January 1, 1998.

Title II - Masau Trail

Designation of Trail

Section 201 Authorizes the National Park Service (NPS) to designate a vehicular tour route linking prehistoric and historic cultural sites in New Mexico and eastern Arizona.

Areas Included

Section 202 Initially the trail will link El Malpais National Monument, El Morro National Monument, Chaco Culture National Historical Park, Aztec Ruins National Monument, Canyon de Chelly National Monument, Pecos National Monument, and Gila Cliff Dwellings National Monument. Additional trail segments designated later by the Secretary of the Interior.

Information and Interpretation

Section 203 The Secretary may enter into cooperative agreements to help interpret natural and cultural resources of such sites. The Secretary, in cooperation with other public, Indian, and non-profit entities, must prepare and distribute information about sites along the trail.

Markers

Section 204 The trail will be marked appropriately. Signs and other informational devices may be accepted as donations.

(Senate Report) The NPS should work closely with the States of New Mexico and Arizona in establishing the trail markers, sharing the costs. If petroglyphs on the Albuquerque West Mesa are added to the National Park System, they should be incorporated into the Masau Trail.

Title III - El Malpais National Conservation Area

Establishment of Area

Section 301 Establishes a 262,690-acre National Conservation Area (NCA) to be managed by the Bureau of Land Management (BLM) to protect natural, cultural, scenic, and wilderness resources of national importance.

(Senate Report) The BLM is to erect a ranger station along NM State Road 117.

Management

Section 302(a) The NCA shall be managed according to applicable laws.

(Senate Report) Resource management plans referred to in this act are those required by the Federal Land Policy and Management Act (FLPMA).

Section 302(b) Hunting and trapping are to be permitted in the conservation area, subject to limitations of the State of New Mexico.

Section 302(c) Commercial wood collection is prohibited.

Section 302(d) Livestock grazing will continue.

Title IV - Wilderness

Designation of Wilderness

Section 401 Designates the 60,000-acre Cebolla Wilderness and the 38,210-acre West Malpais Wilderness.

Management

Section 402 Wilderness is to be managed in accordance with the Wilderness Act of 1964, and grazing is allowed to continue.

Title V - General Provisions

Management Plans

Section 501(a) Separate General Management Plans will be prepared for the monument and conservation area within 3 years. Each must include an interpretation and public education plan, a public facilities plan (providing for both a visitor center and a multi-agency orientation center), a natural and cultural resource plan, and a wildlife management plan.

(Senate Report) Cultural resource plans will include wilderness. Appropriate forms of archeological research, including identification, excavation, stabilization, conservation, and protection of cultural resource sites will be permitted. Short-term disturbances resulting from these activities will be rehabilitated. Long-term scientific use of archeological values will conform to the concept that wilderness is devoted to recreational, scenic, scientific, educational, conservational, and historical use.

(House Report) Wilderness is to be included in the cultural resource plans, which will provide for active identification and management of historic properties, including protection of archeological values from looting, vandalism, and artifact collection. Appropriate forms of research and related activities should be permitted in wilderness, including investigation, identification, stabilization, conservation, and protection of cultural resource sites from deterioration by natural forces or vandalism. Research should be conducted so as to minimize impacts, and short-term disturbances resulting from such activities must be rehabilitated. The BLM should consult with the Advisory Council on

Historic Preservation and the State Historic Preservation Officer to establish guidelines for identification, management, and research of historic properties within wilderness. This guidance is consistent with the Wilderness Act. The need to prevent looting and vandalism is stressed, and public support for protection, recognition, and interpretation is noted.

Section 501(b) A 17,500-acre Wilderness Study Area is established. Wilderness potential of this area will be protected until completion of the General Management Plan, which shall include a review of the wilderness suitability of these lands and a recommendation on this subject.

Section 501(c) All roadless areas within the National Monument (except potential development areas) will be reviewed for wilderness suitability, with a recommendation made in the General Management Plan. Pending submission of the recommendation, managers will protect wilderness potential of the areas.

(Senate Report) Protection of wilderness values does not preclude improving access and providing interpretive and recreational facilities in areas currently penetrated by roads.

(Senate and House Reports) The NPS should use the BLM wilderness inventory policy definition of "road" in determining which lands are "roadless." "Potential development areas" may be included in the wilderness suitability study at the discretion of the agency.

(Senate Report) The Department of the Interior is urged to enter into a cooperative agreement with the Department of Defense to locate and clear military ordnance in the monument and conservation area.

(House Report) The Secretary of the Interior is expected to consult with the Secretary of Defense concerning the nature and extent of unexploded ordnance in the monument and conservation area, and the cost and feasibility of removing these materials or protecting the public from them.

Acquisitions

Section 502 The Secretary of the Interior is authorized to acquire lands and interests within the monument and conservation area. Lands owned by the State of New Mexico may be acquired only by exchange. The Congress expects acquisition of subsurface interests to be completed within 3 years.

(Senate and House Reports) Authority to acquire lands and minerals may extend beyond 3 years. Indian trust lands may not be condemned, and Indian lands should only be acquired with the consent of the Indian owners.

State Exchanges

Section 503(a) Upon request by the State of New Mexico, the Secretary is required to exchange state land within the monument or conservation area for equal value parcels elsewhere in the state.

Section 503(b) Within 6 months, the Secretary will identify for the State Land Commissioner those state lands within the monument and conservation area and those federal lands that are available for transfer to the State of New Mexico in exchange. Such listing is to be updated annually. The Congress expects the land exchanges to be completed within 2 years.

(Senate and House Reports) Authority for state exchange may extend beyond 2 years.

Mineral Exchanges

Section 504 The Secretary is directed to exchange approximately 15,000 acres of federal mineral rights identified in the act for approximately 15,000 acres of mineral rights owned by Santa Fe Pacific Industries within the conservation area. Such exchange is to be on the basis of equal value, consistent with FLPMA, and the Secretary must determine that the exchange is in the public interest. The exchange is to be completed within 3 years.

(Senate and House Reports) Authority for the exchange may extend beyond 3 years.

(House Report) The Committee believes that this exchange is in the public interest and intends these provisions to facilitate the exchange, consistent with FLPMA.

Acoma Pueblo Exchanges

Section 505 (Senate and House Reports) Congress intends that the NPS and the BLM be sensitive to needs of Native American groups. Boundaries of the National Monument and Cebolla Wilderness were drawn specifically to allow continued road access to Acoma deeded land. Acoma grazing may continue for 10 years within the monument and indefinitely within the conservation area.

Section 505(a) The Secretary is authorized, at the request of Acoma Pueblo, to exchange certain lands within the conservation area or other lands of equal value outside the conservation area for Acoma trust lands west of NM State Road 117. Lands exchanged to the Acoma shall be held in trust while the acquired lands will be incorporated into the monument.

Section 505(b) Consistent with law and existing land use plans, BLM lands within New Mexico shall be available for exchange.

Section 505(c) Certain identified lands within the conservation area are available for exchange, provided Acoma Pueblo requests exchange within 1 year. Otherwise these public lands are incorporated into the conservation area and certain areas will be included in the Cebolla Wilderness.

(Senate Report) The NPS and the BLM should pursue exchanges before purchasing these lands. All lands within the conservation area need not be consolidated into federal ownership. Power of condemnation will be used to acquire lands in the conservation area only where there is an imminent threat to the purposes for which the conservation area was established. Both agencies should work cooperatively with private land owners and range users to minimize construction of permanent fences and to maintain existing access to private property, where possible.

(House Report) The 1-year deadline for the Acoma exchange involving conservation area lands is intended to minimize potential interference with proper management of the conservation area and wilderness. Additional proposals for transfer of lands in these areas to the Pueblo of Acoma are not considered necessary or desirable.

Exchanges and Acquisitions Generally; Withdrawal

Section 506(a) Generally, exchanges should be on the basis of equal value. However, the Secretary may make exceptions if they are in the public interest.

Section 506(b) "Public Lands" has the same meaning as in FLPMA.

Section 506(c) Lands or interests acquired within the monument or conservation area after enactment of this legislation shall be incorporated into the monument or conservation area.

Section 506(d) No federal lands within the monument or conservation area shall be transferred out of federal ownership or placed in trust, except as provided for in this act. Subject to valid existing rights, federal lands within the monument and conservation area are withdrawn from all forms of entry, appropriation, or disposal and from location, entry, and patent under the mining laws. They are closed to mineral and geothermal leasing.

Section 506(e) Acreages in the act are approximate; referenced maps take precedence over acreage figures.

Section 506(f) The Secretary is authorized to accept land contiguous to Pecos National Monument by donation.

Section 506(g) Capulin Mountain National Monument is redesignated Capulin Volcano National Monument, and other administrative details of records and boundaries of this monument are enacted.

Access

Section 507(a) The Secretary is required to permit access for continued traditional cultural and religious use of the monument and conservation area by Native Americans.

Section 507(b) The Secretary shall request the recommendations of Acoma Pueblo and other Indian tribes about methods of ensuring access, enhancing the privacy of traditional cultural and religious activities, and protecting traditional cultural and religious sites.

Section 507(c) The Secretary may temporarily close to public use specific, limited portions of the conservation area and monument to protect the privacy of the religious activities of Indian people. Written notification of such action must be provided to the Energy and Natural Resources Committee of the Senate, and to the Interior and Insular Affairs Committee of the House, within 7 days after initiation of any such closure.

Section 507(d) An advisory committee including representatives of Acoma, Zuni, other appropriate Indian tribes and other persons or groups may be established to advise the Secretary on these matters.

(Senate and House Reports) The Secretary must consult appropriate Indian tribes and their traditional cultural and religious authorities during preparation of the General Management Plans to determine what the traditional cultural and religious uses have been.

Cooperation

Section 508 The Secretary is authorized and encouraged to cooperate with other agencies and groups to further the interpretation of prehistoric civilizations of New Mexico and eastern Arizona. Specifically, the Secretary is encouraged to cooperate in development of a multi-agency orientation center near Grants, New Mexico.

Water Rights

Section 509 Water rights are reserved for the minimum amount of water needed to carry out the purposes for which the monument, conservation area, and wildernesses were established. This clause shall not affect any existing water right or pending application, and this subsection does not require the NPS to drill wells. Nothing in this action establishes a precedent with regard to future designations, nor does it affect interpretation of any other act or designation.

(Senate Report) The Committee reiterates that reservation of water applies only to this act and should have no bearing on interpretation of any other reserved rights doctrine. The water rights reservation is junior to those of all existing wells and pending applications. No conflicts are anticipated between the federal government's need for water and any valid existing or pending rights.

Authorization

Section 510 This section authorizes $16.5 million for purposes of the act: $10 million for land acquisition in the monument, $1 million for development in the monument, $4 million for land acquisition in the conservation area, $1 million for development in the conservation area, and $500,000 for planning and developing the Masau Trail.

BLM Management Actions Since Establishment of the El Malpais NCA (1986)

APPENDIX B

APPENDIX B

BLM MANAGEMENT ACTIONS SINCE ESTABLISHMENT OF THE EL MALPAIS NCA (1987)

Action [a]	Completion Date(s)
Established staff for NCA; opened temporary information center w/National Park Service (NPS) in Grants.	1988
Established volunteer program to assist w/projects, provide visitor services & help staff information center.	1987
Completed exchanges w/State of New Mexico, New Mexico & Arizona Land Co., & Cerrillos Land Co. to acquire 193,697 acres of mineral estate w/in NCA & National Monument.	1987-90
Completed Land Protection Plan for NCA to guide public realty actions.	1989
Acquired 13,400 acres of surface estate w/in NCA & wilderness by exchange, purchase or donation, plus 14,000 acres contiguous to NCA & Cebolla Wilderness.	1989-94
Inventoried 40,160 acres for cultural resources @ Class II level.	1990
Issued right-of-way to Continental Divide Electric for transmission line to Ranger Station.	1990
Inventoried 320 acres of Cebolla Canyon Prehistoric Community for cultural resources @ Class III level.	1990
Designed, constructed & opened Ranger Station.	1991
Established agreement w/Southwest Natural & Cultural Heritage Association to provide & sell publications @ Ranger Station.	1991
Produced informational video on NCA & published El Malpais Recreation Guide Map.	1991
Inventoried 4,000 acres of Cerritos de Jaspe Unit for cultural resources @ Class II level.	1991
Inventoried & recorded 21 historic homestead sites.	1991
Installed monitoring station; collected air quality, meteorology & soil data as part of Intermountain Wilderness Area Ecosystem Study.	1991-96
Developed Range Improvement Maintenance Plans for Cebolla Wilderness & West Malpais Wilderness.	1991
Completed 5-year intensive monitoring of six I-category (Improve) grazing allotments in NCA.	1991
Completed ecological site inventory on Techado Mesa & Los Pilares grazing allotments.	1991
Reclassified Bright's Well Allotment from M (Maintain) to C (Custodial) category.	1991

APPENDIX B (concl'd)

Action [a]	Completion Date(s)
Developed & paved La Ventana Natural Arch parking lot, installed portable toilets & improved trail.	1988-91
Fenced five historic homesteads.	1991-93
Issued joint decision w/U.S. Forest Service (USFS) on location of Continental Divide National Scenic Trail.	1992
Inventoried 760 acres of Armijo Canyon Prehistoric Community for cultural resources @ Class III level.	1992
Completed site stabilization project @ Armijo Canyon Homestead & Springhouse.	1992
Issued grazing decisions for six I-category allotments.	1992
Maintained 48 miles of roads in NCA.	1992-93
Designed & developed interpretive displays for Ranger Station.	1993
Completed brochures for West Malpais Wilderness & Chain of Craters Back Country Byway; dedicated byway.	1993
Completed stabilization project @ Dittert Site.	1993
Issued right-of-way to USFS for portion of FS Road #50.	1993
Completed management plans for Techado Mesa & Los Pilares grazing allotments.	1993
Developed Limits of Acceptable Change (LAC) standards for recreation & wilderness.	1993
Constructed protective riparian pasture @ Cebolla Spring w/assistance from students at Southwestern Indian Polytechnic Institute.	1994
Installed vault toilets @ La Ventana Natural Arch.	1995
Completed emergency stabilization project @ Stone House in Cebolla Canyon.	1995
Issued commercial recreation permits to South Mountain Wilderness Tours & Curt Farmer Pack Llamas, who may conduct day & overnight hiking, mule or llama treks w/in NCA.	1995
Los Amigos del Malpais built two wilderness barricades, maintained trail @ La Ventana Natural Arch, & planted demonstration garden @ Ranger Station.	1995

Note: [a] Many of these actions were completed with significant help from Los Amigos del Malpais and other volunteer organizations. Further information is available at the Albuquerque Field Office.

RECREATION OPPORTUNITY SPECTRUM

APPENDIX C

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RECREATION OPPORTUNITY SPECTRUM

INTRODUCTION

The goal of the recreationist is to have satisfying leisure experiences by participating in preferred activities in favorable environmental settings. Opportunities for achieving satisfying experiences depend on natural elements such as vegetation, landscape and scenery, and conditions controlled by land-management agencies, such as developed sites, roads and regulations. The goal of the recreation resource manager then becomes to provide the opportunities to obtain such experiences by managing the natural setting and the activities within it.

The Recreation Opportunity Spectrum (ROS) is the BLM's framework to inventory, plan and manage recreational opportunities. The ROS is divided into six classes, ranging from essentially natural, low-use areas (resource-dependent recreational opportunities) to highly developed, intensive use areas (facility/vehicle-dependent recreational opportunities). Each class is defined in terms of three principal components: the environmental setting, the activities possible, and the experiences that can be achieved.

The primary factor in determining ROS classes is the setting. This describes the overall outdoor environment in which activities occur, influences the types of activities, and ultimately determines the types of recreation that can be achieved.

Activities are not completely dependent on opportunity class, and most can take place in some form throughout the spectrum. However, general activities can be characterized for each ROS class. For each person, her/his recreational experience depends on the environmental setting and individual differences based on background, education, sex, age and place of residence.

RECREATION OPPORTUNITY SETTINGS

The ROS encompasses a variety of recreational settings under which certain experiences are possible. Seven elements provide the basis to inventory and delineate recreational settings. These are: access, remoteness, naturalness, facility and site management, visitor management, social encounters, and visitor impacts.

Access--Includes the mode of travel used within the area and influences both the level and type of recreational use an area receives.

Remoteness--Concerns the extent to which individuals perceive themselves removed from human activity. Vegetation or topographic variation can increase this sense of remoteness. Lack of remoteness is important for some recreational experiences.

Naturalness--Concerns the varying degrees of human modification of the environment. Often described in terms of scenic quality influenced by the degree of alteration of the natural landscape.

Site Management--Refers to the level of site development. Lack of site modifications can facilitate feelings of self-reliance and naturalness, while highly developed facilities can enhance comfort and increase the opportunity to meet and interact with others.

Visitor Management--Includes both regulation and control of visitors as well as providing them with information and services. A continuum of visitor management can be described, ranging from subtle techniques such as site design, to strict rules and regulations. In some recreational settings controls are expected and appropriate; in others, onsite controls detract from the desired experience.

Social Encounters--Involve the number and type of others met in the recreation area. Also measures the extent to which an area provides experiences for solitude or social interaction.

Visitor Impacts--Affect natural resources such as soil, vegetation, air, water and wildlife. Even low levels of use can produce significant ecological impacts, and these impacts can influence the visitor's experience.

RECREATION OPPORTUNITY CLASSES

Based on the seven elements described above, six recreation opportunity classes have been developed and are described below. Reclassification of lands can occur in response to alternative management prescriptions.

Primitive

This setting is characterized by a large-sized area of about 5,000 acres or more, lying at least 3 miles from the nearest point of motor vehicle access. It is essentially an unmodified natural landscape, with little evidence of others and almost no onsite management controls. Activities include overnight backpack camping, nature study and photography, back-country hunting, horseback riding, and hiking. The experience provides visitors with a chance to achieve solitude and isolation from human civilization, feel close to nature, and encounter a greater degree of personal risk and challenge.

Semi-Primitive Nonmotorized

This setting consists of about 2,500 acres lying at least ½ mile from the nearest point of motor vehicle access. The area is predominantly a natural landscape. Where there is evidence of others, interaction is low, and few management controls exist. Activities include backpack camping, nature viewing, back-country hunting (big game, small game, and upland birds), climbing, hiking, and cross-county skiing. The experience provides for minimal contact with others, a high degree of interaction with nature and a great deal of personal risk and challenge.

Semi-Primitive Motorized

This setting consists of about 2,500 acres within ½ mile of primitive roads and two-track vehicle trails. The area has a mostly natural landscape with some evidence of others (but numbers and frequency of contact seem to remain low) and few management controls. Activities include hunting, climbing, vehicle trail riding, back-country driving, mountain biking, hiking, and snowmobiling. The experience provides for isolation from human civilization, a high degree of interaction with the natural environment and a moderate degree of personal risk and challenge.

Roaded Natural

This setting consists of areas near improved and maintained roads. While these areas are mostly natural in appearance, some human modifications are evident, with moderate numbers of people, visible management controls and developments. Activities include wood gathering, downhill skiing, fishing, off-highway vehicle driving, interpretive uses, picnicking, and vehicle camping. The experience provides for a sense of security through the moderate number of visitors and developments, some personal risk-taking and challenges.

Rural

This setting is characterized by a substantially modified natural environment. Resource modification, development and use are obvious. Human presence is readily evident, and interaction between users is often moderate to high. Activities consist mostly of facility/vehicle-dependent recreation and generally include vehicle sightseeing, horseback riding, on-road biking, golf, swimming, picnicking, and outdoor games. The experience provides for modern visitor conveniences, moderate to high levels of interactions with others, and a feeling of security from personal risk.

Urban

This setting consists of areas near paved highways, where the natural landscape is dominated by human modifications. Large numbers of users can be expected. Sights and sounds of others dominate, while management controls are numerous. Activities are facility/vehicle-dependent and include concerts, wave pools, amusement parks, zoos, vehicle racing facilities, spectator sports and indoor games. The experience provides for numerous modern conveniences, large numbers of people, interaction with an exotic and manicured environment, and a feeling of high personal security.

MANAGEMENT OBJECTIVES FOR ROS CLASSES

Objectives for a specific class contain minimum guidelines and standards as well as directions

concerning the type of activities, physical and social settings, and recreational opportunities to be managed for.

Primitive

The primitive class is managed to be essentially free from evidence of humans and onsite controls. Motor vehicle use within the area is not permitted. The area is managed to maintain an extremely high probability of experiencing isolation from others (not more than three to six encounters per day) and little to no managerial contact. Independence, closeness to nature, self-reliance and an environment that offers a high degree of challenge and risk characterize this class. Back-country use and management of renewable resources is subject to the protection of back-country recreational values.

Semi-Primitive Nonmotorized

Semi-primitive nonmotorized areas are managed to be largely free from the evidence of humans and onsite controls. Motor vehicle use is not permitted (except as authorized). Facilities for the administration of livestock and for visitor use are allowed but limited. Project designs stress the protection of natural values and maintenance of the predominantly natural environment. Areas are managed to maintain a good probability of experiencing minimum contact with others, self-reliance through the application of back-country skills, and an environment that offers a high degree of risk and challenge.

Back-country use and management of renewable resources are dependent on maintaining naturally occurring ecosystems. The consumption of renewable resources is subject to the protection of back-country recreational values.

Semi-Primitive Motorized

These areas are managed to provide a natural-appearing environment. Evidence of humans and management controls are present but subtle.

Motor vehicle use is allowed, but the concentration of users should be low. Onsite interpretive facilities, low-standard roads and trails, trailheads, and signs should stress the natural environment and be the minimum necessary to achieve objectives.

The consumption of natural resources is allowed. Effort is taken to reduce the impact of utility corridors, rights-of-way, and other surface- disturbing projects on the natural environment. Frequency of managerial contact with visitors is low to moderate.

Roaded Natural

Roaded natural areas are managed to provide a natural appearing environment with moderate evidence of humans. Motor vehicle use is permitted and facilities for this use are provided. Concentration of users is moderate with evidence of others prevalent. Resource modification and use practices are evident but harmonize with the natural environment.

Placement of rights-of-way, utility corridors, management facilities, and other surface-disturbing activities would be favored here over placement in semi-primitive nonmotorized and semi-primitive motorized areas. The consumption of natural resources is allowed except at developed trailheads, developed recreational areas and sites, and where geological, cultural, or natural interests prevail. Frequency of managerial contact with visitors is moderate.

Rural

Rural areas are managed to provide a setting that is substantially modified with moderate to high evidence of civilization. Motor vehicle use is permitted. Concentration of users is often high with substantial evidence of others. Resource modification and use practices are mostly dominant in a somewhat manicured environment. Standards for road, highway, and facility development are high for user convenience. Frequency of managerial contact with visitors is moderate to high.

Urban

Urban areas are managed to provide a setting that is largely modified. Large numbers of users can be expected, and vegetation cover is often exotic and manicured. Facilities for highly intensified motor vehicle use and parking are available, with mass transit often included to carry people throughout the site. The probability for encountering other individuals and groups is prevalent, as is the convenience of recreational opportunities. Experiencing natural environments and their challenges and risks is relatively unimportant. Opportunities for competitive and spectator sports are common.

LIMITS OF ACCEPTABLE CHANGE

APPENDIX D

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LIMITS OF ACCEPTABLE CHANGE

INTRODUCTION

As developed by George Stankey and others (1985), using Limits of Acceptable Change (LAC) is a process that requires deciding what kinds of conditions are acceptable in recreational settings, then prescribing actions to protect or achieve those conditions. The objective of the LAC system is not to prevent change but rather to control it, and to decide what management actions are required to maintain or enhance the desired conditions.

The LAC process consists of four major components: (1) specifying acceptable and achievable resource and social conditions, defined by a series of measurable parameters, (2) analyzing of the relationships between existing conditions and those judged acceptable, (3) identifying management actions necessary to achieve these conditions, and (4) a program of monitoring and evaluating management effectiveness. These four components are broken down into nine steps to ease application. Each of the nine steps is designed to achieve a particular task and provide the basis for later activities.

By following the LAC process, manager with public input identify issues and concerns that need to be resolved through the land use planning and environmental assessment processes. First they define opportunity classes, select resource and social indicators, and inventory the planning area to determine current indicator status. After this inventory, managers specify standards for the indicators within each opportunity class. The management actions needed to maintain resource and social indicators within these standards are written as prescriptions. (These may vary by alternative.) The final phase involves monitoring the indicators and comparing the results against previous measurements and acceptable standards to see if the objectives are being achieved or maintained to the desired standard. Unacceptable change signals the need for corrective management action.

THE ROLE OF OPPORTUNITY CLASSES

When an area contains a diversity of physical and biological features and uses, subdivisions or opportunity classes can be applied. Within diversified areas, the type of management needed is expected to vary throughout. Opportunity classes delineate zones where different resources, social and managerial conditions will be maintained. Map D displays the four opportunity classes set for the El Malpais National Conservation Area in 1993.

THE ROLE OF INDICATORS

BLM managers will monitor how much change is occurring in the El Malpais NCA. They will need to look at the indicators, which are specific elements of the NCA setting that change in response to human activities.

Indicators provide quantitative documentation on how much conditions have changed, serve as tools to examine trends and highlight problems, and can act as an early warning to predict future conditions. When compared with standards that describe the acceptable limits of change, indicators can signal the need for corrective action, evaluate the effectiveness of management actions, and help determine if desired NCA conditions are being achieved.

Criteria For Indicator Selection

Quantitative --Can the indicator be measured?

Correlated--Does the indicator detect a change in conditions caused by humans?

Feasible--Can the indicator be measured using simple equipment and sampling techniques?

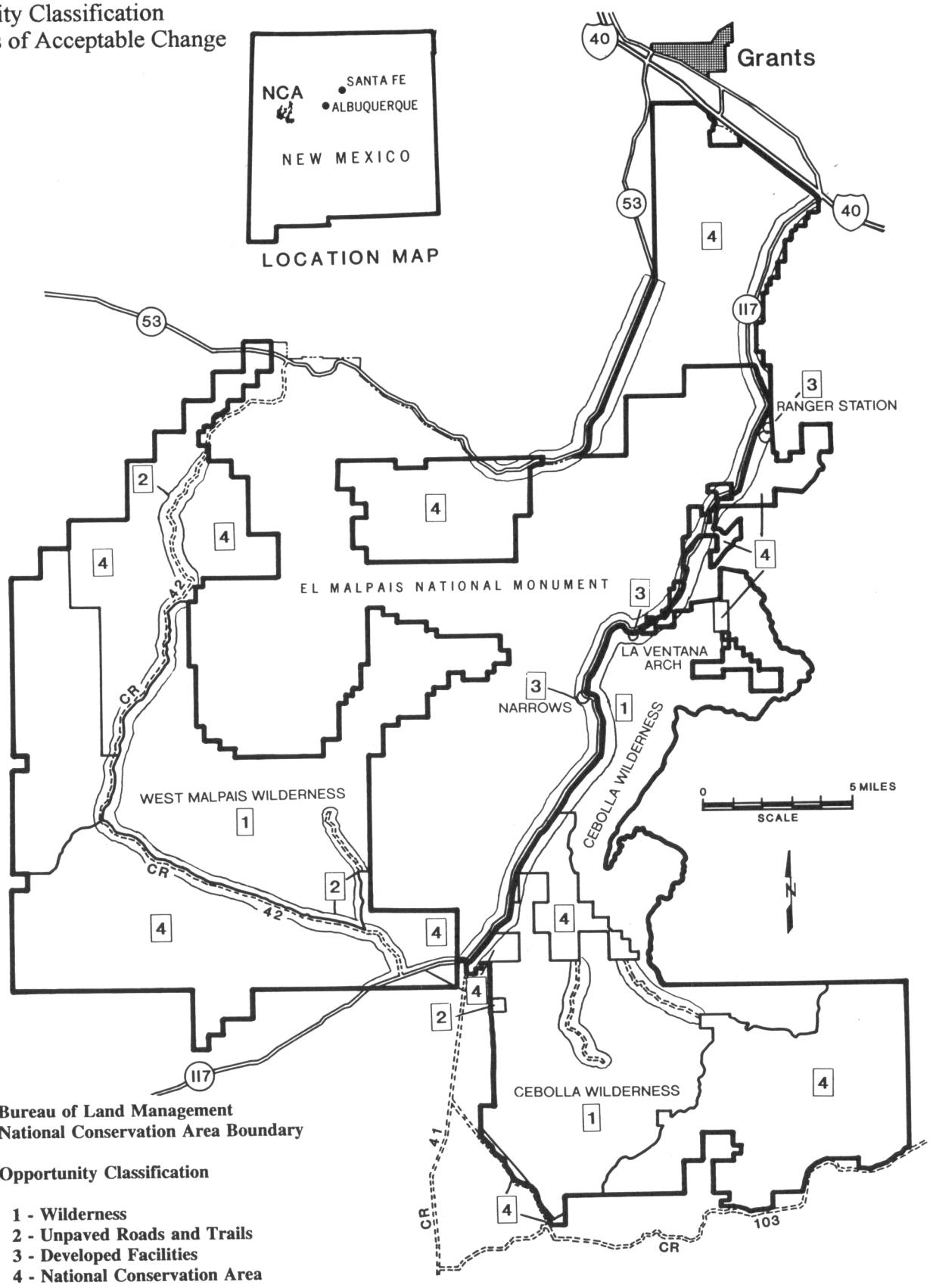
Reliable--Can the indicator be measured consistently (i.e., will different observers collect the same information)?

Responsive --Does the indicator detect a change in conditions in response to management control?

Sensitive --Can the indicator detect a change in conditions that occur within a year?

Map D

Opportunity Classification for Limits of Acceptable Change



Bureau of Land Management National Conservation Area Boundary

Opportunity Classification

1 - Wilderness
2 - Unpaved Roads and Trails
3 - Developed Facilities
4 - National Conservation Area

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by BLM. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notificatio

Integrated--Does the indicator reflect the conditions of more elements than itself?

Early Warning Ability--Does the indicator act as an early warning, alerting managers to deteriorating conditions before unacceptable changes have occurred?

Significance--Does the indicator detect a change in conditions that persist for a long time (e.g., 5 years), disrupts ecosystem functioning, or reduces the future desirability of the area for visitors, researchers, grazing allottees, and other NCA users?

THE ROLE OF STANDARDS

Standards provide a way to monitor existing and future conditions against those defined as acceptable. They establish (quantitatively, qualitatively, and judgmentally) the range of conditions or "limits of acceptable change" for each indicator.

WHY MONITOR?

The designation of an area as an NCA does not ensure that desired conditions will be protected, or opportunities will exist for visitors to obtain a positive recreational or wilderness experience. However, the desired NCA conditions for which the BLM strives and monitors include:

- Air quality maintained at levels that meet or exceed federal and state standards.
- Water quality maintained at levels that protect aquatic ecosystems, and drinking water free from fecal contamination.
- Wildlife and plant species in natural distributions and abundances
- Outstanding opportunities for diverse recreational experience within a natural setting.
- Outstanding opportunities in wilderness for solitude, challenge, self-reliance, primitive and unconfined recreation, and scientific study.
- Natural processes operating freely in wilderness.
- The imprint of human activities substantially unnoticeable in wilderness.

Various uses will inevitably cause some change in NCA conditions. Recreational use, transportation and trail systems, livestock grazing, fire suppression, exotic species introduction, air pollution, crowding, littering and excessive regulation all can threaten the values the NCA was designated to conserve. However, change does not necessarily have to be bad. Under careful observation, some existing conditions need to change to become acceptable.

Steps in a Monitoring Program

1. Describe the area's natural and human characteristics. Identify unique area attributes. Gather all available data.
2. Identify human activities that impact conditions. Identify issues and concerns.
3. Define goals and objectives that reflect the desired NCA conditions.
4. Select indicators of environmental and experiential conditions.
5. Describe sampling and measurement methods for each indicator.
6. Specify standards for acceptable limits of change for each indicator.
7. Inventory indicator conditions and compare with standards.
8. Identify management actions in areas where conditions need to be brought up to standard.

NCA Monitoring Forms

The El Malpais NCA has been divided into four opportunity classes, as shown on Map D. Within each class, key monitoring locations have been identified. A standard form has been developed for each class to ensure consistency of data and decrease subjectivity. The following forms used for data collection show selected indicators, standards, sampling methods for collecting information, monitoring locations, and corrective actions to be taken when standards are exceeded for each opportunity class.

TABLE D-1

REVISED 6/95

I	EL MALPAIS NATIONAL CONSERVATION AREA--LIMITS OF ACCEPTABLE CHANGE						
ELEMENT	**MONITORING LOCATIONS**	**INDICATORS**	**STANDARDS**	**VISUAL MONITORING**	**PHOTO-MONITORING**	**ACTIONS (based on present condition)**	**OBSERVER RECOMMENDATIONS**
Opportunity Classification I Wilderness Unmodified natural environment, surface disturbance small; trails acceptable; no motorized vehicles; no facilities for user convenience; little evidence of previous recreation use. Compare with baseline photos & data (observations)	Proposed Narrows Rim Trail (Cebolla Wilderness) Armijo Canyon (Cebolla Wilderness) Homestead Canyon (Cebolla Wilderness)	Number/distribution of campsites	2 campsites visible within 300 feet of each campsite	Establish baseline data collection Visual observation of 100% for each site, 1 time/year Once during high-use period, May-September or hunting season	Establish baseline inventory photos Establish 1 photo point/site where standard was exceeded Photo-monitor sites 1 time/year	Use "Leave No Trace" ethics Increase patrols Increase interpretive effort using brochures, guided tours Sign trailheads & access points outside wilderness boundary Restrict areas for rehabilitation Remove undesired fire rings Collect trash	Date: Time: Observer:
		Fire-ring density	One fire-ring/ campsite				
		Number of encounters with other groups/day	80% probability during all use periods of <3 other groups encountered/ day while traveling along trails				
		Group size	80% probability during all use periods of <6 persons/group encountered/day while traveling along trails				
		Number of unauthorized trails (leading to Narrows Rim Trail)	2 distinct trails from designated trail (leading to Narrows Rim Trail)				
		Vegetative loss	Bare mineral soil 100 sq. ft. at desired campsites				
		Trail erosion	Location of erosion or gullying 1 ft. /¼ mile				

TABLE D-2

REVISED 6/95

II	EL MALPAIS NATIONAL CONSERVATION AREA--LIMITS OF ACCEPTABLE CHANGE						
ELEMENT	**MONITORING LOCATIONS**	**INDICATORS**	**STANDARDS**	**VISUAL MONITORING**	**PHOTO-MONITORING**	**ACTIONS (based on present condition)**	**OBSERVER RECOMMENDATIONS**
Opportunity Classification II Unpaved roads & trails Frequency of contact is low to moderate on unpaved roads & trails; primitive roads & motorized use are present; small isolated structures may be present; surface disturbance is limited & small. Compare with baseline photos & data (obser-vations)	Hole-in-the-Wall Cherry-Stemmed Road & Trailhead Dittert Site & Trailhead CR 42	Unauthorized trails	2 distinct trails from designated trail	Establish baseline data collection Visual observation of 100% for each site, 1 time/year Once during high-use period, May-September or hunting season	Establish baseline inventory photos Establish 1 photo point/site where standard was ex-ceeded Photo-monitor sites 1 time/year	Use "Leave No Trace" ethics & interpretive programs Increase BLM patrols Increase signing Law enforcement actions Restrict areas for rehabilitation Contact County Highway Department for road maintenance (CR 42) Notify public at Ranger Station & Grants Field Station on road conditions for CR 42	Date: Time: Observer:
		Number of com-plaints concerning road or trail conditions	10 complaints /year				
		Road conditions presenting safety hazard (potholes, ruts)	Seasonally monitor road conditions annually				
		Damage to ROW, poor weather conditions	Notify County Highway Department for maintenance (CR 42)				

TABLE D-3

REVISED 6/95

III	EL MALPAIS NATIONAL CONSERVATION AREA--LIMITS OF ACCEPTABLE CHANGE						
ELEMENT	**MONITORING LOCATIONS**	**INDICATORS**	**STANDARDS**	**VISUAL MONITORING**	**PHOTO-MONITORING**	**ACTIONS (based on present condition)**	**OBSERVER RECOMMENDATIONS**
Opportunity Classification III Developed facilities Developed recreational facilities; facilities available for user conven-ience; frequency of contact is moderate to high in developed sites & on roads & trails; onsite controls obvious & numerous. Compare with baseline photos & data (obser-vations)	Trail at La Ventana Natural Arch Narrows Picnic Area	Trail width	Width 12 inches over design trend	Establish baseline inventory data collection Visual observation of 10% for each facility, 3 times /year 3 times during high- use period, May-September or hunting season	Establish baseline inventory photos Establish 1 photo point/site where standard was ex-ceeded Photo-monitor sites 1 time/year	Use "Leave No Trace" ethics & interpretive programs Increase BLM patrols Establish “Public Land Watch” Program Increase signing Rehabilitate area or restrict areas for rehabilitation Law enforcement actions Issue permits for visitor use or reservations for Ranger Station programs Keep records/data of vandalism	Date: Time: Observer:
		Trail erosion	2 locations of erosion or gullying 1 ft./¼ mi.				
		Unauthorized trails	2 distinct trails from designated trail				
		Number of incidents of vandalism	5 incidents of vandalism/facility				
		Vegetation tram-pled or disturbed that does not re-cover annually	25% vegetation trampled or disturbed when compared with adjacent undisturbed area				

TABLE D-4

REVISED 6/95

IV	EL MALPAIS NATIONAL CONSERVATION AREA--LIMITS OF ACCEPTABLE CHANGE						
ELEMENT	**MONITORING LOCATIONS**	**INDICATORS**	**STANDARDS**	**VISUAL MONITORING**	**PHOTO-MONITORING**	**ACTIONS (based on present condition)**	**OBSERVER RECOMMENDATIONS**
Opportunity Classification IV National Conservation Area Facilities for user safety & resource protection; limited evidence of previous recreation use; low to moderate frequency of contact; primitive roads & motorized use are present. Compare with baseline photos & data (observations)	Sand Canyon Road Chain of Craters WSA (Cerro Piedrita, Cerro Lobo, Cerro Chato) Cerro Rendija	Number of pieces of trash	25 pieces of trash/location	Establish baseline data collection Visual observation of each site, minimum 1 time/year Once during high-use period, May-September or hunting season	Establish baseline inventory photos Establish 1 photo point/site where standard was exceeded Photo-monitor sites 1 time/year	Use "Leave No Trace" ethics & interpretive programs Increase BLM patrols Law enforcement action Restrict areas for rehabilitation or repair Operation Respect during hunting season	Date: Time: Observer:
		Number/distribution of campsites	3 campsites visible within 300 ft. of each campsite				
		Number of unauthorized roads	2 distinct unauthorized roads from designated road in BLM road inventory				
		Vegetative loss	Base mineral soil 400 sq. ft. at established campsites				

VISUAL RESOURCE MANAGEMENT CLASSES & OBJECTIVES

APPENDIX E

APPENDIX E

VISUAL RESOURCE MANAGEMENT CLASSES AND OBJECTIVES

The overall objective of Visual Resource Management (VRM) is to manage public lands administered by the Bureau of Land Management (BLM) in a manner that will protect the quality of the visual (scenic) values in accordance with Section 102(a)(8) of the Federal Land Policy and Management Act of 1976. The VRM system uses a methodical approach to inventory and manage the scenic resources of the public lands. It provides a way to identify visual (scenic) values, to establish management objectives through the Resource Management Planning process or on a case-by-case basis, and to provide timely input into proposed surface-disturbing projects.

