TriCounty
Analysis of the Management Situation

June 2006

BLM - Las Cruces District Office

Department of the Interior

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LIST OF ACRONYMS AND ABBREVIATIONS

^{o}C	Centigrade
^{o}F	degrees Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
AAI	American AG International
ACEC	Area of Critical Environmental Concern
ADC	Animal Damage Control
AMP	Allotment Management Plans
AMR	Appropriate Management Response
AMS	Analysis of the Management Situation
AMU	Antelope Management Units
AQB	Air Quality Bureau
AUM	Animal Unit Month
BEA	Bureau of Economic Analysis
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practice
BOR	Bureau of Land Reclamation
CBM	Coalbed methane
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CMP	Coordinated Management Plan
CO	carbon monoxide
CRMP	Cultural Resource Management Plan
CSP	Concentrating Solar Power
CUA	Common Use Area
CWCS	Comprehensive Wildlife Conservation Strategy
DEA	Draft Environmental Assessment
EA	Environmental Assessment
ECP	erosion control plan
EIS	Environmental Impact Statement
EMNRD	Energy Minerals, and Natural Resources Department
EO	Executive Order
EOI	Expression of Interest
EOR	Enhanced Oil Recovery
EPA	Environmental Protection Agency

ESA	Endangered Species Act
ESD	Eclogical Site Description
ETA	Extraterritorial Zoning Authority
ETZ	Extraterritorial Zoning
FEIS	Final Environmental Impact Statement
FGDC	Federal Graphic Data Committee
FHWA	Federal Highway Adminstration
FLPMA	Federal Land Policy and Management Act of 1976
FMP	Fire Management Plan
FMU	Fire Management Unit
FONSI	Finding of No Significant Impact
FRCC	Fire Regime Condition Class
FS	U.S. Forest Service
FWS	U.S. Fish and Wildilfe Service
FY	fiscal year
GIS	geographic information system
GMU	Game Management Unit
GPS	Global Positioning System
HAP	hazardous air pollutants
HMP	Habitat Management Plan
I-25	Interstate 25
IMPROVE	Integrated Monitoring of Protected Visual Environments
kg	kilogram
KGRA	Known Geothermal Resource Area
km	kilometer
kV	kilovolt
LGMP	Livestock Grazing Management Practices
LRGWUA	Lower Rio Grande Water Users Association
LRU	Land Resource Unit
MET	meteorological
mg/l	milligrams per liter
MLRA	Major Land Resource Area
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MTR	military training route
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NASS	National Agricultural Statistics Service

NDVI	Normalized Difference Vegetation Index
NEAP	Natural Events Action Plan
NEPA	National Environmental Policy Act of 1969
NIR	near-infrared
NLCS	National Landscape Conservation System
NLCT	Natural Land Cover Types
NLDC	National Landcover Dataset Classification
NMAC	New Mexico Administrative Code
NMBGMR	New Mexico Bureau of Geology and Mineral Resources
NMCRIS	New Mexico Cultural Resource Information System
NMDGF	New Mexico Department of Game and Fish
NMDOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NMEMNRD	New Mexico Energy, Minerals and Natural Resources Department
NMHD	New Mexico Highway Department
NMMNHS	New Mexico Museum of Natural History and Science
NMRU	New Mexico Cooperative Fish and Wildlife Research Unit
NMSA	New Mexico Statutes Annotated
NMSF	New Mexico State Forestry
NMSU	New Mexico State University
NMWA	New Mexico Wilderness Alliance
NMWQCC	New Mexico Water Quality Control Commission
NNL	National Natural Landmark
NO_2	nitrogen dioxide
NPS	National Park Service
NRCS	National Resource Conservation Service
NSSSWR	National Speleogical Society
NWR	National Wildlife Refuge
O_3	ozone
OHV	off-highway vehicle
ORV	off-road vehicle
OSE	Office of the State Engineer
Pb	lead
PILT	Payment in Lieu of Taxes
PL	Public Law
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
PRIA	Public Rangelands Improvement Act
PV	photovoltaic

R&PP	Recreation and Public Purpose
RAMP	Recreation Area Management Plan
RAWS	Remote Automatic Weather Station
RC&D	Resource Conservation and Development
RCRA	Resource Conservation and Recovery Act
RMP	Resource Management Plan
RMPA	Resource Management Plan Amendment
RMPR	Resource Management Plan Revision
RNA	Research Natural Area
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RPS	Rangeland Program Summary
S&G	New Mexico's Standards and Guidelines
S&WCD	Soil and Water Conservation District
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCS	Soil Conservation Service
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SHS	Standard Habitat Sites
SIP	State Implementation Plan
SMA	Special Management Area
SMCRA	Surface Mining Control and Reclamation Act
SMP	smoke management plan
SO_2	sulfur dioxide
SR	State Route
SRMA	Special Recreation Management Area
STIP	Statewide Transportation Improvement Program
SWReGAP	Southwest Region Gap Analysis Project
SWTDI	Southwest Technology Development Institute
TGA	Taylor Grazing Act
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TPWD	Texas Parks and Wildlife Department
TWS	The Wilderness Society
USC	United States Code
USDA	U.S. Department of Agriculture
USDC	U.S. Department of Commerce
USDI	U.S. Department of the Interior
USDOE	U.S. Department of Energy
USDOT	U.S. Department of Transportation

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USNVC	U.S. National Vegetation Classification
UXO	unexploded ordnance
VIS	visible
VRM	visual resource management
WFU	Wildland Fire Use
WRCC	Western Regional Climate Center
WSA	Wilderness Study Area
WSMR	White Sands Missile Range
WUI	Wildland Urban Interface
WWF	Worldwide Federation

1.0 INTRODUCTION

1.1 OVERVIEW

The U.S. Department of the Interior (USDI), Bureau of Land Management (BLM) Las Cruces District Office in New Mexico is preparing a resource management plan revision (RMPR) to address management of public land in Sierra and Otero Counties and a resource management plan amendment (RMPA) to address management of public land in Doña Ana County. The BLM also is preparing an associated environmental impact statement (EIS) to identify the potential effects of implementing the RMPR and RMPA. The combined efforts of the RMPR and RMPA, along with the EIS, are referred to as the TriCounty RMPs/EIS.

The Las Cruces District Office administers public land in Hidalgo, Grant, Luna, Doña Ana, Sierra, and Otero Counties in southwestern New Mexico. The Planning Area includes Doña Ana, Sierra, and Otero Counties. The public land in Sierra and Otero Counties is currently managed under the 1986 White Sands Resource Management Plan (RMP), and public land in the other four counties is managed under the 1993 Mimbres RMP. These documents set forth land use decisions and terms and conditions for guiding the management of activities on the public land in these counties.

1.2 PURPOSE AND NEED FOR THE RESOURCE MANAGEMENT PLAN

In accordance with the Federal Land Policy and Management Act of 1976 (FLPMA), USDI, BLM is responsible for management of public land and its resources based on the principles of multiple use and sustained yield. Management direction is provided by land use plans, which determine appropriate multiple uses, allocate resources, develop strategies to manage and protect resources, and establish systems to monitor and evaluate the status of resources and effectiveness of management over time. Land use plans are intended to guide management for a period of 10 to 15 years, allowing response to new legislation, changing policies, and changing uses of public land over longer time periods. If an RMP is found to be inadequate in these respects, one of three document preparations can be implemented as a remedy: (1) preparation of a new plan, (2) revision of the existing RMP, or (3) amendment of the existing RMP.

The Las Cruces District Office has determined that the 1986 White Sands RMP needs to be revised and updated to provide a more comprehensive framework for management guidance. The 1993 Mimbres RMP needs to be amended to address the pertinent issues associated with the significant growth in Doña Ana County (and nearby El Paso, Texas) that have affected changes in demographic characteristics as well as increased use and consequent pressure on public land. Some elements of the current management documents provide appropriate management direction; however, many elements of the current management documents for the area, particularly Sierra and Otero Counties, have become outdated because of changing circumstances, demographics, resource conditions, and/or policies, and need revising.

EIS studies will identify the potential effects that implementation of the RMPs could have on the environment, and identify appropriate measures to mitigate those effects. The EIS will be prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality guidelines for implementing the (40 CFR 1500-1508), the FLPMA, and other associated regulations. In formulating the RMPs, BLM will work collaboratively with local communities, the public, interested groups, and all levels of government to ensure that the resulting plans will best address future needs.

1.3 PURPOSE OF THE ANALYSIS OF THE MANAGEMENT SITUATION

The Analysis of the Management Situation (AMS) is a working document prepared as an early step of the planning process for the RMPs/EIS and to address the management of public land in the Planning Area. Land use planning for public land is a systematic process guided by BLM Land Use Planning Handbook H-1601-1. Following the initial step, scoping, which results in the identification of issues to be addressed during the planning process, BLM conducts the AMS. The AMS is designed to assemble the data and information needed as the basis for formulating reasonable alternative management strategies to evaluate. The AMS begins with a description of the current condition and character of the Planning Area to encourage an understanding of the land and its resources (2.0 – Area Profile). This profile of the Planning Area is followed by an examination of the way in which BLM currently manages the land and resources of the public land it administers within the Planning Area (3.0 – Current Management Direction). Considering the Planning Area profile, current management direction, and the issues identified during scoping and any management concerns BLM may have, BLM then reviews the adequacy of current management and identifies opportunities to modify management to respond to changes in law, regulation and/or policy; the resource conditions and/or uses of the resources; and other circumstances (e.g., demographics).

The AMS is not a compilation of all available data, but is rather a collection of information appropriate and commensurate with the planning issues identified by the public during scoping, and additional issues identified by BLM. Some information that is not related to the planning issues may be summarized or referenced.

BLM is directed to use the best available data when preparing an RMP and does not use the RMP/EIS process to generate substantial amounts of original (new) data. Where possible, the discussion and maps included in this AMS illustrate data for the entire Planning Area; however, data were not readily available for all resources for the entire area. Some information that is not related to the planning issues may be summarized or referenced.

The majority of the data were provided by the Las Cruces District Office of BLM. In some cases data were acquired from Federal, State, county, and local agencies, including the U.S. Geological Survey, U.S. Fish and Wildlife Service, New Mexico Game and Fish Department, and other public and private sources. These sources provided published and unpublished reports, maps, and data in digital format (geographic information system [GIS]). The compiled data represents a level of detail appropriate for and

commensurate with the programmatic nature of the RMPs/EIS. Where spatial data are lacking, information has been provided through interpretation of the best available sources. Field verification of the data has not been conducted.

GIS has been used extensively to capture, manage, analyze, and display the geographic data for this AMS. In particular, GIS was used to execute certain complex spatial analyses. Acreages presented within this document have been calculated from GIS data; when GIS data are not available other sources have been used (e.g., existing plans, legislation, etc.).

1.4 GENERAL DESCRIPTION OF THE PLANNING AREA, GEOGRAPHIC SCOPE, AND RESOURCES AND PROGRAMS

1.4.1 Location

The area defined for this planning effort includes Sierra, Otero and Doña Ana Counties in south-central New Mexico (see Map 1-1). The three counties are surrounded by Luna and Grant Counties to the west; Catron, Socorro, and Lincoln Counties to the north; Chaves and Eddy Counties to the east; and the State of Texas and the Republic of Mexico to the south.

It is useful to note that there are two terms used in this chapter to describe the areas addressed: (1) Planning Area and (2) Decision Area. The Planning Area includes the entirety of the three counties (i.e., Sierra, Otero, and Doña Ana) regardless of jurisdiction or ownership, and includes portions of the White Sands Missile Range, McGregor Range, Holloman Air Force Base, Doña Ana Range, Gila National Forest, Lincoln National Forest, and Cibola National Forest. However, BLM's authority to make decisions applies only to public land (i.e., land administered by BLM within the three counties). The Decision Area also extends to the minerals of split estate (areas where BLM administers Federal subsurface minerals, but the surface is owned by a non-Federal entity [e.g., State of New Mexico] or administered by another Federal entity [e.g., U.S. Fish and Wildlife Service, U.S. Forest Service]). Federal minerals are discussed further in Section 2.2.2.

The Planning Area includes approximately 9.4 million acres. Approximately 3.4 million surface acres (about 36 percent of the total acres) and 6.9 million acres of Federal mineral estate (subsurface) are administered by the BLM (i.e., the Decision Area).

McGregor Range, an area of 697,472 acres of Federal land, is located within the Planning Area. Although much of McGregor Range is BLM-administered public land, it is withdrawn from the public domain for military use. Management of McGregor Range currently is being addressed in the McGregor Range RMPA/EIS, the draft of which was published in January 2005. Therefore, McGregor Range will not be subject to land use planning decisions resulting from the TriCounty RMPs/EIS.

1.4.2 Description

The TriCounty Planning Area varies greatly in resource diversity, production, and potential due to differences in elevation, climate, soils, and topography—it exhibits influences from the Chihuahuan Desert, Mexican Highlands, southern Rocky Mountains, and Mogollon Plateau. The Planning Area, with elevations of 3,800 to 5,000 feet and mountainous areas of up to 8,900 feet, is characterized by abruptly rising desert mountains and gently sloping plains. Approximately 490 species of vertebrate wildlife are known to inhabit the region. Archaeological and historical studies indicate that a succession of different cultural groups have inhabited the region for approximately the past 12,000 years.

The Planning Area includes 29 specially designated areas (i.e., 15 areas of critical environmental concern, of which two are Research Natural Areas; 12 wilderness study areas, and one back country byway) that have been designated to protect one or more resources.

BLM will continue to manage land in accordance with the respective RMPs until the TriCounty RMPs/EIS is completed and a Record of Decision is signed.

1.5 KEY FINDINGS

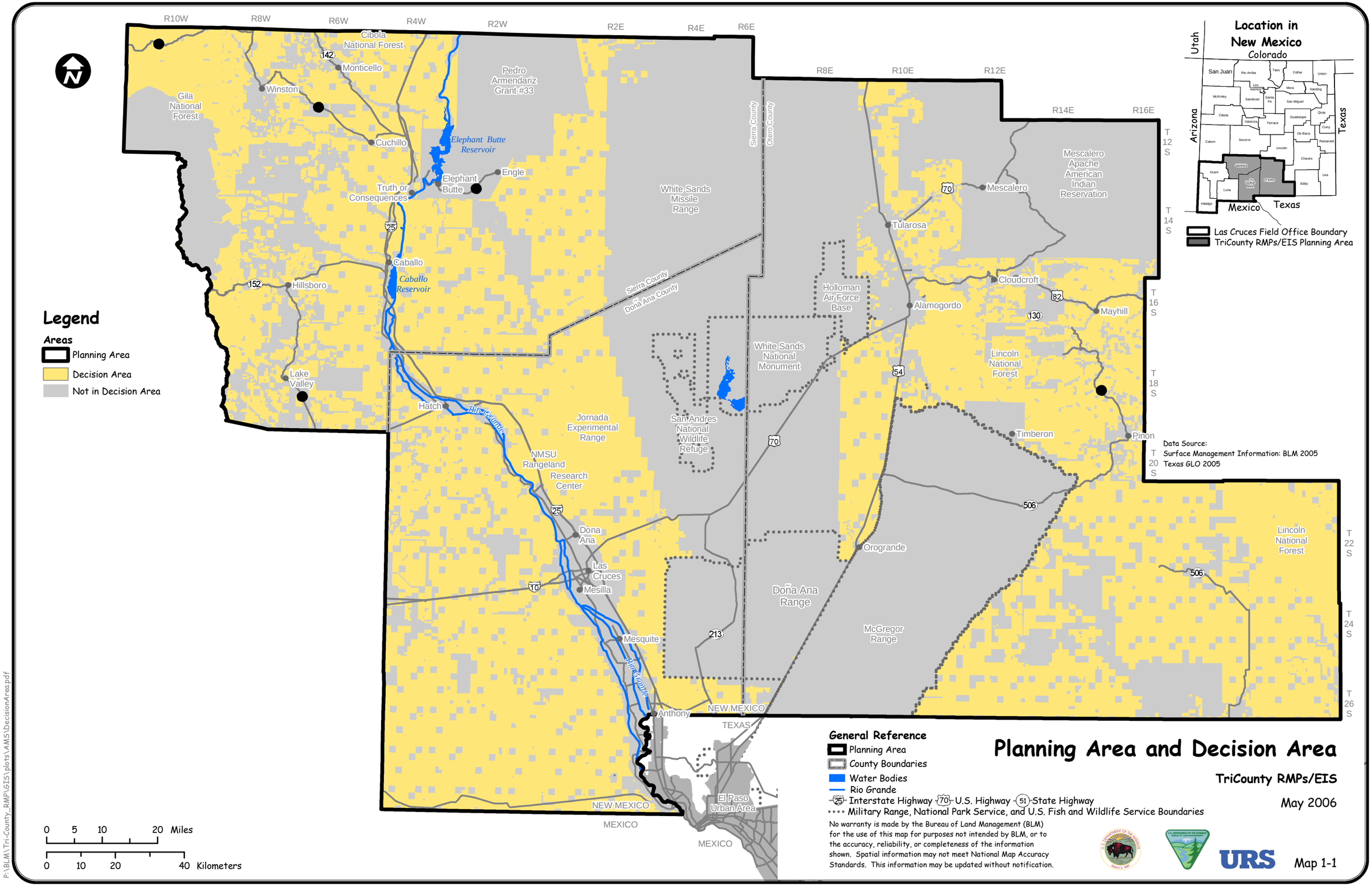
Based on the current management, data collected to date, and an analysis of the opportunities for changing the existing management of the Planning Area, several common themes are apparent among the resources and resource uses; these commonalities will be considered through development and completion of the RMPs.

Natural Resource Management – For many of the natural resources managed by BLM, desired outcomes, or goals for future conditions, have not been established. Development of these desired outcomes in the RMP process would provide BLM with information to guide the management of these resources at a watershed level consistent with New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management (USDI, BLM 2001a). The establishment of desired outcomes also could provide opportunities for adaptive management in the future.

Resource Uses – Many of the resource uses are guided by specific decisions regarding where and activity can or cannot take place. These decisions provide the overall framework for resource uses in the Decision Area. However, population growth, particularly in Doña Ana County, is expected to increase pressures on public land for recreation, extractive uses (e.g., mining), land use authorizations (e.g., rights-of-way), and transportation and access. Though the specific use demands cannot be predicted, BLM could establish criteria through this RMP process that would guide future management of resources and their uses. For example, BLM could develop criteria for when a right-of-way would be authorized. This would add to the overall framework guiding use of public land resources and, similar to natural resources management described above, provide opportunities for adaptive management in the future.

Cooperation and Coordination with Other Agencies – As many of the resources or resource uses can be influenced by management actions of other jurisdictions or agencies, BLM may need to coordinate

efforts with these agencies for ongoing management of public land within Sierra, Otero, and Doña Ana Counties. Though cooperation and coordination with agencies does not require a decision within the RMPs, this will continue to be an important component of public land management in the Planning Area.



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2.0 AREA PROFILE

2.1 RESOURCES

The following sections describe the current character of the Planning Area. For each resources or resource use, a discussion of the indicators, current conditions, trends, forecast, and key features is provided. An indicator is an attribute, the presence or absence of which is a visible and/or measurable sign or index of the condition of the resource or resource use. Next is a description of the location, extent, and current condition of the resources (e.g., air, water, geology, soils, etc.) and resource uses (e.g., livestock grazing, minerals, recreation, transportation and access, etc.). Available data have been gathered from various sources (e.g., Bureau of Land Management [BLM], other agencies, published and unpublished reports, databases, maps) and compiled to create an inventory. Trends refer to the degree and direction of change between the present and some point in the past. Forecast is a prediction of the changes in the resource or resource use anticipated given current management. Key features are the geographic location, distribution, areas, or types of resource features that should guide the allocation of land uses or management decisions.

For some resources and resource uses, the term Study Area also is used. This term is used to describe resources that must consider areas outside the Planning Area (such as air quality and socioeconomics) when determining the effects of BLM actions.

The Planning Area is located within the Chihuahuan Desert, Mexican Highlands, Southern Rocky Mountains, and Mogollon Plateau. Desertscrub vegetation, or vegetation such as creosotebush, grasses, and cactus, dominate the landscape. Wildlife including reptiles, amphibians, birds, insects and mammals also thrive in the desert ecosystem. The climate is mostly dry, with most precipitation occurring during the summer monsoon season. Temperatures are extreme and range from 100 degrees Fahrenheit to below freezing (Worldwide Federation [WWF] 2001a).

2.1.1 Regional Context

The regional context can be described by ecoregions that have been designated by The Nature Conservancy (TNC) for areas including the Planning Area and surrounding lands. An ecoregion is a large area of land and water that contains a geographically distinct assemblage of natural communities, with similar landforms, climate, ecological processes, and vegetation. They typically span millions of acres and multiple states (TNC 1999). The Nature Conservancy developed ecoregions based on earlier designations developed by the U.S. Department of Agriculture (USDA), U.S. Forest Service, and the WWF. The Planning Area is within the Chihuahuan Desert and the Arizona-New Mexico Mountains ecoregions. Other organizations have also classified ecoregions for the continental United States, including southern New Mexico (e.g., Sierra Club, New Mexico Wilderness Alliance), but the TNC-defined ecoregions are the ones most used and referred to by agencies and organizations.

The Chihuahuan Desert ecoregion contains a wide range of landforms such as plains with low mountains, plains with high hills, open hills, and tablelands with moderate relief at elevations ranging from 2,600 to

5,500 feet. Natural vegetation within the area is arid or semi-desert grassland dominated by shrubs and native grasses, including trans-Pecos shrub savanna, grama-tobosa desert grasslands, oak-juniper woodland, and mesquite-tarbush desert scrub (USDA, U.S. Forest Service Undated).

The Arizona-New Mexico Mountains ecoregion is distinguished from neighboring mountainous ecoregions by the lower elevations of its mountains and associated vegetation indicative of drier, warmer environments, due also in part to the more southerly location. Chaparral is common on the lower elevations, piñon-juniper and oak woodlands are found on lower and middle elevations, and the higher elevations are mostly covered with open to dense ponderosa pine forests. Forests of spruce, fir, and douglas fir, common in the southern Rocky Mountains and the Uinta and Wasatch Mountains, are found only in a few high-elevation parts of this region (University of Purdue 1999).

The Chihuahuan Desert and Arizona-New Mexico Mountains ecoregions are described in Table 2-1 and Table 2-2, respectively.

Table 2-1
Chihuahuan Ecoregion/Planning Area Information

Information about the Ecoregion	Information about the Planning Area as it Relates to the Ecoregion
The Chihuahuan Desert ecoregion comprises portions of south-central and southeastern New Mexico and west Texas, but is primarily within northern Mexico. The desert is approximately 174 million acres (Pronatura et al. 2004). The area is characterized by the basins and ranges of the Mexican Plateau, surrounded by the foothills of the Sierra Madre Oriental on the east and the Sierra Madre Occidental on the west (Bell et al. 2004). While wetter than some North American desert areas, the Chihuahuan Desert experiences hot summers, cool, dry winters, and intermittent rainfall mostly of monsoonal origins during the summer months (MacMahon 1997). The vegetation of the ecoregion is typically grassland and desert scrub, with areas of chaparral and woodland in the mountains and narrow ribbons of riparian forest and scrub along stream channels and springs (Bell et al. 2004). With the notable exception of the Rio Grande and its tributaries, most river systems are within closed basins and many streams and springs are isolated (Bell et al. 2004).	The Planning Area is located in the northernmost portion of the Chihuahuan Desert ecoregion, within the Rio Grande Basin.
• In New Mexico, the ecoregion includes Luna, Doña Anna, Sierra, Eddy, Socorro, Lincoln, Otero, Chaves, and Lea counties (15.2 million acres) • Metropolitan areas include Las Cruces, Deming, Carlsbad, Artesia, and Roswell. • Population increased 24% between 1990 and 2000 (U.S. Census Bureau 2000) • Chihuahuan semi-desert grasslands and desert scrub are the dominant vegetation cover. • Approximately 66% of the Chihuahuan Desert Ecoregion is privately owned. • Chihuahuan semi-desert grasslands include 55 New Mexico Species of Greatest Conservation Need (New Mexico Department of Game and Fish [NMDGF] 2005b).	The Planning Area comprises less than 10 percent of the Chihuahuan Desert ecoregion, which spans multiple U.S. states and a large part of Mexico. BLM administered lands in the Planning Area comprise less than 5 percent of the ecoregion as a whole. The ecoregion covers approximately 80 percent of the Planning Area, in Doña Ana County, southern and western Otero County, and central and eastern Sierra County, and over 90 percent of BLM administered lands within the Planning Area.
The overall condition or conservation status of the Arizona-New Mexico Mountains ecoregion is fair. The semi-desert grassland communities of this ecoregion have experienced a marked shift from perennial grassland to shrub-dominated desert scrubland around the mid-1800s (NMDGF 2005). In addition the ecoregion has experienced a reduction of biological diversity though extinction or population decline resulting from loss of fire as a natural cyclical event, the eradication of keystone species (e.g. prairie dog colonies), heavy grazing by livestock, the introduction of nonnative grasses, shrub encroachment, and habitat fragmentation (Finch 2004). Portions of Chihuahuan semi-desert grasslands have been transformed from perennial grasslands to a mixed-phase	The Planning Area is a small portion of the Chihuahuan Desert ecoregion. The ecoregion constitutes an important portion of the ecosystem as noted by the diversity of the species. As the elements of the ecoregion (e.g., soil, climate, and topography) are disturbed, the biological processes are affected. For example, loss of natural soil because of agricultural uses or loss of natural vegetation because of livestock grazing may affect the biological diversity of various species.

Information about the Ecoregion	Information about the Planning Area as it Relates to the Ecoregion
woodland or shrubland (Wilson et al. 2001). Today, portions of the ecoregion appear to be undergoing additional desertification (Bell et al. 2004). - a mixed-phase woodland or shrubland (Wilson et al. 2001). Today, portions of the ecoregion appear to be undergoing additional desertification (Bell et al. 2004). The Chihuahuan Desert ecoregion is considered to be one of the most biologically rich and diverse ecoregions in the world; it is thought to be one of the richest deserts for plants in the Americas and the third richest desert for reptiles in the world. The isolation of the desert by the Sierra Madres Oriental Mountains, the Sierra Madre Occidental, and the Arizona-New Mexico Mountains has produced an area rich in endemic species, especially among plants and reptiles (Pronatura et al. 2004). The Sierra Madres Oriental Mountains provide one of the oldest and richest centers of plant evolution in the North American continent, and the Chihuahuan Desert has produced at least 1,000 endemic plant taxa and 18 endemic species of reptiles and amphibians, and numerous endemic fish (Pronatura et al.2004).	

Table 2-2
Arizona-New Mexico Mountains Ecoregion/Planning Area Information

Information about the Ecoregion	Information about the Planning Area as it Relates to the Ecoregion
The Arizona-New Mexico Mountains ecoregion is located in the highlands of eastern Arizona, and western and central New Mexico, from Flagstaff, Arizona to the Guadalupe Mountains National Park in Texas. The region includes approximately 46,800 square miles (Bell et al. 1999). • Approximately 78% of this ecoregion is found in New Mexico. • The ecoregion is based upon the oldest mountains in the southwest, containing Precambrian igneous rocks as old as 1.5 billion years. • Much of the land in the ecoregion is under federal ownership, particularly the U.S. Forest Service. • Natural communities typical of the ecoregion are Ponderosa Pine and White Fir forest types above 5,500 feet and piñon pine / juniper savannas at lower elevations, although the ecoregion also includes grasslands and shrublands. The overall condition or conservation status of the Arizona-New Mexico Mountains ecoregion is fair. The ecoregion has been affected by human activity for millennia. Prehistoric people used this ecoregion for firewood, construction materials, and sources of food (NMDGF 2005b). In the late 1800s and early 1900s farmers, miners, and ranchers used the ecoregion for sources timber and smelter fuel (Dahams et al. 1997). Livestock has grazed portions of the ecoregion since the 1880s. Human population has increased have increased steadily since the arrival of settlers in the 1800s. However, the ecoregion has few urban areas. A number of stresses are affecting the ecological condition of the Arizona-New Mexico Mountains Ecoregion. These include (1) habitat destruction, (2) habitat fragmentation, (3) altered hydrologic regimes, (4) lowered water table, (5) altered erosion/sediment, (6) reduced water quality, (7) altered fire regime, and (8) altered species composition (Bell et al. 1999). These stressors have resulted in changes in stand structure (species composition, density, and structural diversity, etc.) and productively (Dahams et al. 1997). In particular, altered fire regimes have contributed to reduced aspen stands and the habitat they provide for a variety of wildlife species (NMDGF 2005b). In addition, these stressors have increased siltation of streams and wetlands, affected stream hydrology and water quality, and reduced soil permeability and the potential to support plants due to soil compaction (NMDGF 2005b). The Arizona-New Mexico Mountains ecoregion is considered to be one of the ecological treasures of the United States, with more species of birds and mammals than any other area in the Southwest (The Nature Conservancy [TNC] 1999). The region is home to more than 200 species of rare plants and animals, with more than 30 of them	The Planning Area overlaps with the southeastern portion of the Arizona-New Mexico Mountains ecoregion. The Planning Area comprises approximately 10 percent of the Arizona-New Mexico Mountains ecoregion, which spans lands in Arizona and New Mexico. BLM-administered lands in the Planning Area comprise less than 2 percent of the ecoregion as a whole. The Arizona-New Mexico Mountains ecoregion covers approximately 20 percent of the Planning Area, in western Sierra County and eastern Otero County (primarily on U.S. Forest Service-administered land), and less than 10 percent of BLM-administered lands within the Planning Area. The Planning Area occupies a small portion of the Arizona-New Mexico Mountains ecoregion. The ecoregion constitutes an important portion of the ecosystem because of the quantity of different plants and animals, including those considered endangered or threatened. As the elements of the ecoregion (e.g., soil, climate, and topography) are disturbed, the biological processes are affected. For example, the loss of natural habitat as a result of urbanization may affect the biological diversity of various species.

Information about the Ecoregion	Information about the Planning Area as it Relates to the Ecoregion
listed as endangered or threatened by the state and national governments (TNC 1999). This ecoregion contains the headwaters for a number of important streams and rivers, including the Little Colorado, Gila, San Francisco, and Mimbres. Riparian habitats in this ecoregion host a great diversity of flora and fauna. Some of the most critically imperiled aquatic species occur in this ecoregion, including the Gila chub, the Chihuahua chub, the Gila trout, the Apache trout, the roundtail chub, the loach minnow, the spikedace, and the Chiricahua leopard frog.	

2.1.2 Air Quality

2.1.2.1 Indicators

To characterize the existing conditions and anticipated trends in air quality within the TriCounty Planning Area, it is necessary to examine specific indicators. Quantifiable indicators associated with air quality include the following:

- Monitored ambient concentrations for the criteria air pollutants with National Ambient Air Quality Standards (NAAQS), as identified in the Clean Air Act and regulated by the U.S. Environmental Protection Agency (EPA), including nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), ozone (O_3), particulate matter equal to or less than 10 microns in diameter (PM_{10}), particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb).

- Observed levels of visibility, as a measure of air quality, which is monitored in most Class I areas. The Clean Air Act defines Class I areas as certain wilderness areas greater than 5,000 acres, national memorial parks greater than 5,000 acres, national parks greater than 6,000 acres, and international parks that were in existence on or before August 7, 1977.

For most of the Planning Area and locations in the surrounding region (Study Area), relatively complete information resources are available to support these indicators in the form of air quality monitoring data, air permit data, and visibility data. Using these indicators, one can understand the current air quality situation and evaluate trends for the Planning Area.

2.1.2.2 Current Conditions

Air Quality Designations

Attainment, Nonattainment, and Unclassified Areas

Geographic areas, which may not coincide with political boundaries, are designated as “attainment,” “nonattainment,” or “unclassified” for each of the criteria pollutants with respect to the NAAQS. If sufficient monitoring data are available, the EPA may designate an area as attainment if air quality is shown to meet the NAAQS. Areas in which air pollutant concentrations exceed the NAAQS are designated as nonattainment for specific pollutants and averaging times. An unclassified designation indicates that the status of attainment has not been verified through data collection. When permitting new

sources, an unclassified area is treated as an attainment area. Because the status of an area is designated separately for each criteria pollutant, one geographic area may have all three classifications.

Class I Areas

Of the three counties that are included in the Planning Area, only Doña Ana County contains an area that is designated as nonattainment with respect to the 1-hour O_3 NAAQS and PM_{10} NAAQS (USEPA 2005a).

Under the Federal Clean Air Act, areas meeting criteria for relatively pristine air quality may be designated as Class I areas. The Planning Area does not include any Class I areas. However, there are four Class I areas located just outside the Planning Area—Carlsbad Caverns National Park (east of the Planning Area), Guadalupe Mountains National Park (southeast of the Planning Area), White Mountain Wilderness and Apache Kid Wilderness (north of the Planning Area), and Gila Wilderness (west of the Planning Area).

Meteorological Conditions

In evaluating climate conditions in the TriCounty Planning Area, the three separate counties within the Planning Area—Sierra County, Otero County, and Doña Ana County—were examined separately.

Meteorological conditions recorded at sites within Sierra County are summarized in Table 2-3. As noted in the table, the meteorological conditions at the various monitors are comparable. The Western Regional Climate Center (WRCC) does not record humidity data for Sierra County.

Table 2-3
Meteorological Conditions in Sierra County

Monitor	Winter	Spring	Summer	Fall
Mean Monthly Temperature Average (°F) [a]				
Caballo Dam [b]	42.9	59.9	78.9	61.1
Truth or Consequences [b]	43.8	61.4	79.8	61.8
Hillsboro	41.1	57.1	74.4	57.6
Mean Monthly Precipitation Average (inches) [a]				
Caballo Dam [b]	0.46	0.27	1.48	0.97
Truth or Consequences [b]	0.53	0.33	1.51	0.96
Hillsboro	0.66	0.41	1.85	1.27
Total Snowfall (inches) [a]				
Caballo Dam [b]	0.6	0.1	0.0	0.2
Truth or Consequences [b]	2.8	0.2	0.0	0.1
Hillsboro	4.9	0.5	0.0	1.0
Average Wind Speed (miles per hour) [c]				
Truth or Consequences [b]	5.5 [11.3]	3.4 [11.6]	6.2 [31.1]	6.9 [13.0]

SOURCES: New Mexico Climate Office 2005; Western Regional Climate Center 2005a
NOTES: °F = degrees Fahrenheit
[a] For mean monthly temperature, mean monthly precipitation averages, and total snowfall values, the period used for Caballo Dam is 1938-2005, for Truth or Consequences is 1951-2005, and for Hillsboro is 1924-2005.
[b] Monitor is located in the Rio Grande Valley.
[c] For average wind speed values [maximum wind speed values], values are based on data collected between 2002 and 2005.

Meteorological conditions recorded at sites within Otero County are summarized in Table 2-4. As can be seen in this table, the meteorological conditions at the various monitors are somewhat similar, with the exception of the Cloudcroft monitor, which has lower average temperatures and higher levels of precipitation and snow. Both monitors are similar in their average wind speeds, but the Mayhill monitor has much higher maximum wind speeds. For humidity percentages, humidity levels are always greater in the morning as compared to the afternoon, with the highest levels occurring in the fall and winter.

Table 2-4
Meteorological Conditions in Otero County

Monitor	Winter	Spring	Summer	Fall
Mean Monthly Temperature Average (°F) [a]				
Orogrande	43.9	61.2	79.3	61.9
Alamogordo	44.3	61.6	79.2	61.8
Cloudcroft	30.7	44.1	58.4	45.4
Tularosa	44.0	60.3	77.6	61.0
Mayhill	37.7	52.4	67.5	52.6
White Sands National Monument	41.1	59.5	78.7	59.5
Mean Monthly Precipitation Average (inches) [b]				
Orogrande	0.48	0.37	1.57	0.96
Alamogordo	0.67	0.46	1.60	1.08
Cloudcroft	1.97	1.22	4.45	2.15
Tularosa	0.58	0.45	1.35	0.99
Mayhill	0.65	0.52	3.02	2.43
White Sands National Monument	0.52	0.32	1.26	0.87
Total Snowfall (inches) [b]				
Orogrande	2.5	0.3	0.0	1.3
Alamogordo	2.4	0.5	0.0	0.2
Cloudcroft	47.3	15.3	0.0	10.9
Tularosa	1.5	0.0	0.0	0.2
White Sands National Monument	1.4	0.1	0.0	0.2
Average Wind Speed (miles per hour) [c]				
Alamogordo	3.6 [8.0]	5.2 [11.1]	4.4 [10.5]	3.4 [7.8]
Mayhill	3.8 [16.8]	4.6 [16.8]	4.7 [18.0]	4.8 [17.6]
Average Percent Relative Humidity (Morning)				
Alamagordo-Holloman	63.3	42.7	54.0	63.3
Average Percent Relative Humidity (Afternoon)				
Alamagordo-Holloman	38.7	22.3	31.0	34.7

SOURCE: New Mexico Climate Office 2005; Western Regional Climate Center 2005a
NOTES: °F = degrees Fahrenheit
[a] For mean monthly temperature, the period used for Orogrande, Alamogordo, and Tularosa is 1914-2005, for Cloudcroft is 1987-2005, for Mayhill is 1985-2005, and for White Sands National Monument is 1939-2005.
[b] For mean monthly precipitation averages and total snowfall values, the period used for Orogrande, Alamogordo, and Tularosa is 1914-2005, for Cloudcroft is 1987-2005, for Mayhill is 1971-2000, and for White Sands National Monument is 1939-2005.
[c] For average wind speed values [maximum wind speed values], values are based on data collected between 2002 and 2005.

Conditions recorded at sites within Doña Ana County are summarized in Table 2-5. As can be seen in this table, the meteorological conditions at the various monitors located within Doña Ana and Sierra Counties are comparable. Doña Ana County does not have recorded humidity data from the WRCC.

Table 2-5
Meteorological Conditions in Doña Ana County

Monitor	Winter	Spring	Summer	Fall
Mean Monthly Temperature Average (°F) [a]				
Las Cruces [b]	44.5	61.1	79.2	61.8
Jornada Experimental Range	40.4	57.3	76.8	58.6
Mean Monthly Precipitation Average (inches) [a]				
Las Cruces [b]	0.53	0.25	1.45	0.86
Jornada Experimental Range	0.53	0.30	1.53	0.98
Total Snowfall (inches) [a]				
Las Cruces [b]	2.9	0.3	0.0	1.6
Jornada Experimental Range	1.8	0.1	0.0	0.2
Average Wind Speed (miles per hour) [c]				
Las Cruces [b]	5.1 [10.6]	3.0 [9.6]	6.3 [35.4]	5.8 [11.3]
Hatch [b]	6.6 [12.9]	4.5 [14.4]	7.7 [35.9]	7.4 [14.0]
Jornada Experimental Range	5.1 [10.9]	4.4 [16.4]	6.6 [30.3]	6.4 [12.7]

SOURCES: New Mexico Climate Office 2005; Western Regional Climate Center 2005a
NOTES: °F = degrees Fahrenheit
[a] For mean monthly temperature, mean monthly precipitation averages, and total snowfall values, the period used for Las Cruces is 1959-2005, for Jornada Experiment Range is 1925-2005, for Caballo Dam is 1938-2005, for Truth or Consequences is 1951-2005, and for Hillsboro is 1924-2005.
[b] Monitor is located in the Rio Grande Valley.
[c] For average wind speed values [maximum wind speed values], values are based on data collected between 2002 and 2005

Four remote automatic weather station (RAWS) monitors provide data that represent the wind patterns within the Planning Area (WRCC 2005b). These data were evaluated, with the following results:

- Based on wind patterns recorded at the Bosque New Mexico RAWS monitor, which is located on the border of Sierra County and Doña Ana County, winds are from the north-northeast approximately 24 percent of the year, and winds are from the south-southwest approximately 21 percent of the year. The remaining winds from the other compass directions are evenly distributed.

- The wind pattern observed at the Cosmic New Mexico RAWS monitor, which is located in central Otero County, shows wind patterns that are predominantly from the southwest approximately 23 percent of the year. Winds from the northeast counteract this effect to a smaller degree (approximately 16 percent of the year). The remaining winds from the other compass directions are somewhat evenly distributed.

- Mountainous regions affect the recorded wind patterns at RAWS monitors located within Doña Ana County. This is evident in the varying wind patterns between the Dripping Springs New Mexico RAWS monitor, which is located in the southeastern portion of the county, and the Sierra De Las Uvas New Mexico RAWS monitor, which is located in the northwestern portion of the county. Wind patterns at the Dripping Springs monitor show that winds are predominantly from the east-southeast (approximately 30 percent of the year) and southwest (approximately 19 percent of the year), with the remaining winds evenly distributed. However, at the Sierra De Las

Uvas monitor, winds are predominantly from the south-southwest (approximately 34 percent of the year), with the remaining winds somewhat evenly distributed.

Visibility Conditions

The Cooperative Institute for Research in the Atmosphere operates a network of visibility monitoring stations in or near Class I areas, and publishes Integrated Monitoring of Protected Visual Environments (IMPROVE) data to identify and evaluate patterns and trends in regional visibility. Data from IMPROVE monitors located in three of the four Class I areas near the Planning Area provide the standard visual range for each monitor, which is the maximum distance at which one can identify a black object against the horizon (USEPA 1999). Standard visual ranges for each of the three monitors on their best (highest visibility), worst (lowest visibility), and intermediate (average visibility) visibility days are provided in Table 2-6.

Table 2-6
Standard Visual Ranges from IMPROVE Monitors Near the Planning Area

Monitor	Standard Visual Range (km) [a]		
	Best Visibility Days	Intermediate Visibility Days	Worst Visibility Days
Gila Wilderness [b]	238	163	98
Guadalupe Mountains National Park [b]	189	122	77
White Mountain Wilderness [b]	244	158	92

SOURCE: Interagency Monitoring of Protected Visual Environments 2005
NOTES: km = kilometers
[a] Standard visual range represents the maximum distance at which one can identify a black object against the horizon (U.S. Environmental Protection Agency 1999).
[b] The period used for the Gila Wilderness is 1995-2003, for Guadalupe Mountains National Park is 1989-2003, and for White Mountain Wilderness is 2002-2003.

As evidenced in this table, the Guadalupe Mountains National Park monitor, which is located outside the southeastern corner of the Planning Area, recorded the lowest standard visual ranges in each category. The two monitors that demonstrated the best standard visual range, Gila Wilderness and White Mountain Wilderness, are located outside the northwestern corner of the Planning Area and north of the Planning Area, respectively.

Air Quality Monitor Data

There are no air quality monitors located within Sierra and Otero Counties. However, there are numerous monitors located within Doña Ana County that are representative of conditions in the Planning Area for different criteria pollutants. With few exceptions, each of these monitors track only one pollutant. Ambient air pollutant concentration data for these monitors, as reported on the EPA's AirData Web site (USEPA 2005b) are summarized in Table 2-7.

As evident in this table, average NO_2, SO_2, CO, and $PM_{2.5}$ concentrations were all below the NAAQS (refer to Table 6-1) and New Mexico Ambient Air Quality Standards (refer to Table 6-2).

Table 2-7
2004 Air Quality Monitor Data from Monitors in Doña Ana County

Identifier	Nitrogen Dioxide (ppm)	Carbon Monoxide (ppm)		Sulfur Dioxide (ppm)			Ozone (ppm)		Particulate Matter ≤ 10 Microns (µg/m^3)		Particulate Matter ≤ 2.5 Microns (µg/m^3)	
	Annual Average	1-Hour Average	8-Hour Average	3-Hour Average	24-Hour Average	Annual Average	1-Hour Average	8-Hour Average	24-Hour Average	Annual Average	24-Hour Average	Annual Average
DAC1	N/A	N/A	N/A	N/A	N/A	N/A	0.099	0.075	N/A	N/A	N/A	N/A
DAC2	N/A	N/A	N/A	0.009	0.005	0.001	0.108	0.073	313	57	39	10.2
DAC3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	23	6.1
DAC4	N/A	N/A	N/A	N/A	N/A	N/A	0.082	0.068	N/A	N/A	N/A	N/A
DAC5	N/A	4.2	2.5	N/A	N/A	N/A	0.067	0.063	N/A	N/A	N/A	N/A
DAC6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	391	45	N/A	N/A
DAC7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	159	21	N/A	N/A
DAC8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	280	20	N/A	N/A
DAC9	N/A	N/A	N/A	N/A	N/A	N/A	0.097	0.080	401	31	N/A	N/A
DAC10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	264	31	N/A	N/A
DAC11	0.011	N/A	N/A	N/A	N/A	N/A	0.096	0.076	N/A	N/A	N/A	N/A
DAC12	0.005	N/A	N/A	N/A	N/A	N/A	0.096	0.081	N/A	N/A	N/A	N/A

SOURCE: U.S. Environmental Protection Agency 2005b
NOTES: N/A = Not Available
ppm = parts per million
µg/m3 = micrograms per cubic meter
DAC1 = St Luke's Episcopal Ch Rt 1 (La Union)
DAC2 = Sunland Park City Yard
DAC3 = 1170 N. Solano Drive, Las Cruces
DAC4 = 750 N. Solano Drive, Las Cruces
DAC5 = Holiday Inn, Las Cruces
DAC6 = SE Corner of Anthony Elem. School Yard, Anthony
DAC7 = Dirt Road East of Telshor Drive, Las Cruces
DAC8 = South of I-10 at Las Cruces Well #46, Las Cruces
DAC9 = 680 McCombs, Chaparral
DAC10 = Las Cruces Well Station #41, Holman Road
DAC11 = 5935a Valle Vista, Sunland Park
DAC12 = 104-2 Santa Teresa International Blvd

Two of seven O_3 monitors registered exceedances of the 8-hour O_3 NAAQS according to the highest recorded 8-hour concentrations. However, both of these monitors registered concentrations below the 8-hour O_3 NAAQS for the third highest 8-hour concentration readings.

For PM_{10}, all six monitors registered exceedances of the 24-hour PM_{10} NAAQS according to the highest recorded 24-hour concentrations. The monitors with the greatest numbers of exceedances of the 24-hour PM_{10} NAAQS were the Sunland Park City Yard monitor (16 recorded exceedances from 357 measurements) and the Anthony Elementary School Yard monitor (11 recorded exceedances from 359 measurements). Only one of the six PM_{10} monitors registered an exceedance of the annual PM_{10} NAAQS (Sunland Park City Yard recorded one exceedance from 357 measurements). These results are consistent with the PM_{10} nonattainment area designation for Doña Ana County.

Emission Sources

There are numerous emission sources located within the Planning Area, which include major, minor, mobile, and nonpermitted sources as described below. The significant concentration of these sources is in and around Las Cruces, New Mexico, which is a major city located within the Planning Area.

Major Sources

A major source, for permitting purposes, is defined as a source or facility that has the potential to emit 100 tons or more per year of any single criteria pollutant, 10 tons per year of any single hazardous air pollutant (HAP), or 25 tons per year of any combination of HAPs. The predominant facility with a major source permit in Sierra County is a copper mine. However, this facility currently is not operating and therefore is not a major source of air pollution within Sierra County. Major sources in Otero County include an Air Force base and an aluminum foundry. The types of major sources located in Doña Ana County include power plants, space research and technology facilities, missile ranges, and natural gas compressor stations.

Minor Sources

A minor source, for permitting purposes, is defined as a source or facility that has a potential to emit criteria air pollutants in amounts greater than the “significance” threshold, but less than a major source. The significance threshold provides an emission baseline for criteria pollutants that determines which facilities must obtain permits. Sources that have emissions below the threshold would not be required to obtain a permit unless there are other applicable Federal, State, or county regulations that apply to the equipment at their facility.

Minor sources include a variety of industrial and commercial operations, as well as rock and construction product industries such as portable crushing and screening plants, hot mix asphalt plants, and concrete batch plants. Stationary industrial sources in this category include paint shops, dry cleaners, and a broad range of manufacturing facilities such as those for consumer goods.

Mobile Sources

On-road vehicles represent the largest single air pollutant source category in the Planning Area. Emissions from vehicles consist of NO_2, CO, and PM_{10}, which may warrant consideration in any assessment of ambient air quality in the Planning Area. Consideration of mobile source emissions may be reasonably limited to the major traffic routes that run through the Planning Area such as Interstate Highway 25, U.S. Highway 70, and U.S. Highway 54.

On a regional scale, the effects of air pollution from vehicle exhaust typically are quantified using accepted statistical models that consider the emission profile of the vehicle population, combined with traffic counts that measure daily or annual numbers of vehicles passing on specified roadways. The dispersion of these emissions is modeled following methods recommended by the EPA that represent the roadways as "line-sources."

Nonpermitted Sources

There are many small stationary emission sources that are not required to have an operating permit. These types of sources do not produce levels of air pollution that would substantially affect regional air quality. An air quality assessment of the Planning Area should treat such sources on the basis of expected distribution of generic emission source categories in and around the Planning Area.

2.1.2.3 Trends

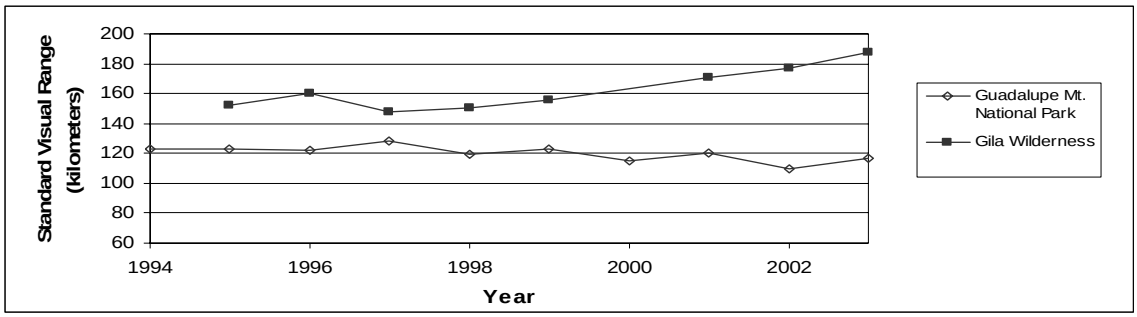
Regional Visibility

Regional visibility trends for the Planning Area are best characterized using data obtained from IMPROVE stations at three of the four Class I areas near the Planning Area: Gila Wilderness (located northwest of the Planning Area), White Mountain Wilderness (located north of the Planning Area), and Guadalupe Mountains National Park (located southeast of the Planning Area). Although all of these monitors are located outside the Planning Area, they provide an understanding of the visibility characteristics within the Planning Area.

Visual range is a mathematically related metric that defines visibility conditions. Visual range is defined as "the maximum distance at which one can identify a black object against the horizon" (USEPA 1999). In the IMPROVE system, visibility is characterized in terms of the annual average values for the clearest ("best") 20 percent, middle ("typical") 20 percent, and haziest ("worst") 20 percent of the days monitored each year.

Only two years of data were available from the monitor located in the White Mountain Wilderness, which are not enough data to establish a trend. However, there were sufficient amounts of data from the other two monitors (Gila Wilderness and Guadalupe Mountains National Park) to interpret the trend in visibility at those locations. The "typical" visual ranges recorded at these monitors over the past several years are plotted in Figure 2-1.

Figure 2-1
Standard Visual Range Trends



SOURCE: Interagency Monitoring of Protected Visual Environments 2005a

The data from the Guadalupe Mountain National Park monitor shows a relatively consistent typical visual range that fluctuates around 120 kilometers. Since 1997, the Gila Wilderness monitor has shown an improving trend in the standard visual range with values significantly larger than those at the Guadalupe Mountain National Park.

One contributing factor to the observed improvement in long-range visibility at the Gila Wilderness monitor has likely been the widespread use of reformulated fuels with lower sulfur contents. The California Air Resources Board recognizes the use of low sulfur reformulated fuel as a measure that prevents and controls sulfur dioxide and ozone emissions, both of which contribute to the formation of visibility reducing particles (California Air Resources Board 2006). Another factor that explains the general trend toward improved regional visibility is the increasing prevalence of automobiles that use catalytic converters with a 3-way catalyst. This technology reduces the nitrogen oxide emissions, which are an ozone precursor (USEPA 2006).

Air Quality Monitor Data Trends

Data trends for criteria air pollutants measured and recorded at various monitors were evaluated based on data obtained from the EPA's AirData Web site for years 2000 through 2004 for Doña Ana County (USEPA 2005b). There are no air quality monitors located in Otero or Sierra Counties.

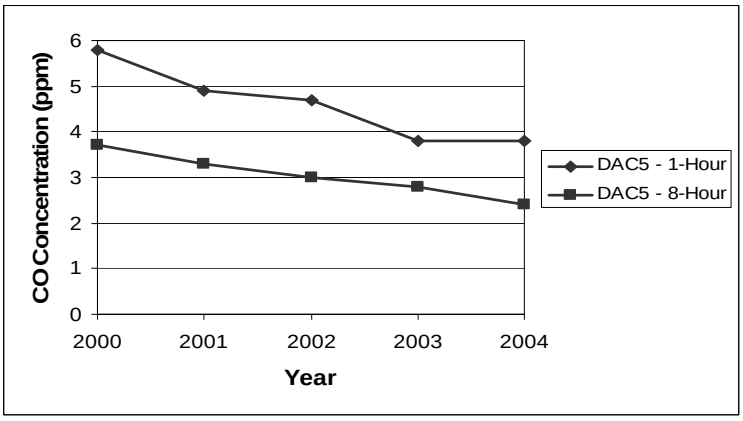
For those pollutants with ambient standard concentration values for shorter averaging times (i.e., 24 hours or less), the second highest recorded reading was used for the trend analysis. The highest value was not evaluated in the assessment of long-term trends. The NAAQS allows for one annual exceedance of the short-term standards based on the observation that a single elevated reading is not usually representative of normal conditions.

Carbon Monoxide

CO monitors track 1-hour or 8-hour periodic average concentrations, or both. Only one monitor in the Planning Area, which is located in Las Cruces, New Mexico, had enough data to provide a legitimate

trend. This monitor showed decreasing values of the second highest recorded CO concentration, for both a 1-hour and 8-hour average, over the past five years, as shown in Figure 2-2.

Figure 2-2
Second Maximum 1-Hour and 8-Hour CO Concentration Trends

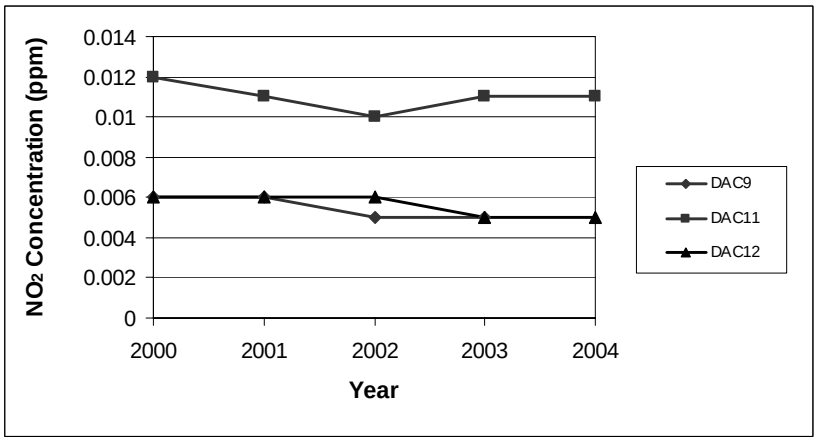


SOURCE: U.S. Environmental Protection Agency 2005b
NOTES: CO = carbon monoxide
ppm = parts per million
DAC5 = Holiday Inn, Las Cruces

Nitrogen Dioxide

NO_2 monitors may track any combination of 1-hour, 24-hour, or annual periodic average concentrations. However, there is only a NAAQS for annual NO_2 concentrations. The Planning Area contains three NO_2 monitors, which are all located in Doña Ana County. Each monitor shows relatively stable annual NO_2 concentrations that fluctuate within 0.002 parts per million, as shown in Figure 2-3.

Figure 2-3
Annual NO_2 Concentration Trends

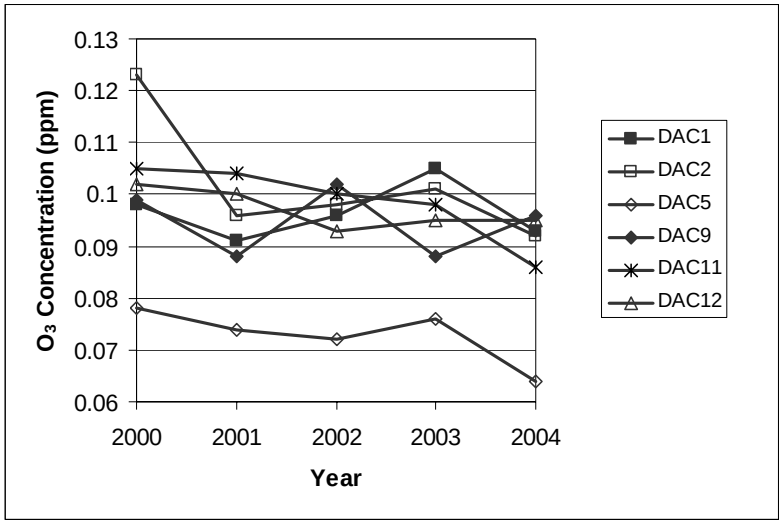


SOURCE: U.S. Environmental Protection Agency 2005b
NOTES: NO_2 = nitrogen dioxide
ppm = parts per million
DAC9 = 680 McCombs, Chaparral
DAC11 = 5935a Valle Vista, Sunland Park
DAC12 = 104-2 Santa Teresa International Blvd

Ozone

O_3 monitors track 1-hour or 8-hour periodic average concentrations, or both. O_3 concentration trends over a 1-hour average are very different among the six monitors located in Doña Ana County, as shown in Figure 2-4. The concentrations also fluctuate for each monitor. For 2004, all of the monitors registered decreases in 1-hour O_3 concentrations, with the exception of DAC12 (104-2 Santa Teresa International Blvd), which remained constant, and DAC9 (680 McCombs, Chaparral), which had an increase of 0.011 parts per million.

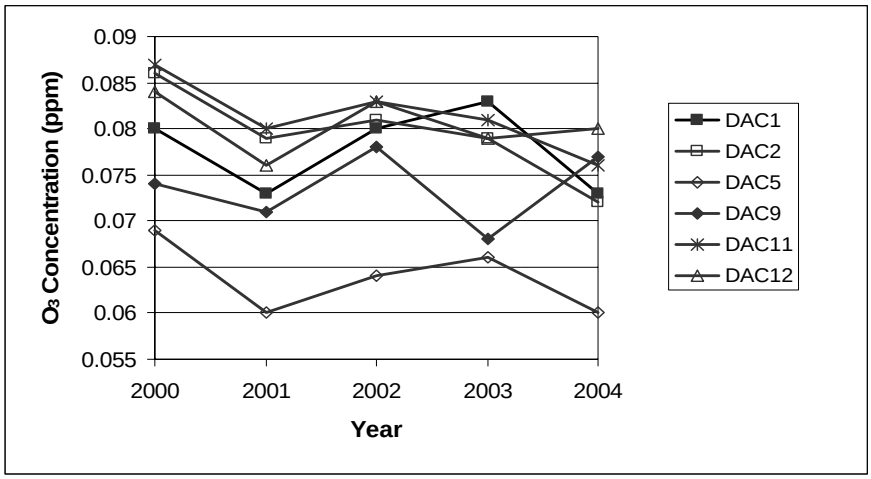
Figure 2-4
1-Hour O_3 Concentration Trends



SOURCE: U.S. Environmental Protection Agency 2005b
NOTES: O_3 = ozone
DAC1 = St. Luke's Episcopal Ch Rt 1 (La Union)
DAC2 = Sunland Park City Yard
DAC5 = Holiday Inn, Las Cruces
DAC9 = 680 McCombs, Chaparral
DAC11 = 5935a Valle Vista, Sunland Park
DAC12 = 104-2 Santa Teresa International Blvd, Anthony

As with the 1-hour trends, annual average 8-hour O_3 concentration trends are very different between the six monitors located in Doña Ana County; these concentrations fluctuate for each monitor, as shown in Figure 2-5. For 2004, all of the monitors registered decreases in 8-hour O_3 concentrations with the exception of DAC12 (104-2 Santa Teresa International Blvd), which had a slight increase, and DAC9 (680 McCombs, Chaparral), which had a more pronounced increase of 0.008 parts per million.