The visual resource inventory process (BLM Manual H-8410-1) provides the BLM with a means of determining visual values. The inventory consists of a scenic quality evaluation, a sensitivity level analysis, and a delineation of distance zones. Based on these factors, BLM-administered lands are placed into one of four VRM classes.

Class I, the most highly valued, is assigned to those areas where decisions have been made to maintain a natural landscape. This includes areas such as national wilderness, the wild component of a Wild and Scenic River, scenic Areas of Critical Environmental Concern, and other congressionally and administratively designated areas.

Classes II, III, and IV are assigned based on a combination of scenic quality, sensitivity level, and distance. The specific VRM class objectives provide the standards for planning, designing and evaluating actions.

The Visual Contrast Rating System (Manual Section 8431) provides a methodical way to evaluate activities and determine whether they conform with the approved VRM objectives. The degree of contrast is measured in terms of the basic elements of form, line, color, and texture in the predominant natural features of the characteristic landscape.

The VRM classes and their management objectives are as follows.

Class I. To preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II. To retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must mimic the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III. To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should mimic the basic elements found in the predominant natural features of the characteristic landscape.

Class IV. To provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be a major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.

WILDLIFE SPECIES KNOWN OR POTENTIALLY OCCURRING WITHIN CIBOLA COUNTY (EL MALPAIS PLANNING AREA)

APPENDIX F

APPENDIX F

WILDLIFE SPECIES KNOWN OR POTENTIALLY OCCURRING WITHIN CIBOLA COUNTY (EL MALPAIS PLANNING AREA)

Common Name	Scientific Name	Status [a]
Mammals		
Abert's squirrel	Sciurus aberti	
badger	Taxidea taxus	
banner-tailed kangaroo rat	Dipodomys spectabilis	
big brown bat	Eptesicus fuscus	
big free-tailed bat	Nyctinomops macrotis	SC/BS
black bear	Ursus americanus	
black-footed ferret	Mustela nigripes	FE
black-tailed jack rabbit	Lepus californicus	
bobcat	Lynx rufus	
Botta's pocket gopher	Thomomys bottae	
brush mouse	Peromyscus boylii	
Cebolleta southern pocket gopher	Thomomys umbrinus paquatae	SC/BS
cliff chipmunk	Eutamias dorsalis	
Colorado chipmunk	Eutamias quadrivattatus	
coyote	Canis latrans	
deer mouse	Peromyscus maniculatus	
desert cottontail	Sylvilagus audubonii	
Eastern cottontail	Sylvilagus floridanus	
elk	Cervus elphus	
fringed myotis	Myotis thysanodes	SC/BS
gray fox	Urocyon cinereoargenteus	
Gunnison's prairie dog	Cynomys gunnisoni	
hoary bat	Lasiurus cinereus	
long-eared myotis	Myotis evotis	SC/BS
long-legged myotis	Myotis volans	SC/BS
meadow vole	Microtus pennsylvanicus	
Mexican free-tailed bat	Tadarida brasiliensis	
Mexican woodrat	Neotoma mexicana	
mountain lion	Felis concolor	
mule deer	Odocoileus hemionus	
Northern grasshopper mouse	Onychomys leucogaster	
occult little brown bat	Myotis lucifugus occultus	SC/BS
Ord's kangaroo rat	Dipodomys ordii	
pallid bat	Antrozous pallidus	
piñon mouse	Peromyscus truei	
porcupine	Erethizon dorsatum	
Plains pocket mouse	Perognathus flavescens	
pronghorn antelope	Antilocapra americana	
raccoon	Procyon lotor	
red squirrel	Tamiasciurus hudsonicus	
ringtail	Bassaricus astutus	
rock mouse	Peromyscus difficilis	
rock squirrel	Spermophilus variegatus	
silky pocket mouse	Perognathus flavus	
silver-haired bat	Lasionycteris noctivagans	

Common Name	Scientific Name	Status [a]
Mammals, concl'd		
small-footed myotis	Myotis ciliolabrum	SC/BS
Southern Plains woodrat	Neotoma micropus	
spotted bat	Euderma maculatum	SC/BS/ST
spotted ground squirrel	Spermophilus spilosoma	
spotted skunk	Spilogale gracilis	
Stephen's woodrat	Neotoma stephensi	
striped skunk	Mephitis mephitis	
Western pipistrelle	Pipistrellus hesperus	
Western harvest mouse	Reithrodontomys megalotis	
white-throated woodrat	Neotoma albigula	
Yuma myotis	Myotis yumanensis	SC/BS
Birds		
American avocet	Recurvirostra americana	
American bittern	Botaurus lentiginosus	
American coot	Fulica americana	
American crow	Corvus brachyrhynchos	
American kestrel	Falco sparverius	
American peregrine falcon	Falco peregrinus anatum	***SC***/SE
American robin	Turdus migratorius	
American wigeon	Anas americana	
acorn woodpecker	Melanerpes formicivorus	
Arctic peregrine falcon	Falco peregrinus tundrius	***SC***
ash-throated flycatcher	Myiarchus cinerascens	
bald eagle	Haliaeetus leucocephalus	FT/ST
band-tailed pigeon	Columba fasciata	
bank swallow	Riparia riparia	
barn owl	Tyto alba	
barn swallow	Hirundo rustica	
belted kingfisher	Ceryle alcyon	
Bendire's thrasher	Toxostoma bendirei	
Bewick's wren	Thryomanes bewickii	
black-billed magpie	Pica pica	
black-chinned hummingbird	Archilochus alexandri	
black-headed grosbeak	Pheucticus melanocephalus	
black-throated gray warbler	Dendroica nigriscens	
black-throated sparrow	Amphispiza bilineata	
blue-gray gnatcatcher	Polioptila caerulea	
blue-winged teal	Anas discors	
Brewer's blackbird	Euphagus cyanocephalus	
Brewer's sparrow	Spizella breweri	
broad-tailed hummingbird	Selasphorus platycercus	
brown creeper	Certhia americana	
brown-headed cowbird	Molothrus ater	
bufflehead	Bucephala albeola	
Bullock's oriole	Icterus bullockii	
burrowing owl	Athene cunicularia gypugea	SC/BS
bushtit	Psaltriparus minimus	
canvasback	Aythya valisineria	

Common Name	Scientific Name	Status [a]
Birds, cont'd		
canyon towhee	Pipilo fuscus	
canyon wren	Catherpes mexicanus	
Cassin's finch	Carpodacus cassinii	
Cassin's kingbird	Tyrannus vociferans	
Cassin's sparrow	Aimophila cassinii	
Chihuahuan raven	Corvus cryptoleucus	
chipping sparrow	Spizella passerina	
cinnamon teal	Anas cyanoptera	
Clark's nutcracker	Nucifraga columbiana	
cliff swallow	Hirudo pyrrhonota	
common goldeneye	Bucephala clangula	
common nighthawk	Chordeiles minor	
common poorwill	Phalaenoptilus nuttallii	
common raven	Corvus corax	
common snipe	Gallinago gallinago	
common yellowthroat	Geothlypis trichas	
Coopers's hawk	Accipiter cooperii	
crissal thrasher	Toxostoma crissale	
curve-billed thrasher	Toxostoma curvirostre	
dark-eyed junco	Junco hyemalis	
downy woodpecker	Picoides pubescens	
dusky flycatcher	Empidonax oberholseri	
European starling	Sturnus vulgaris	
ferruginous hawk	Buteo regalis	SC/BS
flammulated owl	Otus flammeolus	
Gamble's quail	Callipepla gambelii	
gadwall	Anas strepera	
golden eagle	Aquila chrysaetos	
Grace's warbler	Dendroica gracaei	
gray-breasted jay (see Mexican jay)		
gray catbird	Dumatella carolinensis	
gray vireo	Vireo vicinior	ST
gray flycatcher	Empidonax wrightii	
great blue heron	Ardea herodias	
great horned owl	Bubo virginianus	
greater roadrunner	Geococcyx californianus	
green-tailed towhee	Pipilo chlorurus	
green-winged teal	Anas crecca	
Hammond's flycatcher	Empidonax hammondii	
hepatic tanager	Piranga flava	
hermit thrush	Catharus guttatus	
horned lark	Eremophila alpestris	
house finch	Carpodacus mexicanus	
house wren	Troglodytes aedon	
indigo bunting	Passerina cyanea	
killdeer	Charadrius vociferus	
ladder-backed woodpecker	Picoides scalaris	
lazuli bunting	Passerina amoena	
least sandpiper	Calidris minutilla	
lesser goldfinch	Carduelis psaltria	

Common Name	Scientific Name	Status [a]
Birds, cont'd		
lesser nighthawk	Chordeiles acutipennis	
Lewis' woodpecker	Melanerpes lewis	
loggerhead shrike	Lanius ludovicianus	SC/BS
long-eared owl	Asio otus	
MacGillivray's warbler	Oprornis tolmiei	
mallard	Anas platyrhynchos	
marsh wren	Cistothorus palustris	
merlin	Falco columbarius	
mountain bluebird	Sialia currucoides	
mountain chickadee	Parus gambeli	
mountain plover	Charadrius montanus	***PT***
mourning dove	Zenaida macroura	
Mexican jay (gray-breasted jay)	Aphelocoma ultramarina	
Mexican spotted owl	Strix occidentalis	FT
Northern flicker	Colaptes auratus	
Northern goshawk	Accipiter gentilis	SC/BS
Northern harrier	Circus cyaneus	
Northern mockingbird	Mimus polyglottos	
Northern oriole (see Bullock's oriole)		
Northern pygmy owl	Glaucidium gnoma	
Northern pintail	Anas acuta	
Northern rough-winged swallow	Stelgidopteryx serripennis	
Northern saw-whet owl	Aegolius acadicus	
Northern shoveler	Anas clypeata	
orange-crowned warbler	Vermivora celata	
phainopepla	Phainopepla nitens	
pine siskin	Carduelis pinus	
piñon jay	Gymnorhinus cyanocephalus	
plain titmouse	Parus inornatus	
prairie falcon	Falco mexicanus	
pygmy nuthatch	Sitta pygmaea	
red-breasted nuthatch	Sitta canadensis	
red crossbill	Loxia curvirostra	
red-tailed hawk	Buteo jamaicensis	
red-winged blackbird	Agelaius phoeniceus	
rock dove	Columba livia	
rock wren	Salpinctes obsoletus	
rough-legged hawk	Buteo lagopus	
ruby-crowned kinglet	Regulus calendula	
ruddy duck	Oxyura jamaicensis	
rufous-crowned sparrow	Aimophila ruficeps	
rufous hummingbird	Selasphorus rufus	
rufous-sided towhee (see spotted towhee)		
sage sparrow	Amphispiza belli	
sage thrasher	Oreoscoptes montanus	
savannah sparrow	Passerculus sandwichensis	
Say's phoebe	Sayornis saya	
scaled quail	Callipepla squamata	
Scott's oriole	Icterus parisorum	
scrub jay (see Western scrub jay)		

Common Name	Scientific Name	Status [a]
Birds, concl'd		
sharp-shinned hawk	Accipiter striatus	
snowy egret	Egretta thula	
solitary sandpiper	Tringa solitaria	
solitary vireo	Vireo solitarius	
song sparrow	Melospiza melodia	
sora rail	Porzana carolina	
Southwestern willow flycatcher	Empidonax traillii extimus	FE/ST
spotted sandpiper	Actitis macularia	
spotted towhee (rufous-sided towhee)	Pipilo maculatus (Pipilo erythrophthalmus)	
Steller's jay	Cyanocitta stelleri	
Swainson's hawk	Buteo swainsoni	
Townsend's solitaire	Myadestes townsendi	
Townsend's warbler	Dendroica townsendi	
turkey vulture	Cathartes aura	
vesper sparrow	Poocetes gramineus	
Virginia rail	Rallus limicola	
Virginia's warbler	Vermivora virginiae	
warbling vireo	Vireo gilvus	
Western bluebird	Sialia mexicana	
Western kingbird	Tyrannus verticalis	
Western meadowlark	Sturnella neglecta	
Western screech owl	Otus kennicotti	
Western scrub-jay (scrub jay)	Aphelocoma californica (Aphelocoma coerulescens)	
Western tanager	Piranga ludoviciana	
Western wood-pewee	Contopus sordidulus	
whip-poor-will	Caprimulgus vociferus	
white-breasted nuthatch	Sitta carolinensis	
white-crowned sparrow	Zonotrichia leucophrys	
white-throated swift	Aeronautes saxatalis	
wild turkey	Meleagris gallopavo	
Williamson's sapsucker	Sphyrapicus thyroideus	
Wilson's phalarope	Phaleropus tricolor	
yellow-bellied sapsucker	Sphyrapicus varius	
yellow-breasted chat	Icteria virens	
yellow-headed blackbird	Xanthocephalus xanthocephalus	
yellow-rumped warbler	Dendroica coronata	
Fish		
Zuni bluehead sucker	Catostomus discobolus yarrowi	SC/BS/SE
Amphibians		
Great Plains toad	Bufo cognatus	
leopard frog	Rana pipiens	
red-spotted toad	Bufo punctatus	
tiger salamander	Ambystoma tigrinum	
Western spadefoot	Scaphiopus hammondi	
Woodhouse's toad	Bufo woodhousei	

Common Name	Scientific Name	Status [a]
Reptiles		
blackneck garter snake	Thamnophis cyrtopsis	
Chihuahua whiptail	Cnemidophorus exsanguis	
coachwhip	Masticophis flagellum	
collared lizard	Crotaphytus collaris	
desert stripped whipsnake	Masticophis taeniatus	
Eastern fence lizard	Sceloporus undulatus	
gopher snake	Pituophis catenifer	
Great Plains skink	Eumeces obsoletus	
longnose leopard lizard	Crotaphytus wislizenii	
lesser earless lizard	Holbrookia maculata	
many lined skink	Eumeces multivirgatus	
night snake	Hypsiglena torquata	
racer	Coluber constrictor	
short-horned lizard	Phrynosoma douglassi	
side blotched lizard	Uta stansburiana	
Texas horned lizard	Phrynosoma cornutum	SC/BS
tree lizard	Uta ornata	
Western bullsnake	Pituophis melanoleucus	
Western diamondback rattlesnake	Crotalus atrox	
Western garter snake	Thamnophis elegans	
Western rattlesnake	Crotalus viridis	

Notes: [a] Status Codes: FE [b] - Federal Endangered, FT [b] - Federal Threatened, FC [b] - Federal Candidate (Old Category 1 Species), SC [b] - Species of Concern (Old Category 2 Species), BS [c] - BLM Sensitive Species, SE [d] - State Endangered, ST [d] - State Threatened.

[b] USDI, FWS ***1995, 2000.***

[c] USDI, BLM 1996.

[d] NMDG&F 1996.

COMMON & SPECIAL-STATUS PLANT SPECIES (VASCULAR) KNOWN OR POTENTIALLY OCCURRING WITHIN CIBOLA COUNTY (EL MALPAIS PLANNING AREA)

APPENDIX G

APPENDIX G

COMMON AND SPECIAL-STATUS PLANT SPECIES (VASCULAR) KNOWN OR POTENTIALLY OCCURRING WITHIN CIBOLA COUNTY (EL MALPAIS PLANNING AREA) [a, b]

Common Name	Scientific Name	Status [c]
GRASSES/FORBS		
Forbs		
Eaton's lip-fern	Cheilanthes eatonii	
slender lip-fern	Cheilanthes feei	
Fendler's lip-fern	Cheilanthes fendleri	
purple cliffbrake	Pellaea atropurpurea	
grass fern	Asplenium septentrionale	
maidenhair spleenwort	Asplenium trichomanes	
rockfern	Woodsia plummerae	
pussytoes	Antennaria plantaginifolia	
ragleaf bahia	Bahia dissecta	
horseweed	Conyza canadensis	
Acoma fleabane	Erigeron acomanus	SC/BS/SS
spreading fleabane	Erigeron divergens	
Zuni (rhizome) fleabane	Erigeron rhizomatus	FT/SE
fleabane	Erigeron vetensis	
white thoroughwort	Eupatorium herbaceum	
puzzle sunflower	Helianthus paradoxus	***T***/SE
hairy goldenaster	Heterotheca villosa	
hawkweed	Hieracium fendleri	
white ragweed	Hymenopappus filifolius	
silver sunflower	Hymenoxys argentea	
Colorado rubberweed	Hymenoxys richardsonii	
white aster	Leucelene ericoides	
aster	Machaeranthera linearis	
spiny goldenweed	Machaeranthera pinnatifida	
Tahoka daisy	Machaeranthera tanacetifolia	
tailleaf pericome	Pericome caudata	
greenstem paperflower	Psilostrophe sparsiflora	
lavendar thistle	Cirsium neomexicanum	
groundsel	Senecio multicapitatus	
lobeleaf groundsel	Senecio multilobatus	
Wright's goldenrod	Solidago wrightii	
common sow-thistle	Sonchus oleraceus	
slender daisy	Townsendia leptotes	
annual goldeneye	Viguiera annua	
yellow hiddenflower	Cryptantha flava	
James' hiddenflower	Cryptantha jamesii	
stickweed	Lappula redowskii	
puccoon	Lithospermum incisum	
Fendler rockcress	Arabis fendleri	
Richardson's tansy mustard	Descurainia richardsonii	
spectacle pod	Dithyrea wislizenii	
Western wallflower	Erysimum capitatum	
Fendler's bladderpod	Lesquerella intermedia	

APPENDIX G (cont'd)

Common Name	Scientific Name	Status [c]
Forbs, cont'd		
narrow-leaf mustard	Thelypodiopsis linearifolia	
(none)	Thelypodium wrightii	
wild candytuft	Thlaspi montanum	
Fendler's sandwort	Arenaria fendleri	
sandwort	Arenaria lanuqinosa	
Mexican campion	Silene laciniata	
narrow-leaved goosefoot	Chenopodium leptophyllum	
dayflower	Commelina erecta	
Western spiderwort	Tradescantia occidentalis	
pinedrops	Pterospera andromedea	
rattlesnake weed	Chamaesyce chaetocalyx	
thymeleaf spurge	Chamaesyce serpyllifolia	
spurge	Euphorbia lurida	
enema weed	Astragalus humistratus	
Zuni milkvetch	Astragalus missouriensis	SS
deervetch	Lotus nummularius	
silvery lupine	Lupinus argenteus	
American vetch	Vicia americana	
catchfly gentian	Eustoma exaltatum	SE
purple geranium	Geranium eremophilum	
white geranium	Geranium lentum	
blue scorpionweed	Phacelia coerulea	
cinder cone phacelia (scorpionweed)	Phacelia serrata	SC/BS
Inland rush	Juncus interior	
pale horsemint	Agastache pallidiflora	
false pennyroyal	Hedeoma drummondii	
beebalm	Monarda punctata	
craglily	Anthericum torreyi	
Plains flax	Linum puberulum	
gypsum blazing star	Mentzelia perennis	SS
globemallow	Sphaeralcea digitata	
Fendler's globemallow	Sphaeralcea fendleri	
four-o'clock	Mirabilis diffusa	
desert four-o'clock	Mirabilis linearis	
Silvestre four-o'clock	Mirabilis multiflora	
umbrellawort	Mirabilis oxybaphoides	
tufted evening primrose	Oenothera caespitosa	
evening primrose	Oenothera coronopifolia	
spike broomrape	Orobanche ludoviciana	
pale trumpets	Ipomopsis longiflora	
woody dogretch	Ipomopsis multiflora	
winged buckwheat	Eriogonum alatum	
annual buckwheat	Eriogonum annuum	
wild buckwheat	Eriogonum hieracifolium	
antelope-sage	Eriogonum jamesii	
marsh rosemary	Limonium limbatum	SS
Northen fairy candelabra	Androsace septentrionalis	
Plains larkspur	Delphinium virescens	

APPENDIX G (cont'd)

Common Name	Scientific Name	Status [c]
Forbs, concl'd		
Fendler's meadowrue	Thalictrum fendleri	
Pennsylvania cinquefoil	Potentilla pennsylvanica	
desert innocence	Hedyotis rubra	
alumroot	Heuchera parvifolia	
wholeleaf paintbrush	Castilleja integra	
beardlip penstemon	Penstemon barbatus	
meadow penstemon	Penstemon oliganthus	SS
wandbloom beardtongue	Penstemon virgatus	
(none)	Schistophragma intermedia	
spikemoss	Selaginella densa	
desert verbena	Glandularia wrightii	
Western sagebrush	Artemisia campestris	
flat sagebrush	Artemisia carruthii	
Mexican sagebrush	Artemisia ludoviciana	
threadleaf groundsel	Senecio douglasii	
Riddelli's groundsel	Senecio riddellii	
rough menodora	Menodora scabra	
Grasses & Grasslike Plants		
Western wheatgrass	Agropyron smithii	
big bluestem	Andropogon gerardii	
Fendler threeawn	Aristida fendleriana	
pine dropseed	Blepharoneuron tricholepis	
sideoats grama	Bouteloua curtipendula	
black grama	Bouteloua eriopoda	
blue grama	Bouteloua gracilis	
hairy grama	Bouteloua hirsuta	
red brome	Bromus lanatipes	
sedge	Carex eleocharis	
threadleaf sedge	Carex filifolia	
Rocky Mountain sedge	Carex occidentalis	
Fendler's flat sedge	Cyperus fendlerianus	
flat sedge	Cyperus schweinitzii	
spike pappusgrass	Enneapogon desvauxii	
hairy tridens	Erioneuron pilosum	
Idaho fescue	Festuca idahoensis	
galleta grass	Hilaria jamesii	
foxtail barley	Hordeum jubatum	
Junegrass	Koeleria cristata	
wolftail	Lycurus phleoides	
muhly	Muhlenbergia fragilis	
mat muhly	Muhlenbergia richardsonis	
mountain muhly	Muhlenbergia montana	
spike muhly	Muhlenbergia wrightii	
New Mexico muhly	Muhlenbergia pauciflora	
sandhill muhly	Muhlenbergia pungens	
Indian ricegrass	Oryzopsis hymenoides	
littleseed	Oryzopsis micrantha	

APPENDIX G (cont'd)

Common Name	Scientific Name	Status [c]
Grasses & Grasslike Plants, concl'd		
muttongrass	Poa fendleriana	
Parish's alkali grass	Puccinellia parishii	SE
little bluestem	Schizachyrium scoparium	
bottlebrush squirreltail	Sitanion hystrix	
alkali sacaton	Sporobolus airoides	
sand dropseed	Sporobolus cryptandrus	
New Mexico porcupine grass	Stipa neomexicana	
SHRUBS (Shrubs, half shrubs, vines & cacti)		
skunkbush sumac	Rhus trilobata	
slender gray sagebrush (Bigelow sage)	Artemisia bigelovii	
sand sagebrush	Artemisia filifolia	
fringed sagebrush	Artemisia frigida	
short-leaved brickelbush	Brickellia brachyphylla	
California brickelbush	Brickellia californica	
tasselflower brickelbush	Brickellia grandiflora	
(none)	Chrysothamnus nauseosus greenei	
rubber rabbitbrush	Chrysothamnus nauseosus Var. albicaulis	
rubber rabbitbrush	Chrysothamnus nauseosus Var. bigelovii	
broom snakeweed	Gutierrezia sarothrae	
gray horsebrush	Tetradymia canescens	
snowberry	Symphoricarpos oreophilus	
fourwing saltbush	Atriplex canescens	
winterfat	Ceratoides lanata	
feather indigobush	Dalea formosa	
wavyleaf oak	Quercus pauciloba Var. undulata	
wax current	Ribes cereum	
cliff fendlerbush	Fendlera wrightii	
flowering ash	Fraxinus cuspidata	
Western virgin's bower	Clematis ligusticifolia	
silver-leaf mountain-mahogany	Cerocarpus montanus Var. argenteus	
alder-leaf mountain-mahogany	Cerocarpus montanus Var. montanus	
Apache plume	Fallugia paradoza	
rock spirea	Holodicus dumosus	
pale wolfberry	Lycium pallidum	
Virginia creeper	Parthenocissus inserta	
New Mexico wild olive	Forestiera neomexicana	
Western black chokecherry	Prunus virginiana	
fineleaf yucca	Yucca angustissima	
banana yucca	Yucca baccata	
Wright's pincushion cactus	Mammillaria wrightii Var. wrightii	
pincushion cactus	Coryphantha vivipara	
Fendler's hedgehog cactus	Echinocereus fendleri	
claret-cup cactus	Echinocereus triglochidiatus Var. Melanacanthus	
claret-cup hedgehog	Echinocereus triglochidiatus Var. Triglochidiatus	
tree cholla	Opuntia imbricata	
berry pricklypear	Opuntia phaeacantha	
central pricklypear	Opuntia polycantha	

APPENDIX G (concl'd)

Common Name	Scientific Name	Status [c]
SHRUBS, concl'd		
Santa Fe cholla	Opuntia viridiflora	SC/BS
grama grass cactus	Pediocactus papyracanthus	SC/BS/SE
small-flower devil's claw	Sclerocactus parviflorus	SE
TREES		
Douglas fir	Pseudotsuga mensiesii	
alligator juniper	Juniperus deppeana	
oneseed juniper	Juniperus monosperma	
Rocky Mountain juniper	Juniperus scopulorum	
Gambel oak	Quercus gambelii	
piñon pine	Pinus edulis	
ponderosa pine	Pinus ponderosa	
netleaf hackberry	Celtis reticulata	
quaking aspen	Populus tremnloides	
Fremont cottonwood	Populus fremontii	

Notes: [a] This list includes only common species and is not comprehensive, except for special-status species.
[b] Sources: Francis & Williams 1988; Sivinski & Lightfoot 1992; USDI, FWS 1995, 1996; Vincent 1997.
[c] Status Codes: FE [d] - Federal Endangered, FT [d] - Federal Threatened, PE [d] - Proposed Endangered, FC [d] - Federal Candidate (Old Category 1 Species), SC [d] - Species of Concern (Old Category 2 Species), BS [e] - BLM Sensitive Species, SE [f] - State Endangered, SS [f] - State Sensitive.
[d] USDI, FWS 1995***, 2000***.
[e] USDI, BLM 1996.
[f] Sivinski & Lightfoot 1992.

SUMMARY OF LAND PROTECTION PLAN

APPENDIX H

APPENDIX H

SUMMARY OF LAND PROTECTION PLAN

INTRODUCTION

The BLM has prepared a Land Protection Plan for the El Malpais National Conservation Area (NCA) to provide strategies and priorities for the protection and preservation of resources, and for visitor use on nonfederal lands. This appendix summarizes the BLM's Final Land Protection Plan which was published in September 1989. The Final Land Protection Plan is incorporated by reference into this El Malpais Plan.

The Land Protection Plan was prepared to determine what land inside the boundary of the NCA needed to be in public ownership, as well as investigating other means of protection besides acquisition to achieve NCA purposes as established by the Congress. The plan is used to facilitate opportunities to protect the NCA through cooperation with state and local governments, landowners, and the private sector. It assists the BLM in identifying priorities for funding to protect public and private resources.

The Land Protection Plan also informs landowners about the BLM's intentions to acquire land or protect it through other means. Land protection priorities are identified, and requests for acquisition funds are based on these priorities.

It must be emphasized that the Land Protection Plan is not an offer to purchase land or interests in land. Rather, it serves to guide future protection efforts, subject to the availability of funds and other constraints. The plan in no way diminishes the rights of nonfederal landowners. The public has been encouraged to comment on the Land Protection Plan and to aid in its revision.

ISSUES SUMMARY

A summary of the issues regarding private land use within the NCA follows.

1. About 96,800 acres of privately owned mineral estate underlying federally owned surface is spread in a checkerboard pattern over much of the NCA.

2. Some lands within or adjacent to the Cebolla Wilderness, the West Malpais Wilderness, and the El Malpais National Monument are privately owned.

3. Cebolla Spring and the related marsh are key components of the Cebolla Canyon riparian habitat and are privately owned.

4. Control of the scenic quality along New Mexico Highway (NM) 117, Interstate (I) 40, New Mexico Highway (NM) 53 and County Road (CR) 42 is important to maintain the integrity of the NCA.

5. Lands containing some valuable natural and/or cultural resources, such as scattered parcels in the Brazo, Cerritos de Jaspe, and Breaks Units are privately owned.

6. Approximately 800 acres of Acoma Tribal Trust lands have been included within the boundaries of the NCA. Protecting Acoma concerns and the NCA is important.

7. An industrial park is being planned on private land that lies mostly within the NCA, to the northwest of the proposed Multiagency Center.

FUNDING & ACQUISITIONS PLANNED

TABLE H-1

LAND PROTECTION PLAN
ACQUISITION ACREAGE AND FUNDING

Item	Surface Acreage	Mineral Acreage
Current Ownership (NCA)		
Federal	213,600	165,800
Private	48,200	96,800
Acoma Indian Tribe	800	
Total	262,600	262,600
Proposed Method of Protection [a]		
Exchange or Fee Acquisition	14,500	96,800
Scenic & Conservation Easements	9,100	
Statutory Acreage Ceiling	None	
Funding Status		**Millions of $$**
Authorized Acquisition Ceiling		4
Appropriated to 1989		1
Proposed for FY 1990		1.25

Note: [a] The Land Protection Plan summarized here contains complete recommendations for only the first four protection priorities discussed below.

LAND PROTECTION RECOMMENDATIONS

The recommendations in the Land Protection Plan are based on legislative intent and direction established by the El Malpais legislation, Public Law (PL) 100-225. This law requires the BLM to protect important natural, cultural, scenic and scientific values within the designated boundaries of the NCA, but does not direct the agency to consolidate all land within the NCA into federal ownership.

The Congress intended that when the BLM seeks to acquire private land within the NCA, the consent of the property owner be obtained. This consent requirement applies unless an imminent threat exists that the land is to be developed in a manner detrimental to the purposes for which the NCA was established.

A combination of protection methods should be used to protect NCA resources on private lands. As authorized by Sections 502 through 506 of P.L. 100-225, the BLM can acquire lands or interests in lands (mineral estate) by the following four methods: donation, purchase with donated or appropriated funds, exchange, and transfer from any other federal agency. Cooperative agreements can also be used to protect privately owned resources.

The following priorities for land protection and/or acquisition have been identified. Priorities could shift with changing conditions and knowledge. Immediate threats on privately owned lands containing important natural and/or cultural resources could also cause a shift in priorities. Other opportunities for protecting resources on private lands through cooperative agreements or technical assistance have not been identified as priorities, but will be pursued as appropriate.

1. The first priority for acquisition, preferably by exchange, includes all subsurface private interest

within the NCA.

Mineral development within NCA boundaries is incompatible with the area's Congressionally mandated goals and purposes. Federal minerals have been withdrawn, and acquisition of private minerals would provide the same protection to the nonfederal parcels. Mineral exchanges and fee acquisition have already been completed with the principal subsurface landowners (the New Mexico and Arizona Land Company, and the Cerrillos Land Company).

2. The second priority for acquisition, pre-ferably by exchange, includes all private inholdings and edgeholdings within and adjacent to the Cebolla Wilderness, as well as most inholdings and one edgeholding adjacent to the West Malpais Wilderness.

Acquisition of private inholdings would prevent any detrimental changes in land use and improve manageability. Acquisition of the edgeholdings would provide access into wilderness.

Especially important in the NCA is acquisition of private edgeholdings in the Breaks Unit that provide access into the Cebolla Wilderness. Acquisition and rehabilitation of Cebolla Spring and the Cebolla Spring riparian area in the Cebolla Wilderness and the Brazo and Breaks Units would ensure protection of a critical riparian area. The private portion of the Pinole Site in the Breaks Unit would be acquired. The "Old Hughes Place," a historical homestead in the Brazo Unit, may also merit preservation.

The inholding in Section 1, T. 6 N., R. 12 W. of the West Malpais Wilderness is not included in this priority because a house and barn have been built there. Most edgeholdings to the West Malpais Wilderness are not included because major range improvements exist on them.

3. The third priority is acquisition of scenic and/or conservation easements along the federal, state, and county highways passing through the NCA.

Commercial development and visual intrusions along the roadways (e.g., billboards) are incompatible with the goals and purposes of the NCA. Protection of the viewshed along NM 117 in the Neck Unit, the scenic gateway to the NCA, is most important. Also to be protected are the viewsheds along I-40 and NM 53 in the Neck Unit, and along portions of CR 42 in the Continental Divide Unit.

4. The fourth priority is the Acoma Exchange, <u>if</u> initiated by the Pueblo of Acoma. This exchange is mandated by P.L. 100-225 if requested by the Acomas.

5. The fifth priority for acquisition is lands containing natural and/or cultural resources that require management or protection, and lands needed for visitor access and facility development.

For those areas where private uses are incompatible with NCA goals and purposes, or where important resources are located, acquisition may be the only feasible means of protection. All private inholdings in the Brazo and Breaks Units should be acquired. However, other options such as cooperative agreements and easements may be explored. Exchange is the preferred method of acquisition.

In the Cerritos de Jaspe Unit, the trailhead for the Outlaw Trail is on private land, as is part of the Bandera Flow. Extremely destructive unscientific excavation of cultural resources has occurred on private land in this unit. Under this priority, the BLM would acquire any private land in Cerritos de Jaspe offered by owners.