Figure 2-5
8-Hour O_3 Concentration Trends

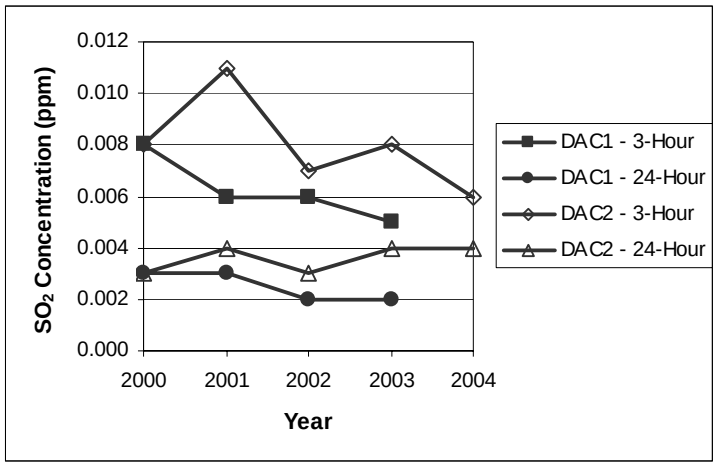


SOURCE: U.S. Environmental Protection Agency 2005b
NOTES: O_3 = ozone
ppm = parts per million
DAC1 = St. Luke's Episcopal Ch Rt 1 (La Union)
DAC2 = Sunland Park City Yard
DAC5 = Holiday Inn, Las Cruces
DAC9 = 680 McCombs, Chaparral
DAC11 = 5935a Valle Vista, Sunland Park
DAC12 = 104-2 Santa Teresa International Blvd

Sulfur Dioxide

SO_2 monitors may track any combination of 3-hour, 24-hour, or annual periodic average concentrations. The trends for the two monitors that record SO_2 concentrations in Doña Ana County differ greatly, with the exception of the annual SO_2 concentration, which has remained 0.001 parts per million at each monitor over the past five years, as shown in Figure 2-6. One monitor (DAC1 - St. Luke's Episcopal Church) has recorded constant or decreasing SO_2 concentrations on both a 3-hour and 24-hour average. The other monitor (DAC2 – Sunland Park City Yard) shows fluctuations over the five-year period. For 2004, the 3-hour average concentration at this monitor decreased, while the 24-hour average remained constant.

Figure 2-6
3-Hour and 24-Hour SO_2 Concentration Trends

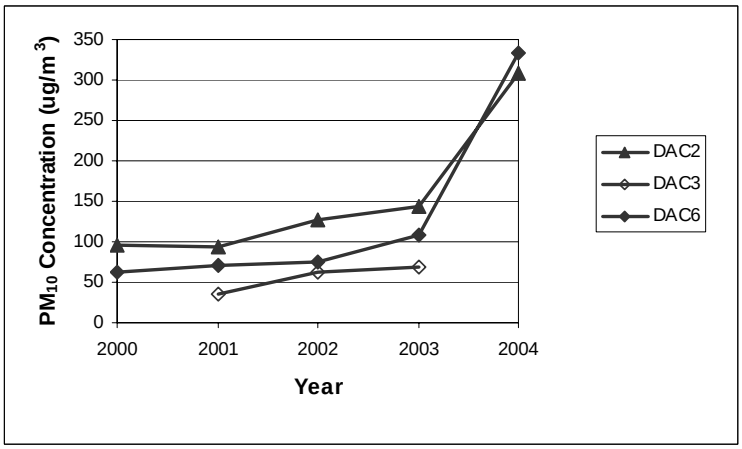


SOURCE: U.S. Environmental Protection Agency 2005b
NOTES: SO_2 = sulfur dioxide
ppm = parts per million
DAC1 = St. Luke's Episcopal Ch Rt 1 (La Union)
DAC2 = Sunland Park City Yard

Particulate Matter Equal to or Less than 10 Microns in Diameter

PM_{10} monitors may track 24-hour or annual periodic average concentrations, or both. Annual 24-hour PM_{10} concentrations at three monitors in Doña Ana County registered increasing levels of PM_{10} over the past five years, as shown in Figure 2-7.

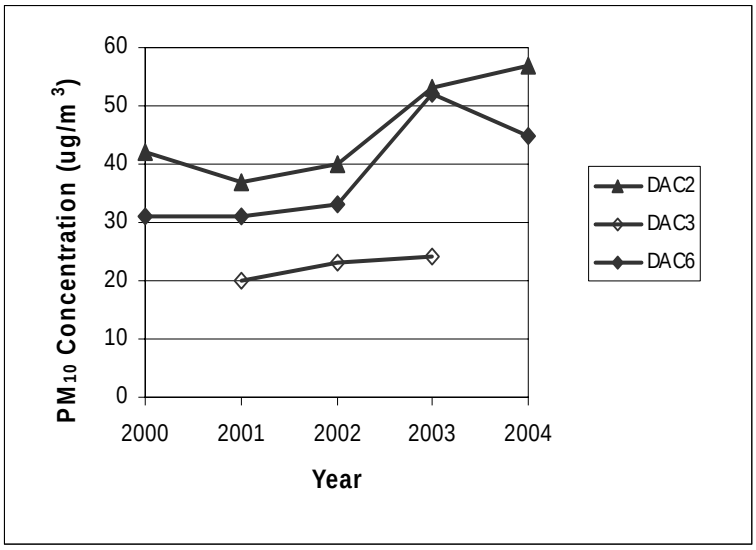
Figure 2-7
24-Hour PM_{10} Concentration Trends



SOURCE: U.S. Environmental Protection Agency 2005b
NOTES: PM_{10} = particulate matter equal to or less than 10 microns in diameter
mg/m3 = micrograms per cubic meter
DAC2 = Sunland Park City Yard
DAC3 = 1170 North Solano Drive, Las Cruces
DAC6 = Southeast corner of Anthony Elementary School Yard, Anthony

Unlike the annual 24-hour PM_{10} concentrations, the annual average PM_{10} concentrations have shown more fluctuation for the three monitors, as shown in Figure 2-8. All of the monitors recorded their lowest concentration levels during 2001 after which annual PM_{10} concentrations at all of the monitors increased with the exception of DAC6 (Anthony Elementary School Yard). This monitor showed a slight decrease in annual PM_{10} concentration in 2004.

Figure 2-8
Annual PM_{10} Concentration Trends

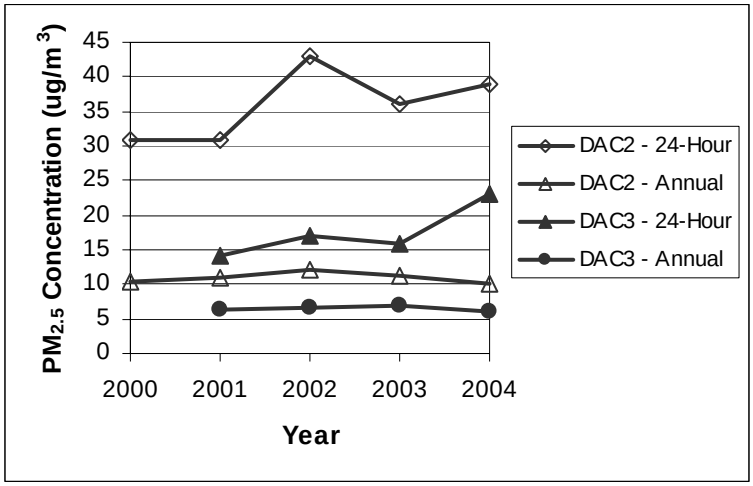


SOURCE: U.S. Environmental Protection Agency 2005b
NOTES: PM_{10} = particulate matter equal to or less than 10 microns in diameter
mg/m3 = micrograms per cubic meter
DAC2 = Sunland Park City Yard
DAC3 = 1170 North Solano Drive, Las Cruces
DAC6 = Southeast corner of Anthony Elementary School Yard, Anthony

Particulate Matter Equal to or Less than 2.5 Microns in Diameter

$PM_{2.5}$ monitors may track 24-hour or annual periodic average concentrations, or both. The trends for the two monitors that record $PM_{2.5}$ concentrations in Doña Ana County are very similar, as shown in Figure 2-9. For 24-hour $PM_{2.5}$ concentrations, both monitors show a similar pattern with an increase in 2002, a decrease in 2003, followed by another increase in 2004. Annual average $PM_{2.5}$ concentrations have remained fairly consistent over the past five years with slight decreases occurring in 2004.

Figure 2-9
$PM_{2.5}$ Concentration Trends



SOURCE: U.S. Environmental Protection Agency 2005b
NOTES: $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
mg/m3 = micrograms per cubic meter
DAC2 = Sunland Park City Yard
DAC3 = 1170 North Solano Drive, Las Cruces

2.1.2.4 Forecast

Regional Visibility

On December 31, 2003, the New Mexico Environment Department (NMED) Air Quality Bureau (AQB) completed preparation of a revision to the New Mexico State Implementation Plan (SIP) for regional haze. This revision has been submitted to the EPA for their review and approval under the Regional Haze Rule in Section 309 of Title 40 of the Code of Federal Regulations, Part 51 (40 CFR 51) (NMED, AQB 2003a). This section mandates the restoration of natural visibility conditions in all Class I areas by 2064 (NMED, AQB 2003b). Although this regional haze SIP only pertains to San Pedro Parks Wilderness in northern New Mexico, it does contain a statement that the NMED intends to comply with Section 309(g)(2) in developing a SIP for the eight additional Class I areas in New Mexico by December 31, 2008 (NMED, AQB 2003a). Three of the eight Class I areas that will be affected by this SIP are located just outside the Planning Area: Gila Wilderness, White Mountain Wilderness, and Carlsbad Caverns National Park. Section 309(g)(2) requires that the SIP include a demonstration of expected visibility conditions for the most impaired and least impaired days based on emissions projections from the long-term strategies in the SIP (USEPA 2005d).

Another relatively new regulation that will impact future visibility levels in the Planning Area is a Smoke Management Program (SMP), which was implemented on December 31, 2003. The SMP is discussed in more detail in Section 6.1.2.1.

Together, these initiatives will ensure that regional visibility continues to improve in and around the Planning Area.

Air Quality Monitor Data

Carbon Monoxide

It is expected that the average CO concentrations will remain relatively consistent, or slightly decrease in future years. This projection is based on the continued use of oxygenated fuels in the area.

Nitrogen Dioxide

It is expected that the average NO_2 concentrations will remain relatively consistent in future years, as past years have shown relatively stable NO_2 concentrations that fluctuate within 0.002 parts per million. Regulatory requirements enacted to improve air quality within the O_3 nonattainment area, which encompasses Doña Ana County, may impact NO_2 emissions, as NO_2 is an O_3 precursor. As a result of tougher regulations inside the nonnattainment area, areas outside the nonattainment area may show increases in NO_2 concentrations due to the increasing presence of industries with major-source levels of NO_2 emissions that will preferentially locate outside the nonattainment area in order to gain greater operational flexibility.

Ozone

Concentrations of O_3 should stabilize somewhat in Doña Ana County as a result of the 1-hour O_3 nonattainment area designation. However, as the current trends are very volatile from year to year, it is impossible to project with reasonable certainty the future trend of O_3 concentrations. O_3 concentrations could increase in the near future if emissions of volatile organic compounds and NO_2, which are precursors for O_3, increase due to the potential for population and industrial growth in the Planning Area.

Sulfur Dioxide

As the use of lower sulfur gasoline and diesel fuels for motor vehicles is expanded in response to Federal requirements that will become effective in 2006, it is anticipated that SO_2 concentrations in the region will remain stable or decrease. Reduced SO_2 emissions from tighter fuel standards may be offset by increased vehicle traffic due to population expansion.

Particulate Matter Equal to or Less than 10 Microns in Diameter

Future trends for PM_{10} concentrations in the Planning Area will be affected by several factors, including the implementation of more stringent fugitive dust regulations, potential increases in population, and extraordinary events such as dust storms. It is impossible to project with certainty what trend will occur with PM_{10} concentrations. However, 24-hour PM_{10} concentrations should decrease from those extreme values seen in 2004, which were most likely caused by a short-term natural event. All but a few of the exceedances of the PM_{10} standard in Doña Ana County have been caused by windblown dust raised by high winds (NMED 2006).

Particulate Matter Equal to or Less than 2.5 Microns in Diameter

Counteracting influences will affect short-term concentrations of $PM_{2.5}$. While use of low-sulfur fuels may reduce $PM_{2.5}$ emissions from vehicles, short-term concentrations of $PM_{2.5}$ may show increases due to potential increases in the number of motor vehicles and other combustion sources. However, based on the relatively stable annual $PM_{2.5}$ concentrations evident over the past five years, it is anticipated that annual $PM_{2.5}$ concentrations will continue to remain stable in the future.

Emission Sources

There are several proposed new or modified emission sources that currently have applications residing with the NMED AQB. For Sierra County, the only source with a permit application for a new or modified source is a mining operation. For Otero County, the types of sources with new or modification permit applications include a concrete product manufacturer and an Air Force Base. Finally, for Doña Ana County, the types of sources with new or modification permit applications include a concrete batch plant, compressor station, chemical company, and miscellaneous industrial facilities (NMED, AQB 2005).

2.1.2.5 Key Features

The types of features within the Planning Area that should guide land use allocation and management decisions include the nonattainment areas and Class I areas identified under Section 2.1.2.2. Air quality operating requirements are more stringent in these areas. BLM should consider these nonattainment areas when making land use allocations, particularly when those allocations/decisions could affect air quality.

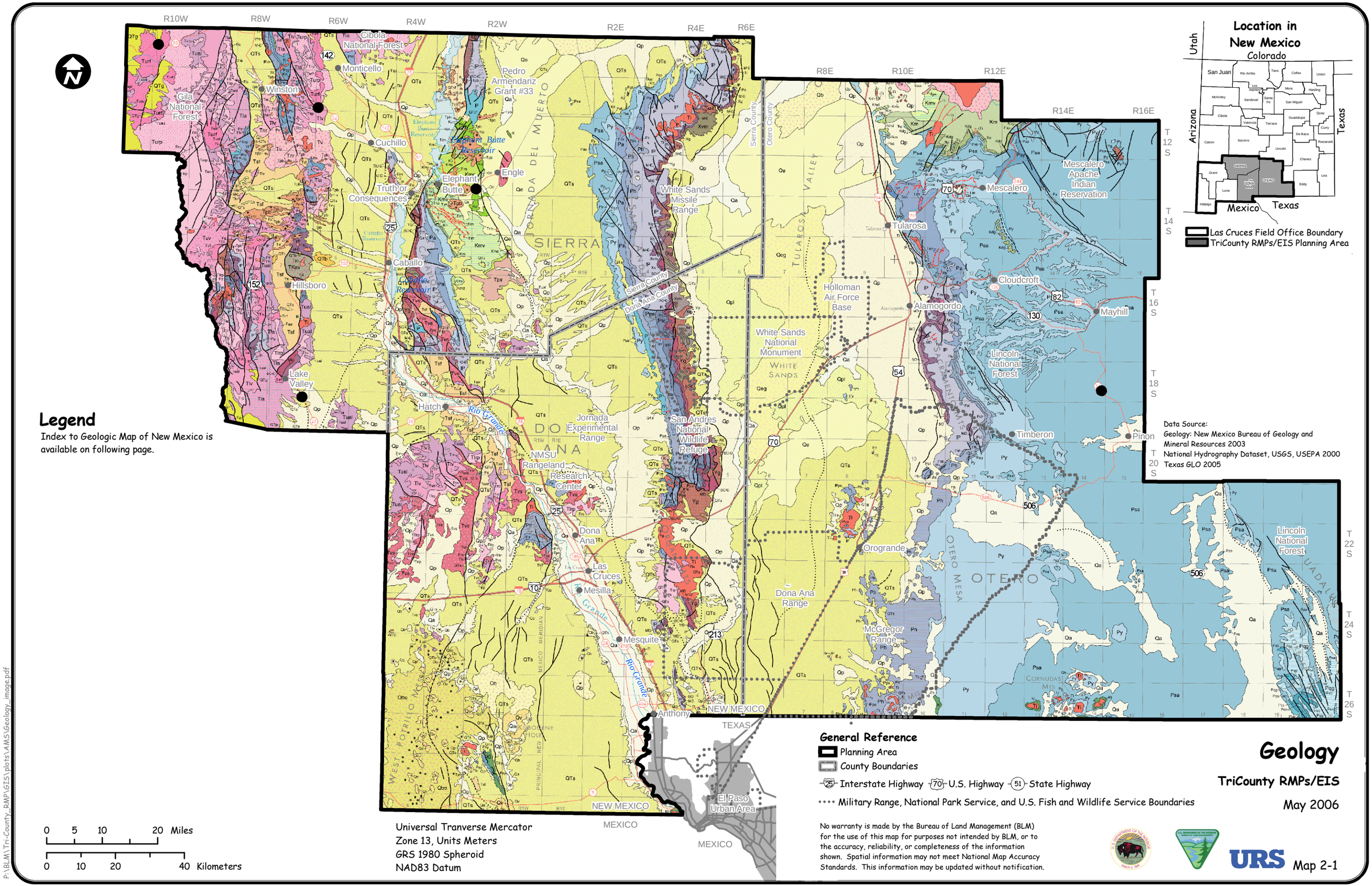
2.1.3 Geology

2.1.3.1 Indicators

Factors that describe the condition of geologic resources may include the demand for and establishment of reserves or parks in areas having unique geologic features of interest or scenic value, and the public desire to have existing scenic views unaffected by surface mining activities or development of oil and gas fields. The impact on geologic resources resulting from uses of mineral resources, such as surface mines or quarries, affects the quality of the geology resource. Such factors are different from those related to the use of geologic mineral resources, such as lease sales, mining permits or mineral material sales, which will be discussed in Section 2.2.2.

2.1.3.2 Current Conditions

The geologic resources of the Planning Area are best understood within the context of the regional physiography, the mode of formation and spatial occurrence of the various rock types within the area, and the geologic structures and history that combined to produce the geologic conditions that exist in the area (Map 2-1). The physiography, rock units, geologic structure and tectonic history of the Planning Area are discussed in this section. Rather than describing current conditions for each county, conditions are summarized for the entire Planning Area, with specific counties mentioned as applicable.


Location in New Mexico
Utah
Colorado
Arizona
Texas
Mexico
Las Cruces Field Office Boundary
TriCounty RMPs/EIS Planning Area
Legend
Index to Geologic Map of New Mexico is available on following page.
Data Source:
Geology: New Mexico Bureau of Geology and Mineral Resources 2003
National Hydrography Dataset, USGS, USEPA 2000
Texas GLO 2005
General Reference
Planning Area
County Boundaries
Interstate Highway
U.S. Highway
State Highway
Military Range, National Park Service, and U.S. Fish and Wildlife Service Boundaries
Geology
TriCounty RMPs/EIS
May 2006
No warranty is made by the Bureau of Land Management (BLM) for the use of this map for purposes not intended by BLM, or to the accuracy, reliability, or completeness of the information shown. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
0 5 10 20 Miles
0 10 20 40 Kilometers
Map 2-1
URS
Cibola National Forest
Gila National Forest
Monticello
Winston
Cuchillo
Truth or Consequences
Elephant Butte
Engle
Caballo
Hillsboro
Lake Valley
Hatch
Las Cruces
Mesilla
Mesquite
Anthony
Dona Ana
Jornada Experimental Range
NMSU Rangeland Research Center
San Andres National Wildlife Refuge
White Sands Missile Range
Holloman Air Force Base
White Sands National Monument
Tularosa
Mescalero
Mescalero Apache Indian Reservation
Cloudcroft
Alamogordo
Mayhill
Lincoln National Forest
Timberon
Pinon
Orogrande
Dona Ana Range
McGregor Range
Sierra County
Otero County
Dona Ana County
NEW MEXICO
TEXAS
MEXICO
El Paso Urban Area
R10W
R8W
R6W
R4W
R2W
R2E
R4E
R6E
R8E
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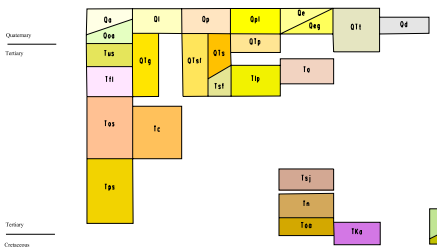
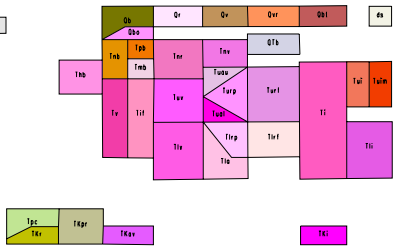
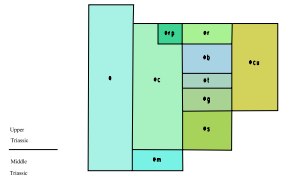






QUATERNARY

ds - disturbed ground
Qa - Alluvium; upper and middle Quaternary
Ql - Landslide deposits and colluvium
Qe - Eolian deposits
Qeg - Gypsiferous eolian deposits
Qd - Glacial deposits; till and outwash; upper and middle Pleistocene
Qpl - Lacustrine and playa-lake deposits; includes associated alluvial and eolian deposits of major lake basins; upper Quaternary
Qp - Piedmont alluvial deposits: upper and middle Quaternary; includes deposits of higher gradient tributaries bordering major stream valleys, alluvial veneers of the piedmont slope, and alluvial fans
Qb - Basalt and andesite flows and locally vent deposits
Qr - Silicic volcanic rocks
Qv - Basaltic volcanics; tuff rings, cinders, and proximal lavas
Qbo - Basalt or basaltic andesite; middle and lower Pleistocene
Qvr - Valles Rhyolite; Jemez Mountains area only
Qbt - Bandelier Tuff; Jemez Mountains area only
Qoa - Older alluvial deposits of upland plains and piedmont areas, and calcic soils and eolian cover sediments of High Plains region; includes scattered lacustrine, playa, and alluvial deposits of the Tahoka, Double Tanks, Tule, Blanco, Blackwater Draw, and Colunn Formations, the latter of which may be Pliocene at base; outcrops, however, are basically of Quaternary deposits; upper Quaternary to uppermost Pliocene(?)

QUATERNARY and TERTIARY

QTp - Older piedmont alluvial deposits and shallow basin fill; includes Quemado Formation and in northeast, high level pediment gravels
QTb - Basaltic and andesitic volcanics interbedded with Pleistocene and Pliocene sedimentary units
QTt - Travertine
QTg - Gila Group. Includes Mimbres Formation and several informal units in southwestern basins; Middle Pleistocene to uppermost Oligocene
QTsf - Santa Fe Group, undivided. Basin fill of Rio Grande rift region; middle Pleistocene to uppermost Oligocene
QTs - Upper Santa Fe Group. Includes Camp Rice, Fort Hancock, Palomas, Sierra Ladrones, Ancha, Puye, and Alamosa Formations; middle Pleistocene to uppermost Miocene

TERTIARY

Tus - Upper Tertiary sedimentary units; includes Bidahochi Formation, the Picuris Formation, and Los Feveros Formation, and locally Tonglomerates; Pliocene to upper Miocene
Tfl - Fence Lake Formation; conglomerate and conglomeratic sandstone, coarse fluvial volcaniclastic sediments, minor eolian facies, and pedogenic carbonates of the southern Colorado Plateau region; Miocene
Tsf - Lower and Middle Santa Fe Group. Includes Hayner Ranch, Rincon Valley, Popotosa, Cochiti, Tesuque, Chamita, Abiquiu, and other Formations; Miocene and uppermost Oligocene
To - Ogallala Formation, alluvial and eolian deposits, and petrocalcic soils of the southern High Plains; Lower Pliocene to middle Miocene (locally includes unit Qoa)
Tlp - Los Pinos Formation of Lower Santa Fe Group (Miocene and upper Oligocene); includes Carson Conglomerate (Dane and Bachman, 1965) in Tusas Mountains-San Luis Basin area
Tos - Mostly Oligocene and upper Eocene sedimentary and volcaniclastic sedimentary rocks with local andesitic to intermediate volcanics; includes Espinaso, Spears, Bell Top, and Palm Park Formations
Thb - Hinsdale Basalt; northern Taos and eastern Rio Arriba Counties; basalt flows interbedded with Los Pinos Formation
Tnb - Basalt and andesite flows; Neogene. Includes flows interbedded with Santa Fe and Gila Groups
Tpb - Basalt and andesite flows; Pliocene
Tmb - Basalt and andesite flows; Miocene

TERTIARY (continued)

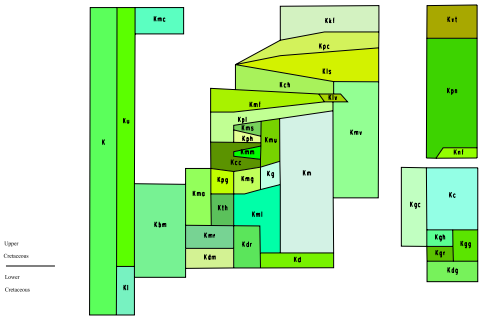
Tnr - Silicic to intermediate volcanic rocks; mainly quartz latite and rhyolite Neogene; may locally include flows interbedded with Santa Fe Group
Tnv - Neogene volcanic rocks; primarily in Jemez Mountains
Tc - Chuska Sandstone; restricted to Chuska Mountains
Tv - Middle Tertiary volcanic rocks, undifferentiated
Tif - Middle Tertiary felsic shallow-intrusive rocks; phonolites and trachytes of northeastern N.M.; includes the rhyolite of Ash Mountain
Tuv - Volcanic and some volcaniclastic rocks, undifferentiated; lower Miocene and Upper Oligocene (younger than 29 Ma)
Tlv - Lower Oligocene and Eocene volcanic rocks, undifferentiated; dominantly intermediate composition, with interbedded volcaniclastic rocks; (31-44 Ma)
Tuou - Lower Miocene and uppermost Oligocene basaltic andesites (22-26 Ma). Includes Bearwallow Mountain Andesite and basaltic andesite of Mangas Mountain
Tuol - Upper Oligocene andesites and basaltic andesites (26-29 Ma); includes La Jara Peak Basaltic Andesite, Uvas Basalt, the basaltic andesite of Poverty Creek, and Squirrel Springs Andesite, the Razorback, Bear Springs Canyon, Salt Creek, Gila Flat, and Middle Mountain Formations, and the Alum Mountain Group; locally includes more silicic flows
Turp - Upper Oligocene rhyolitic pyroclastic rocks (ash-flow tuffs); includes Davis Canyon Tuff, South Crosby Peak Formation, La Jencia, Vick's Peak, Lemitar, South Canyon, Bloodgood Canyon, Shelley Peak Tuffs, tuff of Horseshoe Canyon, Park Tuff, Rhyolite Canyon Tuff, Apache Springs Tuff, Diamond Creek, Jordan Canyon, Garcia Camp Tuffs, the Turkey Springs Tuff, the tuff of Little Mineral Creek, the Amalia Tuff, and others. Some contain volcaniclastic and reworked volcaniclastic rocks, and volcanic sandstone; (24-29 Ma)
Tlrp - Lower Oligocene silicic pyroclastic rocks (ash-flow tuffs); includes Hell's Mesa, Kneeling Nun, lower part of Bell Top Formation, Caballo Blanco, Datil Well, Leyba Well, Rock House Canyon, Blue Canyon, Sugarlump and Tadpole Ridge Tuffs, the tuffs of the Organ cauldron, Treasure Mountain Tuff (now known as Chiquito Peak Tuff), Bluff Creek Tuff, Oak Creek Tuff, tuff at Steins Mountain, tuff at Black Bill Canyon, tuff of Farr Ranch, Woodhaul Canyon, Gillespie and Box Canyon Tuffs, Cooney Tuff, and other volcanic and interbedded fluvial and pumiceous units; (31-36.5 Ma)
Turf - Upper Oligocene silicic (or felsic) flows and masses and associated pyroclastic rocks; includes Taylor Creek, Fanney, and Rocky Canyon Rhyolites
Tlrf - Lower Oligocene silicic (or felsic) flows, domes, and associated pyroclastic rocks and intrusions; includes Wimbres Peak Formation
Ti - Tertiary intrusive rocks; undifferentiated
Tui - Miocene to Oligocene silicic to intermediate intrusive rocks; dikes, stocks, plugs, and diatremes
Tuim - Upper and Middle Tertiary mafic intrusive rocks
Tli - Quartz monzonites (Eocene) in the Silver City and Los Pinos Range, intermediate intrusives of the Cookes Range (Oligocene), and other intermediate to felsic dikes and plugs of Oligocene and Eocene age
Tlo - Lower Tertiary, (Lower Oligocene and Eocene) andesite and basaltic andesite flows, and associated volcaniclastic units. Includes Rubio Peak Formation, and andesite of Dry Leggett Canyon
Tps - Paleogene sedimentary units; includes Baca, Galisteo, El Rito, Blanco Basin, Love Ranch, Lobo, Sanders Canyon, Skunk Ranch, Timberlake, and Cub Mountain Formations
Tsj - San Jose Formation; Eocene, San Juan Basin
Tn - Nacimiento Formation; Paleocene, San Juan Basin
Toa - Ojo Alamo Formation; Paleocene, San Juan Basin
Tpc - Poison Canyon Formation; Paleocene, Raton Basin

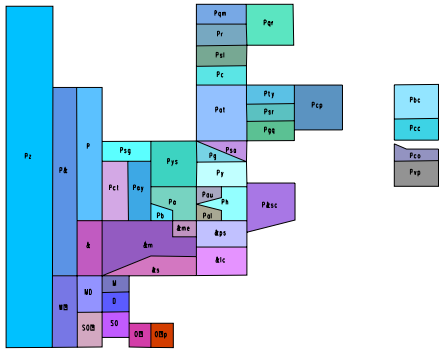
TERTIARY and CRETACEOUS

TKr - Raton Formation; in Raton Basin; unit contains conformable K/T boundary
TKgr - Poison Canyon and Raton Formations; undivided
TKa - Animas Formation; in northeast San Juan Basin
TKav - Andesitic volcanics
TKi - Paleogene and Upper Cretaceous intrusive rocks; includes Hanover, Fierro, Tyrone, and Lordsburg granodiorite-quartz monzonite porphyries

TRIASSIC

e - Triassic rocks, undivided; continental red beds
erp - Rock Point Formation of Chinle Group; Upper Triassic. May locally include Lukachukai Member of Wingate Sandstone
ec - Chinle Group; Upper Triassic; includes Moenkopi Formation (Middle Triassic) at base in many areas; in eastern part of state the following five formations are mapped;
er - Redonda Formation
eb - Bull Canyon Formation; Norian
et - Trujillo Formation; Norian
eg - Garita Creek Formation; Carnian
es - Santa Rosa Formation; Carnian; includes Moenkopi Formation (Middle Triassic) at base in most areas
ecu - Upper Chinle Group, Garita Creek through Redonda Formations, undivided
em - Moenkopi Formation; Middle Triassic





PALEOZOIC

Pz - Paleozoic rocks, undivided
P - Permian rocks, undivided
Pzr - Quartermaster and Rustler Formations; Upper Permian
Pzm - Quartermaster Formation; red sandstone and siltstone; Upper Permian
Pr - Rustler Formation; siltstone, gypsum, sandstone, and dolomite; Upper Permian
Psl - Salado Formation; evaporite sequence; Upper Permian
Pc - Castile Formation; dominantly anhydrite sequence; Upper Permian
Pzl - Artesia Group; shelf facies forming broad south-southeast trending outcrop from Glorieta to Artesia area; includes Grayburg, Queen, Seven Rivers, Yates, and Tansill Formations; Guadalupian. May locally include Moenkopi Formation (Triassic) at top
Pty - Yates and Tansill Formations; sandstone, siltstone, limestone, dolomite, and anhydrite; Guadalupian
Psr - Seven Rivers Formation; gypsum, anhydrite, salt, dolomite, and siltstone; Guadalupian
Pzq - Grayburg and Queen Formations; sandstone, gypsum, anhydrite, dolomite, and red mudstone; Guadalupian
Pcp - Capitan Formation; Upper Guadalupian age limestone (reef facies)
Pbc - Bell Canyon Formation; basin facies-sandstone, limestone, and shale; Guadalupian
Pcc - Cherry Canyon Formation; basin facies-sandstone, limestone, and shale
Psg - San Andres Formation; limestone and dolomite with minor shale; Guadalupian in south, in part Leonardian to north
Pg - Glorieta Sandstone; texturally and mineralogically mature, high-silica quartz sandstone
Psg - San Andres Limestone and Glorieta Sandstone; Guadalupian and Leonardian
Pco - Cutoff Shale; in Brokeoff Mountains only
Pvp - Victorio Peak Limestone; in Brokeoff Mountains only
Py - Yeso Formation; sandstones, siltstones, anhydrite, gypsum, halite, and dolomite; Leonardian
Pa - Abo Formation; red beds, arkosic at base, finer and more mature above; Wolfcampian; may include limestone beds of Pennsylvanian age (Virgilian) in Zuni Mountains. In Robledo Mountains the Abo may be considered a member of the Hueco Formation
Pau - Upper part of Abo Formation; Wolfcampian
Pal - Lower part of Abo Formation; Wolfcampian, and in part Virgilian ?
Pys - Yeso, Glorieta and San Andres Formations, undivided
Pay - Abo and Yeso Formations, undivided
Pcl - Cutler Formation; used in northern areas and Chama embayment only
Ph - Hueco Formation; limestone unit restricted to south-central area; Pendejo Tongue divides Abo Formation into upper and lower parts; Wolfcampian
Pb - Bursum Formation; shale, arkose, and limestone; earliest Permian
P& - Permian and Pennsylvanian rocks, undivided; includes Horquilla Limestone, Earp Formation, Epitaph and Scherrer Formations, and Concha Limestone
P&sc - Sangre de Cristo Formation, in Sangre de Cristo Mountains
& - Pennsylvanian rocks, undivided; In Sangre de Cristo Mountains may include Sandia Formation, Madera Limestone, La Pasada, Alamitos, and Flechado Formations; elsewhere may include Bar-B, Nakaye, Red House, Oswaldo, and Syrena Formations
&m - Madera Formation (Limestone, or Group); in Manzano Mountains includes Los Moyos Limestone and Wild Cow Formation; in Lucero Mesa includes Gray Mesa, Atrasado, and Red Tanks Members; in Sacramento Mountains includes Beeman and Holder Formations; may include strata lumped as Magdalena Group in a few areas
&me - Madera Limestone, exotic blocks; present only in the Chloride area of Sierra County
&s - Sandia Formation; predominately clastic unit (commonly arkosic) with minor black shales, and limestone in lower part; locally includes Osha Canyon Formation in Nacimiento Mountains
&ps - Panther Seep Formation; Organ, Franklin, and San Andres Mountains
&tc - Lead Camp Formation; San Andres and Organ Mountains
M - Mississippian rocks, undivided; Arroyo Penasco Group in Sangre de Cristo Mountains, Sierra Nacimiento, San Pedro Mountain, and Sandia Mountains; Lake Valley Limestone in south-central New Mexico
MD - Mississippian and Devonian rocks, undivided; includes the Lake Valley Limestone, Caballeros, Las Cruces, Rancheria, and Helms Formations and Escabrosa Group; Mississippian; the Onate, Sly Gap, Contadero Formations, and Percha Shale of south-central New Mexico, and Canutillo Formation of Northern Franklin Mountains and Bishops Cap area; Devonian
MB - Mississippian through Cambrian rocks, undivided; includes Lake Valley Limestone; Mississippian; Devonian rocks, undivided; El Paso Formation and Montoya Group (or Formation); Ordovician; and Bliss Sandstone; Cambrian and Ordovician
D - Percha Shale; southern Caballo Mountains; includes the Onate and Sly Gap Formations
SO - Silurian and Ordovician rocks, undivided
SOB - Silurian through Cambrian rocks, undivided
OB - Ordovician and Cambrian rocks, undivided; includes Bliss Sandstone, El Paso Formation, and Montoya Formation (or Group)
OBp - Ordovician-Cambrian plutonic rocks of Florida Mountains

PRECAMBRIAN

Zl - Upper Proterozoic; mafic dikes
Yi - Middle Proterozoic; mafic dikes, diabase, metadiabase, metadiorite mainly of Burro Mountains; age not well constrained
Ys - Middle Proterozoic sedimentary rocks of the Sacramento Mountains
Yp - Middle Proterozoic plutonic rocks (younger than 1600 Ma)
Yfp - Middle and Lower Proterozoic plutonic rocks, undivided
X - Lower Proterozoic rocks, undivided
Xms - Lower Proterozoic metasedimentary rocks (1650-1700 Ma). Essentially equivalent to Hondo Group; locally includes high-grade quartzite-pelitic schist of unknown age
Xm - Lower Proterozoic metamorphic rocks, dominantly felsic volcanic, volcaniclastic and plutonic rocks (1650-1700+ Ma); includes Vadito Group; locally includes high-grade felsic gneisses of unknown age
Xp - Lower Proterozoic plutonic rocks (older than 1600 Ma)
Xmo - Lower Proterozoic metamorphic rocks, dominantly mafic (1720-1760 Ma)
Xmu - Lower Proterozoic metamorphic rocks, undivided

CRETACEOUS

K - Cretaceous rocks, undivided
Ki - Uppermost Cretaceous intrusive rocks; restricted to Copper Flats area in Sierra County
Ka - Uppermost Cretaceous andesite flows; restricted to southwestern area
Ku - Upper Cretaceous, undivided, includes Virden Formation in northern Hidalgo County, Ringbone Formation in Hidalgo and Luna and Grant Counties, and locally Beartooth and Sarten, Mancos in Silver City area; Cenomanian - Maastrichtian for most part, although Beartooth is pre-Cenomanian
Kmc - McRae Formation; Engle basin - Cutter sag area; Maastrichtian
Kvl - Vermejo Formation and Trinidad Sandstone; Maastrichtian
Kkl - Kirtland and Fruitland Formations; coal-bearing, coal primarily in the Fruitland; Campanian to Maastrichtian
Kpc - Pictured Cliffs Sandstone; prominent cliff-forming marine sandstone
Kls - Lewis Shale; marine shale and mudstone
Kpn - Pierre Shale and Niobrara Formation
Kmf - Fort Hays Limestone Member of Niobrara Formation
Kmv - Mesaverde Group includes the Gallup Sandstone, Crevasse Canyon Formation, Point Lookout Sandstone, Menefee Formation, and Cliff House Sandstone
Kch - Cliff House Sandstone; transgressive marine sandstone; Campanian
Klv - La Ventana Tongue of the Cliff House Sandstone
Kml - Menefee Formation; mudstone, shale, and sandstone; coal-bearing
Kpl - Point Lookout Sandstone; regressive marine sandstone in McKinley and Sandoval Counties. The lower, Hosta Tongue, of Point Lookout is transgressive and is separated from main body by the Satan Tongue of Mancos Shale; Santonian - Campanian
Kms - Satan Tongue of Mancos Shale
Kph - Hosta Tongue of Point Lookout Sandstone; transgressive marine sandstone
Kmm - Mulatto Tongue of Mancos Shale
Kcc - Crevasse Canyon Formation; coal-bearing units are Dilco and Gibson Coal Members; other members are Bartlett Barren, Dalton Sandstone, and Borrego Pass Sandstone (or Lentil)
Kg - Gallup Sandstone; generally regressive marine sandstone; Turonian
Kmg - Gallup Sandstone and underlying D-Cross Tongue of the Mancos Shale; Turonian
Kmr - Rio Salado Tongue of the Mancos Shale. Overlies Twowells Tongue of Dakota Sandstone; mapped only where Tres Hermanos Formation or the Atarque Sandstone is present; mapped as Kdr in parts of Socorro County; Turonian
Kpg - Pescado Tongue of the Mancos Shale and Gallup Sandstone; in Zuni Basin only. Pescado is chrono-stratigraphic equivalent of Juana Lopez Member of Mancos Shale; Turonian
Kth - Tres Hermanos Formation; formerly designated as Lower Gallup Sandstone in the Zuni Basin; Turonian
Kmq - Moreno Hill Formation and Atarque Sandstone; in Salt Lake coal field and extreme southern Zuni basin; Turonian
Km - Mancos Shale; divided into Upper and Lower parts by Gallup Sandstone
Kmu - Mancos Shale, Upper part
Kml - Mancos Shale, Lower part
Kdr - Dakota Sandstone and Rio Salado Tongue of the Mancos Shale. In northwest Socorro County locally includes overlying Tres Hermanos Formation
Kgc - Greenhorn Formation and Carlile Shale, undivided; locally includes Graneros Shale
Kc - Carlile Shale; limited to northeastern area; Turonian-Coniacian
Kgg - Graneros Shale and Greenhorn Formation; limited to northeastern area; lower Turonian and Cenomanian
Kgh - Greenhorn Formation; limited to northeastern area. The Upper member (Bridge Creek Limestone) can be traced into western area where it is commonly shown as a bed-rank unit in Mancos Shale on detailed maps.
Kgr - Graneros Shale; limited to northeastern area; Cenomanian
Kdm - Intertongued Dakota-Mancos sequence of west-central New Mexico; includes the Whitewater Arroyo Tongue of Mancos Shale and the Twowells Tongue of the Dakota
Kd - Dakota Sandstone; includes Oak Canyon, Cubero, and Paguate Tongues plus Clay Mesa Tongue of Mancos Shale; Cenomanian
Kdg - Dakota Group of east-central and northeast New Mexico; in ascending order, Mesa Rica Sandstone, Pajarito Shale, and Romeroville Sandstone; includes the underlying Tucumcari Shale in Tucumcari area and Glencairn Formation in Union County. Encompasses both Upper and Lower Cretaceous rocks
Kbm - Mancos Formation and Beartooth Quartzite (and Sarten Sandstone); Mancos includes what was formerly referred to as Colorado Shale which in turn may include equivalents of Tres Hermanos Formation
Kl - Lower Cretaceous, undivided; in northern Lea and Roosevelt Counties includes equivalents of Tucumcari Shale. In Cornudas Mountains includes Campagrande, Cox and other Washita Group formations. At Cerro de Cristo Rey includes several Fredericksburg and Washita Group formations, and the Boquillas Formation; Cenomanian. In the southwest includes Hell-To-Finish, U-Bar, and Mojado Formations which are equivalent to Bisbee Group of Arizona

JURASSIC

J - Jurassic rocks, Middle and Upper, undivided
Jm - Morrison Formation; Upper Jurassic nonmarine rocks present only in northern one-third of state
Jmsu - Morrison Formation and upper San Rafael Group
Jz - Zuni Sandstone; consists of undivided equivalents of the Summerville Formation and Bluff Sandstone; restricted to Zuni Basin area
Jze - Zuni and Entrada Sandstones, undivided
Je - Entrada Sandstone, Middle Jurassic; Callovian
Jsr - San Rafael Group; consists of Entrada Sandstone, Todilto and Summerville Formations, Bluff Sandstone, and locally Zuni Sandstone (or only Acoma Tongue of Zuni)

GEOLOGIC MAP of NEW MEXICO

compiled by

O.J. Anderson, G.E. Jones, and G.N. Green

USGS Open-File Report OF-97-52

Digital data base by G.N. Green and G.E. Jones

New Mexico Bureau of Mines and Mineral Resources
U.S. Geological Survey, Department of the Interior

1997

Physiography

Portions of four major physiographic provinces are located within the boundaries of New Mexico: the Colorado Plateau, Basin and Range, Southern Rocky Mountains, and Great Plains. The Planning Area is primarily within the Basin and Range province, but includes a small portion of the Great Plains province in northeast Otero County and a small portion of what is known as a Transition Zone in western Sierra County that has characteristics of both the Colorado Plateau and the Basin and Range provinces (Chamberlin and Cather 1994; Grant and Foster 1989).

The Basin and Range province contains the Rio Grande Rift, a dominant tectonic feature that has influenced the geomorphic features and geologic history of the Planning Area. Most of the land within Sierra and Otero Counties has been subjected to severe deformation by Cenozoic extensional tectonism associated with the Rio Grande Rift. The rift system was superimposed on a weakened crustal region of block faults and thrust faults that were active during Pennsylvanian-age tectonism. The rift is characterized by deep, asymmetric north-trending horsts, grabens, and half-grabens superimposed on the older structure (Butler 1996). The deep Jornada del Muerto and Mesilla Basins are part of the extensional rift zone. Block-faulted, uplifted mountains are located on both sides of the Rio Grande Rift and expose Precambrian granite and metamorphic basement rocks near the eastern flank of the San Andres and Organ Mountains, the western edge of the Caballo Mountains, and the center of the Mimbres Mountains.

Rock Units

The lithology, areal extent, and thickness of the major rock types present in New Mexico are described by Grant and Foster (1989) in an introduction to their discussion of future petroleum provinces. A general stratigraphic chart for the south-central New Mexico region, prepared by Butler (1996), is presented on Figure 2-10. It is useful to mention that the formation names for Figure 2-10 may not match those for Map 2-1 and corresponding legend because the U.S. Geological Survey (USGS) geologic map includes formation names for age-correlative formations in other areas of New Mexico. This report describes the rock types, areal extent, stratigraphic thicknesses, and general thickness trends for rock units in the Planning Area, beginning with the oldest known rocks.

Precambrian (Proterozoic)

Precambrian rocks exposed in the Planning Area include granites, quartzites, gabbros, metasedimentary, and metavolcanics. In Sierra County, significant exposures of Precambrian rocks are found in the San Andres, San Mateo and Caballo Mountains, and lesser outcrops are found in the Sierra Cuchillo Mountains and Fra Cristobal and Black Ranges. In Doña Ana County, Precambrian rocks are found in the San Andres and Organ Mountains. The only Precambrian rocks exposed in Otero County are in Pajarito Mountain in the far northeast corner. Precambrian rocks typically host metallic and other locatable minerals and have been mined for gold, silver, gems, and other minerals at several locations in the Planning Area.

Ordovician–Cambrian

Sedimentary rocks of Cambrian–Ordovician age exposed in the Planning Area include basal quartz sandstones, shales, limestones and dolomites. In Sierra County, significant exposures of Ordovician–Cambrian rocks are found in the San Andres, San Mateo and Caballo Mountains, and lesser outcrops are found in the Sierra Cuchillo Mountains and Fra Cristobal and Black Ranges. In Doña Ana County, Ordovician–Cambrian rocks are found in the San Andres and Organ Mountains. Ordovician rocks are exposed in the Sacramento Mountains in Otero County. Formations include quartz sandstones of the Upper Cambrian-Lower Ordovician Bliss Formation, and dolomites of the Lower Ordovician El Paso Formation and Middle Ordovician Montoya Group.

Silurian-Devonian

Sedimentary rocks of Silurian-Devonian age exposed in the Planning Area include shales, limestones, and dolomites. In Sierra County, significant exposures of Silurian and Devonian rocks are found in the San Andres, San Mateo and Caballo Mountains, and lesser outcrops are found in the Sierra Cuchillo Mountains and in the Fra Cristobal and Black Ranges. In Doña Ana County, Silurian and Devonian rocks are found in the San Andres and Organ Mountains. Ordovician rocks are exposed in the Sacramento Mountains in Otero County. Formations include the cherty dolomite of the Silurian Fusselman Formation, and black shale of the Late Devonian Percha Formation.

Mississippian

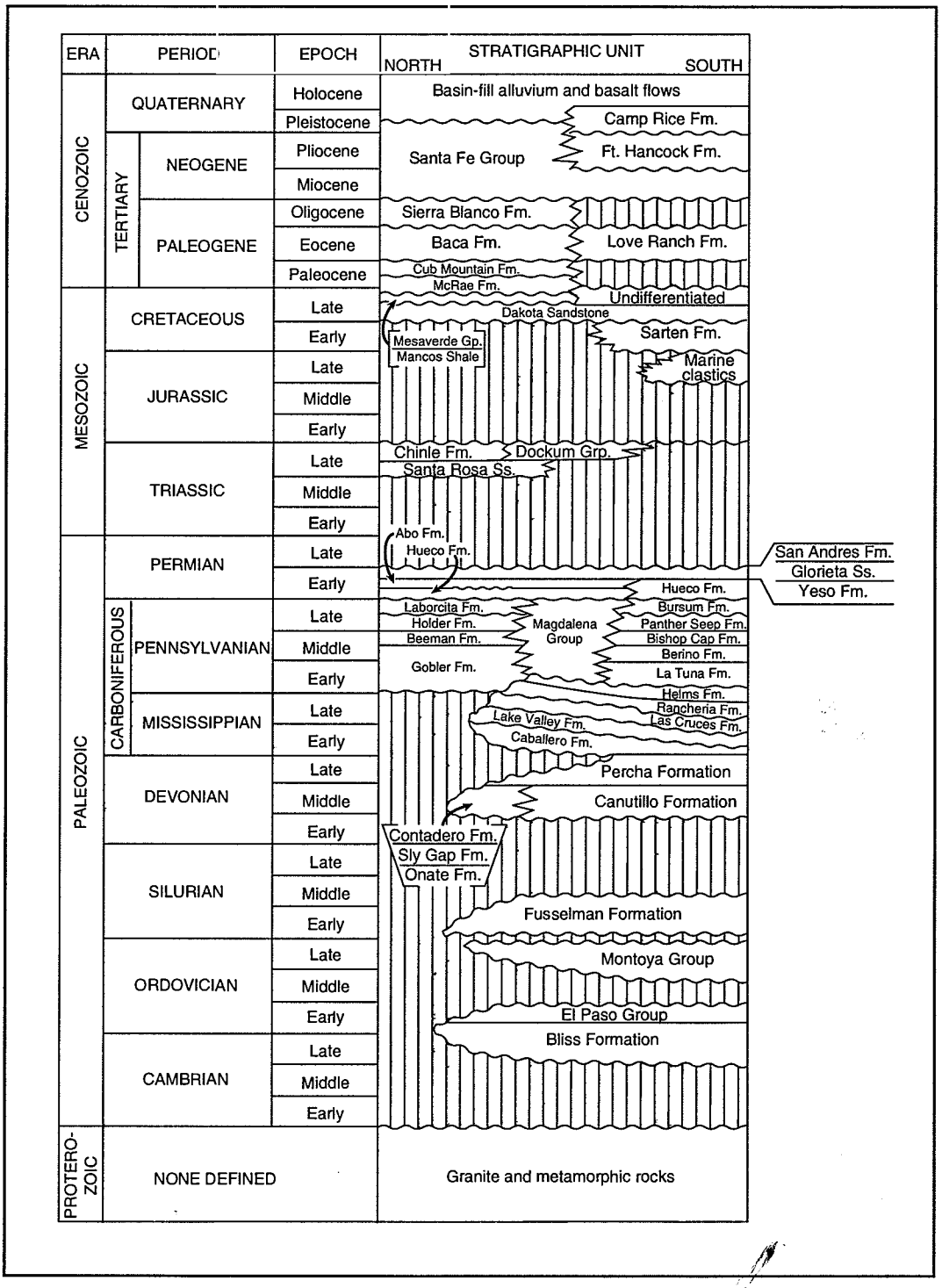
Sedimentary rocks of Mississippian age exposed in the Planning Area consist of dark, cherty limestone and shale. In Sierra County, significant exposures of Mississippian-age rocks are found in the San Andres, San Mateo and Caballo Mountains, and lesser outcrops are found in the Sierra Cuchillo Mountains and Fra Cristobal and Black Ranges. In Doña Ana County, Mississippian-age rocks are found in the San Andres and Organ Mountains. Mississippian-age rocks are exposed in the Sacramento Mountains in Otero County. Lithologies include porous carbonate shelf facies of the Late Mississipian Lake Valley Formation.

Pennsylvanian

The abundance of isolated outcrops of Pennsylvanian strata in New Mexico that resulted from the complex geological history of the region has led to a confusion of multiple names and descriptions for Pennsylvanian sediments that are difficult to correlate. Grant and Foster (1989) observed that extensive tectonism during the Pennsylvanian orogeny “resulted in the accumulation of a varied suite of rocks.” The variation in Pennsylvanian-age rocks is evident in the long list of Pennsylvanian-formation names in New Mexico.

Sedimentary rocks of Pennsylvanian age are exposed in outcrops throughout Sierra and Doña Ana Counties and have been penetrated by the drill bit in much of the Planning Area. Isopach maps of the Pennsylvanian System show a sedimentary sequence in the Rio Grande Rift ranging from 1,000 to more than 3,000 feet thick. Compression toward the rift caused thrust faulting and thickening of the

Figure 2-10
Stratigraphic Section
South-Central New Mexico



Pennsylvanian section in deep basins of northern Doña Ana County and southern Sierra County. Uplift of the Otero Platform resulted in thinning and nondeposition of Pennsylvanian sediments in the eastern half of Otero County. Formations within the Magdalena Group include the Lower Pennsylvanian Lead Camp Limestone; and gray limestone, shaly limestone, and black shale of the Upper Pennsylvanian Panther Seep Formation. Pennsylvanian rocks are exposed in the San Andres, San Mateo, and Caballo Mountains, and lesser outcrops are found in the Sierra Cuchillo Mountains and Fra Cristobal and Black Ranges. In Doña Ana County, Pennsylvanian-age rocks are found in the San Andres and Organ Mountains. Pennsylvanian-age rocks are exposed in the Sacramento Mountains in Otero County.

Permian

Rocks of Permian age are present in mountain range outcrops throughout Sierra and Doña Ana Counties and are common throughout the western Planning Area in subsurface rocks penetrated by the drill bit during oil and gas exploration. An isopach map of the Permian System shows sediment thicknesses ranging from 1,000 feet in western Doña Ana County to more than 3,000 feet in northern Sierra County and western Otero County (Grant and Foster 1989). Relatively flat-lying Permian rocks outcrop extensively in eastern Otero County. Formations include the Lower Permian Abo Formation consisting of red bed sandstones, siltstones, and shale; limestones of the Lower Permian Hueco Formation; evaporates and sandstones of the Lower Permian Yeso Formation; sandstones of the Lower Permian Glorieta Formation; and Middle Permian San Andres Limestone.

Triassic

Minor outcrops of Triassic rocks occur in northern Otero County. Outcrops are recognized as the Upper Triassic Chinle Formation.

Jurassic

Jurassic rocks are recognized in the deep Mesilla Basin in southern Doña Ana County. No outcrops have been mapped in the Planning Area. The rocks consist of Upper Jurassic marine sandstones and shales.

Cretaceous

Rocks of Cretaceous age are exposed east of the Caballo Mountains in central Sierra County and in northern Otero County on the western slope of the Sacramento Mountains. Although relatively thin in outcrops, the deposits near the Caballo Mountains thicken into the Jornada del Muerto Basin and attain subsurface thicknesses of up to 2,000 feet (Grant and Foster 1989). Cretaceous formations have been grouped into depositional packages associated with a series of transgressive-regressive marine shoreline features that include interbedded sand, shale, and coal sequences. Formations include the Upper Cretaceous Dakota Formation and Upper Cretaceous Mesaverde Group. The Mesaverde Group has been mined for coal in the Engle field east of Truth or Consequences and in the Sierra Blanca field northeast of Tularosa.

Tertiary

Tertiary-age rocks are present throughout the Planning Area and consist primarily of volcanic lava flows, ash-fall tuffs, and pyroclastic flows. The Sierra de las Uvas, Organ Mountains, Black Mountains, and Sierra Cuchillo Mountains are dominated by Tertiary volcanic rocks. Minor occurrences also are found in the southern Caballo Mountains, northern Sacramento Mountains, and northern San Andres Mountains. Because of their abundance, localized extent, and discontinuity, these rocks have local names too numerous to mention here.

Tertiary-Quaternary

Outcrops of Tertiary- and Quaternary-age sedimentary rocks are extensive throughout the Planning Area. An isopach map of the Quaternary-age sedimentary rocks reveals thick sequences of alluvial sediments in Cenozoic structural basins, such as the Tularosa, Jornada del Muerto, and Palomas Basins. The Tertiary rocks in south-central New Mexico are a complex suite of sedimentary and volcanic rocks. In the Rio Grande Rift basins, the Tertiary System can be greater than 5,000 feet thick (Grant and Foster 1989). Formations include Tertiary intrusives and volcanics, the Miocene-Pliocene Popotosa Formation, and the Plio-Pleistocene Santa Fe Group.

Quaternary

Rocks of Quaternary age in the Planning Area are diverse, widespread, and have a range of thickness up to a few hundred feet. Quaternary deposits include alluvial and colluvial sands, silts, and gravels; piedmont slope and valley border fanglomerates grading from proximal bouldery alluvium to distal sand-silt-clay mixtures; basin floor playa and lacustrine mudstones and siltstones; fine-grained eolian sand sheets and dunes; terrace, valley fill, floodplain, and channel sand, silt and clay deposits along major streams; angular cobble- and boulder-size talus deposits; and basalt flows. Quaternary deposits locally may intertongue with Plio-Pleistocene Santa Fe Group deposits. The surface accumulation and local abundance of these sediments make them preferred sources for construction aggregate and other industrial materials.

Structural Geology and Tectonics

The location of the Planning Area at the intersection of the Basin and Range, Great Plains, and Transition Zone physiographic provinces has resulted in a complex structural regime (Butler 1996; Chamberlin and Cather 1994; Grant and Foster 1989). The structural geology is dominated by the Rio Grande Rift system. Tectonic features in the Planning Area are described below.

The majority of the Planning Area is in the Basin and Range province and has been subjected to severe deformation by Tertiary-age extensional tectonism associated with the Rio Grande Rift. The rift system was superimposed on a weakened crustal region of block faults and thrust faults that were active during Pennsylvanian-age tectonism. The rift is characterized by deep, asymmetric north-trending horsts, grabens, and half-grabens superimposed on the older structure (Butler 1996). Deep north-trending basins that formed during Rio Grande rifting include the Tularosa-Hueco, Jornada del Muerto-Mesilla, and

Palomas-Mimbres Basins. These basins are filled with thousands of feet of sedimentary rocks and interbedded lava flows. The basins are separated by block-faulted, uplifted mountains located on both sides of the Rio Grande Rift that expose Precambrian granite and metamorphic basement rocks. The Sacramento, San Andres, Organ, and Caballo Mountains, and the Sierra Cuchillo and Sierra de las Uvas all are block-faulted horst mountains.

The western part of Sierra County is characterized by thick volcanic deposits of the Mogollon-Datil Volcanic Field, which is situated in the Transition Zone between the Basin and Range province and the Colorado Plateau province to the northwest. These Tertiary-age volcanic rocks were deposited during the opening of the Rio Grande Rift beginning about 30 million years ago. The thickness of the volcanic rocks has made investigation of underlying structures and rock types difficult, and not much is known of the deep subsurface.

The eastern part of the Planning Area in Otero County is part of the stable Great Plains province. The area is characterized by older buried structural features including Permian-age basins enclosed by a shallow marine shelf where carbonate reef, sandstone, and mudstone sediments predominate. North- to northwest-trending faults are present in the northeast and southeast corners of Otero County but do not have the large displacements of the Rio Grande Rift faults.

The historical record of earthquakes in the Planning Area from 1962 through 1998 lists only four earthquakes of magnitude 3.0 or greater (Sanford et al. 2002). Those earthquakes were located within the Rio Grande Rift system north and east of Las Cruces. Although New Mexico is in a seismically active area, the average earthquake intensity is a moderate 4.5 on the Richter scale. As such, a strong, damaging earthquake is not likely to occur in the Planning Area.

Geologic Value

Geologic resources may have an intrinsic aesthetic value that is often appreciated in scenic views or unique geomorphic features formed by geologic processes. Several locations within the Planning Area have received special designation to preserve natural geologic features having scenic value or unusual features that are valued by the public. These locations and a description of the geologic or scenic value responsible, at least in part, for the special designation are discussed in the section on Special Designations.

2.1.3.3 Trends

The trend for geologic resources is one of continued interest for scenic value or unique geologic interest, particularly in areas proposed for or having special designation. During the past 19 years, several areas of geologic and/or scenic interest have been included in areas given special designation by the BLM as areas of critical environmental concern (ACECs) and wilderness study areas (WSAs). There were eight ACECs (including two research natural areas [RNAs]), seven WSAs, one trail, and one national natural landmark (NNL) listed as special designations within Doña Ana County in the 1993 Mimbres RMP. The White Sands RMP designated one ACEC and the 1997 White Sands RMP Amendment designated five ACECs. There were eight new ACECs nominated in the 2003 Proposed RMP Amendment and EIS for Federal

Fluid Minerals Leasing and Development in Sierra and Otero Counties. Approximately one third of those designations listed scenic and/or geologic values to the area description.

The Scoping Report for the TriCounty RMPs/EIS lists 15 proposed ACECs or WSAs, of which 10 are mentioned as having scenic or geologic value. Although some of those proposed designations are additions or changes to existing designations, frequency of proposals indicates that BLM and the public continue to designate new land to protective status for geologic and scenic values.

2.1.3.4 Forecast

Continued interest in and demand for protection of unique or scenic geologic resources, and that future RMP amendments will include special management designations for their protection. As such, more geologic resources will be included in proposed special designations for management during subsequent RMP amendments. Population increase will be the driving factor for increased demand for protection of geologic and scenic resources. The public will demand development of new areas where scenic and other geologic resources can be accessed and enjoyed, as existing areas are increasingly visited.

2.1.3.5 Key Features

The most prominent geologic resources are located in the rugged and colorful mountain ranges found throughout the Planning Area. The unique or scenic geologic features in the many north-trending mountain ranges, including the San Andres, Organ, Caballo, and Mimbres Mountains, add value to the existing and proposed ACECs and WSAs that are managed for other resources.

2.1.4 Cave and Karst Resources

2.1.4.1 Indicators

There are numerous karst landforms and caves in central and southern New Mexico, including the world-renowned Carlsbad Caverns, one of the largest and deepest caverns in the world. Permian carbonate rocks in central and southern New Mexico contain numerous well-developed karst features. Caves formed in these carbonate deposits are generally very large and contain miles of passages with vertical extents of 1,000 feet or more (National Speleological Society 2005; USDI, BLM 2003a).

Karst is a type of landscape formed by the dissolution of soluble carbonate rocks (limestone, dolomite, marble) or evaporites (gypsum, anhydrite). Karst regions contain aquifers that are capable of providing large supplies of water. Natural landscape features typical of karst regions include caves, springs, and sinkholes, and are the result of the solutional action of the circulating groundwater. Caves are a critical component of the hydrological cycle. Caves may contain a variety of dissolution features, sediments, and speleothems (deposits with various forms and mineralogy, chiefly calcite), all of which may preserve a record of the geological and climatic history of the area. Since the great variety of subsurface voids and deposits are protected from surface weathering and disturbance, karst preserves a record of environmental change. Temperature, rainfall, the nature of soil and vegetation cover, glaciation, fluvial erosion and deposition, and patterns of groundwater flow can usually be read from cave patterns and deposits. This record can be determined on an annual scale in the case of certain fast-growing speleothems. Karst

deposits and landforms may persist for a very long time in relict caves and paleokarst (USDI, BLM 2003a).

Smaller caves formed in lava tubes are located in some of the widespread lava flow deposits. These are typically dry caves but may serve as an important biological habitat and may include cultural and paleontological resources. Some of these caves have served as traps for hundreds of thousands of years and preserve a record of the changing conditions through the ice ages (New Mexico Museum of Natural History and Science [NMMNHS] 2005a).

Indicators for the condition of cave resources are as follows:

- Scientific, educational, and/or recreational value of the cave resource (though evaluations have not yet been conducted by BLM).
- Whether or not the cave may support various cave biological species.

2.1.4.2 Current Conditions

Sierra and Otero Counties

The caves in Sierra and Otero Counties are located primarily in Paleozoic limestone and Quaternary-Tertiary lava flow deposits (cave locations may be kept secret and are not subject to disclosure under the Freedom of Information Act). To date, 111 caves have been reported in Sierra County and 68 have been reported in Otero County, with approximately one-third of these likely occurring on BLM-administered land (Gomez 2005). The Guadalupe Mountains area includes more than 200 caves located on public and private lands (New Mexico Wilderness Alliance 2005). Some of these are located within BLM's Decision Area of eastern Otero County, though many of the caves are located in adjoining counties. World-renowned caves such as Carlsbad Caverns and Lechuguilla Cave are located in the Guadalupe Mountains complex of eastern New Mexico. The Jornada del Muerto lava flow has several caves, including Lava Cave, which has numerous bat openings and has recently been afforded protection through a Nature Conservancy conservation easement (Altenbach 2005). Although Lava Cave is not in BLM's Decision Area, portions of the Jornada del Muerto lava flow are in the Decision Area, and there are likely additional caves in the lava tubes.

Other cave locations within the Planning Area are found in the San Andres, Caballo, Mimbres, San Mateo, and Black Range Mountains. The proposed Caballo Mountains Scenic ACEC includes caves that may be significant for bats and may have other resource significance (Altenbach 2005; New Mexico Wilderness Alliance 2005, 2003a; USDI, BLM 2003a, b). Some of the caves within the Decision Area have been vandalized and have no significant resources remaining (Hakkila 2005a). Additional caves that are undiscovered or undisclosed may occur within the Paleozoic sedimentary deposits or within some volcanic rocks in the area. The scientific, educational, and recreational value of potential caves is expected to be quite variable and would need to be assessed individually. Disclosure of a cave's location to the public and possible development of the cave is dependent on the quality and significance of the cave.

Doña Ana County

The caves within Doña Ana County are located primarily in the Paleozoic limestones and Quaternary-Tertiary lava flow deposits. To date, 26 caves have been reported in this county (Gomez 2005). Locations include Sierra de las Uvas, San Andres, Organ, and Franklin Mountains, as well as the West Potrillo volcanic field (USDI, BLM 2003a). The Aden Lava Flow RNA contains lava tubes. A fossilized ground sloth was discovered in one of these lava tube caves in 1920, and other significant caves and cave resources occur in the area. The proposed Robledo Mountains—Sierra las Uvas Scenic Primitive Recreation Area and the proposed Broad Canyon ACEC areas—include caves that might have significant habitat for bats, and other resource significance (New Mexico Wilderness Alliance 2003b; USDI, BLM 2005a). Some of the caves in the Decision Area have been vandalized and have lost their significance value as a result (Hakkila 2005a). Additional caves that are undiscovered or undisclosed may occur within the Paleozoic sedimentary deposits or within some volcanic rocks in the area. The caves also may be located at depth, a function of the geologic structures in the area. The scientific, educational, and recreational value of potential caves is expected to be quite variable and would need to be assessed individually. Disclosure of a cave's location to the public and possible development of the cave is dependent on the quality and significance of the cave.

2.1.4.3 Trends

The importance of caves to surrounding ecosystems was not well understood until fairly recently. In the past, caves generally were perceived more as potential hazards to visitors than as valuable resources, with the exception of caves that had enough notable features to warrant development for tourism. To prevent public access to caves, sometimes the cave entrance was blocked causing changes in ventilation and thereby affecting some of the natural processes of the cave and causing losses in bat populations. Caves are now known as potentially important habitat areas, or as areas of scientific and cultural importance. Caves may have geologic, biologic, hydrologic, paleontologic and cultural significance. The challenge for BLM is to protect fragile cave and karst environments, including the valuable groundwater resources. Caves must be managed so their ecosystems are not adversely impacted by direct or indirect human activities (USDI, BLM 2003a).

2.1.4.4 Forecast

Additional caves may be located in the Decision Area and, when discovered, are expected to be evaluated for significance and afforded better protection than caves that have been found previously. The BLM will continue to incorporate consideration of caves as part of its management decisions and planning processes. For any action on BLM land proposed by the BLM or by others, BLM will conduct an assessment of caves in the area of potential effects. If determined to be of value, the cave will be afforded protection through the various Federal and State laws as well as through the BLM management guidelines. The scientific, educational, and recreational value of any located caves is expected to be quite variable and will need to be assessed individually by geological, biological, and other resource specialists.

The BLM will abide by the various memorandum of understandings and cooperative agreements to evaluate and protect newly discovered caves and cave resources. BLM may decide to conceal the whereabouts of newly discovered caves in an effort to prevent vandalism and as a public safety measure.

2.1.4.5 Key Features

Sierra and Otero Counties

In the Planning/Decision Areas for Sierra and Otero Counties, caves are known to exist and additional caves may be located in the following areas:

- Sacramento Mountains
- Cornudas Mountains
- San Andres Mountains
- Caballo Mountains
- Mimbres Mountains
- Black Range
- San Mateo Mountains
- Otero Mesa
- Jornada del Muerto lava flow

The Guadalupe Mountains extend into eastern Otero County and more than 200 caves have been identified in the Guadalupe Mountains complex. The Jornada Lava Cave is located in the Planning Area, to the east of Elephant Butte Reservoir in part of the Jornada del Muerto lava flow, and there are several large bat caves in the broad lava flow. The Jornada del Muerto lava flow extends under public lands and there are likely additional caves in the lava. In 1994, The Nature Conservancy was given a conservation easement over portions of the Jornada del Muerto, including the openings of several large bat caves. This area is considered to be ecologically and geologically significant and is now afforded protection through The Nature Conservancy's easement (Altenbach 2005). In Sierra and Otero Counties, additional caves may be located in many of the mountainous areas with limestone deposits, and in the broad basaltic and andesitic lava flow areas of the valleys.

Doña Ana County

In Doña Ana County, the following areas are known to have caves or may have caves (USDI, BLM 2003a):

- Sierra de las Uvas
- San Andres Mountains
- Organ Mountains
- Franklin Mountains

- Aden Lava Flow RNA
- West Potrillo volcanic field

Almost all of the areas listed above are located on Federal land with some on State Trust Land. Caves are located primarily in the Paleozoic limestones and Quaternary-Tertiary lava flow deposits. Additional caves may occur within these Paleozoic sedimentary deposits or within some volcanic rocks in the areas that are undiscovered or undisclosed. The Aden Lava Flow RNA, located southwest of Las Cruces in western Doña Ana County, is primarily managed by BLM with a portion under State Trust Lands. The lava flow is a nearly flat landform with steep-walled depressions, varying in size. The area contains lava tubes. Significant caves and cave resources may be located in portions of the broad lava flow (New Mexico Wilderness Alliance 2003a).

2.1.5 Soil Resources

For many reasons, the preservation of topsoil and the productivity of public land are of high priority in any RMP. The indicators of the status and trends of the soil resources in the Decision Area are relevant to a number of land management decisions. In this section, the soils of the Planning Area will be discussed as they relate to planning decisions.

2.1.5.1 Indicators

The removal of soil by wind or water is normal and part of the proper ecological function of any landscape. Through this process, nutrients are replaced, microbial communities are renewed, and the soil structure is reestablished, determining a fundamental time scale for life. However, when the process of removing or redepositing soils exceeds the ability of the plant and animal community to adapt to this scale, or when soil is lost from the landscape, the ecological landscape can degrade. Destructive soil erosion and deposition, so defined, is a consequence to be avoided in any land management plan.

There are many land uses that can contribute to soil loss. Any use that removes or alters soil properties has the potential to accelerate soil loss. Fortunately, these types of uses can be managed in such a way that *destructive* erosion and deposition are avoided.

Over the past ten years, the BLM has published, in cooperation with other Federal/State/local agencies, universities, and other resources scientists, several technical manuals that detail the conditions of destructive erosion and deposition on rangelands (Pellant, et al. 2000), in riparian areas (Pritchard 1998) and within watersheds (MacCammon, et al. 1998). These studies are helpful because they lay out a strategy for determining what *proper functioning conditions* are for a particular ecological community and list a series of indicators for *proper functioning conditions* that can be applied, based upon the similarity of the landscape to a reference ecological community.

This approach has proven so useful in rangeland management that it has become the underlying philosophy behind the National and New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management (referred to as the Standards and Guidelines) (USDI, BLM 2001a). BLM-New Mexico has adopted a specific strategy for increasing general ecological health when a use is

determined to be a casual factor in not meeting a standard then guidelines for management practices that result in progress toward meeting that standard are implemented.

The Standards and Guidelines include two standards that use *proper functioning conditions* for soil. They are divided by ecosystem as Standard 1, Upland Sites, and Standard 3, Riparian-Wetlands Sites. The standards explicitly invoke guidance outlined in Pritchard (1999, 1998, 1993). The third standard applies specifically to biotic communities and is dependent upon first meeting the prior standards.

Indicators for soil health at Standard 3 sites are presented in the guidelines for both lotic (flowing water, i.e., stream) and lentic (standing water, i.e., pond, marsh systems). There is no BLM guidance similar to Pritchard's (1999, 1998) on desert wash ecological function. The following are indicators of soil health for the lotic system:

- Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody debris) are adequate to dissipate energy.
- Point bars are revegetating.
- Lateral stream movement is associated with natural sinuosity.
- System is vertically stable.
- Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition).

The indicators for lentic systems are as follows:

- Accumulation of chemicals affecting plant productivity/composition is not apparent.
- Saturation of soils (i.e., ponding, flooding frequency and duration) is sufficient to compose and maintain hydric soils.
- Underlying geologic structure/soil material/permafrost is capable of restricting water percolation.
- Riparian wetland is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition).
- Islands and shoreline characteristics (i.e., rocks, coarse and/or large woody debris) are adequate to dissipate wind and wave-event energies.

For upland sites (Standard 1) no checklist is presented in the New Mexico Standards and Guidelines. Nonetheless, the discussion indicates that *proper functioning conditions* for the upland sites is very similar to that defined by Pellant, et al. (2000) and MacCammon, et al. (1998). Both of these manuals are very clear about defining indicators carefully on the basis of reference areas and a clear understanding of hydro-ecological function. As an example, Pellant, et al. (2000) give a list of seventeen generic indicators of public land health that can be used to compare the assessed landscape to a reference area. Further, the Jornada Experimental Range of the USDA, Agricultural Research Service, is finalizing a monitoring

manual that details rangeland soil health data collection methods that can be integrated into a watershed assessment program.

The indicators for the conditions of the soil resource that would best assure the objectives of National Environmental Policy Act of 1969, FLPMA, and the Standards and Guidelines are the indicators listed below from Pellant, et al (2000):

- Number and extent of rills
- Presence of water flow patterns
- Number and height of erosional pedestals or terracettes
- Number of gullies and erosion associated with gullies
- Extent of wind-scouring, blowouts, and/or deposition
- Amount of litter movement
- Reduction in soil surface resistance to erosion
- Amount of soil surface loss or degradation
- Presence and thickness of compaction layer

The eight remaining indicators are specific to vegetation.

Desert wash communities are distinct parts of the upland ecosystem in the Planning Area that have specific ecological utility to the larger environment. Specifically, a large part of shallow groundwater recharge occurs in ephemeral desert streams (Osterkamp, et al. 1994) and the higher density of trees adjacent to desert washes provides important bird habitat (Johnson and Haight 1985; Krueper, et al., 2003). BLM evalutates these areas as part of public land health assessments.

There are also no specific New Mexico State Office guidelines or standards for soil erosion from roads. Road crossings of streams and desert washes can cause extensive erosion and sedimentation, sufficient in some cases to seriously degrade range and habitat function. For this reason, the soil impacts from road crossings currently should be judged against the rangeland standards for upland and riparian sites, as appropriate.

2.1.5.2 Current Conditions

The soils of the Planning Area are the subject of three Natural Resource Conservation Service (NRCS) soil surveys: Sierra County (USDA, NRCS 1984), Otero County Area (USDA, NRCS and U.S. Forest Service 1981), and Doña Ana County Area (USDA, NRCS and BLM 1980). In addition, individual reports exist for White Sands Missile Range and Fort Bliss; however, since they are not included in the Decision Area, they are not referenced herein.

The soil resources of the Planning Area are categorized according to soil associations or in the recent terminology of the NRCS surveys, general soil map units. These units are large enough to be of

importance to the scale of the RMP, but detailed enough to distinguish the important regional variety of the Planning Area.

Soils in the Planning Area are primarily the product of the climate, the underlying bedrock lithology, and the landscape. Across this section of New Mexico, the landscape provides the most systematic discrimination of soil resources, relative to the uses of the public lands. The soil associations mapped by NRCS are most closely correlated to the various landforms of the Planning Area and the following description is primarily developed from the Soil Survey references listed above.

Sierra County

Soil associations and underlying parental material is very similar in Sierra County. Along the Rio Grande and the banks of the Caballo and Elephant Butte Reservoirs, the Glendale-Gila-Brazito association predominates—a deep, well drained group of fine to very fine sandy loam soils. The association supports a dense riparian plant community and much of the irrigated crop land of the northern Palomas Valley. Further upslope, on either side, is the Nickel-Bluepoint association, which is located on piedmonts and truncated alluvial fans, axially distributed about the Rio Grande. Textures include very gravelly sandy loam, and the soils are deep and well to excessively drained.

The Simona-Delnorte-Nickel association is found on the western piedmonts and in the Jornada del Muerto. This is gravelly sandy loam with caliche nodules, variously shallow and deep, and well drained. Grazing and wildlife habitat are the primary uses of these soils. The western plateaus of the Sierra County are underlain by the Tres Hermanos-Hap-Eba association, which is deep and well drained. The textures included gravelly to extremely gravelly sandy loam and support the more arid wildlife habitat (for pronghorn antelope, for example) and limited grazing. A little further upslope, the Ildefonso-Scholle-Goldust association is found, which is a deep, well drained gravelly to very gravelly clay loam that occupies piedmont slopes in the western half of the county (Winston graben, Hillsboro region).

More extensive in the Jornada del Muerto are the Doña Ana-Stellar-Wink and Akela-Elbutte-Courthouse associations. The former is deep and well drained with sandy to clay loams while the latter is shallow and formed from basaltic host rocks, with a cobbly texture. Finally, the Fuzena-Rock outcrop is composed of residual silicic igneous rocks and occurs in the Black Range, while the Rock outcrop-Torriorthents-Courthouse association is found in the Caballo Mountains and is of mixed parentage. Both are shallow and well drained and of highly diverse textures.

Otero County

In Otero County, soil association is similar to the upland parts of Doña Ana County with a few critical differences. The associations Alamogordo-Gypsum land-Aztec, Holloman-Gypsum land-Yesum, and Holloman-Reeves-Gypsum land are found within the eolian gypsum sand deposits of the eastern Tularosa Valley. The Alamogordo-Gypsum land-Aztec association is found on alluvial fans and piedmonts, and is deep and well drained; the other two occupy basin floors and uplands southwest of Alamogordo and Crow Flats.

Eight associations are found on the central and southern part of the Tularosa Valley and Otero Mesa. The Tome Mimbres and Reakor-Tome-Tencee associations are found on the west-facing escarpments of Otero Mesa, the Brokeoff Mountains, and the Sacramento Mountains. These soils are deep and well drained. They are silty loam and silty clay loam, with slightly more gravel in the Reakor-Tome-Tencee association. The central Tularosa Valley, away from the gypsum sands, is underlain by Prelo-Tome-Largo association soils, which are deep and well drained. These are silty loams and silty clay loams, and much of the agricultural and urban development in the Tularosa Valley is located on lands with these soils. Most of Otero Mesa proper is underlain by Philder-Armesa-Reyab association soils, which are well drained with both shallow and deep sections. Textures are silty and the use for rangeland is extensive.

The southern Tularosa Valley is mostly mantled by Bluepoint-Onite-Wink and Pintura-Doña Ana association soils. These are deep and very well drained units, sandy in texture with some loam. Eolian deposits (formed by wind deposition) and dunes are commonly found in these associations and many areas are highly erosive. Further upslope, Nickel-Tencee association deposits are found as both deep and shallow, and are well drained and gravelly, with a prevalent carbonate horizon. Finally, the Pena-Cale-Kerrick association is found in the creek beds and floodplains of the Sacramento Mountains. It is a deep and moderately well drained, gravelly loam, primarily derived from the erosion of limestone outcrops.

In the higher mountains of Otero County, three associations are described by NRCS. The Deama-Tortugas-Rock outcrop, Ecktor-Rock outcrop, and Lozier-Rock outcrop associations are all derived from limestone rock and are very gravelly, shallow and well drained. The Lozier-Rock outcrop association is more gypsiferous than the first two.

Doña Ana County

In Doña Ana County, the most important soil-forming feature is the Rio Grande and its tributaries. The central part of the county is bisected by the river and associated alluvial deposits. Glendale-Harkey association soils are formed on the alluvial deposits and are deep, well drained soils. Irrigated crops and pastures along the river take advantage of the productive attributes of this association. On the upland areas between the river and mountain ranges, seven associations are found. These include the Bluepoint association—deep loamy sand to loamy fine sand, highly drained soils that have formed in reworked alluvium and fan deposits. Most of the urban areas occupy these soils. Fans and terrace deposits also provide source material for the Caliza-Bluepoint-Yturbide association, which are deep and well drained but with more gravel than the Bluepoint association. These soils are commonly found on rangelands and in the less urban, residential developments (USDA, NRCS and USDI, BLM 1980).

Further upslope are the Pajarito-Onite-Pintura and Pintura-Wink associations, which have significant eolian components. They are deep and well-drained. Sand and fine sand are the principal textures. The Mimbres-Stellar association occupies floodplains and fans associated with desert arroyos in the upland parts of the Planning Area. Furthest from the river are the Berino-Doña Ana and Nickel-Upton associations. These soils are on the piedmont slopes of the Organ, Doña Ana, Sierra de las Uvas, and East Potrillo ranges. They are shallow and well drained, with a gravelly, loamy texture.

On the upper plateaus and basins of the Planning Area, two more associations are found: the Cacique-Cruces and Harrisburg-Simona-Wink associations. Much of this land is rangeland or wildlife habitat and the soils are composed of loamy sand and fine loamy sand. Greater proportions of eolian deposits occur in the Harrisburg-Simona-Wink association. Finally, there are several associations in the steep mountainous parts of Doña Ana County, including the Rock outcrop-Motoqua, Akela-Rock outcrop-Aftaden and Rock outcrop-Torriorthents associations. The first association is derived from granitic and sandstone outcrops, comprises cobbly loam, and is almost exclusively found in the Sierra de las Uvas. The Akela-Rock outcrop-Aftaden, association is located primarily in the East Potrillo Mountains and is derived from basaltic lava. The final association is from mixed sources and is found in all of the major mountain ranges.

In the Mimbres RMP, two terms were used to define areas unsuitable for large-scale surface disturbance. The term “critical soils” was used to identify special soils and was based on erosion potential as defined by Soil Conservation Service (SCS, now NRCS) range site guides. The range site guides give only the hydrologic soil group of characteristic soil series that make up the range site. “Critical soils” were further divided into three slope range classes.

“Fragile areas” were defined as areas in poor or fair ecological condition located on “critical soils" and were shown on an accompanying map (USDI, BLM 1993a). Within the Doña Ana County area covered by the Mimbres RMP, the majority of public land was assessed as fragile, under this definition.

The White Sands RMP does not identify critical soils or fragile areas. Trends

Assessment of watersheds has only recently begun under the Standards and Guidelines, which are the primary guidance for the condition of soils and erosion problems on the public lands, and are incomplete. Overall, the upland soils do not show evidence of a systemic problem. However, due to the limited amount of past monitoring of the health and condition of public land within all three counties in relationship to the Standards and Guidelines, trend information related to the identified indicators is not readily available.

2.1.5.3 Forecasts

The forecast for soil resources on the public lands in all three counties is partly dependent on precipitation, the corresponding condition of upland and riparian species, and overall biotic health. Based on grazing practices, increases in other resource uses (such as recreation, military training, urban development, etc.), increased public scrutiny of public land conditions, and the continuing regional drought, soil conditions on public land could be degraded. As a result, increased monitoring and assessment of soil erosion on public land probably will be required.

2.1.5.4 Key Features

There are no key features for soils. Management of soils on public land is directly tied to the Standards and Guidelines and should be a criterion used in future land-use decisions. However, this should be done on a case-by-case basis during watershed assessments or NEPA analyses.

2.1.6 Water and Watershed Resources

The Planning Area, located mostly in the Chihuahuan Desert, normally operates under a rainfall deficit, where evaporation outstrips rainfall most years. This provides challenges for BLM land managers as competition for scarce water resources must be balanced among the many users of the public land. This section provides an overview of the indicators, status, and trends of water resources in the overall TriCounty Planning Area as applicable to management decisions. The sections on biological resources and grazing should be consulted to interpret some of the coupled effects of water and watershed management.

The Rio Grande River and Tularosa Valley dominate both the physical and water management conditions in the Planning Area without regard to county boundaries. To maintain clarity of the issues affecting water resources in Sierra and Otero Counties and Doña Ana County, some repetition and some discussion of areas outside the respective counties is necessary in the subsequent discussion.

2.1.6.1 Groundwater

Indicators

Water resource indicators are slightly different compared to other resources. The BLM, unlike the Corps of Engineers or Bureau of Reclamation, only makes decisions about water resources as directly applicable to uses and protection of public land, in accordance with NEPA and FLPMA. However, the multi-use function of the public lands requires that the impact of land use decisions on water resources be carefully considered. The indicators discussed below are those that indicate the effects of land use decisions on groundwater quality and quantity, and the potential for subsidence to occur.

The use of groundwater to support public land management is extensive. Livestock and wildlife rely on wells, artificial tanks, and springs. Developed recreation is often far from municipal water lines and must use wells for campgrounds or administrative and/or maintenance facilities. Mines and extractive facilities are also heavy water users. Natural vegetation, whether riparian or upland or vegetation used primarily for habitat or recreation (interpretive activities/programs, cultural plant gathering, or hiking), requires dependable amounts of shallow groundwater and soil moisture. To various degrees, all of these water uses occur, or could someday occur, in the Decision Area.

In addition to quantity, public land requires groundwater of sufficient chemical quality (as defined under the Clean Water Act) to sustain its designated beneficial uses. This would include primarily livestock watering, recreational public drinking supplies, and possible industrial use for mining or power generation. The first two of these activities have usable water quality criteria defined by New Mexico and surface water regulations. In situations where springs or wells supply wildlife watering stations, New Mexico has not established any water quality regulations; however, it is assumed that the requirements would be similar to those for livestock watering.

Based on BLM's lack of authority to directly manage groundwater resources and the uses of groundwater in the Planning Area, the following indicators have been selected to describe the conditions of groundwater:

Groundwater Quantity

- Adequate deep groundwater is present, as indicated by the availability of groundwater to water livestock and wildlife, occurs on upland as indicated by assessments of public land health (Standards 1 and 3, New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management [USDI, BLM 2001a]).
- No ground subsidence is present in the Planning Area, as indicated by the absence of visible ground fissures or surface collapse features.

Groundwater Quality

- Groundwater, when used for livestock and wildlife catchments on public land, meets New Mexico livestock watering numeric and narrative water-quality criteria.
- Groundwater, where used at BLM recreational and administrative facilities, meets New Mexico domestic water supply numeric and narrative water-quality criteria.

Current Conditions

Groundwater Quantity

Groundwater is scarce in the Chihuahuan desert but it is an important resource in rural areas that are far removed from municipal water supplies. Water uses in major watersheds (as defined by the U.S. Geologic Survey) are listed in Table 2-8.

The New Mexico Office of the State Engineer (OSE), as delineated by statute and judicial decision, is responsible for assuring that groundwater resources are protected for beneficial use by all those with rights to such use. All waters not in use are retained by the State of New Mexico. The OSE has divided the State into declared[1] groundwater basins in order to assess and adjudicate water resources (Map 2-2, Groundwater Basins). Some of these basins are not described in detail within this section (e.g., the Mimbres Basin) due to their small size or lack of public land or public land impacts.

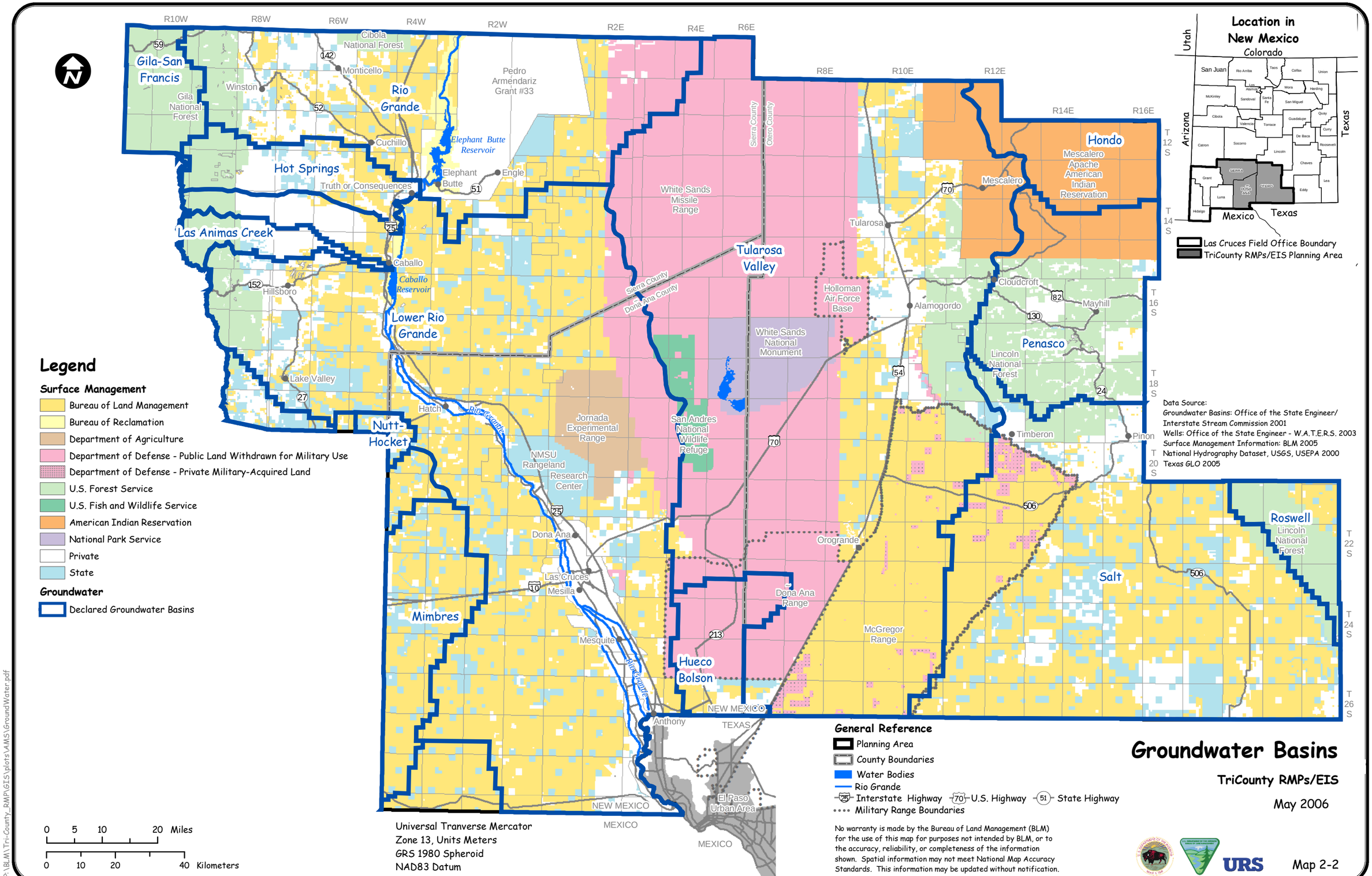
Hueco Bolson Basin – The Hueco Bolson Basin is located east of the Franklin Mountains, west of McGregor Range and north of the Texas line (refer to Map 2-2). The larger Tularosa Basin on the north and Hueco Basin are actually one continuous groundwater basin. Groundwater flows continuously from the northern end of the Tularosa Basin south into El Paso County, Texas. The OSE divided the upper Hueco Bolson Basin near the State line into the Hueco Bolson and Tularosa declared groundwater basins for administration of groundwater withdrawal applications.

[1] A declared groundwater basin is an area of the State proclaimed by the State Engineer to be underlain by a groundwater source having reasonably ascertainable boundaries. By such proclamation, the State Engineer assumes jurisdiction over the appropriation and use of groundwater from the source.

Table 2-8
Water Use for Major Watersheds Within the Planning Area[a]

County:	Doña Ana		Sierra		Otero				
	El Paso-Las Cruces	Mimbres	Jornada Draw	Elephant Butte Reservoir	Caballo	Jornada Draw	Tularosa Valley	Salt Basin	Jornada Del Muerto
Public Supply									
Population served by surface water, in 1000s	0	0.45	0	0	0	0	28.06	0	0
Total population served, in thousands	125.8	35.58	6.75	0.39	8.97	6.75	56.92	0.2	0
Total withdrawals, groundwater	27.28	7.08	0.89	0.12	2.08	0.89	7.62	0.05	0
Total withdrawals, surface water	0	0.11	0	0	0	0	6.89	0	0
Deliveries to domestic	16.99	5.34	0.58	0.12	1.23	0.58	9.91	0.04	0
Deliveries to commercial	6.19	1.61	0.22	0	0.72	0.22	3.54	0.01	0
Deliveries to industrial	1.02	0	0.09	0	0.02	0.09	0.33	0	0
Water deliveries, total deliveries	24.2	6.95	0.89	0.12	1.97	0.89	13.78	0.05	0
Water deliveries, public use and losses	3.08	0.24	0	0	0.11	0	0.73	0	0
Per-capita withdrawal, in gallons per day	216.8	202.1	131.9	307.7	231.9	131.9	254.9	250	0
Livestock Water Use (total)									
Total withdrawals, groundwater	1.63	0.91	0.66	0.27	0.15	0.66	0.93	0.06	0.22
Total withdrawals, surface water	0.03	0.18	0.02	0.03	0.02	0.02	0.13	0.03	0.02
Total withdrawals	1.66	1.09	0.68	0.3	0.17	0.68	1.06	0.09	0.24
Consumptive use, total	1.66	1.09	0.67	0.29	0.16	0.67	1.06	0.09	0.23
Irrigation Water Use									
Groundwater withdrawals, fresh	66.25	110.8	0	5.25	5.08	0	20.08	9.08	0
Total withdrawals, surface water	336.7	22.85	0	6.52	17.67	0	5.08	0	0
Total withdrawals	402.9	133.7	0	11.77	22.75	0	25.16	9.08	0
Consumptive use, total	198.8	76.6	0	6.81	11.39	0	18.37	7.22	0
Conveyance loss	117.7	2.59	0	1.95	6.18	0	1.53	0	0
Acres irrigated, sprinkler, in thousands	1.51	0.59	0	0	0	0	2.94	2.16	0
Acres irrigated, microirrigation, in thousands	0.24	0.66	0	0.66	0	0	1.97	0	0
Acres irrigated, surface, in thousands	71.38	46.22	0	2.42	4.82	0	1.62	0.32	0
Acres irrigated, total, in thousands	73.13	47.47	0	3.08	4.82	0	6.53	2.48	0
Wastewater Treatment									
Returns by public wastewater facilities	8.6	0.64	0	0	0.77	0	0	0	0
Number of public wastewater facilities	5	1	0	0	1	0	0	0	0
Number of other facilities	4	1	0	1	1	0	1	0	0
Reclaimed wastewater released by POTWs	0	0.5	0	0	0	0	0	0	0
Number of wastewater facilities, total	9	2	0	1	2	0	1	0	0

SOURCE: U.S. Department of the Interior, U.S. Geological Survey 2005a
NOTES: [a]Areas excluded from the table are the Upper Gila, Rio Penasco, Rio Felix, Rio Hondo, and Upper Pecos-Black that include only a small portion of the Decision Area.
All data are expressed in million gallons per day, except where noted
POTW = Publicly owned treatment works


Groundwater Basins
TriCounty RMPs/EIS
May 2006
Map 2-2
Legend
Surface Management
Bureau of Land Management
Bureau of Reclamation
Department of Agriculture
Department of Defense - Public Land Withdrawn for Military Use
Department of Defense - Private Military-Acquired Land
U.S. Forest Service
U.S. Fish and Wildlife Service
American Indian Reservation
National Park Service
Private
State
Groundwater
Declared Groundwater Basins
General Reference
Planning Area
County Boundaries
Water Bodies
Rio Grande
Interstate Highway
U.S. Highway
State Highway
Military Range Boundaries
Location in New Mexico
Las Cruces Field Office Boundary
TriCounty RMPs/EIS Planning Area
Gila-San Francis
Rio Grande
Hot Springs
Las Animas Creek
Lower Rio Grande
Nutt-Hocket
Mimbres
Tularosa Valley
Hueco Bolson
Hondo
Penasco
Salt
Roswell
Gila National Forest
Cibola National Forest
Lincoln National Forest
Mescalero Apache American Indian Reservation
Elephant Butte Reservoir
Caballo Reservoir
White Sands Missile Range
White Sands National Monument
Holloman Air Force Base
San Andres National Wildlife Refuge
Jornada Experimental Range
NMSU Rangeland Research Center
Dona Ana Range
McGregor Range
Pedro Armendariz Grant #33
Winston
Monticello
Cuchillo
Elephant Butte
Engle
Truth or Consequences
Caballo
Hillsboro
Lake Valley
Hatch
Dona Ana
Las Cruces
Mesilla
Mesquite
Anthony
Tularosa
Alamogordo
Mescalero
Cloudcroft
Mayhill
Timberon
Pinon
Orogrande
Sierra County
Otero County
Dona Ana County
NEW MEXICO
TEXAS
MEXICO
El Paso Urban Area
Rio Grande
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
0 5 10 20 Miles
0 10 20 40 Kilometers
Data Source:
Groundwater Basins: Office of the State Engineer/ Interstate Stream Commission 2001
Wells: Office of the State Engineer - W.A.T.E.R.S. 2003
Surface Management Information: BLM 2005
National Hydrography Dataset, USGS, USEPA 2000
Texas GLO 2005
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The Hueco Bolson Basin is underlain by Tertiary to Pleistocene-age, Camp Rice Formation (Santa Fe Group) basin-fill sands and gravels, deposited in a deep graben and surrounded by Precambrian to Tertiary-age igneous, metamorphic, and sedimentary rocks. In places, the fill in the Hueco Bolson Basin is as much as 8,000 feet thick. Depth to groundwater averages about 358 feet below surface (New Mexico NMOSE 2005). Subsurface recharge to the New Mexico portion of the Hueco Bolson Basin comes mostly from the Tularosa Basin, with a small amount of flow from the Lower Rio Grande Basin. Surface recharge to the basin-fill comes from the Organ and Franklin Mountains, approximately 3 percent of annual precipitation in the mountains, and an additional 5,600 acre-feet per year enter the Hueco Bolson Basin from the Tularosa Basin (Lower Rio Grande Water Users' Association [LRGWUA] 2004). Non-saline water available from the aquifers is estimated to be about 13 million acre-feet, with about 6.6 million acre-feet actually recoverable.

Lower Rio Grande Basin – The much larger Lower Rio Grande groundwater basin lies directly adjacent and west of the Hueco Bolson Basin. This declared basin is made up several smaller and very distinct subbasins in both Doña Ana and Sierra Counties, which will be described individually.

Mesilla Subbasin **–** The Mesilla Subbasin of Doña Ana County includes the area, about 1,110 square miles, from the border north to Las Cruces north to the Robledo and Doña Ana Mountains (refer to Map 2-2). It is bounded on the east by the Franklin and Organ Mountains and on the west by the East Portrillo Mountains. Like the Hueco Bolson Basin, this is a fault-bounded, alluvium filled, structural depression, which shares it origin with the larger Rio Grande Rift of Colorado, New Mexico, and Texas. Similarly, water-bearing units include Tertiary to Pleistocene-age, Santa Fe Group, basin-fill sands and gravels, bounded by Precambrian to Tertiary-age crystalline rocks (LRGWUA 2004).

Groundwater in the Mesilla subbasin comes from two sources: shallow supplies in the Rio Grande active alluvium and deeper aquifers in the Santa Fe Group sediments. In the active alluvium, depths to groundwater are usually less than 100 feet below ground surface and average about 44 feet. For the Santa Fe group aquifers, the average depth to groundwater is 330 feet below ground surface (OSE 2005).

Similar to most of the arid West, recharge to the Santa Fe deposits in the Mesilla subbasin occurs along ephemeral stream channels (arroyos) during precipitation events that originate in the steep, bounding, range fronts. Subsurface recharge also is supplied by the Jornada del Muerto subbasin to the east and the Mimbres Basin to the west. Recharge also occurs to the Rio Grande alluvium aquifer from the Rio Grande and associated irrigation canals. In the reach between Las Cruces and Anthony, the river loses between 1.0 to 4.8 cubic feet per second (cfs) per mile of river or 20,300 to 97,400 acre-feet/year to the aquifer (LRGWUA 2004).

Jornada del Muerto Subbasin – North of the Mesilla Basin lays the Jornada del Muerto subbasin (refer to Map 2-2), which also is contained within the Lower Rio Grande Groundwater Basin (LRGWUA 2004; Socorro Soil and Water Conservation District [S&WCD] 2003). The geography of the groundwater basin is very similar to the surface-water basin, bounded by the San Andres on the east and Caballo Mountains on the west. Fillmore Pass on the south is the lower boundary. Water-bearing units in the Jornada del Muerto are similar to the Mesilla Basin; however the absence of an integrated drainage in the valley

means that active alluvium is both shallow and poorly sorted, principally the result of the aggregation of alluvial fans, wind-borne deposits, playas, and other arid-climate surficial processes. Closed basins like the Jornada del Muerto are sometimes called “bolsons” and collectively the deposits of this basin can be called “bolson fill,” as distinguished from the alluvial fill of the Rio Grande basins.

Recharge in the Jornada del Muerto is also a product of mountain-front recharge on alluvial fans and ephemeral stream channels. Again, the absence of a central drainage system eliminates a shallow aquifer system, except where ponded water remains in playas or longer-lived ephemeral water bodies. Average depth to groundwater in wells across the basin is about 300 feet below ground surface and groundwater appears to be moving to the southwest, discharging to the Mesilla Valley. It is estimated that perhaps 100 million acre-feet of water is stored in the aquifers of the Jornada del Muerto subbasin (LRGWUA 2004).

Palomas Subbasin **–** Directly west and on the other side of the Caballo Mountains from the Jornada del Muerto is the Palomas subbasin of the Lower Rio Grande in Sierra County. It is bounded by the Sierra del Uvas on the south, and the Black Range on the west. The Rincon Valley, which is within the Palomas Subbasin, is another rifted basin surrounded by uplifted Paleozoic and Precambrian crystalline rocks. The Santa Fe Group fill in this valley is unlike the Mesilla Valley, with a higher clay content and lower permeability. However active alluvium associated with the Rio Grande is highly permeable and provides the main water-bearing units. Depth to groundwater averages about 68 feet below surface, reflecting the higher proportion of wells drilled into the alluvial aquifers of the Rio Grande.

Alluvial aquifers are primarily recharged by streambed conductance, with a minor but locally important contribution from mountain-front recharge and leakage from irrigation canals. Water flows axial to the river in the shallow aquifers, exiting the basin in the south. It has been assumed that there is about 238,000 acre-feet of nonsaline water available in the alluvial aquifers of the Doña Ana County section of the Palomas subbasin (LRGWA 1994). However, like the Mesilla Valley, the highly dynamic stream-to-groundwater recharge in this system makes an accurate estimate impossible. With increased pumpage and decreased river flows, the availability of water should be highly reactive to changes in the Rio Grande.

Within the Sierra County portion of the Palomas subbasin, the OSE has distinguished two smaller groundwater planning units: the Hot Springs Artesian and Las Animas Creek Groundwater Basins (refer to Map 2-2) (OSE 2005). Although the Las Animas Creek regions within the Palomas subbasin, the OSE administers it separately because of its heavily used resources. The lower reaches of the creek are bordered almost continuously by public land, although the creek itself is mostly private.

Because of lateral variations in the clay-rich units of the Santa Fe Group of the Palomas subbasin and the transition to more permeable, alluvial fan deposits of the Las Animas Creek subsurface, groundwater is partially confined in some parts of the Las Animas Creek region, and artesian wells are common (Socorro S&WCD 2003). Some of this water also percolates upward to recharge the small alluvial aquifers directly below the creek. Recharge of the Santa Fe Group strata occurs upstream of the artesian area, along the front of the Black Range. In order to preserve this hydrogeologic function, the OSE has attempted to manage groundwater in this area more conservatively than other parts of the Palomas subbasin.

Similarly, the Hot Springs artesian groundwater basin is also hydrogeologically distinct from the rest of the Palomas subbasin. The area is bounded by the Rio Grande River along the east and the Black Range near Hermosa on the west (refer to Map 2-2) and basically conforms to the Palomas Creek drainage area. The northern extent of the region is the topographic divide between Palomas and Cuchillo Creeks. And the southern boundary is the divide with King Arroyo. Similarly to the Las Animas Creek area, groundwater in the Hot Springs area is artesian presumably for the same hydrogeological reasons (Socorro S&WCD 2003).

One important difference is the thermal water component of the aquifer, occurring in the Pennsylvanian limestones of the Magdalena group. The resource has supplied the Truth or Consequences (formerly Hot Springs) area since the early 20th century. Although the geothermal resource has limited energy or industrial use, thermal waters and their associated recreation remain a major economic resource for the town of Truth or Consequences.

Tularosa Valley Basin – The next major groundwater basin to the east is the Tularosa Valley groundwater basin (refer to Map 2-2). Most of the basin's 6,500 square miles are included in the Planning Area. The extent of the groundwater basin is virtually the same as the Tularosa Valley watershed, basically defined by the San Andres Mountains on the west and the Sacramento Mountains/Sierra Blanca on the east.

To the north, the basin is closed by the Gallinas Mountains and nearby highlands, but some subsurface recharge may flow from the northern Roswell Basin. Although it is off of the Rio Grande Rift, the Tularosa Valley is another structural basin, perhaps the easternmost extent of the Basin and Range physiographic province. The bolson fill, which extends in places to 5,000 feet below ground surface, is a mixture of both Tertiary and Quaternary units, including substantial halite and gypsum salt beds. In a number of places (for example, Valley of Fires State Park), Holocene (< 10,000 years) and extensive basaltic lava has traversed the surface of the valley and redirected surface drainages. The valley is bounded by diverse crystalline rocks, including thick Permian sedimentary sequences in the San Andres and Sacramento Mountains, Tertiary volcanic units in the Gallinas Mountains and the dissected stratovolcano of Sierra Blanca, and Precambrian granites and metamorphic rocks in the Organ, Sierra Oscura, and San Andres Mountains. Many of these rocks are water-bearing and provide subsurface recharge to the valley (Socorro S&WCD 2003; South Central Mountain Resource Conservation and Development [RC&D] Council 2002).

In the northern part of the Tularosa Valley, depth to groundwater averages about 440 feet below ground surface (OSE 2005). In the Otero County part of the basin, the average depth to groundwater is much less, at 142 feet below ground surface. However, it may be that this reflects numerous shallow wells tapping perched or alluvial waters on the basin margins (for example, in the Alamogordo area). Further to the south, west of McGregor Range, depth to groundwater ranges from 50 to 600 feet below ground surface (USDI, BLM 2005b).

Most of the very deep groundwater in the valley is highly saline. Recharge to the aquifers comes from mountain front sources, including several perennial streams that basically "disappear" on the eastern margin of the valley. Significant freshwater aquifers are perched upon deeper saline aquifers along the

east Valley (Socorro S&WCD 2003). Another small zone of good-quality groundwater occurs along the western edge of the Sacramento Mountains, from the mouth of Grapevine Canyon to beyond the northern boundary of McGregor Range. This fresh water aquifer is estimated to range from 0 to 1,400 feet in thickness with a storage volume of approximately 1.4 to 2.1 million acre-feet of water (USDI, BLM 2005b).

Along the western side of the Tularosa Valley almost all of the groundwater reserves are saline (total dissolved solids greater than 1,000 parts per million). Less than 6 million out of 62 million acre-feet of recoverable water is below this criterion (South Central Mountain RC&D Council 2002).

Salt Basin – The Salt Basin (refer to Map 2-2) was designated a declared groundwater basin in September 2000. The Salt Basin is closed to surface flow and is similar to the Tularosa Valley Basin, although with even less water. The Sacramento River is the only integrated drainage and the combination of high evaporation rates, low rainfall, and poor winter snowpack deprives this basin of any usable surface water and little groundwater recharge. The Salt Basin includes approximately 2,400 square miles and is bounded on the west by the Otero Mesa and the Hueco Mountains, and on the east by the Guadalupe Mountains. Unlike the Tularosa Basin basin-fill aquifer, the Salt Basin aquifer occurs in fractured Paleozoic and Mesozoic carbonate rocks. The bolson fill deposits are estimated to range in thickness from 0 to 1,400 feet.

Depth to groundwater in the basin averages about 450 feet below ground surface, with some water levels extending to over 1,000 feet below ground surface. Groundwater is brackish to saline with limited potential for development of groundwater resources. Out of the more than 28 million acre-feet of recoverable groundwater in the basin, about 15 million acre-feet is less than 1,000 parts per million dissolved salts. However, freshwater may occur in alluvial sediments south of the Sacramento Mountains, where groundwater conditions may be similar to those of Grapevine Canyon (USDI, BLM 2005b).

Subsidence

Depletion of groundwater could lead to subsidence. The permanent removal (mining) of groundwater and changes to underground geology from subsurface mining, or oil and gas development can cause the aquifer to compact. This can result in collapse of the surface and the formation of earth fissures. Although subsidence problems are suspected in the Mimbres Basin near Albuquerque in the Rio Grande Basin, there have been no reports of problems in the Planning Area. Kernodle (1992) estimated 0.2 feet of subsidence between 1984 and 1992 in the El Paso/Ciudad Juarez region; however, at this time no land subsidence problems have been seen in Doña Ana County. The potential for land subsidence on the public land remains in areas with high rates of groundwater pumping (Mesilla Basin, Palomas Basin, east Tularosa Valley).

Groundwater Quality

Aside from the high salinity in deep groundwater, most groundwater problems in the Planning Area are confined to specific areas. In general, the region depends heavily on groundwater for domestic sources and, with only a few urban areas, there has been little chance for serious problems with water quality.

NMED is the agency most closely responsible for protecting New Mexico aquifers, with some assistance from the OSE and other Federal, State, and local agencies. The status of New Mexico groundwater quality is reported biannually in the 305(b) report (King 2004), described in Section 2.1.6.2.

Lower Rio Grande Basin – Based on the most recent report, the Lower Rio Grande groundwater basin has had the most problems with groundwater quality. The Lower Rio Grande regional water plan (LRGWUA 2004) also reported several problems. Sulfate and chloride concentrations have exceeded the New Mexico Water Quality Control Commission (NMWQCC) aesthetic standard, in wells near or at Las Cruces, Mesquite, La Mesa, Vado, Berino, and La Union. Nitrate concentrations exceeding the standard of 10 milligrams per liter (mg/l) were reported in wells near or at Mesquite and La Union. Septic tanks, dairies, and feedlots are all potential nitrate sources. The plan cites the large number of dairies in the Mesilla Valley as a likely source (LRGWUA 2004).

Other problems with groundwater in the Mesilla Valley include the presence of organic solvents from industrial sources (USEPA 2005e). Leaking underground storage tanks have been remediated throughout the urban areas of Doña Ana County.

The City of Las Cruces uses a total of 28 wells within the Santa Fe Group aquifer to provide drinking water to the people of the city. Dissolved tetrachloroethylene has been detected both up-gradient and down-gradient from these wells; the extent of the plume is estimated to be about 1.5 miles in radius and within the central district of the city (this is known as the Griggs & Walnut Groundwater Plume, EPA ID# NM0002271286). The plume extends vertically from the water table to the depth of the water supply wells. EPA, the City of Las Cruces, Doña Ana County and the NMED signed a settlement agreement in April, 2005, allowing for completion of a remedial investigation and feasibility study.

In the Palomas subbasin, wells in the Town of Garfield tend to have high fluoride content, and manganese concentrations often exceed the EPA maximum contaminant level (LRGWUA 2004). Other contamination sources in the Palomas subbasin include liquid waste disposal, septic tanks, and cesspools (King 2004).

NMED (King 2004) reports thirteen cases of point source contamination of groundwater and twelve contaminated supply wells in Sierra County. Seventeen leaking underground storage tanks have been reported from the Truth or Consequences/Williamsburg area. There is one potential Superfund site in Sierra County, the North Broadway Groundwater Plume in Truth or Consequences (EPA ID# NM0000605458); however, an assessment of that site remains to be initiated (USEPA 2005e). There are very few groundwater quality problems in the Hot Springs, Las Animas Creek, and Jornada Del Muerto subbasin and none that appear connected to public land management decisions (King 2004).

Tularosa and Salt Basins – In the Tularosa and Salt groundwater basins, high total dissolved solids (salts) are a problem. In addition, leaking underground storage tanks in Alamogordo and at Holloman Air Force Base, White Sands Missile Range, and Fort Bliss have been detected in the past. However, there are no reported water-supply wells in the Tularosa and Salt Basins that have been contaminated from the potential sources described above (King 2004; South Central Mountain RC&D Council 2002).

Water quality data are not abundant for the Hueco Bolson Basin. However, most of the land is within Fort Bliss, White Sands Missile Range, or McGregor Range. Therefore, water quality issues from the public lands management are not expected.

Trends

Groundwater Quantity

Because of slow recharge dynamics, deep groundwater dynamics usually are isolated from short-term drought. These aquifers are more strongly tied to pumping rates in large municipal, agricultural, and industrial well field. Conversely, shallow aquifers and soil moisture supplies used by range grasses and riparian communities are highly dependent upon direct recharge and greatly impacted by drought. Hence, the trends in both deep and shallow groundwater quantity over the Planning Area are negative but for greatly different reasons.

Pumpage in municipal well fields and agricultural irrigation systems represent the primary large volume users in both the Lower Rio Grande and Tularosa Valley Groundwater Basins. Further, these two users have increased their consumption of groundwater over the last few years. Domestic and livestock well water use has stayed stable, with only a slight increase over the same period.

Wells in the Planning Area are reflecting this increased pumpage and downward movement of the water table. Data from selected USGS monitoring wells indicate that this is a regional phenomenon over the Planning Area (USGS 2005a).

The trends in shallow groundwater and soil moisture are more difficult to measure directly . Nevertheless, the combination of the drought and the urbanization of the Mesilla Basin, among other places, is clearly affecting shallow groundwater in the Planning Area. Recharge is primarily coming from direct infiltration on range land and within ephemeral streams (South Central Mountain RC&D Council 2002) in the Mesilla Basin, as it does elsewhere in the arid West (Osterkamp et al 1994). Increased conversion of former agricultural and rangeland to impervious urban surfaces greatly decreases the recharge potential of the landscape. Hardbank channelezation of desert washes cuts off stream-bed infiltration and recharge of aquifers (Schueler 1987).

Increasing infiltration is a major functional objective of the New Mexico Standards and Guidelines for Livestock Grazing Management and is scientifically supported by a large body of research as an element of a healthy ecosystem (see references in Pellant, et al. 2000). However, as land is converted to paved and landscaped urban and suburban land, shallow groundwater quantities should, overall, trend downward.

Groundwater Quality

The chemical water quality of aquifers in New Mexico generally has trended upward over the last ten years (King 2004). This is attributed to a vigorous program of regulatory effort, cultural awareness, and rapid response to groundwater problems. In the Planning Area, several of the urban areas have experienced problems resulting from leaking underground storage tanks, contaminant plumes, and

unlined landfills. A majority of these problems have been promptly detected and remediated under a host of private and public programs.

Nonpoint source pollution of groundwater, which is more prevalent on public land, also declined as a result of a number of programs. Nitrate concentrations in groundwater remain a problem and can be attributed to agricultural chemicals and septic systems. Problems with these sources of nonpoint source pollution are on the rise in the Mesilla Valley and Alamogordo area (King 2004). Pesticides and herbicides are also a nonpoint source pollutant; however, strong control programs have caused a decrease in nonpoint source pollution overall within the Planning Area.

Arsenic in groundwater is a continuing problem and is becoming of greater concern because of more-stringent public health criteria. New Mexico is one of the Western states with a high natural background level of arsenic in groundwater, with most of the problems residing in shallow aquifer systems. As more of these systems have become used for drinking water, the problem has increased, particularly along the Rio Grande. As reported in the Lower Rio Grande Regional Water Plan (South Central Mountain RC&D Council 2002), the New Mexico Border Health Office commissioned a 1996 study on water quality in domestic wells in the Mesilla Valley. One hundred thirty-five wells were examined for nitrate, bacteria, viruses, organic compounds (including pesticides and herbicides), metals, and other inorganic parameters. In 31 wells, concentrations exceeded water quality standards for lead, arsenic, nickel, selenium, and uranium.

Forecasts

Groundwater Quantity

There is no reason to suspect that the downward trends in groundwater levels will not continue into the short-term future. With population growth increasing in the rural and urban West, including the Planning Area, and with increasing over-appropriation of surface water, all regional water planners expect to see more pressure on existing aquifers (LRGWUA 2004; Socorro S&WCD 2003; South Central Mountain RC&D Council 2002). On the public land, pressure to use wells and groundwater sources for urban and exurban (residential areas beyond the suburbs of cities) use cannot be avoided, even in areas previously thought too remote to be practical. For example, discussion topics in the Socorro/Sierra regional water plan included construction of a pipeline from the Jornada del Muerto to Truth Or Consequences for the importation of groundwater (Socorro S&WCD 2003). Public land management decisions will need to anticipate these sorts of ideas in the next 10 years.