Surface inholdings owned by the New Mexico-Arizona Land Company in the Continental Divide Unit, as well as private land owned by any other willing sellers, would be acquired under this priority. The BLM does not plan to acquire lands in the heavily subdivided areas of the Continental Divide Unit.

6. The sixth priority is protection of private lands and resources within the NCA to benefit resources within the El Malpais National Monument.

Any development visible from CR 42 in the Continental Divide Unit would intrude on the natural scenic quality of the National Monument. Acquisition of scenic or conservation easements

along CR 42 would protect the viewshed in the monument.

Proliferation of access roads into the subdivided areas within and west of the Continental Divide Unit of the NCA would also intrude on the natural scenic quality of the National Monument. The BLM and the NPS will work with Cibola County and local landowners to limit the number of access roads across the National Monument and NCA, while still providing access from outside.

7. The seventh priority is lands on which no immediate threat to natural or cultural resources exists.

As lands become available in these other areas, they will be evaluated for their suitability for acquisition. Only exchange and sale proposals from private landowners that are in the best interest of the federal government and that meet the goals of the NCA will be pursued.

CHAIN OF CRATERS WILDERNESS ANALYSIS & SUITABILITY REPORT

APPENDIX I

APPENDIX I

CHAIN OF CRATERS
WILDERNESS ANALYSIS AND SUITABILITY REPORT

GENERAL DESCRIPTION

On December 31, 1987, the Chain of Craters area was designated a Wilderness Study Area (WSA) by the El Malpais legislation, Public Law (P.L.) 100-225. Section 501(b)(1) of P.L. 100-225 directs the Bureau of Land Management (BLM) to review the Chain of Craters for its suitability as wilderness and submit a recommendation to the Congress.

The Chain of Craters WSA is located within the western portion of the El Malpais National Conservation Area (NCA) in north-central Cibola County, approximately 26 air miles southwest of Grants, New Mexico (refer to Map I-1). The unit is situated along the western edge of the North Plains, a topographically closed basin. The Continental Divide crosses the northern and central portions of the WSA. Topographic relief is created by numerous cinder cones that rise over a high plain. The highest point, Cerro Lobo, reaches an elevation of 8,345 feet. A natural, closed basin at the southern end of the WSA occurs at an elevation of 7,380 feet. Maximum relief is approximately 867 feet.

Precipitation averages 12 inches annually, with the majority occurring in July and August. The driest months are generally May and June. Winters are rather cold, summers are warm, and days are mostly sunny. Daily temperatures vary by 30 to 40 degrees. The average temperature for the warmest month (July) is 70 degrees Fahrenheit, and for the coldest month (January) is 32 degrees Fahrenheit (Roybal, et al. 1984).

The Chain of Craters contains approximately 18,300 acres of publicly owned surface and subsurface estate administered by the BLM. No private surface or subsurface estate exists within the unit (refer to Map I-2).

The western edge of the Chain of Craters WSA borders Ramah Navajo Indian lands and forms the western boundary of the NCA. Private lands are scattered just outside the WSA boundary. A quarter-section of land in Section 28, which borders the Chain of Craters on its northeast side, has been subdivided and contains approximately 600 lots. However, the subdivision has not yet been extensively developed.

The Chain of Craters WSA can be reached from County Road (CR) 42, which is accessed from New Mexico (NM) 53 on the north and NM 117 on the south. Access to the Chain of Craters is largely controlled by the condition of CR 42. The road is maintained by occasional blading; however, water collects on portions of the roadbed during wet periods, making it impassable during and after storms.

EXISTING RESOURCES, USES & ENVIRONMENT

Geology & Topography

The Chain of Craters is a series of volcanic cones and craters aligned along a large-scale zone of structural strain (shear). This zone consists of northeast- and north-trending faults, creating areas of weakness where basaltic magma has flowed to the earth's surface.

The Chain of Craters is a small portion of the Zuni-Bandera volcanic field where the structural shear zone has concentrated volcanic activity (Laughlin, et al. 1982). Activity occurred most recently within the last 1,000 years. Evidence indicates that the magma producing the volcanic features in the Zuni-Bandera field was generated at great depths in the earth's mantle. Analysis of geophysical data suggest a shallow (3.5-km) magma body occurs in this area. The cinder cones within the Chain of Craters are thought to be associated with the northeastern edge of the hypothesized magma body (Ander 1980). The cones formed as volcanic debris was ejected from vents and built up steep-sided slopes. Many of the cones have collapsed along one side.

Basalt and scoria are present in the WSA but are not considered significant resources because they also exist outside the unit and the NCA (Bigsby and Maxwell, 1981). Despite geologic and geophysical evidence for geothermal potential, the Chain of Craters is not included in any classification scheme for geothermal energy development. Neither the U.S.

Geological Survey nor the New Mexico State Land Office has included the area in Known Geothermal Resource Areas or Known Geothermal Resource Fields (McLemore, et al. 1986).

Water Resources

No perennial streams flow within the WSA. Unnamed ephemeral streams drain east and south away from the cinder cones into low-lying basins near the WSA boundaries. Most streamflow results from infrequent storms and snowmelt that vary from year to year. Mean annual runoff ranges from 0.1 to 0.5 inches (Roybal, et al. 1984).

Hydrologically, the WSA is part of a closed basin with no outflow of surface water. Water collects in low-lying areas where shallow lakes periodically form. Lake depth, areal extent, and longevity are controlled by the amount of precipitation and the evaporation rate.

Developed waters within the unit consist of dirt and metal tanks for livestock operations, and metal catchments for wildlife. Some metal tanks for livestock are connected to buried pipeline systems. These tanks are supplied by a water well on a private section outside the unit, and another on public land (T. 7 N., R. 13 W., Sec. 34 NW¼) within ¼ mile of CR 42 on the east side of the WSA.

The northern portion of the Chain of Craters is located within the Bluewater Underground Water Basin, while the southern portion is in the Rio Grande Underground Water Basin. These basins are administrative entities established by the New Mexico State Engineer to help regulate the appropriation of groundwater.

Soils

Four soil groupings occur in the WSA. Groupings found on the cinder cones are gravelly, cobbly loams of colluvium or windblown sediments that are derived predominantly from unconsolidated cinders or basalt. Ridges between cinder cones and lower slopes are covered in sandy, cobbly loams that are very stony in places. These loams are a mixture of alluvium and windblown sediments covering basalt.

At lower elevations, fans and swales spread from the cinder cones to flats and valley bottoms. Soil groupings in these areas range from fine sandy loams of mixed alluvium, to light brown sandy clay loams and olive brown clays. Overuse could encourage overland flow to channelize and create gullies.

Under ponderosa pine forest soils on the cinder cones tend to have slow to moderate permeability. Runoff is slow to medium, with erosion potential slight to moderate. Lower slopes and ridges in the piñon-juniper areas tend to have soils of slow permeability. Runoff is slow to medium, with erosion potential slight to moderate. The deep, well-drained soils of the brushy flats tend to have moderate erosion potential.

Water erosion is evident within the unit, with rates between .2 and .5 acre-feet per square mile (Roybal, et al. 1984). However, compared to the east side of the NCA, with erosion rates of .5 to 1 acre-feet per square mile, erosion in the Chain of Craters is less severe. Some vehicular ways are downcut to the point they are impassable. Where gully development has occurred, some two-tracks may skirt the developing gully.

Vegetation

The Chain of Craters contains three general vegetative types, according to the Bailey-Kuchler classification system. These are ponderosa pine, piñon-juniper woodland, and grama-galleta steppe. (The BLM has selected the Bailey-Kuchler Ecosystem classification system of the United States because it facilitates planning at a national level and provides a broad synthesis of current knowledge about the ecosystem geography of the country. It also serves as a useful reference for those who want an overview of ecosystem and landform representation in existing and potential parts of the National Wilderness Preservation System.)

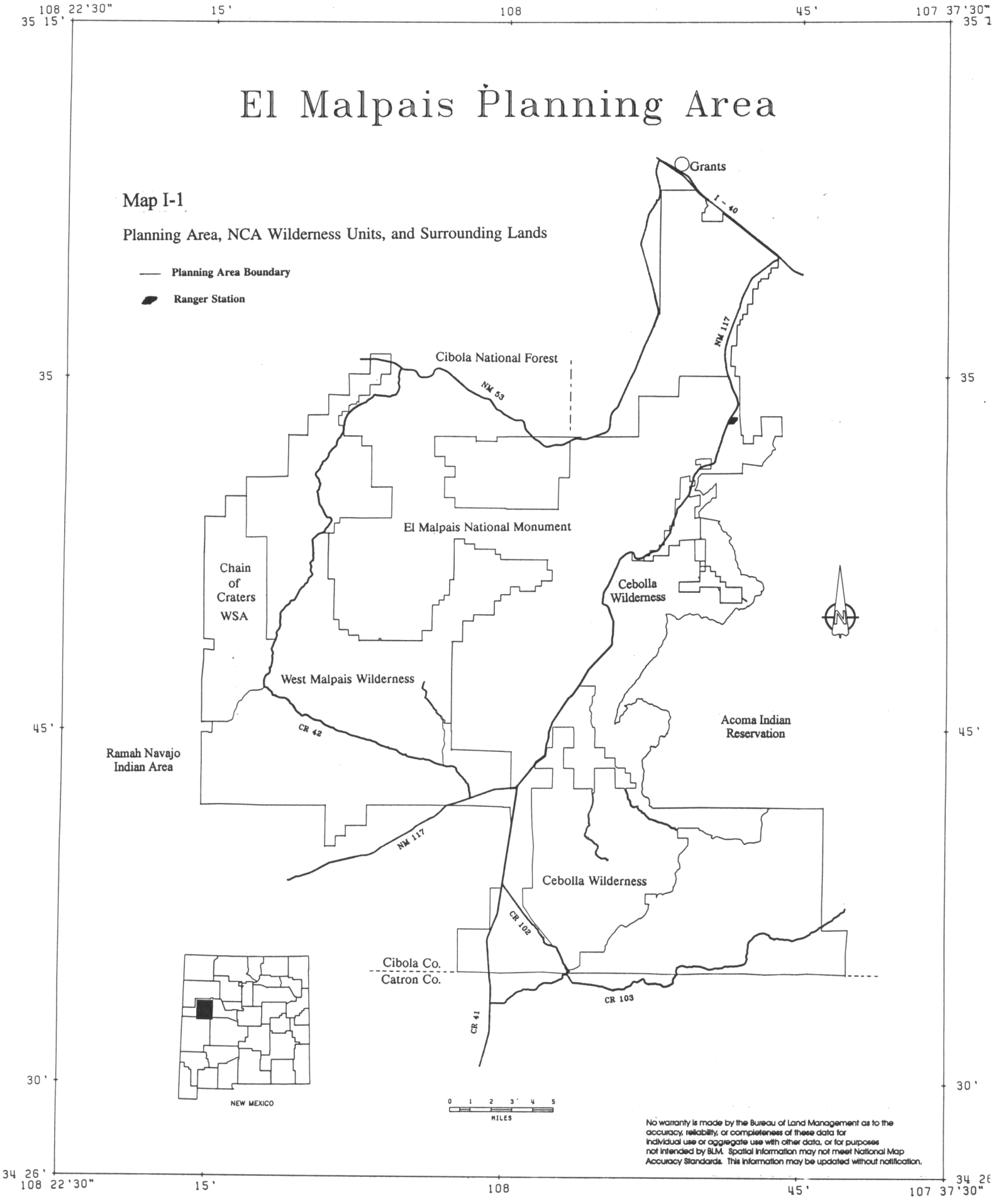
Ponderosa Pine

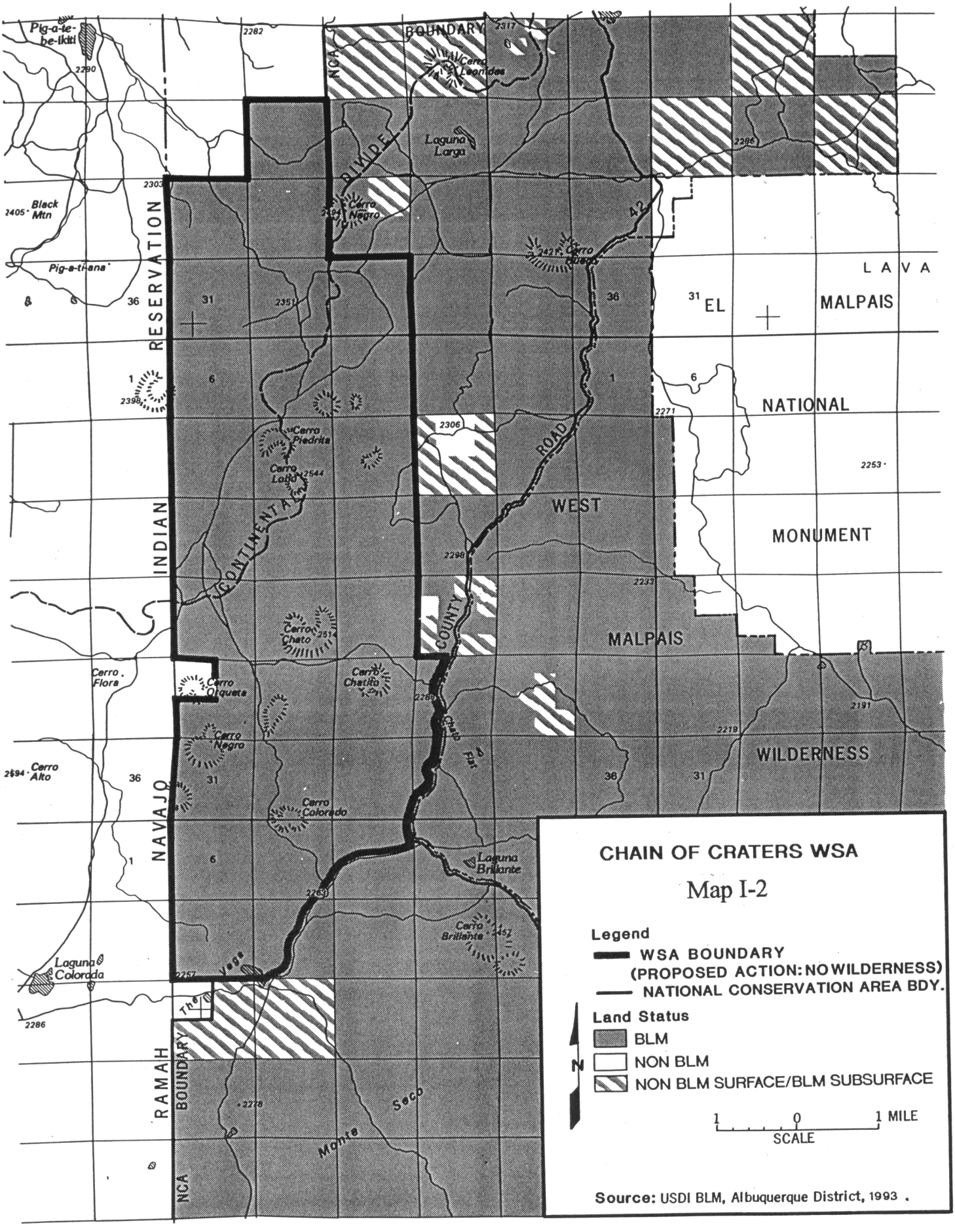
Located on the upper slopes of the cinder cones at elevations of 7,300 to 8,300 feet, this vegetation type covers approximately 5,500 acres. Slopes range from 1 to 55 percent.

The forest is actually a mixed conifer woodland that combines ponderosa pine, piñon, alligator bark juniper, and other juniper species. Slope and aspect determine if ponderosa or piñon will be the dominant tree species at any site. The occurrence of alligator bark junipers in the WSA constitutes the

northeastern extension of this species' range.

El Malpais Planning Area




CHAIN OF CRATERS WSA
Map I-2
Legend
WSA BOUNDARY
(PROPOSED ACTION: NO WILDERNESS)
NATIONAL CONSERVATION AREA BDY.
Land Status
BLM
NON BLM
NON BLM SURFACE/BLM SUBSURFACE
N
1 0 1 MILE
SCALE
Source: USDI BLM, Albuquerque District, 1993 .
NCA BOUNDARY
INDIAN RESERVATION
NAVAJO
RAMAH
NCA BOUNDARY
CONTINENTAL DIVIDE
COUNTY ROAD 42
WEST MALPAIS
EL MALPAIS NATIONAL MONUMENT
LAVA
WILDERNESS
Pig-a-te-be-Ikiti
Black Mtn
Pig-a-tiana
Cerro Leonides
Laguna Larga
Cerro Negro
Cerro Hueco
Cerro Piedrita
Cerro Lobo
Cerro Chato
Cerro Chatito
Cerro Flora
Cerro Orquita
Cerro Negro
Cerro Alto
Cerro Colorado
Laguna Brillante
Cerro Brillante
Laguna Colorada
Chain of Craters
The Vega
Monte Seco

Shrubs include oak species, gooseberries, and mountain mahogany. Forbs include Indian paint-brush, pingue, creeping mahonia, and buckwheats. Small areas of open ponderosa parkland occur with a grassy understory of Arizona fescue, mountain muhly, Junegrass, and mutton bluegrass.

Piñon-Juniper Woodland

Located on the lower slopes and ridges, piñon-juniper woodland ranges from 7,100 to 7,500 feet in elevation. Small patches of woodland are also scattered at higher elevations along the eastern and northeastern slopes of the cinder cones.

This vegetative type covers about 8,300 acres, invading ponderosa pine at higher elevations. At lower elevations, this woodland invades shrublands. Slopes vary from 1 to 50 percent. Trees range in age from 1 to 30 or more years and show good growth.

Rocky Mountain junipers are common at higher elevations, while oneseed junipers become common at lower elevations. Understory grasses are typically blue grama with some bottlebrush squirreltail and mountain muhly. Common shrubs are gray horse brush, sage, snakeweed and rabbitbrush. Forbs include Indian paintbrush, locoweed, mullein, saxifrages and groundsels. About 20 percent of this area is rock outcrop.

Grama-Galleta Steppe

This vegetation type includes two classes, sparse- bare and grass-shrub. Vegetation is sparse on grassy or shrubby fan terraces, flats and swales that slope gently upward into shrub-conifer. Elevations range from 7,000 to 7,500 feet with slopes of 1 to 8 percent. This type covers about 4,500 acres of the WSA.

Shrubs in this type include gray horsebrush, snakeweed, several species of sage, junipers, yucca, and *opuntia* cactus species with blue grama growing as a thin mat understory. Rabbitbrush forms nearly pure stands in some flatland areas. Lower flatlands in the southeastern portion of the WSA are predominantly blue grama or Western wheatgrass, with forbs and shrubs common.

Wildlife

Several special-status plant and animal species (cinder cone phacelia, Acoma fleabane, bald eagle) are known or have the potential to occur within the Chain of Craters. Should any special-status species on either the federal or state list be identified within the WSA, it will be protected in accordance with applicable laws and regulations.

The cinder cones, broken ridges and brushy flats form diverse wildlife habitats. This complex system provides potential habitat for over 60 species of birds, more than 20 species of small mammals, a mule deer herd, antelope, coyotes, bears, many species of reptiles, and game birds such as turkey and dove. The diverse vegetation and elevation make the WSA attractive to many migrating species of birds. The rough terrain and good cover make it likely that the WSA is visited by mountain lions.

Visual Resources

The Chain of Craters WSA contains highly rated scenic values. The unit has been designated as a Class II landscape with Class A/B scenic values. Visual Resource Management (VRM) Class II designation indicates that any change in the basic landscape elements (form, line, color or texture) caused by a management activity should not be evident in the characteristic landscape.

The views from the peaks of the cinder cones are of volcanic fields, sandstone bluffs rising above the fields, and broad panoramas of open forests with Mount Taylor in the background. The open forests create variety in form and texture in the foreground.

Air Quality

Air quality over the Chain of Craters is within state and federal standards. The unit has a federal designation as a Class II airshed, which allows moderate degradation of the WSA's air quality. The landscape characteristics of the Chain of Craters make alteration of the airshed apparent.

Cultural Resources

Archeological survey in the Chain of Craters is limited to a 10 percent sampling of eight sections, amounting to a total of 581 acres of Class III inventory. No cultural resource sites and few isolated artifacts were found in this survey, suggesting that cultural resources are minimal.

Reconnaissance in the WSA has revealed three historical sites. A homestead consisting of two partially standing cabins, a barn, a cellar, and assorted materials is located close to the eastern boundary. A camp with two standing cabins and sawmill remains are located near the northern boundary. A large shrub meadow close to the northwest boundary contains subtle evidence of a logging camp.

At least three American Indian tribes (Acoma, Zuni, and Navajo) have close ties to the Chain of Craters. All three claim it as part of the area they used before European settlement, and current boundaries find the Chain of Craters adjacent to Ramah Navajo Indian lands on the west.

Recognizing that American Indians have used the NCA in the past, P.L. 100-225 guarantees them access for traditional cultural and religious purposes (consistent with the American Indian Religious Freedom Act and the Wilderness Act). P.L. 100-225 further provides that specific portions of the NCA can be temporarily closed to protect privacy for traditional activities.

Mineral Development

No mineral resources have been developed with in the Chain of Craters WSA, and no mining claims or federal leases exist. With passage of P.L. 100-225, all federal minerals in the NCA were withdrawn from entry and development. The private subsurface in the Chain of Craters (approximately 8,960 acres) has been acquired and withdrawn from mineral entry.

Livestock Grazing

Portions of two BLM grazing allotments lie within the boundaries of the Chain of Craters, each containing range improvements (refer to Maps I-3 and I-4). Since P.L. 100-225 established the WSA, the Cerro Chato and Los Cerros Allotments have been combined to form one allotment called Los Cerros, which covers the WSA's northern portion.

Total dry herbage production ranges from 500 pounds per acre in poor years up to 1,200 pounds per acre in favorable years. Stocking rates range from 5 to 10 acres per animal unit month. The unit is poorly suited for yearlong grazing due to high elevation and potentially severe winter weather.

The northern portion of the WSA contains approximately 39 percent of the Los Cerros grazing allotment. The current grazing level is approximately seven head per section per year. Range improvements include approximately 21.5 miles of barbed wire fence line, 17 dirt tanks, 16 water troughs, 9 miles of buried water pipeline, two water wellheads and three l0,000- gallon water storage tanks.

The water well in the Los Cerros Allotment was drilled in 1981 to provide livestock water. Because the well did not exist before passage of the Federal Land Policy and Management Act (October 21, 1976), it cannot be considered as part of a "grand- fathered" grazing operation and is therefore a temporary improvement. In accordance with the *Interim Management Policy for Lands Under Wilderness Review*, if the Chain of Craters was designated as wilderness, the well would have to be abandoned, equipment removed, and the area restored.

The southern end of the WSA contains about 12 percent of the Cerro Brillante Allotment. The current grazing use level for this allotment is approximately seven head per section per year. Range improvements include about 3.5 miles of fence line and a dirt tank.

Timber Production

Records of logging in the Chain of Craters date from 1948 through 1975. During this period, 22 sale contracts were awarded for the harvest of 6,353 million board feet of timber within several sections of the WSA. The lands covered in these contracts were: T. 7 N., R. 13 W., Sections 4, 5, 6, 18, 19, 20, 21, 29, 30; and T. 8 N., R. 13 W., Sections 12 and 20. Associated with the harvest of timber, a right-of-way (Serial No. NM 0184210) for a timber access road was acquired in September of 1960 through private lands that existed in the WSA at that time. However, designation of the Chain of Craters as part of the NCA in 1987 retired commercial timber production.

Recreation

The most current BLM Recreation Opportunity Spectrum (ROS) inventory (USDI, BLM, 1996) has classified the WSA as roaded natural, semi-primitive motorized, and semi-primitive nonmotorized (refer to Map I-5). The area that borders CR 42 is considered roaded natural because the road is maintained by the county. However, the condition of CR 42 limits accessibility during wet weather.

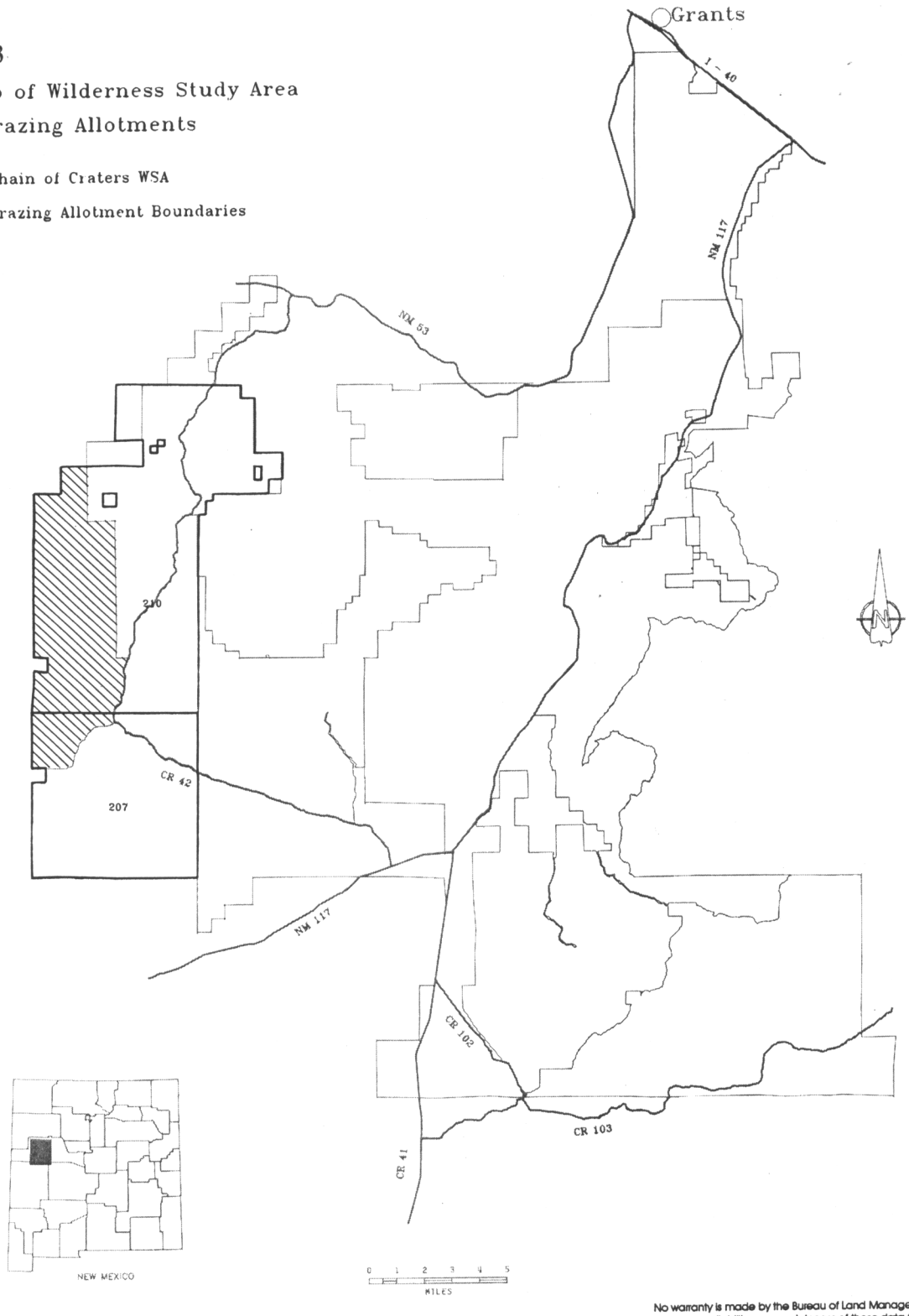
El Malpais Planning Area

Map I-3

Overlap of Wilderness Study Area with Grazing Allotments

Chain of Craters WSA

Grazing Allotment Boundaries



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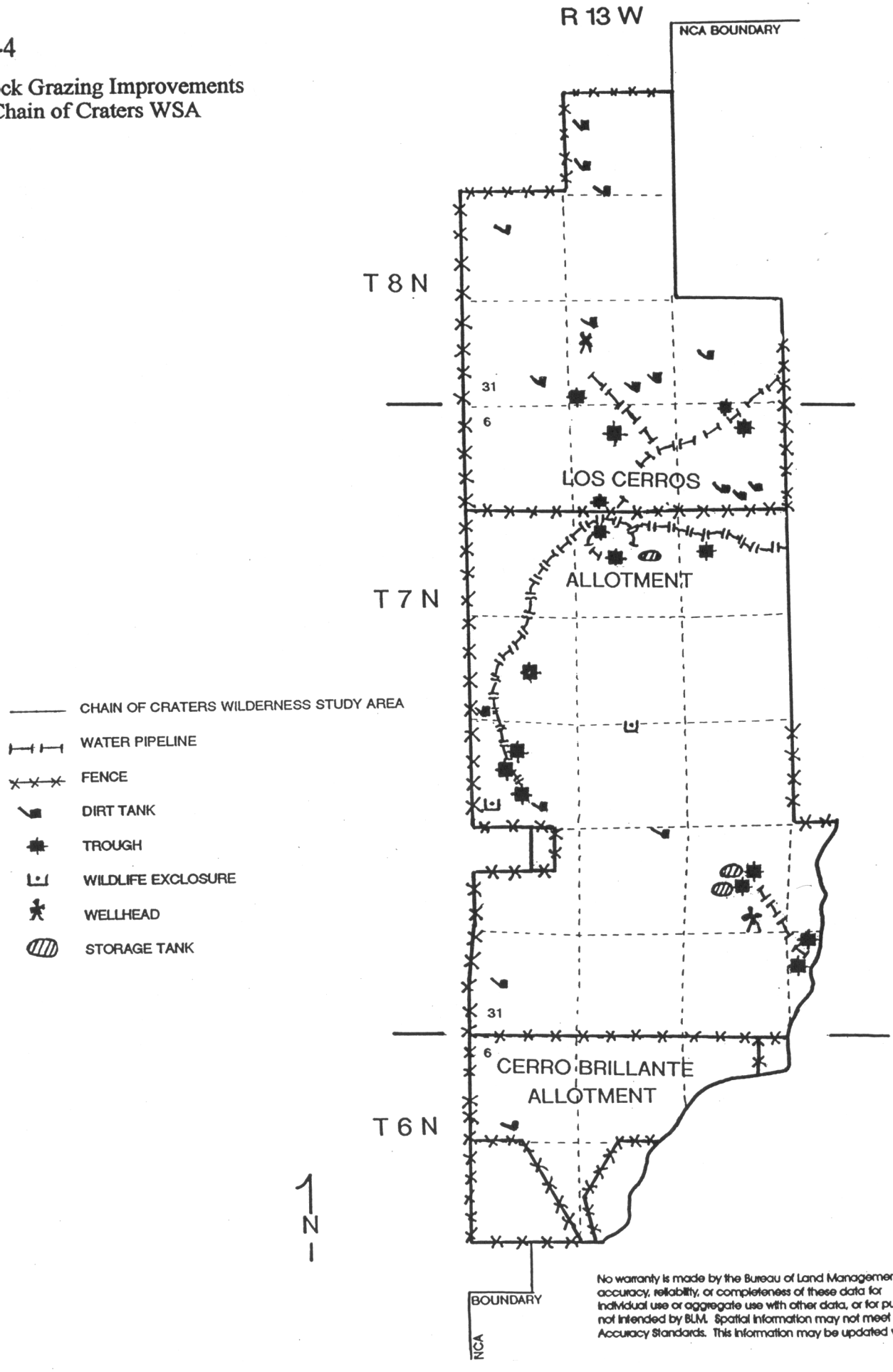
Map I-4

Livestock Grazing Improvements in the Chain of Craters WSA



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The WSA offers high potential for recreational use. Suitable activities include sightseeing, day hiking, mountain biking along old vehicle routes, backpacking, camping, semi-primitive motorized touring, and horseback riding. Opportunities exist for bird-watching, landscape and nature photography, and observation of geologic features.

The amount of recreation use in the Chain of Craters has not been quantified. Hunting is known to take place; in recent years BLM employees have encountered deer hunters during patrols. Other activities observed by BLM personnel are camping, hiking, mountain biking, and back-country driving (off-highway vehicle use). A corridor for the Continental Divide National Scenic Trail has been selected and passes through the Chain of Craters (USDA, FS 1993; refer to Map I-6).

Access & Transportation

The BLM's *Rio Puerco Resource Management Plan* (RMP; USDI, BLM 1986) limited motor vehicle use in the Chain of Craters to existing ways and trails. Approximately 35 miles of ways were inventoried and mapped in the RMP. More intensive road inventories conducted since 1986 now show 46.5 miles of travel routes (USDI, BLM, 1996) ***(refer to Map I-7)***. Some routes identified in the earlier inventory as abandoned or showing signs of little use now show evidence of renewed use. This use is the result of increased back-country recreational driving, livestock management and facility maintenance.

Wildlife Habitat

Two wildlife exclosures lie within the Chain of Craters, both in T. 7 N., R. 13 W. One exclosure in Section 17 is located in ponderosa parkland between two cinder cones. This exclosure contains an inverted umbrella water collection device. The other exclosure in Section 19 is located in a rabbitbrush flat.

The WSA was included in the BLM's *El Malpais Habitat Management Plan* (USDI, BLM 1981), which proposed 28 wildlife projects in what is now the Chain of Craters WSA. Projects included exclosures, waters, and habitat alteration.

Geologic Research

The Chain of Craters offers an excellent opportunity for observing and studying volcanic features and processes. Geologic research conducted in the past includes geochemical and isotopic studies (e.g., Laughlin, et al. 1982; Causey 1971).

American Indian Uses

The Chain of Craters is a cultural landscape, used by local American Indian groups to define and perpetuate their culture and traditions. Besides subsistence and economic uses and explicitly religious activities, the importance of the WSA is primarily tied to the sacredness of nature. Even though Indian people believe land resources are there to be used, they believe any use should be accompanied by reverence for the spiritual power in the landscape.

Although all of El Malpais and the universe have this sacred power, certain points are more important because they are mentioned in origin stories, serve as symbols for events in mythological time, or are places where spiritual beings can be contacted. General categories of important places to Navajo people include those in mythology, places of spiritual danger, shrines, and gathering areas. Important places to Pueblo people include those related to mythology, boundary points, shrines, ancestral villages, pilgrimage trails, and gathering areas.

Examples of most of these general categories are believed to be present in the WSA. Major Zuni shrines are located a short distance to the north and Acoma boundary shrines are found to the north, west, and south of the WSA.

The Ramah Navajos have expressed strong concerns about the Chain of Craters. Many Navajo religious shrines are believed to be present in the WSA, as are specific areas where plants, birds, minerals and other natural resources are gathered for use in ceremonies. Also, in more generalized areas Navajos hunt, gather dye materials, and pick nuts.

However, Pueblo and Navajo people are reluctant to divulge the location of sacred places or discuss traditional cultural and religious practices in any detail. Therefore, many specific places and practices pertaining to the Chain of Craters are omitted in this

discussion, and continued consultation and coordination with the concerned American Indian groups is imperative.

Cultural Resources

No cultural resources are being actively managed in the Chain of Craters WSA. Surveys conducted in the WSA during the summer of 1989 indicated that cultural resources are very sparse.

WILDERNESS CRITERIA

Quality of Mandatory Wilderness Characteristics

The quality of mandatory wilderness characteristics of the Chain of Craters WSA has been documented in discussions for the development of P.L. 100-225. The following paragraphs elaborate on these characteristics.

Size

The area meets the size requirements of the 1964 Wilderness Act, "... at least 5,000 acres," as it contains 18,300 acres. The area is slightly over 3 miles wide at its widest point and approximately 11 miles in length at its longest point. The WSA is bounded on the west by the Ramah Navajo Indian lands, on the south by roads, on the north/northeast by private lands and roaded public lands (refer to Map I-1). One mile of a powerline right-of-way also helps form the boundary on the east side in Section 16, T. 7 N., R. 13 W. A 30-foot-wide right-of-way (Serial No. NMNM 76793) originally issued by the State of New Mexico in 1977 to the Continental Divide Electric Coop was acquired by the BLM as part of state land exchanges in 1988.

Naturalness

A detailed description of the human imprints in the Chain of Craters WSA is contained in the Wilderness Intensive Inventory (USDI, BLM 1988b), on file at the BLM Albuquerque Field Office. When assessing naturalness, the BLM must consider the overall impacts of such imprints on the entire unit.