Groundwater Quality

The quality of groundwater is on an improving trend that should continue. Maintaining and improving groundwater quality will need to be balanced with the need to use greater and greater quantities of groundwater. Continuing extraction of groundwater resources could degrade groundwater quality by causing vertical migration of poorer quality or contaminated groundwater into these aquifers. This is particularly possible on rangeland where shallow groundwater is often used for livestock watering. Shallow groundwater is often of poorer initial quality due to its proximity to contaminant sources. Land managers will need to track the available water for livestock, particularly in areas of heavy pumping.

2.1.6.2 Surface Water

Indicators

Surface water quality is measurable by the concentrations of those parameters causing impairment of designated, existing, or past uses. Surface water is necessary on public land to maintain existing riparian vegetation, to provide for wildlife and livestock watering, for authorized recreational activities, and to recharge aquifers. If surface water quality is degraded to the point that the water cannot be used, or degrades human or ecological health, public land use is also impaired.

Based on these surface water uses and concerns, the following hydrologic indicators have been selected to describe the conditions of surface water relative to good land health:

Surface Water Quantity

- Sufficient surface water is present for existing land uses, as indicated by assessments of public land health (Standards 1 and 3, New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management [USDI, BLM 2001a]).

Surface Water Quality

- Clean surface water is available and suitable for existing land uses, as indicated by assessments of public land health (Standards 1 and 3, New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management [USDI, BLM 2001a]).

- No additional load of pollutants to streams from the Decision Area occurs in excess of the State-written and EPA-approved total maximum daily loads (TMDLs) for streams in the Planning Area.

Current Conditions

In this section, the current status of surface water quantity and quality within the Planning Area will be described as relevant to the issues, indicators, and BLM responsibilities outlined elsewhere in the AMS.

Surface Water Quantity

Although perennial surface water is uncommon in southern New Mexico, ephemeral and intermittent water are both common and essential components of the public land. Desert washes primarily function as areas of overland flow collection and recharge areas for the surrounding watershed, differing in this respect from streams in more humid climates. Ephemeral pools, either in-channel or in the uplands are essential as both watering sites for wildlife, livestock, and feral horses, and as entire aquatic ecosystems supporting amphibians and aquatic invertebrates in times of drought.

Arid conditions are the norm over the entire Planning Area. The National Weather Service data (WRCC 2005a; Table 2-9) suggest that most of the area is consistently at or close to 10 inches of rainfall per year. Snowfall is sparse to nonexistent most years, sometimes dusting the higher mountains, but not providing any significant spring melt-off. The Planning Area experiences several rainfall “seasons” (Gutzler 2004).

The general southeasterly circulation from the Gulf of Mexico brings moisture into the Planning Area. Strong surface heating combined with orographic lifting as the air moves over higher terrain causes air currents and condensations. July and August are the rainiest months over most of the State, with from 30 to 40 percent of the year's total moisture falling during those months.

Table 2-9
Meteorological Data from National Weather Station Stations in the Planning Area

NWS Meteorological Stations	County	Elevation	Monitored Parameters			
			Temperature		Precipitation	
Name & NWS Number		Above Mean Sea Level (feet)	Mean Maximum (ºFahrenheit)	Mean Minimum (ºFahrenheit)	Average Annual Rainfall (inches)	Average Annual Snowfall (inches)
New Mexico State University (298535)	Doña Ana	3880	77.2	46.0	9.21	3.8
Hatch (293855)	Doña Ana	4040	77.9	41.8	9.77	2.6
Orogrande (296435)	Otero	4180	77.6	45.6	10.11	3.2
Truth or Consequences (299128)	Sierra	4400	77.3	46.1	9.93	3.2
Tularosa (299165)	Otero	4430	75.8	45.7	10.11	1.7
Chloride (299806)	Sierra	6200	70.2	34.8	12.81	10.9

SOURCE: Western Regional Climate Center 2005b

During the fall, winter, and early spring, about 50 to 60 percent of the total annual precipitation for New Mexico falls in the form of cold-front storms that originate in the Pacific Ocean. This precipitation is following the same jet stream that brings storms through southern California and the Sierra Nevada Mountains; however, these storms are depleted of moisture as they travel eastward. Winter is the driest season in New Mexico, except for the portion west of the Continental Divide. In May and June, the continental high-pressure ridge over northern Mexico tends to deflect the storm track northward, creating a dry season.

During July, the subtropical ridge moves further east and the Mexican monsoon begins affecting southern New Mexico. Circulation of air masses around the continental high creates a storm track that brings moisture from the Gulf of California. These moist air masses, further concentrated by surface heating and uplift over the central mountains, build dramatically into the July and August thunderstorms that sweep through Rio Grande Valley. Commonly, the Planning Area experiences almost half of its total annual precipitation during the months of July, August, and September.

Surface Water Basins

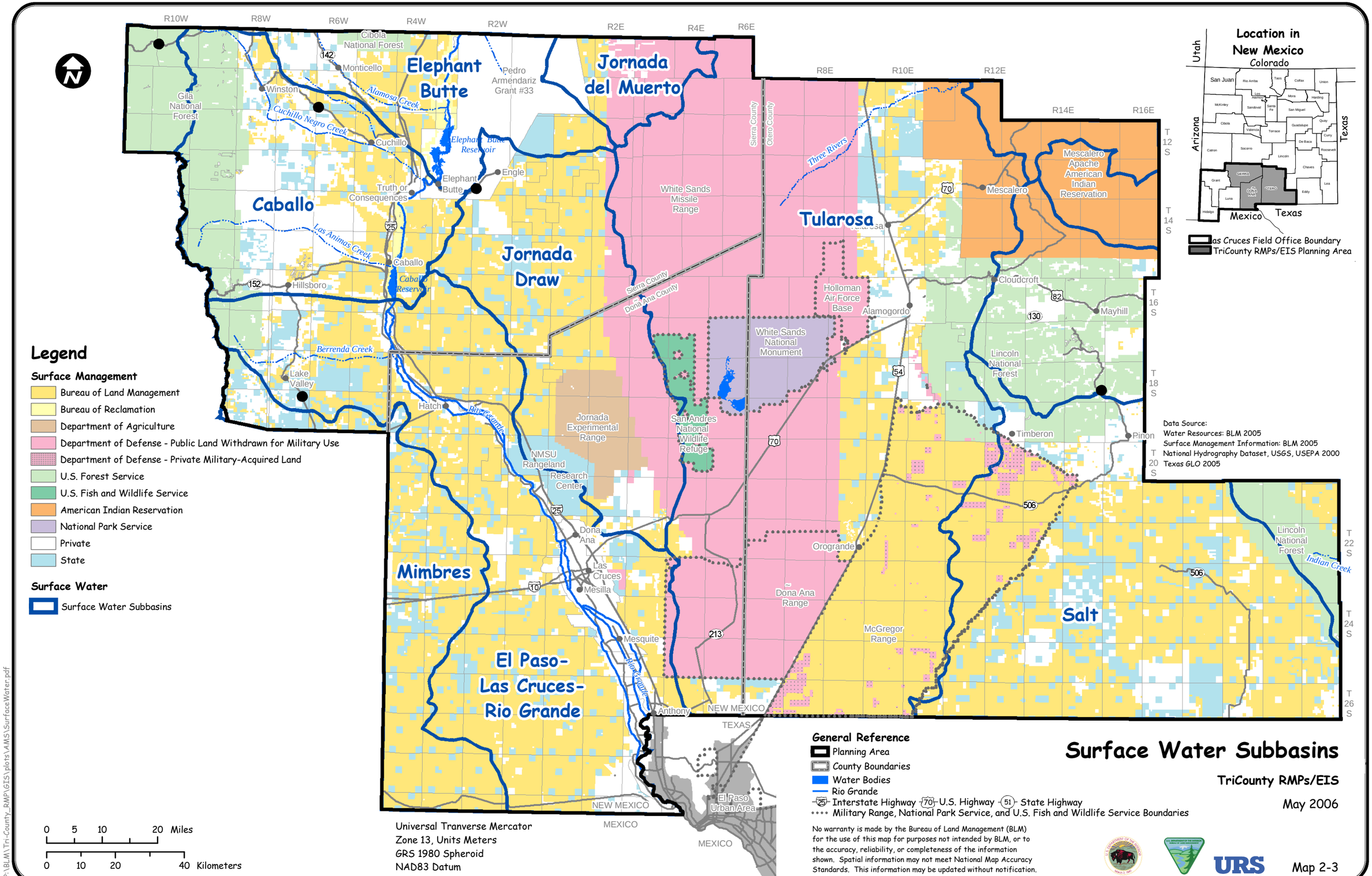
The designation of watersheds has been standardized for the USDI under the Interagency Convention (Federal Geographic Data Committee [FGDC 2004) adopted by BLM; watershed planning generically occurs at the 4th-level hydrologic unit, or "subbasin" level of the USGS Hydrologic Unit system. Using this breakdown, there are parts of 13 USGS subbasins in the Decision Area (Table 2-10; Map 2-3). However, only eight of these subbasins contain enough of the Decision or Planning Areas to be individually important. USGS stream-gaging stations located in five of the eight subbasins record either daily or peak flows. However, only eight of these subbasins contain enough of the Decision or Planning Areas to be individually important.

Table 2-10

USGS Stream-Gaging Stations and Data Available for the Planning Area Watersheds

USGS Number and Name of Station		Period of Record		
Subbasin: El Paso-Las Cruces (Planning Area: Doña Ana County)				
08362500	Rio Grande below Caballo Dam, NM	Real time		
	Peak streamflow	8/7/1938	to	6/28/2003
	Daily streamflow	1/1/1938	to	9/30/2004
	Water quality samples	2/12/1966	to	7/24/1996
08363600	Las Cruces Arroyo near Las Cruces, NM			
	Peak streamflow	7/2/1961	to	8/16/1966
	Daily streamflow	10/1/1958	to	9/30/1966
Subbasin: Caballo (Planning Area: Sierra, Otero, and Doña Ana Counties)				
08361000	Rio Grande below Elephant Butte Dam, NM	Real time		
	Peak streamflow	6/16/1915	to	7/21/2004
	Daily streamflow	10/1/1916	to	9/30/2004
	Water quality samples	7/30/1975	to	9/2/1982
Subbasin: Elephant Butte Reservoir (Planning Area: Sierra and Otero Counties)				
08359500	Rio Grande at narrows in Elephant Butte Reservoir, NM	Real time		
	Daily streamflow	4/1/1951	to	9/30/1957
Subbasin: Tularosa Valley (Planning Area: Sierra and Otero Counties)				
08481500	Tularosa Creek near Bent, NM	Real time		
	Peak streamflow	10/13/1947	to	8/16/2004
	Daily streamflow	1/1/1948	to	9/30/2004
	Water quality samples	8/8/1953	to	9/26/1995
08482000	Rio Tularosa near Tularosa, NM			
	Peak streamflow	9/3/1938	to	10/13/1947
	Daily streamflow	10/1/1938	to	9/30/1947
08484500	La Luz Creek at La Luz, NM	9/9/1982	to	2/13/1989
	Peak streamflow	9/29/1983	to	8/2/1988
	Daily streamflow	9/9/1982	to	2/13/1989
08486250	Tularosa Valley Trail near White Sands, NM			
	Peak streamflow	8/22/1965	to	8/19/1978
	Daily streamflow	10/1/1965	to	6/30/1974
08486260	Tularosa Valley Trail at White Sands, NM			
	Peak streamflow	6/29/1966	to	7/17/1973
	Daily streamflow	10/1/1965	to	6/30/1974
	Water quality samples	7/16/1976	to	7/16/1976
08480595	Salt Creek near Tularosa NM			
	Peak streamflow	7/24/1997	to	8/4/2004
	Daily streamflow	8/31/1995	to	9/30/2004
	Water quality samples	8/16/1995	to	9/1/2004
Subbasin: Salt Basin (Planning Area: Sierra and Otero Counties				
08492900	Sacramento River near Sunspot, NM	Real time		
	Peak streamflow	8/14/1984	to	8/19/1989
	Daily streamflow	7/10/1984	to	9/30/1989

SOURCE: U.S. Department of the Interior, U.S. Geological Survey 2005b


Surface Water Subbasins
TriCounty RMPs/EIS
May 2006
Map 2-3
Legend
Surface Management
Bureau of Land Management
Bureau of Reclamation
Department of Agriculture
Department of Defense - Public Land Withdrawn for Military Use
Department of Defense - Private Military-Acquired Land
U.S. Forest Service
U.S. Fish and Wildlife Service
American Indian Reservation
National Park Service
Private
State
Surface Water
Surface Water Subbasins
General Reference
Planning Area
County Boundaries
Water Bodies
Rio Grande
Interstate Highway
U.S. Highway
State Highway
Military Range, National Park Service, and U.S. Fish and Wildlife Service Boundaries
Elephant Butte
Jornada del Muerto
Caballo
Jornada Draw
Tularosa
Mimbres
El Paso-Las Cruces-Rio Grande
Salt
Elephant Butte Reservoir
Caballo Reservoir
Alamosa Creek
Cuchillo Negro Creek
Las Animas Creek
Berrenda Creek
Rio Grande
Three Rivers
Indian Creek
Gila National Forest
Cibola National Forest
Lincoln National Forest
Mescalero Apache American Indian Reservation
White Sands Missile Range
White Sands National Monument
Holloman Air Force Base
San Andres National Wildlife Refuge
Jornada Experimental Range
NMSU Rangeland Research Center
Dona Ana Range
McGregor Range
Sierra County
Otero County
Dona Ana County
Monticello
Winston
Cuchillo
Truth or Consequences
Engle
Hillsboro
Lake Valley
Hatch
Dona Ana
Las Cruces
Mesilla
Mesquite
Anthony
Alamogordo
Cloudcroft
Mayhill
Timberon
Pinon
Orogrande
Mescalero
Pedro Armendariz Grant #33
NEW MEXICO
TEXAS
MEXICO
El Paso Urban Area
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
0 5 10 20 Miles
0 10 20 40 Kilometers
Location in New Mexico
Colorado
Utah
Arizona
Texas
Mexico
Las Cruces Field Office Boundary
TriCounty RMPs/EIS Planning Area
Data Source:
Water Resources: BLM 2005
Surface Management Information: BLM 2005
National Hydrography Dataset, USGS, USEPA 2000
Texas GLO 2005
No warranty is made by the Bureau of Land Management (BLM) for the use of this map for purposes not intended by BLM, or to the accuracy, reliability, or completeness of the information shown. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.
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P:\BLM\Tri-County_RMP\GIS\plots\AMS\SurfaceWater.pdf

El Paso-Las Cruces Rio Grande Subbasin (USGS Cataloging Unit 13030102) - This watershed includes the New Mexico portion of the drainage to the Rio Grande from Caballo Dam at Caballo Lake to the City of El Paso, Texas, south of Anthony, New Mexico (refer to Map 2-3). Only the western half of the watershed is in New Mexico. This watershed includes a higher percentage of public land included in the Decision Area than any other in the Planning Area. The watershed boundary extends from the dam due west to the crest of the Mimbres Mountains, then southeast and east to the Sierra de Las Uvas. Major ephemeral streams entering this reach of the Rio Grande include Arroyo Jaralosa and Tierra Blanca Creek. From Sierra de Las Uvas, the boundary follows a topographically diffuse line south to the West Potrillo Mountains, Mt. Riley, and the East Potrillo Mountains. There are no real integrated stream systems in this part of the Planning Area. On the east side of the Rio Grande, the watershed boundary follows the crest of the Franklin, Organ, and Doña Ana Mountains north from El Paso and along a topographically indistinct line over to the southern terminus of the Caballo Mountains and Caballo Dam. Again, there are few integrated drainages. Many of the arroyos that impinge upon the Las Cruces and El Paso metropolitan areas are intercepted by flood-control structures and routed, by way of conveyance channels, to the Rio Grande.

There are two stream-gaging stations in this watershed (refer to Table 2-10). Station 08363600, Las Cruces Arroyo near Las Cruces, records both daily and peak stream flow. One other station, at Caballo Dam (08362500), also records peak and daily flows on the Rio Grande, in addition to water quality samples. BLM administers five flood control dams (Alameda Arroyo Dam, Las Uvas Dams Nos. 1, 4, 5, and 6) in the subbasin.

Mimbres Subbasin (USGS Cataloging Unit 13030202) - Very little of this watershed is included within the Planning Area. However, it includes a large amount of the public land in western Doña Ana County (refer to Map 2-3). The watershed includes all of the land between the western boundary of the Rio Grande watershed and the western boundary of Doña Ana County, including the far side of the Potrillo Mountains. It also includes the southern boundary of Sierra County, including Nutt Mountain. However, the drainage in this part of the watershed is not at all integrated and all streams in it are ephemeral. There are no USGS stream gaging stations in this part of the Planning Area.

Jornada Del Muerto Subbasin (USGS Cataloging Unit 13020210) - This catchment is similar to the Mimbres watershed, with no integrated drainage and no stream gages (refer to Map 2-3). There are several large blocks of public land in Sierra County that are part of Jornada del Muerto, between the Pedro Armendaris Grant and White Sands Missile Range. The boundary between the Jornada del Muerto and Elephant Butte watersheds follows a topographically indistinct line east of the Fra Cristobal Range. The San Andres Mountains form the eastern boundary and the two boundaries converge close to Rhodes Canyon. There are no stream-gaging stations in the watershed.

Jornada Draw (USGS Cataloging Unit 13030103) - The Jornada Draw subbasin is located immediately south of the Jornada Del Muerto Subbasin and is another closed basin with no regularly flowing streams (refer to Map 2-3). Jornada Draw runs from near Engle to a point near Gram, where it loses any topographic distinction. The boundaries of the subbasin are the Caballo Mountains and Hogue Hills on

the west and the San Andres Mountains on the east. On the south, it is cut off from the Rio Grande by the Doña Ana Mountains. There are no stream-gaging stations in this subbasin.

Elephant Butte Subbasin (USGS Cataloging Unit 13020211) - This watershed includes the northern part of Sierra County draining to the Rio Grande, from Elephant Butte Dam north to the county line (refer to Map 2-3). The southern boundary runs from the Fra Cristobal Range, across the dam to the Cuchillo Mountains between Cuchillo and Alamosa Creeks, ending at the Continental Divide, northwest of Chloride. The subbasin is bounded by a very small part of the Upper Gila watershed which, due to the absence of public land, has not been described in this AMS.

In addition to the Rio Grande, both Alamosa and Cuchillo Creeks are well-defined drainages in this subbasin. A very small section of the perennial reach of Alamosa Creek in included in the Planning Area. There is only one USGS stream-gaging station (08359500) in the Planning Area, on the Rio Grande at the upper end of the reservoir and it only records daily streamflow (refer to Table 2-10).

Caballo Subbasin (USGS Cataloging Unit 13030101) - This watershed supplies water for Caballo Reservoir and the Rio Grande River (refer to Map 2-3). There are a number of fairly long creeks within the watershed, extending from the Rio Grande back to the western boundary along the crest of the Black Range, including Cuchillo, Palomas, and Percha Creeks; however, all are ephemeral. The eastern margin of the watershed runs from the Caballo Mountains northeast along an indistinct divide with Jornada Draw.

The only real-time stream gaging station on the Rio Grande is located below Elephant Butte Dam (08361000) (refer to Table 2-10). This station records daily and peak flows and is a water quality station. Both this station and the one below Caballo Dam are accounting points for the delivery of water under the Rio Grande Compact, which is administered by the Bureau of Reclamation.

Tularosa Subbasin (USGS Cataloging Unit 13050003) - The Tularosa Valley is the largest watershed in Sierra and Otero Counties, despite its extreme paucity of running surface water. There is no outlet to the basin and no integrating drainage. What significant volume of surface water leaves the watershed either infiltrates to groundwater, evaporates, or transpires from plants.

The boundaries of the watershed include, on the west, the San Andres, Organ, and Franklin Mountains from the Socorro County line to El Paso. On the east, the basin is bounded by the Sacramento Mountains, from the Lincoln County line to Otero Mesa and then the Mesa escarpment south to Texas. Sierra Blanca Peak provides a reentrant, where the Rio Hondo subbasin protrudes west. Thanks to the orographic effects of Sierra Blanca, this is the only area to receive significant snowmelt run-off, although most of it heads into the eastern watersheds.

There are five USGS stream-gaging stations in the basin (refer to Table 2-10), including a real-time station on Tularosa Creek, near the village of Bent (08481500). All have both peak and daily records, with water quality stations also at Tularosa Creek (08481500), Tularosa Valley (08486250, 08486260), and Salt Creek (08484500).

Salt Subbasin (USGS Cataloging Unit 13050004) - Only a small part of the Salt Subbasin is included in New Mexico in Otero County; most of it extends south into Texas (refer to Map 2-3). It is another very dry, closed-basin, non-integrated topographic depression, where evaporative and infiltration losses predominate over stream flow. All of the streams in this subbasin are ephemeral except for the upper reaches of the Sacramento River; however, the Sacramento River is mostly ephemeral and loses all topographic distinction on the back side of Otero Mesa.

The Sacramento Mountains and topographic extension of them to the southeast and Guadalupe Mountains form the eastern boundary of the basin. The western boundary with the Tularosa Valley is defined by Otero Mesa. There is only one USGS stream-gaging station in the Salt Subbasin, on the Sacramento River near the village of Sunspot where both peak and daily discharge is measured (refer to Table 2-10).

Surface Water Quality

Water quality within these subbasins has been assessed by the NMED on a biennial schedule as part of the State of New Mexico 305(b) report to the U.S. Congress (King 2004). The NMED divides the Planning Area into a somewhat different series of regions because of requirements of the program and report [305(b) report], to develop a list of water-quality-impaired waters of the U.S. These are waters that are not currently attaining water-quality standards and will require future remedial and/or regulatory actions, including a TMDL for the offending pollutant. More discussion of this subject can be found in Chapter 6.

There are parts of five NMED surface-water-quality basins in the Planning Areas, including the Southwestern Closed, Lower Rio Grande, Central Closed, Gila River, and Pecos River Basins. The Gila River and Pecos River Basins include only small portions of the Planning Areas that contain no public land and will not be discussed further. The Southwestern Closed Basin has no streams monitored by NMED or EPA and also will not be discussed in detail (though brief mention is made in the section on Groundwater Quality).

Within the Lower Rio Grande water-quality basin, there are several lakes and streams that NMED and EPA monitor and a few among those that may have water-quality problems (Table 2-11). Assessment of water quality within the basin indicates that the Rio Grande between Las Cruces and the Texas border (Mimbres RMP Planning Area) has exceeded water-quality standards for fecal coliform and has been placed on the 303(d) list for future assessment and establishment of a TMDL of bacteria. Indications are that the current load is due to urban sources, including pet wastes and septic systems; livestock grazing also has been cited as a cause by NMED (King 2004). However, the use of these surface waters for livestock watering has not been assessed.

On the Caballo and Elephant Butte reaches of the Rio Grande, both reservoirs currently are not attaining water-quality standards for concentration of mercury in fish tissues. This is a national problem as mercury deposition has been attributed to atmospheric sources as a result of air quality degradation. However, mining in the watershed also could be a significant source of aquatic mercury. The source of mercury will not be known until the TMDL study is completed. Percha Creek also is impaired for its designated use because of excess sediment. The source is listed as unknown, which may mean that natural erosive

processes are responsible. However, NMED has indicated that causes will be examined as possible contributors to sedimentation in the TMDL study (King 2004).

The Central Closed Basin, as defined by the NMED 205(b) report (King 2004), can be divided into the Tularosa Valley, west of U.S. Highway 180, and the Salt Basin, from U.S. 180 east to the Otero County line. The Salt Basin has no waters listed as impaired (King 2004). In the Tularosa Valley, two streams may create consequences requiring management decisions. Three Rivers, from the Lincoln National Forest to U.S. Highway 54, is not attaining its designated use as fish habitat due to specific conductivity (dissolved salts) and temperature. The cause is listed in King (2004) as grazing; however, the increase in stream temperatures caused by riparian canopy loss is known to both elevate temperature elsewhere in the West (Cushing and Allen 2001). Tularosa Creek, between Tularosa and the Mescalero Apache Reservation, also is listed as impaired for use as a fishery; however, the reason is given as "unknown."

Trends

In this section ground- and surface-water quality and quantity trends will be examined relative to the indicators and management decisions applicable to the public lands of the Planning Area.

Surface Water Quantity

The major river supplying surface water within the Planning Area, the Rio Grande, is entirely controlled by the operation of Elephant Butte and Caballo Dams by the Bureau of Reclamation. These operational schedules are, in turn, governed by the Rio Grande Compact and the obligation of the Federal and New Mexico State government to deliver water to the State of Texas. In addition, the Treaty of 1906 between the United States and Mexico further limits the quantity of available surface water from the Rio Grande below the dams. Thus, there are no natural trends in surface-water supply from the river and there are no deliberate management decisions by BLM that can reduce the flow in the river without impact on these treaties.

Away from the river, surface-water quantity has been strongly influenced by the regional drought experienced by the entire southwestern United States. There is some suggestion that southern New Mexico may be entering an extended period of lowered precipitation because of changes in circulation in the Pacific Ocean. Study of the Pacific Decadal Oscillation is an area of active research that might have applications to the climate of the arid Southwest (Mantua, et al. 1997). The Pacific Decadal Oscillation research has produced a numerical climate index based on sea surface temperatures in the North Pacific. In general, there is a correlation of drought with negative Pacific Decadal Oscillation values, which has been the case since 2000.

It appears that surface-water statistics are supporting a drought trend. Several years of below-normal precipitation and runoff have drawn the two Rio Grande reservoirs (Elephant Butte and Caballo) down considerably and despite a brief respite in the spring of 2005, additional depletions occurred in 2005. For example, the August mean discharge at the San Marciel gage above Elephant Butte reservoir was 110 cfs, almost identical to the 5-year average of 106 cfs and four times less than the 50-year mean value (USDI, USGS 2005b).

Table 2-11
Applicable Portions of the New Mexico 303(d) List of Impaired Waters

Listed Stream Reach	Livestock Watering	Wildlife Habitat	Warmwater Fishery	Limited Warmwater Fishery	High Quality Coldwater Fishery	Coldwater Fishery	Marginal Coldwater Fishery	Industrial Water Supply	Domestic Water Supply	Primary Contact	Secondary Contact	Irrigation	Fish Culture	Probable Causes of Impairment	Probable Sources of Impairment
HUC: 13030102 El Paso-Las Cruces															
Rio Grande (Texas border to Leasburg Dam)	NA	FS		FS							NS	FS		fecal coliform	urbanization, grazing, pet wastes, CAFOs, septic systems
All others not in Planning Area or fully supportive															
HUC: 13030202 Mimbres															
None in Planning Area															
HUC: 13050003 Tularosa Valley															
Three Rivers (Perennial HWY 54 to U.S. Forest Service)	NA	FS			NS				FS		NA	FS		specific conductivity, temperature	grazing and unknown
Tularosa Creek (Tularosa to Mescalero Apache bnd)	NA					NS		FS				FS	FS	unknown	unknown
All others not in Planning Area or fully supportive															
HUC: 13050004 Salt Basin															
All fully supportive or not assessed															
HUC: 13020211 Elephant Butte Reservoir															
Elephant Butte Reservoir	FS	FS	NS							FS		FS		mercury	air deposition, unknown
All others not in Planning Area or fully supportive															
HUC: 13030101 Caballo															
Caballo Reservoir	FS	FS	NS							FS		FS		mercury	air deposition, unknown
Percha Creek (Perennial reaches Caballo R to M Fork)	NA	FS	NS				NS				NA	FS	FS	sediments	unknown
All others not in Planning Area or fully supportive															

SOURCE: King 2004
NOTES: NA = not assessed; FS = fully supportive of designated use; NS = mot supportive of designated use. Only waters that are nonsupportive are listed here

Other parts of the Planning Area are less easy to judge; however, it is clear that lower quantities of surface water are following in the wake of the regional drought. The towns of Carrizozo, Tularosa, and the City of Alamogordo have historically relied upon surface water exiting the perennial streams of the Sacramento Mountains and Sierra Blanca. All have had to look elsewhere for future supplies. USGS stream gaging records for Tularosa Creek over the past ten years and indicate a 30 percent decline in discharge during this time (USDI, USGS 2005b).

The villages of Timberon and Orogrande rely on water piped from surface diversions on the Sacramento River. The amount of water held in the Sacramento Lake has diminished significantly in recent years (South Central Mountain RC&D Council 2002).

Summing up, the current trend for surface water quantity in the Planning Area is for declining supplies, at least over the short term (10 years), putting pressure on public land managers to increase runoff to area streams and reservoirs.

Surface Water Quality

The surface water quality of the rural parts of the Planning Area is reasonably good and the trend has been to improve the protection of water bodies from point and nonpoint source pollution over the last 10 to 20 years resulting in a subsequent improvement in surface water quality. Primarily this has been through vigorous enforcement of the Clean Water Act; however, the implementation of the State nonpoint source protection plan, including BLM's duties under it, has also improved the water quality of lakes and streams. Most recently, the adoption of the Standards for Public Land Health and Guidelines for Livestock Grazing Management have provided a state-of-the-art methodology for monitoring and assessing water quality impairment due to excess siltation and sedimentation. In the urban area of Las Cruces, surface water quality has shown a less positive trend. Increased urbanization, conversion of rangeland to suburbs, and development of more roads have increased runoff of storm water and decreased infiltration to shallow groundwater. This trend, mixed with increased litter, pet wastes, and other urban pollutants, have caused higher concentrations of bacteria to be routed to rivers, such as the Rio Grande. This scenario is posed to explain the exceedances in bacteriological pollutants (fecal coliform and E. coli) that have led to a TMDL scheduled for the Rio Grande, downstream of Las Cruces.

The surface water body in the Planning Area potentially most influenced by public land management is the Rio Grande, which according to the New Mexico 303(d) list of impaired waters is not meeting water quality standards with respect to fecal coliform. The listed sources of impairment are long and include livestock grazing. However, elsewhere on the Rio Grande, it has been shown that a significant emergent source of this contaminant is the transformation of undisturbed or rural land uses to developed urban or suburban land. Thus it can be expected that the State would view the disposal of public land and subsequent development as increasing the bacteriological load to the river.

The TMDL will likely use the trend of urbanization in the Planning Area as one metric to project increases in pollution of the Rio Grande. This has been the procedure in the Albuquerque Basin, where similar loss of open range has resulted in increased urban and suburban land uses and similar increases in the bacteriological load to the river over the last 20 years.

In summary, while the trend in rural surface water quality appears to be improving, the negative trend in urban and suburban surface water quality might increasingly be a factor in public land management decisions.

Forecast

The conditions most likely to impact future land use planning are the expected long-term drought (applied to increased urbanization in the Mesilla Valley and other municipal regions) and the increasing competition for the scarce water resources of the Planning Area.

Surface Water Quantity

Competition for Rio Grande water for agriculture, domestic uses, industrial uses, and habitat will most certainly continue into the future. While urbanization may add water to the river as stormwater runoff, the poor quality of the water may cause increased treatment costs and other limiting factors to become critical. Public land managers will be asked to work with regional agencies to conserve and enhance surface water quantity in the Rio Grande.

In the other streams of the Planning Area, protection of in-stream flow and recharge to groundwater will result in additional pressure on land managers to develop innovative approaches. The use of surface water in the eastern Tularosa Valley, both directly and as recharge to fresh water shallow aquifers, will become greater, with consequent requirements on the adjacent public land.

Surface Water Quality

The primary forecast for surface-water quality involves the increased need to protect the Rio Grande from additional bacterial loads. Since increasing bacterial load would most likely come from urbanization of existing public land, land managers could be asked by NMED and EPA to restrict land-tenure adjustments to limit residential development and preserve existing rural or open-space uses.

Elsewhere in the Planning Area, surface-water quality should be maintained or improved over time, at least on the public lands, as the Standards and Guidelines become better implemented and erosion on the range and loss of riparian communities become less problematic. Surface-water contamination by pesticides also might become less of a problem as better methods of integrated pest control become more widespread.

2.1.6.3 Key Features

Key features for water and watersheds would be the following:

Sierra County

- Alamosa Creek, Cuchillo Negro Creek, and Las Animas Creek.

Otero County

- Streams flowing into the eastern side of the Tularosa Valley that are used for municipal and domestic water supplies and that receive runoff from public land.
- Percha Creek, Tularosa Creek, and Three Rivers.
- Managers should consider impacts of nonpoint-source pollution in land use decisions.

Doña Ana County

- The Rio Grande reach and major tributaries flowing through and below the Las Cruces metropolitan area and receiving runoff from public land or land anticipated to be part of tenure adjustments.
- Berrenda Creek and various springs, including Hackler, Minehouse, Cleophus, Aguirre, Tellis, Middle, Lapointe, and 5 unnamed springs.
- In land tenure adjustments, managers should consider the potentiality that increased urbanization and its effects on water quality could result in a nonattainment status for the Rio Grande.

2.1.7 Vegetative Communities

2.1.7.1 Community Characterization Background

The information used to characterize current conditions within Sierra, Otero, and Doña Ana Counties was obtained from the following three information sources: (1) NRCS Major Land Resource Areas (MLRAs) descriptions (as included in USDI, BLM 2000a), (2) ecological site descriptions (USDA, NRCS 2005), and (3) land cover information derived from the Southwest Region Gap Analysis Project (SWReGAP) data (USDI, USGS 2004a). The MLRAs provide a coarse-scale description of the vegetation and habitat found within the project area and are included below; this information has be excerpted from the New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management (New Mexico Standards and Guidelines) (USDI, BLM 2001a). Ecological site descriptions, described in Section 2.1.7.2, provide more detailed information on vegetation within the MLRAs (based on a general association of these two datasets). The SWReGAP data has been aggregated using the National Landcover Dataset Classification (NLDC) system (USDI, USGS 2004a, b), developed in collaboration with NatureServe (2003) to represent the U.S. National Vegetation Classification system. The NLDC system combines finer-scale units defined by the USNVC to provide the basis for interpreting coarse-scale ecological systems more practically. The U.S. National Vegetation Classification categories are further combined into Natural Land Cover Types (NLCT) for coarse-scale analysis, for which NLDC Classifications would be impractical. The following discussion integrates these data sets in order to most accurately describe the current condition and trend of vegetation, as they relate to both the Planning Area and Decision Area.

2.1.7.2 MLRA/Ecological Sites/ReGAP Integration

Plant communities are variable systems, both in space and time, with dynamic interrelationships associated with environmental changes (Barbour et al. 1999). Based on this dynamic nature, it is common to identify multiple vegetative communities or ecological sites with the NLCT dataset (Tausch et al. 1993). Therefore, the vegetation models (and resulting data) have been integrated in order to get the most in-depth description of the vegetation communities, while identifying the general ecological sites these communities may occupy as they cross over community thresholds and transition through various states of succession (Barbour et al. 1999; Johnson and Mayeux 1992; and Friedel 1991). Table 2-12 identifies the dominant ecological sites (which are based on soils, landforms, and precipitation) and NLCT communities present within each MLRA. While these data sets do not overlap exactly, the relationships are based on a 90 percent association, i.e., the NLCT communities listed are found within the ecological sites that they are listed under 90 percent of the time or greater. Both the NLCT and ecological sites are ranked within each MLRA by frequency of occurrence. Those at the top have a greater frequency of occurrence within the MLRA or ecological site than those below.

Table 2-12
MLRA Associated with Ecological Sites and Natural Land Cover Type Communities

MLRA	Ecological Site[a]	NLCT Community
New Mexico and Arizona Plateaus and Mesas	hills (10”-16” and 12”-16”)	NLCD Evergreen Forest
		NLCD Grassland/Herbaceous
		NLCD Shrub/Scrub
	breaks (9”-14” and 12”-16”)	NLCD Grassland/Herbaceous
		NLCD Evergreen Forest
	gravelly (10”-16” and 12”-16”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
	loamy (9”-14” and 10”-16”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
		NLCD Barren Lands
	clayey (9”-14”;10”-16”; and 12”-16”)	NLCD Grassland/Herbaceous
		NLCD Shrub/Scrub
	bottomland (10”-16” and 12”-16”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
		NLCD Barren Lands
	sandy (9”-14” and 12”-16”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
Southern Desertic Basins, Plains, and Mountains	gravelly (8”-10”;10”-13”; and 12”-14”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
	loamy (8”-10”;10”-13”; and 12”-14”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
		NLCD Barren Lands
	sandy (8”-10” and 10”-13”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
	limestone hills (8”-10” and 10”-13”)	NLCD Grassland/Herbaceous
		NLCD Shrub/Scrub
	gravelly sand (8”-10”;10'-13”; and 12”-14”)	NLCD Shrub/Scrub

MLRA	Ecological Site[a]	NLCT Community
		NLCD Grassland/Herbaceous
	shallow sandy (8”-10”;10”-13”; and 12”-14”)	NLCD Grassland/Herbaceous
		NLCD Shrub/Scrub
		NLCD Barren Lands
	draw (8”-10”;10”-13”; and 12”-14”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
	gravelly loam (10”-13”; and 12”-14”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
	bottomland (8”-10”;10”-13”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
		NLCD Barren Lands
	gyp upland (8”-10” and 10”-13”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
		NLCD Barren Lands
	deep sand (8”-10” and 10”-13”)	NLCD Shrub/Scrub
		NLCD Barren Lands
	shallow (10”-13”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
	clayey (8”-10”;10”-13”; and 12”-14”)	NLCD Grassland/Herbaceous
		NLCD Shrub/Scrub
	malpais (8”-10”)	NLCD Grassland/Herbaceous
		NLCD Barren Lands
	gyp hills (8”-10”and 10”-13”)	NLCD Grassland/Herbaceous
		NLCD Shrub/Scrub
	salt flats (8”-10”)	NLCD Shrub/Scrub
		NLCD Barren Lands
		NLCD Grassland/Herbaceous
	limy (8”-10”;10”-13”; and 12”-14”)	NLCD Grassland/Herbaceous
		NLCD Shrub/Scrub
		NLCD Barren Lands
Pecos-Canadian Plains and Valleys	limestone hills (13”-16” high and 13”-18”)	NLCD Grassland/Herbaceous
		NLCD Shrub/Scrub
	shallow loamy (13”-18”)	NLCD Grassland/Herbaceous
		NLCD Evergreen Forest
	loamy (13”-16” low and 13”-16” high)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
		NLCD Barren Lands
	shallow (13”-16” low and 13”-18”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
	gravelly (13”-16” low, 13”-16” high, and 13”-18”)	NLCD Shrub/Scrub
		NLCD Grassland/Herbaceous
	swale (13”-16” low and 14”-16”)	NLCD Grassland/Herbaceous
		NLCD Shrub/Scrub
		NLCD Barren Lands

SOURCES: U.S. Department of Agriculture, Natural Resource Conservation Service 2005; U.S. Department of the Interior, Bureau of Land Management 2000a; U.S. Department of the Interior, U.S. Geological Survey 2004a

NOTES: MLRA = Major Land Resource Area
NLCT = Natural Land Cover Type
NLCD = National Landcover Dataset Classification
[a] The number in parenthesis identifies the affective precipitation zone associated with the site. Affective precipitation is the amount of moisture available for use by plants, and is not the total precipitation. In cases where precipitation values are the same, elevation differences will be included, i.e. high or low.

2.1.7.3 Current Conditions

Major Land Resource Areas

MLRAs found within the Planning Area classify nearly homogeneous areas in terms of land use, elevation, topography, climate, water resources, potential natural vegetation, and soils. These coarse-scale descriptions of the Planning Area are based upon aggregations of geographically associated areas derived from New Mexico state soil geographic database map unit boundaries, and include the known plant community types that could potentially occur (USDI, BLM 2000a). The smaller units derived from soils data are commonly referred to as ecological site descriptions (USDA, NRCS 2005). A large number of ecological site descriptions occur within the Planning Area; however, only the dominant ecological sites occurring within the Decision Area are described in this section.

There are four MLRAs identified within the Planning Area: New Mexico and Arizona Plateaus and Mesas; Arizona and New Mexico Mountains; Southern Desertic Basins, Plains, and Mountains; and Pecos-Canadian Plains and Valleys (USDI, BLM 2000a). The Southern Desertic Basins, Plains, and Mountains is the dominant MLRA in all three counties. The counties in which each of these MLRAs occurs are identified in Table 2-13. All four MLRAs also are found within the Decision Area. However, the Arizona and New Mexico Mountains MLRA occupies only approximately 19,000 acres (less than 1 percent) of the Decision Area; therefore, it will not be referenced in discussions associated with the Decision Area. A description of each MLRA in the Planning Area is found following Table 2-13.

Table 2-13
Major Land Resource Areas by County

Major Land Resource Area	Acres by County		
	Sierra	Otero	Doña Ana
New Mexico and Arizona Plateaus and Mesas	353,271	0	0
Arizona and New Mexico Mountains	395,826	999,996	0
Southern Desertic Basins, Plains, and Mountains	1,702,884	2,380,150	2,183,792
Pecos-Canadian Plains and Valleys	254,740	846,224	244,448

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2000a

New Mexico and Arizona Plateaus and Mesas

The elevation of this MLRA ranges from 4,500 to 7,000 feet above mean sea level, with isolated mountains above 8,000 feet. These plateaus and mesas are gently sloping; however, precipitous slopes are located along edges of mesas and valley walls. Average annual precipitation is between 10 and 14 inches, but higher elevations may receive more. Roughly two-thirds of the precipitation falls from mid-summer to early autumn, with the average annual temperature ranging from 48 to 54 degrees Fahrenheit (˚ F). The average freeze period is between 120 and 180 days. Water is generally scarce due to low precipitation levels and sparse stream flows. A small amount of water is available for irrigation along the major streams that flow into the area from surrounding mountains. Most of the soils are Argids and Orthents. They are well drained and fine textured to medium textured with a mesic temperature regime, an aridic moisture regime, and mixed mineralogy.

The most abundant NRCS ecological sites found within the New Mexico and Arizona Plateaus and Mesas inside the Decision Area are identified in Table 2-12.

Historic Climax Community – Most of this MLRA is composed of grassland vegetation, including: Indian ricegrass (*Achnatherum hymenoides*), blue grama (*Bouteloua gracilis*), dropseed (*Sporobolus* spp.), and galleta (*Pleuraphisjamesii*) as the most common species. Alkali sacaton (*Sporobolus airoides*), fourwing saltbrush (*Atriplex canescens*), winterfat (*Krascheninnikovia ceratoides*) and rabbitbrush (*Chrysothamnus* spp.) grow in the valleys between the mesas. Piñon-juniper woodland (*Pinus cembroides* and *Juniperus* spp., respectively) occurs at the higher elevations and also on shallow soils and escarpments. The understory include western wheatgrass (*Pascopyrum smithii*), galleta, sideoats grama (*Bouteloua curtipendula*), and in some places, big sagebrush (*Artemisia tridentata*).

Arizona and New Mexico Mountains

In most places, elevation ranges from 4,600 to 7,900 feet with a maximum height of about 12,500 feet. This area is largely mountainous with steep canyons dissecting an upland plateau. The average annual precipitation ranges from approximately 11-35 inches, increasing with elevation. Average annual temperature is between 40-60˚ F. In forested areas at higher elevations, the average temperature is 45˚ F, and 50˚ F at lower elevations. Average freeze-free period ranges from less than 70 days at higher elevations, to 170 days at lower elevations, averaging about 115 days. This MLRA supplies most of the water for the adjoining irrigated land. Because more than half of the precipitation occurs in winter, there is a general deficiency of moisture during the growing season. Several of the larger streams and a few of their larger tributaries maintain a yearlong flow. Much of the water is stored in reservoirs near or below the southern edge of the area and is used for irrigation and municipal water supplies. Small natural and artificial lakes at higher elevations are used for fishing and other recreation. Annual runoff into reservoirs is highly variable, and most of the smaller lakes and reservoirs are dry in some years. Ground water is generally limited due to the depth of the water table from the surface. Dominant soils include Borolls, Boralfs, and Ustolls, Ustalfs, and Orthents, and Orthids. They have a cyric, frigid, or mesic temperature regime, depending mainly on elevation.

The dominant NRCS ecological sites found within the Arizona and New Mexico Mountains have not been identified in Table 2-12 based on the limited number of acres of this MLRA within the Decision Area. However, as a general note, the few ecological sites within this MLRA in Sierra County have similar characteristics to those in the New Mexico and Arizona Plateaus and Mesas, and those in Otero County are similar to the Pecos-Canadian Plains and Valleys ecological sites.

Historic Climax Community – This MLRA is composed of alpine vegetation, conifer forests, chaparral, and grasses due to the broad range in elevation. Such cushion plants as moss campion (*Silene acaulis*), kobresia (*Kobresia* spp.), alpine timothy (*Phleum alpinum*), and many low growing forbs occur above timberline. Aspen grows on sites that have not been disturbed by past fires. The understory includes Thurber's fescue (*Festuca thurberi*), brome (*Bromus* spp.), bluegrass (*Poa* spp.), mountain muhly (*Muhlenbergia montana*), Arizona fescue (*Festuca arizonica*), lupine species (*Lupinus* spp.), aspen peavine (*Lathyrus laetivirens*), penstemon species (*Penstemon* spp.), and various daisies (*Asteracea* family). The majority of the area consists of a ponderosa pine (*Pinus ponderosa*) forest. Common

understory plants include bromes (*Bromus* spp.), Junegrass (*Koeleria* spp.), pine dropseed (*Blepharoneuron tricholepis*), wheatgrass (*Agropyron* spp.), mountain muhly, blue grama, sedges, and snowberry (*Symphoricarpos* spp.). Piñon-juniper woodland is found at elevations below 6,900 feet. The understory includes blue grama, tobosa (*Pleuraphis mutica*), sideoats grama, and western wheatgrass. Below elevations of about 6,000 feet, turbinella oak (*Quercus* spp.), mountain mahogany (*Cercocarpus* spp.), holly leaf buckthorn (*Rhamnus crocea*), ceanothus (*Ceanothus* spp.), and manzanita (*Arctostaphylos* spp.) grow along with sideoats grama, blue grama, Junegrass, and muttongrass (*Poa fendleriana*), squirreltail (*Elymus elymoides*), and bluegrasses (*Poa* spp.).

Southern Desertic Basins, Plains, and Mountains

Elevations within this MLRA range from 2,600 to 5,000 feet in basins and valleys, and more than 7,800 feet in the tallest mountains. Broad desert basins and valleys are bordered by gently sloping to strongly sloping fans and terraces. Steep north-south trending mountain ranges and many small mesas occur in the western portion of the MLRA. Average annual precipitation ranges from 8-14 inches. Most precipitation occurs from mid-spring to mid-autumn. Average annual temperature is between 55-65˚ F. An average freeze-free period from 200 to 240 days occurs in most of the area but only 180 days are freeze-free in the northern ends of the Rio Grande and Pecos River valleys. The Rio Grande and Pecos Rivers and a few of their larger tributaries are the only perennial streams. Water for irrigation generally is obtained from these rivers or from wells. Groundwater in deep basin fill provides water for domestic use, wildlife, and livestock, and in places for some irrigation. Most of the soils are Argids and Orthids. They are well drained and medium textured and have a thermic temperature regime, aridic moisture regime, and mixed or carbonatic mineralogy.

The dominant NRCS ecological sites found within the Southern Desertic Basins, Plains, and Mountains inside the Decision Area are identified in Table 2-12.

Historic Climax Community – This MLRA is composed of desert grass-shrub vegetation. Giant dropseed (*Sporobolus giganteus*) and mesa dropseed (*Sporobolus flexuosus*), along with scattered shrubs such as sand sagebrush (*Artemisia filifolia*) and yuccas (*Yucca* spp.), grow on the sandier soils. Creosotebush (*Larreatridentata*), tarbush (*Flourensia cernua*), and catclaw (*Acacia* spp.) are generally found on gravelly, calcareous foot slopes. Giant sacaton (*Sporobolus wrightii*), vine mesquite (*Panicum obtusum*), desert willow (*Chilopsis* spp.), brickellbush (*Brickellia* spp.), and mesquite (*Prosopis* spp.) grow in drainageways and depressions. Juniper, piñon pine , scattered ponderosa pine, and Douglas fir (*Pseudotsuga menziesii*) occur on upper mountain slopes.

Pecos-Canadian Plains and Valleys

This MLRA generally occurs on eastern slopes of the high mesas in the north, and are covered by forest vegetation, although total forested area is small relative to the overall size of the Planning Area. Elevation ranges from 4,000 to 6,900 feet, increasing gradually from southeast to northwest, but reaches 7,900 feet on a few mesas and mountains. Most of these dissected high plains are gently sloping to rolling, but bands of steep slopes and rough broken land border the stream valleys. A few isolated mountains, mesas, and canyon walls have steep to very steep slopes. Valley floors are mostly narrow and cut by stream channels.

Average annual precipitation is between 12 and 16 inches, but it fluctuates widely from year to year. Maximum precipitation is from late spring to early autumn. The average annual temperature ranges from 50 to 60˚ F, and the average freeze-free period are between 135 to 200 days, decreasing from southeast to northwest. Water is scarce throughout the area because of the low and erratic precipitation and the few perennial streams. Ground water in deep sand and gravel in the north and limestone in the southern two-thirds of the area provides water for domestic use, wildlife, livestock, and locally for irrigation. Ground water is scarce in areas where shale and sandstone are near the surface. Most of the soils are Orthids, Argids, and Ustolls. They are well drained and moderately fine textured to moderately coarse textured and have mixed mineralogy. In the north and west, these soils have a mesic temperature regime and in the south and east a thermic temperature regime. They have an ustic or aridic moisture regime.

The dominant NRCS ecological sites found within the Pecos-Canadian Plains and Valleys inside the Decision Area are identified in Table 2-12.

History Climax Community – This MLRA is composed of plains grassland vegetation that is dominated by short and mid-grasses. Blue grama is the dominant species. Western wheatgrass is associated with blue grama in the northern part of the area, while lesser amounts of blue grama in association with black grama (*Bouteloua eriopoda*), galleta, New Mexico feathergrass (*Hesperostipa neomexicana*), and a variety of shrubs, half shrubs, and forbs characterize the southern part. Scattered juniper and piñon pine with an understory of sideoats grama, squirreltail, and western wheatgrass grow on shallow soils and in escarpments. Ponderosa pine grows on the north and east slopes of the high mesas.

National Landcover Dataset Classification

While the MLRA model uses a soils-up approach to identify and describe potential vegetative communities and habitat, the SWReGAP data uses canopy cover and reflectance values in a vegetation-down approach to map and assess current vegetative communities (USDI, USGS 2004a). Since the SWReGAP data set emphasizes the vegetative communities more so than the MLRA data set, and provides greater detail describing the different plant communities, it has been used to a greater extent in order to describe the overall vegetation composition within the Planning and Decision Areas.

There are 11 NLCTs including seven natural vegetation types and four non-vegetation types in the TriCounty Planning Area. Non-vegetation cover types are included because they have direct and indirect effects on adjacent vegetation types. The dominant cover type in all three counties is Shrub/Scrub and Grassland/Herbaceous (combined these cover approximately 75 percent). However, a large segment of the northeast and northwest portion of the Planning Area is also composed of Evergreen Forest (17 percent). The Decision area has considerably fewer forested communities and is dominated by Shrub/Scrub and Grassland/Herbaceous to a greater extent than the Planning Area (approximately 91 percent). The distribution of these and other cover types are shown on Map 2-4. The cover types, associated vegetation classifications, and their acreages for each county are shown in Table 2-14 below.

Table 2-14
Community Types and Vegetation Classifications by County in the TriCounty Planning Area

Community Types/ Vegetation Classifications	Acres By County		
	Sierra	Otero	Doña Ana
NLCD Evergreen Forest	580,786	923,289	58,644
NLCD Deciduous Forest-Total	26,473	5,837	0
NLCD Scrub-Total	936,214	1,589,882	1,537,553
NLCD Grassland/Herbaceous	983,062	1,368,741	563,891
NLCD Woody Wetland-Total	18,944	22,972	8,699
NLCD Emergent Herbaceous Wetland-Total	562	223	225
NLCD Mixed Forest-Total	0	25	0
NLCD Barren Lands-Total	114,384	293,101	128,523
Developed and Agriculture-Total	13,924	25,540	139,617
Altered or Disturbed-Total	35,705	6,557	3,227
Open Water	33,512	574	3,227
Total	**2,743,566**	**4,236,741**	**2,443,606**

SOURCES: NatureServe 2003; U.S. Department of the Interior, U.S. Geological Survey 2004a, b

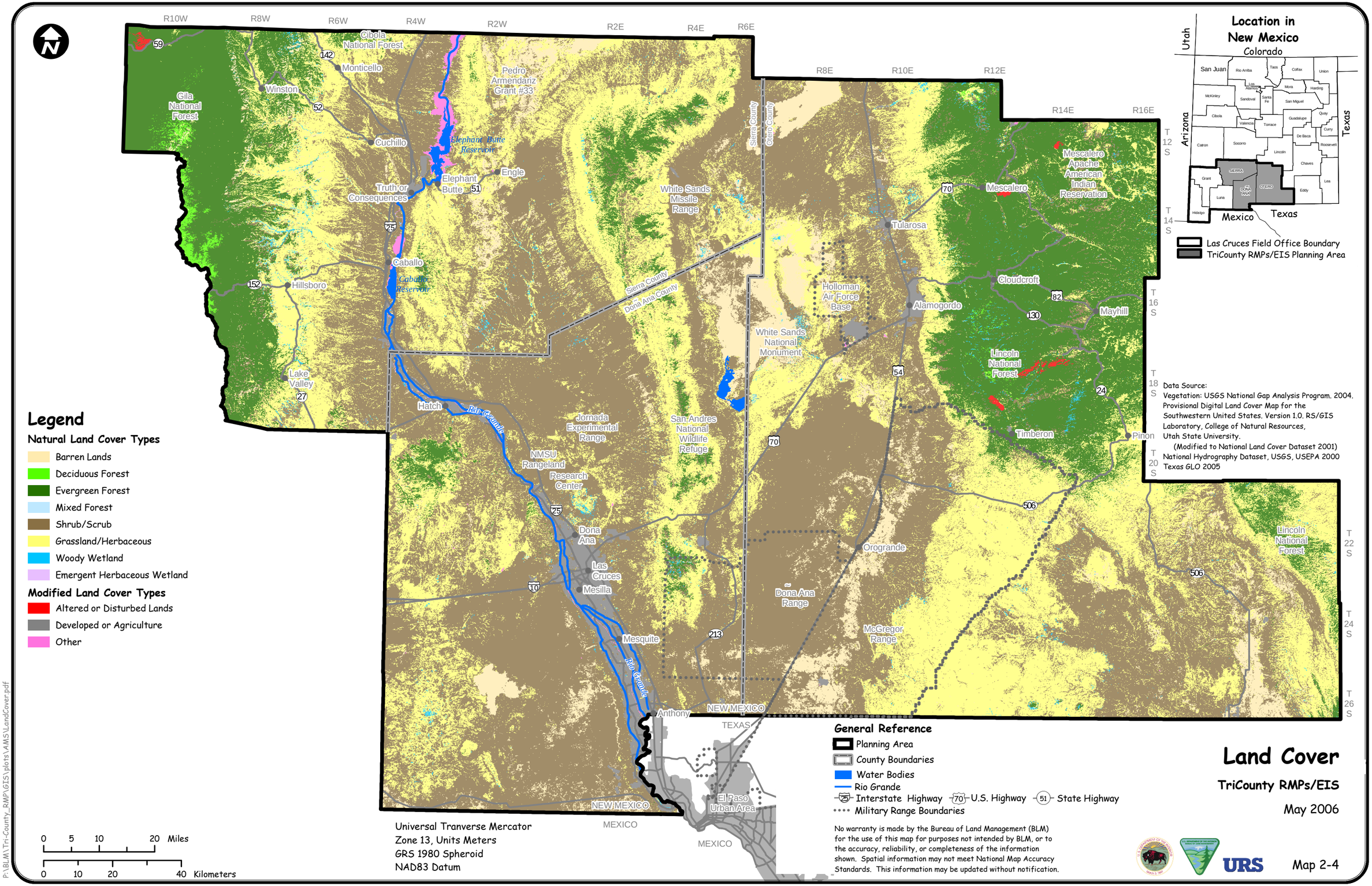
Evergreen Forests

This cover type occupies approximately 580,786 within Sierra County, 923,289 within Otero County, and 58,644 within Doña Ana County. It is the third largest coverage within the Planning Area, approximately 1.6 million acres (17 percent), and the fourth largest in the Decision Area, approximately 90,600 acres (3 percent). It has the largest elevation range within the planning area, from 3,800 feet to 12,000 feet. These areas receive variable annual precipitation, and are generally differentiated by aspect, elevation, and soil moisture, texture, and depth. An expanded description of the vegetation classifications associated within this community type is found in Appendix A. These areas are made up of upland forests, woodlands, and savannas. Woodland areas can be further grouped into: Mixed conifer, Pinyon-Juniper, Pine-oak, Ponderosa pine, Lodgepole pine, and Madrean Encinal. The understory can range from a dense matrix of shrub and herbaceous layers to a sparse monoculture or bare ground, depending on the site characteristics and use. These sites provide forage and cover for numerous wildlife species, and are a dominant habitat type for the many wildlife species within the Planning Area.

Of the 1.6 million acres of this cover type within the Planning Area, it is primarily managed by the U.S. Forest Service (46 percent), the Mescalero Apache Indian Reservation (23 percent), BLM (6 percent), the Department of Defense (DOD) (6 percent), and the State of New Mexico (4 percent). Private ownership accounts for approximately 15 percent of the total (refer to Map 2-4 and Map 2-21).

Deciduous Forests

This cover type occupies approximately 26,473 within Sierra County and 5,837 within Otero County. It is the fourth smallest coverage within the Planning Area, approximately 32,000 acres (0.3 percent), and no presence in the Decision Area. There are no deciduous forest types within Doña Ana County as well. It is normally found at higher elevations (>5,000 feet) within the planning area. These areas usually receive the most consistent annual precipitation, generally in the form of snow pack and seasonal rain, and are limited to areas with adequate soil moisture. An expanded description of the vegetation classifications associated within this community type) is found in Appendix A. These areas are generally made up of upland forests and woodlands dominated by non-evergreen tree species and with large canopy covers.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Monticello
Winston
Gila National Forest
Cuchillo
Pedro Armendariz Grant #33
Elephant Butte Reservoir
Elephant Butte
Engle
Truth or Consequences
Caballo
Caballo Reservoir
Hillsboro
Lake Valley
Hatch
Rio Grande
Jornada Experimental Range
NMSU Rangeland Research Center
Dona Ana
Las Cruces
Mesilla
Mesquite
Anthony
NEW MEXICO
TEXAS
MEXICO
El Paso Urban Area
White Sands Missile Range
Sierra County
Otero County
Dona Ana County
White Sands National Monument
San Andres National Wildlife Refuge
Holloman Air Force Base
Tularosa
Alamogordo
Mescalero
Mescalero Apache American Indian Reservation
Cloudcroft
Mayhill
Lincoln National Forest
Timberon
Pinon
Orogrande
Dona Ana Range
McGregor Range
Location in New Mexico
Utah
Colorado
Arizona
Texas
Mexico
Las Cruces Field Office Boundary
TriCounty RMPs/EIS Planning Area
Data Source:
Vegetation: USGS National Gap Analysis Program. 2004. Provisional Digital Land Cover Map for the Southwestern United States. Version 1.0. RS/GIS Laboratory, College of Natural Resources, Utah State University.
(Modified to National Land Cover Dataset 2001)
National Hydrography Dataset, USGS, USEPA 2000
Texas GLO 2005
Legend
Natural Land Cover Types
Barren Lands
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Woody Wetland
Emergent Herbaceous Wetland
Modified Land Cover Types
Altered or Disturbed Lands
Developed or Agriculture
Other
General Reference
Planning Area
County Boundaries
Water Bodies
Rio Grande
Interstate Highway
U.S. Highway
State Highway
Military Range Boundaries
No warranty is made by the Bureau of Land Management (BLM) for the use of this map for purposes not intended by BLM, or to the accuracy, reliability, or completeness of the information shown. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
0 5 10 20 Miles
0 10 20 40 Kilometers
Land Cover
TriCounty RMPs/EIS
May 2006
URS
Map 2-4
P:\BLM\Tri-County_RMP\GIS\plots\AMS\LandCover.pdf

The understory is normally a matrix of shrubs and herbaceous layers, both dense and sparse depending on the site characteristics and use. These sites can provide forage and cover for wildlife species, but based on the limited number of acres throughout the Planning Area the amount of forage and cover provided by this cover type would be minimal.