In the Chain of Craters WSA, impacts include 21.5 miles of fenceline, 17 dirt tanks, a water well with a motorized pump, a capped wellhead, 9 miles of buried water pipeline, three 10,000-gallon above ground water storage tanks, 16 metal water troughs linked to the pipeline, three small historical dump sites (which could be removed using hand tools), 46.5 miles of vehicular routes, and two wildlife exclosures. These human imprints are scattered throughout the area.

P.L. 100-225 allowed for the continuation of grazing in the NCA, including the Chain of Craters. Should the area be designated wilderness, grazing and the appropriate use of motorized and mechanized equipment would still be allowed.

Past logging activity has left evidence of timber access routes, downed logs, and stumps. These stumps are dispersed throughout a range of maturity levels of mixed conifer and ponderosa pine. Some old slash piles can also be seen.

Many vehicular ways are evident throughout the WSA. Some appear to be abandoned and are difficult to trace in places, while others are very noticeable and are maintained by continuous use. A 1996 inventory mapped 46.5 miles of vehicle routes in the WSA (refer to Map I-7). With the existing density of vehicle routes, it is difficult to get more than ½ mile from any evidence of a vehicle route.

The berms around the dirt tanks are vegetated like the rabbitbrush meadows they stand in. These tanks are small and hold less than 10 acre-feet of water.

One wildlife exclosure is located in ponderosa parkland and contains a wildlife water catchment shielded by vegetative cover. The second exclosure is located in rabbitbrush flats edged by mixed conifer woodland, and blends in with its surroundings.

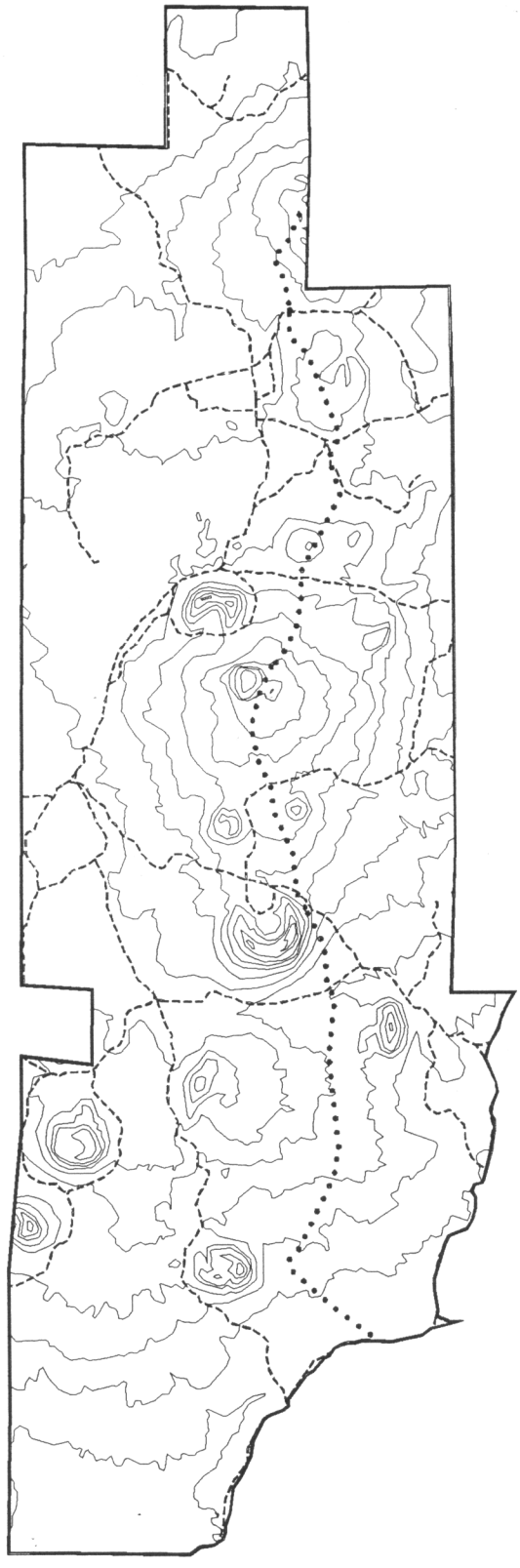
The WSA as a whole appears natural and is considered to exhibit the wilderness characteristic of naturalness. Vegetation and topography screen human impacts, contributing to the naturalness.

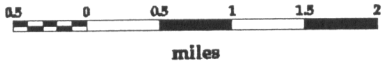
Solitude

The volcanic terrain and vegetation combine to create screening that provides an opportunity for individuals or groups to find secluded places for solitude. However, the configuration of the WSA, density of the vehicle routes, and the continuous need to maintain range improvements affect the opportunity to find isolated locations for solitude.

Map I-5
Chain of Craters WSA

CDNST
Vehicle Routes
Contours





Produced by the Albuquerque Field Office Geographic Sciences, Bureau of Land Management, June 07, 2000

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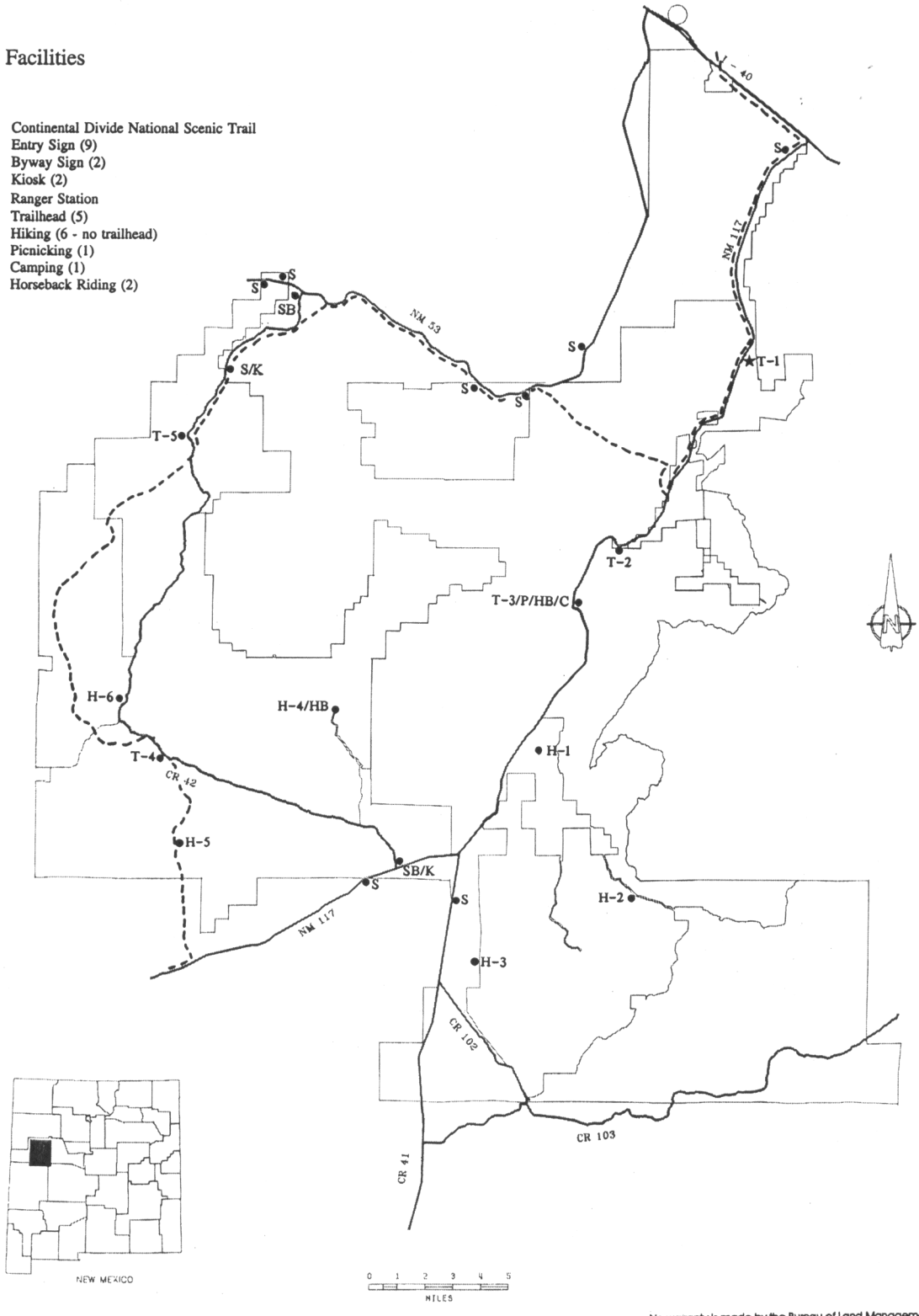
El Malpais Planning Area

Map I-6

Recreation Facilities

- - - -	Continental Divide National Scenic Trail
S	Entry Sign (9)
SB	Byway Sign (2)
K	Kiosk (2)
★	Ranger Station
T	Trailhead (5)
H	Hiking (6 - no trailhead)
P	Picnicking (1)
C	Camping (1)
HB	Horseback Riding (2)



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Opportunities for Primitive & Unconfined Recreation

The BLM defines this wilderness characteristic as the potential for a WSA to provide opportunities for diverse activities that are not dependent on motorized vehicles. The terrain and vegetative features of the Chain of Craters WSA lend themselves to sightseeing, day hiking, nature photography, bird-watching, backpacking, camping and horseback riding. The WSA provides an outstanding opportunity for primitive recreation.

Special Features

The Chain of Craters is part of a large volcanic field in west-central New Mexico. The complex terrain and vegetation offer a variety of habitats for many species of wildlife including deer, bears, raptors and possibly mountain lions. The unit may occasionally be used as wintering ground by bald eagles. Several historical homesteads are located within.

Multiple Resource Benefits

The Chain of Craters contains many natural resources. Congressional designation of the area as wilderness would carry the weight of law and provide long-term protection. Through P.L. 100-225 the area is withdrawn from all forms of entry, appropriation, or disposal under public land laws; location, entry and patent under mining laws; and operation of mineral/geothermal leasing laws and all amendments.

No valid existing mineral rights are known within the Chain of Craters. The NCA is also closed to the collection of green or dead wood for sale or other commercial purposes.

Ecotypes Present

The vegetative-ecosystem classification for the Chain of Craters WSA is as follows (after Kuchler 1964; Bailey 1976).

Dry Domain
- Highland Province
- Colorado Plateau Subprovince
- Ponderosa pine
  - 5,500 acres (30 percent)
- Piñon-juniper woodland
  - 8,300 acres (45 percent)
- Grama-galleta steppe
  - 4,500 acres (25 percent)

Distance from Major Population Centers

The Chain of Craters is within a 1-hour drive of Grants, New Mexico and within 5 hours of Bernalillo and Sandoval Counties. In the 1980 census, parts of these two counties were included in a Standard Metropolitan Area (USDC, BC 1982). The unit is within 3 hours of Albuquerque and 4 hours of Santa Fe, two of the largest population centers in New Mexico.

The WSA is within a day's drive of several designated wildernesses, as shown on Map I-8. The western boundary of the West Malpais Wilderness for over 2 miles is separated from the Chain of Craters by CR 42 (refer to Map I-1). The BLM's other wilderness within the NCA, the Cebolla, is located approximately 14 miles to the east. The western boundary of the El Malpais National Monument is located 3 miles to the east of the WSA. Most of the National Monument (86,267 acres) has been identified as suitable for wilderness (USDI, NPS 1990a). Several other WSAs within a day's driving time of the Chain of Craters and the El Malpais National Monument have been found suitable for wilderness preservation.

MANAGEABILITY

To be recommended for designation, the Chain of Craters WSA must be capable of being effectively managed as wilderness. In determining manageability, the BLM must consider such factors as private and state inholdings, valid existing rights, mineral leases, rights-of-way, and the overall land ownership pattern.

No private surface inholdings, mineral leases, claims, or rights-of-way exist in the WSA. As of March 29, 1995, all private subsurface rights have been acquired.

The two grazing allotments that encompass the unit are not considered to be incompatible with wilderness management. However, continued maintenance of range improvements will result in the extended use of certain existing vehicle routes.

Because of use by local American Indians and the nature of Navajo religious practices, the BLM cannot effectively administer the Chain of Craters as wilderness without serious conflicts. Wilderness

designation is perceived by American Indians in the area as causing significant hardships for them in carrying out traditional ceremonies, which are not confined to specific locations, times of year, or designated individuals.

P.L. 100-225 allows for nonexclusive access by Indian people for traditional and religious purposes as long as it is consistent with the intent of the Wilderness Act. Subject to certain exceptions, the Wilderness Act prohibits the use of motor vehicles and motorized equipment. Under these circumstances, it would be extremely difficult to prescribe an administrative procedure to allow vehicular access for traditional purposes without being in violation of the Wilderness Act. Special legislative provisions for this area would be required.

Also, land ownership along the boundaries (Ramah Navajo on the west, and private owners on the north and east) may present management problems. The possibility of trespass onto private or tribal land by wilderness users exists, although this threat might occur regardless of wilderness designation. The proximity of the subdivided quarter-section to the north could intrude on the unit's visual qualities if development takes place.

PUBLIC INVOLVEMENT

Since 1981, BLM activities have focused public attention on the Chain of Craters. The number of people expressing interest has been small, but they have been vocal in their support and opposition. Between 1981 and 1991, the drafts of four Chain of Craters documents were sent to the public for review and comment concerning WSA use and management. During this same period two El Malpais update letters were sent to persons on the Rio Puerco Resource Area mailing list requesting comments, and several editions of the El Malpais Update Newsletter were mailed to the public for input. Meetings were held to discuss the NCA, including the WSA.

Public meetings were held in Grants and Albuquerque in June 1988, and in Ramah in August 1988. At these meetings, 13 comments were received regarding the Chain of Craters' designation as wilderness. Five of these inputs expressed support for wilderness designation. Reasons cited were the potential wildlife benefits and the untrammeled naturalness of the WSA. Three inputs were apprehensive about grazing having an impact on the wilderness characteristics of the WSA. Seven comments reflect a concern that wilderness designation would negatively impact ranching operations. Ten inputs indicated that wilderness designation would make collecting vegetative material for traditional uses difficult for local American Indians.

Additional public meetings were held in Albuquerque and Grants in December of 1988, and Acomita and Ramah in January of 1989 to discuss alternative ways of managing the Chain of Craters. Public input received in response to these meetings and the newsletter mailing included 17 comments that wilderness designation would negatively impact existing ranching activities. Fourteen comments expressed concern that the diversity of wildlife habitats in the Chain of Craters should be maintained. Twenty-two comments reflected the view that wilderness designation for the Chain of Craters would negatively impact access for older American Indians to conduct traditional practices or collect vegetative materials. Eighteen comments favored closing specified vehicle routes inside the WSA boundaries. Thirty-two comments expressed concern that the large adult piñons be protected, while 10 comments expressed concern that more fires could occur because woodcutting would be limited.

On January 13, 1989, the Ramah Navajo Chapter passed a resolution affirming that the entire El Malpais is very sacred to them. The resolution states that it is important to the chapter that development be restricted and privacy be ensured for traditional practices. It also states their need for "unlimited and unrestricted access to the El Malpais to gather plants, native foods, medicines and salt required for traditional purposes, to make sacred offerings, and to carry out other traditional cultural practices and uses."

In April, 1990, open houses were held in Grants and Albuquerque to gather public input on the Draft El Malpais General Management Plan (GMP) and Environmental Assessment. Formal hearings were also held to take testimony on Chain of Craters wilderness suitability. Attendance at the open houses and hearings is shown in Table I-1.

The hearing transcripts are on file at the Albuquerque Field Office. Portions of the Draft and Final GMPs (the latter released in January 1991) with accompanying BLM responses are printed in the Chain

of Craters Wilderness Analysis Report/EA.

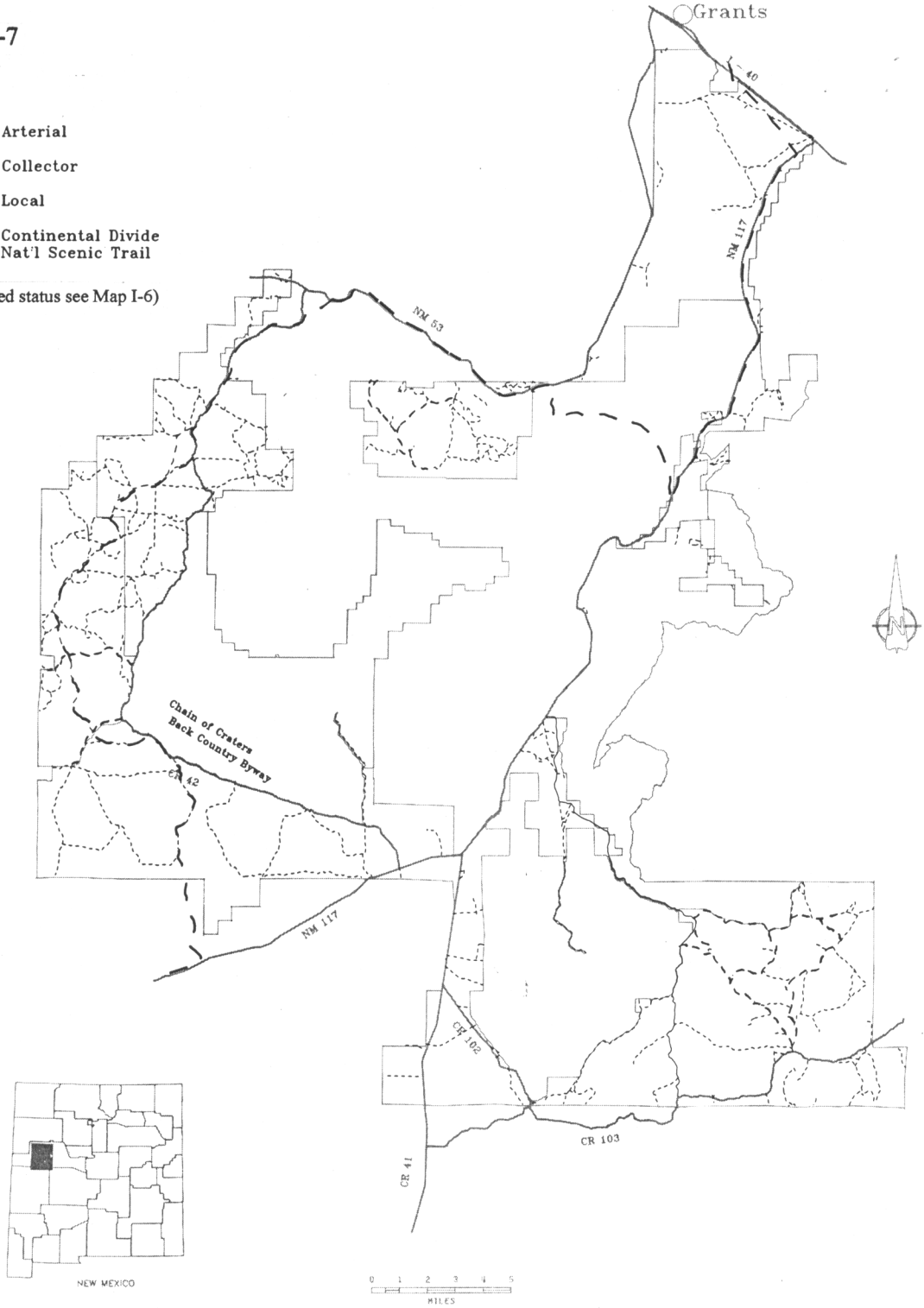
El Malpais Planning Area

Map I-7

Roads

- Arterial
- Collector
- Local
- Continental Divide Nat'l Scenic Trail

(For revised status see Map I-6)



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Map I-8
Wilderness in Western New Mexico

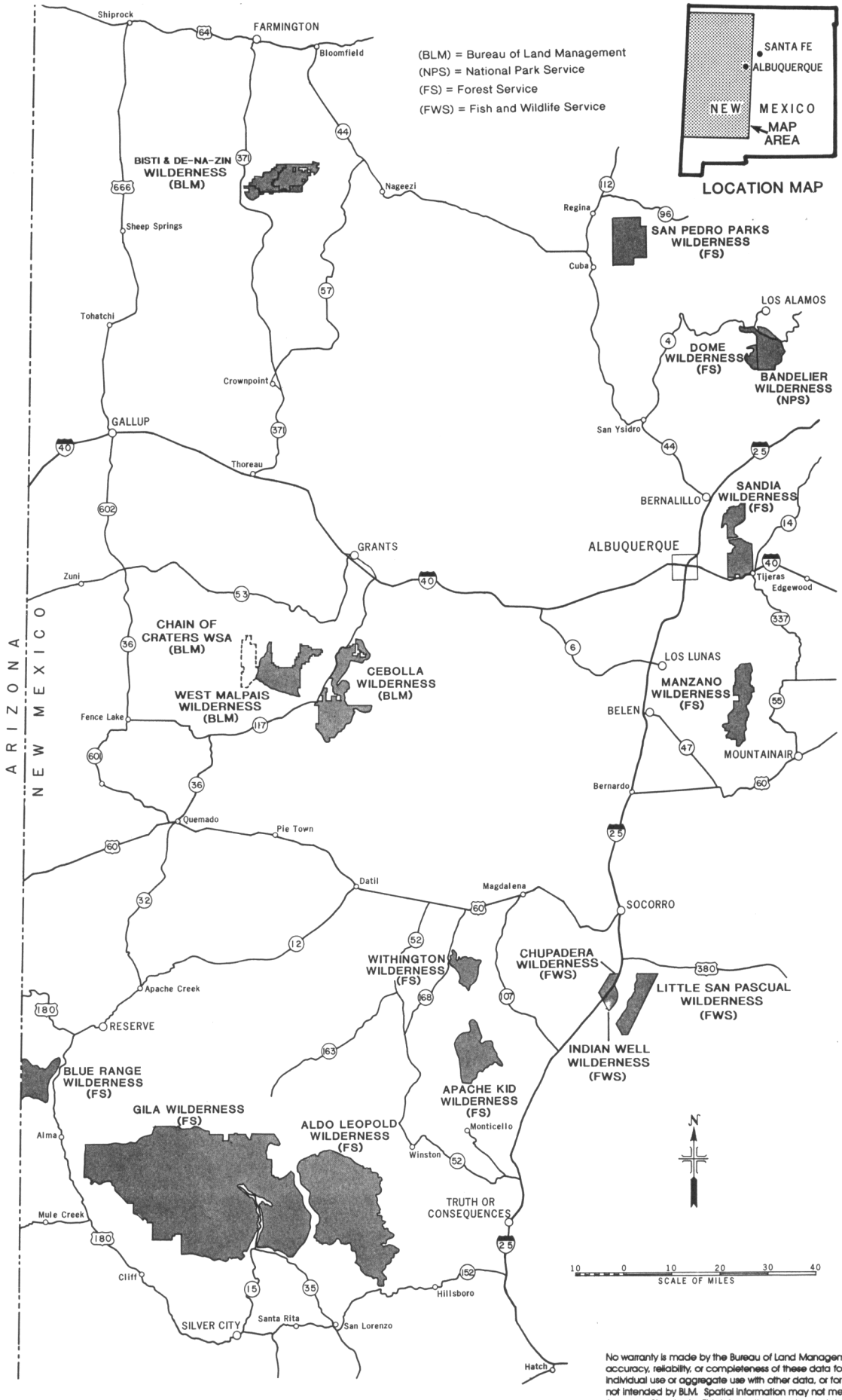

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TABLE I-1

ATTENDANCE AT CHAIN OF CRATERS WILDERNESS MEETINGS

Location	Date	Attendance-- Open House	Attendance-- Hearing	Number Testifying
Grants	4/18/90	53	3	2
Albuquerque	4/19/90	44	6	5

(July 1991). In the final GMP, the No Wilderness Alternative was selected as the proposed action for the WSA.

Comments both opposing and favoring wilderness designation were received. Both groups share a concern for maintaining the integrity of the area's resource values, but differ in how to accomplish this goal.

Proponents of wilderness designation cite the WSA's natural character and its setting within the NCA. The Chain of Craters is contiguous with the western boundary of the West Malpais Wilderness, a fact that leads some to support wilderness designation. Some comment that the area is inappropriate for non-wilderness-related recreation activities such as mountain biking. Also it was expressed that significant reasoning was not presented to justify a no wilderness designation, and that a compromise could be worked out with the Ramah Navajos on access to sacred sites.

Opponents of wilderness designation cite possible limitations on ranch operations, and restrictions on access for traditional American Indian practices. The existence of other designated wilderness with the NCA boundaries has raised concerns by some recreationists that additional nonwilderness recreational opportunities would be lost.

The *Federal Register* of March 31, 1992, contained the Revised Implementing Procedures for the National Environmental Policy Act. This revision identified proposals for wilderness as a major action normally requiring an EIS. As a result, the BLM determined that an EIS should be prepared for the Chain of Craters WSA. The BLM announced its intention to prepare an EIS in a Notice of Intent published in the *Federal Register* on October 21, 1993 (Vol. 58, No. 202, p. 54369). This notice announced a 30-day public scoping period. The release of the Draft EIS was preempted by an April 1994, Interior Board of Land Appeals (IBLA) decision on the approval of the 1990-91 GMP/EA for the NCA. The IBLA directed the BLM to prepare an RMP/EIS for the entire NCA (including the Chain of Craters).

Comments received during the 1993 EIS public scoping period centered around the following issues:

Supporting Wilderness

- The area should be permanent wilderness because of its naturalness.
- The sense of isolation exists.
- Visits are a unique and special experience.
- Use for research and study of evolutionary adaptations, protect melanistic species.
- The wilderness system lacks grassland representation; Chain of Craters will help fill this gap.
- The area has high-quality natural and scenic values.
- The main objections to wilderness are raised by Ramahs and ranchers, but accommodations can meet these.
- Consider a full range of alternatives.
- The Draft EIS should examine the potential for developing the National Monument and the NCA, including paving CR 42 and the potential recreational use of the Chain of Craters.
- Show data on grazing uses, including species composition, production, and utilization.
- The 1991 EA mentions seasonal American bald eagle use.
- Show plans for roads.
- An NCA EIS should be done first to look at the big picture.

Opposing Wilderness

- How will senior and disabled citizens see the land if vehicle traffic is restricted?
- Six comments simply said "No Wilderness."
- Wilderness creates a burden on the ranchers. Pipeline and fence maintenance would require a full-time person with hand tools. Worker safety could be a problem with only horseback access.

American Indian Issues

- The WSA is within an aboriginal land claim area.
- Shrines and landmarks are located along the Chain of Craters.
- American Indians have land use rights to shrines and natural resources such as forests, plants and minerals for traditional purposes.
- American Indians require vehicular access because of time and distance.
- Indians oppose wilderness because it denies efficient and timely access and is too restrictive.
- This is one of the holiest areas, with American Indian ties going back to creation.
- Protect the area as sacred, with unrestricted American Indian access and privacy for respectful traditional use.
- Proper management of this sacred living landscape should require consideration of an American Indian Wilderness.
- Give priority to nondestructive American Indian uses.
- There is a big difference between what the BLM considers cooperation with American Indians and what the Indians themselves consider cooperation from agencies regarding protection of religious and cultural rights.
- We do not believe it is fact that Ramah Navajos oppose wilderness designation.
- Has the BLM met with American Indians regarding vehicular access to any areas within the NCA?
- An all-wilderness alternative with full American Indian rights should be drawn up in consultation with these groups.

These comments have been considered in the preparation of this Plan Amendment/EIS.

WILDERNESS INVENTORY OF LANDS CONTIGUOUS TO THE CEBOLLA WILDERNESS

APPENDIX J

APPENDIX J

WILDERNESS INVENTORY OF LANDS CONTIGUOUS TO THE CEBOLLA WILDERNESS

(October 1995)

INTRODUCTION

In determining if public lands possess wilderness values, the BLM conducts inventories using the criteria found in BLM guidance and given by the Congress in the Wilderness Act of 1964. If the agency concludes that the inventoried lands possess wilderness characteristics, it then conducts a study (through the planning process, with public participation) on the area's suitability or nonsuitability for preservation.

BACKGROUND

Inventories of roadless public lands now included in the southern portion of the Cebolla Wilderness were conducted under Section 603 of the Federal Land Policy and Management Act of 1976 (FLPMA). Since designation of the Cebolla Wilderness in December 1987, the BLM has acquired approximately 8,200 acres of private lands contiguous to the wilderness. With acquisition of these lands, another 2,180 acres of public lands not previously inventoried are now being considered for wilderness preservation. These lands were not previously considered because they were not of sufficient size, were bounded by roads, and were isolated parcels at the time of the Section 603 inventory. The 10,380 acres of contiguous public land covered by this inventory are shown on Map J.

The following documentation of human imprints is based on existing information and field inventories of the contiguous lands. Field reconnaissance to record location, size and description of these imprints and determine the impacts on overall naturalness was conducted in September 1995 by BLM staff members.

A vehicle travel route inventory was also conducted during the summer and fall of 1995 in the National Conservation Area (NCA), including the contiguous lands. (Note: The mileage listed in this report has been rounded to the nearest tenth of a mile. It was generated either by driving the route or calculating the distance by measuring the route as drawn on the inventory maps.)

The contiguous lands are being used primarily for grazing, recreation and wildlife habitat. ***The contiguous lands lie entirely within El Malpais Allotment, No. 203. The grazing allotment is an "I" category allotment. Category "I" (improve) allotments have unsatisfactory ecological conditions and/or significant resource conflicts. In a 1998 assessment of this allotment, BLM staff observed no change in resource conditions to warrant changing this category. Portions of Cebolla Creek lie within the contiguous lands. The condition and relative health of the lotic riparian areas (moving water riparian habitats) along Cebolla Creek have been rated at functional-at-risk. The primary cause for this rating was vegetative decline resulting from concentrated livestock's use during the growing season.***

The 62,000-acre Cebolla Wilderness is considered predominantly natural, although it has been influenced by such historical human use as agriculture, fuelwood gathering, and grazing. More recent additional use includes scientific research and dispersed recreation. The wilderness contains nationally significant archeological sites in extremely high density. A number of historical homestead-era sites can also be found there.

WILDERNESS CHARACTERISTICS

Size

Criteria for Size

The size criteria can be satisfied if an area has at least 5,000 acres of contiguous roadless public land, or is sufficiently large that its preservation and use in an unimpaired condition is practicable. An area less than 5,000 acres in size must possess naturalness, outstanding opportunities for solitude or a primitive and unconfined type of recreation, and be contiguous with a designated wilderness or roadless

area of sufficient size to make practicable its preservation as wilderness.

Evaluation of Present Situation

The 10,380 acres of inventoried lands are contiguous to the Cebolla Wilderness along its boundaries. They are located between the wilderness boundary, highways, or bladed roads and other appropriate boundaries.

Conclusion

The lands are contiguous to and a natural extension of the Cebolla Wilderness. Adjustments through inclusion of additional lands will allow for the wilderness boundary to be relocated to more identifiable locations on the ground, and a more extensive area supporting wilderness characteristics. Additional acreage will allow visitors more opportunities to experience isolation or participate in primitive recreational activities over a larger area in which the imprint of human work is substantially unnoticeable.

Naturalness

Criteria for Naturalness

A wilderness "generally appears to have been affected by the forces of nature, with the imprint of man's work substantially unnoticeable." Areas in which the imprint of human work is substantially noticeable, but that otherwise contain wilderness characteristics, are further studied when the imprints are expected to become substantially unnoticeable either naturally or by reclamation.

The cumulative impact of the intrusion of human work can be adverse on the overall naturalness of the study area. This is a function of the size of the unit, the number, distribution and scale of the impacts.

Evaluation of Present Situation

The following is a description and location of the structural imprints of human work in the inventory area or along the periphery. Each identified letter or number refers to the location of the imprint plotted on the corresponding field maps on file in the Albuquerque Field Office.

Fencelines

Imprint A consists of a network of fencelines constructed primarily of metal and wood posts with barbed wire strands. Occasional metal or wooden posts are placed where a gate might be located. Most of these fencelines are either for livestock management (to separate grazing allotments and pastures) or for road rights-of-way (ROWs).

A-1 Originates in T. 6 N., R. 10 W., Section 6 and proceeds in a southeasterly direction from the New Mexico Highway (NM) 117 ROW fence. The pasture boundary fenceline is 1 mile long.

A-2 Originates in T. 6 N., R. 10 W., Section 6 and proceeds south to Section 7. The northern portion of the fenceline connects to the A-1 fenceline at ½ mile. The pasture boundary fenceline is ½ mile long.

A-3 Forms part of the NM 117 ROW fence and is located in T. 6 N., R. 10 W., Section 6. The -mile-long fenceline is located on the east side of NM 117. A metal gate is part of the ROW fenceline; it provides access to the Henson No. 2 Windmill and Cebolla Canyon.

A-4 Part of the pasture boundary fenceline from Section 6. Continues south in T. 6 N., R. 10 W., Section 7, ¼ mile to the Henson No. 2 Windmill.

A-5 Continues south in T. 6 N., R. 10 W., Section 7, from the Henson No. 2 Windmill to Section 18. The fenceline is 3/4 mile long. A wooden gate on the fenceline (to allow access to an east pasture) is located on the section line between Sections 7 and 18.

A-6 Continues south in T. 6 N., R. 10 W., Section 18, for 1 mile. The fenceline follows the east side of the road. Approximately mile south of the northern boundary of Section 18, the fenceline reaches a cattleguard.

A-7 Originates at the cattleguard in T. 6 N., R. 10 W., Section 18. The fenceline runs ½ mile west to the western boundary of Section 18.

A-8 Continues south, then turns east in T. 6 N., R. 10 W., Section 19, for .4 mile. Fenceline follows the east and north side of the road.

A-9 Continues east in T. 6 N., R. 10 W., Section 20, for ¼ mile to the Sand Canyon Windmill. Fence line follows the north side of the road.

A-10 Continuation of the east-side, NM 117 ROW fence in T. 6 N., R. 11 W., Section 1. The fenceline is .85 mile long.
Map J 11x17

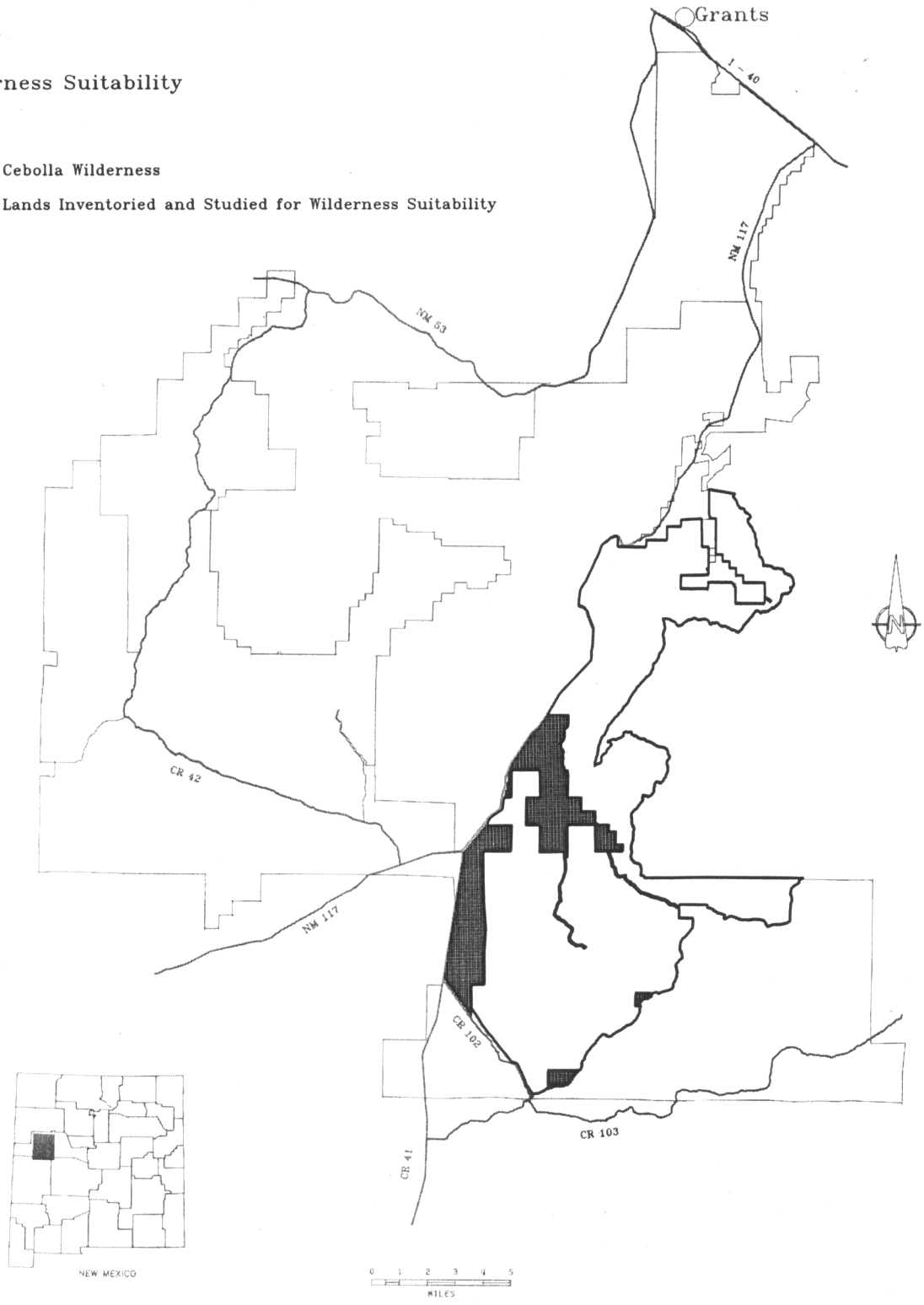
El Malpais Planning Area

Map J

Wilderness Suitability

Cebolla Wilderness

Lands Inventoried and Studied for Wilderness Suitability



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by BLM. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification

A-11 Continuation of east-side, NM 117 ROW fence in T. 6 N., R. 11 W., Section 11. The fenceline is ¼ mile long.

A-12 Continuation of east-side, NM 117 ROW fence in T. 6 N., R. 11 W., Section 12, for .85 mile.

A-13 Continuation of east-side, NM 117 ROW fence in T. 6 N., R. 11 W., Section 14, for 1 mile.

A-14 Continues south for 3/4 mile in T. 6 N., R. 11 W., Section 34 to the A-15 pasture boundary fence line.

A-15 Originates in T. 6 N., R. 11 W., Section 34, on the east side of County Road (CR) 41. This pasture boundary fenceline begins at a cattleguard and proceeds east for 3/4 mile, separating Sections 34 and 3.

A-16 Originates at the cattleguard and proceeds north for .4 mile on the east side of CR 41. The location is T. 6 N., R. 11 W., Section 34.

A-17 Originates at the northern end of fenceline A-16, then proceeds east to the Head Windmill and continues northeast to the A-14 fenceline. The A-17 fenceline is ½ mile long in T. 6 N., R. 11 W., Section 34.

A-18 Originates near the Henson No. 2 Windmill and follows the east side of a dirt road. This fenceline in T. 6 N., R. 10 W., Section 7, is ½ mile long and creates an enclosure of 40 acres. The bottom portion of this fenceline connects with the A-5 fenceline at the southern portion of Section 7.

A-19 Continues from the Sand Canyon Windmill in a southeasterly direction to the Henson No. 1 Windmill. This fenceline is ½ mile long and is located in T. 6 N., R. 10 W., Section 20.

A-20 Originates at the Henson No. 1 Windmill, proceeds north for ¼ mile and connects to a rock barrier. This fenceline is located in T. 6 N., R. 10 W., Section 20.

A-21 Fenceline in T. 4 N., R. 10 W., Section 7, surrounds the entire boundary of this section. It is 4 miles long (with approximately 1 3/4 miles within the inventory area and 2¼ outside).

Range Improvements

Imprint B is a 500-foot-deep well consisting of a maintained, 33-foot windmill tower with a 14-foot fan. Next to the windmill are two water storage ring tanks, one to hold 5,000 gallons and the other 500 gallons. The windmill and tanks are located within the NW¼NW¼ of Section 6, T. 6 N., R. 10 W. Approximately 5 acres are without vegetation.

Imprint C is a 475-foot-deep well consisting of a maintained, 33-foot windmill tower with a 10-foot fan. Adjacent to the windmill are a 5,000- gallon, water storage ring-tank and a 6-foot-diameter water storage tank. A 2-acre wire fence surrounds the windmill and serves as a livestock holding trap. The North Pasture topographical map labels this structure as the Henson No. 2 Windmill, located within the W½NE¼ of Section 7, T. 6 N., R. 10 W. Approx-imately 5 acres are without vegetation.

Imprint D is a cattleguard located in T. 6 N., R. 10 W., Section 18.

Imprint E is a 440-foot-deep well consisting of a maintained, 33-foot windmill tower with a 10-foot fan. Adjacent are a 5,000-gallon water storage tank and a 6-foot-diameter, water storage ring-tank. The Sand Canyon Windmill and tank are located within the NW¼NW¼ of Section 20, T. 6 N., R. 10 W. Ap-proximately 5 acres are devoid of vegetation, with four standing wooden posts and several fallen posts about 50 feet away.

Imprint F is a 440-foot-deep well with a 33-foot windmill tower and a 10-foot fan. Adjacent to the windmill are a 6-foot-diameter, water storage ring-tank and a 5,000-gallon storage ring-tank. The windmill has not been maintained and probably is not operational. The Henson No. 1 Windmill is located within the NW¼SE¼ of Section 20, T. 6 N., R. 10 W.

Imprint G is a wooden corral with sandstone walls. The corral contains .25 mile of a fenced trap. The wooden trap with a wire wing trap is located on the east side of the corral. The wooden corral has not been maintained and is located adjacent to the Henson No. 1 Windmill within the NW¼SE¼ of Section 20, T. 6. N., R. 10 W.

Imprint H is the North Pasture Tank. The ½-acre dirt tank is located adjacent to the NM 117 ROW

fence within the N½ of Section 12, T. 6. N., R. 11 W. The tank was filled with water.

Imprint I is the Head Windmill consisting of a 400-foot-deep well with a 33-foot tower and a 12-foot fan. Adjacent are two 6,400-gallon, water storage ring-tanks that are 22 feet in diameter and 2¼ feet deep. The maintained windmill and tank are located in T. 6 N., R. 11 W., Section 34. Approximately 2 to 3 acres are without vegetation.

Imprint J is a maintained wooden corral located in T. 6 N., R. 11 W., Section 34. Two wire traps direct livestock into the corral. A wooden log house is located next to the corral. The house is in disrepair, but appears to have historical significance.

Imprint K is a cattleguard located on the section line between Section 34, T. 6 N., R. 11 W. and Section 3, T. 5 N., R. 11 W.

Imprint L is the Indian Windmill consisting of a 400-foot-deep well with a 33-foot tower and a 12-foot fan. Adjacent are a 6-foot storage tank and a 6,400-gallon water storage tank that is 22 feet in diameter and 2¼ feet deep. The windmill and tank are located within the SE¼NE¼ of Section 15, T. 5 N., R. 11 W. An abandoned 6-foot-diameter water storage tank is also located at this site. Approxi-mately 5 acres are without vegetation.

Imprint M is three dirt stock tanks that are vegetated and have not been maintained. The locations of these tanks are as follows.

M-1 NW¼SW¼ of Section 7, T. 4 N., R. 10 W. This tank holds ¼ acre-feet of water. Four upright wooden posts are in the tank, with a wooden sign nailed to an adjacent tree.

M-2 SE¼NE¼ of Section 7, T. 4 N., R. 10 W. This dirt tank holds ½ acre-feet of water, and is outside the inventory area but adjacent to it.

M-3 NE¼SE¼ of Section 7, T. 4 N., R. 10 W. This dirt tank is breached, but the storage capacity is ¼ acre-feet of water. The tank is outside the inventory area but adjacent to it.

Imprint N is a large, maintained dirt stock tank located in the SE¼SE¼ of Section 7, T. 4 N., R. 10 W. This tank is breached, has no storage capacity, and is outside the inventory area but adjacent to it.

Imprint O is a small dirt diversion dike located within the SE¼SE¼ of Section 7, T. 4 N., R. 10 W. This imprint is outside the inventory area but adjacent to it.

Miscellaneous Imprints

These intrusions are discarded items that can easily be removed.

Imprint P is an abandoned and rusted 55-gallon drum. The drum is split, with no evidence of hazardous materials. It is located in T. 6 N., R. 10 W., Section 6.

Imprint Q is a discarded rubber tire on the west side of the dirt road in T. 6 N., R. 10 W., Section 7.

Imprint R is a wooden pump jack that is part of the Rowe Homestead. The jack is located in T. 6 N., R. 10 W., Section 6, outside the fenced enclosure.

The Rowe Homestead is located in T. 6 N., R. 10 W., Section 6 and consists of a wooden building, fowl shed, barn and root cellar. This unstabilized home-stead is surrounded by a 4-acre wire fence to protect it from livestock. A pedestrian walk-through was built for visitor access.

The Sandstone Homestead at the Henson No. 1 Windmill is located in T. 6 N., R. 10 W., Section 20. The stone homestead has collapsed, although the walls remain and a wooden corral (Imprint G) sur-rounds them. Visitors to the homestead must cross a deep arroyo.

Vehicle Routes

[Note: In this section, the letters and numbers in parentheses correlate to a route number and a 7.5-minute series, U.S. Geological Survey quadrangle map, with initials used in the inventory, e.g., (SC 19). The map is on file at the BLM Albuquerque Field Office.]

Route 1 is a low-use, revegetated two-track 1.4 miles long that originates in T. 6 N., R. 10 W., Section 6.

Route 2 is a low-use, revegetated two-track 1 mile long that originates in T. 6 N., R. 11 W., Section 1.

Route 3 is a low-use, revegetated two-track .3

mile long that is located in T. 6 N., R. 10 W., Section 7.

Route 4 is 1.6 miles long. It originates in T. 6 N., R. 11 W., Section 12 at the North Pasture Tank, and proceeds east past the Henson No. 2 Windmill. The usage is low.

Route 4A is a low-use, spur two-track from Route 4 that originates in T. 6 N., R. 11 W., Section 12. The route is ½ mile long.

Route 5 is a revegetated two-track originating in T. 6 N., R. 10 W., Section 7. The route is .6 mile long with low usage.

Route 6 (SC 19) is the main access route to Cebolla Canyon. It is a 6.2-mile, constructed and flat-bladed route with evidence of erosion. Originating at the ROW gate on NM 117 in T. 6 N., R. 10 W., Section 6, the route follows Cebolla Canyon and enters the wilderness boundary at the bottom of Section 28, T. 6 N., R. 11 W. The usage is medium and the road is 11 feet wide. It has been maintained by mechanical means but is in need of major maintenance, and some sections may need to be redirected. The route provides access for recreation users and ranchers.

Route 7 (NP 7) is a new, low-use vehicle route for authorized users only. This two-track could be used to gain access to range improvements. It is 8 feet wide and 2 miles long, originating at the wooden gate in T. 6 N., R. 10 W., Section 3 and terminating near the Henson No. 1 Windmill.

Route 8 is a low-use ,revegetated two-track 1 mile long. The route originates east of the Henson No. 2 Windmill.

Route 9 (SC 18) is the main access to Sand Canyon. This cherry-stemmed route is 2 miles long from the connection of Route 6 to the bottom of Section 30 in T. 6 N., R. 10 W. This is a constructed route, flat-bladed by mechanical means. The usage of this 11-foot-wide route is medium, primarily for recreation and livestock activities. The upper part of the road is in poor condition.

Route 9A is a new, connects with Route 9 and is .3 mile long. It is located in T. 6 N., R. 10 W., Sections 19 and 30.

Route 10 is a revegetated two-track .6 mile long that connects with Route 9. It originates in T. 6 N., R. 10 W., Section 20 and runs south to Section 19.

Route 11 is a revegetated two-track .7 mile long that connects with Route 9. It begins in T. 6 N., R. 10 W., Section 20 and runs south to Section 30.

Route 11A is a revegetated two-track, a spur off Route 11 that is 1 mile long. It is located in T. 6 N., R. 10 W., Section 19.

Route 12 (SC 2) originates off CR 41 and is used to access the Head Windmill. It is a ½-mile-long, 8-foot-wide two-track with low usage by ranchers. The location is T. 6 N., R. 11 W., Section 34.

Route 13 originates at CR 41 and is used to access the Head Windmill. It is .2 mile long, authorized for use by ranchers, and located in T. 6 N., R. 11 W., Section 34.

Route 14 (SC 3) originates off CR 41 and runs through T. 5 N., R. 11 W., Sections 9 and 10. The low-use route serves as access to Homestead Canyon, reaching a locked gate at the wilderness boundary and continuing beyond the gate. The 1.1-mile-long two-track is 8 feet wide and is authorized for use by ranchers. Although the route is closed to the general public, is also used by recreationists.

Route 15 (SC 4) extends north and south of the Homestead Canyon Road. The southern portion ends at an arroyo and the northern portion fades out. The route is 7 feet wide and .8 mile long. This new, low-use route is located in T. 5 N., R. 11 W., Sections 3 and 10.

Route 16 (SC 5) is an old woodcutting route. This low-use route located in T. 5 N., R. 11 W., Section 10 is .3 mile long.

Route 17 (SC 7) allows the rancher access to the Indian Windmill off Armijo Canyon Road without entering the Cebolla Wilderness. This new, low-use two-track route is for authorized users only. It measures 7 feet wide and .6 mile long, located in T. 5 N., R. 11 W., Section 15. It has two arroyo crossings in good condition.

Route 18 is the Armijo Canyon Road, located in T. 5 N., R. 11 W., Sections 15 and 16. It is 1.2 miles long, ending in a parking area at the Cebolla Wilderness boundary. Used by recreationists and ranchers, the route is a limited-access two-track. The

nearby Dittert Site is visited by the public.

Route 19 (SC 9) originates off CR 41 and is located in T. 5 N., R. 11 W., Sections 21 and 22. This low-use, revegetated route is 1.6 miles long.

Route 20 (SC 11) originates off CR 102 and is a low-use, revegetated two-track .4 mile long. It is located in T. 5 N., R. 11 W., Section 27.

Route 21 enters T. 4 N., R. 10 W., Section 7 from the west through a gate in the pasture fence that surrounds the section. This two-track, which originates from CR 102 and is 1.3 miles long, provides access to two dirt stock tanks. The low-use route is 7 feet wide.

Route 22 (BC 5) is a .3-mile-long, low-use two-track that leads to Pen's Windmill. It is 7 feet wide and located in T. 4 N., R. 10 W., Section 7, outside the inventory area but adjacent to it.

Route 23 is revegetated and .3 mile long. It is located in T. 4 N., R 10 W., Section 7, outside the inventory area but adjacent to it.

Conclusion

As a whole, human imprints are scattered throughout the inventory area. In some cases they are screened by topography and vegetation and do not significantly detract from the area's naturalness. The imprints on naturalness exist from facilities built for livestock management, such as fences, windmills, watering tanks and troughs, and vehicle routes. The 33-foot-tall windmills with fans and associated watering tanks surrounded by barren ground are the most noticeable. However, they are scattered throughout the contiguous lands.

The contiguous lands have been influenced by past human uses such as agriculture (homesteads), fuelwood harvesting and present and past grazing and motorized recreation use. Ecological conditions within the contiguous lands have been assessed as unsatisfactory as a result of past uses.

Outstanding Opportunity for Solitude or Primitive & Unconfined Recreation

Criteria for Solitude

Solitude is the opportunity for a visitor to avoid the sights, sounds and evidence of other people within a particular study area. He or she should be able to feel alone or isolated.

Evaluation of Present Situation

Visitors in the core of the inventoried parcels and closest to the existing wilderness are well screened from others by the surrounding terrain and vegetation. Opportunities for isolation or solitude are diminished in some of the peripheral lands on the north and west, which are more open, with gentler slopes and sparse, low-growing vegetation. These lands are also closer to roads, their sights and sounds in the northern and western portions of the inventoried lands.

Conclusion

A majority of the lands in T. 6 N., R. 10 and 11 W. have outstanding opportunities for solitude, primarily because of the topographic and vegetative screening. Less-than-outstanding opportunities are provided on some peripheral lands because of the lack of such screening and the presence of nearby roads.

Criteria for Primitive & Unconfined Recreation

A study area that meets these criteria is favorable for those activities that provide dispersed, undevelop-ed recreation that does not require facilities or motorized equipment.

Evaluation of Present Situation

Along with the adjacent Cebolla Wilderness, the canyons, drainages and mesas of the contiguous lands allow for unconfined movement over a large area. The semiarid climate allows for participation in nonmotorized, primitive recreation activities earlier and later in the year than in other typical, high-altitude wild areas. The mesas and rimrocks also provide numerous panoramic vistas of the surrounding land-scape. Opportunities are also available for viewing cultural and wildlife resources.

Conclusion

The modification of the Cebolla Wilderness boundary would extend the area in which outstanding primitive recreational opportunities such as hiking, camping, backpacking, photography, and viewing of wildlife and other special features could be enjoyed.

Supplemental Values

Criteria for Supplemental Values

The Wilderness Act states that an area may also contain ecological, geological, or other features of scientific, educational, scenic or historical value. Special features of the area are optional, but the degree to which their presence enhances the area's suitability for wilderness designation should be considered. The evaluation should be based on an assessment of the estimated abundance or importance of each of the features.

Evaluation of Present Situation

The contiguous lands contain archeological and historical resources. Cultural resources in the Cebolla Wilderness range from early Archaic lithic scatters (about 7,000 years old) to historical homesteads and sawmills. Most common are small pueblos dating from Pueblo II through Pueblo III times (about 1,000 years old).

The Rowe Homestead is located in T. 6 N., R. 10 W., Section 6. The unstabilized site consists of a wooden building, fowl shed, barn and root cellar. A 4-acre wire fence surrounds the homestead to protect it from livestock. A pedestrian walk-through was built to allow visitor access.

The Sandstone Homestead at the Henson No. 1 Windmill is located in T. 6 N., R. 10 W., Section 20. The stone homestead has collapsed, but the walls remain and a wooden corral (Imprint G) surrounds it.

Conclusion

Special features within the contiguous lands, which include scenic values, cultural and historical values, contribute to the value of the area.

BACKGROUND INFORMATION ON POTENTIAL NATURAL VEGETATIVE COMMUNITIES

APPENDIX K

APPENDIX K

BACKGROUND INFORMATION ON POTENTIAL NATURAL VEGETATIVE COMMUNITIES

The BLM has chosen the achievement of Potential Natural Communities (PNCs) as one of its vegetative goals for the Planning Area (refer to Chapter 2). Background information on the PNCs is briefly described below.

Ecological Sites

Soils in the Planning Area are included in the Cibola County soil survey performed by the Natural Resources Conservation Service (USDA, NRCS 1993--formerly the Soil Conservation Service). In the survey, areas with similar soil classification characteristics (e.g., depth, texture, source materials) are grouped as "soil map units."

The NRCS further categorizes the soil map units into "ecological sites." An ecological site is an area of rangeland with a specific Potential Natural Community (PNC) and specific physical site characteristics, which differs from other kinds of rangeland in its ability to produce vegetation and respond to management techniques (BLM Technical Reference 4400-4). In other words, an ecological site is an area that has the potential to produce a unique vegetative community.

In its Ecological Site Guides, the NRCS describes the sites in terms of their vegetative composition. For each site, the PNC is the mixture of plants that would become established if natural processes were allowed to be completed. The Site Guides express this mixture as the combination of a range of percentages. For example, the PNC for a given site may contain 20 to 30 percent trees, 50 to 60 percent grasses, 10 to 20 percent shrubs and 10 to 20 percent forbs.

Ecological Condition

Comparing the PNC (ideal) to the existing plant mixture on a given site then yields a measure of that site's "ecological condition," or percentage of similarity to the PNC. Ecological condition is based on the concept of plant succession. Succession is the orderly process of community change, the sequence of communities that replace each other in a given area over time, as the result of natural processes (e.g. climate, fire). Each successional community is referred to as a "seral stage," ranging from Low to Climax. Table K-1 shows the seral stages, the percentage of plants each contains as compared to the ideal (climax) mixture or PNC, and the number of Planning Area acres currently found in each seral stage. Table K-2 summarizes the ecological condition of the grazing allotments in the Planning Area.

TABLE K-1

SERAL STAGES IN THE PLANNING AREA

Seral Stage	Planning Area Acres	% Similarity to PNC [a]
Low	598	0-25
Middle	107,296	26-50
High	209,697	51-75
Climax (PNC)	0	76-100
Total Acres	317,591	---

Note: [a] PNC-Potential Natural Community.

TABLE K-2

ECOLOGICAL CONDITION OF GRAZING ALLOTMENTS WITHIN THE PLANNING AREA [a]
(public land acres)

Allotment Number	Allotment Name	Ecological Condition (Seral Stage) [b]		
		Low	Middle	High
201	Cerritos de Jaspe	0	1,753	6,779
202	Bright's Well	0	80	545
203	Malpais	0	57,930	118,659
204	Raney	0	1,582	551
205	Los Pilares	546	862	14,342
206	Little Hole-in-the-Wall [c]	0	794	880
207	Cerro Brillante	0	5,239	17,849
208	Loma Montosa	0	3,907	0
209	Techado Mesa	0	23,063	6,515
210	Los Cerros [d]	0	9,817	36,701
211	Ventana Ridge	0	2,216	6,821
438	Monument Lake	0	2,560	0
439	La Vega	52	53	55
	Totals	598	107,296	209,697

Notes: [a] Allotments #222 (Chical) and #457 (Palomas) shown on Map -- have recently been acquired from the State of New Mexico and are not yet inventoried.
[b] No allotments in the Planning Area are in the climax seral stage.
[c] Includes 640 acres in the Arrosa Allotment (#226).
[d] Cerro Chato (#200) and Los Cerros (#210) have been combined.

CHANGES IN LIVESTOCK GRAZING MANAGEMENT IN THE EL MALPAIS NCA & PLANNING AREA

APPENDIX L

APPENDIX L

CHANGES IN LIVESTOCK GRAZING MANAGEMENT IN THE EL MALPAIS NCA AND PLANNING AREA

Administrative Changes

In 1987, the BLM completed a major land exchange with the New Mexico State Land Office. Approximately 27,000 acres of public land in Torrance County were exchanged for approximately 29,000 acres of state land in Cibola County.

The state had leased all the acquired acres for grazing. The BLM agreed to honor these leases until their expiration, and then to incorporate them into public land grazing. The majority of the acquired lands were already within BLM grazing allotments and were easily incorporated.

However, in two situations, the acquired state lands were completely surrounded by large blocks of private land, with no other BLM public land available in the grazing area. As a result, the two state lessees did not have public land grazing privileges. Each person was found to be qualified for these privileges, and was issued a grazing lease, one on the Chical (#222) and one on the Palomas (#457) Allotment.

In another administrative change, the BLM in April 1995 combined the Cerro Chato (#200) and the Los Cerros (#210) to form a single allotment. The combined allotment is now referred to as the Los Cerros (#210).

Other Changes Since Completion of the El Malpais GMP (1991)

As specified in both the *Rio Puerco* and the *Socorro RMPs*, the BLM initiated intensive monitoring studies on the I category allotments. Based on the studies, the agency reviewed grazing preferences and issued decisions in 1992 to establish new preferences. Using New Mexico Department of Game & Fish estimates of big game populations (antelope, deer and elk) for each of the I allotments, the BLM allocated sufficient wildlife forage. Table L-1 displays the grazing preference at the onset of the monitoring studies and after the decisions (including the wildlife allocations) were issued.

In addition to adjusting grazing preferences, the BLM has made other changes in grazing management in the Planning Area since completion of the *El Malpais NCA General Management Plan*. These are listed in Table L-2.

TABLE L-1

ADJUSTMENTS IN GRAZING PREFERENCE IN THE PLANNING AREA (1992)

Allotment Number	Allotment Name	Grazing Preference (AUMs) [a]		Wildlife Forage Allocation (AUMs)
		Before Monitoring	After Monitoring	
203	El Malpais	14,899	14,899	2,332
205	Los Pilares	2,446	1,716	483
207	Cerro Brillante	4,086	3,572	238
208	Loma Montosa	672	997	87
209	Techado Mesa	5,294	4,768	1,470
210	Los Cerros [b]	5,670	5,420	349
	Totals	33,067	31,372	4,959

Notes: [a] Grazing preference is the total number of AUMs grazed by livestock on the public lands (43 CFR 4100.0-5). An AUM is an Animal Unit Month, or the amount of forage needed to sustain one cow or its equivalent for one month (43 CFR 4100.0-5)

[b] AUMs are the combined total for Los Cerros and the former Cerro Chato Allotments.

TABLE L-2

ONGOING GRAZING MANAGEMENT PLANNING FOR ALLOTMENTS OVERLAPPING THE PLANNING AREA

Allotment Number	Allotment Name	Management Change
205	Los Pilares	Grazing Plan (1993) [a]
208	Loma Montosa	No grazing, June through September (1992)
209	Techado Mesa	Grazing Plan (1993) [a]
210	Los Cerros [b]	Grazing Plan (1995) [a]

Notes: [a] Includes pasture use schedule that provides for regular rest from livestock grazing use.

[b] Plan includes the former Cerro Chato Allotment.

AUMs PERMITTED IN EL MALPAIS NATIONAL MONUMENT THROUGH DECEMBER 31, 1997

APPENDIX M

APPENDIX M

AUMS PERMITTED IN THE EL MALPAIS NATIONAL MONUMENT THROUGH DECEMBER 31, 1997 [a]

Allotment Number	Allotment Name	Monument Acres	Monument AUMs
201	Cerritos de Jaspe	10,880	129
203	El Malpais	40,179	1,172
204	Raney	7,360	105
205	Los Pilares	1,670	312
206	Little Hole-in-the-Wall	2,134	180
208	Loma Montosa	5,120	1,950
210	Los Cerros	12,254	625
211	Ventana Ridge	1,794	182
	Totals	81,391	4,655

Note: [a] AUMs in the BLM portions of these allotments have now been reduced.

TECHNICAL DESCRIPTION OF THE BIOPHYSICAL LAND UNIT (BLU) MODEL

APPENDIX N

APPENDIX N

TECHNICAL DESCRIPTION OF THE BIOPHYSICAL LAND UNIT (BLU) MODEL

Biophysical Land Units (BLU) are homogeneous, ecological response units derived using a Geographic Information System (GIS), or ecological regions or divisions that are spatially analyzed and defined on the basis of contributing physical ecological components and cohesive interactive dynamics. The term "biophysical" represents the combination of biological and physical attributes.

The most important emphasis of the model is its focus on delineating and describing the expression of a dynamic system captured in a snapshot in time. There are, however, several other emphases of BLUs that separate the concept from other land inventory and mapping methods. Among these emphases are: (1) the BLU model can be used to consider the responses (or lack thereof) of the units to both natural and manipulated influences through time; (2) the spatial extent of an ecological response, using BLUs, can be mapped and analyzed without necessarily being visually discernible in the field; and (3) the amount of detail or scale of a BLU (the level in the hierarchy of the model in which analysis is accomplished) can be adapted to fit the question asked.

The base or "core" BLU data are derived from satellite remote sensing data, Digital Elevation Models (DEMs), soils data, and surface water data. The satellite data provide the "snapshot in time," or total area coverage of current condition, and are particularly useful in land areas that are difficult to access. The core layers (and if desired, any subsequently added hierarchical or "fine tuning" layers) are not merely merged, or defined through arbitrary visual assessment. BLUs are delineated when these "core" layers are modeled in matrix form, through Boolean logic (deductive operations of intersection and symmetric difference).

In other words, the matrix of defined components (vegetation/landcover, soils, surface water, slope, elevation, and aspect) draws the BLU boundary lines. Therefore, human perspective (emotions, values, and visual interpretation) do not predetermine the spatial delineation of BLUs. If an ecotype component combination has not been anticipated in the formulation of the matrix, that spatial area "drops out" of the BLU model. This simply results in a blank space on the map that is reanalyzed, one map (component) layer at a time, combined with field verification of the site. In this way, previously unknown anomalies, ecotypes, ecological responses, or disturbances may be identified. Finally, the hierarchical concept of BLUs, both in scale and attribute detail, contained in a GIS framework allows addition or deletion of data layers, integration of multi-temporal datasets, and analysis of change detected and multiple scenarios.

BLUs can be used to spatially model the extent and composition of ecotypes (and therefore biodiversity) by recognizing existing spatial divisions based on ecological responses. In other words, ecosystem biodiversity can be assessed across a region by the differentiation and location of separate BLUs, homogeneous response units defined spatially by attribute composition. A desirable effect of using BLUs to spatially model biodiversity is the retention of the "patchy" detail of existing environments.

BLUs provide spatial definition of complex ecologic details in a form that can be graphically displayed in a single map layer. This single BLU layer can display the first level of analysis--the homogeneous mix of the "core components" of existing environments, to which other defining layers (such as administrative boundaries or cultural features) can be added for reference, without confusing the displayed information beyond the point of recognition and interpretation. The focus is on spatial patterns, the assemblages of those patterns (reflecting communities) and the ecotones that provide the transition between homogeneous areas. This approach allows the analyst to better understand the dynamics occurring in the ecological system, without becoming overwhelmed with the specifics of multiple data layers. The emphasis, therefore, becomes one of dynamics, anomalies, edge conditions, stability and sustainability.

ASSESSMENT AND MONITORING

When areas of anomalies have been identified, field verified, and found to require more detailed analysis, another step in the hierarchy of BLU resolution is added. Additional spatial data layers can be over-

laid to isolate possible contributing dynamics, or site-specific data can be collected, geocoded, and analyzed.

Enhancements to BLU modeling methods could use site-specific data. Site data, like vegetation transects, correlate detailed (localized) snapshots in time to the broader, more generalized spatial snapshots in time provided by satellite remote sensing data. Satellite data, along with subsequently derived layers like BLUs, provide total area coverage. It has long been recognized that one of the most practical uses of satellite data is the identification of areas where more specific data collection and evaluation methods are required. This same simple notion supports the BLU concept of hierarchal scales of detail, allowing bi-directional flow of information between generic, regional dynamics, and local, more specific dynamics.

A practical example is to automate and link transect data to satellite data and BLUs. The approach is to use vegetation transect data collected into polycorder files and Global Positioning System (GPS) data for geocoding transect location. At those transect points, a simple compass is used to determine the vector of transects in relationship to spectral classes and BLUs. Locations of transects would include sites well within a homogeneous area, allowing a clear definition of the vegetative community assemblages. Locations could also include transects perpendicular to ecotones, thus defining spectral or community boundaries. Transects could also be long enough to bisect the boundary and allow for boundary shifts through time. By correlating these datasets, it should be possible to track subtle shifts in local ecological dynamics through the relationship of vegetation community changes and spatial change identified by BLUs.

Change that has already been detected and analyzed using BLUs considers the rate, amount, and direction of change, as well as the relationship of change to management manipulations and fluctuations in weather patterns. For example, habitat patchiness, difficult to quantify without GIS-derived BLUs and critical to ecosystem management, has been recognized as becoming more homogeneous in some areas of the El Malpais National Conservation Area (NCA).

Another use of BLU tracking of ecological change is the delineation and monitoring of response components that represent only a small percentage of a protected area. Tracking these areas, and using GIS to overlay management alternatives, could eliminate the areas from consideration for incompatible uses like a camping area, interpretive trail, or range improvement. GIS graphic representation of BLUs and conflict resolutions are then useful for policy implementation within an agency, and for public information.

The hierarchical framework of BLUs, besides providing flexibility in scale and detail of components of current conditions, is meant to facilitate correlation with other historical and continuously collected datasets. It is also meant to help provide "common ground" ecological datasets among scientific and/or management disciplines. This facet of the BLU concept is not meant to establish a totally new perspective, but rather to provide a methodology to link past and present datasets with future predictions. Improving methods of relating historic and current environmental data is crucial to identifying past patterns, developing analysis models for predicting change, evaluating historic manipulations of natural resources, and projecting preferred management alternatives.

BLUs have been used to help define and monitor "potential" and “desired” plant communities. Definition of potential plant communities includes an evaluation of the capability of a geographic area to support different plant species and assemblages. As potentials and capabilities are defined and understood, progress can be made toward managing for desired plant communities. Such management considers not only the capability of the land, but the social, economic, and political parameters that define land management alternatives. Using multi-temporal BLU datasets, the progress through time of current conditions, the relationship of potential and desired conditions can be measured in acreage and percent.

When these ecological analyses or identifications of change are accomplished, layers of cultural activities or management actions can be added to determine correlation. If changes are linked to management actions, are the changes acceptable? Can the amount and location of change be predicted? Change reflecting a developed, trailhead parking lot that controls vehicular impacts and mitigates erosion potentials may be very acceptable. Disappearance of an “undesirable" BLU in favor of a "desirable" BLU may be acceptable. An excessive percentage of loss of a BLU that represents a small, unique percentage

of the NCA, or a threatened habitat, would be unacceptable.

CONCLUSION

Beyond the BLU applications of inventory, monitoring, and capability assessment, other applications that can be used or developed include compatibility analysis (between resource management programs), suitability analysis (alternative selection by value-based criteria), feasibility analysis (alternative selection dependent upon land capability and fiscal resources), and problem analysis (issue-specific, solution-driven study to support an action).

Example analyses could include determination of where to expect visitation based on visual resources and recreation opportunities; appropriate locations for trails or campsites; seasonally dependent impacts and possible closures; and interactions/conflicts between such interests as wildlife, recreation, livestock grazing, and uses by indigenous peoples.

These BLU analyses using geographic technologies are part of an assortment of tools for monitoring ecological responses and changes in natural resource management. A dynamic, responsive model like BLUs provides a framework for continuing analyses of natural and cultural components. Such a model facilitates management decisions as whether to maintain a condition, allow change, encourage change, or set limits for change--all in relationship to the capabilities and limitations of the ecosystem. Ultimately, BLUs are a combination of subtle, yet incredibly obvious spatial-temporal notions. They focus first on ecological dynamics (responses) separate from human expectations and desires, helping to sort the puzzle pieces for natural resource monitoring and managing.

TECHNICAL INFORMATION ON DIGITAL GEOGRAPHIC DATA SOURCES, PROCESSING, ANALYSES & MAPPING

APPENDIX O

APPENDIX O

TECHNICAL INFORMATION ON DIGITAL GEOGRAPHIC DATA SOURCES, PROCESSING, ANALYSES AND MAPPING

Geographic processing, analyses and mapping were accomplished in this planning effort on a Prime computer using a Prime operating system. Geographic Information System (GIS) software employed on this platform included: Automated Digitizing System (ADS), Map Overlay Statistical System (MOSS), Map Analysis and Processing System (MAPS), and Cartographic Output System (COS).

Base data, in vector format, were digitized at a scale of 1:24,000, and/or edited and updated at that scale. These data included:

- Administrative boundaries (e.g., Planning Area, NCA),
- Fire management areas,
- Livestock grazing allotments,
- Land ownership,
- Roads,
- Continental Divide National Scenic Trail,
- Soil groupings, and
- Facilities.

Digital Elevation Model (DEM) data, in raster (cell) format at the 30- meter scale, were purchased from the United States Geological Survey.

Vegetation/landcover data were derived from Landsat Thematic Mapper (satellite remote-sensing) data. These data were field verified during the classification process.

Because vegetation/landcover and DEM data are in raster (cell) format, analyses that required these data layers were accomplished in this format. For example, analyses were made of potential and desired plant communities in reference to the administrative boundaries of livestock grazing allotments and wilderness. The vector format data of soil groupings, allotments and wilderness boundaries were rasterized to be compatible for overlay analyses with vegetation and DEMs.

All raster-format analyses were accomplished at a 30-meter scale, except for Visual Resource Management (VRM), Recreation Opportunity Spectrum (ROS), and Off Highway Vehicle (OHV) data analyses. These analyses were accomplished at a 100-meter scale, which was more appropriate to the smaller- scale, more generalized or relative nature of the data. Also, these data were modelled through multiple stages of complex overlay analyses that required intensive computer processing, and because the relative nature of the data did not require a more specific scale, more timely processing was accomplished at the 100-meter scale.

Hardcopy output maps of digital data were generated through the COS program, and in some cases cartographically enhanced by hand.