Of the 32,000 acres within the Planning Area, this community type is primarily managed by the U.S. Forest Service (95 percent) and the Mescalero Apache Indian Reservation (4 percent). The remaining 1 percent is under private ownership. The BLM currently has no management responsibilities associated with this community type (refer to Map 2-4 and Map 2-21).

Scrub

This cover type occupies approximately 936,214 within Sierra County, 1,589,882 within Otero County, and 1,537,553 acres within Doña Ana County. It is the largest coverage within the Planning Area, approximately 4.1 million acres (43 percent), and the largest in the Decision Area, approximately 1.9 million acres (55 percent). Scrub and shrub areas are normally found at mid to low elevations (3,800 feet to 7,800 feet) within the Planning Area. These areas are usually drier, with limited annual precipitation, generally in the form of spring and fall rain. These areas are commonly associated with more xeric, coarser-texture substratus such as limestone, basalt, or alluvium, and can range from shallow rocky alkaline, to deep sandy loam. An expanded description of the vegetation classifications associated within this community type is found in Appendix A. These areas typically occur on dry flats and plains, alluvial fans, rolling hills, mesas, upper bajadas, rocky hillslopes, saddles, and ridges. They are normally open-canopy sites with herbaceous grass or forbs understories. The density of the understory varies depending on the site characteristics and use. These sites provide forage and cover for wildlife species, but not to the extent of forested systems.

Of the 4.1 million acres within the Planning Area, this community type is primarily managed by the BLM (46 percent), the DOD (25 percent), and the State of Mexico (12 percent). Private ownership accounts for approximately 11 percent of the total (Map 2-4 and Map 2-21).

Grassland/Herbaceous

Currently, this cover type occupies approximately 983, 062 within Sierra County, 1,368,563 acres within Otero County, and 563,891 acres within Doña Ana County. It is the second largest coverage within the Planning Area, approximately 2.9 million acres (31 percent), and the second largest in the Decision Area, approximately 1.3 million acres (36 percent). Grassland/herbaceous types are normally found at lower elevations (3,800 feet to 7,600 feet) within the planning area. These areas are usually associated with more arid climates on low mountain slopes, gently sloping bajada, rolling hills, plateaus, mesas, swales, playas, alluvial flats, basins, and flats. Soils are generally, though not always, sedimentary and range from poorly infiltrating shallow claypans to well-drained sandy or loamy-textured sites that are deep. High variation in amount and timing of precipitation impacts the relative cover of cool- and warm-season herbaceous species. An expanded description of the vegetation classifications associated within this community type is found in Appendix A. These sites are typically dominated by graminoides with an

open shrub or juniper layer. The density of graminoides on the site varies depending on the site characteristics and use.

Of the 2.9 million acres within the Planning Area, this community type is primarily managed by the BLM (43 percent), the DOD (19 percent), the State of Mexico (11 percent), and the U.S. Forest Service (4 percent). Private ownership accounts for approximately 18 percent of the total (Map 2-4 and Map 2-21).

Woody Wetland

This cover type occupies approximately 18,944 acres within Sierra County, 22,972 acres within Otero County, and 8,699 acres within Doña Ana County. It is one of the smallest coverage within the Planning Area, approximately 49,000 acres (less than 1 percent), and the Decision Area, approximately 11,800 acres (less than 1 percent). Woody wetland cover types can be found at a wide range of elevations (from 3,800 up to 10,500 feet) within the Planning Area. These areas are usually associated with perennial and seasonally intermittent streams in canyons, desert valleys, arroyos that dissect bajadas, mesas, plains, and basin floors. However, these sites can also be found in areas with less developed flood plains that are subject to intermittent flooding. An expanded description of the vegetation classifications associated within this community type is found in Appendix A. Vegetation within these sites is variable, ranging from sparse and patchy to dense, but normally consists of mixed riparian woodlands and shrublands. Vegetation typically is found along the banks, but may occur within the channel. These communities are generally tolerant of periodic flooding and high water tables. These sites often have large diversity of species due to the consistent presence of water; therefore, they provide habitat for a broad range of wildlife.

Of the 49,000 acres within the Planning Area, this community type is primarily managed by the BLM (24 percent), the U.S. Forest Service (11 percent), the State of Mexico (11 percent), the Mescalero Apache Indian Reservation (10 percent), the DOD (9 percent), and the National Park Service (NPS) (5 percent). Private ownership accounts for greatest portion of this community type with approximately 29 percent of the total (Map 2-4 and Map 2-21).

Emergent Herbaceous Wetland

This cover type occupies approximately 562 acres within Sierra County, 223 acres within Otero County, and 225 acres within Doña Ana County. It is one of the smallest coverage within the Planning Area, approximately 980 acres (less than 1 percent), and the Decision Area, approximately 130 acres (less than 1 percent). Emergent herbaceous Wetland cover types can be found at a wide range of elevations within the planning area. These areas are usually surrounded by savanna, shrub steepe, grass steepe, or desert vegetation. Natural marshes may occur in depressions in the landscape (ponds, kettle ponds), as fringes around lakes, and along slow-flowing streams and rivers. These sites are frequently or continually inundated with water up to depths of two meters. These levels may be stable or fluctuate up to one meter over the growing season. Soils are typically mineral, result from long-periods of anabolic conditions, but can accumulate organic material. An expanded description of the vegetation classifications associated within this community type) is found in Appendix A. Herbaceous plants adapted to saturated soils

generally characterize vegetation. These sites often have large diversity of species due to the consistent presence of water; therefore, they provide habitat for a broad range of wildlife.

Of the 980 acres within the Planning Area, this community type is primarily managed by the DOD (16 percent), the BLM (13 percent), the Bureau of Reclamation (BOR) (12 percent), and the State of Mexico (9 percent). Private ownership accounts for greatest portion of this community type with approximately 45 percent of the total (Map 2-4 and Map 2-21).

Mixed Forest

This cover type is only found in Otero County and occupies approximately 25 acres. Based on the limited number of acres identified under this category and the relative scarcity throughout the region, this community type would have little or no affect on other resources or resource uses within the Decision Area. An expanded description of the vegetation classification associated within this community type is found in Appendix A.

Barren Lands

Barren lands are naturally occurring areas that are relatively devoid of vegetation, such as sand dunes, cinder lands, playas, rocky outcrops, etc. This cover type occupies approximately 114,384 acres within Sierra County, 293,101 acres within Otero County, and 128,523 acres within Doña Ana County. It is the fourth largest coverage within the Planning Area, approximately 523,000 acres (6 percent), and the third largest in the Decision Area, approximately 197,000 acres (6 percent).

Of the 523,000 acres within the Planning Area, this community type is primarily managed by the BLM (38 percent), the DOD (28 percent), the NPS (11 percent), and the State of Mexico (6 percent). Private ownership of this community type accounts for approximately 16 percent of the total (Map 2-4 and Map 2-21). An expanded description of the classifications associated within this community type is found in Appendix A.

Agriculture and Developed Lands

These cover types occupy approximately 13,925 acres within Sierra County, 25,540 acres within Otero County, and 139,617 acres within Doña Ana County. It is the fifth largest coverage within the Planning Area, approximately 178,000 acres (2 percent), but one of the smallest in the Decision Area, approximately 3,800 acres (less than 1 percent). Management programs associated with these community types would likely emphasize recreation, livestock grazing, or some other consumptive use based on historic uses.

Of the 178,000 acres within the Planning Area, privately owned lands account for greatest portion of these areas with approximately 92 percent of the total. Other owners or surface managers include the Department of Defense (4 percent), BLM (2 percent), and State of Mexico (2 percent). Expanded descriptions of the classifications associated within these community types are found in Appendix A.

Altered or Disturbed Lands

Altered or disturbed lands include areas where natural conditions do not occur, but the area is not cultivated or developed, such as recently burned areas. This cover type generally changes at a greater rate than the other cover types. It currently occupies approximately 35,705 acres within Sierra County, 6,557 acres within Otero County, and 3,227 acres within Doña Ana County. It is the second smallest coverage within the Planning Area, approximately 8,200 acres (less than 1 percent), and is not found within in the Decision Area and would likely have little or no affect on management programs. An expanded description of the classifications associated within this community type is found in Appendix A.

Open Water

Areas associated with open water that generally have less than 25 percent cover of vegetation or soil. This cover types occupies approximately 33,512 acres within Sierra County, 574 acres within Otero County, and 3,227 acres within Doña Ana County.

Noxious and Invasive Species

The establishment and spread of invasive species can directly affect vegetation by increasing the overall competition with native species for limited resources (water, nutrients, space, etc.), limiting the capacity of native or desirable communities to reestablish (Laycock and Conrad 1981). Over time, invasive species also can alter the structural and functional components of a system, i.e., soil structure/function, hydrologic function, fire return intervals, energy flow, etc. severely enough that reestablishment of native or desirable species is not feasible (Barbour et al. 1999; West 1993).

Noxious weeds are non-native plants that have been designated “noxious” by state law because of their potential harm to the State economy, generally associated with agriculture and livestock. Under the New Mexico Noxious Weed Act of 1963 “noxious weeds" are identified as, “any species of plant, which is liable to be detrimental or destructive, and difficult to control or eradicate.” Based on the comprehensive noxious weed inventory that was conducted by New Mexico State University (NMSU), 21 noxious weed species in 146 distinct populations have been identified by the Las Cruces District Office and (Table 2-15). Common locations for noxious weed infestations in the TriCounty region include roadsides and areas that are highly disturbed or degraded.

Table 2-15
Noxious Weeds Present (by Species) in Sierra, Otero, and Doña Ana Counties

Noxious Plant Species		Noxious Species Present		
Common Name	**Scientific Name**	**Sierra**	**Otero**	**Doña Ana**
Russian Knapweed	*Acroptilon repens*	X	X	X
Jointed Goatgrass	*Aegilops cylindrica*		X	X
Camelthorn	*Alhagi maurorum*	X		X
Onionweed	*Asphodelus fistulosis*		X	X
Whitetop	*Cardaria draba*	X	X	X
Musk Thistle	*Carduus nutans*		X	
Spotted Knapweed	*Centaurea stoebe*		X	
Purple Starthistle	*Centaurea calcitrapa*		X	
Malta Starthistle	*Centaurea melitensis*	X	X	X
Canada Thistle	*Cirsium arvense*		X	

Noxious Plant Species		Noxious Species Present		
Bull Thistle	*Cirsium vulgare*		X	
Poison Hemlock	*Conium malculatum*		X	
Field Bindweed	*Convovulus arvensis*	X	X	X
Teasel	*Dispacus fullonum*		X	
Russian Olive	*Elaeagnus angustifolia*	X	X	X
Leafy Spurge	*Euphorbia esula*		X	
Perennial Pepperweed	*Lepidium latifolium*	X		X
Eurasian Watermilfoil	*Myrophyllum spicatum*	X		
African Rue	*Peganum harmala*	X	X	X
Saltcedar	*Tamarix spp.*	X	X	X
Siberian Elm	*Ulmus pumila*	X	X	X

SOURCES: New Mexico State University 2005 , Renz 2005; U.S. Department of Agriculture, Natural Resources Conservation Service 2006
NOTE: X = noxious weed present in this county

2.1.7.4 Indicators

Public Land Health

BLM is committed to ecosystem and interdisciplinary resource management. Consequently, in 1995, State directors were required by the Department of the Interior final rule for Grazing Administration to develop State or regional standards and guidelines for grazing administration. These were to be developed in consultation with numerous cooperators including the public. The result for New Mexico was the "New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management."

Although the standards and guidelines were developed specifically for grazing administration, as developed for New Mexico, they have applications that are broader than just grazing administration. They are also standards for public land health and are intended for incorporation into BLM's management goals and objectives.

Standards consist of goals for the desired condition of biological and physical components and characteristics of public land that are measurable and attainable. They also must comply with Federal and State statues, policies, and directives applicable to BLM public lands. Guidelines are management approaches, methods, and practices that are intended to achieve a standard. Guidelines share the following characteristics: (1) they typically identify and prescribe methods of influencing or controlling specific public land uses, (2) they are developed and applied consistent with the desired condition and within site capability, and (3) they may be adjusted over time. There are three standards, described below:

Standard 1

Upland Sites Standard – Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type, climate, and landform. The kind, amount, and/or pattern of vegetation provide protection on a given site to minimize erosion and assist in meeting State and Tribal water quality standards.

Standard 2

Biotic Communities Standard (Includes Native, Endangered, Threatened, and Special Status Species) – Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities. Desired plant community goals include maintaining and conserving productive and diverse populations of plants and animals within the capability of the ecological site, which sustain ecological functions and processes.

Standard 3

Riparian Sites Standard – Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide for groundwater recharge, provide habitat and assist in meeting State and Tribal water quality Standards.

The standards listed above represent the conditions that BLM is to strive for in their planning and management of the land, resources, and their uses. However, regular measurement of the parameters that determine and/or describe the standards throughout the Planning Area is cost prohibitive, and may not be possible. Though the Planning Area is large, compiling the necessary information to assess the condition of blocks of land could be completed every few years. Because the rate of change in arid communities is generally relatively slow, conducting such surveys would allow managers to observe alteration before the changes become extreme.

Noxious Weeds

A second indicator for the vegetation in the TriCounty Planning Area is the presence, abundance, and distribution of the noxious weeds. Native vegetation is at risk from the introduction of invasive, nonnative species, including noxious weeds. A weed (defined as a plant that interferes with the management objectives of a given area of land at a given time) generally is considered to be noxious if it is exotic (nonnative), and negatively impacts agriculture, navigation, fish, wildlife, or public health. Most invasive species are opportunistic, and have specific adaptations that allow them to quickly invade disturbed areas and out-compete native species. Additional weed species are regulated by the Federal government and may not be transported without specific permit. The appearance of an invasive or noxious weed species in a natural area where it did not previously occur, or the spread of existing invasive species within or between natural areas, are indicators that native vegetation and wildlife habitat is at risk and management action must be taken.

2.1.7.5 Trends

Public Land and Health

Due to limited past monitoring of the health and condition of the rangeland, and the recent implementation of the Standards and Guidelines, trend information related to the indicators identified is not readily available. However, BLM historically has conducted district-wide monitoring annually on selected allotments in an effort to quantitatively and qualitatively characterize the overall condition and production of vegetation. The number of allotments monitored each year varies. Monitoring and

inventory data are aggregated annually and compared with historical data to analyze the general condition of vegetation over time in an effort to characterize the overall trend. According to the information provided in the annual Rangeland Inventory, Monitoring, and Evaluation Report in the Las Cruces District Office, approximately 18 percent of the acres monitored are in an upward trend (making progress toward the potential natural community), 65 percent are static, and 17 percent are in a downward trend (shifting away from the potential natural community) for the years 2001 through 2005. These figures are based on data collected at established sites within the Las Cruces District Office. We estimate that is a similar trend within the Planning Area.

Noxious Weeds

The trend for noxious weed abundance and distribution is difficult to assess because the only comprehensive data for noxious weed occurrence was collected in 2003 and is based on presence/absence, providing little abundance data. However, a general understanding of the nature of the noxious weed issue in the southwestern deserts can be interpolated to the Planning Area. Noxious weeds continue to expand their distribution by a variety of mechanisms, and often the mechanism is associated with human activity and soil disturbance. Abundance of most of the species results from the ability of the species to out-compete local native species for water or other resources.

2.1.7.6 Forecast

Public Land Health

Forecasts of public land health would depend on comprehensive baseline data and good trend data over a long period of time, combined with expected weather conditions. As noted above, trend information associated with public land health is not readily available due to limited past monitoring; therefore, forecasts cannot be made. A forecast of a maintenance or improvement of public land health would require a stable or improving trend, properly implemented management actions based on monitoring results and sufficient precipitation to allow vegetation to respond after being disturbed. BLM will continue to collect monitoring data, similar to historical efforts and in accordance with the Standards and Guidelines. These data will be analyzed and used to make management decisions. Future trends in vegetation would be dependent on a number of changing environmental variables as well as management direction.

Noxious Weeds

The forecast for the noxious weeds in the TriCounty Planning Area varies by species because of the variety of natural strategies each species possesses for survival. In some instances the plant is relatively widespread but responds to management actions to control it if implemented consistently over time. Other species currently cannot be controlled with current established methods, so preventing their initial establishment is the only means of managing them.

Based on current weed management for both invasive and noxious species, BLM is likely to continue individual and cooperative efforts to inventory the extent and location of existing populations, and to control and/or prevent new infestations where possible. However, as the amount and types of human uses

increase, so does the potential for the spread and establishment of invasive and noxious weed species. Therefore, unless management and control measures are intensified to address increased land uses, it is likely that invasive and noxious weed species could proliferate throughout the Planning Area.

2.1.8 Fish, Wildlife, and Habitat

This section describes the indicators, current condition, trends, forecasts, and key features for fish, wildlife, and habitat in the Planning and Decision Areas. The data supporting the discussion of wildlife resources was obtained primarily from BLM, New Mexico Department of Game and Fish (NMDGF), and other Federal agencies. The extent to which fish, wildlife, and habitat within the Planning Area are discussed is largely dependent on the availability of existing data.

2.1.8.1 Indicators

Several indicators were identified for fish, wildlife, and habitat to assess habitat quality and to identify and monitor specific issues at the landscape level, rather than on a species-by-species approach. These indicators include the following:

- BLM Standard Habitat Sites (SHSs)
- Land cover types
- NMDGF Comprehensive Wildlife Conservation Strategy key habitats

The SHS system was designed by the BLM to assist in accumulating, storing, retrieving, and analyzing data on wildlife, vegetation, and other ecosystem determinants as they relate to wildlife resources. The BLM-based SHSs are used as indicators because they provide the best available data on current condition, trends, and forecasts of fish, wildlife, and habitat. However, SHS data are only available for the Decision Area (Map 2-5). For that reason, land cover types (derived from the SWReGAP) are used to supplement SHS data, particularly for those regions of the Planning Area not covered by SHS data. Land cover types are good indicators of wildlife habitat because they represent habitat requirements for a broad range of species. Furthermore, it is a more efficient use of agency resources to monitor changes in land covers and extrapolate these changes to a broad range of wildlife and fish species. Finally, the key habitats identified in the NMDGF Comprehensive Wildlife Conservation Strategy (CWCS) for New Mexico, which is based upon SWReGAP vegetation classifications (NMDGF 2005a), is included out of a desire on the part of BLM to identify cooperative and collaborative approaches with the NMDGF to addressing important wildlife and habitat conservation needs. Table 2-16 summarizes the association of SHSs, land-cover types, and key habitats. The association of SHSs, land cover types, and CWCS key habitats is based on similarities in vegetation.

Table 2-16
Association of SHSs, land cover types, and key habitats

Standard Habitat Site	Land Cover Type	CWCS Key Habitat
Arroyo	Woody Wetland/ Emergent Herbaceous Wetland	Riparian
Creosote Breaks	Scrub	Not identified

Standard Habitat Site	Land Cover Type	CWCS Key Habitat
Creosote Hill	Scrub	Not identified
Creosote Rolling Upland	Scrub	Not identified
Grass Flat	Grassland/Herbaceous	Chihuahuan Semi-Desert Grassland
Grass Hill	Grassland/Herbaceous	Chihuahuan Semi-Desert Grassland
Grass Mountain	Grassland/Herbaceous	Chihuahuan Semi-Desert Grassland
Grass Rolling Upland	Grassland/Herbaceous	Chihuahuan Semi-Desert Grassland
Half-Shrub Hill	Grassland/Herbaceous	Chihuahuan Semi-Desert Grassland
Half-Shrub Rolling Upland	Grassland/Herbaceous	Chihuahuan Semi-Desert Grassland
Malpais-Rock/Lava	Barren	Not identified.
Mesquite Rolling Upland	Scrub	Chihuahuan Semi-Desert Grassland/
Mesquite Sand Dune	Barren	Not identified
Mixed Shrub Hill	Scrub	Not identified
Mixed Shrub Rolling Upland	Scrub	Not identified
Piñon-Juniper Grass Mountain	Forest/Woodland	Madrean Encinal Madrean Pine-Oak Conifer-Oak Forest and Woodland
Riparian	Wetland	Riparian
Salt Flat	Barren	Not identified

SOURCE: USDI, BLM, 2005 Surface Management Information: RGIS, 2002 National Hydrography Dataset, U.S. Geological Survey, U.S. Environmental Protection Agency, 2000 Texas GLO, 2005. National Landcover Dataset Classification System 2003. NMDGF CWCS 2005a.

2.1.8.2 Current Conditions

The discussion of current conditions describes the location, extent, and current condition of fish, wildlife, and habitat resources in the Planning Area. Indicators discussed above were used to describe the current condition of fish, wildlife, and habitat.

Standard Habitat Sites

BLM has developed SHSs to categorize wildlife habitat according to commonality of vegetation present, landforms, and soil types. SHSs data is limited to the Decision Area. Eighteen SHSs have been identified in the Decision Area (Table 2-17; refer to Map 2-5). Table 2-17 summaries the acres of SHSs in the Decision Area.

Table 2-17
Acres of Standard Habitat Sites in the Decision Area in Sierra, Otero, and Doña Ana Counties

Standard Habitat Site	Doña Ana County	Otero County	Sierra County
Arroyo	7,561	62	34,302
Creosote Breaks	103,721	0	74,220
Creosote Hill	42,765	5,785	17,943
Creosote Rolling Upland	378,513	385,978	505,749
Grass Flat	35,075	100,864	63,115
Grass Hill	3,320	35,565	4514
Grass Mountain	67,105	142,500	46,203
Grass Rolling Upland	46,549	190,574	111,700
Half-Shrub Hill	0	0	137
Half-Shrub Rolling Upland	119,609	0	41,821
Malpais-Rock/Lava	23,300	0	8,830
Mesquite Rolling Upland	56,197	9,178	24,796
Mesquite Sand Dune	586,540	63,189	75,823

Standard Habitat Site	Doña Ana County	Otero County	Sierra County
Mixed Shrub Hill	11,494	239,359	29,328
Mixed Shrub Rolling Upland	11,523	119,631	34,995
Piñon-Juniper Grass Mountain	0	42,438	36,651
Riparian	3,253	0	5,408
Salt Flat	0	28,905	0
Total	**1,542,782**	**1,395,816**	**1,143,853**

SOURCE: Vegetation: SWA – U.S. Department of the Interior, Bureau of Land Management 2005 Surface Management Information: RGIS, 2002 National Hydrography Dataset, U.S. Geological Survey, U.S. Environmental Protection Agency 2000 Texas GLO, 2005

A determination of the current conditions of SHSs is based on three sources: (1) Environmental Statement of Potential Ecosystem Changes on Standard Habitat Sites (American Ag International [AAI] 1979), (2) White Sands Resource Area Management Situation Analysis (USDI, BLM 1984a), and (3) Mimbres Resource Area Management Situation Analysis (USDI, BLM 1990a). SHSs were sampled for plant and vertebrated species for the Environmental Statement of Potential Ecosystem Changes on Standard Habitat Sites (AAI 1979). Inventories were conducted for the White Sands Resource Area Management Situation Analysis (USDI, BLM 1984a) for Otero and Sierra Counties. The Mimbres Resources Area Management Situation Analysis (USDI, BLM 1990a) summarized wildlife resources for Doña Ana, Luna, Hidalgo, and Grant Counties. Table 2-18 summarizes the ecological condition of each SHS (within Sierra and Otero Counties and extrapolated for Doña Ana County). Descriptions of the SHSs are provided following Table 2-18 (refer to Map 2-5).

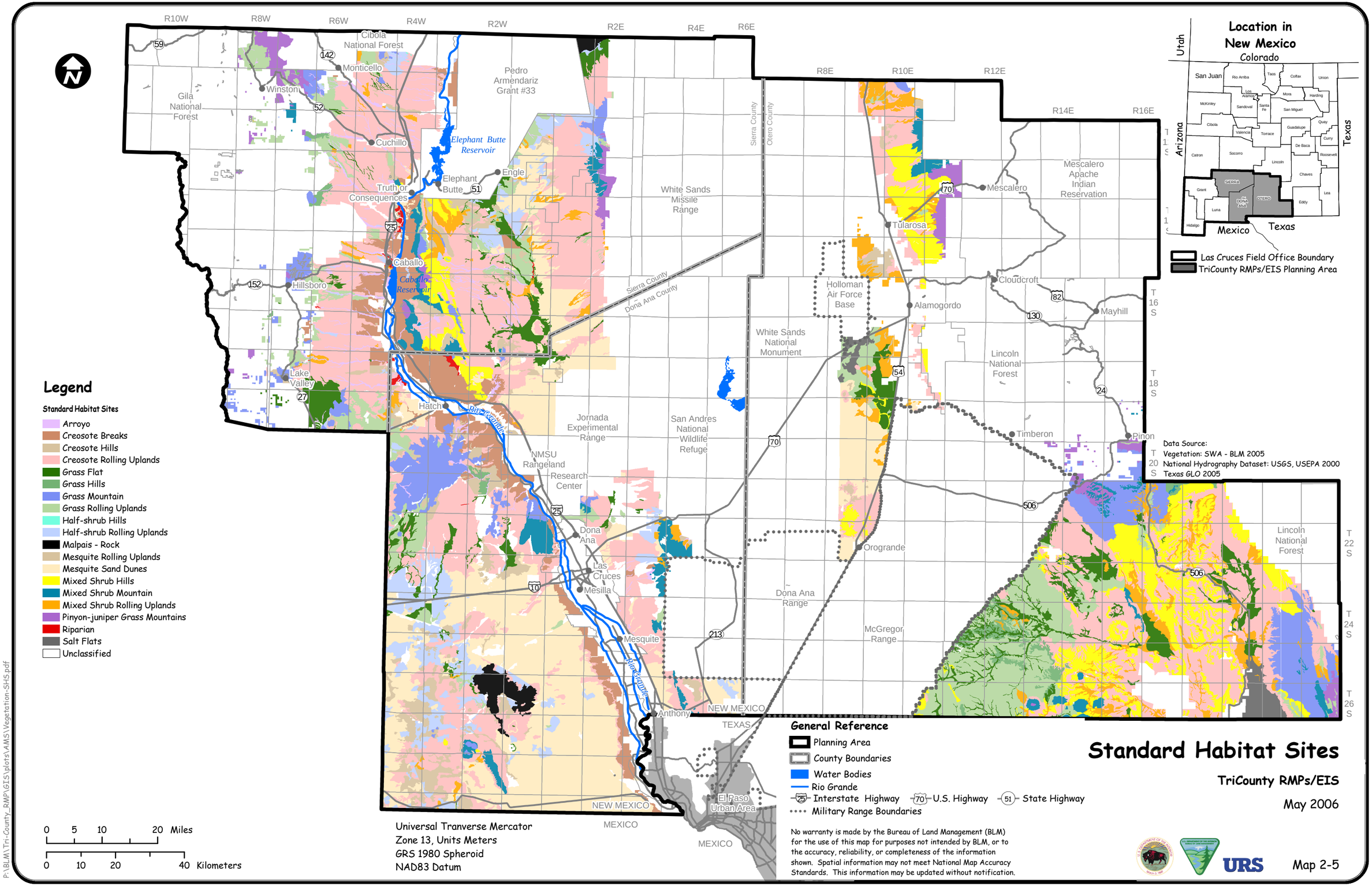
Table 2-18
Ecological Condition of Standard Habitat Sites in the Decision Area
(Sierra and Otero Counties)

Standard Habitat Site	Percent Poor	Percent Fair	Percent Good
Arroyo	18	33	49
Creosote Breaks	Not identified		
Creosote Hill	88	12	0
Creosote Rolling Upland	68	23	7
Grass Flat	53	19	38
Grass Hill	2	72	27
Grass Mountain	38	32	28
Grass Rolling Upland	14	83	3
Half-Shrub Hill	Not identified		
Half-Shrub Rolling Upland	Not identified		
Malpais-Rock/Lava	Not identified		
Mesquite Rolling Upland	86	14	0
Mesquite Sand Dune	99	0	0
Mixed Shrub Hill	9	60	31
Mixed Shrub Rolling Upland	63	36	1
Piñon-Juniper Grass Mountain	32	64	4
Riparian	6	31	64
Salt Flat	91	9	0

SOURCE: American Ag International 1979, U.S. Department of the Interior, Bureau of Land Management 1984a

Arroyo

This SHS is defined as drainages or arroyos with only brief intermittent water flow supporting vegetation not characteristic of surrounding uplands. Grass and forb species are often sparse. Typical shrub and tree



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species are desert willow (*Chilopsis linearis*), hackberry (*Celtis* spp.), Apache plume (*Fallugia paradoxa*), western soapberry (*Sapindus saponaria*.), saltcedar (*Tamarix spp*.), littleleaf sumac *(Rhus microphylla*), honey mesquite (*Prosopis glandulosa*), ash (*Fraxinus* spp.), and bricklebush (*Brickellia* spp.). Species diversity is low for herptiles and high for birds and mammals (USDI, BLM 1984a).

Arroyo habitats support most or all wildlife species found in surrounding habitats, plus additional species that are restricted to theses habitats (riparian obligates) such as Southwestern willow flycatchers, yellow-billed cuckoos, leopard frogs, and fishes. Riparian habitats support the highest diversity of wildlife species of any SHS. Arroyo habitats are critical for breeding birds and mule deer throughout the Planning Area.

Creosote Breaks

Vegetation in this SHS is dominated by creosotebush (*Larrea tridentata*) found on steep slopes and gravel ridges. This SHS experiences a high degree of soil erosion. Ecological condition and species diversity has not been identified for this SHS.

Typical wildlife species of creosote breaks include Couch's spadefoots, western whiptails, side-blotched lizards, western diamondback rattlesnakes, cactus wrens, Merriam's kangaroo rats, and black-tailed jackrabbits. Because of proximity to the Rio Grande, this is an important wildlife habitat.

Creosote Hill

Vegetative composition is predominantly creosotebush which typically exists with a variety of subdominate species. These include bush muhly (*Muhlenbergia porteri*), burrograss *(Scleropogon brevifolius*), buffalo grass (*Buchloe dactyloides*), broom snakeweed (*Gutierrezia sarothrae*), tarbush (*Flourensia cernua*), and littleleaf sumac. It is similar to the other creosotebush SHSs, but grama grasses (*Bouteloua* spp.) are more prevalent and there is a higher diversity of shrub species, such as mariola (*Parthenium incanum*), spicebush (*Lindera benzoin*), whitethorn acacia (*Acacia constricta*), and four-wing saltbush (*Atriplex canescens*). Bird species diversity for this SHS is low (USDI, BLM 1984a). Species diversity for herptiles and mammals has not been identified.

Typical wildlife species of the creosote hills include red-spotted toads, western diamondback rattlesnakes, black-chinned sparrows, and black-tailed jackrabbits.

Creosote Rolling Upland

Vegetation in this SHS is dominated by creosotebush. Other subdominant species include bush muhly, burrograss, tobosa (*Hilaria mutica*), desertholly (*Atriplex hymenelytra*), broom snakewood, tarbush, and littleleaf sumac. Upland areas are drained by numerous arroyos and consist primarily of eroded soils and gravelly inclusions. Species diversity is moderate for herptiles, birds, and mammals (USDI, BLM 1984a).

Creosote rolling uplands generally exhibit some of the lowest species diversities and densities of any SHS in the Planning Area. Typical wildlife species include side-blotched lizards, Big Bend patch-nosed snakes, black-chinned sparrows, and blac-tailed jackrabbits.

Grass Flat

Grass flats typically occur in low swales and consist primarily of grass species, the dominant being tobosa grass. Other grasses include vine mesquite (*Panicum obtusum*), gramas (*Bouteloua* spp.), muhlys (*Muhlenbergia* spp.), burrograss, dropseeds (*Sporobolus* spp.), and lovegrasses (*Eragrostis* spp.). Some areas are entirely alkali sacaton (*Sporobolus airoides*). Shrub species are found in low numbers with soaptree yucca (*Yucca elata*) being most common along with broom snakeweed, honey mesquite, and allthorn (*Koeberlinia spinosa*). Species diversity is moderate for herptiles, and low for birds and mammals (USDI, BLM 1984a).

Grass flats in good condition can provide excellent wildlife habitat, particularly for ground-nesting and seed-eating birds. Grass flats often support playa lakes that are key breeding habitats for toads and spadefoots, and key wintering areas for shorebirds and waterfowl. Typical wildlife species include coachwhips, western box turtles, horned larks, meadowlarks, Ord's kangaroo rats, silky pocket mice, coachwhips, and pronghorn.

Grass Hill

Grama (*Bouteloua* spp.) and tobosa grasses are the vegetation in this SHS. Forbs are seasonally abundant. Succulents are represented by ocotillo (*Fouquieria splendens*) and yuccas (*Yucca* spp.). Shrub overstory is limited to Apache plume, skunkbush sumac (*Rhus trilobata*), and broom snakewood. Species diversity has not been identified for this SHS.

Typical wildlife species of the grass hills include desert grassland whiptails, mountain patch-nosed snakes, black-tailed rattlesnakes, scaled quail, canyon wrens, rock pocket mice, eastern cottontails, and mule deer.

Grass Mountain

This SHS occurs on slopes of mountain ranges above the surrounding uplands. It typically supports a high percentage of grama grasses (*Bouteloua* spp.) with inclusions of tobosa grass, Kentucky bluegrass (*Poa pratensis*), June grass (*Koeleria cristata*), and bluestems (*Bothriochloa* spp.). Shrubby vegetation is widely scattered and represented by Datil yucca (*Yucca baccata*), Engelmann prickly *pear (Opuntia engelmannii*), mountain mahogany (*Cerococarpus montanus*), ocotillo, oaks (*Quercus* spp.), beargrass (*Nolina* spp.), Apache plume, rabbitbrush (*Chrysothamnus* spp.), and fringed sage (*Artemisia frigida*). Species diversity is moderate for herptiles and mammals, and low for birds (USDI, BLM 1984a).

Typical wildlife species of the grass mountain areas include eastern fence lizards, tree lizards, black-tailed rattlesnakes, mountain patch-nosed snakes, scaled quail, eastern cottontails, and mule deer.

Grass Rolling Upland

This SHS occurs in nonswale or isolated pocket settings with a lower density of grass species than the grass flat SHS. Grama grasses are common along with other grasses such as tobosa grass. Desert shrubs

occur along with perennial forbs. Species diversity is moderate for herptiles, birds, and mammals (USDI, BLM 1984a).

Typical wildlife species of the grass rolling upland include desert grassland whiptails, western box turtles, silky pocket mice, lesser earless lizards, prairie rattlesnakes, gopher snakes, horned larks, lark buntings, western meadowlarks, silky pocket mice, eastern cottontails, and pronghorn.

Half-Shrub Hill

Half-shrub hill SHS occurs on slopes were vegetation is dominated by broom snakeweed, tarbush (*Flourensia cernua*) and other vegetation components such as burrograss (*Scleropogon brevifolius*). The 137-acres of this SHS only occurs in Sierra County. Ecological condition and species diversity has not been identified for this SHS.

Tyical wildlife species of this SHS includes mourning dove, Gambel's quail (*Callipepla gambelii*), desert whiptail and mule deer.

Half-Shrub Rolling Upland

Half-shrub rolling uplands are composed mostly of broom snakeweed with few other shrub components such as mormon tea (*Ephedra spp.*) and soap tree yucca. Sandy soils are dominanted by honey mesquite and scattered grasses including tobosa grass, blue grama (*Bouteloua gracilis*), and bush muhly. Forbs include leatherweed (*Croton pottsii*), globemallow (*Sphaeralcea* spp.), sandmat (*Euphorbia* spp.), and desert daisy (*Bahia absinthifolia*). Ecological condition and species diversity has not been identified for this SHS.

Typical wildlife species of the half-shrub rolling upland include side-blotch lizards, Merriam's kangaroo rats, and black-tailed jackrabbits.

Malpais-Rock/Lava

This SHS is composed of broken and cracked basalt lava beds. Grass is the dominant vegetation of the area. Dominant grass species include grama grasses (*Bouteloua* spp.), tobasa grass and dropseed (*Sporobolus* spp.). Shrubby vegetation is represented by broom snakeweed, Wright's buckwheat (*Eriogonum wrightii*), four-wing saltbush, and littleleaf sumac (*Rhus microphylia*). Ecological condition and species diversity has not been identified for this SHS.

Typical wildlife species of the malpais-rock/lava types include red-spotted toads, tree lizards, checkered whiptails, black-tailed rattlesnakes, canyon wrens, rock wrens, rock pocket mice, cottontails, and mule deer.

Mesquite Rolling Upland

The dominant plant species in this SHS is honey mesquite. Other shrub species associated with mesquite rolling upland include creosotebush, little leaf sumac, soaptree yucca, skunkbush sumac, Morman tea (*Ephedra trifurca*), broom snakeweed, and four-wing saltbush. Tobosa grass is the dominant grass in this

SHS. Vine mesquite, black grama, and bush muhly occur in lesser amounts. Species diversity is moderate for birds and mammals (USDI, BLM 1984a). Species diversity has not been identified for herptiles.

Typical wildlife species of the mesquite rolling upland include western whiptails, coachwhips, common kingsnakes, western diamondback rattlesnakes, Gambel's quail, curve-billed thrashers, Chihuahuan ravens, white-throated woodrats, and black-tailed jackrabbits.

Mesquite Sand Dune

The dominant plant species in this SHS is honey mesquite. Other commonly associated plants include four-wing saltbush, sand sagebrush (*Artemisia filifola*), broom snakeweed, and a variety of annual and perennial forbs. Grasses are typically scarce with mesa dropseed (*Sporobolus flexuosus*) being most common. Dunes vary in height from 2 to 10 feet depending on soil depth. Species diversity is low for herptiles, birds, and mammals (USDI, BLM 1984a).

Typical wildlife species of the mesquite sand dunes include western whiptails, coachwhips, common kingsnakes, western diamondback rattlesnakes, Gambel's quail, curve-billed thrashers, mourning doves, white-throated woodrats, and black-tailed jackrabbits. Exotic oryx have become established in this habitat type, and will be difficult or impossible to extirpate.

Mixed Shrub Hill

Dominant species of this SHS are desert-type shrubs with local occurrence of succulents including yuccas (*Yucca* spp.), beargrass (*Nolina* spp.), and cacti. Typical shrubs are broom snakeweed, honey mesquite, creosotebush, feather dalea (*Dalea formosai*), Wrights lemon verbena (*Alovsia wrightii*), mariola, and tarbush. Clumps of grama grasses (*Bouteloua* spp.) are common. Species diversity is moderate for herptiles, birds, and mammals (USDI, BLM 1984a).

Typical wildlife species of the mixed shrub hills include Great Plains toads, eastern fence lizards, Abert's towhees, rock squirrels, white-throated woodrats, and mule deer.

Mixed Shrub Mountain

Shrub species dominate the vegetation composition of this SHS along with an understory of grama grasses (*Bouteloua* spp.), bush muhly, slim tridens (*Tridens muticus*), and three-awn (*Aristida* spp.). Characteristic shrubs are broom snakeweed, whitethorn acacia, catclaw mimosa (*Mimosa aculeaticarpa*), Apache plume, skunkbush sumac, and mountain mahogany. This SHS is located between surrounding uplands and below the piñon-juniper vegetation community. Species diversity is high for mammals, moderate for herptiles, and low for birds (USDI, BLM 1984a).

Typical wildlife species of the mixed shrub mountain habitat type include tree lizards, Chihuahuan whiptails, Great Plains skinks, rock rattlesnakes, canyon wrens, white-throated swifts, rock squirrels, and mule deer. This is the primary habitat for exotic Barbary sheep in the Las Cruces District.

Mixed Shrub Rolling Upland

Shrub species dominate the vegetation. Characteristic shrubs are broom snakeweed, whitethorn acacia, catclaw acacia (*Acacia greggii*), Apache plume, fragrant sumac (*Rhus aromatica*), Wright's buckwheat, and mountain mahogany. Understory vegetation is composed mostly of grama grasses (*Bouteloua* spp.). The vegetation is similar to mixed shrub mountain species, but has more grasses and less shrub species. Species diversity is moderate for herptiles, birds, and mammals (USDI, BLM 1984a).

Typical wildlife species of the mixed shrub rolling upland include Couch's spadefoots, green toads, western whiptails, Big Bend patch-nosed snakes, cactus wrens, crissal thrashers, eastern cottontails, and mule deer.

Piñon-Juniper Grass Mountain

Dominant plant species of this SHS are piñon pine (*Pinus edulis*) and one-seed juniper *(Juniperus monosperma*) with sparse to medium dense grass cover of gramas (*Bouteloua* spp.), muhlys (*Muhlenbergia* spp.), and three-awns (*Aristida* spp.) grasses. The shrubs understory consists of mountain mahogany, oaks (*Quercus* spp.), rubber rabbitbrush (*Chrysothamnus nauseousus*), skunkbush sumac, and Opuntia species (*prickly pear and cholla*). Several annual and perennial forb species are represented. Species diversity is high for birds and moderate for mammals (USDI, BLM 1984a). Species diversity has not been identified for herptiles.

Typical wildlife species associated with this SHS include plateau stripped whiptail, sagebrush lizard, piñon jay, gray vireo , cliff chipmunk, piñon mouse , and mule deer.

Riparian

This SHS refers to areas along perennial streams and sometimes around permanent water sources. Dominant plant species are saltcedar with occasional aspen (*Populus* spp.), willow (*Salix* spp.), Arizona sycamore (*Platanus wrightii*), boxelder (*Acer negundo*), and ash (*Fraxinu*s spp.) present. Understory cover consists of barberry (*Mahonia trifoliolata*), buckbrush (*Ceanothus* spp.), ratany (*Krameria* spp.), and honey mesquite. Grasses are typically sparse. Species diversity is high for birds, herptiles, and mammals (Degenhart et al; Findley et al; USDI, BLM 1984a).

Typical wildlife species of riparian habitats include leopard frogs, checkered garter snakes, Chihuahuan whiptails, Bell's vireo, southwestern willow flycatchers, western red bats, and raccoons. Most wildlife species of the Planning Area can be found in riparian habitats.

This SHS consists of a large area with a slight depression that collects runoff water and has saline or highly alkaline soils. Vegetation is characteristically dominated by alkali sacaton, dropseeds (*Sporobolus* spp.), inland saltgrass (*Distichlis spicata*), tobosa grass, and galleta grass (*Pleuraphis* spp.). Forbs are common, with typical species consisting of seepweed (*Suaeda* spp.), sunflowers (*Helianthus* spp.), and Russian thistle (*Salsola kali*). Species diversity is high for herptiles and low for birds (USDI, BLM 1984a). Species diversity has not been identified for mammals.

Key wildlife species have not been identified for this SHS.

Land Cover Types

Land cover types, derived from the SWReGAP data, were used to supplement SHS types in order to include those regions of the Planning Area not covered by SHS data, because SHS data is limited to the Decision Area. Because of the availability of existing wildlife habitat models, particularly those provided by Biotic Information System of New Mexico (BISON-M), land cover types described in the Vegetation Communities section (Section 2.1.7) were combined into searchable groups. As a result, all forest and woodland land covers were combined into one Evergreen Forest/Deciduous Forest land cover. In addition, the two wetland land covers identified in the vegetation section were combined into one Woody Wetland/Emergent Herbaceous land cover. A total of seven land covers are described for fish, wildlife, and habitat.

- Evergreen Forest/Deciduous Forest
- Scrub
- Grassland/Herbaceous
- Woody Wetland/Emergent Herbaceous Wetland
- Barren Lands
- Developed and Agriculture
- Open Water

Evergreen Forest/Deciduous Forest

Evergreen Forest/Deciduous Forest land cover is found at the higher elevational limits of the Planning Area, which receive the greatest amounts of precipitation. Evergreen Forest/Deciduous Forest land cover is found primarily within the Black Range in Sierra County, the Sacramento Mountains in Otero County, and the Organ Mountains in Doña Ana County. Vegetation communities associated with this land cover include piñon-juniper woodlands (generally on mountain ranges at about 6,000 feet), montane coniferous forest (on mountain ranges between 8,000 to 10,000 feet), and subalpine coniferous forest (on mountain ranges between 9,500 and 12,000 feet). Only the piñon-juniper SHS is found in this land cover. The U.S. Forest Service manages most of the Evergreen Forest/Deciduous Forest land cover located in the Planning Area.

Evergreen Forest/Deciduous Forest land cover is an area of exceptionally high biological diversity and biogeographical interest. These habitat types occur within a topographically and geologically complex region. The complex topography and steep elevational gradients within the Evergreen Forest/Deciduous Forest land cover results in a rich assemblage of floral and faunal species (Dahms and Geils 1997). Table 2-19 summarizes species taxa, big game species, small game species, and furbearers known to occur in forest/woodland land cover in Doña Ana, Otero, and Sierra Counties. These data have been compiled from the NMDGF Biota Information System of New Mexico database (NMDGF 2004a), which is a database of distribution information for wildlife found throughout New Mexico.

Table 2-19
Species Taxa, Big Game Species, Small Game Species, and Furbearers Known to Occur in Evergreen Forest/Deciduous Forest Land Covers in Sierra, Otero, and Doña Ana Counties

County	Amphibians	Reptiles	Birds	Mammals	Big Game	Small Game	Furbearers
Sierra	7	43	103	77	7	8	8
Otero	5	42	149	87	11	7	9
Doña Ana	4	43	149	74	5	7	11

SOURCE: New Mexico Department of Game and Fish 2004a

Fire and logging are the primary causes for disturbances to the Evergreen Forest/Deciduous Forest land cover (Dahms and Geils 1997). The elimination of fire has caused a major change in species composition and structure in the past century. Dense sapling understories have developed in evergreen and decidous forests as a result of fire suppression and subsequent tree regeneration. Logging in forests has created extensive road networks, which has furthered habitat fragmentation.

Non-sustainable grazing practices (those which reduce the ability of the land to sustain long-term forage removal) in evergreen and deciduous forests have created competition with wildlife for water, forage, and space. These practices have altered vegetation composition and structure, increased siltation, affected stream hydrology and water quality, and reduced soil permeability and the potential to support plants due to soil compaction (Dahms and Geils 1997).

Scrub

Scrub land cover occurs throughout the Planning and Decision Areas at lower elevations. Typically, scrub land cover occurs in arid environments in which plant are separated by significant areas devoid of perennial vegetation. Scrub land cover consists of creosote breaks, creosote hill, creosote rolling upland, mesquite rolling upland, mixed shrub hill, and mixed shrub rolling upland SHSs. Large areas of scrub land cover are found in central Sierra and Doña Ana Counties within the Rio Grande Valley, and central Otero County in the Tularosa Valley. A large portion of the Decision Area is classified as scrub land cover. The complex topography of alluvial plains, bajadas, and scattered mountains, and the influence of converging ecoregions such as the Rocky Mountains, the Sierra Madre Oriental, and the Sierra Madre Occidental contributes to a rich collection of fish and wildlife species. Table 2-20 summarizes species taxa and management groups known to occur in scrub land cover in Sierra, Otero, and Doña Ana Counties.

Table 2-20
Species, Taxa, Big Game Species, Small Game Species, and Furbearers Known to Occur in Scrub Land Cover in Sierra, Otero, and Doña Ana Counties

County	Amphibians	Reptiles	Birds	Mammals	Big Game	Small Game	Furbearers
Sierra	6	47	102	80	7	8	8
Otero	7	45	146	89	11	7	9
Doña Ana	7	45	146	77	5	6	11

SOURCE: New Mexico Department of Game and Fish 2004a

The structure and health of scrub land cover is affected by human activities. Many of the urban centers (e.g., Las Cruces and Truth or Consequences) are located in scrub lands (i.e., desertscrub). Growth of these urban areas has led to habitat conversion and fragmentation. Heavy livestock grazing in scrub land cover can affect stand structure and productivity, and increase sand dunes' vulnerability to wind erosion and blowouts.

Grassland/Herbaceous

Grasslands are found extensively throughout the Planning and Decision Areas. Grasses and/or other herbaceous plants dominate the grassland land cover. Grassland/Herbaceous land cover consists of grass flats, grass hills, grass mountain, grass rolling uplands, half-shrub hill, and half-shrub rolling upland SHSs. They adjoin and largely surround much of the scrub land cover in the Planning Area. Grasslands are found in south-central Sierra County, south-central Otero County, and western Doña Ana County. Key grassland areas include the Rio Grande Valley and Tularosa Valley. Grasses provide an important food source for wildlife including deer, pronghorn, and other herbivores. Table 2-21 summarizes species taxa and management groups known to occur in Grassland/Herbaceous land cover in Sierra, Otero, and Doña Ana, Counties.

Table 2-21
Species, Taxa, Big Game Species, Small Game Species, and Furbearers Known to Occur in the Grassland/Herbaceous Land Cover in Sierra, Otero, and Doña Ana Counties

County	Amphibians	Reptiles	Birds	Mammals	Big Game	Small Game	Furbearers
Sierra	8	42	87	80	7	6	8
Otero	8	45	127	90	11	7	9
Doña Ana	8	43	132	76	5	7	11

SOURCE: New Mexico Department of Game and Fish 2004a

Grassland/Herbaceous land covers occurring in the southwestern United States have experienced a marked shift from perennial grassland to shrub-dominated desert scrubland in the mid-1800's (Finch 2004). The exact cause of this shift is debated, but livestock grazing may play a role in this shift. In addition, grassland conversion and human-caused fragmentation have caused increased runoff and erosion, decreased biological diversity through isolation and reduced carrying capacity, shifts in avian species assemblages, increased invasion by nonnative species, and decreased livestock and wildlife forage (Finch 2004). Today, portions of Grassland/Herbaceous land cover appear to be undergoing additional desertification.

Woody Wetland/Emergent Herbaceous Wetland

Woody Wetland/Emergent Herbaceous Wetland land cover is widely distributed, but covers a very small portion of the total acres of land in the Planning Area. This land cover includes such diverse areas as riparian habitats and ephemeral and perennial march/cienega/spring/seep habitat. Riparian habitat is a wetland community dominated by short trees and/or woody shrubs, often with a closed canopy, whose presence can be either directly or indirectly attributed to stream-induced or related factors. March/cienega/spring/seep habitat is a wetland community in which the principal plant components are

herbaceous emergents that normally have parts of this structure annually, periodically, or continually submerged. Wetland land cover consists of arroyo/pseudoriparian and riparian SHSs.

Within Doña Ana County, the Mimbres MSA (USDI, BLM 1990a) identified the following riparian areas: Sotal Creek, Indian Hollow Creek, Filmore Canyon, Ice Canyon, and Adams Riparian Area. In addition, USDI, BLM (2003) has identified approximately 14.5 miles of riparian habitat along creeks and surrounding seeps and springs within Sierra and Otero Counties. Additional riparian areas occur along major perennial, intermittent, and ephemeral washes in the Planning and Decision Areas, such as the Rio Grande, Tularosa Creek, Alamosa Creek, and others. Marshland occurs sporadically throughout the Planning Area. The most extensive reach of marsh habitat occurs in the bosque located near Truth or Consequences in Sierra County.

Riparian habitats support a greater diversity of plants and animals compared to upland habitats. Most wildlife (including common wildlife) use riparian corridors for a number of reasons in their life history. Despite the scarcity of riparian and wetlands habitat, it promotes substantial diversity in floral, and resident and migratory faunal communities. Table 2-22 summarizes species taxa and management groups known to occur in Woody Wetland/Emergent Herbaceous Wetland land cover in Sierra, Otero, and Doña Ana Counties.

Table 2-22
Species, Taxa, Big Game Species, Small Game Species, and Furbearers Known to Occur in the Wetland Land in Sierra, Otero, and Doña Ana Counties

County	Amphibians	Reptiles	Birds	Mammals	Big Game	Small Game	Furbearers
Sierra	13	48	160	79	6	9	8
Otero	9	43	254	83	9	12	9
Doña Ana	9	46	270	75	4	12	11

SOURCE: New Mexico Department of Game and Fish 2004a

Over the last century, New Mexico and Arizona have lost an estimated 90 percent of their original riparian ecosystems (NMED 1998). It is estimated that one-third of the wetlands that once existed in New Mexico have been lost (NMED 1998). There was an 87 percent decrease in wetland acreage along the main stem of the Rio Grande from 1918 to 1982 (Shaw and Finch 1996). Of over 6,561 primarily perennial stream miles, almost 2,612 miles (40 percent), have been identified as impaired, designated, or attainable uses (NMED 1998). Heavy metal contamination, stream bottom deposits (sedimentation/siltation), temperature, and turbidity are the major causes of surface water impairment. Because many riparian systems occur in the broad valley floor and these areas are suitable for human occupation and agricultural uses, riparian/wetlands have been extensively altered and/or fragmented.

Barren Lands

Barren land cover has a limited distribution in the Planning Area, occurring primarily on rocky hills and mountains, and deserts. However, despite a limited distribution in the Planning Area, this land cover type includes such diverse habitats as sand dunes, desert pavement, cliffs, and rock outcrop. Barren land cover is associated with malpais-rock/lava and salt flat SHSs. These diverse habitats provide for a wide range of wildlife species including rattlesnakes, raptors, and bats. Table 2-23 summarizes species taxa and management groups known to occur in barren lands land cover in Sierra Otero, and Doña Ana Counties.

Table 2-23
Species, Taxa, Big Game Species, Small Game Species, and Furbearers Known to Occur in Barren Lands Land Cover in Sierra, Otero, and Doña Ana Counties

County	Amphibians	Reptiles	Birds	Mammals	Big Game	Small Game	Furbearers
Sierra	1	20	15	65	4	0	6
Otero	1	22	18	73	6	0	7
Doña Ana	1	22	19	64	4	0	7

SOURCE: New Mexico Department of Game and Fish 2004a

Developed and Agriculture

Developed land cover associated with major metropolitan areas is found in the Planning Area such as Las Cruces, Truth or Consequences, and Alamogordo. Agriculture land cover is generally found along valley bottoms, particularly the Rio Grande Valley in Sierra and Doña Ana Counties. There are no SHSs associated with this land cover (generally because developed and cultivated areas do not occur on public land managed by BLM). Developed and agriculture land covers contain a great diversity of wildlife habitat, ranging from nearly natural remnants of regional biomes to completely artificial habitats. Small parcel size, diverse ownership, unexpected juxtaposition, intense human management, and rapid change characterize developed and agriculture land covers. Developed and agricultural habitats exist within a fragmented landscape often extensively altered (e.g., loss of soil cover or the shrub layer); degraded by soil compaction and chemical influence (herbicides and insecticides); and isolated from similar or complementary nature habitats. Exotic wildlife is often abundant on developed and agriculture land covers. Table 2-24 summarizes species taxa and management groups known to occur in developed and agriculture land covers in Doña Ana, Otero, and Sierra Counties.

Table 2-24
Species, Taxa, Big Game Species, Small Game Species, and Furbearers Known to Occur in Developed and Agriculture Land Cover in Sierra, Otero, and Doña Ana Counties

County	Amphibians	Reptiles	Birds	Mammals	Big Game	Small Game	Furbearers
Sierra	7	37	86	61	6	4	7
Otero	8	35	136	71	9	5	8
Doña Ana	7	39	146	64	4	6	10

SOURCE: New Mexico Department of Game and Fish 2004a

Open Water

Open water has a limited distribution in the Planning Area. Open water includes habitats that consist of permanent water that provides habitat for aquatic and semi-aquatic species such as fish and amphibians. There are no SHSs associated with this land cover. Two areas, the Rio Grande River and the Elephant Butte Reservoir, account for the majority of aquatic habitat sites in the Planning Area. The Rio Grande River flows north to south through Sierra and Doña Ana Counties. The Elephant Butte Reservoir is located on the Rio Grande River south of Truth or Consequences. The Rio Grande River and Elephant Butte Reservoir provide important habitat for native and sport fish. In addition, many bird, mammal, amphibian, and reptile species utilize aquatic habitat at some stage in their life cycles. Table 2-25 summarizes species taxa and management groups known to occur in open water land cover in Sierra,

Otero, and Doña Ana Counties. No big game species occurrences were listed for open water; therefore, big game species are not included in Table 2-25.

Table 2-25
Species, Taxa, Big Game Species, Small Game Species, and Furbearers Known to Occur in Open Water Land Cover in Sierra, Otero, and Doña Ana Counties

County	Amphibians	Reptiles	Birds	Mammals	Big Game	Small Game	Furbearers
Sierra	36	10	9	61	2	2	2
Otero	7	6	3	111	1	6	1
Doña Ana	20	6	6	119	3	7	3

SOURCE: New Mexico Department of Game and Fish 2004a

Aquatic habitats found in the open water land cover have been greatly affected by human activity in the following ways:

- Channel diversion and dewatering, which may pose the greatest threat to fish occupying the Rio Grande.
- Building of dams has segmented river habitat, thereby creating a barrier for fish movement.
- Agricultural return flows alter water chemistry and sediment load.
- Large dams alter water quality.

New Mexico Game Fish Department Comprehensive Wildlife Conservation Strategy Key Habitats

The CWCS is a strategic plan intended as a blueprint to guide collaborative and coordinated wildlife conservation initiatives. The plan identifies key habitats, a statewide list of Species of Greatest Conservation Need (SGCN), and conservation needs. SGCN are those species indicative of the diversity and health of New Mexico's wildlife, including low and declining populations and species of high recreational, economic, or charismatic value. Key habitats were identified according to the following criteria:

- Important to the biodiversity of New Mexico
- Important to endemics or obligate species of New Mexico
- Captures a broad range of indicative species
- Adds unique species to State fauna
- Hosts a variety of scarce or threatened wildlife
- Threatened by land uses/management practices
- Limited or has been significantly reduced in New Mexico
- Habitat type is unique to New Mexico, Southwest, the United States, or worldwide
- Key breeding or foraging habitat for species of concern
- Hosts wide-ranging species that are not found in other habitats
- Supports species with isolated or relict distributions in New Mexico
- Habitat functions as a refuge or indicator of the quality of the system

- Critical functioning habitat; habitat has greater ecological value

The CWCS identifies several key habitats in the Planning Area. Key terrestrial habitats are grouped by ecoregion, and key perennial aquatic habitats are grouped by watershed. Table 2-26 summarizes key terrestrial and aquatic habitats in the Planning Area. For each key habitat a list of associated SGCN were identified. SGCN for each key habitat were identified by habitat, distribution, and abundance. Predictive habitat models for SGCN were created by NMDGF to identify areas that are likely suitable habitat for a species, but which may or may not be occupied. A list of SGCN for each key habitat is available in the CWCS.