TYPICAL WILDLIFE PROJECTS

APPENDIX P

APPENDIX P
TYPICAL WILDLIFE PROJECTS

WATER DEVELOPMENTS

Water guzzlers come in many varieties, but most are in the 400-square-foot range. A 10,000-square-foot area is generally fenced to protect the water development from livestock. A typical water development would cause a direct long-term disturbance of approximately 400 square feet and an indirect, short-term disturbance of vegetation (crushing by vehicle and foot traffic during construction).

Water development projects would not cause any irreversible damage or irretrievable commitment of resources. These projects could be dismantled and removed and the disturbed areas would revegetate.

VEGETATIVE MANIPULATION

Vegetative manipulation can be accomplished by five main methods: livestock management, prescribed and wildland fires, mechanical means, chemical means, or biological means. Vegetative manipulation for wildlife enhancement is generally accomplished through the use of livestock management and prescribed fires.

The following are some anticipated impacts to other resources created by prescribed fire to enhance wildlife habitats.

- Loss of Vegetation: A portion of the existing vegetation would be consumed by fire. Burn plans would emphasize prescriptions to create a mosaic of vegetative stages. Burns would be conducted to allow the existing wildlife populations to continue to use the area.

- Scenic Values: These would be reduced for a period of time, depending on the habitat and size of the treatments. Grass and small brush treatments are generally short term and blend back into the surrounding area within 1 to 3 years. Treatments in piñon/juniper woodlands or forest habitats would have short-term (2- to 5-year) or long-term (more than 5-year) impacts, depending on the prescription. Burns that took out the grass and brush understory and only a few trees would create a short-term impact on scenic values. Burns that were used to reduce woodland habitat or create a forest parkland type habitat would create long-term impacts by taking out trees to create openings and reduce densities. These dead standing trees could remain for decades. However, by incorporating fire back into a functioning ecosystem, the overall scenic values of the area would be enhanced.

- Air Quality: This would be diminished during and immediately after the fire.

- Loss of Livestock Forage: Prescribed fires would consume livestock forage within treatment areas. The overall loss of forage would be minimized within any one allotment to maintain ongoing livestock operations. The long-term effect on livestock and wildlife forage would be to enhance the diversity of vegetation. In areas where brush and/or trees were reduced, additional growth of herbaceous vegetation would be expected.

FENCES

A mile of fence would cause direct, long-term disturbance of approximately 50 square feet of vegetation. This disturbance would be considered long term because fences generally last 25 years or more. Short-term vegetative disturbance would be caused by vehicle and foot traffic during construction. This disturbance would generally be noticeable for a few weeks to a few months, depending on the terrain and type of equipment used. In some instances, where a fence was constructed through closed woodlands, a loss of approximately ¼ acre of trees per mile of fence would occur.

Fence projects would not cause any irreversible or irretrievable commitment of resources. These projects could be dismantled and removed, and the disturbed areas would generally revegetate. For grass- shrub habitats, the disturbance would be short-term and revegetation would generally occur over a 2- to 5-year period. In woodland habitat, the disturbance would be long term and revegetation would generally take 10 to 20 years or more.

BIOLOGICAL ASSESSMENT

APPENDIX Q

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
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Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

BLM
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ALBUQUERQUE, N.M.

August 3, 2000

Cons. #2-22-94-I-153

Memorandum

To: Field Manager, Albuquerque, Bureau of Land Management, Albuquerque, New Mexico

From: Field Supervisor, New Mexico Ecological Services Field Office

Subject: Concurrence with the Biological Assessment for the El Malpais National Conservation Area General Management Plan and Environmental Impact Statement

This memorandum is in response to your request for concurrence with the biological assessment (assessment) for the El Malpais National Conservation Area (NCA) General Management Plan (Plan) and Environmental Impact Statement, in accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (Act). The Plan is used to set management direction for 248,000 acres of public lands located in central New Mexico within Cibola County administered by the Bureau of Land Management (BLM). The final assessment was received by the U.S. Fish and Wildlife Service (Service) on May 15, 2000. You are requesting concurrence on the determination of "may affect, is not likely to adversely affect" the proposed threatened mountain plover *(Charadrius montanus)*. You identified "no effect" determinations for all other listed, proposed and candidate species within the El Malpais NCA. These species include the black-footed ferret *(Mustela nigripes)*, southwestern willow flycatcher (*Empidonax traillii extimus*), bald eagle (*Haliaeetus leucocephalus*), Mexican spotted owl (*Strix occidentalis lucida*), Zuni (= Rhizome) fleabane (*Erigeron rhizomatus*), and puzzle (= Pecos) sunflower (*Helianthus paradoxus*).

Currently ongoing and proposed activities within the planning area include recreation, facility development, road and trail use/development, vegetation removal, prescribed and wildland fire management, grazing management, and watershed management. The procedures under which the Albuquerque Field Office of BLM operates, as described in the assessment and briefly summarized below, indicate the intent of your office to avoid adverse effects to listed species from these activities.

1. An evaluation of all listed, proposed, candidate, and BLM-sensitive species is conducted before any project is begun. If a "may affect" situation is encountered, section 7 consultation or conference in accordance with the Act is initiated. The results of the consultation/conference would determine the course of action needed to avoid adverse effects on the species under consideration.

2. If land disposals/exchanges are proposed, surveys are conducted beforehand to ensure that no lands containing listed or proposed species and/or their habitats leave public ownership.

The Service concurs with your determination of "may affect, is not likely to adversely affect" the mountain plover, meaning that all effects are beneficial, insignificant, or discountable. Our concurrence is based on the following understanding of your proposed plan. If any of these items conflict with your proposal or are otherwise infeasible, please contact the Service as soon as possible for further consultation. Should the proposal change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

The assessment states that mountain plover habitat is found throughout the NCA area, on BLM-administered and adjacent State and private lands. A mosaic of vegetation and bare ground occurs throughout the NCA lands. Preferred habitats for the mountain plover, including short-grass prairies and grazed pastures, are found throughout the NCA and adjacent lands. No BLM actions, such as land treatments or prairie dog control, are planned within the NCA that would affect mountain plover habitat. The upland habitats within the NCA are considered to be either properly functioning, or changes have been identified to move them in that direction. Mountain plovers are mobile and will move from one pasture to another to find preferred habitat conditions. Livestock watering facilities, including wells, troughs, and dirt tanks, exist throughout all of the NCA, also providing preferred habitat for mountain plovers. A prairie dog colony enhancement project, planned for approximately 1,000 acres of land within the NCA, is anticipated to have potential benefits to the mountain plover. Surveys to determine nesting concentration areas for mountain plovers are being planned by the Albuquerque Field Office and will begin in 2001. If these surveys identify nesting concentration areas, the areas will be protected, such as by fencing, to reduce or eliminate potential disturbances to this species.

This concludes section 7 consultation on the proposed NCA Plan. The Service appreciates the substantial amount of interagency early coordination contributed by BLM staff who also prepared this excellent, comprehensive assessment. We also commend the intent of the Albuquerque Field Office of the BLM to avoid adverse effects to listed species, and to provide additional habitat for the mountain plover and benefits to other species with this project. In future communications regarding this memorandum or the proposed plan, please

refer to Consultation #2-22-94-I-153. If you have any questions concerning this memorandum, please contact Dr. Patricia Zenone of my staff at (505) 346-2525, ext. 118.

Joy E. Nicholopoulos

Joy E. Nicholopoulos

cc:

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico

Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry and Resources Conservation Division, Santa Fe, New Mexico

State Director, Bureau of Land Management, 1474 Rodeo Road, P.O. Box 27115, Santa Fe, New Mexico 87502-0115

Assistant Regional Director for Ecological Services, U.S. Fish and Wildlife Service, Albuquerque, New Mexico

APPENDIX Q

BIOLOGICAL ASSESSMENT

INTRODUCTION

The "Rio Puerco Resource Management Plan Amendment/Environmental Impact Statement for El Malpais National Conservation Area (NCA) and Chain of Craters Wilderness Study Unit" referred to as the "Plan" is a document used to set the management direction on 248,000 acres of public lands administered by the Bureau of Land Management (BLM). These lands are located in central New Mexico within Cibola County.

This Biological Assessment (BA) is being prepared for the proposed action as identified within the Environmental Impact Statement (EIS), and covers all of the BLM's major programs including grazing, forestry, lands and recreation. This BA evaluates all listed, proposed and candidate species potentially found within Cibola County.

Seven federally listed, proposed, and candidate species are known or have the potential to occur within Cibola County, which covers the scope of the NCA. However, because of the land ownership patterns and the specific habitats used by many of these species, they may occur with the broad borders of Cibola County but not occur within the NCA. The potential for these species' presence within the area, and any impacts on them resulting from implementation of the Plan are examined in this BA.

SUMMARY OF RESOURCE MANAGEMENT PLAN (RECORD OF DECISION)

The Preferred Alternative (Balanced Management) would protect important environmental values and sensitive resources, while at the same time allowing development that provides commercial goods and services. A summary of the NCA plan is as follows:

DESCRIPTION OF THE PREFERRED ALTERNATIVE (RESOURCE PROGRAMS)

For a complete description of all programs and actions in the NCA, refer to the Plan and Record of Decision, which are available for review at the Albuquerque Field Office (AFO). The programs summarized below are those that have the potential to affect species being evaluated for this BA.

Animal Damage Control Program

Presently the Animal Damage Control program for the AFO is operating under a Memorandum of Understanding between the BLM and the Animal and Plant Health Inspection Service, Wildlife Services (USDA, APHIS 1995).

The Animal and Plant Health Inspection Service (APHIS), Wildlife Services branch is responsible for conducting Environmental Analysis (EAs) on all ADC actions, including any section 7 consultation associated with Threatened and Endangered Species. An Environmental Assessment (USDA, APHIS 1997) was prepared for Northern New Mexico, of which AFO is a part. The Record of Decision found no significant impacts from implementation of the Animal Damage Control on BLM and other lands.

An annual operating plan for northern New Mexico is completed each year by APHIS-Wildlife Services with input from the BLM. The Albuquerque Field Office provides information to APHIS-Wildlife Services on safety concerns (e.g., recreation use areas) and wildlife issues as part of the preparation of the annual work plan. Some BLM wildlife concerns include, no rodent control (prairie dogs) within areas identified as potential future reintroduction sites for the Black-footed ferret and within the hunting vicinity of nesting peregrine falcons.

Forestry Program

The woodland resources program in the NCA consists of managing limited ponderosa pine stands and the more extensive piñon-juniper woodlands. In addition, a few scattered Douglas fir trees occur in association with the ponderosa pine stands.

The long-term objectives for ponderosa pine management in the NCA Area are to increase reproduction and stand vigor, as well as to reduce en-

croachment of piñon-juniper into the ponderosa pine stands. All of the forestry program practices for ponderosa pine habitat, would be to enhance the habitat, no commercial harvest of timber (P.L. 100-225), and no firewood sales would be allowed within the NCA. Because there are only a few Douglas fir trees, the BLM has developed no specific management objectives for them. These small stands are intermingled within ponderosa pine stands, so they are managed under the same long-term objectives.

The long-term objectives for the woodland (piñon-juniper) management program in the NCA area is to establish and maintain healthy woodland stands.

Ponderosa Pine

Providing for the long-term maintenance of the ponderosa pine stands is the long-term goal of the program. Because existing ponderosa pine is managed for enhancement and protection of the stands, rather than the maximization of forest products, no specific allowable cut goals have been established for this species in the NCA area. The public law (P.L. 100-225) that established the NCA, specifically eliminated commercial use of timber resources within the area.

Piñon-Juniper

The main guidelines for the agency's woodland (piñon-juniper) program are contained in the Public Domain Woodlands Management Policy Statement (USDI, BLM 1982a). However, due to P.L. 100-225, the piñon-juniper woodlands, like ponderosa pine, are not managed on a sustained-yield basis. Only home-use firewood and removal of trees to improve resource values of the area are allowed. For example, thinning of piñon-juniper woodland stands may be undertaken, to develop wildlife habitat or promote the growth of ponderosa pine stands.

Range Management Program

The primary objective of the range program is to ensure that grazing management for each allotment in the NCA area is suited to the environmental conditions and resource uses found on the allotment. Data from vegetative inventory and monitoring studies is used to evaluate the need for changes in allotment grazing management. These changes are designed to achieve long-term improvement in vegetative condition for wildlife habitat and watershed protection as well as for livestock grazing use. Table 1 gives a description of the grazing management program by allotment.

Description of the Grazing Program by Allotment

Thirteen allotments (Table 1) within the NCA area were evaluated for Rangeland Health in 1998 (USDI, BLM 1998). In addition, Environmental Assessments (EAs) for grazing activities were completed on all thirteen allotments. Where the allotment was found to be functioning, no additional measures were identified to adjust the grazing program. In allotments where upland habitats were identified as non-functioning or functioning-at-risk, specific measures were identified as part of a new grazing operation to move the rangeland health to functioning condition. There are three allotments within the NCA (Table 1) that have not been evaluated for rangeland health or an EA prepared. These allotments will be evaluated through the EA process as they are renewed in the future as part of the ongoing effort to prepare EAs on all grazing allotments with the AFO. As with previous renewal authorizations, each allotment would be required to meet the rangeland health standards or changes would need to be identify to move the areas toward healthy rangeland condition.

Data from monitoring ecological condition, trend, utilization, climatic conditions and actual use is analyzed and evaluated to determine grazing use adjustments on allotments. The results of allotment evaluations aid the BLM to determine if adjustments in grazing use are needed. Grazing adjustments are made on a periodic basis, after taking into account all information needed to evaluate proper grazing use of an allotment.

Removing or restricting livestock from riparian areas year-long or during the growing season is a major step in riparian recovery. Allowing the riparian zone to re-vegetate will eventually establish a higher water table and allow the area to maintain a stable condition even during peak runoff periods.

The BLM is managing upland areas to maintain functioning ecosystems. Range improvement

projects and other actions to improve the condition of the uplands include; sagebrush control, better water distribution, and fencing to provide for grazing management (i.e., rest rotation between pastures).

TABLE 1
ALLOTMENT SUMMARY INFORMATION (Part 1)

	Acreage by Ecological and/or Range Condition*							T&E/Proposed Species	
Allotment Name/Number	Early Seral (Poor)	Mid Seral (Fair)	Late Seral (Good)	PNC (Ex.)	Total Acre-age of Public Land	Riparian PFC (mi./class)	Percent Federal For-age	List Species That Occur on the Allotment	List Species With Unoccupied Habitat in the Allotment
El Malpais-203	Functioning at Risk (76,700 acres of grasslands)				135200	2/PF	72%	Mountain Plover.	Potential Mountain Plover Habitat occurs in all of the allotments.
Cerro Brillante-207	Functioning				21760	None	95%	Mountain Plover	
Techado Mesa-209	Fun-5140, Fun at Risk-32483				37623	None	90%	None	
Los Pilares-205	Fun-11900 Fun at Risk-2100				14000	None	64%	None	
Ventana Ridge-211	Functioning				3013	None	100%	None	
Los Cerros-210	Functioning				40109	None	91%	None	
Cerritos de Jaspe-201	Functioning				9138	None	93%	None	
Palomas-457	Functioning				640	None	100%	None	
Bright's Well-202	Functioning				304	None	100%	None	
Little Hole in the Wall-206	Functioning				320	None	100%	None	
Raney-204	Functioning				1980	None	74%	None	-
Chical-222	Functioning				1600	None	100%	None	
Monument Lake-438	Functioning				3200	None	100%	None	
Loma Montosa-208	Not Assessed				7520	None	40%	None	
Arrossa Individual-226	Not Assessed				304	None	100%	None	
La Vega-439	Not Assessed				160	None	100%	None	

TABLE 1 (Cont.)
ALLOTMENT SUMMARY INFORMATION (Part 2)

	Current Livestock Management									Proposed Livestock Management						
Allotment Name/Number	Trend or Apparent Trend in Key Areas[1] Rip	Upland	Utilization in Key Areas[1] Rip	Upland	Kind/Class of Livestock	Max. No. of Head[2]	AUMs	Season of Use	Management Scheme (Briefly ID grazing system, etc.)	Utilization in Key Areas[1] Rip	Upland	Kind/Class of Livestock	Max. No. of Head[2]	AUMs	Season of Use	Proposed Changes in Management Scheme (Briefly ID grazing system, etc.)
El Malpais-203	Up	Up	N/A	50%	Cattle	1235	10670	YL	No System	N/A	35%	Cattle	1962	16950	YL	Deferred
Cerro Brillante-207	N/A	Stable	N/A	40%	Cattle	270	3325	YL	No System	N/A	40%	Cattle	270	3325	YL	Deferred
Techado Mesa-209	N/A	Stable	N/A	50%	Cattle	397	4768	YL	No System	N/A	50%	Cattle	397	4768	YL	Deferred
Los Pilares-205	N/A	Up	N/A	50%	Cattle	198	1521	YL	Deferred							No Changes
Ventana Ridge-211	N/A	Stable	N/A	50%	Cattle	17	204	YL	No System							No Changes
Los Cerros-210	N/A	Stable	N/A	50%	Cattle	1296	5420	Seasonal	4/30-10/1	-	-		-	-	-	No Changes
Cerritos de Jaspe-201	N/A	Stable	N/A	50%	C/Horse	45/9	1239	YL	No System							No Changes
Palomas-457	N/A	Up	N/A	50%	Cattle	20	89	Seasonal	12/1-4/15							No Changes
Bright's Well-202	N/A	Up	N/A	50%	Cattle	10	48	YL	No System							No Changes
Little Hole in the Wall-206	N/A	Up	N/A	50%	Cattle	3	36	YL	No System							No Changes
Raney-204	N/A	Up	N/A	50%	C/Horse	31/3	410	YL	No System			-				No Changes
Chical-222	N/A	Stable	N/A	50%	Cattle	15	180	YL	No System							No Changes
Monument Lake-438	N/A	Stable	N/A	50%	Cattle	78	472	Seasonal	5/1-10/31							No Changes
Loma Montosa-208	N/A	N/A	N/A	50%	Cattle	298	949	Seasonal	10/1-5/30							Not Assessed
Arrossa Individual-226	N/A	N/A	N/A	50%	Cattle	6	72	YL	No System							Not Assessed
La Vega-439	N/A	N/A	N/A	50%	Cattle	2	24	YL	No System							Not Assessed

Recreation Program

The recreation program's primary goal within the NCA is to ensure the continued availability of outdoor recreation opportunities that are not readily available from other sources. Recreation use is managed to protect the health and safety of users, to protect natural and cultural resource values, and to promote public use and enjoyment. Recreational use of riparian areas within the NCA is very limited, due to the same factors for limited OHV use. The riparian habitat is contained within deep incised arroyos, and do not provide the ascetics (e.g., babbling brook) that attract recreational users, as does many riparian areas within Forest Service and Park Service lands.

Public lands under BLM administration are open for recreational uses such as hunting, camping, hiking, backpacking, mountain biking, horseback riding, bird-watching and other uses. These uses are not specifically permitted or controlled by the agency, but are considered casual use. Except for a few areas (e.g., wilderness, special management areas) where the BLM is doing user-day surveys, no reliable estimate of the amount of recreational use on the public lands within the NCA area has been determined.

All actions permitted on BLM lands are evaluated through the EA process, with appropriate stipulations attached to mitigate any potential impacts to public lands and their resources.

Off Highway Vehicles are presently limited to existing roads and trails within lands administered by the Bureau of Land Management, Albuquerque Field Office. Because the riparian habitat within the field office is contained with deep incised arroyos and are fenced off, vehicle use of these areas is virtually non-existent. The OHV use that does occur on BLM lands is associated with wood cutting, hunting, and pinion nut collecting, which are concentrated in the Pinion/Juniper woodland areas.

Riparian/Wetland Program

Riparian areas are extremely limited in size and extent throughout the NCA. As such they are unique and extremely important, not only for many species of wildlife that are dependent on them, but also for maintenance of water quality, spring and stream flow, and forage production. There are a few small riparian/ wetland marshy areas that occur around natural springs. In addition, the playa lakes which are ephemeral and dependent on annual precipitation, at times can resemble wetlands due to large summer rainstorms. Cebollita and Cebolla are the best known springs (Los Pilares and El Malpais Allotments respectively) and both provide enough water to form riparian/ wetland areas of several acres in size (Cebollita-<1 Acres, Cebolla-7 Acres). In addition, these springs provide enough water to support riparian vegetation (e.g., willows, sedges) below the spring areas (Cebollita-¼ Mile, Cebolla-4 Miles). Both Cebollita and Cebolla springs and the riparian areas below the springs areas are fenced and protected.

Except for the streams below Cebollita and Cebolla springs, there are no other perennial streams on BLM administered lands within the NCA. Runoff occurs only from high intensity summer storms and occasional snow melt. The majority of the area is a closed basin.

The AFO is aggressively engaged in a riparian restoration program (e.g., fencing, planting) to protect and enhance riparian habitats. It is the BLM's goal to restore these habitats to functioning condition, not only for the many wildlife species that use this habitat, but for other resource values (e.g., limiting soil erosion). As identified in the preferred alternative, the stream below Cebolla Spring will be fenced to exclude livestock.

STANDARD OPERATING PROCEDURES

The Standard Operating Procedures under which the AFO operates will help alleviate any possibility of authorized actions affecting a threatened or endangered species. All actions permitted are subject to the following procedures.

#1. An evaluation of all listed, proposed, candidate, and BLM sensitive species is conducted as part of the EA process before any project is begun. The detail of each analysis (e.g., preparation of a Biological Assessment) is based on the size and complexity of the proposal. If a "May Affect" situation is encountered for a listed species, formal consultation under Section 7 of the Endangered Species Act is undertaken with the U.S. Fish and

Wildlife Service (FWS), unless during informal consultation and with written concurrence from the FWS, a "May Affect-Not Likely to Adversely Affect" determination is made. If a "May Affect" situation is encountered for a proposed species, an informal conference with the FWS would be initiated. The results of the consultation/conference would determine the course of action needed to avoid adverse effects on the species under consideration.

#2. If land disposals/exchanges proposed in the RMP are made, surveys are conducted beforehand to ensure that no lands containing listed or proposed species and/or their habitats leave public ownership.

DETERMINATION OF AFFECT

The AFO has prepared this BA on the threatened, endangered and candidate species shown in Table 2, as identified by the FWS in a memorandum dated June 21, 1999 (USDI, FWS 1999a), Consultation #2-22-94-I-153.

The BLM has determined, based on this Biological Assessment, that the implementation of the programs identified within the NCA Plan will result in the following determinations for all the listed, proposed, or candidate species: "No Affect," or "May Affect-Not Likely to Adversely Affect" (refer to Table 2).

TABLE 2

THREATENED AND ENDANGERED, PROPOSED, AND CANDIDATE SPECIES
EL MALPAIS NATIONAL CONSERVATION AREA

Species	Determination	Classification of Affect
Mammals		
black-footed ferret	Endangered	No Affect
Birds		
Southwestern willow flycatcher	Endangered	No Affect
bald eagle	Threatened	No Affect
Mexican spotted owl	Threatened	No Affect
mountain plover	Proposed Threatened	May Affect*
Plants		
Zuni (rhizome) fleabane	Threatened	No Affect

Pecos (Puzzle) sunflower	Threatened	No Affect

* Not Likely to Adversely Affect

SPECIES EVALUATIONS

Black-Footed Ferret (*Mustela nigripes*)

This species is usually associated with prairie dog towns in grassland plains, semi-arid grasslands and adjacent mountain basins. The black-footed ferret historically occurred over most of New Mexico (USDI, BLM 1984). The last confirmed sighting in New Mexico was in 1934 (USDI, BLM 1995). No black-footed ferrets are known to exist other than the captive and reintroduced populations in Wyoming, Montana, South Dakota, and Arizona. However remnant populations may still exist in portions of the former range (*ibid*).

The best information available indicates that the black-footed ferret is extirpated from the wild in New Mexico (NMDG&F 1996). However, in 1998, a captive breeding project was initiated in New Mexico at the Vermejo Park Ranch near Raton.

The most recent information from the FWS (USDI, FWS 1989) indicates that prairie dog towns of the following sizes are necessary to maintain a black-footed ferret population: (a) 80 acres for black-tailed prairie dogs, and (b) 200 acres for Gunnison's prairie dogs.

An evaluation for the presence of prairie dogs to support black-footed ferrets was conducted within the NCA in 1998 (USDI, BLM 1998). No prairie dog colonies of size necessary to support black-footed ferrets were identified within the NCA.

It appears from the available literature that grazing (including intense use) does not have a negative impact on prairie dog colonies. In fact, some literature sources support grazing because it seems to increase the density of prairie dog colonies. In particular, black-tailed prairie dogs have been shown to prefer areas with short vegetation cover, which apparently allows them to view predators and maintain a complex social system (Fagerstone and Ramey 1996-1). Rates of prairie dog colony settlement and expansion have been shown to increase under intense livestock grazing and other human disturbance such as homesteading, fencing, cultivation, and the construction of water impoundments (*ibid*. 1996-2). All of these land management practices reduce the height and density of grasses, and provide a desirable environment for prairie dogs to expand and establish new colonies. Fagerstone and Ramey (1996-3) found that prairie dog burrow densities in the Conata Basin of South Dakota increased twice as fast on sites grazed by cattle as on ungrazed sites.

Prairie dog colonies modify the grasslands in a similar manner as grazing cattle do, by their feeding activities. The rodents depend on being able to see terrestrial predators from a distance (*ibid*. 1996-1) and modify vegetation by feeding on grasses and clipping unpalatable plants to ground level (*ibid*. 1996-4). In well-established prairie dog colonies, large areas of bare soil are common (*ibid*. 1996-5).

Prairie dogs were widespread on the Plains throughout the 1800s, being estimated to cover 283 million hectares (about 700 million acres) and to number over 5 billion (*ibid*. 1996-6). To control prairie dog numbers, rodenticides were developed; in the early 1900s millions of hectares were treated with grains containing strychnine and other poisons, significantly reducing prairie dog numbers and eliminating most large colonies. By 1919, after 20 years of control efforts, the area occupied by prairie dogs was reduced to an estimated 40.5 million hectares (100 million acres; *ibid*. 1996-7). In 1971 the estimated occupied areas in the United States was only 566,000 hectares (1.4 million acres; *ibid*. 1996-8). Before that year, these control efforts eliminated approximately 99.8 percent of the prairie dog population in the United States. From the available literature, it appears the decline in prairie dog colonies, and consequently the black-footed ferret throughout the west, was related to federal, state, and local poisoning programs. Also, land use practices reduced available habitat by converting vast areas of the Great Plains to agriculture and urban areas.

The prairie dog population within AFO lands appears to be stable; however, colony sizes fluctuate up and down on a regular basis, mainly due to plague that occurs throughout New Mexico. Plague appears

to be the limiting factor in controlling the size of prairie dog colonies within the state.

Baseline Data

Historically, large prairie dog towns occurred throughout New Mexico and probably Cibola County. Due to widespread poisoning programs and habitat alterations of prairie dog colonies, primarily for agricultural and grazing purposes, suitable habitat for the black-footed ferret was basically eliminated from the state (USDI, BLM 1995).

No black-footed ferrets are known to exist other than the captive and reintroduced populations in Wyoming, Montana, South Dakota, Arizona and New Mexico. The best information available indicates that the black-footed ferret is apparently extirpated from the wild in New Mexico.

Presently the largest known prairie dog colony within the NCA is approximately 20 acres in size. In the past nine years, the number of prairie dogs within the colony have fluctuated due to the periodic outbreak of plaque, but the actual size of the colony has remained constant at about 20 acres. This particular area would be designated under the preferred alternative (EIS-page 4-35) as a prairie dog enhancement project area. The area (1,000 acres) would set aside within two grazing pastures to allow the colony to expand in size if possible. This area supports several special-status species (burrowing owl and mountain plover) and possible if the colony could expand support a potential release site for the black-footed ferret.

Previous Section 7 Consultation

In September, 1996, the BLM completed informal section 7 consultation (#2-22-95-I-410) on the Rio Puerco Resource Management Plan for the black-footed ferret. The FWS concurred with BLMs determination of “No Affect” for the black-footed ferret (USDI, FWS 1996). In September, 1999, the BLM completed informal section 7 consultation (#2-22-97-I-340B) on Grazing Permit Renewals for the NCA (USDI, FWS 1999b).

Affect Determination

Based on the analysis that no habitat exists (e.g., large prairie dog colonies) necessary to support this species within the NCA, the BLM has determined that implementation of the preferred alternative identified within the EIS for the NCA would result in a "No Affect” situation for the black-footed ferret.

Rationale

No black-footed ferrets are known to exist outside of the captive and reintroduced populations in Wyoming, Montana, South Dakota, Arizona and New Mexico. The best information available indicates that the black-footed ferret is apparently extirpated from the wild in New Mexico.

No habitat (large prairie dog colonies) necessary to support this species has been identified on BLM-administered lands within the NCA. The largest known colony within the NCA is proposed to be set aside for their enhancement and the possibility of providing potential habitat for the black-footed ferret in the future.

Historically, large prairie dog towns occurred throughout New Mexico and probably the Cibola County area. Due to widespread poisoning programs and habitat alterations of prairie dog colonies, primarily for agricultural purposes, suitable habitat for the black-footed ferret was basically eliminated in the state.

The available literature indicates that grazing (including intense use) does not have a negative impact on prairie dog colonies. In fact, some literature sources support grazing because it seems to increase the density of prairie dog colonies.

Cumulative Impacts

No current habitat exists within the NCA to support the Black-footed Ferret.

Because the preferred alternative (Balanced Management) has a “No Affect” for the Black-footed Ferret, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state

activities) for this species would not change due to this action.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The Southwestern willow flycatcher is found along riparian habitats (e.g., rivers, streams and wetlands) of the desert Southwest where dense groves of willows (e.g., *Salix, Baccharis* spp.), arroweed, buttonbrush, boxelder and alder are present, often with a scattered over story of cottonwood (Tibbitts *et al.* 1994). In some locations, exotic plants including tamarisk and Russian olive are also used for nesting. The bird is associated with multi-layered vegetation in close proximity to slack water. The surrounding vegetation of the nesting areas generally ranges from 12 to 21 feet high (*ibid*). Southwestern willow flycatchers breed in habitat where surface water is present (Sferra *et al.* 1995).

Historically the Southwestern willow flycatcher nested along the major river systems in northern New Mexico. However, as the result of riparian degradation during the past century, very little habitat remains.

An evaluation for riparian/wetland habitats to support Southwestern willow flycatchers was conducted within the NCA in 1998 (USDI, BLM 1998). No current or potential riparian/wetland areas needed to support Southwestern willow flycatchers were identified. There are a few small riparian/wetland marshy areas that occur around natural springs. In addition, the playa lakes which are ephemeral and dependent on annual precipitation, at times can resemble wetlands due to large summer rainstorms. Cebollita and Cebolla are the best known springs (Los Pilares and El Malpais Allotments respectively) and both provide enough water to form riparian/wetland areas of several acres in size (Cebollita-2 Acres, Cebolla-7 Acres). In addition, these springs provide enough water to support riparian vegetation (e.g., willows, sedges) below the spring areas (Cebollita-1 Mile, Cebolla-4 Miles).

Except for the streams below Cebollita and Cebolla springs, there are no other large perennial streams within the NCA. Runoff occurs only from high intensity summer storms and occasional snow melt. The majority of the area is a closed basin.

Baseline Data

Historically the Southwestern willow flycatcher nested along the major river systems in northern New Mexico.

No habitats (e.g., riparian/wetland areas) have been identified on BLM-administered lands that would support the Southwestern willow fly-catcher within the NCA. The riparian habitat that exists on BLM-administered lands within the NCA, is limited to intermittent and perennial

springs, small streams below perennial springs, stock watering tanks, and ephemeral playa's.

Previous Section 7 Consultation

In March, 1997, the BLM completed formal section 7 consultation (#2-22-95-I-410) on the Rio Puerco Resource Management Plan for the Southwestern willow flycatcher. The FWS found that the ongoing actions identified within the RMP would not jeopardize the continued existence of the Southwestern willow flycatcher and a non-jeopardy opinion was rendered (USDI, FWS 1997). However, in order to help improve the potential habitat for the Southwestern willow flycatcher within the AFO, seven Conservation Recommendations (CR) were identified. The implementation of the seven conservation recommendations are as follows:

CR-1 Continue flycatcher surveys

The 1998 and 1999 flycatcher surveys were completed as part of a challenge cost sharing agreement with Hawks Aloft. All currently potential and short-term potential habitat areas were surveyed three times during the nesting season according to current protocol. This will continue to be an ongoing annual effort for those currently potential and short-term potential habitat areas. Migrating flycatchers have been observed during several of the surveys, but no nesting activity has been identified.

CR-2 No livestock grazing should occur within areas considered unoccupied, currently potential flycatcher habitat as well as any areas that become occupied by flycatchers from April 15 to August 15

Bluewater Creek ACEC is the only area that is considered unoccupied, currently potential flycatcher habitat within AFO lands. The area has no grazing year-long. No other areas have become occupied by the flycatchers.

CR-3 No habitat-modifying or vegetative manipulation activities should occur within areas considered unoccupied, currently potential fly-catcher habitat. In all other areas, removing vegetation/planting non-native species would require consultation.

Bluewater Creek ACEC is the only area that is considered unoccupied, currently potential flycatcher habitat within AFO lands. No habitat or vegetative manipulation is occurring within the Bluewater Creek ACEC. In other flycatcher habitats, planting of native vegetation is occurring on a regular basis. Planting of native vegetation (willows, cottonwoods) is an ongoing effort to restore riparian habitat on lands managed by the AFO.

CR-4 Summarize trend information so that uplands can be better assessed

In 1998 all of the lotic (running water) segments within the resource area were reevaluated for Properly Functioning Condition. Beginning in July, 1998, an environmental analysis process (EA) was initiated to determine conditions of all grazing allotments, including those with riparian habitat. This EA process will take several years due to the large number of allotments, but will help in the future to summarize upland information and the recovery of riparian communities.

CR-5 Develop a management plan for the flycatcher in the interim until a recovery plan has been completed

The Albuquerque Field Office, Southwestern Willow Flycatcher Management Plan was completed and implemented in 1998.

CR-6 Assess the impacts of winter grazing in riparian habitat

In 1997, a riparian enclosure was established within the Lost Valley riparian pasture. In 1999, a riparian enclosure will be established in the Azabache Riparian pasture, to evaluate winter grazing within the allotments.

CR-7 Continue fencing riparian areas to exclude livestock grazing and track vegetative trends

In 1998, the BLM finished fencing the Coal Creek Allotment, and established a riparian pasture in the Azabache Allotment to protect these riparian areas. As part of a Habitat Management Plan/ Environmental Impact Statement (HMP/EIS) for all riparian areas within the AFO, the BLM will be establishing protective measures for all riparian areas identified during the process. The HMP/EIS is anticipated to be completed in the summer of 2000.

Affect Determination

Based on the analysis that no current or potential habitat (e.g., riparian/wetland areas) needed to support this species exists within the NCA, the BLM has determined that implementation of the preferred alternative identified in the EIS for the NCA would result in a "No Affect" situation for the Southwestern willow flycatcher.

Rationale

No current or potential habitat (e.g., riparian/ wetland areas) to support the Southwestern willow flycatcher have been identified on BLM-administered lands within the NCA. The riparian habitat that exists on BLM-administered lands within the NCA, is limited to intermittent and perennial springs, small streams below perennial springs, stock watering tanks, and ephemeral playa's.

Cumulative Impacts

No current or potential habitat exists within the NCA to support the Southwestern willow flycatcher.

Because the preferred alternative (Balanced Management) has a "No Affect" for the Southwestern willow flycatcher, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagles are generally associated with medium to large perennial streams, rivers and other water bodies that provide an adequate prey base and appropriate nesting/roosting habitat. Outside of the major river corridors (e.g., Rio Grande, Chama), the bald eagle has been observed to be a migrant only, due to the lack of any large streams, rivers or water bodies.

An evaluation for riparian/wetland habitats to support bald eagles was conducted within the NCA in 1998 (USDI, BLM 1998). No foraging habitat (e.g., rivers/streams/waterbodies) or roosting habitat (e.g., large trees) needed to support bald eagles were identified. There are a few small riparian/wetland marshy areas that occur around natural springs. In addition, the playa lakes which are ephemeral and dependent on annual precipitation, at times can resemble wetlands due to large summer rainstorms. Cebollita and Cebolla are the best known springs (Los Pilares and El Malpais Allotments respectively) and both provide enough water to form riparian/wetland areas of several acres in size (Cebollita-2 Acres, Cebolla-7 Acres). In addition, these springs provide enough water to support riparian vegetation (e.g., willows, sedges) below the spring areas (Cebollita-1 Mile, Cebolla-4 Miles).