Table 2-26
CWCS Key Habitats in Sierra, Otero, and Doña Ana Counties

Key Habitat Types	Doña Ana	Otero	Sierra
Key Terrestrial Habitats			
Arizona-New Mexico Mountains Ecoregion			
Madrean Encinal			X
Madrean Pine-Oak Conifer-Oak Forest and Woodland		X	
Riparian Habitats	X	X	X
Chihuahuan Desert Ecoregion			
Chihuahuan Semi-Desert Grassland	X	X	X
Madrean Encinal	X		X
Key Ephemeral Aquatic Habitats			
Ephemeral 1st and 2nd Order Streams	X	X	X
Ephemeral Manmade Catchments	X	X	X
Ephemeral Natural Catchments	X	X	X
Ephemeral Marsh/Cienega/Spring/Seep	X	X	X
Key Perennial Aquatic Habitats			
Pecos Watershed			
Perennial 1st and 2nd Order Streams		X	
Rio Grande Watershed			
Perennial Marsh/Cienega/Spring/Seep			X
Perennial Large Reservoir			X
Perennial 1st and 2nd Order Streams			X
Perennial 3rd and 4th Order Streams			X
Perennial 5th Order Streams	X		X
Tularosa Watershed			
Perennial Marsh/Cienega/Spring/Seep		X	X
Perennial 1st and 2nd Order Streams		X	X

SOURCE: New Mexico Department of Game and Fish 2005

A key terrestrial habitat not included in the CWCS, but important to BLM managed lands in Doña Ana, Otero, and Sierra Counties is Chihuahuan Desert Scrub. Large areas of Chihuahuan Desert Scrub are located in the Decision Area, especially in Doña Ana County. Chihuahuan Desert Scrub provides habitat for numerous species including important breeding areas and dispersal habitat between upland land covers. Some key species found in Chihuahuan Desert Scrub habitat include Sneed pincusion cactus, Texas horned lizard, and spotted bat.

2.1.8.3 Trends

This section describes the degree and direction of change in fish, wildlife, and habitat over time, based on current management direction.

Standard Habitat Sites

There have been changes in the distribution and amount of each SHS type over time resulting from natural fluctuations and human activities including, but not limited to livestock grazing, road construction, and the introduction of exotic (nonnative) species. It is estimated that overall there has been a 37 percent increase in creosote-dominated SHS, a 2 percent increase in half-shrub SHS, a 7 percent increase in mesquite-dominated SHS, and a 17 percent increase in mixed shrub SHS (USDI, BLM 2003b). This has resulted in an overall loss of 62 percent of grassland SHS (USDI, BLM 2003b). Areas now dominated by creosotebush and shrubs represent a disclimax vegetation condition largely as the result of historical livestock grazing practices (AAI 1979).

National Land Cover Types

Evergreen Forest/Deciduous Forest

Overall, the ecological health of Evergreen Forest/Deciduous Forest land cover appears to have a positive trend. Recent logging techniques have moved toward selective, uneven-aged silvicultural practices that help protect the health of Evergreen Forest/Deciduous Forest land cover (Dahms and Geils 1997). Furthermore, timber harvests from public forests have declined in recent years, thus reducing the impact of logging on forest health. Finally, while there has been a recent increase in catastrophic wildfires, the establishment management practices designed to reinstate natural fire regimes is a positive trend in the ecological health of Evergreen Forest/Deciduous Forest land cover.

Scrub

The trend in scrub land cover has been habitat degradation and loss. Habitat degredation has resulted in the reduced ability of scrub land cover to support long-term forage removal. This has negatively influenced scrub plant communities and fish and wildlife habitat by reducing vegetation cover, increasing soil erosion, and aggravating local flooding (Finch 2004). Habitat loss has contributed greatly to the loss of native vegetation and increased fragmentation. Finally, within scrub land cover, there has been increased road building and associated vehicle trafficleading to habitat loss and fragmentation, reduced effective (useable) habitat for wildlife populations, and increased roadkill, poaching, and illegal collecting of wildlife (Forman et al. 2003).

Grassland/Herbaceous

The trend in the ecological health of grasslands is mixed. Grasslands in the Planning Area have experienced a transition from perennial grassland to shrub-dominated desert scrubland (Finch 2004). Invasion of grasslands by woody shrubs and habitat fragmentation have resulted in decreased biological diversity (herbaceous), isolation and diminished carrying capacity, shifts in community species composition, increased incursion by nonnative species, and decreased livestock and wildlife forage (Finch 1996). Uses of grassland/herbaceous land covers that contribute to ecological health and need to be managed include livestock grazing, recreational off-highway vehicle use, and Border security efforts.

Woody Wetland/Emergent Herbaceous Wetland

Over the last century, New Mexico and Arizona lost an estimated 90 percent of their original riparian ecosystems (USDI, BLM 1990b). Restricted wetland habitat and changes to larger river channel dynamics has resulted in the loss of many native fish species. Riparian areas have experienced a decrease in biological diversity and riparian vegetation cover. Riparian corridors have been interrupted, resulting in decreased wildlife movement corridors.

Habitat degradation has influenced the availability of foraging, breeding, and wintering habitats and food resources for migratory birds (Dahms and Geils 1997). These impacts also have altered the composition, structure, and dynamics of plant and animal communities in riparian ecosystems.

Increased presence of saltcedar has resulted in increasingly drier riparian systems (Finch 1995). Dense saltcedar thickets form barriers to wildlife, livestock, and human access to water. Bird species richness and abundance in saltcedar-dominated communities are substantially lower than in native plant communities.

Barren Lands

Trend data for barren lands land cover in the Planning Area is limited. Barren lands land cover comprises a small portion of the Planning Area, which is not likely to change significantly. Generally, barren land has low vegetation cover with large areas of barren ground covered by bare soil or rock. Because of the low vegetation cover and high degree of barren ground, management practices are unlikely to have greatly influenced land cover. However, management practices on adjacent land covers of grassland and scrub may contribute to the conversion of these land cover types to barren land.

Developed and Agriculture

Developed and agriculture land cover has increased in size in the Planning Area. This land cover has largely occurred along streams and rivers in the Planning Area. Urban, residential, commercial, and agricultural development have accelerated over the past century. All land covers in the Planning Area are affected by increased development and agriculture, but grassland and scrub land covers, the two predominant land covers on BLM-administered land, have experienced the greatest conversion to developed and agriculture land cover.

Open Water

River and reservoir hydrology can have major impacts on fish communities within them. Spawning and recruitment typically coincides with irrigation season, thus fish populations can be greatly affected. Nonnative fish also may affect native fish species within a reservoir. However, the abundance of nonnative prey species within these reservoirs buffers native fish from predation. Crayfish, nonnative sunfish, catfish, and bullfrogs are known to cause localized reductions in native frogs. They also may exert a negative influence on native turtle populations by consuming hatchling turtles. Invasive aquatic nuisance species pose numerous concerns for abiotic and biotic conditions of all aquatic habitat types in the Rio Grande River and Elephant Butte Reservoir.

Aquatic habitats have been greatly reduced through the Rio Grande River Valley. Water tables have been lowered and areas that were once perennial cienegas and marshes have become ephemeral (NMED 1998). This has caused a decline in Western painted turtles (*Chrysemys picta bellii*), leopard frogs (*Rana* spp.), and New Mexico garter snakes *(Thamnophis sirtalis dorsalis)*.

New Mexico Game and Fish Department Comprehensive Wildlife Conservation Strategy Key Habitats

Trends in CWCS key habitats correspond to trends in the SHSs and land cover types discussed above (based on the associations provided in Table 2-16).

2.1.8.4 Forecast

This section describes the anticipated changes in the condition of fish, wildlife, and habitat for SHSs and land cover types. Agents of change are described using CWCS factors that influence key habitats and SGCN.

Standard Habitat Sites

Trends previously identified for SHSs in the Planning Area are likely to contribute to the future conditions of SHSs. The most important trend affecting fish, wildlife, and habitat that will continue to influence the future condition of SHSs is the conversion of grassland SHSs to brush- and shrub-dominated SHSs in certain areas. Several factors could hinder the return of grassland conditions to areas now dominated by creosotebush and mixed shrub, including the situations described below.

- As areas are invaded by brush and shrub, the ground cover is greatly reduced, thereby allowing significant increases in soil erosion. In many areas, the soil surface has eroded to the extent that only a thin covering of gravel and stones remains. This creates environment conditions that impede the reestablishment of grass species.
- Sporadic precipitation characteristic of the region makes it difficult for grass species to reestablish.
- Once shrubs have established in an area, they reduce the chances of grass species to reestablish in that area.

National Land Cover Types

The future health of land cover types in the Planning and Decision Areas is difficult to predict due to the numerous factors that play a part in the health of an ecological system. Because much of the Planning Area is administered by land management agencies such as BLM, U.S. Forest Service, and the National Park Service, the outlook for the ecological health of the fish and wildlife habitat will be managed through multiple use mandates. The conservation and management of the geological, topographic, and vegetative composition and structure of the area will help maintain important wildlife habitat features of the area.

Habitat management, however, is limited by uncertainty: limited information, including limitations in the scientific community's understanding of the functioning of ecological systems, precludes a definitive assessment of the area's ecological prospects. Management decisions thought to be beneficial may result in unforeseen, negative results, potentially affecting the ecological health of the area. Likewise, unplanned natural or human-caused events, such as drought, flood, wildfires, or infestations, may occur that also could negatively affect the ecological health of the area.

Evergreen Forest/Deciduous Forest land cover is generally expected to improve in ecological condition as management practices continue to address key problems. Scrub land cover could continue to experience habitat loss and conversion, and habitat degradation. Grassland/herbaceous land cover may continue to experience conversion to scrub and forest land cover. Woody Wetland/Emergent Herbaceous Wetland land cover could continue to be degraded and fragmented by various land uses. The current condition of barren lands land cover is expected to continue under existing management practices. Developed and agriculture land cover is expected to grow in size. A change to the quantity of open water land cover is not anticipated; however, open water land cover will continue to be degraded by pollution, groundwater depletion, and exotic species.

New Mexico Game Fish Department Comprehensive Wildlife Conservation Strategy Key Habitats

The CWCS does not predict the future condition of key habitats or forecast changes in SGCN, but it does identify a number of factors that influence key habitats and SGCN. The CWCS identifies eight major factors that influence key habitats and SGCN. Each major factor has a number of secondary factors. For example, habitat conversion is identified as a major factor and is further described by two secondary factors: development activities and aquatic habitat conversion factors.

2.1.8.5 Key Features

Crucial Wildlife Areas

There are three Habitat Management Plans (HMPs), one Coordinated Resource Management Plan, three ACEC, and one RNA in Doña Ana County with wildlife management objectives. In Otero County there are three ACECs with wildlife management objectives. There is one HMP with specific wildlife management objectives for Antelope in Sierra County.

Otero County

- Cornudas Mountain ACEC
- Alamo Mountain ACEC
- Wind Mountain ACEC
- Sacramento Escarpment ACEC
- Alkali Lakes ACEC

Doña Ana County

- Doña Ana Mountains ACEC

- Organ/Franklin Mountains ACEC
- Robledo Mountains ACEC
- Aden Lava Flow RNA
- Riparian and Aquatic HMP/EIS developed for the Mimbres RMP

Sierra County

- Jornada Del Muerto HMP

2.1.9 Special Status Species

New Mexico has one of the most diverse landscapes in the United States. This diversity in topography, climate, and biological communities provides a home for 42 species (29 animal species and 13 plant species) that are listed as threatened and endangered species under the Endangered Species Act ("federally listed species"). Of those 42 species, the Planning Area provides habitat for a total of 15 federally listed species, including 11 endangered and four threatened species. The federally listed species discussed in this section were identified through the U.S. Fish and Wildlife Service (USFWS) Southwest Region Ecological Services Website (USDI, USFWS 2005a). Additional information has been acquired from the NMDGF Biota Information System of New Mexico database (NMDGF 2004b), which is a database of distribution information for wildlife found throughout New Mexico.

In addition to federally listed species, special status species include those species listed by the State of New Mexico as threatened or endangered ("state-listed species"), BLM-sensitive animals as designated and plants, as well as other identified rare plant species. New Mexico has 123 state-listed animals by the NMDGF (NMDGF 2004a) and 58 state-listed plants as designated by the New Mexico State Forestry (NMSF) Division within the New Mexico Energy, Minerals and Natural Resources Department. The BLM State Office has designated 34 animals and 26 plants as BLM-sensitive species (New Mexico Natural Heritage Program 1997). The New Mexico Rare Plant Technical Council (1999) has developed an exhaustive list of New Mexico's rare plants, based on literature reviews, and council members' expertise and experience on distribution, ecology, and conservation status of the plants (New Mexico Rare Plant Technical Council 1999). On this list, 25 species occur in Sierra County, 32 species occur in Otero County, and 23 species occur in Doña Ana County. Some of these plants occur in more than one county and may have Federal, State, or BLM special status. Designated critical habitat, which is established by the USFWS under the authority of the Endangered Species Act, exists in Doña Ana County for the Mexican spotted owl and in Sierra County for the endangered plant, Todsen's pennyroyal (*Hedeoma todsenii*).

The following sections of this chapter describe special status species indicators, trends, forecasts, and key features in the context of abundance of special status species taxa that could occupy key habitat types.

2.1.9.1 Indicators

The variety of environments in Sierra, Otero, and Doña Ana Counties provide important habitat for a number of special status species. Suitable habitat is the prerequisite for the presence and continued

existence of special status species. Furthermore, the condition and health of habitats are associated with the potential for presence and maintenance of special status species in that particular habitat. Therefore, the condition of the environment is one indicator of the condition and/or viability of special status species.

One way to describe the variety of environments in the Planning Area is through the use of land cover types, as identified in Section 2.1.8. Land cover types represent habitat requirements for a broad range of special status species as it can be more efficient use of agency resources to monitor changes in land covers and extrapolate these changes to a broad suite of special status species, rather than focusing on individual species. Despite the emphasis on habitats, each special status species has been associated with one or more of the following land cover types: forest/woodland, grassland, scrub, and/or wetland. A complete list of special status species potentially occuring within the Planning Area is included in Appendix B.

2.1.9.2 Current Conditions

The current condition of special status species is discussed by analyzing special status species associated with four land cover types: forest/woodland, scrub, grassland, and wetland. For each land cover type the number of special status species that are federally listed, BLM sensitive, and New Mexico State listed are summarized.

Forest/Woodland

The majority forest/woodland land cover occurs outside the Decision Area; therefore, U.S. Forest Service, USFWS, and NMDGF manage most special status species within this land cover type. A number of special status species are dependent on forest/woodland habitats including the Mexican spotted owl (*Strix lucida occidentalis*) and many BLM sensitive bat species. Table 2-27 summarizes the numbers of special status species known to occur in forest/woodland land cover in Sierra, Otero, and Doña Ana and Counties.

Table 2-27
Number of Special Status Species Known to Occur in Forest/Woodland Land Covers in Sierra, Otero, and Doña Ana Counties

County	Federal T&E	BLM Sensitive	FS Sensitive	NM T&E
Sierra	3 birds 1 mammal 1 plant	1 amphibian 4 birds 8 mammals 6 plants	1 amphibian 10 birds 6 mammals 3 reptiles 2 plants	4 birds 1 mammal 13 plants
Otero	2 birds 1 mammal 3 plants	1 amphibian 4 birds 13 mammals 6 plants	1 amphibian 11 birds 10 mammals 4 reptiles 8 plants	1 amphibian 4 birds 3 mammals 1 reptile 24 plants
Doña Ana	3 birds	4 birds 10 mammals 8 plants	10 birds 8 mammals 3 reptiles 1 plant	4 birds 3 mammals 12 plants

SOURCES: New Mexico Department of Game and Fish 2004b; New Mexico Natural Heritage Program 1997; New Mexico Rare Plant Technical Council 1999
NOTES: T&E = Threatened and Endangered; FS = Forest Service; NM = New Mexico

Scrub

Scrub land cover includes large areas of the Planning and Decision Areas occurring at low elevations. Much of the BLM land in the Planning and Decision Areas is classified as scrub land cover. Many special status species are dependent on scrub land cover including desert bighorn sheep (*Ovis canadensis mexicana* [endangered populations]), burrowing owl (*Athene cunicularia hypugaea*), and eight BLM sensitive bat species. Table 2-28 summarizes the numbers of special status species known to occur in scrub land cover in Doña Ana, Otero, and Sierra Counties.

Table 2-28
Number of Special Status Species Known to Occur in Scrub Land Covers in Sierra, Otero, and Doña Ana Counties

County	Federal T&E	BLM Sensitive	FS Sensitive	NM T&E
Sierra	3 birds 1 mammal	6 birds 9 mammals 1 reptile 5 plants	11 birds 6 mammals 4 reptiles	6 birds 1 mammal 6 plants
Otero	3 birds 1 mammal 1 plant	4 birds 13 mammals 1 reptile 8 plants	11 birds 9 mammals 4 reptiles 5 plants	6 birds 2 mammals 10 plants
Doña Ana	3 birds 1 plant	4 birds 11 mammals 1 reptile 12 plants	10 birds 8 mammals 4 reptiles 2 plants	6 birds 3 mammals 13 plants

SOURCES: New Mexico Department of Game and Fish 2004b; New Mexico Natural Heritage Program 1997; New Mexico Rare Plant Technical Council 1999
NOTES: T&E = Threatened and Endangered; FS = Forest Service; NM = New Mexico

Grassland

Grasslands are found extensively throughout the Planning and Decision Areas. Grasslands are found in western Doña Ana County, south-central Otero County, and south-central Sierra County. Key grassland special status species include the northern aplomado falcon (*Falco femoralis septentrionalis*), spotted bat (*Euderma maculatum*), and meadow jumping mouse (*Zapus hudsonius luteus*). Table 2-29 summarizes the numbers of special status species known to occur in grassland land cover in Doña Ana, Otero, and Sierra Counties.

The northern aplomado falcon has broad habitat preferences, typically requiring in open grassland terrain that includes suitable nesting platforms of yucca and mesquite. Approximately 13 percent of the Planning Area (89,432 acres) contains habitat that it highly suitable, and 9 percent (62,322 acres) that is moderately suitable for the falcon. The USFWS proposes to reintroduce the northern aplomado falcon into its historic habitat in southern New Mexico and Arizona through a Proposed Special Rule issued on February 9, 2005. The purpose of this reintroduction is to establish a viable resident population. When this proposed rule is finalized, the intent is to release captive-raised falcons annually in the summer and/or fall for 10 or more years until a self-sustaining population is established. The proposed reintroduced population would be designated as nonessential experimental population according to 10(j) of the Endangered Species Act of 1973, as amended.

Table 2-29
Number of Special Status Species Known to Occur in Grassland Land Covers in Sierra, Otero, and Doña Ana Counties

County	Federal T&E	BLM Sensitive	FS Sensitive	NM T&E
Sierra	4 birds 1 mammal	6 birds 9 mammals 1 reptile 1 plant	14 birds 6 mammals 4 reptiles 1 plant	6 birds 1 mammal 2 plants
Otero	3 birds 1 mammal 1 plant	5 birds 14 mammals 1 reptile 4 plants	14 birds 10 mammals 4 reptiles 1 plant	6 birds 3 mammals 3 plants
Doña Ana	4 birds	5 birds 10 mammals 1 reptile 3 plants	14 birds 8 mammals 4 reptiles 1 plant	7 birds 2 mammals 3 plants

SOURCES: New Mexico Department of Game and Fish 2004b; New Mexico Natural Heritage Program 1997; New Mexico Rare Plant Technical Council 1999

NOTES: T&E = Threatened and Endangered; FS = Forest Service; NM = New Mexico

Wetland

Wetland land cover is widely distribution throughout the Planning Area and includes such diverse habitats as riparian habitats and, ephemeral and perennial march/cienega/spring/seep habitat. Species dependent on wetland habitat include the Chiricahua leopard frog (*Rana chiricahuensis*), whooping crane (*Grus americana*), and Pecos River muskrat (*Ondatra zibethicus ripensis*). Table 2-30 summarizes the numbers of special status species known to occur in wetland land cover in Doña Ana, Otero, and Sierra Counties.

Table 2-30
Number of Special Status Species Known to Occur in Wetland Land Covers in Sierra, Otero, and Doña Ana Counties

County	Federal T&E	BLM Sensitive	FS Sensitive	NM T&E
Sierra	1 amphibian 6 birds 1 mammal	1 amphibian 7 birds 9 mammals 1 reptile	3 amphibians 23 birds 6 mammals 3 reptiles 1 plant	10 birds 1 mammal
Otero	6 birds 1 mammal	5 birds 13 mammals 1 reptile	1 amphibian 30 birds 9 mammals 3 reptiles 2 plants	11 birds 3 mammals 1 plant
Doña Ana	6 birds	6 birds 11 mammals 1 reptile	1 amphibian 30 birds 8 mammals 3 reptiles	10 birds 3 mammals

SOURCES: New Mexico Department of Game and Fish 2004b; New Mexico Natural Heritage Program 1997; New Mexico Rare Plant Technical Council of 1999

NOTES: T&E = Threatened and Endangered; FS = Forest Service; NM = New Mexico

2.1.9.3 Trends

The majority of special status species in the Planning and Decision Area are found in forest/woodland, scrub, grassland, and wetland land covers. Changes in the condition and distribution and range of these key habitat types will ultimately affect the species' ability to survive. Urban growth and development has the greatest potential of degrading these important habitats that species rely on for growth, foraging, cover, and movement. The most useful conclusions regarding special status species viability and habitats depend on a variety of information including baseline and monitoring data for species and habitats over long periods of time. Little of this kind of information gathering has been done and almost none is available in consistent and comparable form for the entire Planning Area. Most conclusions can, therefore, only be general and related to the conditions and trends in key habitats. For detailed discussion on key habitats, refer to Section 2.1.8.

2.1.9.4 Forecast

Predicting changes in species status species in the Planning and Decision Areas is difficult due to the number and complexity of factors that play a part in the health of species and ecosystems. Special status species are often listed because of small population size, limited habitat or range, or some other factor that imperials a species in some way. As a result, small changes in environmental conditions, management prescriptions, or administrative rules can have a significant influence on special status species. Management tools such as Aplomado Falcon Habitat Model and Assessment Protocol were developed with BLM cooperation to provide a baseline, and ability to monitor trends in the future. Other monitoring is in place for threatened and endangered species. This monitoring would be incorporated to assist with conservation planning (Young et al 2004).

Predicted changes in the environmental condition of key land covers in the Planning and Decision Areas can be used as a tool to describe changes to special status species and their habitat. The environmental condition of forest/woodland land cover is expected to generally improve as management practices continue to address key influencing factors such as altered fire regime and logging practices. As a result, special status species habitat should continue to improve, with subsequent positive effects on special status species. It is predicted that scrub land cover will continue to experience conversion to developed/agricultural land cover and degradation from land uses such as livestock grazing, off-road vehicle use, and mining. The continuing influence of these factors and general localized degradation of scrub land cover could continue to negatively affect special status species and their habitat in scrub land cover. Persistent demands of multiuse management will continue drive grassland conversion to scrub and forest/woodland land cover. Pressure on grasslands from multiuse management will continue to negatively influence special status species and habitat. Wetland land cover will be degraded by various land uses including livestock grazing and continued fragmentation resulting from continued urban development and growing transportation infrastructure. Degradation and loss of wetland habitat will have a considerable impact on special status species and habitat.

2.1.9.5 Key Features

Key features consist of those geographic areas and/or landforms, the protection of which, are important for management of special status species and habitat. Table 2-31 summaries key features (areas) within the Planning Area, the associated land cover types, and the special status species that potentially occur in those areas.

Table 2-31
Key Features in the Planning Area for Special Status Species

Key Feature	Land Cover Types Present	Special Status Species Potentially Occurring
Organ/Franklin Mountains	Forest/woodland; Scrub Grassland; Wetland	Organ Mountain Colorado chipmunk (*Neotamias quadrivittatus australis*), desert bighorn sheep
Robledo Mountains	Scrub; Grassland; Wetland	Important pronghorn (*Antilocapra americana*) release site
San Andres Mountains	Forest/woodland; Grassland; Wetland	Critical to desert bighorn sheep recovery. T&E plants: canyon prickly poppy (*Argemone pleiacantha* ssp. *Pinnatisecta*) and Todsen's pennyroyal (*Hedeoma todsenii*)
Ladron Mountains	Forest/woodland; Scrub Grassland; Wetland	Desert bighorn sheep
Wind Mountain	Scrub; Grassland; Wetland	Special status birds and plants
Sacramento Mountains	Forest/woodland; Scrub Grassland; Wetland	T&E plants: Todsen's pennyroyal
Cornudas Mountain	Scrub; Grassland Wetland	Rare/sensitive plants and invertebrates
Alamo Mountain	Scrub; Grassland Wetland	Various special status species
Caballo Mountains	Forest/woodland; Scrub Grassland; Wetland	Rare plants
Brokeoff Mountains	Forest/woodland; Scrub Grassland; Wetland	Rare plants including the Federal candidate species Guadalupe mescal bean (*Sophora gypsophila* var. *guadalupensis*)
Mud Mountain	Scrub; Grassland Wetland	Only known location for Federal candidate, Duncan's pincushion (*Escobaria duncanii*)
Mineral Creek	Wetland	Special status invertebrates and plants
Percha Creek	Wetland	Special status invertebrates and plants
Otero Mesa	Grassland; Wetland	Northern aplomado falcon, black-tailed prairie dog (*Cynomys ludovicianus ludovicianus*)
Alkali lakes	Scrub; Grassland; Wetland	Special status birds, lizards, plants [Gypsum Scalebroom (*Lepidospartum burgessii)* –federal candidate and state endangered]
Pup Canyon	Scrub; Grassland; Wetland	Special status plants including gypsum ringstem (*Anulocaulis leiosolenus* var. *howardii*) and gypsum blazingstar (*Astragalus gypsodes*)
Jornada Del Muerto	Scrub; Grassland; Wetland	Important pronghorn release site.

2.1.10 Wildland Fire Ecology and Management

2.1.10.1 Indicators

The nature of fire in ecosystems is often used as an indicator of how well ecosystems are adapted to fire and can be discussed in terms of fire regime, which is the combination of fire frequency, predictability,

intensity, seasonality, and extent characteristic of fire in an ecosystem. There are many ways to classify fire regimes. They can be based on the characteristics of the fire itself or on the effects produced by the fire (Agee 1993). Fire regimes have been described by factors such as frequency, periodicity, intensity, size of burn, and depth of burn.

The 2001 Federal Fire Policy references preliminary Fire Regime Condition Class (FRCC) data as a way of inferring risk to ecosystem sustainability and risk of uncharacteristic wildland fire behavior and effects (Schmidt et al. 2002). These are qualitative measures that incorporate the concept of historic fire regimes as a baseline against which current conditions are compared. Table 2-32 describes the attributes associated with each FRCC.

Table 2-32
Fire Regime Current Condition Classes

Condition Class	Attributes	Example Management Options
Condition Class 1	• Fire regimes are within or near a historical range. • The risk of losing ecosystem components is low. • Fire frequencies have departed from historical frequencies by no more than one return interval. • Vegetation attributes (species composition and structure) are intact and functioning within a historical range.	Where appropriate, these areas can be maintained within the historical fire regime by treatments such as fire use.
Condition Class 2	• Fire regimes have been moderately altered from their historical range. • The risk of losing key ecosystem components has increased to moderate. • Fire frequencies have departed (either increased or decreased) from historical frequencies by more than one return interval. This results in moderate changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns. Vegetation attributes have been moderately altered from their historical range.	Where appropriate, these areas may need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the historical fire regime.
Condition Class 3	• Fire regimes have been significantly altered from their historical range. • The risk of losing ecosystem components is high. • Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns. • Vegetation attributes have been significantly altered from their historical range.	Where appropriate, these areas may need high levels of restoration treatments, such as hand or mechanical treatments. These treatments may be necessary before fire is used to restore the historical fire regime.

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2004a

Fire regime alteration over time and space is vitally important to understanding the role of fire in ecosystems. Historic fire regimes may be thought of as a backdrop against which current FRCC is described. Restoration of historic fire regimes may or may not be a goal within a particular area due to social and political constraints. However, by delineating FRCCs within the context of historic fire regime, land managers may be better able to predict fire extent, severity, intensity, and effects.

2.1.10.2 Current Conditions

Fire Regimes

Based on the historic fire regimes and on-the-ground conditions, BLM had assigned lands within the TriCounty Planning Area into the three FRCCs. Table 2-33 summarizes current FRCC acres for the TriCounty Planning Area. The geographical locations of the FRCC in each county are included on Map 2-6.

Table 2-33
Fire Regime Condition Class Acreages by County

Area	Class 1 Acres	Class 2 Acres	Class 3 Acres	Not Inventoried	Total
Sierra County	360,453	663,634	67,892	1,619,832	2,711,811
Otero County	645,280	628,761	60,353	1,106,746	2,441,140
Doña Ana County	233,989	645,508	520,621	2,838,525	4,238,643

SOURCE: URS Corporation 2005c

Land managers have recognized fire as a natural disturbance factor that plays a significant role in healthy ecosystem function and that there is a need to reintroduce fire into the landscape. The FRCC system is useful in determining ecosystem degree of departure from its historic range of variability in terms of fire. The development of Fire Management Units (FMUs) is an attempt by managers to allow fire to play its role as a natural disturbance factor within social constraints. FMUs are predetermined areas that have similar fuels, topography, management objectives, and resource needs that allow each area to be managed as a unit. In terms of fire management, FMUs are important planning categorizations that allow management to determine how to respond to wildfire in a given area and where to focus resources in case of multiple ignitions. FMUs are delineated with consideration of public safety concerns first and natural resource values second. Public lands in New Mexico are assigned to one of four FMU categories as described below in Table 2-34. These FMU categories are shown on Map 2-6.

Table 2-34
Approved Fire Management Unit–Category Overview

Fire Management Unit (FMU) Category		Wildland Fire Management			Vegetation Treatments	
		Suppression Priority	Suppression Strategy	Wildland Fire Use[a]	Prescribed Fire	Mechanical/ Chemical/ Biological
A	Full Suppression Areas - Fire is not desired at all.	High	Aggressive. Suppress fires to limit acreage burned.	No	No, except pile burning of mechanically removed vegetation.	Yes, fuel hazard reduction to mitigate risks a priority.
B	Fire Use Following Mitigation - Unplanned wildland fire is not desired.	High	Limit acreage burned, weighing suppression costs against potential damage from fire.	No	Yes, fuel hazard reduction to mitigate risks a priority.	Yes, fuel hazard reduction to mitigate risks a priority.
C	Fire Use as Opportunities Arise - Wildland fire is desired with consideration of significant constraints.	Moderate	Use least cost suppression tactics where fire is not damaging resources.	Yes, under very limited prescribed conditions .	Yes, used to attain desirable resource conditions.	Yes, used to attain desirable resource conditions.

Fire Management Unit (FMU) Category		Wildland Fire Management			Vegetation Treatments	
		Suppression Priority	Suppression Strategy	Wildland Fire Use[a]	Prescribed Fire	Mechanical/ Chemical/ Biological
D	Fire Use Emphasis Area - Wildland fire desired fewer constraints.	Low	Use least cost suppression tactics. Consider wildland fire use if appropriate.	Yes, under prescribed conditions .	Yes, used to attain desirable resource conditions; fuel hazard reduction is lower priority than "C" FMU.	Yes, used to attain desirable resource conditions; fuel hazard reduction is lower priority than "C" FMU.

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2004a

NOTE: [a]Wildland fire use is the management of wildland fires to accomplish specifically stated resource management goals in defined geographic areas.

Wildland Fire Management Strategies

Within the defined FMUs, BLM has developed specific management strategies to meet public safety and resource objectives. For example, fires within ACECs and WSAs may not pose a threat to public safety if allowed to burn. However, the resource values associated with ACECs and WSAs may necessitate a high fire suppression priority; therefore, these areas may be assigned to FMU Category A.

Table 2-35 shows fire and fuels management strategies for the FMUs in the Planning Area.

Table 2-35
Description of Wildland Fire Management Strategies by Fire Management Unit in the Planning Area

Fire Management Unit (FMU)	Suppression Priority	Wildland Fire Use[a]	Fuels Treatment	Community Assistance/ Protection	County
A1. Three Rivers Recreation Site and Petroglyph ACEC	High	Low	Medium	Low	Otero
A2. Timberon	High	Low	High	High	Otero
A3. Caballo Mountain Communication Site	High	Low	Medium	Low	Sierra
A4. Aguirre Springs Recreation Site	High	Low	Medium	Low	Doña Ana
A5. La Cueva Recreation Site	High	Low	Medium	Low	Doña Ana
A6. Cox Visitor Center	High	Low	Low	Low	Doña Ana
A7. Dripping Springs Recreation Site	High	Low	Medium	Low	Doña Ana
A8. Talavera Subdivision	High	Low	Low	High	Doña Ana
A9. Lake Valley	High	Low	Low	High	Sierra
B1. Sacramento Escarpment WSA/ACEC	Medium	Low	Low	Low	Otero
B3. Hillsboro	Medium	Low	Medium	High	Sierra
B4. Rio Grande Corridor	Medium	Low	Low	Medium	Doña Ana
B5. Chaparral Community	Medium	Low	Medium	High	Doña Ana
B6. Winston/Ladder Ranch	Medium	Medium	Low	Low	Sierra
C1. Tularosa Basin/Otero Mesa	Medium	Low	Medium	Medium	Otero
C2. Franklin Mountains	Medium	Medium	Low	Low	Doña Ana
C3. Rio Grande Valley Uplands	Low	Medium	Medium	Medium	Sierra
D1. McGregor Range	Low	High	Low	Low	Otero
D2. Brokeoff Mountain WSA	Low	High	Low	Low	Otero
D3. Organ Mountain WSA/ACEC	Low	High	Low	Low	Doña Ana

Fire Management Unit (FMU)	Suppression Priority	Wildland Fire Use[a]	Fuels Treatment	Community Assistance/ Protection	County
D4. Robledo Mountains WSA/ACEC	Low	High	Low	Low	Doña Ana
D5. West Potrillos WSA/ACEC	Low	High	Medium	Low	Doña Ana / Luna
D6. Las Uvas WSA/ACEC	Low	High	Medium	Low	Doña Ana

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2004a
NOTES: ACEC = area of critical environmental concern, WSA = wilderness study area, WFU = wildland fire use

[a] Wildland fire use is when unplanned ignitions are monitored rather than suppressed in order to achieve resource objectives. For example, if a lightning strike ignites a fire in an area slated for prescribe fire in the following year, appropriate management response may include WFU as a tactic, as long as the intensity of the burn is not such that it would harm the soil, air, or other natural or cultural resources.

Fuels Treatments

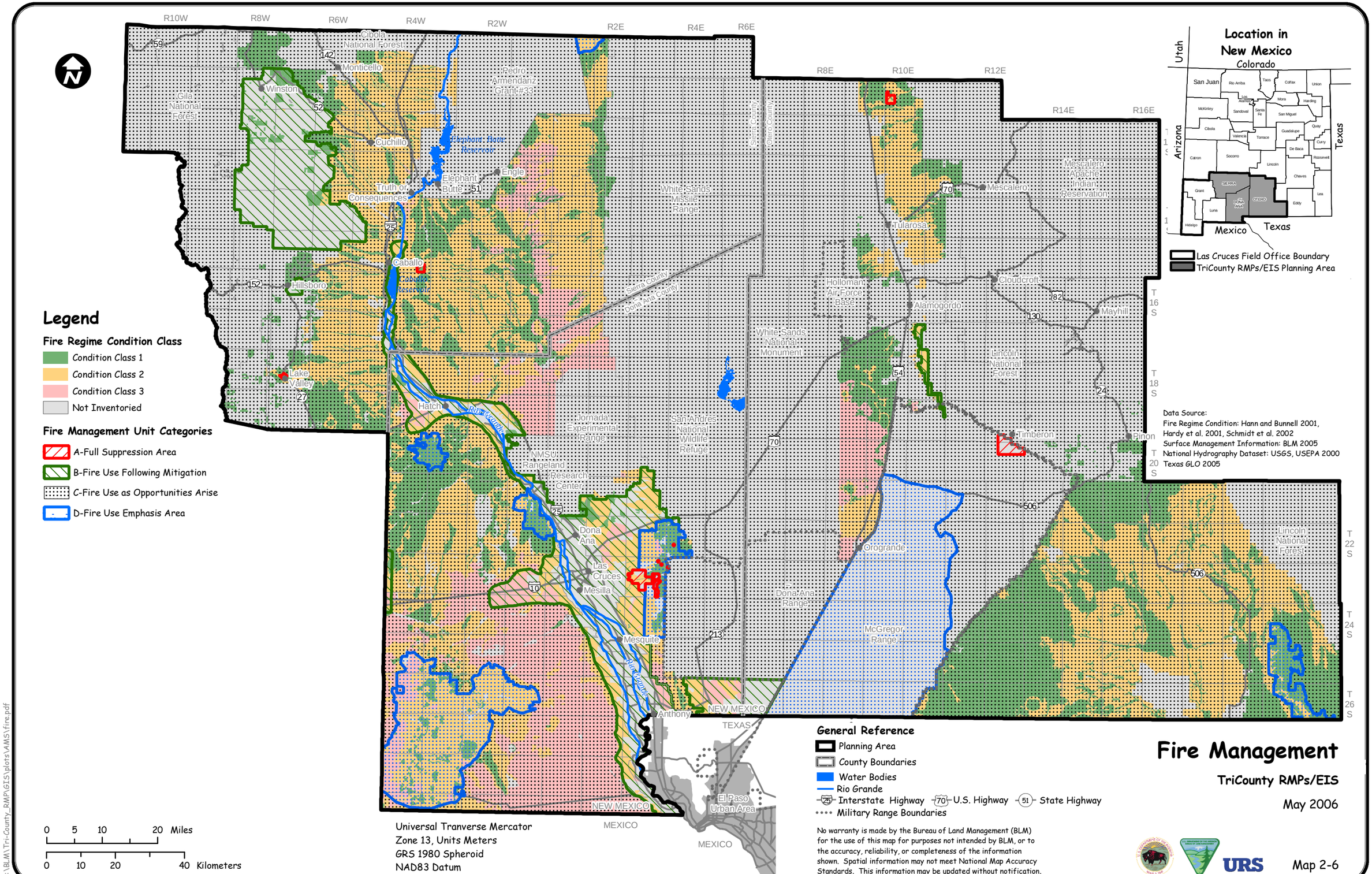
According to coarse-scale spatial estimates for New Mexico, the fire regimes and frequencies on about 7.8 million of the 13.4 million acres of BLM-administered public land in the State have been either moderately or significantly altered (USDI, BLM 2004b). The result is moderate to dramatic changes in fire size, intensity, severity, and/or landscape patterns. Based on estimates of the condition, these 7.8 million BLM-administered acres in New Mexico need treatments to restore the historical fire regime.

Fuels treatment uses various tools (i.e., prescribed fire, mechanical, biological, chemical) to reduce hazardous fuel loads, or to achieve resource objectives. A goal of treating 73,249 acres by prescribed fire and non-fire treatments annually for the Las Cruces District Office was developed in the Decision Record and RMPA for Fire and Fuels Management on Public Land in New Mexico and Texas (USDI, BLM 2004a). The acreage goal was based on a full funding and staffing scenario. Actual prescribed fire accomplishments vary greatly from year to year due to weather patterns; actual mechanical treatment accomplishments tend to be based on annual budget allocation. Treatment, via prescribed burning and mechanical treatments, likely would never occur on this total number of acres in a given year. However, over time, treatments could occur across this area.

Prescribed burning within the Las Cruces District Office area takes place year round. The majority of pile burning takes place during the winter and late spring, but also can take place during monsoon season. Grassland burns take place before green-up in late winter. Piñon-juniper burns take place during late spring and summer and have the tightest windows for opportunity, as they require the warmest and driest parameters to meet objectives. The fuels treatments approved for upcoming years are all in Otero County. Acreages are as follows: 1,710 acres of thinning; 9,116 acres of prescribed fire; 332 acres of fuel breaks; 503 acres of meadow restoration; and 50 acres of wildlife habitat area.

Fire Suppression

Residential developments in outlying areas that are surrounded by lands in the Planning Area are termed wildland/urban Interface (WUI) areas. These are high priority suppression areas due to public safety concerns. The WUI areas in the Planning Area are shown as FMU full suppression areas on Map 2-6. The following is a list of WUI areas in the Planning Area:


Legend
Fire Regime Condition Class
Condition Class 1
Condition Class 2
Condition Class 3
Not Inventoried
Fire Management Unit Categories
A-Full Suppression Area
B-Fire Use Following Mitigation
C-Fire Use as Opportunities Arise
D-Fire Use Emphasis Area
Location in New Mexico
Colorado
Utah
Arizona
Texas
Mexico
Las Cruces Field Office Boundary
TriCounty RMPs/EIS Planning Area
Data Source:
Fire Regime Condition: Hann and Bunnell 2001, Hardy et al. 2001, Schmidt et al. 2002
Surface Management Information: BLM 2005
National Hydrography Dataset: USGS, USEPA 2000
Texas GLO 2005
General Reference
Planning Area
County Boundaries
Water Bodies
Rio Grande
Interstate Highway
U.S. Highway
State Highway
Military Range Boundaries
No warranty is made by the Bureau of Land Management (BLM) for the use of this map for purposes not intended by BLM, or to the accuracy, reliability, or completeness of the information shown. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
0 5 10 20 Miles
0 10 20 40 Kilometers
Fire Management
TriCounty RMPs/EIS
May 2006
URS
Map 2-6
P:\BLM\Tri-County_RMP\GIS\plots\AMS\fire.pdf
Cibola National Forest
Gila National Forest
Monticello
Winston
Cuchillo
Truth or Consequences
Elephant Butte
Engle
Caballo
Hillsboro
Lake Valley
Hatch
Rio Grande
Dona Ana
Las Cruces
Mesilla
Mesquite
Anthony
NEW MEXICO
TEXAS
MEXICO
El Paso Urban Area
Pedro Armendariz Grant #33
Elephant Butte Reservoir
Caballo Reservoir
White Sands Missile Range
Sierra County
Otero County
Sierra County
Doña Ana County
Jornada Experimental Range
NMSU Rangeland Research Center
San Andres National Wildlife Refuge
White Sands National Monument
Holloman Air Force Base
Tularosa
Mescalero
Mescalero Apache Indian Reservation
Alamogordo
Cloudcroft
Mayhill
Lincoln National Forest
Timberon
Pinon
Orogrande
Dona Ana Range
McGregor Range
Lincoln National Forest
R10W
R8W
R6W
R4W
R2W
R2E
R4E
R6E
R8E
R10E
R12E
R14E
R16E
T 16 S
T 18 S
T 20 S
T 22 S
T 24 S
T 26 S

- Timberon, Otero County
- Talavera Subdivision, Doña Ana County
- Lake Valley, Sierra County
- Hillsboro, Sierra County
- Chaparral Community, Doña Ana County

The community of Timberon also is listed in the *Federal Register* as a "community at risk" from wildfire. The National Fire Plan directs funding to identified communities at risk for projects designed to reduce the risks to these communities.

The Las Cruces District Office area contains 66 rural volunteer fire departments that are eligible for rural fire assistance grant funding. In 2002, 13 grant requests were filled for $83,200. In 2003, 17 grants were issued for $110,000; and in 2004, 13 grants were issued for $81,600. These monies go to the departments to enhance their abilities to fight wildland fires on BLM or nearby lands and are typically used for wildland firefighting equipment and training.

2.1.10.3 Trends

Fire Regimes

Historic fire regimes in New Mexico developed through an interaction of vegetation communities, topography, climate, and ignition sources. Lightning has been a source of fire ignition over geologic time, and the use of fire by Native Americans during the past several centuries is probably not fully understood (Denevan 1992). The term "historic" generally refers to the period from about 1500 to late 1800, a time before extensive settlement by European-Americans in many parts of North America, before intense conversion of wildlands for agricultural and other purposes, and before fire suppression effectively altered fire frequency in many areas (Brown et al. 2000).

The number and size of wildland fires is heavily dependent on environmental factors that are variable over time. Fuel characteristics, climate, topography, and suppression activities all interplay to create the dynamics of wildland fire. However, some trends may be apparent by analyzing the number and size of past fires (Table 2-36).

Table 2-36
Wildland Fire History Trends on Public Land of the Las Cruces District Office, 1980-2003[a]

	Lightning-Caused Fires		Human-Caused Fires		Total Fires	
Years	**Number**	**Acres**	**Number**	**Acres**	**Number**	**Acres**
1980-1987	27	3,579	11	284	38	3,863
1988-1995	137	145,722	55	18,882	192	164,604
1996-2003	33	41,939	40	28,599	77	70,538
Total	**197**	**191,240**	**106**	**47,765**	**307**	**239,005**

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2004b
NOTE: [a] Includes Hildago, Grant, Luna, Doña Ana, Sierra, and Otero Counties.

While lightning fires are clearly the dominant cause of fires in the Las Cruces District Office area, note the increasing proportion of acres burned from human-caused fires since 1980. From 1980 through 1987, human-caused ignitions accounted for only 7 percent of all burned acreage in the area. From 1988 through 1995, human-caused ignitions burned 11 percent of all burned acreage. From 1996 through 2003, 40 percent of the acres that burned resulted from human-caused fires.

Ignitions in the Las Cruces District Office from human activities have been increasing since 1980. This trend is not likely to be positive in terms of FRCC. Unplanned ignitions often require aggressive suppression tactics, especially in WUI areas where human activity is greatest. Disturbances from fire in WUI areas often lead to increased fine fuel accumulations due to the presence of invasive weed vectors (e.g., people, vehicles, livestock, etc.). FRCC would not be improved where unplanned ignitions required aggressive suppression and restoration were minimal.

From 1984 through 2003, the Las Cruces District Office averaged 15 fires per year, burning an average of 12,750 acres annually. Generally, lightning or naturally caused fires accounted for approximately two-thirds of the number of fires, while a variety of human-caused fires account for the other one-third. The majority of the lightning-caused fires occurred from May to September, while human-caused fires have occurred at all times of the year (USDI, BLM 2004b).

While the majority of fires are relatively insignificant in terms of size and fire intensity, periodic large fire events typically burn at high-intensity levels. These fires can reach several thousand acres in size in just one burning period. The majority of large fires in the Las Cruces District Office area occur in short-grass savanna and short-grass shrub vegetation. Other large fires occur in the isolated mountain ranges in piñon-juniper shrublands.

Fire history specific to Sierra, Otero, and Doña Ana Counties also varies from year to year. Based on GIS data maintained by the Las Cruces District Office, there were 113 fires on public land administered in these three counties between 1980 and 2004. The eight fires recorded on public land in Sierra County occurred between 1983 and 2001, and ranged from 1 to 650 acres. The 58 fires on public land in Otero County occurred between 1982 and 2004, and ranged from less than one acre to approximately 19,000 acres. The 47 fires on public land in Doña Ana County occurred between 1980 and 2003, and ranged from less than one acre to approximately 13,800 acres.

Wildland Fire Management Strategies

The following information is summarized from the Las Cruces District Office Fire Management Plan for 2004.

Fuels Treatments

Approximately five mechanical fuels treatment projects for a total of 300 to 500 acres are currently planned each year across the Las Cruces District Office. Approximately 300 acres are fuels reduction projects in the WUI. Some form of fuel reductions occurred on 4,102 acres in 2004 (USDI, BLM 2004b). The Las Cruces District Office has contracted out most of its mechanical fuels reduction projects.

Since the advent of the National Fire Plan, the mechanical fuels reduction workload has increased dramatically from 35 acres in 2001 to 351 acres in 2004 (USDI, BLM 2004b). Yearly fluctuations in acres of mechanical fuels reductions are noted below.

2001: 35 acres

2002: 347 acres

2003: 259 acres

2004: 351 acres

In addition to mechanical treatments, the Las Cruces District Office uses chemical treatments for fuels reduction. In 2004, approximately 1,060 acres were treated with the chemical Tebuthiron to reduce piñon and juniper encroachment onto historical grasslands. This treatment is being monitored and evaluated to see if this is an effective tool for fuels reduction in the future. As a result of fuel treatments, approximately 550 acres of FRCC 3 have been moved to FRCC 1, and approximately 450 acres of FRCC 2 have been moved to FRCC 1 since 2001 (USDI, BLM 2004b). These treatments all occurred in Otero County.

A prescribed fire program was started in the BLM's former Mimbres Resource Area, which includes Doña Ana County, in 1989. Five prescribed burns were completed there between 1989 and 1993 (USDI, BLM 1993a). Since 2001, the Las Cruces District Office conducted prescribed fires on 6,275 acres in 2003 and 2,691 acres in 2004; no prescribed fires were conducted in 2001 or 2002. All burns were on FRCC 2 lands with about 40 percent moving to FRCC 1 after the burns. The fire management staff, in collaboration with the resource specialist staff, (e.g., archaeologists, biologists, etc.) initiates most of the prescribed fire projects.

Fire Suppression

Fire suppression in the Planning Area has been influenced primarily by direction provided in the Review and Update of the 1995 Federal Wildland Fire Management Policy (National Interagency Fire Center 2001). This policy emphasizes the role of fire as a natural process and contains guidance to allow fire to function in this role, among other things. As a result, suppression activities have been supplanted in some cases by wildland fire use opportunities. In addition, expanding WUI areas are creating more areas where wildfire poses a risk to the public. These areas demand high suppression priority. Collaborative efforts have begun in Sierra and Otero Counties to create countywide fire risk and hazard mitigation plans.

2.1.10.4 Forecast

Fire Regime

Natural and human-caused fires will continue throughout the Planning Area. The majority of natural fires will be ignited by lightning every year from May to September. Natural fires are expected to continue to account for approximately two-thirds to one-half of the annual number of ignitions. The size of these fires will depend on weather, topography, fuel characteristics, and suppression response times.

Human-caused fires will continue to occur year round and likely will increase in ignitions per year over the next twenty years. The primary drivers for increased human caused ignitions in the Planning Area are activities associated with recreation and WUI areas. Places that draw recreation and development have an increased potential for ignition from human activities.

The likelihood that any fire will improve the FRCC of an ecosystem will depend on two things—first, the condition of the system before the burn, and second, the management of the community after the burn. A community that is in FRCC 3 due to high densities of invasive grasses for example, will not likely improve as a result of fire alone. Disturbance from fire creates niches for colonizing plants and releases a pulse of nutrients to the soil. These conditions create ideal conditions for opportunistic and invasive plant colonization. If the fire does not burn hot enough to destroy the existing seedbank of invasive grass, or if there is a seed source adjacent to the burned area, the FRCC may not be improved and could potentially deteriorate.

In addition, the management of an area after a burn will continue to play a key role in the resulting FRCC. Emergency stabilization and rehabilitation practices may improve FRCCs by altering the post-burn plant community. FRCC is improved when the resulting plant community better resembles those plant community characteristics present under the historic fire regime. These characteristics involve surface fuel continuity, fuel structure, fuel moisture, and photosynthetic processes.

Wildland Fire Management Strategies

Fuels Treatments

Planned burning treatments identified in the 1989 Mimbres Resource Area RMP are described below Table 2-37. Comparable data were not available for Sierra and Otero Counties.

Table 2-37
Planned Burning Treatments in the Mimbres Resource Area RMP

Plant Community	Acres Treated By Burning[a]	Purpose
Mixed Desert Shrub (>10% slope)	86,830	Wildlife, watershed, forage production
Mountain Brush	141,510	Wildlife, watershed, forage production
Snakewood	281,250	Wildlife, watershed, forage production
Grass Bottomlands	168,550	Improve plant vigor, reduce shrub invasion, increase forage and palatability
TOTAL	678,140	

SOURCE: U.S. Department of the Interior, Bureau of Land Management 1993a

NOTE: [a] Burning treatment could include wildland fire use and prescribed fire.

The average fire size will remain static or be reduced slightly over the next twenty years. The primary drivers include mechanical fuel treatments, prescribed fire, suppression activities, and natural variables such as weather and vegetation conditions. Fuel reduction using mechanical methods outside the WUIs will be done in piñon-juniper woodlands and in grasslands with piñon-juniper and other shrub encroachment. With treatment, these areas should be converted from FRCC 3 to FRCC 2. There are small areas that may be treated to convert FRCC 2 to FRCC 1. The Las Cruces District Office is considering using goats or other ungulates to offset some of the resprouting in oak and mahogany stands.

A goal of treating 73,249 acres by prescribed fire and nonfire treatments annually for the Las Cruces District Office was developed in the RMPA for Fire and Fuels Management on Public Land in New Mexico and Texas (USDI, BLM 2004a). Assuming this goal is met, reductions in average yearly fire size and number could be realised throughout the Planning Area. Fuels treatments over the next 20 years are expected to increase with priority given to communities at risk and communities of interest. As hazardous fuel treatments and prescribed fire increase, FRCCs will change to lower classes on a greater number of acres. Reducing fuels across large areas would decrease the potential for large fires.

Fire Suppression

WUI areas are expected to grow, or remain static over the next 20 years, which would result in fire suppression in more areas to respond to public safety concerns. Risk of fire danger will increase as population and recreation increases and will continue to rise until communities complete community wildfire protection plans, or countywide fire risk and hazard mitigation plans. Completion of these plans will enhance agency partnerships and the potential of communities to receive rural fire assistance monies and grants.

The communities of Timberon and Hillsboro are prioritized for accomplishment of community wildfire protection plans; however, plans for these specific communities have not been completed to date. Plans for protection of these communities have been included in countywide wildfire protection plans (Whitaker 2005). Any future community wildfire protection plan would be tiered to the respective county plan.

2.1.10.5 Key Features

Key features for fire management focus on the priority areas for both fuels treatments and fire suppression, mainly for public safety reasons. WUI areas, in priority order for fuels treatment, are Timberon Fuel Break and Caballo Mountain Communication Site. Non-WUI-prescribed fire projects are scattered across the Planning Area and include Iron Mountain, Caballo Mountains, Potrillo Mountains, McGregor Range, Cornucopia Draw, and Timber Mountain.

The highest priority FMUs for suppression in the Planning Area are as follows:

- Timberon, Otero County
- Aguirre Springs, Doña Ana County
- La Cueva, Doña Ana County
- Cox Visitor Center, Doña Ana County
- Dripping Springs, Doña Ana County

La Cueva, Aguirre Springs, Cox Visitor Center and Dripping Springs are important recreation sites. Timberon is a WUI area.

2.1.11 Cultural and Heritage Resources

BLM defines a cultural resource or cultural property as:

> a definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups (BLM Manual 8100, Cultural Resource Management).

2.1.11.1 Cultural History

Decades of research have documented that the cultural history of the Planning Area extends back in time approximately 12,000 years, and perhaps substantially longer. [In fact, claims for more than 50,000 years of human occupation in the New World have been based on excavations in Pendejo Cave in Otero County (MacNeish and Libby 2004). Ongoing study of the thousands of archaeological sites and historical resources that dot the landscape of southern New Mexico continues to add information about the cultural history of the region. The following brief summary of this cultural history provides a context for evaluating the cultural resources of the TriCounty Planning Area (Griffen 1983; Kirkpatrick and Duran 1998; LeBlanc and Whalen 1980; Lekson 1984, 1992; Opler 1983a, 1983b; Spicer 1962; Stuart and Gauthier 1981; Wilson 1975, 1985 provide additional details).

The earliest well-documented occupants, who are referred to as Paleoindians, occupied the region from about 10,000 to 7,000 or 6,000 B.C. During this period, the regional climate was transitioning from the cooler and wetter regime of the last Ice Age to weather patterns more like current conditions.

Various Paleoindian phases or complexes (such as, Clovis, Folsom, Midland, Belen, Portales, Firstview, Cody, and Eden) have been defined, primarily on the basis of different styles of stone points used on spears or darts for hunting various game animals, including several large, now extinct species such as mammoths. The camps, killing and butchering sites, and stone tool quarrying and knapping sites of the Paleoindian era are rare, because these earliest occupants lived in small groups, left little durable evidence of their presence, and what archaeological evidence was left has been subject to millennia of erosion. The distinctive projectile points are the most common evidence of this period, but they often are found in isolation without other archaeological remains or are mixed with later deposits, suggesting the points were collected and perhaps reused by later occupants of the region.

Archaeologists call the long period from about 7,000 or 6,000 B.C. to about A.D. 200 the Archaic era. Archaic sites are more common than Paleoindian sites. The Archaic period represents a continuation of the Paleoindian subsistence strategy of hunting game and gathering indigenous plant foods. However, the large Pleistocene species had become extinct and Archaic hunters focused on smaller game animals, particularly deer and rabbits. Ground stone tools indicate that Archaic peoples relied more on plant foods and processed those foods intensively. The Archaic era commonly is divided into three or four periods based on changing styles of projectile points, but the overall hunting and gathering adaptation appears to have been quite stable.

Sizeable villages of pit houses, probably representing winter settlements of populations that dispersed during other seasons of the year, have been dated as early as the Keystone phase (4300-2500 B.C.) but are uncommon. Sites with smaller numbers of pit houses became much more common during the late Archaic era. Corn was being grown as early as about 1000 B.C., as evidenced in sites such as Fresnal Shelter in Otero County. But corn and other subsequently adopted crops, such as beans and amaranth, appear to have been a minor element of the diet for centuries, and had little effect on the general Archaic lifeway for some time. Population appears to have increased throughout the Archaic era although almost certainly not in a steady, uninterrupted trend. The range of seasonal rounds traveled annually by any given social group probably decreased in proportion to population growth.

The subsequent period from about A.D. 200 to about 1400 or 1500 is called the Ceramic or Formative era. The Formative period represents an era of increased population, increased reliance on farming, and less mobile populations who occupied more settlements year round. More substantial villages were built during this era and ceramic vessels were made, used, and broken by the thousands. Although pottery vessels are fragile, the individual sherds of broken pots are extremely durable and pottery fragments are key pieces of archaeological evidence about the Formative era. Formative-era sites dominate the archaeological record of the region.

Regional variation became more pronounced during the Formative era, and the period is divided into a series of chronological phases. Most of the Formative sites in the eastern part of the Planning Area are classified as the Jornada, or lowland branch, of the Mogollon culture. The Mesilla phase of the Jornada Mogollon, dated from about A.D. 300 to 1100, represents farming groups who lived in pit house villages and made primarily brown ware ceramics. The Doña Ana phase, dated from about A.D. 1100 to 1200, represents a transition to the El Paso phase (A.D. 1200-1400). During the El Paso phase farming groups lived in villages of adobe buildings with contiguous rooms rather than pit houses. They decorated some of their brown wares with red and black paint, and acquired and used several other types of decorated ceramics from adjacent areas. Through time, the Jornada farming groups aggregated into fewer, larger villages, although they continued to generate many small archaeological sites at temporary camps and locations used briefly for collecting and processing various resources.

Most of the Formative sites in the western part of the Planning Area are classified as the Mimbres, or upland lowland branch, of the Mogollon culture. The Early Pit House Period (Cumbre phase in the Mimbres Valley), dated from about A.D. 200 to 550, represents groups who lived in small villages, usually with fewer than 10 shallow pit houses, often on high, steep-sided knolls and mesas. Although corn and corn-processing artifacts are found at these sites, hunting and gathering probably was emphasized more than farming. Pottery dated to this period is mostly plain brown ware, but sometimes an exterior red wash was applied. The Late Pit House period is dated from about A.D. 550 to 1000, and is divided into three phases: Georgetown, San Francisco, and Three Circle, primarily on the basis of changing types of pottery. Population grew throughout this period, and larger villages were occupied (some with 100 or more pit houses) and they were commonly built on terraces above major drainages, reflecting increased emphasis on farming alluvial soils.

The Pueblo period (divided into the Mimbres, Black Mountain, and Cliff phases) is dated from about A.D. 1000 to 1450. During this period, habitations shifted from pit houses to stone pueblos and the

distinctive Mimbres Classic Black-on-white pottery was made. Many larger pueblos were built (up to about 300 rooms), but many smaller sites were dispersed across the landscape. The emphasis on farming, using diversions and canals along streams and manipulating rainfall runoff with check dams and rock alignments in upland settings, appears to have been intense. Around A.D. 1150, the Mimbres phase ended and the archaeological record of the subsequent Black Mountain Cliff phases is radically different. The Black Mountain phase, characterized by what appears to be a much smaller population living in adobe pueblos, is interpreted as reflecting influence from the very large Casas Grandes community, centered to the south in Chihuahua. At about A.D. 1300 the Cliff phase began and appears to reflect influence of the Salado phenomenon that encompassed much of southern Arizona and southwestern New Mexico.

The Jornado and Mimbres branches of the Mogollon cultural system appear to have collapsed in the mid-1400s, or at least changed so drastically that they left an essentially invisible archaeological record. When the first Spanish expeditions passed through south-central New Mexico in the 1580s, they encountered various groups of hunters and gatherers. The Mansos were reported in the El Paso area ranging north along the Rio Grande, the Janos and Jocomes ranged west of the Rio Grande, and the Sumas and Jumanos were farther to the south. Very little is known about these peoples, and it is not clear what type of languages they spoke. The southernmost puebloan peoples that the Spanish encountered were the Piros in the Rio Grande Valley about 150 miles north of El Paso, and north of the Planning Area.

These native groups subsequently were devastated by warfare or were largely blended into Mexican or Apache societies. Descendents of Piro and Tigua (or Tiwa), who moved south with the Spanish when the Pueblo Revolt of 1680 drove them out of New Mexico, reside at Ysleta del Sur Pueblo on the southern edge of El Paso, Texas. A composite community of Tigua, Piro, and Manso Indians formed a daughter colony known as Tortugas in Las Cruces, some time between 1850 and 1900. Tortugas was formally incorporated in 1914, but the Federal government has not approved the colony's request for formal recognition as an Indian tribe (Houser 1979).

By the late 1500s (and perhaps earlier), Athapascan-speaking peoples moved into southern New Mexico and came to dominate this territory. The Athapascan speakers differentiated into the Navajo and several groups of Apaches. The Chiricahua Apache occupied the western parts of the Planning Area west of the Rio Grande and the Mescalero Apache occupied areas to the east. The Apaches relied primarily on hunting and gathering, but practiced some farming in selected locations. The Apaches often were in conflict with the Comanche to the east, the Spanish to the south, and the Piro Pueblos, who abandoned their villages along the Rio Grande because of Apache raiding.

The first Spanish explorers entered what is now New Mexico in the early sixteenth century, but left after finding no mineral wealth and they did not return to settle the area until late in the century. Early Spanish settlement focused on the northern Rio Grande Valley, well to the north of the Planning Area, which was largely a place to get through, rather than to. A major route of travel between Mexico and the New Mexican colony—the Camino Real de Tierra Adentro (Inland Royal Road) or Chihuahua Trail—developed along the Rio Grande at that time. The trail generally was adjacent to the river, except for a 90-mile waterless cutoff—the Jornado del Muerto—that continued due north as the river veered to the west.

The Spanish waged campaigns against the Apaches in southern New Mexico but did not settle in the region. A string of Spanish military presidios established in the late 1600s all were south of the current border with Mexico. The only Spanish settlement in southwestern New Mexico, dating from early in the 1800s, was at the Santa Rita mine in what is now Grant County.

Mexico gained independence from Spain in 1821, and after establishing more open relations with the United States, the Camino Real essentially became an extension of the Santa Fe Trail. However, the Apaches remained in control of most of southern New Mexico and their raiding thwarted commerce along the route. Mexican agricultural settlement began expanding north from the El Paso area in the 1840s with the settlement of Doña Ana and Las Cruces in the Mesilla Valley along the Rio Grande. At this time Mexico lost New Mexico to the United States as a result of the Mexican War of 1846–1848, and adjustments of additional territory through the Gadsden Purchase ratified in 1854.

The United States invested considerable effort in establishing military posts to explore and map the country, describe local resources, and identify the best routes of travel, as well as to protect new settlers from Apache raids. Fort Bliss, Fort Fillmore, Fort Thorn, and Fort Craig were established in the Rio Grande Valley in 1853 and 1854 to protect immigrants moving west as well as travelers along the north-south Camino Real. Fort Bliss also was located to guard the border with Mexico. Later forts in the area included Fort McRae and Fort Selden established in 1863 and 1865, respectively.

In the late 1850s, Hispanics cautiously began to expand farther north along the Rio Grande. These small agricultural settlements relied on ditch irrigation from the Rio Grande. A few small farming communities, such as villas Cuchillo and Cañada Alamosa (Monticello), also were established in the foothills of the Black Range and Mimbres Mountains along the smaller, western tributaries of the Rio Grande. Fort McRae, built in 1863 near where Elephant Butte Reservoir is now, provided additional protection, but the Civil War diverted military efforts away from the campaigns against the Apaches. Southern New Mexico was part of the Confederacy for about a year from mid-1861 through mid-1862.

The U.S. Army was able to control the Apaches only after the Civil War ended and more troops became available. By the beginning of the 1870s, relations with the Apaches shifted from hostilities to reciprocal trade, and many Apaches were relocated to reservations. The Mescalero Apache Reservation in northeastern Otero County was established in 1873.

The presence of the U.S. Army provided protection for travel through the region. One of the more famous routes was the Butterfield Overland Mail Company road, which John Butterfield established as a mail and passenger service from St. Louis to San Francisco in 1858. The Butterfield route generally followed the initial wagon road pioneered across the Southwest by the Mormon Battalion, under the leadership of Capitan Philip St. George Cooke, during the 1846-1848 War with Mexico.

Mining in southern New Mexico was seriously pursued only after the Apaches were defeated. Some gold, silver, and copper was mined in the Tularosa and High Rolls Districts of the Sacramento Mountains in eastern Otero County, and in the Jarilla Mountains in western Otero County. More substantial mining efforts focused on the eastern slopes of the Black Range, where the discovery of gold and silver in the

1870s and 1880s led to establishment of numerous mining communities in western Sierra County, including Winston, Chloride, Kingston, Hillsboro, and Lake Valley.

Ranching was a major theme of historic Euro-American settlement of the uplands. Although some livestock, particularly sheep, were raised in conjunction with the agricultural communities in the Rio Grande Valley, large scale cattle ranching dates only from the 1880s—the decade when railroads arrived in the territory and grasslands thrived under wetter than normal conditions. Early ranching was an expansion of the Texas cattle industry, and most ranching soon was consolidated into large, corporate ranches financed by Eastern and European capital. A return to more arid conditions and increased competition for water sources and forage led to violent range wars that are the grist of popular historical images of the West. Droughts, falling cattle prices after World War II, institution of more sustainable grazing practices, and development of a feedlot cattle business greatly reduced the size of herds on the ranges. In 1916, the Bureau of Reclamation completed construction of Elephant Butte Dam on the Rio Grande, and stabilized the water supply for irrigation agriculture that was used particularly for raising cotton and alfalfa, as well as vegetables and pecans. Agriculture continues to be important to the regional economy.

During World War II, the federal government leased and purchased several large ranches for use as a military training facility, including Oliver Milton Lee's Sacramento Cattle Company, and the Fleck, McGregor, and Atkins family ranches. The White Sands Proving Ground (now Missile Range) was established in 1945. On 16 July of that year, the world's first atomic bomb was detonated on the range. After the war, the Department of the Army acquired other ranches for McGregor Range, which was first developed as an anti-aircraft artillery firing range and then for missile testing and training. Military training and research continues to be a prominent activity within the Planning Area.

Other important sectors of the economy are related to increased trade across the international border and "Sun Belt" retirement. The potential for oil and natural gas reserves also continues to be explored, particularly on Otero Mesa.

2.1.11.2 Indicators

Factors relevant for describing the condition of cultural and heritage resources of the Planning Area include the:

- Extent of inventory and evaluation
- Extent of threats to the integrity of cultural and heritage resources and responses to those threats
- Extent of public and professional interpretation of cultural resources.

2.1.11.3 Current Conditions

Extent of Inventory and Evaluation

A major challenge in managing cultural resources is simply to inventory and evaluate them. Archaeological sites, reflecting both prehistoric and historic era occupation of the region, are so abundant that total inventory is impractical. When the White Sands RMP was being prepared in 1985, it was

estimated that less than 0.2 percent of Otero and Sierra Counties and less than 1 percent of the public land in those counties had been surveyed for cultural resources. The RMP stated that 10 historic and 129 prehistoric sites had been recorded at that time on public land within those counties. Summary information for selected large surveys that, in the aggregate, had covered about 50 square miles indicated that the densities of archaeological and historical sites varied from about 1 to more than 60 per square mile, with an average density of almost 5 sites per square mile (although the draft RMP/EIS reported only 2 sites per square mile). Those numbers suggest there could be more than 50,000 archaeological and historical sites in those two counties (although the draft RMP/EIS projected about 13,000). No comparable statistics were compiled when the Mimbres Resource Management plan was issued in 1993.

Information about the status of the inventory and evaluation of cultural resources within the Planning Area was compiled from two sources: (1) annual reports of the BLM cultural resource program, and (2) the New Mexico Cultural Resource Information System (NMCRIS). Both sources of information have their limitations, but provide a basis for characterizing the cultural resources of the Planning Area.

The BLM annually compiles statistical information about the agency's cultural resource program. The format of the annual reports has changed over the years, and not all of the information has been consistently tallied over the years. Also, the boundaries of the reporting units have been modified over time. Information was compiled for Otero and Sierra Counties (formerly the White Sands and then renamed the Caballo Resource Area) since 1986 (subsequent to the completion of the White Sands RMP) and for Doña Ana County (one of four counties within the former Mimbres Resource Area) since 1993 (subsequent to the issuance of the Mimbres RMP). Annual statistics were reported for Otero and Sierra Counties for 10 of the 19 years that were summarized. For the other years, only aggregate information for the entire Las Cruces District (which included 8 counties during the early years and 6 counties after the Socorro office began reporting independently), except for one year when no report was available. For those years, statistical information for Otero and Sierra Counties was estimated based on the proportion of public land within Otero and Sierra Counties compared to the entire district. No statistical information was ever reported for Doña Ana County, and proportional estimates were made in similar manner based on reports for the Mimbres Resource Area or Las Cruces District.

Based on the annual reports it is estimated that since 1986, the BLM cultural resource program resulted in cultural resource survey of almost 20,000 acres (31 square miles) of public land within Otero and Sierra Counties, and more than 380 archaeological and historical sites were recorded (Table 2-38). Survey projects included in the BLM annual reports are not limited just to public lands because some projects within the purview of BLM review also cross non-public lands. The annual reports indicate that almost 11,000 acres (17 square miles) of non-public land was surveyed and more than 200 archaeological and historical sites were recorded in conjunction with those surveys.

Table 2-38
Historical Cultural Resource Inventory and Evaluation Data for Sierra and Otero Counties

	Acres Surveyed			Sites Recorded			Sites Evaluated[3]	
Fiscal Year	**BLM**	**non-BLM**	**Total**	**BLM**	**non-BLM**	**Total**	**National Register Eligible**	**National Register Ineligible**
1986[a]	1,091	3,916	5,007	not reported	not reported	85	84	1
1987[a]	338	1,116	1,454	not reported	not reported	67	48	1
1988	2,741	89	2,830	5	31	36	0	0
1989	118	1,376	1,493	5	54	59	5	2
1990	460	248	708	6	0	6	5	1
1991	1,086	148	1,234	16	4	20	15	5

	Acres Surveyed			Sites Recorded			Sites Evaluated[3]	
1992	854	17	871	31	0	31	not reported	not reported
1993[b]	2,122	1,134	3,256	42	36	78	37	9
1994	854	180	1,034	12	0	12	7	4
1995	1,749	184	1,933	60	2	62	55	5
1996	1,012	601	1,613	27	3	30	24	3
1997	230	not reported	230	2	not reported	2	not reported	not reported
1998	1,132	87	1,219	81	4	81	73	11
1999[b]	1,157	68	1,225	11	1	12	4	6
2000[b]	1,458	1,161	2,619	25	40	65	52	11
2001[b]	1,344	636	1,980	31	34	65	20	0
2002[b]	1,496	0	1,496	24	0	24	5	1
2003[b]	no report available							
2004[b]	658	15	673	3	1	4	3	0
totals	**19,899**	**10,977**	**30,875**	**381**	**206**	**739**	**437**	**60**
square miles	31.1	17.2	48.2				**% ineligible**	14%
averages[c]	1,105	646	1,715	24	15	41	27	4
square miles	1.7	1.0	2.7					
sites per square mile				14	15	15		

SOURCE: U.S. Department of the Interior, Bureau of Land Management 1986 - 2004

NOTES: [a] proportional estimated based on public land in Otero and Sierra Counties constituting 33.6 percent of public land in old Las Cruces District

[b] proportional estimated based on public land in Otero and Sierra Counties constituting 43 percent of public land in revised Las Cruces District

[c] annual average calculated for years with reported data

Based on the annual reports, it is estimated that since 1993 the BLM cultural resource program resulted in cultural resource survey of almost 12,500 acres (20 square miles) public land within Doña Ana County, and more than 160 archaeological and historical sites were recorded (Table 2-39). Almost 7,200 acres (11 square miles) of non-public land was surveyed by projects within the purview of BLM review and almost 140 archaeological and historical sites were recorded in conjunction with those surveys.

Table 2-39
Historical Cultural Resource Inventory and Evaluation Data for Doña Ana County

	Acres Surveyed			Sites Recorded			Sites Evaluated[c]	
Fiscal Year	**BLM**	**non-BLM**	**Total**	**BLM**	**non-BLM**	**Total**	**NRHP Eligible**	**NRHP Ineligible**
1993[a]	1,791	958	2,749	36	30	66	32	8
1994[a]	677	1,225	1,902	7	12	19	8	2
1995[a]	537	361	898	25	5	30	not reported	not reported
1996[a]	335	122	457	12	0	12	0	0
1997[a]	1,557	not reported	1,557	not reported	not reported	9	not reported	not reported
1998[a]	1,436	2,876	4,312	6	27	33	19	0
1999[b]	977	57	1,034	9	1	10	3	5
2000[b]	1,231	980	2,211	21	34	55	44	9
2001[b]	1,134	537	1,671	26	29	55	17	0
2002[b]	1,263	0	1,263	20	0	20	4	1
2003[b]	no report available							
2004[b]	1,530	35	1,565	2	1	3	3	0
totals	**12,468**	**7,151**	**19,619**	**164**	**139**	**312**	**130**	**25**
miles[b]	19.5	11.2	30.7				**% ineligible**	19%
averages[c]	1,133	715	1,784	16	14	28	14	3
miles[2]	1.8	1.1	2.8					
sites per square mile				9	12	10		

SOURCE: U.S. Department of the Interior, Bureau of Land Management 1986 - 2004

NOTES: [a] Proportional estimated based on public land in Doña Ana County constituting 36.3 percent of public land in Mimbres Resource Area

[b] Proportional estimated based on public land in Doña Ana County constituting 20.7 percent of public land in Las Cruces District

[c] Annual average calculated for years with reported data

The NMCRIS was used as another source of information about the extent of inventory and evaluation of cultural resources within the Planning Area. NMCRIS is a statewide database that was developed and is maintained by the State Historic Preservation Office (with support from BLM). Originally, NMCRIS was a tabular database of archaeological and historical site attributes, but it has been upgraded to GIS with computerized spatial information. Most available GIS data about the location of archaeological and historical sites in the Planning Area appears to have been incorporated into the NMCRIS database. Incorporation of information about the extent of cultural resource surveys appears to be less complete.

It must be noted that the NMCRIS information was collected by many different researchers for a variety of reasons over a period of at least eight decades, and is subject to some inconsistencies, incompleteness, and errors. The database is constantly being upgraded and expanded. The vast majority of NMCRIS information about the Planning Area has been compiled by surveys undertaken since the mid-1970s in response to increasing Federal and State historic preservation regulations and growing interest in cultural resource management. But even during the last 30 years, standards for intensive cultural resource survey and resource recording and evaluation have evolved considerably. Therefore, not all survey coverage is of comparable intensity and completeness.

At the end of 2004, NMCRIS included information about 9,995 archaeological and historical sites recorded in Otero and Sierra Counties, and 2,608 of those are on public land (Table 2-40). That is five times more than the estimate of approximately 520 sites based on the information reported in the White Sands RMP and subsequent annual reports. The NMCRIS data indicate that 14 percent of the public land has been surveyed, which is a higher percentage than for any other jurisdiction and an estimated 9 percent of Otero and Sierra Counties. Despite the higher percentage of survey on public land and the fact that public land constitutes 30 percent of Otero and Sierra Counties, the recorded sites on public land make up only 26 percent of the site inventory.

Table 2-40
Cultural Resource Surveys and Sites in TriCounty Planning Area

Jurisdiction	Sierra and Otero Counties	Doña Ana County
BLM		
Total Area (square miles)	3,671	1,747
Surveyed Area (square miles)	529	65
Percent of Total Area Surveyed	14%	4%
Number of Recorded Sites	2,608	1,077
Sites in Documented Surveys	1,598	367
Sites per Square Mile	3	6
Other Federal Lands		
Total Area (square miles)	3,730	1,114
Surveyed Area (square miles)	331	20
Percent of Total Area Surveyed	9%	2%
Number of Recorded Sites	5,437	986
Sites in Documented Surveys	1,337	133
Sites per Square Mile	4	7
Indian Lands		
Total Area (square miles)	721	0
Surveyed Area (square miles)	46	
Percent of Total Area Surveyed	6%	
Number of Recorded Sites	294	
Sites in Documented Surveys	130	

Jurisdiction	Sierra and Otero Counties	Doña Ana County
Sites per Square Mile	3	
State Lands		
Total Area (square miles)	975	451
Surveyed Area (square miles)	18	25
Percent of Total Area Surveyed	2%	6%
Number of Recorded Sites	338	352
Sites in Documented Surveys	64	118
Sites per Square Mile	4	5
Private		
Total Area (square miles)	1,854	525
Surveyed Area (square miles)	91	67
Percent of Total Area Surveyed	5%	13%
Number of Recorded Sites	1,318	955
Sites in Documented Surveys	584	453
Sites per Square Mile	6	7
Totals		
Total Area (square miles)	10,951	3,838
Surveyed Area (square miles)	1,015	178
Percent of Total Area Surveyed	9%	5%
Number of Recorded Sites	9,995	3,370
Sites in Documented Surveys	3,713	1,071
Sites per Square Mile	4	6

SOURCE: New Mexico Cultural Resource Information System 2004

About 39 percent of the sites recorded on public land within Otero and Sierra Counties are mapped within areas that are not documented in NMCRIS as having been surveyed, and about 63 percent of all sites recorded within Otero and Sierra Counties are not associated with documented surveys. This probably reflects early (pre-1970s) inventories that did not rigorously document survey areas or the fact that information about some survey projects has not yet been entered into the NMCRIS database. Based on the number of sites recorded by documented surveys, it is estimated that the average site density on public land in Otero and Sierra Counties is 3 sites per square mile, compared to 4 per square mile for the entire two counties. Only private land (6 sites per square mile) has higher average site densities. Those averages suggest there are more than 40,000 archaeological sites in Otero and Sierra Counties, and more than 11,000 of those are on public land, with approximately three-fourths of those yet to be recorded.

The NMCRIS database includes information about 3,838 archaeological and historical sites recorded in Doña Ana County, and 1,077 of those are on public land (refer to Table 2-40). The data indicate that 4 percent of the public land has been surveyed for cultural resources compared to 5 percent for the entire county. Although public land constitutes 46 percent of Doña Ana County, the archaeological and historical sites on public land constitute only 32 percent of the sites recorded within the county.

About 66 percent of the recorded sites are within areas that are not documented in NMCRIS as having been surveyed, and about 68 percent of all sites recorded within Doña Ana County are not associated with documented surveys. Again, this probably reflects early (pre-1970s) inventories that did not rigorously document survey areas or the fact that information about some survey projects has not yet been entered into the NMCRIS database. Based on sites recorded by documented surveys, it is estimated that the average site density on public land in Doña Ana County is 6 sites per square mile, which is the same as the estimated average density for the entire county. Those averages suggest there are 20,000 to 25,000

archaeological sites in Doña Ana County, and more than 10,000 of those are on public land, with approximately 85 to 90 percent of those yet to be recorded.

Cultural Landscapes

BLM Information Bulletin 2002-101 provides direction for considering cultural resources during preparation of RMPs. In recognition of the influence that environmental factors have on the human occupation of any given region, the bulletin recommended that cultural resources be considered at a "landscape scale," focusing on "continuity of geographic and cultural similarities and influences" more than on current administrative boundaries. In consideration of environmental variability and the overall patterns of the regional cultural history as summarized above, the Planning Area was divided into five cultural landscapes (Map 2-7). Natural environmental factors considered in defining these cultural landscapes include natural vegetation, rainfall, landform, and elevation. Although the boundaries of these units cannot be sharply defined, they partition the environmental and cultural variability of the Planning Area into units that are useful for organizing and summarizing information about the cultural resources of the area.

Rio Grande Corridor

The Rio Grande Valley cultural landscape is defined as including not only the riparian area along the river but also the adjacent creosotebush and mesquite desertscrub and Chihuahuan grasslands extending west to the foothills of the Black Range and Mimbres Mountains, and east to the San Andreas, Organ, and Franklin Mountains. The corridor ranges from about 10 to 50 miles wide. Elevations generally range from 4,000 to 5,000 feet above sea level. The unit includes three small mountain ranges on the east side of the river—Fra Cristobal Range, Caballo Mountains, and Doña Ana Mountains. Those mountains rise to elevations of approximately 5,700 to 7,400 feet.

Annual precipitation in the Rio Grande Corridor is approximately 9 to 11 inches. The water of the Rio Grande and a narrow riparian zone were important environmental resources. This zone has been highly altered by agricultural development, and non-native species such as salt cedar and Russian olive have replaced much of the native cottonwood-willow community and mesquite bosques along the river. In the northern part of the corridor, a series of washes drain uplands from the west into the Rio Grande (Alamosa Creek, Cuchillo Negro Creek, Palomas Creek, Seco Creek, Animas Creek, Percha Creek, Trujillo Canyon, Tierra Blanca Creek, Berrenda Creek, and Richardson Draw). Drainage from the west along the southern part of the corridor, south of the Sierra de las Uvas, is limited to local washes. On the east side of the Rio Grande, drainage west from the San Andreas Mountains is poorly developed and generally terminates in closed basin playas before reaching the Rio Grande. Washes on the western slopes of the Organ Mountains drain into the Rio Grande.

The resources of the Rio Grande riparian zone undoubtedly attracted populations throughout the human occupation of the region, and continue to do so today. Oxbows and marshy cienegas provided hunting and foraging grounds for Paleoindian and Archaic inhabitants. During the Formative era, the Jornada Mogollon farmed along the southern parts of the corridor in areas such as the Mesilla Valley, and the Mimbres Mogollon farmed in the northern part of the corridor. In the early twentieth century canal

systems and reservoirs were built, and farming remains a major economic activity along the Rio Grande, particularly in the southern portion of the Planning Area.

The Rio Grande Valley is a natural travel corridor. During the Spanish Colonial era the Camino Real was established as a trade route along the east side of the river, connecting Mexico City with Santa Fe. After the United States acquired the area, railroads and highways were constructed in the corridor.

This cultural landscape unit is the most densely settled part of the Planning Area, with Las Cruces and about 20 small towns scattered along the margins of the Rio Grande. Most of the intensively settled land along the river has left the public domain, but there is considerable public land in the adjacent desertscrub and grasslands.

About 4 percent of the 1,718-square-mile Rio Grande landscape within Sierra County has been surveyed for cultural resources and 830 archaeological and historical sites have been recorded (Table 2-41).

Documented surveys indicate that the average density is about 5 sites per square mile. Public land constitutes about 49 percent of the area within this landscape, and about 2 percent has been surveyed for cultural resources and 207 archaeological and historical sites have been recorded. The estimated average site density on public land is 2 sites per square mile.

Table 2-41
Cultural Resource Surveys and Sites within Cultural Landscapes in Sierra and Otero Counties

Jurisdiction	Rio Grande Corridor	Uvas-Potrillo Basin and Range	Black Range-Mimbres Mountains	Tularosa Basin and Range	Sacramento-Guadalupe Mountains	Totals
BLM						
Total Area (square miles)	849	34	154	2,089	545	3,671
Percent of Total Area	23%	1%	4%	57%	15%	100%
Surveyed Area (square miles)	17	0	10	439	62	529
Percent of Surveyed Area	3%	0%	2%	83%	12%	100%
Percent of Total Area Surveyed	2%	1%	7%	21%	11%	14%
Number of Recorded Sites	207	2	91	2,070	238	2,608
Percent of Recorded Sites	8%	0%	3%	79%	9%	100%
Sites in Documented Surveys	28	0	28	1,404	138	1,598
Percent of Documented Surveys	2%	0%	2%	88%	9%	100%
Sites per Square Mile	2	0	3	3	2	3
Other Federal Lands						
Total Area (square miles)	94	0	590	2,131	914	3,730
Percent of Total Area	3%	0%	16%	57%	25%	100%
Surveyed Area (square miles)	23	0	6	83	220	331
Percent of Surveyed Area	7%	0%	2%	25%	67%	100%
Percent of Total Area Surveyed	24%	0%	1%	4%	24%	9%
Number of Recorded Sites	224	0	218	3,664	1,331	5,437
Percent of Recorded Sites	4%	0%	4%	67%	24%	100%
Sites in Documented Surveys	130	0	37	326	844	1,337
Percent of Documented Surveys	10%	0%	3%	24%	63%	100%
Sites per Square Mile	6		7	4	4	4
Indian Lands						
Total Area (square miles)	0	0	0	0	721	721
Percent of Total Area	0%	0%	0%	0%	100%	100%
Surveyed Area (square miles)	0	0	0	0	46	46
Percent of Surveyed Area	0%	0%	0%	0%	100%	100%
Percent of Total Area Surveyed	0%	0%	0%	0%	6%	6%
Number of Recorded Sites	0	0	0	0	294	294

Jurisdiction	Rio Grande Corridor	Uvas-Potrillo Basin and Range	Black Range-Mimbres Mountains	Tularosa Basin and Range	Sacramento-Guadalupe Mountains	Totals
Percent of Recorded Sites	0%	0%	0%	0%	100%	100%
Sites in Documented Surveys	0	0	0	0	130	130
Percent of Documented Surveys	0%	0%	0%	0%	100%	100%
Sites per Square Mile					16	16
State Lands						
Total Area (square miles)	233	26	159	408	149	975
Percent of Total Area	24%	3%	16%	42%	15%	100%
Surveyed Area (square miles)	3	0	4	8	2	18
Percent of Surveyed Area	16%	2%	25%	44%	12%	100%
Percent of Total Area Surveyed	1%	1%	3%	2%	1%	2%
Number of Recorded Sites	81	4	92	137	24	338
Percent of Recorded Sites	24%	1%	27%	41%	7%	100%
Sites in Documented Surveys	7	0	25	20	12	64
Percent of Documented Surveys	11%	0%	39%	31%	19%	100%
Sites per Square Mile	2		6	3	5	4
Private						
Total Area (square miles)	541	4	547	422	340	1,854
Percent of Total Area	29%	0%	30%	23%	18%	100%
Surveyed Area (square miles)	28	0	22	29	13	91
Percent of Surveyed Area	30%	0%	24%	31%	14%	100%
Percent of Total Area Surveyed	5%	0%	4%	7%	4%	5%
Number of Recorded Sites	318	0	672	197	131	1,318
Percent of Recorded Sites	24%	0%	51%	15%	10%	100%
Sites in Documented Surveys	154	0	300	98	32	584
Percent of Documented Surveys	26%	0%	51%	17%	5%	100%
Sites per Square Mile	6		14	3	3	6
Totals						
Total Area (square miles)	1,718	63	1,451	5,050	2,669	10,951
Percent of Total Area	16%	1%	13%	46%	24%	100%
Surveyed Area (square miles)	70	1	43	558	344	1,016
Percent of Surveyed Area	7%	0%	4%	55%	34%	100%
Percent of Total Area Surveyed	4%	1%	3%	11%	13%	9%
Number of Recorded Sites	830	6	1,073	6,068	2,018	9,995
Percent of Recorded Sites	8%	0%	11%	61%	20%	100%
Sites in Documented Surveys	319	0	390	1,848	1,156	3,713
Percent of Documented Surveys	9%	0%	11%	50%	31%	100%
Sites Per Square Miles	5	0	9	3	3	4

SOURCE: New Mexico Cultural Resource Information System 2004

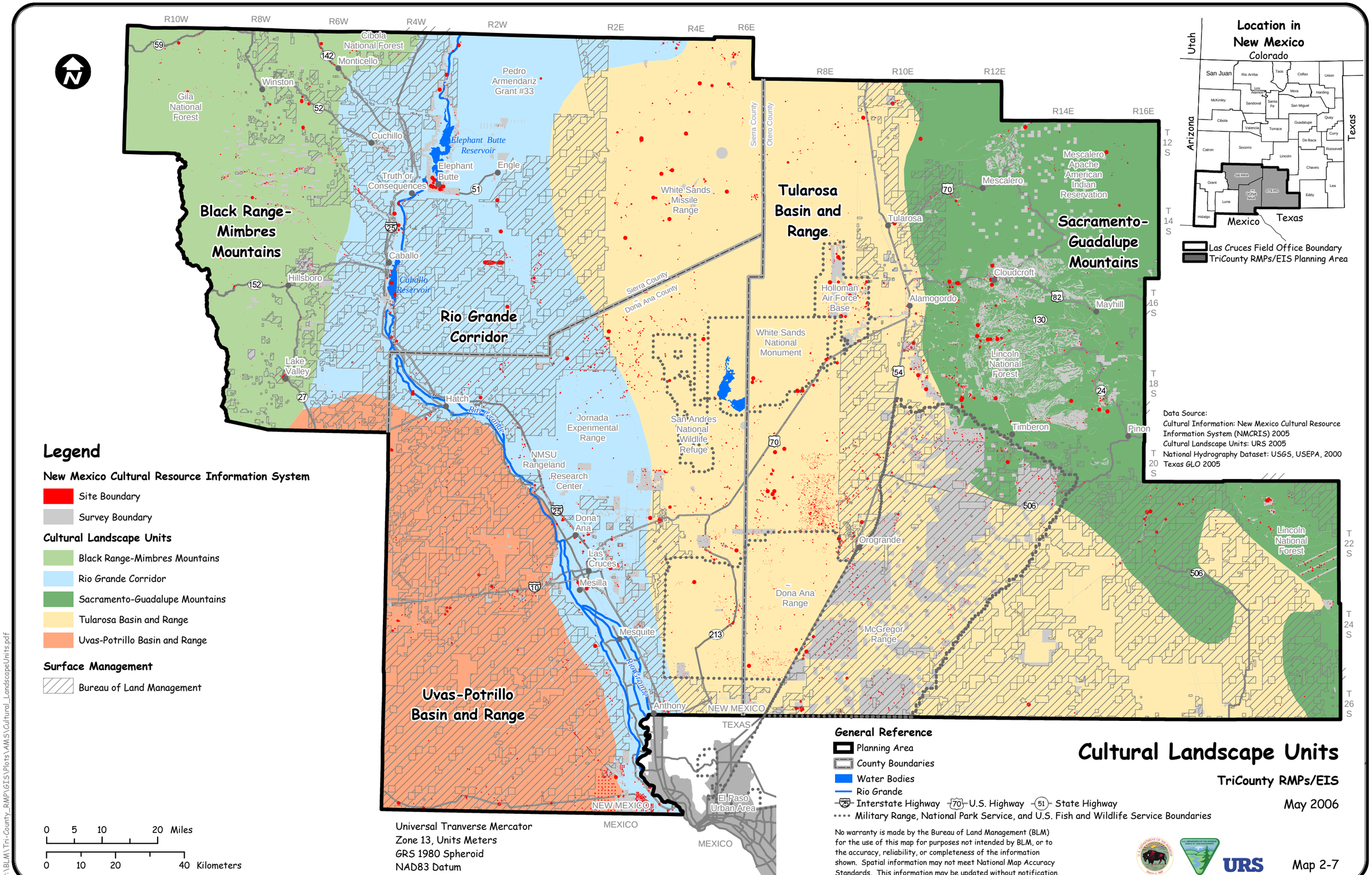
About 8 percent of the 1,156-square mile Rio Grande landscape within Doña Ana County has been surveyed for cultural resources and 1,416 archaeological and historical sites have been recorded (Table 2-42). Public land constitutes about 36 percent of the area within this landscape. About 7 percent has been surveyed for cultural resources, and 465 archaeological and historical sites have been recorded. The estimated average site density on public land is that same as for the entire landscape—7 sites per square mile.

Table 2-42
Cultural Resource Surveys and Sites within Cultural Landscapes in Doña Ana County

Jurisdiction	Rio Grande Corridor	Uvas-Potrillo Basin and Range	Tularosa Basin and Range	Totals
BLM				
Total Area (square miles)	412	1,249	86	1,747
Percent of Total Area	24%	71%	5%	100%
Surveyed Area (square miles)	30	32	3	65

Jurisdiction	Rio Grande Corridor	Uvas-Potrillo Basin and Range	Tularosa Basin and Range	Totals
Percent of Surveyed Area	46%	49%	5%	100%
Percent of Total Area Surveyed	7%	3%	4%	4%
Number of Recorded Sites	465	532	80	1,077
Percent of Recorded Sites	43%	49%	7%	100%
Sites in Documented Surveys	195	159	13	367
Percent of Documented Surveys	53%	43%	4%	100%
Sites per Square Mile	7	5	4	
Other Federal Lands				
Total Area (square miles)	196	0	919	1,114
Percent of Total Area	18%	0%	82%	100%
Surveyed Area (square miles)	4	0	17	20
Percent of Surveyed Area	19%	0%	81%	100%
Percent of Total Area Surveyed	2%		2%	2%
Number of Recorded Sites	113	0	873	986
Percent of Recorded Sites	11%	0%	89%	100%
Sites in Documented Surveys	14	0	119	133
Percent in Documented Surveys	11%	0%	89%	100%
Sites per Square Mile	4		7	
State Lands				
Total Area (square miles)	173	271	8	451
Percent of Total Area	38%	60%	2%	100%
Surveyed Area (square miles)	15	10	0	25
Percent of Surveyed Area	61%	38%	0%	100%
Percent of Total Area Surveyed	9%	4%	1%	6%
Number of Recorded Sites	175	171	6	352
Percent of Recorded Sites	50%	49%	2%	100%
Sites in Documented Surveys	68	49	1	118
Percent of Documented Surveys	58%	42%	1%	100%
Sites per Square Mile	4	5	8	
Private				
Total Area (square miles)	376	116	33	525
Percent of Total Area	72%	22%	6%	100%
Surveyed Area (square miles)	43	22	2	67
Percent of Surveyed Area	63%	33%	3%	100%
Percent of Total Area Surveyed	11%	19%	7%	13%
Number of Recorded Sites	663	268	24	955
Percent of Recorded Sites	69%	28%	3%	100%
Sites in Documented Surveys	324	119	10	453
Percent of Documented Surveys	72%	26%	2%	100%
Sites per Square Mile	8	5	4	
Totals				
Total Area (square miles)	1,156	1,636	1,045	3,838
Percent of Total Area	30%	43%	27%	100%
Surveyed Area (square miles)	92	64	22	178
Percent of Surveyed Area	52%	36%	12%	100%
Percent of Total Area Surveyed	8%	4%	2%	5%
Number of Recorded Sites	1,416	971	983	3,370
Percent of Recorded Sites	42%	29%	29%	100%
Sites in Documented Surveys	601	327	143	1,071
Percent of Documented Surveys	56%	31%	13%	100%
Sites per Square Mile	7	5	6	

SOURCE: New Mexico Cultural Resource Information System 2004


Black Range-Mimbres Mountains
Rio Grande Corridor
Tularosa Basin and Range
Sacramento-Guadalupe Mountains
Uvas-Potrillo Basin and Range
Gila National Forest
Cibola National Forest
Monticello
Winston
Cuchillo
Elephant Butte Reservoir
Elephant Butte
Engle
Truth or Consequences
Caballo
Caballo Reservoir
Hillsboro
Lake Valley
Hatch
Rio Grande
Pedro Armendariz Grant #33
White Sands Missile Range
Sierra County
Otero County
Dona Ana County
Holloman Air Force Base
White Sands National Monument
Jornada Experimental Range
San Andres National Wildlife Refuge
NMSU Rangeland Research Center
Dona Ana
Las Cruces
Mesilla
Mesquite
Anthony
NEW MEXICO
TEXAS
MEXICO
El Paso Urban Area
Tularosa
Alamogordo
Mescalero
Mescalero Apache American Indian Reservation
Cloudcroft
Mayhill
Lincoln National Forest
Timberon
Pinon
Orogrande
Dona Ana Range
McGregor Range
R10W
R8W
R6W
R4W
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R2E
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R8E
R10E
R12E
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T 26 S
Location in New Mexico
Utah
Colorado
Arizona
Texas
Mexico
Las Cruces Field Office Boundary
TriCounty RMPs/EIS Planning Area
Data Source:
Cultural Information: New Mexico Cultural Resource Information System (NMCRIS) 2005
Cultural Landscape Units: URS 2005
National Hydrography Dataset: USGS, USEPA, 2000
Texas GLO 2005
Legend
New Mexico Cultural Resource Information System
Site Boundary
Survey Boundary
Cultural Landscape Units
Black Range-Mimbres Mountains
Rio Grande Corridor
Sacramento-Guadalupe Mountains
Tularosa Basin and Range
Uvas-Potrillo Basin and Range
Surface Management
Bureau of Land Management
0 5 10 20 Miles
0 10 20 40 Kilometers
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
General Reference
Planning Area
County Boundaries
Water Bodies
Rio Grande
Interstate Highway
U.S. Highway
State Highway
Military Range, National Park Service, and U.S. Fish and Wildlife Service Boundaries
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URS
Cultural Landscape Units
TriCounty RMPs/EIS
May 2006
Map 2-7
P:\BLM\Tri-County_RMP\GIS\Plots\AMS\Cultural_LandscapeUnits.pdf

Some sites reflect multiple occupations and, when different cultures or time periods can be recognized, they are recorded as separate temporal components. Every site has at least one component but because of missing data, only 9,766 temporal or cultural components have been recorded in the NMCRIS database even though the database identifies 9,995 recorded sites (Table 2-43). One-third of the components have been identified as reflecting occupation of the area by the Formative-period Mogollon culture. Another 9 percent are earlier Archaic-period components, and 1 percent are even earlier Paleoindian components. About 1 percent of the components reflect occupation by Apaches, and 14 percent represent the historical occupation of the region by Hispanic and Anglo Euro-Americans. The cultural and temporal affiliation of 42 percent of the sites has not been identified.

Table 2-43
Cultural Components Recorded in Sierra and Otero Counties

Jurisdiction	Paleo	Archaic	Mogollon	Anasazi	Mogasazi	Apache	Plains	Hispanic	Anglo Euro	Unknown	Total
Rio Grande Corridor											
BLM	4	28	71	0	0	0	0	7	19	98	227
Percent of BLM Lands	2%	12%	31%	0%	0%	0%	0%	3%	8%	43%	55%
Other Federal Lands	1	11	65	2	1	1	0	1	34	86	202
Percent of Other Federal Lands	0%	5%	32%	1%	0%	0%	0%	0%	17%	43%	62%
State Lands	11	15	21	0	0	0	0	9	8	41	105
Percent of State Lands	10%	14%	20%	0%	0%	0%	0%	9%	8%	39%	100%
Private	2	14	121	2	1	1	0	17	67	80	305
Percent of Private Lands	1%	5%	40%	1%	8%	0%	0%	6%	22%	26%	100%
Totals	18	68	278	4	2	2	0	34	128	305	839
Percent of Totals	2%	8%	33%	0%	0%	0%	0%	4%	15%	36%	100%
Uvas-Portillo Basin and Range											
BLM	0	0	0	0	0	0	0	0	0	2	2
Percent of BLM Lands	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
State Lands	0	0	1	0	0	0	0	0	0	3	4
Percent of State Lands	0%	0%	25%	0%	0%	0%	0%	0%	0%	75%	100%
Totals	0	0	1	0	0	0	0	0	0	5	6
Percent of Totals	0%	0%	17%	0%	0%	0%	0%	0%	0%	83%	100%
Black Range-Mimbres Mountains											
BLM	0	5	14	0	0	0	0	1	37	22	79
Percent of BLM Lands	0%	6%	18%	0%	0%	0%	0%	1%	47%	28%	76%
Other Federal Lands	0	5	35	1	0	1	0	0	77	118	237
Percent of Other Federal Lands	0%	2%	15%	0%	0%	0%	0%	0%	32%	50%	83%
State Lands	0	9	37	0	0	0	0	0	5	43	94
Percent of State Lands	0%	10%	39%	0%	0%	0%	0%	0%	5%	46%	100%
Private	0	19	260	1	1	0	0	13	73	345	712
Percent of Private Lands	0%	3%	37%	0%	8%	0%	0%	2%	10%	48%	100%
Totals	0	38	346	2	1	1	0	14	192	528	1,122
Percent of Totals	0%	3%	31%	0%	0%	0%	0%	1%	17%	47%	100%
Tularosa Basin and Range											
BLM	27	98	741	0	0	5	0	0	201	587	1,659
Percent of BLM Lands	2%	6%	45%	0%	0%	0%	0%	0%	12%	35%	48%
Other Federal Lands	48	466	1,229	0	0	5	0	1	310	1,755	3,814
Percent of Other Federal Lands	1%	12%	32%	0%	0%	0%	0%	0%	8%	46%	54%
State Lands	4	6	67	0	0	1	0	0	16	55	149
Percent of State Lands	3%	4%	45%	0%	0%	1%	0%	0%	11%	37%	100%

Jurisdiction	Paleo	Archaic	Mogollon	Anasazi	Mogasazi	Apache	Plains	Hispanic	Anglo Euro	Unknown	Total
Private	3	26	74	0	0	2	0	4	66	50	225
Percent of Private Lands	1%	12%	33%	0%	0%	1%	0%	2%	29%	22%	100%
Totals	82	596	2,111	0	0	13	0	5	593	2,447	5,847
Percent of Totals	1%	10%	36%	0%	0%	0%	0%	0%	10%	42%	100%
Sacramento-Guadalupe Mountains											
BLM	1	37	101	0	0	4	0	0	23	105	271
Percent of BLM Lands	0%	14%	37%	0%	0%	1%	0%	0%	8%	39%	49%
Other Federal Lands	0	77	282	1	0	12	1	1	281	584	1,239
Percent of Other Federal Lands	0%	6%	23%	0%	0%	1%	0%	0%	23%	47%	71%
Indian Lands	0	20	53	0	0	104	0	0	25	75	277
Percent of Indian Lands	0%	7%	19%	0%	0%	38%	0%	0%	9%	27%	100%
State Lands	1	4	6	0	0	0	0	1	3	8	23
Percent of State Lands	4%	17%	26%	0%	0%	0%	0%	4%	13%	35%	100%
Private	1	13	70	0	0	5	0	0	36	17	142
Percent of Private Lands	1%	9%	49%	0%	0%	4%	0%	0%	25%	12%	100%
Totals	3	151	512	1	0	125	1	2	368	789	1,952
Percent of Totals	0%	8%	26%	0%	0%	6%	0%	0%	19%	40%	100%
Totals											
BLM	32	168	927	0	0	9	0	8	280	814	2,238
Percent of BLM Lands	1%	8%	41%	0%	0%	0%	0%	0%	13%	36%	50%
Other Federal Lands	49	559	1,611	4	1	19	1	3	702	2,543	5,492
Percent of Other Federal Lands	1%	10%	29%	0%	0%	0%	0%	0%	13%	46%	60%
Indian Lands	0	20	53	0	0	104	0	0	25	75	277
Percent of Indian Lands	0%	7%	19%	0%	0%	38%	0%	0%	9%	27%	74%
State Lands	16	34	132	0	0	1	0	10	32	150	375
Percent of State Lands	4%	9%	35%	0%	0%	0%	0%	3%	9%	40%	100%
Private	6	72	525	3	2	8	0	34	242	492	1,384
Percent of Private Lands	0%	5%	38%	0%	15%	1%	0%	2%	17%	36%	100%
Totals	103	853	3,248	7	3	141	1	55	1,281	4,074	9,766
Percent of Totals	1%	9%	33%	0%	0%	1%	0%	1%	13%	42%	100%

SOURCE: New Mexico Cultural Resource Information System 2004

The types and proportions of temporal and cultural components within the Rio Grande landscape in Sierra County are very similar to those recorded in the entire County, although the percentage of Hispanic and Euro-American components is slightly higher. The types and proportions of temporal and cultural components on public land within the Rio Grande landscape in Sierra County are similar to those recorded in the entire landscape unit. The primary differences are a higher percentage of Archaic-period sites and a lower percentage of historical Euro-American sites on the public land.

The types and proportions of temporal and cultural components identified in the Rio Grande landscape within Doña Ana County are generally similar to those recorded in the Rio Grande landscape in Sierra County (Table 2-44). However, the percentage of Mogollon sites is about 10 percent greater, and the percentage of Hispanic and Euro-American sites is about 9 percent less. The types and proportions of temporal and cultural components on the public land within the Rio Grande landscape in Doña Ana County are within 4 percentage points of those recorded within the entire landscape in the county.

Table 2-44
Cultural Components Recorded in Doña Ana County

Owner	Paleo	Archaic	Mogollon	Pueblo	Casa Grande	Apache	Navajo	Hispanic	Anglo Euro	Unknown	Total
Rio Grande Corridor											
BLM	4	52	211	1	0	3	0	15	34	224	544
Percent of BLM Lands	1%	10%	39%	0%	0%	1%	0%	3%	6%	41%	51%
Other Federal Lands	1	17	69	0	0	0	0	1	3	45	136
Percent of Other Federal Lands	1%	13%	51%	0%	0%	0%	0%	1%	2%	33%	36%
State Lands	30	15	106	1	0	0	0	2	13	69	236
Percent of State Lands	13%	6%	45%	0%	0%	0%	0%	1%	6%	29%	100%
Private	2	45	362	0	0	0	0	15	92	296	812
Percent of Private Lands	0%	6%	45%	0%	0%	0%	0%	2%	11%	36%	100%
Totals	37	129	748	2	0	3	0	33	142	634	1,728
Percent of Totals	2%	7%	43%	0%	0%	0%	0%	2%	8%	37%	100%
Uvas-Portillo Basin and Range											
BLM	9	59	304	0	1	4	2	0	27	210	616
Percent of BLM Lands	1%	10%	49%	0%	0%	1%	0%	0%	4%	34%	40%
State Lands	3	32	75	0	0	1	0	0	15	72	198
Percent of State Lands	2%	16%	38%	0%	0%	1%	0%	0%	8%	36%	100%
Private	1	23	126	0	0	5	0	1	30	133	319
Percent of Private Lands	0%	7%	39%	0%	0%	2%	0%	0%	9%	42%	100%
Totals	13	114	505	0	1	10	2	1	72	415	1,133
Percent of Totals	1%	10%	45%	0%	0%	1%	0%	0%	6%	37%	100%
Tularosa Basin and Range											
BLM	0	13	29	0	0	0	0	0	22	27	91
Percent of BLM Lands	0%	14%	32%	0%	0%	0%	0%	0%	24%	30%	54%
Other Federal Lands	6	137	407	0	0	2	0	2	108	195	857
Percent of Other Federal Lands	1%	16%	47%	0%	0%	0%	0%	0%	13%	23%	36%
State Lands	0	1	2	0	0	0	0	0	3	1	7
Percent of State Lands	0%	14%	29%	0%	0%	0%	0%	0%	43%	14%	100%
Private	0	1	6	0	0	1	0	1	12	7	28
Percent of Private Lands	0%	4%	21%	0%	0%	4%	0%	4%	43%	25%	100%
Totals	6	152	444	0	0	3	0	3	145	230	983
Percent of Totals	1%	15%	45%	0%	0%	0%	0%	0%	15%	23%	100%
Totals											
BLM	13	124	544	1	1	7	2	15	83	461	1,251
Percent of BLM Lands	1%	10%	43%	0%	0%	1%	0%	1%	7%	37%	46%
Other Federal Lands	7	154	476	0	0	2	0	3	111	240	993
Percent of Other Federal Lands	1%	16%	48%	0%	0%	0%	0%	0%	11%	24%	36%
State Lands	33	48	183	1	0	1	0	2	31	142	441
Percent of State Lands	7%	11%	41%	0%	0%	0%	0%	0%	7%	32%	100%
Private	3	69	494	0	0	6	0	17	134	436	1,159
Percent of Private Lands	0%	6%	43%	0%	0%	1%	0%	1%	12%	38%	100%
Totals	56	395	1697	2	1	16	2	37	359	1279	3,844
Percent of Totals	1%	10%	44%	0%	0%	0%	0%	1%	9%	33%	100%

SOURCE: New Mexico Cultural Resource Information System 2004

Uvas–Potrillo Basin and Range

The bulk of the southwestern part of Doña Ana County, west of the Rio Grande Valley, and a small section of Sierra County is defined as the Uvas–Potrillo Basin and Range cultural landscape. The

elevation of the basin floor in this area ranges from about 4,000 to 4,500 feet above sea level. The Sierra de las Uvas and the West Potrillo and East Potrillo Mountains, as well as the smaller Rough and Ready, Sleeping Lady, and Aden Hills, rise about 500 to 1,500 feet above the surrounding terrain.

Drainage is poorly developed in this arid area, which has an annual precipitation of only about 9 to 11 inches, with a couple of inches more in the low mountains. Desertscrub dominated by creosotebush and scrub mesquite on stabilized coppice dunes is the predominant vegetation on the basin floor. Chihuahuan grasslands occur in the higher elevations to the west, and some juniper woodland is found in the Sierra de las Uvas.

Most of this area apparently was marginal throughout the prehistoric occupation of the region. Except for stations along the Southern Pacific Railroad (now Union Pacific) that crosses the area, there were virtually no settlements in this area during the historic period.

About 1 percent of the small part of the Uvas-Potrillo landscape within Sierra County (63 square miles) has been surveyed for cultural resources and only 6 archaeological and historical sites have been recorded. Public land constitutes about 54 percent of the area within this landscape. About 1 percent has been surveyed for cultural resources, and only 2 archaeological and historical sites have been recorded. The sample is too small to estimate average site density in this landscape unit within Sierra County.

About 4 percent of the Uvas-Potrillo landscape within Doña Ana County has been surveyed for cultural resources and 971 archaeological and historical sites have been recorded (refer to Table 2-42). The estimated average density is 5 sites per square mile. Public land constitutes about 76 percent of the area within this landscape, and about 3 percent has been surveyed for cultural resources and 532 archaeological and historical sites have been recorded. The estimated average density on public land is 5 sites per square mile.

One site recorded in the Uvas-Potrillo landscape within Sierra County is classified as a Mogollon site, and the temporal and cultural affiliation of the other 5 recorded sites (2 on public land) has not been determined (refer to Table 2-43). About 45 percent of the sites recorded in the Uvas-Potrillo landscape within Doña County are classified as Mogollon. Another 9 percent are earlier Archaic-period components, and 1 percent are even earlier Paleoindian components. About 1 percent of the components reflect occupation by Apaches, and 14 percent represent the historical occupation of the region by Hispanic and Anglo Euro-Americans. The cultural and temporal affiliation of 42 percent of the sites has not been identified. The types and proportions of temporal and cultural units recorded on the public land are very similar to those recorded in the entire county.

Black Range-Mimbres Mountains

The Black Range-Mimbres Mountains cultural landscape unit lies west of the Rio Grande Valley, extending westward some 15 to 50 miles from the foothills of the Black Range and the Mimbres Mountains. Elevations range from about 5,000 feet to as high as 10,000 feet at Reeds Peak. Natural vegetation at lower elevations is primarily juniper savanna, which grades into piñon-juniper woodlands, pine-oak woodlands, and ponderosa pine forests and aspen woodlands with increasing elevations. Annual

precipitation varies from about 13 to 25 inches. Most of this area drains to the east into the Rio Grande, but the northwestern corner is within the headwaters of the Gila River and drains to the west.

Archaic groups hunted game (particularly deer) and collected indigenous plant foods, such as piñon nuts and agave in this cultural landscape. During the Formative period, the Mimbres continued that use but also built many farming villages in the lower elevations where the growing season was long enough to allow crops to mature and rainfall was sufficient for upland farming or streams could be diverted into fields planted on the adjacent alluvial soils. This mountainous landscape was home to Apache groups during the protohistoric period. After the U.S. Army forced the Apaches onto reservations, Euro-Americans began to graze livestock, cut timber, and mine for minerals. Settlements, such as Monticello (Cañada Alamosa), reflect the agricultural heritage, and other abandoned or mostly abandoned towns, including Winston, Chloride, Hermosa, Hillsboro, and Lake Valley, reflect the mining heritage of the region.

About 3 percent of the Black Range-Mimbres Mountains landscape within Sierra County has been surveyed for cultural resources and 1,073 archaeological and historical sites have been recorded. Public land constitutes about 11 percent of the area within this landscape. About 7 percent of the public land has been surveyed for cultural resources, and 91 archaeological and historical sites have been recorded. The estimated average site density is 3 sites per square mile. The Black Range-Mimbres Mountains landscape does not extend into Doña Ana County.

About 31 percent of the temporal and cultural units in the Black Range-Mimbres Mountains landscape are classified as Mogollon (refer to Table 2-43). Another 3 percent are earlier Archaic-period components. No Paleoindian components have been recorded. A single component reflects occupation by Apaches, and 18 percent represent the historical occupation of the region by Hispanic and Anglo Euro-Americans. The cultural and temporal affiliation of 47 percent of the sites has not been identified. In contrast, the temporal and cultural affiliations of only 28 percent of the sites on public land within this landscape unit have not been identified. The percentages of Archaic components on public land are three points higher, Mogollon components are 13 percent lower, and Euro-American components are 30 percent higher than the proportions recorded for the entire landscape.

Tularosa Basin and Range

The area east of the Rio Grande Valley eastward to the foothills of the Sacramento and Guadalupe Mountains is labeled as the Tularosa Basin and Range cultural landscape. This unit varies from about 60 to more than 100 miles wide. The Tularosa Valley occupies most of this area. The western edge of the valley is defined by the San Andrea, Organ, and Franklin mountains, which form a north-south barrier some 10 to 15 miles wide. Other landforms in the southern part of this landscape include Otero Mesa, Cornudas Mountains, and the northern end of the Hueco Mountains, which extend into Texas.

Elevations within most of the Tularosa Valley are between 3,500 and 4,000 feet above sea level. The elevation of Otero Mesa varies from about 5,000 to 5,500 feet. The Cornudas and Hueco Mountains are low, with Wind Mountain being the tallest peak, rising to almost 7,300 feet. The highest peaks in the Organ and San Andreas Mountains are approximately 9,000 feet above sea level.

Annual precipitation over most of the Tularosa Basin and Range landscape is about 9 to 11 inches, but increases to 15 inches on Otero Mesa, and up to 20 inches in the highest areas of the San Andreas and Organ Mountains. Drainage is poorly developed over much of this landscape, and washes flow into closed basins forming ephemeral playas.

Natural vegetation over most of the area is creosotebush or mesquite desertscrub on stabilized coppice dunes, with some areas of active dunes. Chihuahuan grasslands cover Otero Mesa and the foothills of the Cornudas, Hueco, San Andreas, and Organ Mountains. Juniper savanna and piñon-juniper woodlands are found in the limited areas at higher elevations.

Hunters and gatherers made seasonal rounds into this landscape unit to collect indigenous plant foods, such as mesquite beans, agave, and grass seeds. During periods of greater rainfall, playas apparently were more reliable water sources and camps were occupied around their margins. During the Formative era, Jornada Mogollon groups built settlements in areas where water was available at seeps and springs or playa margins and along wash margins on low-gradient alluvial fans at the base of mountain slopes. During the protohistoric period, Apache groups hunted and gathered in the area, but resided primarily in more upland areas.

Ranching was a primary use of this landscape during the historical period. During the mid-twentieth century military training and testing complexes were developed, and they remain a primary use of much of the area. Alamagordo, the headquarters for the White Sands Missile Range and Holloman Air Force Base, is the largest community in the area. Most of the other historical settlements were located along the Southern Pacific Railroad (now Union Pacific), which traverses the area from north to south. Tularosa is one of the few pre-railroad communities, having been established in 1862 by Hispanic settlers around the edges of a marsh where Tularosa Creek leaves a canyon and spreads out before disappearing on the valley floor.

About 11 percent of the Tularosa Basin and Range landscape within Otero and Sierra Counties has been surveyed for cultural resources and 6,068 archaeological and historical sites have been recorded (refer to Table 2-43). Public land constitutes about 41 percent of the area within this landscape. About 21 percent of the public land has been surveyed for cultural resources (much of which has been sponsored by the U.S. Army on the McGregor Range), and 2,070 archaeological and historical sites have been recorded. The estimated average site density is 3 sites per square mile.

About 2 percent of the Tularosa Basin and Range landscape within Doña Ana County has been surveyed for cultural resources and 983 archaeological and historical sites have been recorded (refer to Table 2-42). Public land constitutes only about 8 percent of the area within this landscape. About 4 percent of the public land has been surveyed for cultural resources, and 80 archaeological and historical sites have been recorded. The estimated average site density is 4 sites per square mile.

About 36 percent of the temporal and cultural units in the Tularosa Basin and Range landscape in Otero and Sierra Counties are classified as Mogollon (refer to Table 2-43). Another 10 percent are earlier Archaic-period components, and 1 percent are even earlier Paleoindian components. Thirteen of the components (less than 1 percent) reflect occupation by Apaches. Ten percent represent the historical

occupation of the region by Hispanic and Anglo Euro-Americans. The cultural and temporal affiliation of 42 percent of the sites has not been identified. In contrast, the temporal and cultural affiliations of only 35 percent of the sites on public land within this landscape unit have not been identified. The percentage of Archaic components on public land is 4 points lower, and Paleoindian, Mogollon, and Euro-American components are 1, 9, and 2 points greater than the proportions recorded for the entire landscape, respectively.