Except for the streams below Cebollita and Cebolla springs, there are no other large perennial streams within the NCA. Runoff occurs only from high intensity summer storms and occasional snow melt. The majority of the area is a closed basin.

The breeding population of bald eagles has historically been low, although New Mexico does provide habitats for wintering and migration. Food availability is a major factor influencing bald eagle distribution. Fish is generally considered the preferred prey base for bald eagles. However, waterfowl (particularly dead or crippled individuals), dead livestock, rabbits and small mammals can be used as a prey base for a wintering population.

Bald eagles have been observed migrating seasonally through the NCA area, but no nesting or roosting is known to occur (Williams 1995). General wildlife and particularly raptor surveys are conducted annually, and no bald eagle roosting or nesting has been identified.

The bald eagle population is in an upward trend throughout the United States. In July 1994, the FWS proposed to reclassify the bald eagle from endangered to threatened in the lower 48 states, including the southwestern region and Mexico. On August 11, 1995, this reclassification took place.

Baseline Data

No habitats (e.g., rivers/streams/waterbodies) have been identified on BLM-administered lands that would support bald eagles within the NCA.

Bald eagles are known to migrate through Cibola County, but due to the lack of appropriate habitat on BLM-administered lands, no use of these lands is anticipated.

Previous Section 7 Consultation

In September, 1996, the BLM completed informal section 7 consultation (#2-22-95-I-410) on the Rio Puerco Resource Management Plan for the bald eagle. The FWS concurred with BLMs determination of “May Affect-Not Likely to Adversely Affect” for the bald eagle (USDI, FWS 1996). In September, 1999, the BLM completed informal section 7 consultation (#2-22-97-I-340B) on Grazing Permit Renewals for the NCA (USDI, FWS 1999b).

Affect Determination

Based on the analysis that no habitats exists (e.g., streams/rivers) to support this species within the NCA, the BLM has determined that implementation of the preferred alternative identified in the EIS for the NCA would result in a "No Affect” situation for the bald eagle.

Rationale

No habitats (e.g., streams/rivers/waterbodies) have been identified on BLM-administered lands that would support the bald eagle within the NCA.

Bald eagles are known to migrate seasonally through Cibola County, but, with no habitat to support nesting/roosting (e.g., large trees) or foraging (e.g., streams/rivers/waterbodies), they are not expected to use the NCA lands.

The upland habitats are considered to be in functional condition or changes have been proposed to move toward functional condition, and livestock use is not contribution to any vegetation degradation.

Cumulative Impacts

No current or potential habitat exists within the NCA to support the bald eagle.

Because the preferred alternative (Balanced Management) has a “No Affect” for the bald eagle, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Mexican Spotted Owl (*Strix occidentalis lucida*)

The Mexican spotted owl occupies mountainous areas, with its preferred habitat consisting of dense, multi-storied forests with moderately closed to closed canopies. In addition, these owls have been found in canyon systems with little or no tree cover (USDI, FWS 1993). These canyon systems appear to provide the same or similar microclimate as the dense multi-storied forests.

Historically the NCA area contained forest stands that no longer exist today. Beginning in the 1800s homesteaders, owners of land grants, and private logging companies removed most of large commercial timber from the NCA area. These past forestry practices have resulted in a lack of any dense, old-growth forests remaining. Public law 225-100, which established the NCA, precludes any commercial harvest of timber within the NCA. Only home-use firewood sales are allowed to occur within the area.

An evaluation for forest/canyon habitats to support Mexican spotted owls was conducted within the NCA in 1998 (USDI, BLM 1998). No habitat areas to support Mexican spotted owls were identified. Most of the woodland habitat is comprised of piñon-juniper stands, with a few scattered ponderosa pine trees. The Mexican Spotted Owl Recovery Plan (USDI, FWS 1995) does not contain specific guidelines for ponderosa pine and piñon-juniper habitats, which are considered as "Other Forest and Woodland Types" in the plan.

There were some small canyon areas associated with the Cebolla Wilderness area identified during the 1998 surveys. In comparing the habitat of these canyons with the known habitat characteristics (Mexican Spotted Owl Recovery Plan), they do not provide appropriate habitat to support this species. However, all of these known canyon habitats are presently protected by wilderness, wilderness study area, or National Conservation Area status; in which permitted activities are closely monitored.

In 1998, a rangeland health assessment was conducted on thirteen allotments. In eleven of the allotments the upland habitats were considered to be in functional condition, and livestock use was not contribution to any vegetation degradation. In the remaining two, changes are proposed to move the habitat to functional condition (refer to the rangeland management section).

The BLM will follow the Mexican spotted owl recovery plan guidelines in managing its timber and fuelwood programs in areas where BLM lands are adjacent to other lands that have been identified as spotted owl habitat. No critical habitat has been designated by the FWS on any BLM lands within the NCA area.

Baseline Data

Historically the NCA area contained forest stands that no longer exist today. From the 1800s, homesteaders, owners of land grants, and private logging companies removed most of large commercial timber within the NCA area. As the result of these historic forest practices, no habitats that meet the criteria to support this species have been identified on BLM-administered lands.
No specific guidelines have been established for ponderosa pine and piñon-juniper habitats, which are considered as "Other Forest and Woodland Types" within the U.S. Fish and Wildlife Service's Mexican spotted owl recovery plan.

No habitats (e.g., forest/canyon) exists on BLM-administered lands necessary to support this species within the NCA. All of the woodland habitat is comprised mainly of piñon-juniper stands, with a few scattered ponderosa pine and Douglas fir trees.

Previous Section 7 Consultation

In September, 1996, the BLM completed informal section 7 consultation (#2-22-95-I-410) on the Rio Puerco Resource Management Plan for the Mexican spotted owl. The FWS concurred with BLMs determination of “May Affect-Not Likely to Adversely Affect” for the Mexican spotted owl (USDI, FWS 1996). In September, 1999, the BLM completed informal section 7 consultation

(#2-22-97-I-340B) on Grazing Permit Renewals for the NCA (USDI, FWS 1999b).

Affect Determination

Based on the analysis that no habitats exists (e.g., forest/canyon) to support this species within any of the NCA, the BLM has determined that implementation of the preferred alternative identified in the EIS would result in a "No Affect" situation for the Mexican spotted owl.

Rationale

No habitat (e.g., forest/canyon) exists on BLM-administered lands to support this species within any of the NCA. All of the woodland habitat is comprised mainly of piñon-juniper stands, with a few scattered ponderosa pine and Douglas fir trees.

Forestry program practices within the NCA area would not affect any ponderosa pine habitat. Public law 225-100, which established the NCA, precludes any commercial harvest of timber within the NCA. Only home-use firewood sales are allowed to occur within the area.

A rangeland health assessment was conducted on all allotments where canyon habitat exists. The upland habitats are considered to be in functional condition, and livestock use is not contribution to any vegetation degradation, or actions are proposed to move upland habitat to functioning condition.

The BLM will follow the U.S. Fish and Wildlife Service's Mexican spotted owl recovery plan guidelines in managing its timber and fuelwood programs in areas where BLM lands are adjacent to other lands that have been identified as spotted owl habitat.

Cumulative Impacts

No current or potential habitat exists within the NCA to support the Mexican spotted owl.

Because the preferred alternative (Balanced Management) has a “No Affect” for the Mexican spotted owl, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Mountain Plover (*Charadrius montanus*)

The mountain plover prefers flat, short-grass prairie and tends to avoid taller grasses and hillsides (USDI, BLM 1995). Suitable habitat occurs in areas often grazed by livestock (*ibid*). The bird prefers habitat comprised of large areas of bare ground and short grass (less than 4-inch-tall stubble). Prairie dog towns and turf farms are likely areas of use. Outside the breeding season, this species occurs in flocks of individuals up to several hundred feeding in alkaline flats, plowed ground, sprouting grain fields and grazed pastures (Terres 1982). Short vegetation, bare ground, and a flat topography are now recognized as habitat-defining characteristics (USDI, FWS 1999c). In addition to using prairie dog towns, mountain plovers show a strong affiliation with sites that are heavily grazed by domestic livestock (e.g., near stock watering tanks)(*ibid*).

The mountain plover has been identified in numerous locations throughout northern New Mexico during surveys by the New Mexico Department of Game and Fish in 1995 (Williams 1995). The bird is likely to occur throughout the AFO lands, particularly in the short-grass prairie regions. No critical habitat has been established. Additional surveys, to determine nesting concentration areas are being planned for 2001 and beyond. If these surveys do identify nesting concentration areas, the areas will be protected (e.g., fencing) to reduce or eliminate potential disturbances to this species.

The following actions have created and are likely to continue to create impacts to mountain plovers and/or their associated habitat (USDI, FWS 1999c).

Conversion of grasslands to croplands and urban uses
Prairie dog control
Mineral development
Domestic livestock management

The EIS is being prepared to evaluate management activities that are presently occurring on

BLM-administered lands within the NCA. Conversion of grasslands to croplands and urbanization, prairie dog control, and mineral development are not occurring or planned within the NCA and were not addressed in the EIS. Because these activities are not occurring or planned to occur within the NCA, they will not be discussed as part of this biological evaluation. If these or any other activities are planned to occur on BLM-administered lands in the future, they would be analyzed through the EA process, including a biological evaluation before authorization of the action.

Livestock management practices have in the past and are presently encouraging vegetation growth by the development of grazing systems that allow growing season rest and limit the overall utilization levels. This type of management helps to minimize soil disturbance and ultimately erosion within the allotment and the overall watershed. These management practices, which allow vegetative cover to be maintained over the widest area possible, are helping to restore upland and riparian habitats to properly functioning condition. Fencing areas to create riparian pastures and control livestock grazing during the growing season is a major emphasis on BLM lands.

Grazing practices that maintain ground cover to the greatest extent possible could decrease mountain plover habitat, especially in rest pastures where the grass is anticipated to exceed the bird's preferred height. In addition, ground cover and vegetation height will in most cases exceed mountain plover preferred habitat characteristics within riparian enclosures which in many cases incorporate some upland acreage's. However, the rested pastures and riparian enclosures are intermingled and in close proximity to grazed pastures which provides the lower stubble height preferred by mountain plovers. In addition, livestock watering facilities (e.g., wells, troughs, dirt tanks) exist in all NCA, which also provides preferred habitat for mountain plovers.

The NCA lands offer a semi-arid environment, of which bare ground is a natural part. Even with incorporating livestock grazing management strategies to improve vegetative cover, a mosaic of vegetation and bare ground will still occur throughout BLM-administered lands, and adjacent private, state, and Indian reservation lands.

As part of the preferred alternative, a prairie dog colony enhancement project would be initiated on approximately 1,000 acres of land with the NCA. The area would be identified as a primary use area by prairie dogs and other activities would have to conform to that use. Transplanting of prairie dogs from other areas (e.g., subdivision in Albuquerque) would be allowed to help the colony to expand. This project could prevent the achievement of the appropriate vegetative community within the area, however, it is anticipated that it would have minimal impacts to the overall habitat within the area. It is anticipated that this project would have potential benefits to the mountain plover, western burrowing owl, and if the colony was able to expand to an appropriate size (200 acres), the area could be a potential release site for the black-footed ferret.

Baseline Data

Habitat destruction, primarily resulting from the conversion of prairie ecosystems to agricultural croplands, has been the primary cause of long-term population declines. In the late 1800s this species was also subjected to market hunting.

The current nesting range is restricted to small populations in parts of California, Montana, Wyoming, Colorado, Oklahoma, and New Mexico.

Mountain plovers are successful in using areas grazed by livestock, in fact they preferred areas where grazing livestock/wildlife maintain the ground cover at a short stubble height.

Previous Section 7 Consultation

In September, 1996, the BLM completed informal section 7 consultation (#2-22-95-I-410) on the Rio Puerco Resource Management Plan for the Mountain Plover (Candidate). In September, 1999, the BLM completed informal section 7 consultation (#2-22-97-I-340B) on Grazing Permit Renewals for the NCA. The FWS concurred with BLMs determination of "May Affect-Not Likely to Adversely Affect" for the Mountain Plover (USDI, FWS 1999b).

Affect Determination

Based on this analysis of the permitted

activities, the BLM has determined that implementation of the preferred alternative identified in the EIS would have the potential to create a "May Affect-Not Likely to Adversely Affect" situation for the mountain plover.

Rationale

Mountain plover habitat is not limited on the NCA lands, but is found throughout the area on BLM-administered and adjacent state and private lands. A mosaic of vegetation and bare ground occurs throughout the NCA lands.

Short-grass prairies and grazed pastures (preferred habitats) are found throughout the NCA and adjacent state and private lands. The upland habitat within the NCA are considered to be properly functioning condition or changes have been identified to move in that direction. Mountain plovers are mobile and will move from one pasture to another to find preferred habitat conditions.

Livestock watering facilities (e.g., wells, troughs, dirt tanks) exist throughout all of the NCA, which also provides preferred habitat for mountain plovers.

No BLM actions (e.g., land treatments, prairie dog control) are planned within the NCA that would affect mountain plover habitat.

A prairie dog colony enhancement project is planned to be initiated on approximately 1,000 acres of land with the NCA. It is anticipated that this project may have some potential benefits to the mountain plover, depending on other factors (e.g., plague).

Cumulative Impacts

Domestic Livestock Grazing: Approximately 100,000 acres of potential Mountain Plover habitat exists within the NCA. Because many different grazing systems (e.g., rest rotation, deferred) occur within these NCA, not all of the 100,000 acres of habitat would be grazed in any one year or during any particular time period (e.g., spring, summer, fall). Rested and grazed pastures would be scattered throughout the NCA. Most of the available grazing lands (public, private, state) within the NCA are being grazed throughout the year, at least on an intermittent basis. However, because mountain plovers prefer short vegetation and actually seek out grazed pastures, the cumulative impacts from grazing are not anticipated to adversely affect the mountain plover. The available literature has shown that mountain plovers have a strong affiliation with sites that are grazed by domestic livestock.

Conversion of Grasslands to Croplands and Urban Use (Habitat Loss): The main loss of habitat for the mountain plover within the NCA would include new subdivisions and agricultural uses. The present and foreseeable loss of grazing lands to agricultural uses is not specifically known, however, because of the general lack of water and unsuitability of these grazing lands to be converted to agriculture uses, it is not anticipated to be a major factor in habitat loss for the mountain plover.

The loss of grazing lands to subdivisions (urban uses) have been increasing over the last decade and is anticipated to continue. The NCA is considered to be the largest area of prime habitat for the mountain plover within the AFO. Within this area several subdivisions (Approximately 2-3,000 acres) of private lands are presently being developed. These development areas are generally broken up into 10-40 acre tracks. Even when all of the tracks are sold, most of the habitat will be left undeveloped due to the large size of the tracks and the small acreage's actually used as building sites and roads. It is estimated that approximately 100,000 acres of public lands (BLM administered) and another 100,000 acres of private and state lands are potential plover habitat within or adjacent to the NCA. Consequently, the loss of habitat for the mountain plover would be small (<1½%) in comparison to the overall habitat available within or adjacent to the NCA.

The cumulative impacts from loss of habitat to urbanization and agriculture would be minimal and only a slight incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species would be anticipated. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not measurable change due to this action.

Zuni (Rhizome) Fleabane (*Erigeron rhizomatus*)

This species is associated with clay soils derived from Chinle Shale formation outcrops at 7,300- to 8,000- foot elevations in the Zuni, Datil and Sawtooth Mountains. The habitat consists of sandstone slopes and clay banks.

In 1979 a plant survey (Spellenberg) was conducted within the El Malpais National Conservation Area and National Monument and adjacent areas of Cibola County (Then Valencia County). The Zuni fleabane was among the specific plants that were targeted as part of the survey, because of El Malpais' proximity to the known populations in the Zuni Mountains to the west and the Datil and Sawtooth Mountains to the south. No evidence of this species was located.

In 1988 Debruin developed an annotated checklist of vascular plants on the lava and sandstone substrates of Cibola County, New Mexico. Cibola County is the closest county with BLM-administered lands to the known populations of the Zuni fleabane in McKinley and Catron Counties. No evidence was found that identified the Zuni fleabane as having been collected or identified with Cibola County.

In 1998 a plant survey (Ladyman 1998) was conducted by New Mexico Natural Heritage within the El Malpais National Conservation Area. The Zuni fleabane was among the specific plants that were targeted as part of the survey. Soils derived from the Chinle formation are reported to provide the required edaphic conditions for this species. The Chinle formation was not identified within the NCA (Ladyman 1998). However, a survey of erodible slopes that are characteristic of Zuni fleabane habitat were surveyed, with no evidence of this species found, and no potential habitat identified *(ibid*).

Except for its narrow range and very local distribution, no other threats are known for the Zuni fleabane (Spellenberg 1979). Spellenberg, found that grazing was not occurring on the population of plants in the Zuni Mountains near Fort Wingate.

Baseline data

The closest known population of this species to BLM lands within these NCA is in McKinley County on Forest Service lands near Fort Wingate (Sivinski 1995). The other populations occur within the Datil and Sawtooth Mountains in Catron County.

Soils derived from the Chinle formation are reported to provide the required edaphic conditions for this species. No Chinle formation soils

were identified within the NCA during the 1998 survey (Ladyman 1998).

Previous Section 7 Consultation

In September, 1996, the BLM completed informal section 7 consultation (#2-22-95-I-410) on the Rio Puerco Resource Management Plan for the Zuni fleabane. The FWS concurred with BLMs determination of "No Affect" for the Zuni fleabane (USDI, FWS 1996). In September, 1999, the BLM completed informal section 7 consultation (#2-22-97-I-340B) on Grazing Permit Renewals for the NCA (USDI, FWS 1999b).

Affect Determination

Based on the analysis that no habitat on BLM lands have been identified to support this species within the NCA, the BLM has determined that implementation of the preferred alternative identified within the EIS, would result in a "No Affect" situation for the Zuni fleabane.

Rationale

Known distribution of the Zuni fleabane in New Mexico is limited (to the Zuni, Datil and Saw-tooth Mountains.)

Two surveys (1979, 1998) and a literature search have not identified this species or suitable habitat as occurring on BLM lands within the NCA.

Livestock is not known to utilize this species as forage, and it occurs in locations (e.g., sandstone bluffs, lave flows) that are not likely to be used by livestock.

Cumulative Impacts

No current or potential habitat exists within the NCA to support the Zuni fleabane.

Because the preferred alternative (Balance Management) has a "No Affect" for the Zuni fleabane, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Pecos (Puzzle) Sunflower (*Helianthus paradoxus*)

This species has a very limited distribution and population size. It is restricted to alkaline (saline) marshes, river/stream banks and moist open areas of semi-desert grasslands. This species requires permanently wet soils. Within the AFO area it is known from the Laguna Indian Reservation in Valencia County (although it has not been seen at the reservation in over a century) and from private lands in the Grants area (Sivinski 1995).

An evaluation for riparian/wetland habitats was conducted within the NCA in 1998 (USDI, BLM 1998). No permanently wet soils/alkaline seeps were identified within the NCA. There are several Riparian/Wetland areas located in the northern portion (Neck) of the NCA on private lands, one along highway 53 near the town of San Rafael and one in Township 10 North Range 9 West Section 18 (Laguna del Chical) approximately 4 miles south of Grants. No Riparian/Wetland areas are located on any public lands with the northern portion of the NCA.

In 1998 a plant survey (Ladyman 1998) was conducted by New Mexico Natural Heritage within the El Malpais National Conservation Area. The Pecos sunflower was among the specific plants that were targeted as part of the survey. The survey looked at those areas (e.g., springs, playas, dirt tanks) that could potentially provide appropriate habitat. Except for the springs none of the areas provided the necessary permanently wet soils and none of the areas visited were particularly saline which is also a pre-requisite for the sunflower (*ibid*). No evidence of this species was found within the NCA *(ibid*).

Baseline data

The closest known population of this species to BLM lands within the NCA is near the town of Grants.

This species occurs in alkaline seeps and marshes, and requires permanently wet soils.

A survey (Ladyman 1998) within the NCA area did not identified this species as occurring on BLM lands within the NCA.

Previous Section 7 Consultation

In September, 1999, the BLM completed informal section 7 consultation (#2-22-97-I-340B) on Grazing Permit Renewals for the NCA (USDI, FWS 1999b).

Effect Determination

Based on the analysis that no habitat exists to support this species within the NCA, the BLM has determined that implementation of the preferred alternative identified within the EIS, would result in a "No Affect" situation for the Pecos sunflower.

Rationale

Known distribution of the Pecos sunflower in New Mexico is limited to the Laguna Indian Reservation and an area near the town of Grants.

A survey (Ladyman 1998) within the NCA area did not identified this species as occurring on BLM lands within any of the NCA.

No habitat to support this species (e.g., alkaline seeps) exist on BLM administered lands within any of the NCA.

Cumulative Impacts

No habitat exists within the NCA to support the Pecos sunflower.

Because the preferred alternative (Balanced Management) has a "No Affect" for the Pecos sunflower, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

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INFORMATION ON CATRON COUNTY LANDS RECOMMENDED FOR CONGRESSIONAL INCLUSION IN THE EL MALPAIS NATIONAL CONSERVATION AREA

APPENDIX R

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INFORMATION ON CATRON COUNTY LANDS RECOMMENDED FOR CONGRESSIONAL INCLUSION IN THE EL MALPAIS NATIONAL CONSERVATION AREA

EL MALPAIS NATIONAL CONSERVATION AREA (NCA) PLAN

The Albuquerque Field Office is releasing the *Draft El Malpais NCA Resource Management Plan Amendment* (Plan Amendment or Draft Plan) *and Environmental Impact Statement* (EIS) in June 1999. The legislation designating the NCA mandated the development of a General Management Plan (GMP), which the BLM considered to be an activity-level document rather than a formal Plan Amendment and EIS. The GMP and accompanying Environmental Assessment (EA) were completed in 1991. Upon appeal by several wilderness advocates, the Interior Board of Land Appeals (IBLA) decided that the GMP/EA was inadequate and required the BLM to prepare a Plan Amendment/EIS.

The BLM El Malpais Planning Team used the best available scientific, social, economic and cultural data to develop the four alternative management strategies analyzed in the Draft Plan/EIS. Input from local residents, private landowners, recreational user groups, environmental and conservation groups, cultural preservation interests, other government agencies (federal, state, county, local and tribal) was carefully considered in the developing the Draft Plan/EIS. The public will have additional opportunities to provide input during a 90-day Draft Plan/EIS comment period.

BACKGROUND

- The 262,600-acre El Malpais NCA was established in December 1987 with the passage of Public Law (P.L.) 100-225.

- Two wildernesses, the Cebolla and West Malpais, were also established by P.L. 100-225 and are part of the NCA.

- The Plan Amendment integrates recent information with the extensive work previously completed for the GMP. Using an interdisciplinary approach, the planning team has developed adaptive management alternatives that include monitoring and inventory components designed to assess the effect of management on ecosystem health over time.

- The NCA is currently managed under the guidance of existing policy, the El Malpais legislation, the Rio Puerco Resource Management Plan (RMP--1986), and the Socorro Grazing EIS (1982).

- Construction activities in the NCA have been limited to the El Malpais Ranger Station (completed in 1991) and the area around La Ventana Natural Arch. These two projects were initiated based on approved EAs before the GMP appeal.

- Traversing part of the NCA and National Monument, 36-mile County Road 42 was dedicated as the Chain of Craters Back Country Byway in January 1994. The NCA is also home to a segment of the Continental Divide National Scenic Trail.

- Based on aboriginal land use claims, several tribal governments—most notably Acoma Pueblo— strenuously objected to establishment of the NCA and National Monument. Throughout the Draft Plan/EIS process, the BLM has consulted with the affected tribes and attempted to address their concerns.

- The Draft Plan/EIS includes a recommendation to legislatively amend the current Cebolla Wilderness boundary to include contiguous lands recently acquired by the BLM and exclude 160 acres of Acoma Pueblo land. A “non-suitable” recommendation on the Chain of Craters Wilderness Study Area (WSA) is also included.

- The legislation establishing the El Malpais NCA provided for continued livestock grazing in the area. While the Draft Plan/EIS does not include allotment-specific analyses under the National

Environmental Policy Act (NEPA), these have been initiated on all New Mexico grazing allotments. Several allotments within the NCA are considered high priority; NEPA analyses have been initiated and are expected to be completed for those allotments during 1999.

- Portions of several grazing allotments within the NCA extend into Catron County. Although they are within the BLM Socorro Field Office boundaries, these small portions have been managed out of the Albuquerque Field Office through an administrative agreement. The plan recommends legislative extension of the NCA boundaries to include these areas. In the interim, grazing will continue in the area except as specified in the Socorro RMP.

- Unlike a BLM administrative designation (e.g., Area of Critical Environmental Concern or Special Management Area), Congressionally legislated designations—such as an NCA—do not require NEPA analyses or studies before designation. If the Congress officially extends the NCA boundaries, the BLM will then undertake NEPA analysis as part of the resource management planning process for the newly designated portions of the NCA.

- Two required public hearings will be scheduled during the Draft Plan/EIS comment period. The Final Plan and Record of Decision will address and incorporate comments received during the 90-day draft comment period.

THE UNITS & THEIR RESOURCES

Two units of land are involved. The **Techado Mesa-SFO Unit** includes approximately 5,000 acres of public land and 40 acres of privately owned land located in Township 4 North, Range 9 West, Sections 13 through 18 and 22. This unit also includes land in Socorro County (Section 18 in T. 4 N., R. 8 W.).

The **Tank Canyon-SFO Unit** includes approximately 10,100 acres located in T. 4 N., R. 10 W., Section 30 and T. 4 N., R. 11 W., Sections 13 through 16, 22 through 27 and 32 through 36. Public land accounts for 9,900 acres, while the other 200 acres are privately owned.

Both units adjoin lands in Cibola County currently being recommended for inclusion in the El Malpais NCA. These lands have resource values similar to those in the NCA. They are discussed below to the extent of the current available data.

Recreation & Facility Development

Recreation

The 14,900 acres of public land provide opportunities for extensive and unstructured recreation, including day hiking, backpacking, big game hunting, off-highway vehicle driving, horseback riding, camping, mountain biking, and gathering noncommercial products such as piñon nuts. The BLM Socorro Resource Management Plan (1989) did not assign Recreation Opportunity Spectrum (ROS) classes to these lands.

Facilities

Public lands within these two units provide no developed facilities, including trails, for recreational use. Such use of the area is dispersed, with users not dependent on developed facilities.

Inclusion of the units in the NCA would not affect recreational use or facility development.

Interpretation

Interpretation is a management tool that connects visitors with resources, promotes understanding of ecosystems and cultures, reinforces visitor safety and promotes resource management decisions. This tool has been applied to public lands within these two units through brochures for all lands administered by the Socorro Field Office. One of the management goals for the Newton Site in Tank Canyon is to protect the site for public interpretation.

Inclusion of the units in the NCA would not affect interpretation.

Access & Transportation

Transportation systems providing access to the public land within the Tank Canyon and Techado Mesa-SFO Units vary from BLM roads to county roads. Cibola County Road 103, north of the Techado Mesa-SFO Unit, serves as the primary vehicle route for access to public land in this unit. Catron County Roads A-081 and A-083, which traverse the

Tank Canyon-SFO Unit along with numerous BLM roads and vehicle routes, provide access to the public land in that unit. Access to public land in both units may also be gained by hiking and horseback.

Both units are classified as open to off-highway vehicle (OHV) use, except for a 40-acre tract of public land surrounding the Newton archeological site in the Tank Canyon-SFO Unit. Vehicle use on this 40 acres is limited to existing roads and trails. Bicyclists also can access these two units by using the existing vehicle travel routes. Cross-country travel is limited because of terrain and vegetative conditions.

Inclusion of the units in the NCA would likely limit OHV use.

Wilderness Management & Suitability

The 14,900 acres of public land do not contain any designated wilderness or a Wilderness Study Area (WSA). Inclusion of the units in the NCA would not affect wilderness suitability nor management.

Cultural Resources

A major concentration of cultural resources exists along the New Mexico Highway 117 corridor in the Spur, Cebolla, and Breaks Units of the NCA. This concentration of sites continues to the south into the Tank Canyon-SFO Unit. The cultural resources in this region are not well documented, but they are believed to include numerous prehistoric pueblo ruins dating to the Pueblo II and Pueblo III periods (A.D. 950 to 1325).

Among these is the Newton Site, a major ruin with approximately 165 ground-floor rooms that is believed to date between A.D. 1200 and 1325. The site includes distinctive architectural features such as an enclosed plaza, ladder-type construction, and perhaps a blocked-in kiva. Portions of the site were excavated by Theadore Frisbie in the mid-1960s, and the BLM completed some stabilization at this site by the BLM in the late 1970s. In addition to prehistoric resources, numerous historical homesteads are also located in this area.

Inclusion of the units in the NCA would facilitate the management of these cultural resources.

Wildlife

The Tank Canyon and Techado Mesa-SFO Units provide habitat for a wide variety of wildlife species. The Tank Canyon-SFO Unit (9,900 acres) adjoins the southwestern edge of the El Malpais Planning Area and is characterized by mesas, canyons, buttes and wide valleys. The dominant vegetation is shrub-grassland with intermingled piñon-juniper woodlands. This area is attractive and important habitat for mule deer, coyotes and many species of birds.

The Techado Mesa-SFO Unit (5,000 acres) adjoins the southeastern edge of the Planning Area and is characterized by sandstone mesas, buttes capped by lava flows, and wide valleys. The area is predominantly piñon-juniper woodlands and scattered ponderosa pine forests. Small playa lakes form seasonally on the mesa top. This area is attractive and important habitat for mule deer, turkeys, Abert's squirrels, and tree- and hole-nesting wildlife. Elk also are seen occasionally.

Inclusion of the units in the NCA would not affect wildlife.

Threatened, Endangered & Other Special-Status Species

Ten federally listed threatened or endangered, 2 proposed threatened, 2 candidate, and 36 BLM sensitive species are known or potentially could occur on public lands within the SFO Units. These are shown in Table R-1. Informal/formal consultation under Section 7 of the Endangered Species Act would be undertaken if any actions were proposed for these lands that would create a "May Affect" situation for any listed or proposed species.

Inclusion of the SFO Units in the NCA would not change the management of threatened, endangered or special-status species nor their habitats.

Vegetative Resources

Forests & Woodlands

Lands in the two SFO Units contain significant piñon-juniper woodlands and isolated ponderosa pine forests. The piñon-juniper woodlands have good potential to support commercial and personal-use fuelwood cutting, although only limited activity has taken place over the past 10 years.

TABLE R-1

SPECIAL-STATUS SPECIES LIST FOR CATRON COUNTY

Common Name	Scientific Name	Status [a]
Mammals		
Allen's (Mexican) big-eared bat	Idionycteris (=Plecotus) phyllotis	SC
big free-tailed bat	Nyctinomops macrotis (=Tadarida m., T. molossa)	SC
black-footed ferret	Mustela nigripes	E
cave myotis	Myotis velifer	SC
greater Western mastiff bat	Eumops perotis californicus	SC
fringed myotis	Myotis thysanodes	SC
long-eared myotis	Myotis evotis	SC
long-legged myotis	Myotis volans	SC
occult little brown bat	Myotis lucifugus occultus	SC
pale Townsend's (=Western) big-eared bat	Plecotus townsendii pallescens	SC
Southwestern otter	Lutra canadensis sonorae	SC
small-footed myotis	Myotis ciliolabrum	SC
spotted bat	Euderma maculatum	SC
Yuma myotis	Myotis yumanensis	SC
Birds		
American peregrine falcon	Falco peregrinus anatum	E
Arctic peregrine falcon	Falco peregrinus tundrius	E (S/A)
Baird's sparrow	Ammodramus bairdii	SC
bald eagle	Haliaeetus leucocephalus	T
ferruginous hawk	Buteo regalis	SC
Interior least tern	Sterna antillarum	E
loggerhead shrike	Lanius ludovicianus	SC
Mexican spotted owl	Strix occidentalis lucida	T
Mountain plover	Charadrius montanus	PT
Northern goshawk	Accipiter gentilis	SC
Southwestern willow flycatcher	Empidonax traillii extimus	E w/CH
Western burrowing owl	Athene cunicularia hypugea	SC

TABLE R-1, concl'd

Common Name	Scientific Name	Status [a]
Fish		
Chihuahua catfish	Ictalurus sp.	SC
Desert sucker	Catostomus clarki	SC
Gila chub	Gila intermedia	C
Gila trout	Oncorhynchus gilae	E
loach minnow	Rhinichthys cobitis	T
longfin dace	Agosia chrysogaster	SC
roundtail chub	Gila robusta	SC
Sonora sucker	Catostomus insignis	SC
speckled dace	Rhinichthys osculus (Gila drainage)	SC
spikedace	Meda fulgida	T
Amphibians & Reptiles		
Arizona Southwestern toad	Bufo microscaphus microscaphus	SC
Chiricahua leopard frog	Rana chiricahuensis	SC
Lowland leopard frog	Rana yavapaiensis	SC
Mexican garter snake	Thamnophis eques	SC
narrowhead garter snake	Thamnophis rufipunctatus	SC
Invertebrates		
New Mexico silverspot butterfly	Speyeria nokomis nitocris	SC
Gila springsnail	Pyrgulopsis gilae	C
Plants		
Chiricahua dock	Rumex orthoneurus	PT
Gila groundsel	Senecio quaerens	SC
Goodding's onion	Allium gooddingii	SC
Hess' fleabane	Erigeron hessii	SC
Mogollon clover	Trifolium longipes var. neurophyllum	SC
Parish's alkali grass	Puccinellia parishii	SC
Santa Fe cholla	Opuntia viridiflora	SC
Zuni (=rhizome) fleabane	Erigeron rhizomatus	T

Note: [a] C--Candidate, CH--critical habitat, E--Endangered, PT--Proposed Threatened, S/A--similarity in appearance, SC--Species of Concern, T--Threatened.

TABLE R-1, concl'd

Both units are within the Socorro Field Office's Cox Camp Woodland Management Area, which was designated to emphasize use for fuelwood, posts and poles. Because of the low demand for these types of products, no management plan to guide specific projects within the area has been developed. However, because of increasing residential subdivision development throughout the area, the demand for these products from nearby public land may increase substantially.

In addition, using commercial woodcutting to accomplish resource objectives could benefit the area's resources. For example, vegetative diversity, forage production, watershed condition, and wildlife habitat could all be improved by using commercial fuelwood cutting to create numerous small, natural-looking openings in the existing vegetation dominated by piñon and juniper.

Shrub-Grasslands

The shrub-grasslands contribute to vegetative diversity and watershed protection. They also provide wildlife habitat, forage for livestock, and fine fuel to carry natural and/or prescribed fires, making a large contribution to the area's overall ecological health.

Riparian/Wetland Areas

None have been identified.

Inclusion of the units in the NCA under the terms of P.L. 100-225 would stop commercial timber and woodland product sales, but would not affect home fuelwood sales, grazing or riparian/wetland area management.

Fire Management

Fire management in the SFO Units is primarily suppression oriented, using an appropriate management response to each wildfire. Over the past 10 years, however, no wildfires have been recorded on SFO lands in this area, nor have any prescribed burns been implemented. Significant urban/interface areas have been developed adjacent to both units, making carefully planned and coordinated fire management even more important.

The vegetative resources in the units evolved with fire and are fire dependent. The past 100 years of fire suppression and grazing in the area has negatively impacted these resources by increasing woody species such as piñon, juniper and shrubs, while reducing the amount of understory vegetation such as grasses and forbs. This further reduces the potential for a natural fire regime of frequent, low-intensity fires and moves the area into an infrequent, high-intensity regime.

Good potential exists to use fire to manage the vegetative resources in this area and correct some unnatural situations caused by fire exclusion. The isolated ponderosa pine stands should be treated with understory burns in the near future to remove the piñon-juniper encroachments, protect the stands from catastrophic wildfire, and improve their regeneration potential. Encroachments of piñon-juniper into grasslands can and should be treated with fire while the trees are still small.

Inclusion of the units in the NCA would not affect the use of fire for resource management.

Lands & Realty
(Including Boundary Adjustments)

Land Ownership

Three private parcels are included within the SFO Units. The 5,000-acre Techado Mesa-SFO Unit includes a single 40-acre parcel of private land. The 10,100-acre Tank Canyon-SFO Unit includes two private parcels totaling 200 acres.

In the early 1970s, a large block of private land that was part of the Criswell Ranch was sold as small parcels. Recently, a number of subdivisions have been developed in rural areas throughout Catron County. On December 15, 1997, the Catron County Commission approved Phase I of the Wild Horse Subdivision located west of the Tank Canyon-SFO Unit. The proposed subdivision includes private lands situated between the Tank Canyon and Techado Mesa-SFO Units. Preliminary plans for this subdivision indicate that as many as 10 phases could be developed.

Acquisition Priorities

The Socorro RMP identifies the lands in the Tank Canyon area for disposal because they are isolated and difficult to manage. The Techado Mesa lands are identified for retention in support of the El Malpais General Management Plan. The RMP calls for

consolidating land ownership by acquisition of nonpublic lands in various zones, with emphasis on certain Special Management Areas (SMAs).

Rights-of-Way & Land Use Permits

According to SFO records, a single right-of-way is authorized in the Tank Canyon area for a Western New Mexico Telephone Company line. No rights-of-way are on record for the Techado Mesa area.

The Tank Canyon-SFO Unit includes the Newton Site SMA, which is in a designated right-of-way avoidance area. According to the *Socorro Right-of-Way Avoidance Plan* (1991), rights-of-way will be allowed in the Newton Site SMA only if needed to administer and manage the area's resources. This unit contains many other archeological sites and historical homesteads.

Minerals

The Techado Mesa-SFO Unit includes approximately 3,000 acres of federal mineral rights in Catron County and about 570 acres of these mineral rights in Socorro County. The Tank Canyon-SFO Unit includes approximately 3,700 acres of federal mineral rights, all within Catron County. No mining claims are on record for either of the two units, nor are pending or active oil and gas leases.

Mineral potential is an assessment of the favorability or probability that a mineral resource occurs in substantial enough concentrations to be exploited economically. A subjective classification of high, moderate, low, very low, or unknown is used (McLemore 1986), along with highly, moderately, and less favorable or unknown areas (Gray 1989). High potential/favorability exists in areas of known mines or prospects where geologic and economic data show an excellent probability that mineral deposits occur. Moderate potential/favorability exists in areas where data indicates a good possibility that undiscovered deposits occur in formations known to contain economic minerals. Low potential exists in areas where available data imply the occurrence of mineralization, but indicate a low favorability. Less favorable or unknown areas include thoses areas where favorability has not been demonstrated.

In the SFO Units, the potential for leasable minerals ranges from less favorable or unknown to moderately favorable. Coal resources are known to exist in the area and the literature indicates a moderately favorable coal potential. Oil and gas potential is less favorable or unknown. A few wells have been drilled in or near the units, but all were dry holes. However, research shows good potential for exploration in Permian and Pennsylvanian age reservoirs present in the area.

A literature search indicates a low or unknown potential for locatable minerals in the proposed units. The potential for saleable minerals is also low to unknown. Research indicates some basalt, cinders and other volcanics are present in the Techado Mesa area. Also, Cenozoic age basin-fill deposits are present in other parts of the units. It is unknown whether these volcanics and fill are of economic quality or quantity.

It is expected that an increased demand for saleable minerals from public land will occur as the result of subdivision developments in the general area. The demands would likely occur in response to the need for surfacing material for road construction and decorative mineral materials for homesites.

Inclusion of the units in the NCA under the type of management specified in P.L. 100-225 would result in a mineral withdrawal. Federal minerals would not be available for development except under valid existing rights. Privately owned minerals (which are of unknown quantities and location) would not be affected.

Social & Economic Conditions

The figures in Table R-2 show that the Catron County population decreased between 1980 and 1990. A 1996 estimate of 2,665 residents shows the numbers increasing again.

The figures in Table R-3 show that employment between 1985 and 1996 has increased from 1,094 to 1,395. The leading sectors are farming, services, state and local government, and retail trade. Personal income by source and earnings by industry are shown in Table R-4.

TABLE R-2

CATRON COUNTY POPULATION BY RACE AND PARTIAL ETHNIC ORIGIN, 1980 & 1990

Population Category	1980		1990	
	Number	Percent	Number	Percent
Female	1,317	48.42	1,214	47.37
Male	1,403	51.58	1,349	52.63
Total	2,720	100	2,563	100
Race/Ethnic Origin American Indian, Eskimo, Aleut	0	0	---	---
Asian or Pacific Islander	0	0	---	---
Black	10	.37	---	---
Other Race	41	1.51	27 [a]	1.05
White	---	---	---	---
Hispanic Origin	780	28.68	728	28.40
Non-Hispanic White	1,889	69.44	1,808	70.54

Note: [a] Calculated; race, ethnic origin not identified.

In 1998 the county received payment in lieu of taxes in the amount of $296,633. The acres in the SFO Units are some of the lands on which this payment is based.

Inclusion of the SFO Units in the NCA would not likely affect the population, employment or in-lieu-of-tax payment for Catron County.

Soils & Water

The Techado Mesa-SFO Unit is associated with the larger Techado Mesa area. There are 17 soil map units in this larger area (identified between three soil surveys) that include a wide range of soil, geology, vegetation and landscapes. These map units have been placed into five broad groups. The following three groups are found in the Techado Mesa-SFO Unit.

The second of the five groups lies on moderately steep to steep ridges and alluvial fans. Soils are shallow and very shallow over sandstone, and have surface textures ranging from gravelly clay loam to gravelly fine sandy loam. The potential for water erosion is moderate to high, while the hazard for soil blowing is high. The vegetative cover is usually grasses with scattered piñon and juniper.

The fourth of the five groups includes areas of steep rock outcrops and escarpments. Soils depths range from very shallow to deep with coarse to moderately fine textures. The hazards of water erosion and wind blowing range from slight to severe. Vegetation consists of grasses, shrubs and piñon-juniper woodland.

The last of the five groups covers the woodlands from the grass-piñon-juniper complex through the piñon-ponderosa pine to the ponderosa pine forest. Slopes range from 2 to 35 percent on mesa tops, basalt hills, ridges and escarpments. Soil depths range from shallow to deep. Soil textures of sandy loams, stony loams, cobbly loams and cobbly clay loams reflect parent material that includes sandstones, shales and basalts.

TABLE R-3

CATRON COUNTY EMPLOYMENT BY INDUSTRY,
1985 & 1996

Industry	1985		1996	
	No. of Jobs	Percent of Total Jobs	No. of Jobs	Percent of Total Jobs
Farm	333	30.44	270	19.35
Non-Farm [a]	761	69.56	1125	80.65
Private (Total)	468	42.78	772	55.34
Agricultural Services, Forestry, Fisheries & Other	42	3.84	59	4.23
Mining	(D) [b]	(D)	12	.86
Construction	46	4.20	80	5.73
Manufacturing	84	7.68	55	3.94
Transportation & Public Utilities	21	1.92	75	5.38
Wholesale Trade	(L) [c]	(L)	(L)	(L)
Retail Trade	91	8.32	173	12.40
Finance, Insurance & Real Estate	(D)	(D)	51	3.66
Services	166	15.17	266	19.07
Government & Government Enterprises (Total)	293	26.78	353	25.30
Federal-Civilian	107	9.78	127	9.10
Federal-Military	13	1.19	10	.72
State & Local	173	15.81	216	15.48
Totals [d]	1,094	100	1,395	100

Notes: [a] Sum of the Private (Total) and Government/Government Enterprises (Total) categories.
[b] (D)--Not shown to avoid disclosure of confidential information. Estimates are included in totals.
[c] (L)--Less than $50,000. Estimates are included in totals.
[d] Sum of the Farm, Private (Total) and Government/Government Enterprises (Total) categories.

TABLE R-4

CATRON COUNTY PERSONAL INCOME BY MAJOR SOURCE, AND EARNINGS BY INDUSTRY
(figures reflect thousands of dollars, unless otherwise noted)

Category	1985			1996		
	Number	% of Personal Income	% of Earnings by Industry	Number	% of Personal Income	% of Earnings by Industry
Total Personal Income [a]	22,806	100	na [b]	39,076	100	na
Non-Farm Income	20,061	87.96	na	38,264	97.92	na
Farm Income	2,745	12.04	na	812	2.09	na
Population (thousands)	2.6	na	na	2,665	na	na
Per-Capita Personal Income (dollars)	8,867	na	na	14,663	na	na
Derivation of Total Personal Income Earnings by Place of Work	12,580	55.16	100	20,214	51.72	100
Less: Personal Contribution for Social Insurance	637	2.79	na	1,429	3.66	na
Plus: Adjustment for Residence	193	.85	na	-619	-1.58	na
Equal: Net Earnings by Place of Residence	12,136	53.21	na	18,166	46.49	na
Plus: Dividends, Interest & Rent	5,612	24.61	na	9,704	24.83	na
Plus: Transfer Payments	5,058	22.18	na	11,206	28.68	na
Components of Earnings [c] Wages & Salaries	8,273	36.28	65.76	13,356	34.18	66.07
Other Labor Income	689	3.02	5.48	1,684	4.31	8.33
Proprietor's Income	3,618	15.86	28.76	5,174	13.24	25.60
Farm	1,866	8.18	14.83	-93	-.24	-.46
Non-Farm	1,752	7.68	13.93	5,267	13.48	26.06
Earnings by Industry Farm	2,745	12.04	21.82	812	2.08	4.02
Non-Farm	9,835	43.12	78.18	19,402	49.65	95.98
Private	4,604	20.19	36.60	10,221	26.16	50.56
Agricultural Services, Forestry, Fisheries, & Others	389	1.71	3.09	247	.63	1.22
Mining	(D) [d]	---	---	247	.63	1.22
Construction	598	2.62	4.75	1,862	4.76	9.21
Manufacturing	1,204	5.28	9.57	1,637	4.19	8.10
Nondurable Goods	(D)	---	---	647	1.66	3.20
Durable Goods	(D)	---	---	---	---	---
Transportation & Public Utilities	260	1.14	2.07	1,555	3.98	7.69
Wholesale Trade	79	.35	.63	(L) [e]	---	---
Retail Trade	926	4.06	7.36	1,690	4.32	8.36
Finance, Insurance & Real Estate	(D)	---	---	752	1.92	3.72
Services	1,133	4.97	9.01	2,216	5.67	10.96
Government & Government Enterprises	5,231	22.94	41.58	9,181	23.50	45.42
Federal--Civilian	2,365	10.37	18.80	4,273	10.94	21.14
Federal--Military	63	.23	.50	82	.21	.41
State & Local Government	2,803	12.29	22.28	4,826	12.35	23.87

Notes: [a] Income by place of residence.
[b] na--Not applicable.
[c] Earnings by place of work.
[d] (D)--Not shown to avoid disclosure of confidential information. Estimates are included in totals.
[e] (L)--Less than $50,000. Estimates are included in totals.

The microbiotic soil crust community is represented primarily by cyanobacteria and a foliose lichen tentatively identified as Xanthoparmelia. This lichen provides good ground cover and erosion protection under light to moderate grazing. Antelope graze on this lichen.

The 30 soil map units of the El Malpais Allotment have been placed into six broad groups. The following three groups occur in the Tank Canyon-SFO Unit.

Group two, the bottomland association, is found along drainageways, bottomlands and swales. The soils are deep and fine textured on gentle slopes. Vegetation is primarily grasses and shrubs. The hazard for water erosion is moderate for most soils.

Group four is a grass-woodland association with slopes generally less than 10 percent. Soils are moderately deep to deep with sandy loam and fine sandy loam textures. In three areas where gravel or cobbles become significant in the soil, the textures shift to loams and clay loams and depths become shallow. The hazard for water erosion is moderate.

Group five consists of a woodland association on a range of slopes from 2 to 100 percent. Vegetation is an association of piñon, juniper, shrubs and grasses. Soil depths are usually shallow, with textures ranging from gravelly clay loam to sandy loams. The hazard of water erosion is severe for most of the area.

Inclusion of the SFO Units in the NCA would not affect soils or watershed.

Visual Resources

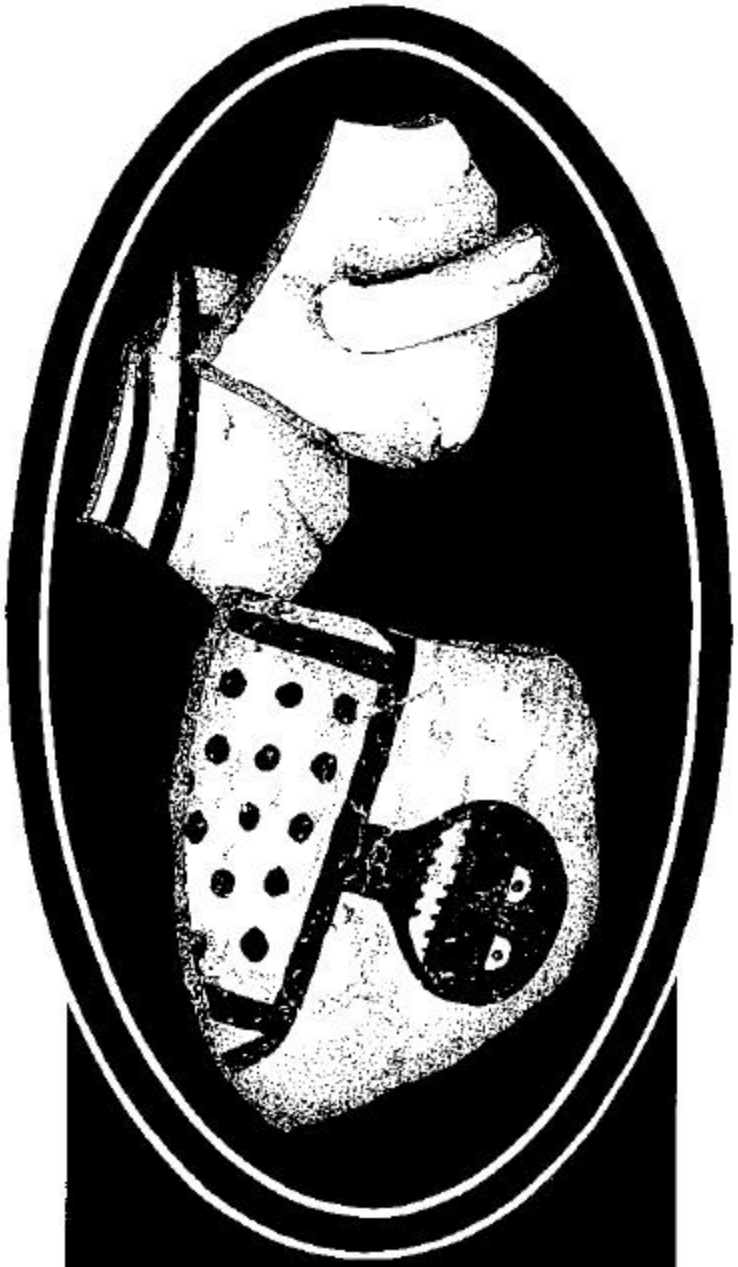
Techado Mesa has rolling topography and a high, steep-sided mesa capped by lava flows. Vegetation is dominated by piñon-juniper woodland and ponderosa pine forest with some oak/deciduous understory. Small playa lakes form seasonally on the mesa top. Tank Canyon has rolling topography with dominant piñon-juniper vegetation.

Visual resources on the public land within these two units are managed by the Socorro Field Office as Visual Resource Management (VRM) Classes III and IV. The BLM has established a system for evaluating visual values and uses four VRM classes to provide management direction. Classes II, III and IV are assigned based on combinations of scenic quality, sensitivity levels, and distance zones.

The VRM objective for Class III lands is partial retention of the existing landscape character. The level of visible change to the characteristic landscape should be moderate. Management activities may attract attention, but should repeat the basic elements (form, line, color, and texture) found in the predominant natural features of the characteristic landscape.

The VRM objective for the Class IV lands is to minimize impacts from activities and uses through careful location, a low level of disturbance, application of design principles, and repetition of the basic landscape elements. Within lands assigned this management class, major modification of the existing character of the landscape is permitted. The level of change can be high, dominate the view and become a major focus of the viewer's attention.

Inclusion of the SFO Units in the NCA would not affect visual resources nor their management.



ABBREVIATIONS & ACRONMYS

ABBREVIATIONS AND ACRONYMS

AADT	adjusted average daily traffic
ACEC	Area of Critical Environmental Concern
AFO (formerly ADO & RPRA)	Albuquerque Field Office (formerly Albq. District Office & Rio Puerco Resource Area)
AMP	Allotment Management Plan
APHIS	Animal & Plant Health Inspection Service
APLIC	Avian Power Line Interaction Committee
ARPA	Archeological Resources Protection Act
AUM	animal unit month
BLM	Bureau of Land Management
BLU	Biophysical Land Unit
C	Custodial (category for grazing allotments)
CDNST	Continental Divide National Scenic Trail
CFR	Code of Federal Regulations
CR	County Road
EA	Environmental Assessment
EIS	Environmental Impact Statement
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FLPMA	Federal Land Policy & Management Act
FR	Federal Register
FS, USFS	U.S. Forest Service
FWS, USFWS	U.S. Fish & Wildlife Service
GMP	General Management Plan
HMP	Habitat Management Plan
I	Improve (category for grazing allotments)

IBLA	Interior Board of Land Appeals
IM	Instruction Memorandum
LAC	Limits of Acceptable Change (monitoring system)
M	Maintain (category for grazing allotments)
NAGPRA	Native American Graves Protection & Repatriation Act
NCA	National Conservation Area
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NM	New Mexico
NMDG&F	New Mexico Department of Game & Fish
NMSH&TD	New Mexico State Highway & Transportation Dept.
NOI	Notice of Intent
NPS	National Park Service
NRCS (formerly SCS)	Natural Resources Conservation Service (formerly Soil Conservation Service)
NWPS	National Wilderness Preservation System
OHV	off-highway vehicle
P.L.	Public Law
P.L. 100-225	Enabling legislation for the El Malpais National Conservation Area & National Monument
PNC	Potential Natural Community
R.	Range
RIM Plan	Range Improvement Maintenance Plan (for wilderness)
RMP	Resource Management Plan
RN	roaded natural (recreation opportunity)
ROS	Recreation Opportunity Spectrum
RPRA	Rio Puerco Resource Area

Sec.	Section
SPM	semi-primitive motorized (recreation opportunity)
SPNM	semi-primitive nonmotorized (recreation opportunity)
SFO (formerly SRA)	Socorro Field Office (formerly Socorro Resource Area)
SRMA	Special Recreation Management Area
SRP	special recreation permit
T.	Township
T&E	threatened & endangered species
USC	United States Code
USDA	U.S. Department of Agriculture
USDC	U.S. Department of Commerce
USDI	U.S. Department of the Interior
VRM	visual resource management
WSA	Wilderness Study Area

GLOSSARY

GLOSSARY

allotment	An area of land designated and managed for livestock grazing.
allotment management plan (AMP)	A documented program that applies to rangeland operations on public land. An AMP (1) is prepared in consultation with the permittee(s) or lessee(s) involved; (2) prescribes the manner and extent to which livestock operations will be conducted; (3) describes the type, location, ownership, and general specifications for the rangeland developments to be installed and maintained; and (4) contains other provisions relating to livestock grazing and prescribed objectives, consistent with applicable law.
alluvial fan	A fan-shaped accumulation of disintegrated soil material, water-deposited and located in a position where the water departs from a steep course to enter a flat plain or open valley bottom.
animal unit month (AUM)	The amount of food or forage required for one month by a mature cow, cow and calf, or the equivalent.
Area of Critical Environmental Concern (ACEC)	An area of public land where special management attention is needed to 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.
arterial road	Often referred to as a "primary access route," provides main access to large blocks of public land for its use, development, protection and administration. Generally open to public use.
back country byway	A BLM component of the National Scenic Byway System that focuses primarily on corridors with high scenic, historical, archaeological, or other public interest values. The road may vary from a single-track bike trail to a low-speed paved road traversing back country areas. The byways are subdivided into four types based on characteristics. (Source: BLM Manual 8357) <u>Type I</u> - Roads with pavement or an all-weather surface and grades that are negotiable by a normal touring car. Usually narrow, slow-speed, secondary roads. <u>Type II</u> - Roads that require high-clearance vehicles, usually not paved but with some type of surfacing. Grades, curves, and road surface can be negotiated with a 2-wheel-drive, high-clearance vehicle without undue difficulty. <u>Type III</u> - Roads that require 4-wheel-drive or other specialized vehicles such as dirt bikes or all-terrain vehicles (ATVs). Usually not surfaced, but maintained for safety and resource protection purposes. They have grades, tread surfaces, and other characteristics that require specialized vehicles to negotiate. <u>Type IV</u> - Trails managed to accommodate dirt bike, mountain bike, snowmobile or ATV use. Usually single-track.
BLM sensitive species	Those wildlife and plant species (formerly Category 2) for which the USFWS has information available that indicates they might warrant listing, but more

information is needed to propose them as endangered or threatened.

candidate species	Those wildlife and plant species (formerly Category 1) for which the USFWS has sufficient information on their biological status to propose them as endangered or threatened, but for which a proposed rule has not been developed.
cherry-stemmed road	***An unofficial term used to describe the way a boundary is drawn to exclude such things as a road or other route of travel, a feature, facility, or structural range improvement that enters into the area with the resulting boundary resembling a cherry-stem.***
Class II airshed	Under the Prevention of Significant Deterioration Program, lands are divided into one of three classes. Class I areas have air that is pristine, such as in some national parks and wilderness areas, and almost no increase in air contaminant levels is allowed. Class II areas allow moderate development, and Class III areas allow extensive growth. The El Malpais NCA and National Monument are Class II areas.
closed basin	An area of land in which topography prevents the occurrence of visible surface water outflow. It is closed hydrologically if neither surface nor underground outflow can occur.
collector road	A BLM road that usually provides primary access to a large block of public land, and connects with arterial and local roads, or is an extension of a public road system. Such a road accommodates mixed traffic and serves many uses, generally receiving the highest volume of traffic of all roads in the BLM road system.
community	General term that can be applied to vegetation types of any size or longevity.
competition	Any interaction that is mutually detrimental to both participants, occurring between species that share limited resources.
composition	Typically refers to the makeup of a plant community whose individual plant species are designated as parts of a unified whole.
contiguous lands	Pertains to wilderness, lands or legal subdivisions having a common boundary. Lands having only a common corner are not contiguous.
critical habitat	Portions of the habitat of a wildlife population that, if destroyed or adversely modified, would result in a reduction of the population to a greater extent than destruction of other portions of the habitat. Also, a specific area formally designated by the Secretary of the Department of the Interior or Commerce that is determined to be essential to the survival and recovery of a threatened or endangered species or one proposed for listing.
cultural resource inventory classes	Class I--Existing Data Inventory: An inventory study of a specific area designed to provide a narrative overview from existing cultural resource information, and to provide a compilation of existing cultural resource site data on which to base 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 resources within a portion of a specific area. This inventory allows an objective estimate of the nature and distribution of cultural resources in a larger area, and is used in management and planning activities as an accurate predictor of cultural resources in a planning area. Alternatively, a Class II inventory is used for a specific project in which an intensive field inventory (Class III) is not practical or necessary.

Class III--Intensive Field Inventory: An inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a specific area. Usually, upon completion of such inventories, no further cultural resource inventory work is needed in that area. Appropriate on small project areas, all areas to be disturbed, and primary cultural resource areas.

designated route — A vehicular route of travel that has been approved through the land-use planning process for motor vehicle use in accordance with the OHV area designation.

dirt tank (earthen tank) — Usually a permanent earthen structure for holding water temporarily, built in areas of high rainfall runoff such as arroyos, canyons or swales.

dispersed recreation — Refers to more spatially dispersed, resource-dependent (not facility-dependent) types of outdoor recreation such as fishing, hunting, backpacking and back-country exploring.

diversity — The relative degree of abundance of wildlife species, plant species, communities, habitats or habitat features per unit area; a combination of species richness and species evenness.

Species Richness - The number of species per unit area within a community.

Species Evenness - The distribution of individuals among the species, or between species.

easement — An interest in land that entitles the holder to enter upon land owned by another for a particular purpose. The easement confers a right of entry, not merely a permissive license that can be revoked at any time. An exclusive road easement grants control to the U.S. and may allow it to authorize third-party use and set road use rules.

ecosystem — The sum of the plant community, animal community and physical environment in a particular region or habitat.

endangered species — Federally Listed--Any species of animal or plant in danger of extinction throughout all or a significant portion of its range.

State Listed (Group One)--Species whose prospect of survival or recruitment in a certain area of the state is in jeopardy in the foreseeable future.

State Listed (Group Two)--Species whose prospect of survival or recruitment in a certain area of the state may become jeopardized in the foreseeable future.

Environmental — A concise public document for which a federal agency is responsible that serves

Assessment (EA)	to (1) briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact, (2) aid an agency's compliance with the National Environmental Policy Act (NEPA) when no EIS is needed, or (3) facilitate preparation of an EIS when needed. An EA includes brief discussions of the need for the proposal, of alternatives including the proposed action [as required by Sec. 102(2) of NEPA], of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted.
ephemeral water	A body of water (e.g., stream, pond) that flows or exists only in direct response to precipitation. Such flow or existence is usually of short duration.
exchange	A trading of public land (surface or subsurface estate) that usually does not have high public value, for land in other ownerships that does have value for public use, management, protection and enjoyment. The exchange may benefit other agencies as well as the BLM.
exotic	Typically a non-native plant or animal.
fault	A fracture in the earth's crust accompanied by a displacement of one side with respect to the other.
FLPMA	Federal Land Policy and Management Act of 1976, which mandated the BLM Wilderness Review. (Often referred to and pronounced as "Flipma.")
forage (competitive)	Plants used as food by large herbivores such as cattle, and by large and small wildlife.
forb	Any herbaceous (non-woody) plant that is not a grass or grass-like plant.
grandfathered	Section 603(c) of FLPMA directs the BLM to manage lands under wilderness review "so as not to impair the suitability of such areas for preservation as wilderness . . ." However, Section 603(c) also provides a special exception to the "nonimpairment" criteria. Mining, grazing, and mineral leases existing on the date of approval of FLPMA (October 21, 1976) may continue in the same manner and degree even if these uses impair wilderness values. Such uses are "grandfathered."
grazing preference	The total number of AUMs of livestock grazing on public land apportioned and attached to base property owned or controlled by a permittee or lessee.
habitat	An area where a plant or animal lives. Sum total of environmental conditions in the area.
Habitat Management Plan (HMP)	A written and officially approved wildlife habitat plan for a specific geographic area of public land. An HMP identifies wildlife-habitat and related objectives, establishes the sequence of actions for achieving them, and outlines procedures for evaluating accomplishments.
hardening	Development of recreation areas to prevent or limit the impact of recreational use on soil, vegetation and other resources. Methods of development include construction of trails and designated use areas such as campsites and picnic sites.

herbaceous	Any flowering plant (i.e., grass, grass-like, or forb) except those that develop persistent woody stems above ground.
herbaceous vegetation	Having the nature of an herb, grass or grass-like plant whose stem withers to the ground after each season's growth.
historical cultural resources	All mines, ranches, towns, resorts, railroads, trails and other evidence of human use in the United States from the entrance of the Spanish to 1932.
igneous rocks	Rocks formed by solidification of heat-melted rock below the earth's crust.
inholding	Private or state-owned land inside the boundary of a wilderness study area but excluded from it.
intensive inventory	The second major step in the BLM wilderness review process. Roadless areas are carefully inventoried for wilderness characteristics, resulting in the identification of wilderness study areas.
intrusion	A feature (landform, vegetation, or structure) that is generally considered out of context because of excessive contrast and disharmony with the characteristic landscape.
jacal	A construction technique that involves building a brush superstructure, then plastering it with mud.
kipuka	***An island of older vegetated basalt flows surrounded by more recent flows.***
lithic	A stone or rock exhibiting human modification. Generally applies to projectile points, scrapers and chips, rather than to ground stone.
lithic scatter	A prehistoric cultural site at which flakes, cores and stone tools are located, indicating the manufacture or use of tools.
local road	This usually serves a smaller area than a collector road, and connects to collector roads or public road systems. Local roads receive lower volumes, carry fewer traffic types, and generally serve fewer users. Often called two- tracks, ways, or back-country routes, they are usually not maintained.
malpais	Rough country composed of dark basaltic lava.
minimum tool rule	Tools, equipment or structures may be used by land management agencies when they are the minimum needed to protect wilderness resources, or in emergency situations for the health and safety of visitors. The chosen tool, equipment or structure should be the one that least degrades wilderness values temporarily or permanently.
multiple use management	The management of the various surface and subsurface earth resources so they are used in the combination that best meets the present and future needs of the American people. Consists of managing the following resources and uses: domestic livestock grazing, fish and wildlife development and use, industrial development, mineral production, human occupancy, outdoor recreation, timber

	production, watershed protection, and preservation of wilderness and other public values.
noxious	An undesirable plant or animal that potentially produces a harmful or undesirable chemical compound.
off-highway vehicle (OHV)	Any motorized vehicle designed for or capable of cross-country travel on or over land, water, sand, snow, ice, marsh, swampland or other terrain.
OHV use	Any use by a motorized vehicle off paved roads, or roads and trails that are regularly and frequently maintained for general transportation purposes.
perennial stream	A stream or portion of a stream that flows continuously.
petroglyph	A form of rock art manufactured by incising, scratching or pecking designs into rock surface.
playa	The usually dry and level lake plain that occupies the lowest part of a closed depression.
prescribed burning	Controlled application of fire, either deliberately or by natural ignition, to wildland fuels in either their natural or modified state. Such burning is done under specified environmental conditions that allow the fire to be confined to a certain area, while at the same time producing the effects required to meet planned resource management objectives.
primitive and unconfined recreation	In the BLM wilderness review process, refers to those activities that provide dispersed, undeveloped recreation not requiring facilities or motorized equipment.
public land	Any land and interest in land owned by the United States and administered by the Secretary of the Interior through the BLM, without regard to how the U.S. acquired ownership. The exceptions are lands held on the Outer Continental Shelf; held for the benefit of Indians, Aleuts and Eskimos; and those for which the U.S. retains the minerals, but the surface is private.
public land laws	The body of laws that regulate the administration of the public land and its resources.
rangeland	Land used for grazing by livestock and big-game animals on which the vegetation is dominated by grasses, grass-like plants, forbs or shrubs.
rangeland improvement	Any activity or program on or relating to rangelands that is designed to improve production of forage, change vegetative composition, control patterns of use, provide water, stabilize soil and water conditions, and provide habitat for livestock or wildlife.
raptor	Any predatory bird (e.g., falcon, hawk, eagle, owl) that has feet with sharp talons adapted for seizing prey and a hooked beak for tearing flesh.
reconnaissance survey	Cultural resources field survey that is less systematic, less intensive or

	otherwise does not fully meet inventory standards (refer to "cultural resource inventory classes--Class II and Class III"). May be useful for checking Class I or II inventory conclusions, or for developing recommendations about further inventory needs in previously unsurveyed areas.
right-of-way	An authorization to use public land for a specified purpose such as a road, powerline, pipeline, water well or communication site.
riparian	Relating to, living or located on the bank of a watercourse (river, stream) or lake.
riparian functional ratings	Properly Functioning Condition--Riparian areas are functioning properly when adequate vegetation, landform or large woody debris is present to (1) reduce the stream energy associated with high waterflows, thereby decreasing erosion and improving water quality; (2) filter sediment, capture bedload and aid floodplain development; (3) improve floodwater retention and groundwater recharge; (4) develop root masses that stabilize streambanks against cutting action; (5) develop diverse ponding and channel characteristics to provide the habitat, water depth, duration and temperature necessary for fish production, waterfowl breeding and other uses; and (6) support greater biodiversity. Functional--At Risk--Riparian areas in functional condition, but an existing soil, water, or vegetative attribute makes them susceptible to degradation. Nonfunctional--Riparian areas clearly not providing adequate vegetation, landform, or large woody debris to reduce the stream energy associated with high waterflows. These areas do not decrease erosion, improve water quality, or have the other characteristics listed above.
riparian/wetland vegetation	Vegetation that occurs in or adjacent to drainage ways or their floodplains.
roadless	Refers to the absence of roads that 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	An area that is roadless and bounded by a road, the edge of a right-of-way, other land ownership, or a significant imprint of humans.
rock art (petroglyph or pictograph)	A general term for the pecking, incising or painting of designs onto rock surfaces.
seral stage	The developmental stage of a plant community in which the community exhibits some directional, cumulative, non-random change in species composition over a period of 1 to 500 years.
sedimentary rocks	Rocks formed by the accumulation of matter suspended in liquid.
Sikes Act program	A program among the U.S. Forest Service, BLM and New Mexico Department of Game & Fish wherein $5 is collected from each hunter and fisher using Forest Service and BLM lands in New Mexico. The collected funds go back to the agencies to restore and improve fish and wildlife habitats.

solitude	For the purpose of the BLM wilderness review process, defined as the state of being alone or remote from habitation. An isolated, unfrequented or secluded place with the opportunity to avoid the sights, sounds and evidence of humans and their activities.
special-status plants & animals	Species that are (1) officially listed, proposed for listing, or candidates for listing as threatened or endangered by the Secretary of the Interior under the provisions of the Endangered Species Act, (2) listed or proposed for listing by a state in a category implying potential endangerment or extinction, and (3) designated by each BLM State Director as sensitive.
split estate	A situation in which the mineral (subsurface) estate is owned or controlled by a party other than the owner of the surface land area.
steppe	Arid land characterized as level and without forests, usually in large tracts, regions of extreme temperature range, and windblown soil.
storage tank	A permanent water-holding structure used to supply water to troughs or pipelines.
supplemental values	Features of ecological, geological, or other scientific, educational, scenic or historical value that may be present in a wilderness inventory unit. These are not necessary criteria for wilderness suitability, as stated in the Wilderness Act of 1964, but must be assessed during the intensive wilderness inventory.
thinning	A forestry process used to remove a portion of the trees or shrubs within a stand through mechanical means.
trail	A route of travel usually associated with recreational use and considered a recreational facility. May be designed and built for one or more uses, or developed through continuous use.
trailhead	The parking area, signs and other facilities available at the beginning and/or end of a trail.
threatened species	Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.
vegetation treatments	Methods used to control the growth and spread of undesirable vegetation by chemical or mechanical means, or by fire.
vehicular way	A two-wheel track maintained solely by the passage of vehicles; does not constitute a road or route (which has been maintained or improved by mechanical means, such as hand or power machinery or tools).
visual resource management (VRM) classes	VRM classes are based on relative visual ratings of inventoried lands. Each describes the different degree of modification allowed to the basic elements of the landscape. (Refer to Appendix E for the minimum management objectives for each class.)
volcanic rock	A heat-formed rock resulting from volcanic action at or near the earth's surface.

wilderness	As defined in Section 2(c) of the Wilderness Act of 1964, "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." Such an area (1) generally appears to have been affected primarily by the forces of nature, with the imprint of humans substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) contains at least 5,000 acres of land for its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological or other features of scientific, educational, scenic or historical value. Also, an area formally designated by the Congress as part of the National Wilderness Preservation System.
wilderness characteristics	Those traits of wilderness described in Section 2(c) of the Wilderness Act, including size, naturalness, solitude, primitive and unconfined types of recreation, and supplemental values.
wilderness inventory	A written evaluation of public land showing on a map those lands that meet the wilderness criteria as established under Section 603(a) of FLPMA and Section 2(c) of the Wilderness Act. Once an inventory has been done, the lands meeting the criteria are released from further wilderness consideration.
wilderness review	The entire wilderness inventory, study and reporting phases of the BLM's wilderness program.
wilderness study	The process of analyzing and planning opportunities for wilderness preservation, along with other resource uses, within the BLM's land-use planning system.
Wilderness Study Area (WSA)	A roadless area that has been inventoried and found to have wilderness characteristics as described in Section 603 of FLPMA and Section 2(c) of the Wilderness Act.
wildlife	Includes all species of mammals, birds, crustaceans, amphibians, reptiles, or their offspring or eggs, that whether raised in captivity or not, are normally found in a wild state. Feral horses and burros are excluded.
withdrawal	An action that restricts the use of public land and segregates it from some or all of the public land and/or mineral laws.

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