About 45 percent of the temporal and cultural components in the Tularosa Basin and Range landscape in Doña Ana County are classified as Mogollon (refer to Table 2-44). Another 15 percent are earlier Archaic-period components, and 1 percent are even earlier Paleoindian components. Three of the components (less than 1 percent) reflect occupation by Apaches. Fifteen percent represent the historical occupation of the region by Hispanic and Anglo Euro-Americans. The cultural and temporal affiliation of 23 percent of the sites has not been identified. In contrast, the temporal and cultural affiliations of 30 percent of the sites on public land within this landscape unit have not been identified. The percentages of Archaic and Mogollon components on public land are 1 and 13 points lower, than the proportions recorded for the entire landscape, respectively. The percentage of Hispanic and Anglo Euro-American components is 9 points higher. No Paleoindian components have been identified on public land within the Tularosa Basin and Range landscape in Doña Ana County.

Sacramento-Guadalupe Mountains

The Sacramento-Guadalupe Mountains cultural landscape unit lies east of the Tularosa Basin and Range landscape. Elevations range from about 5,000 feet to more than 8,500 feet. Natural vegetation at lower elevations is primarily juniper savanna, which grades into piñon-juniper woodlands, and then chaparral and pine-oak forests. Annual precipitation varies from about 13 to more than 30 inches in the highest part of the Sacramento Mountains. Most of this area drains west into the closed basin playas of the Tularosa Valley, but the eastern flanks of the Sacramento and Guadalupe Mountains drain east into the Pecos River.

Archaic groups hunted game (particularly deer) and collected indigenous plant foods, such as piñon nuts and agave in this mountainous zone. During the Formative period, the Jornado Mogollon continued that use, but also built farming settlements at lower elevations where the growing season was long enough to allow crops to mature and rainfall was sufficient for upland farming or streams could be diverted into fields planted on the adjacent alluvium. This mountainous landscape was home to Apache groups during the protohistoric and historic periods. The Mescalero Apache were relegated to a reservation in the northeastern corner of this landscape unit, and the town of Mescalero serves at the headquarters of the tribe. After the Apaches were conquered, Euro-Americans began to graze livestock, cut timber, and mine for minerals in this area. The few settlements in this zone are in the Sacramento Mountains, and are mostly related to lumbering (Cloudcroft, High Rolls, Marcia, Mayhill, Piñon, Sacramento, and Weed).

About 13 percent of the Sacramento-Guadalupe Mountains landscape within Otero County has been surveyed for cultural resources and 2,018 archaeological and historical sites have been recorded (refer to Table Table 2-43). Public land constitutes about 20 percent of the area within this landscape. About 11 percent of the public land has been surveyed for cultural resources, and 238 archaeological and historical

sites have been recorded. The estimated average site density is 2 sites per square mile. The Sacramento-Guadalupe Mountains landscape does not extend into Doña Ana County.

About 26 percent of the temporal and cultural units in the Sacramento-Guadalupe Mountains landscape in Otero County are classified as Mogollon (refer to Table 2-43). Another 8 percent are earlier Archaic-period components, and only 3 Paleoindian components (less than 1 percent) have been recorded. Six percent of the components reflect occupation by Apaches—a much greater percentage than in any other landscape unit. Nineteen percent of the components represent the historical occupation of the region by Hispanic and Anglo Euro-Americans. The cultural and temporal affiliation of 40 percent of the sites has not been identified. The percentage of sites with unidentified temporal and cultural affiliations is similar (39 percent) on public land within this landscape unit. The percentages of Mogollon and Archaic components on public land are 11 and 6 points higher, than the proportions recorded for the entire landscape, respectively. The percentages for Apache and Euro-American components are 5 and 11 points lower.

Inventory Summary

In summary, about 18 percent of the public land in Otero and Sierra Counties has been surveyed for cultural resources and 2,608 archaeological and historical sites have been recorded (Table 2-45). More than half of the public land is in the Tularosa Basin and Range landscape, and almost one-fourth is in the Rio Grande Corridor landscape. About 15 percent is in the Sacramento-Guadalupe Mountains landscape, and minor amounts are in the Black Range-Mimbres Mountains and Uvas-Potrillo Basin and Range landscapes. Almost 80 percent of the recorded archaeological and historical sites are in the Tularosa Basin and Range landscape, where 21 percent of the public land has been surveyed. That is a greater percentage of coverage than in any other unit, and is due primarily to surveys sponsored by the U.S. Army on the McGregor Range. Another 9 percent of the recorded sites are in the Sacramento-Guadalupe Mountains landscape where 11 percent of the public land has been surveyed. Eight percent of the recorded sites are in the Rio Grande Corridor, where only 2 percent of the public land has been surveyed.

Table 2-45
Extent of Cultural Resource Survey and Numbers of Recorded Resources in Sierra and Otero Counties

Cultural Landscape Unit	Size (miles^2)	% of Total Area	Surveyed for Cultural Resources (miles^2)	% of All Surveys	% of Total Area that has been Surveyed	Recorded Cultural Resources[a]	% of Recorded Sites	Density (sites/mile)	Projected Number of Resources
Planning Area									
Rio Grande Corridor	1,718	16%	70	7%	4%	830	8%	5	8,600
Uvas-Potrillo Basin and Range	63	1%	1	0.1%	2%	6	0%	<1	<50
Black Range-Mimbres Mountains	1,451	13%	43	4%	3%	1,073	11%	9	13,100
Tularosa Basin and Range	5,050	46%	558	55%	11%	6,068	61%	3	15,200

Cultural Landscape Unit	Size (miles^2)	% of Total Area	Surveyed for Cultural Resources (miles^2)	% of All Surveys	% of Total Area that has been Surveyed	Recorded Cultural Resources[a]	% of Recorded Sites	Density (sites/mile)	Projected Number of Resources
Sacramento-Guadalupe Mountains	2,669	24%	344	34%	13%	2,018	20%	3	8,000
subtotals	10,951	100%	1,016	100%	9%	9,995	100%	4	44,900
Public Surface Land									
Rio Grande Corridor	849	23%	17	3%	2%	207	8%	2	1,700
Uvas-Potrillo Basin and Range	34	1%	0	0.1%	1%	2	0%	<1	<30
Black Range-Mimbres Mountains	154	4%	10	2%	6%	91	3%	3	500
Tularosa Basin and Range	2,089	57%	439	83%	21%	2,070	79%	3	6,300
Sacramento-Guadalupe Mountains	545	15%	62	12%	11%	238	9%	2	1,100
Totals	**3,671**	**100%**	**528**	**100%**	**14%**	**2,608**	**100%**	**3**	**9,600**

SOURCE: New Mexico Cultural Resource Information System (December 2004)
NOTES: [a] estimated based only on sites recorded by documented surveys

About 4 percent of the public land in Doña Ana County has been surveyed for cultural resources, and 1,077 archaeological and historical sites have been recorded (Table 2-46). More than 70 percent of the public land is in the Uvas-Potrillo landscape, and about half of the recorded sites have been recorded in this landscape although only 3 percent of the public land has been surveyed. Almost one-fourth of the public land in Doña Ana County is in the Rio Grande Corridor, where another 43 percent of the sites recorded on public land have been recorded by survey of about 7 percent of the area.

Table 2-46
Extent of Cultural Resource Survey and Numbers of Recorded Resources in Doña Ana County

Cultural Landscape Unit	Size (miles^2)	% of Total Area	Surveyed for Cultural Resources (miles^2)	% of All Surveys	% of Total Area that has been Surveyed	Recorded Cultural Resources[a]	% of Recorded Sites	Density (sites/mile)	Projected Number of Resources
Planning Area									
Rio Grande Corridor	1,156	30%	92	52%	8%	1,416	42%	7	8,100
Uvas-Potrillo Basin and Range	1,636	43%	64	36%	4%	971	29%	5	8,200
Tularosa Basin and Range	1,045	27%	22	12%	2%	983	29%	6	6,300
subtotals	3,837	100%	178	100%	5%	3,370	100%	6	22,600
Public Surface Land									
Rio Grande Corridor	412	24%	30	46%	7%	465	43%	7	2,900
Uvas-Potrillo Basin and Range	1,249	71%	32	49%	3%	532	49%	5	6,200

Cultural Landscape Unit	Size (miles^2)	% of Total Area	Surveyed for Cultural Resources (miles^2)	% of All Surveys	% of Total Area that has been Surveyed	Recorded Cultural Resources[a]	% of Recorded Sites	Density (sites/mile)	Projected Number of Resources
Tularosa Basin and Range	86	5%	3	5%	3%	80	7%	4	300
Totals	**1,747**	**100%**	**65**	**100%**	**4%**	**1,077**	**100%**	**6**	**9,400**

SOURCE: New Mexico Cultural Resource Information System 2004

NOTES: [a] Estimated based only on sites recorded by documented surveys.

Although many of the recorded sites are not associated with documented surveys, the available data indicate that average site densities vary from less than 1 to about 7 sites per square mile in the various cultural landscapes in the Planning Area. (Some surveys of smaller areas have recorded much higher site densities in some areas.) These estimates suggest that there could be almost 10,000 archaeological and historical sites on the public land in Otero and Sierra Counties and almost three-fourths of those have yet to be discovered and recorded. Similarly, the data suggests there could be almost 10,000 archaeological and historical sites on public land in Doña Ana County and about 90 percent of those remain to be found and recorded.

The archaeological and historical resources that have been inventoried in the Planning Area are diverse. Site function often is difficult to determine only on the basis of surface evidence, and few sites have been excavated. Artifact scatters without any features or with simple features such as cooking pits, rock alignments, petroglyphs, and trails are the most common type of aboriginal site. Other sites represent habitations, which can range from small and temporary to very large sites occupied for more than a century. The historical era also is represented by a diversity of archaeological sites, and buildings and structures. Common themes represented by historical-period resources include military, agricultural/ ranching, transportation/ commerce, industries (particularly mining), and government.

The NMCRIS database codes site as structural or non-structural, which provides an indication of how simple or complex the resources might be. Although there is tremendous variation in these categories, this classification provides some evidence of which sites reflect habitations or places used on a long-term basis for multiple purposes and those that reflect short-term, temporary uses and might consist of only artifact scatters or relatively simple features. About half of all recorded sites in the Otero and Sierra Counties are classified as structural (Table 2-47). The percentage of historic-period sites is higher (more than 80 to 90 percent) than for the prehistoric era (about 50 to 60 percent). The patterns are similar for Doña Ana County.

Table 2-47
Summary of Site Types

Site Type	Non-Structural	Structural	Unknown	Total	% Structural
Sierra and Otero Counties					
Planning Area (All Lands)					
Prehistoric	1,978	1,902	0	3,880	49%
Historic	241	1,193	0	1,434	83%
Both	136	259	0	395	66%
Unknown	2,769	1,503	14	4,286	35%
Totals	5,124	4,857	14	9,995	49%
Decision Area (Public Land)					
Prehistoric	435	614	0	1,049	59%

Site Type	Non-Structural	Structural	Unknown	Total	% Structural
Historic	38	240	0	278	86%
Both	18	70	0	88	80%
Unknown	715	464	14	1,193	39%
Totals	1,206	1,388	14	2,608	53%
Doña Ana County					
Planning Area (All Lands)					
Prehistoric	930	853	0	1,783	48%
Historic	66	311	0	377	82%
Both	23	89	0	112	79%
Unknown	605	492	1	1,098	45%
Totals	1,624	1,745	1	3,370	52%
Decision Area (Public Land)					
Prehistoric	260	304	0	564	54%
Historic	10	67	0	77	87%
Both	6	21	0	27	78%
Unknown	191	218	0	409	53%
Totals	467	610	0	1,077	57%

SOURCE: New Mexico Cultural Resource Information System 2004

Special Status Resources

Not all cultural resources are significant. Since the mid 1980s, criteria for inclusion in the National Register have been used broadly for evaluating the significance of archaeological and historical sites, although BLM also has developed a system of allocating sites to various uses as another measure of significance. The annual reports indicate approximately 80 to 90 percent of the sites recorded in the study area have been evaluated as eligible for the National Register (refer to Table 2-38), and hence are worthy of in-place preservation or the information values they contain are worthy of recovery and preservation.

Another aspect of evaluation is designating special status resources. These include national monuments, national historic sites, and cultural ACECs, as well as actual listing in the National Register. Resources determined eligible for the National Register are afforded the same consideration as those that are actually listed, but the additional effort entailed in listing properties often reflects a higher degree of publicly perceived significance or sentiment for preservation in place.

There is only one national monument in the Planning Area (Table 2-48). It is the White Sands National Monument, which overlaps the boundary of Doña Ana and Otero Counties along U.S. Highway 70 about 15 miles southwest of Alamogordo. The monument was set aside primarily for a natural feature—the largest gypsum dune field in the world, but the National Park Service also manages the cultural resources of the monument for restoration, protection, maintenance, public visitation, and education. A White Sands Monument National Historic District also has been defined.

Table 2-48
Special Status Cultural Resources in the Planning Area

Type	All Jurisdictions	On Public Land
Sierra and Otero Counties		
National Monuments	1	none
National Historic Trail	1	1 (El Camino Real de Tierra Adentro)
National Historic Landmarks	none	none

Type	All Jurisdictions	On Public Land
National Register Properties[a]	6 districts 51 individual properties	none
New Mexico State Register[b]	3 districts 2 multiple properties 31 individual properties	7 (Three Rivers Petroglyph Site, Alamo Spring Stage Station, Lake Valley Mining District, Lake Valley Schoolhouse, Escondida Ruin (on McGregor Range), and archaeological sites LA 1082 near Derry and LA 50751 near Arrey)
ACECs	3 primary 1 secondary	3 primary (Three Rivers Petroglyph Site, Cornudas Mountain, Alamo Mountain) 1 secondary (Wind Mountain)
Back Country Byway	1	1 (Lake Valley)
Doña Ana County		
National Monuments	1	none
National Historic Trail	1	1 (El Camino Real de Tierra Adentro)
National Historic Landmarks	2	none
National Register Properties[a]	5 districts 16 individual properties	none
New Mexico State Register[b]	20	none
ACECs	3 primary 2 secondary	3 primary (Los Tules, Rincon, San Diego Mountains) 2 secondary (Doña Ana Mountains, Organ/Franklin Mountains)
Back Country Byway	none	none

SOURCES: New Mexico Historic Preservation Division 2005; U.S. Department of the Interior, National Park Service 2005a and 2005b

NOTES: [a] National Register counts do not include national historic landmarks, which also are listed in the National Register.
[b] State Register counts do not include those that also are listed in the National Register[3].

El Camino Real de Tierra Adentro (the Royal Road of the Interior), which is only one of 19 designated National Historic Trails, crosses approximately 29 miles of public land through Sierra and Doña Ana Counties. The trail connected Mexico City with New Mexico's Spanish colonial capitals at San Juan Pueblo (1598-1600), San Gabriel (1600-1609) and Santa Fe (1609-1821). Although in many areas physical evidence of the trail has been obliterated and its exact location is unknown, the remaining physical evidence and historical documents were used to identify its probable route and designate a trail corridor. The National Park Service and BLM jointly prepared a comprehensive management plan (USDI, BLM 2000e), and BLM is working with the State of New Mexico to develop a visitor center north of the Planning Area.

Two national historic landmarks have been identified within the Planning Area. Both are historical sites located in Doña Ana County—Mesilla Plaza and White Sands V-2 Launch Site. These landmarks are not on public land.

Six districts and 51 individual buildings, structures, or sites within Otero and Sierra Counties are listed in the National Register. None of those are on public land. Five districts and 16 individual buildings, structures, or sites within Doña Ana County are listed in the National Register. None of those are on public land.

The New Mexico State Register of Cultural Properties includes 3 districts, 2 multiple property listings, and 31 buildings, structures, or sites within Otero and Sierra Counties that are not listed in the National Register. Seven of these properties are on public land. Three of these are in Otero County, including the Three Rivers Petroglyph and Pueblo Site, Alamo Springs Stage Station along the Butterfield Overland Route, and the Escondida Ruin on McGregor Range. The four properties in Sierra County include the Lake Valley Mining District, Lake Valley Schoolhouse, and archaeological sites LA 1082 and LA 50751.

The two other types of special status designations can be applied by the BLM to protect and interpret cultural and other types of resources—ACECs and back-country byways. Three ACECs have been designated primarily to protect cultural resources in Otero County. These include the Three Rivers Petroglyph and Pueblo Site (which also is listed in the State Register), Cornuda Mountain, and Alamo Mountain. The Wind Mountain ACEC was designated primarily to protect scenic resources, but protection of cultural resources was a secondary purpose for the designation. The BLM has not designated any ACECs in Sierra County, but has designated the Lake Valley Back-Country Byway to publicly interpret the historic silver mining towns of Lake Valley and Hillsboro.

Three ACECs have been designated in Doña Ana County primarily to protect cultural resources. They include a Jornada Mogollon pit house village at the Tules ACEC, and petroglyphs at the Rincon and San Diego Mountains ACECs. Protection of cultural resources was a secondary reason for designation of the Doña Ana Mountains and Organ/Franklin ACECs, which were designated primarily to protect biological and scenic resources.

Traditional Cultural Properties

Federally recognized tribes in or near the Planning Area include the Mescalero Apache, who reside on the Mescalero Indian Reservation in northeastern Otero County, and Ysleta del Sur Pueblo (Tigua Reservation), located southeast of El Paso. The Tortugas, a composite community of Tigua, Piro, and Manso Indians and Hispanics, is a daughter colony of Ysleta del Sur that formed in Las Cruces some time between 1850 and 1900. Although the Tortugas formally incorporated in 1914, the Federal government has not recognized the community as an Indian tribe.

No American Indian religious sites or traditional cultural places were discussed in the 1985 White Sands and 1993 Mimbres RMPs. Subsequently, policies have been developed to ensure that the BLM cultural resource program considers traditional cultural places and resources. Traditional concerns of many tribal communities focus on treatment of human remains associated with archaeological sites. In 1996, the BLM, in cooperation with the U.S. Forest Service, completed a cultural affiliation study for New Mexico and Arizona cultures in compliance with the Native American Graves Protection and Repatriation Act (U.S. Department of Agriculture, Forest Service, Southwestern Region 1996). The purpose of the study was to determine which American Indian groups are culturally affiliated with archaeologically defined cultures. BLM and the Forest Service Southwest Region jointly concluded that cultural affiliation of Paleo-Indian, Archaic, and Basketmaker materials cannot be established with modern tribal groups. The three Formative-period archaeological cultures relevant for the Planning Area include the Jornada Mogollon (A.D. 200-1400), Upland Jornada Mogollon (A.D. 500-1450), and the Mogollon/Lowland (200 B.C.-A.D. 1400/1450). Cultural affiliations with the Lowland Mogollon were not firmly identified, but

possible associations were suggested with the Piro or historic groups in northern Chihuahua that lost their cultural identity.

When the Spanish arrived, the Piro were living in a dozen villages along a section of the Rio Grande north of the Planning Area. The Piro suffered from Apache raiding and were substantially affected by Spanish colonization in the sixteenth century. When the Pueblo Revolt of 1680 expelled Spanish colonists, the Piro moved south with them and founded Ysleta del Sur Pueblo in the vicinity of modern day El Paso, Texas. The Apache also are known to have occupied parts of the Planning Area, perhaps as early as the sixteenth century and into the nineteenth century. A database maintained by the State Historic Preservation Office (SHPO) indicates that several other tribes may have traditional cultural interests in the Planning Area, including the Hopi Tribe, Navajo Nation, Fort Sill Apache Tribe, White Mountain Apache Tribe, Kiowa Tribe, Comanche Indian Tribe, and Isleta Pueblo.

The Mescalero Apache commonly regard several types of geographic features to have spiritual significance, including caves, springs, and certain mountain peaks, and have expressed general concerns about plant collecting areas and trails. Members of the Mescalero Apache Tribe make annual trips to gather agave hearts on public land in the foothills of the Sacramento Mountains for use in ceremonies, but the tribe has not yet identified specific traditional cultural places of concern. The Tigua and other tribes identified by the SHPO as having potential traditional cultural interests in the Planning Area have not identified any specific traditional places of concern.

The Tortugas participate in an annual pilgrimage to the top of A-Mountain outside Las Cruces to hold mass. BLM considers the mountain peak to be a traditional cultural property (eligible for the National Register under Criterion A), and leases the shrines on top of the mountain to the Tortugas through the Recreation and Public Purposes Act.

After Native American Graves Protection and Repatriation Act was enacted in 1990, the BLM New Mexico State Office compiled an inventory of human remains, funerary objects, sacred objects, and items of cultural patrimony that had been collected from public land in New Mexico prior to 1990. None of the inventoried human remains or objects was recovered from the Planning Area. Fort Bliss inventoried human remains, representing eight individuals recovered from five sites on the McGregor Range. Analysis concluded that these remains are culturally unaffiliated with any of the tribes known to have occupied the region historically, and they continued to be stored at the Fort Bliss Curatorial Facility. Subsequent to the passage of Native American Graves Protection and Repatriation Act , no human remains have been excavated from public land in the Planning Area.

Extent of and Responses to Threats

Three factors can threaten the historic integrity of cultural resources, including (1) disturbance or destruction by various types of development projects or land uses, (2) natural erosion, and (3) unauthorized excavating and artifact collecting by vandals or uninformed recreational users.

One measure of threats is the number of projects reviewed to ensure that cultural resources are taken into account as projects are planned and implemented. On the basis of the BLM annual reports it is estimated that almost one thousand projects have been reviewed in Otero and Sierra Counties since 1986 (Table

2-49). That is an average of 59 projects annually. As a result of these reviews, almost 370 sites were identified as threatened, but were avoided, which is an average of 23 sites annually.

Table 2-49
Indicators of Threats to Cultural Resources in Sierra and Otero Counties

Fiscal Year	Projects			Threatened Sites Avoided	Sites Monitored	Sites Monitored - Eroding
	BLM	non-BLM	Total			
1986[a]	65	33	98	46	12	0
1987[a]	37	22	59	13	20	0
1988	21	12	33	36	not reported	3
1989	14	16	30	24	0	0
1990	15	10	25	5	5	5
1991	38	5	43	15	5	0
1992	54	7	61	not reported	6	1
1993[b]	not reported		185	51	29	3
1994	34	15	49	11	10	1
1995	26	12	38	64	54	0
1996	14	3	17	30	17	3
1997	not reported					
1998	not reported		16	58	17	2
1999[b]	not reported		47	2	34	0
2000[b]	not reported		79	0	44	1
2001[b]	not reported		98	9	43	0
2002[b]	21	0	21	2	44	1
2003[b]	not reported					
2004[b]	not reported		97	1	49	1
Totals	339	135	996	367	389	21
Averages[c]	31	12	59	23	24	1

SOURCE: U.S. Department of the Interior, Bureau of Land Management 1986 - 2004

NOTES: [a] Proportional estimated based on public land in Otero and Sierra Counties constituting 33.6 percent of public land in old Las Cruces District

[b] Proportional estimated based on public land in Otero and Sierra Counties constituting 43 percent of public land in revised Las Cruces District

[c] Annual average calculated for years with reported data

On the basis of the BLM annual reports it is estimated that more than 300 projects have been reviewed in Doña Ana County since 1993 (Table 2-50). That is an average of more than 30 projects annually. As a result of these reviews, more than 150 sites were identified as threatened, but were avoided, which is an average of 17 sites annually.

Table 2-50
Indicators of Threats to Cultural Resources in Doña Ana County

Fiscal Year	Projects			Threatened Sites Avoided	Sites Monitored	Sites Monitored - Eroding
	BLM	non-BLM[2]	Total			
1993[a]	not reported		67	118	25	3
1994[a]	4	22	26	not reported	not reported	not reported
1995[a]	23	24	47	2	4	1
1996[a]	14	11	25	4	29	0
1997[a]	not reported					
1998[a]	not reported		17	0	29	0
1999[b]	not reported		17	4	34	0
2000[b]	not reported		29	0	44	1
2001[b]	not reported		36	22	43	0
2002[b]	17	0	17	4	44	1

Fiscal Year	Projects			Threatened Sites Avoided	Sites Monitored	Sites Monitored - Eroding
	BLM	non-BLM[2]	Total			
2003[b]	not reported					
2004[b]	not reported		35	3	49	1
Totals	58	57	316	157	301	7
Averages[c]	15	14	32	17	33	1

SOURCE: U.S. Department of the Interior, Bureau of Land Management 1986 - 2004

NOTES: [a] Proportional estimated based on public land in Otero and Sierra Counties constituting 33.6 percent of public land in old Las Cruces District

[b] Proportional estimated based on public land in Otero and Sierra Counties constituting 43 percent of public land in revised Las Cruces District

[c] Annual average calculated for years with reported data

Archaeological data recovery projects were conducted to mitigate the impacts of those projects that could not avoid adverse effects. The annual reports indicate that since 1986 such studies were conducted at 100 archaeological sites in Otero and Sierra Counties, which is an average of 6 sites per year (Table 2-51). Those reviews and treatment plans have been conducted in consultations with the SHPO and affiliated tribes (with an estimated average of one tribal consultation annually.

Table 2-51
Responses to Threats to Cultural Resources in Sierra and Oterro Counties

Fiscal Year	106 Data Recovery (sites)	Tribal Consultations	Sites Signed	Fencing/ Gating	Stabilization/ Restoration	Ongoing Protection	Administrative Measures	Total Sites Protected
1986[a]	34	2	34	7	0	0	0	not reported
1987[a]	5	0	5	3	0	0	0	not reported
1988	0	1	0	4	0	0	0	not reported
1989	43	0	43	0	0	0	1	2
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	1	0	0	0
1992	not reported	not reported	not reported	0	not reported	not reported	not reported	not reported
1993[b]	12	3	12	6	2	1	2	3
1994	1	5	1	0	0	1	0	0
1995	3	0	3	0	2	1	0	0
1996	0	1	0	12	0	2	0	2
1997								
1998	0	0	0	0	0	1	0	0
1999[b]	0	0	0	0	0	0	0	0
2000[b]	2	0	2	0	0	0	0	0
2001[b]	0	1	0	2	0	0	1	0
2002[b]	0	2	0	3	0	0	0	0
2003[b]	not reported							
2004[b]	0	1	0	3	0	0	0	0
Totals	100	16	100	40	5	6	4	7
Averages[c]	6	1	6	2	0	0	0	1

SOURCE: U.S. Department of the Interior, Bureau of Land Management 1986 - 2004

NOTES: [a] Proportional estimated based on public land in Otero and Sierra Counties constituting 33.6 percent of public land in old Las Cruces District

[b] Proportional estimated based on public land in Otero and Sierra Counties constituting 43 percent of public land in revised Las Cruces District

[c] Annual average calculated for years with reported data

The annual reports indicate such studies were conducted at 41 archaeological sites in Doña Ana County, which is an average of 5 sites per year (Table 2-52). Those reviews and treatment plans have been conducted in consultations with the SHPO, and an estimated average of two tribal consultations per year.

Table 2-52
Responses to Threats to Cultural Resources in Doña Ana County

Fiscal Year	106 Data Recovery (sites)	Tribal Consultations	Sites Signed	Fencing/ Gating	Stabilization/ Restoration	Ongoing Protection	Administrative Measures	Total Sites Protected
1993[a]	10	3	5	2	1	1	3	56
1994[a]	not reported							
1995[a]	29	not reported	4	0	0	0	0	20
1996[a]	0	9	0	0	0	0	0	0
1997[a]	not reported							
1998[a]	1	0	0	0	0	0	0	not reported
1999[b]	0	0	0	0	not reported	0	0	
2000[b]	1	0	0	0	0	0	0	not reported
2001[b]	0	1	1	0	0	1	0	not reported
2002[b]	0	1	2	0	0	0	0	not reported
2003[b]	not reported							
2004[b]	0	0	1	0	0	0	0	not reported
Totals	41	14	13	2	1	3	3	76
Averages	5	2	1	0	0	0	0	25

SOURCE: U.S. Department of the Interior, Bureau of Land Management 1986 - 2004

NOTES: [a] Proportional estimated based on public land in Otero and Sierra Counties constituting 33.6 percent of public land in old Las Cruces District

[b] Proportional estimated based on public land in Otero and Sierra Counties constituting 43 percent of public land in revised Las Cruces District

There is only meager data on which to estimate the extent to which erosion is threatening the historic integrity of cultural resources. The annual reports indicate the number of monitored sites that appear to be deteriorating due to erosion, but the sample is small and the extent of erosion damage is not indicated (refer to Table 2-49). The available data indicate that about 5 percent of the almost 400 sites monitored in Otero and Sierra Counties since 1986 are noticeably deteriorating. Similarly, the annual reports indicate that about 2 percent of the approximately 300 sites monitored in Doña Ana County since 1993 are being damaged by erosion (refer to Table 2-50). Stabilization is a treatment for erosion, but it is only rarely used. The annual reports indicate that stabilization projects have been conducted at only 5 sites in Otero and Sierra Counties since 1986 and at only 1 site in Doña Ana County since 1993 (refer to Table 2-51 and Table 2-52).

Intentional vandalism and unauthorized collection of artifacts by recreational users uninformed about cultural resource protection laws are other threats to cultural resources, but there is little quantified information about the extent of the problem. Based on the annual reports, it is estimated that 8 incidences of archaeological site vandalism have been reported since 1986 in Otero and Sierra Counties, but citations and convictions were uncommon. It is estimated that 2 instances of vandalism were noted in Doña Ana County and none resulted in convictions. In 1987, BLM participated in the IMPACT (Interagency Mobilization to Protect Against Cultural Theft) program, but the results of that participation are not documented.

Responses to the threat of vandalism include site monitoring and reconnaissance. An average of approximately 24 sites have been monitored in Otero and Sierra Counties annually since 1986 (refer to Table 2-49), and 33 site in Doña Ana County since 1993 (refer to Table 2-50). BLM cooperates with the SHPO in supporting a statewide site watch program, and works with volunteers who "adopt" sites for regular monitoring and report vandalism or other damage. This has been one of the most successful strategies for protecting cultural resources on public lands.

Another protection measure is the placement of signs at sites to inform visitors of laws protecting cultural resources and penalties for unauthorized collection and excavation. On the basis of the annual reports, it is estimated that signs have been installed annually at an average of 2 sites in Otero and Sierra County since 1986, and at 1 site in Doña Ana County since 1993 (refer to Table 2-51 and Table 2-52). Other measures such as gates and fences, stabilization, and maintenance of protective measures are used even less frequently. The annual reports indicate that such measures have been used at about 15 sites in Otero and Sierra Counties since 1986 and 3 sites in Doña Ana County since 1993 (refer to Table 2-51 and Table 2-52). Administrative measures, including road closures and designation of ACECs, also have been applied to an estimated 7 sites in Otero and Sierra Counties since 1986 and 3 sites in Doña Ana County since 1993 (refer to Table 2-51 and Table Table 2-52).

2.1.12 Extent of Interpretation of Resources

The primary motivation for protecting and preserving cultural resources is to enhance professional and public interpretation and appreciation of our cultural heritage. The annual reports include information about efforts to enhance sites for public interpretation but provide little quantified information about the number of efforts or the audiences reached.

Public outreach efforts in Otero and Sierra Counties have included talks to school classes and civic organizations, site tours, and occasional media contacts that have resulted in newspaper, magazine, or television coverage. Efforts to publicly interpret cultural resources have focused on two resources—the Three Rivers Petroglyph and Pueblo site, which has been a designated recreation area since 1969, and Lake Valley, a historical mining town. The Three Rivers site is often used as an outdoor classroom. Historical buildings in Lake Valley are being stabilized and restored and a Lake Valley Back-Country Byway has been designated to promote heritage tourism. Brochures have been developed to enhance public interpretation for visitors at both resources. In addition, professional research and interpretation has been promoted through university field schools held at both sites.

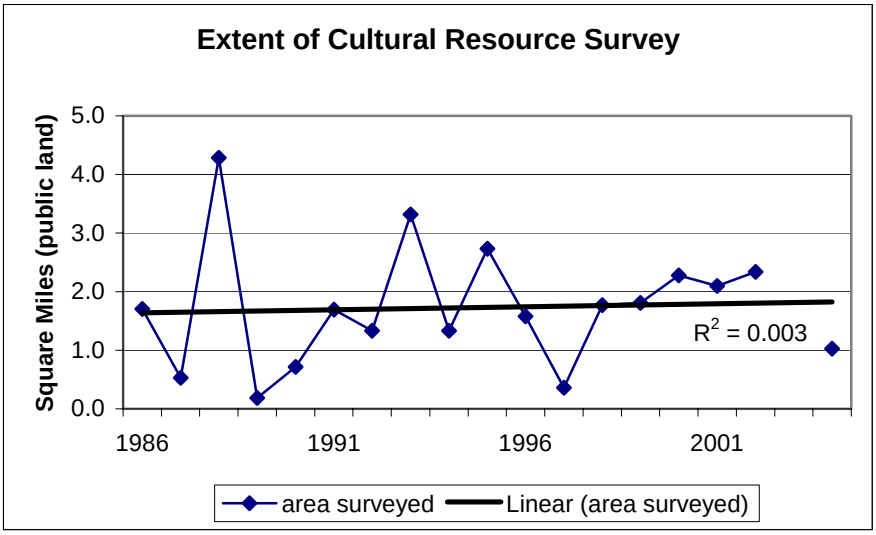
Public outreach efforts in Doña Ana County have included school talks and site tours. A historical ranch, resort, and sanatorium at Dripping Springs within the Organ/Franklin Mountains ACEC, which was designated primarily to protect biological and scenic resources, have been enhanced and a brochure has been prepared to enhance public interpretation of the history of the area.

2.1.12.1 Trends

Extent of Inventory and Evaluation

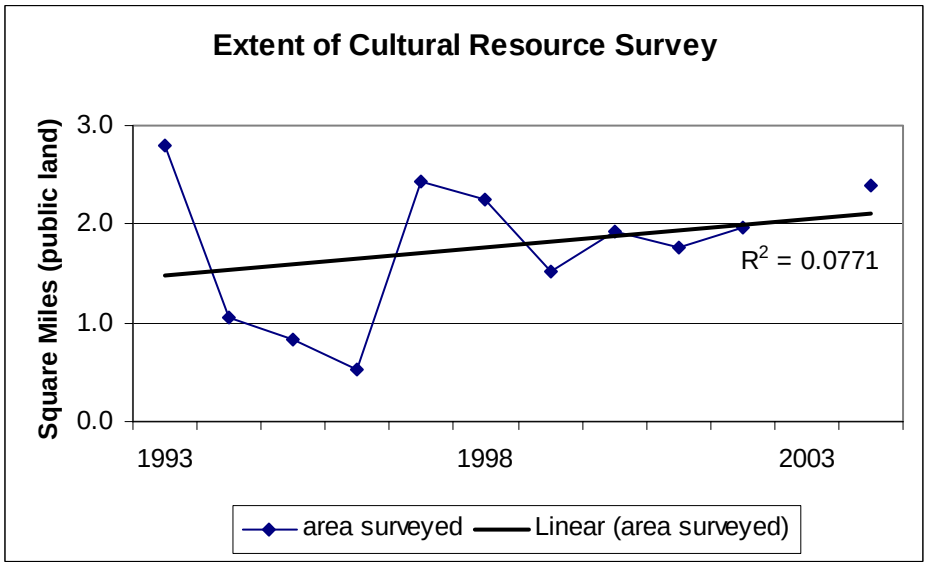
The extent of public land surveyed in Otero and Sierra Counties for cultural resources, as estimated on the basis of the annual reports, has varied considerably from year to year (Figure 2-11). The average has been slightly less than 2 square miles annually, and there is essentially no statistical trend (less than 1 percent of the variation (R^2 value) is "explained" by a linear fit).

Figure 2-11
Cultural Resource Survey Trend in Sierra and Otero County



The temporal pattern of cultural resource survey of public land in Doña County also has varied considerably from year to year (Figure 2-12). The average has been slightly less than 2 square miles annually, and there is essentially no statistical trend. (less than 1 percent of the variation (R^2 value) is "explained" by a linear fit.

Figure 2-12
Cultural Resource Survey Trend in Doña Ana County



The NMCRIS data also were plotted as another source of information regarding temporal trends in cultural resource survey coverage in Otero and Sierra Counties (Figure 2-13) and in Doña Ana County (Figure 2-14). The NMCRIS data for Doña Ana County indicate that 19 square miles of public land have been surveyed since 1993, which is very similar to the 19.5 square miles indicated by the BLM annual reports. However, the amount of survey done annually varies considerably. This might result in differences between use of the Federal year versus the calendar year in recording survey completions or other tracking discrepancies. Regardless, the temporal trends are not statistically strong.

The NMCRIS data for the extent of survey in Otero and Sierra Counties since 1986 (187 square miles) is considerably different from the amount of survey documented in the BLM annual reports (31 square miles). The NMCRIS data indicate an average of about 10 square miles have been inventoried for cultural resources annually since 1986, rather than the less than 2 square miles, as indicated by the BLM annual reports. The reason for this discrepancy is not obvious, but much of it may be due to the fact that surveys sponsored by the U.S. Army on McGregor Range were not included in the BLM annual reports, although most of the range is public land withdrawn for military uses. Neither data set indicates a statistically strong temporal trend. The NMCRIS data do indicate that the extent of survey of public land does tends to mirror the extent of survey throughout the Planning Area.

Figure 2-13
Cultural Resource Survey Trend in Sierra and Otero Counties

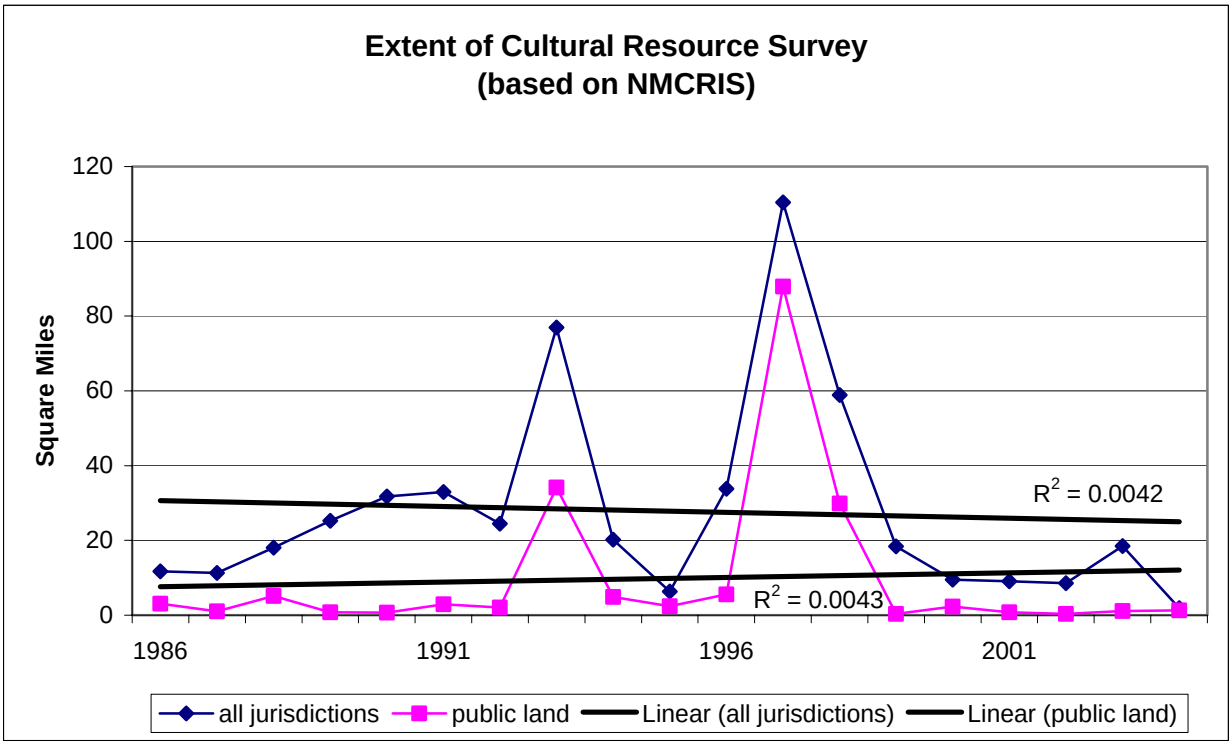
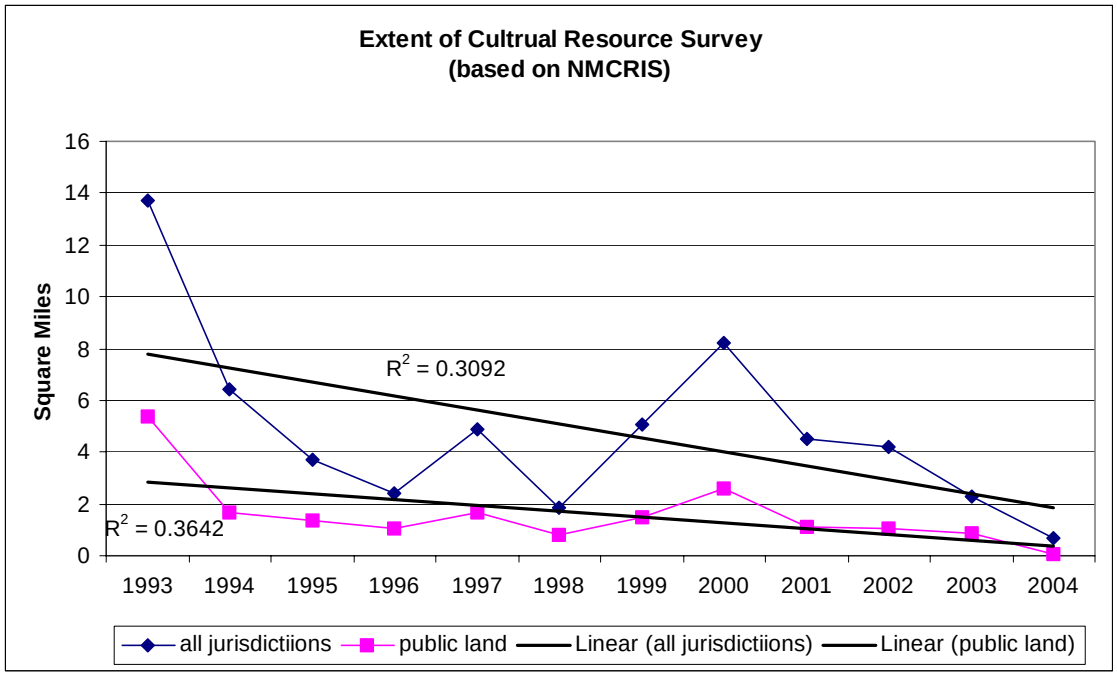
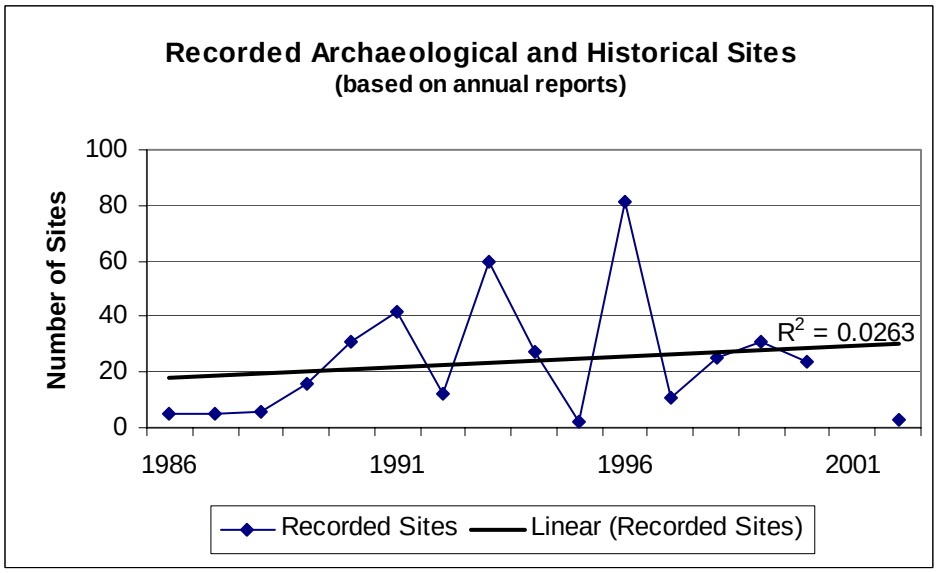


Figure 2-14
Cultural Resource Trend Survey for Doña Ana County



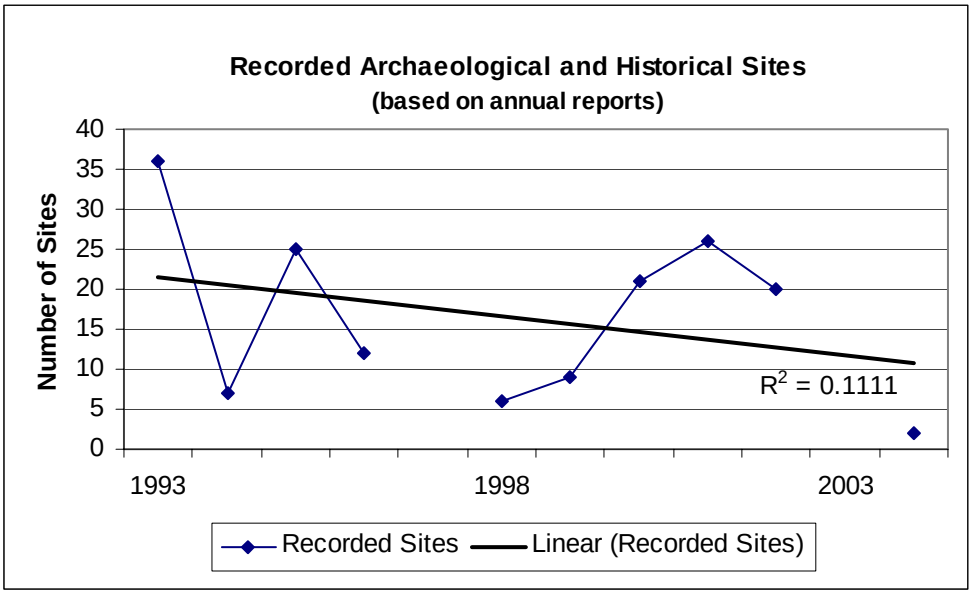
The numbers of archaeological sites recorded on public land in Otero and Sierra Counties, as estimated on the basis of the annual reports, also has varied substantially from year to year (Figure 2-15). The plot shows a trend to record more sites each year, but it is very weak and not statistically significant.

Figure 2-15
Cultural Resource Recording Trend in Sierra and Otero Counties



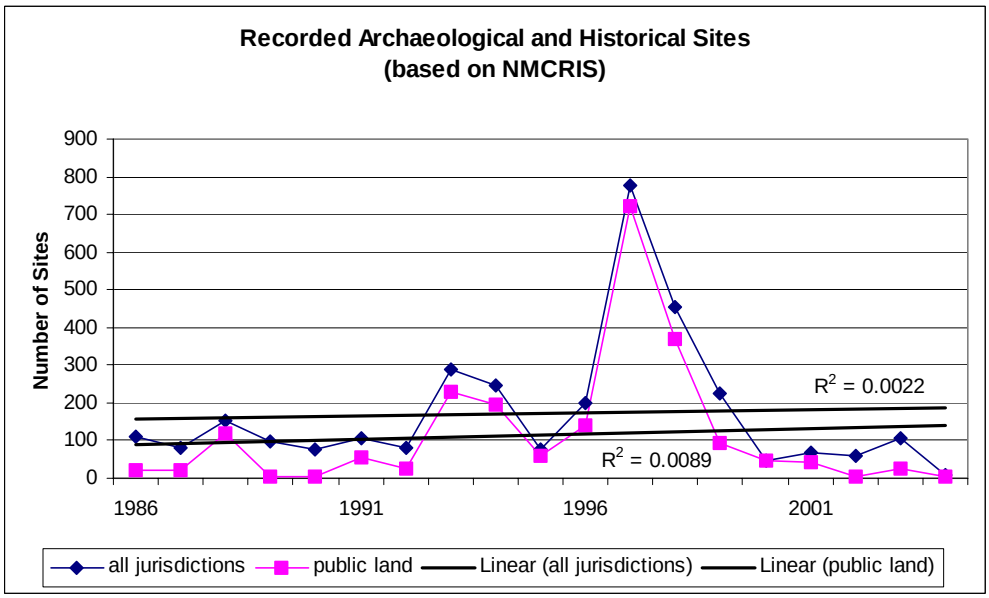
The numbers of archaeological sites recorded on public land in Doña Ana County, as estimated on the basis of the annual reports, also has varied substantially from year to year (Figure 2-16). The plot shows a trend to record fewer sites each year, but it is very weak and not statistically significant.

Figure 2-16
Cultural Resource Recording Trend for Doña Ana County



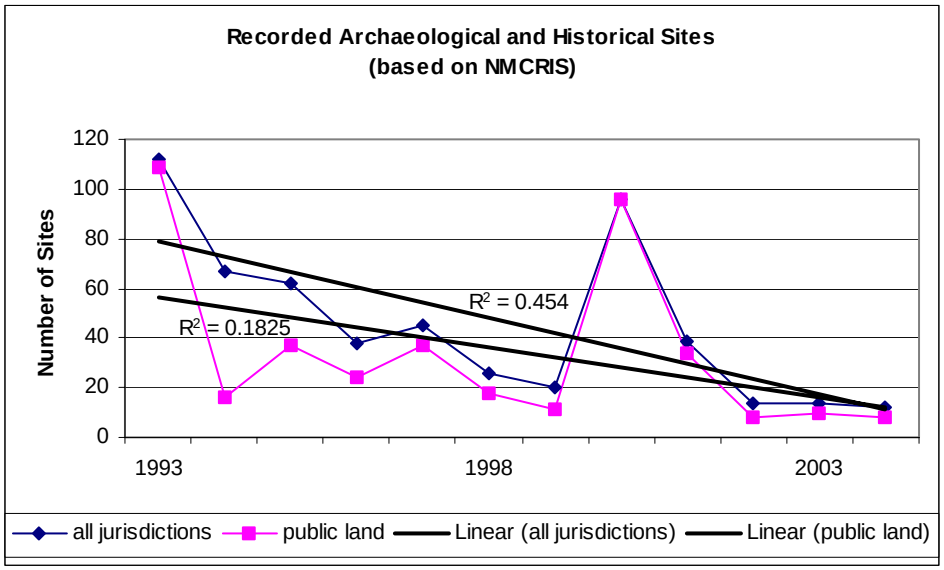
The NMCRIS data also were plotted as another source of information regarding temporal trends in recording cultural resources. The NMCRIS database indicates that considerably more sites have been recorded on public land since 1986 in Otero and Sierra Counties (2,187 sites) than indicated by the BLM annual reports (381 sites). The historical trends also are different (Figure 2-17). Much of this discrepancy may be due to the fact that the BLM annual reports did not include sites recorded on the McGregor Range. Neither data set indicates a statistically strong temporal trend. The NMCRIS data indicate that the number of sites recorded on public land generally mirrors the number of resources recorded throughout Otero and Sierra Counties.

Figure 2-17
Cultural Resources Recording Trend in Sierra and Otero Counties



The NMCRIS database indicates that considerably more sites have been recorded on public land since 1993 in Doña Ana County (408 sites) than indicated by the BLM annual reports (164 sites). The reasons for this discrepancy are not obvious, but much of the difference may be due to the fact that the BLM annual reports did not include sites recorded on the McGregor Range. Both data sets indicate fewer sites have been recorded in recent years, but the temporal trend is not statistically strong (Figure 2-18). The NMCRIS data indicate that the number of sites recorded on public land generally mirrors the number of resources recorded throughout Doña Ana County.

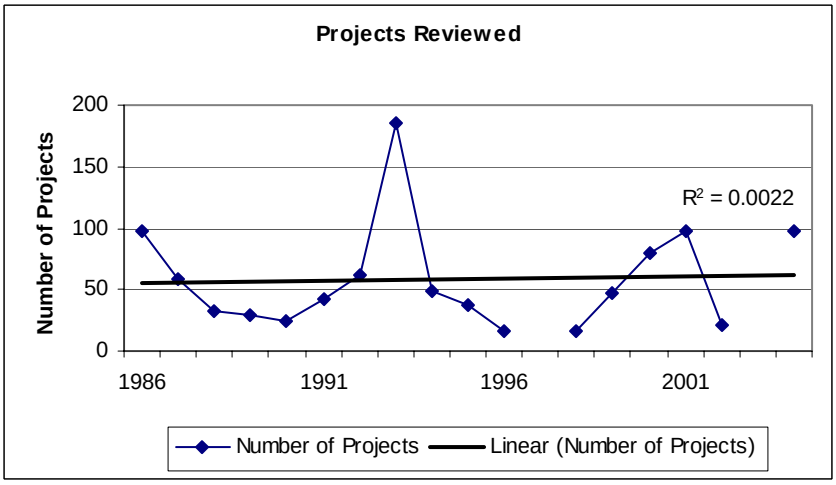
Figure 2-18
Cultural Resources Record Trend in Doña Ana County



Extent of and Responses to Threats

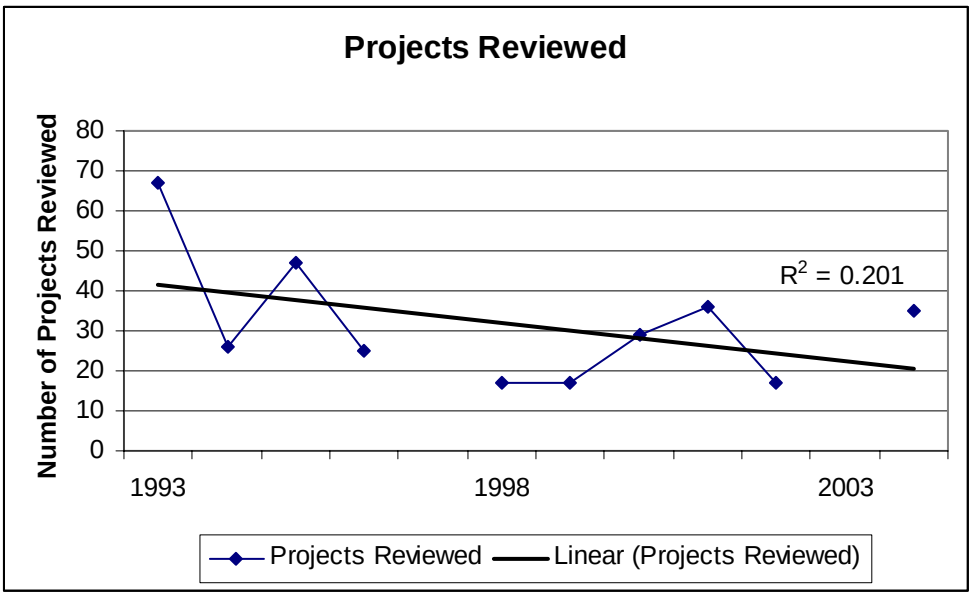
The number of projects reviewed is a measure of threats to cultural resources. Data reported since 1986 indicate than an average of about 60 projects have been reviewed annually in Otero and Sierra Counties, but has varied widely from year to year (Figure 2-19). There is no statistically strong temporal trend.

Figure 2-19
Number of Projects Reviewed in Sierra and Otero County



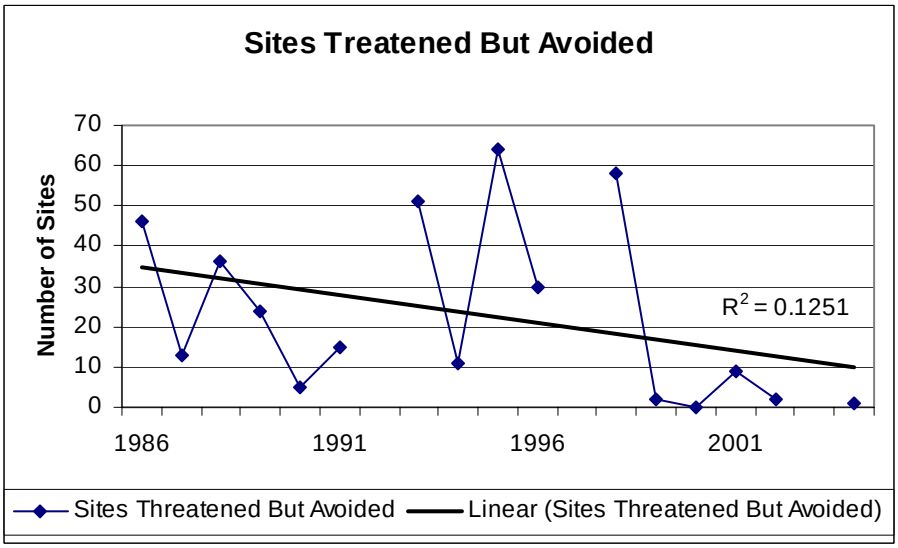
Data reported since 1993 indicate than an average of about 30 projects have been reviewed annually in Doña Ana County, but has varied widely from year to year. The plotted data suggest a decreasing temporal trend from an average of about 40 to 20 projects per year, but the trend is not statistically robust (Figure 2-20).

Figure 2-20
Number of Projects Reviewed in Doña Ana County



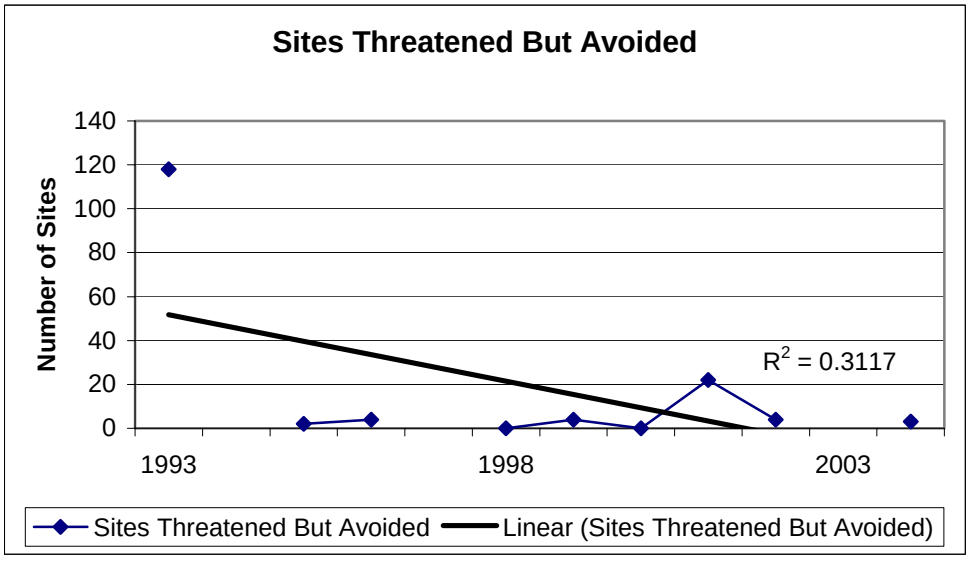
A more direct measure of threats to cultural resources is the number of sites threatened but avoided. An estimated average of approximately 23 sites have been threatened but avoided each year in Otero and Sierra Counties since 1986, but has varied widely from year to year (Figure 2-21). The plotted data suggest a decreasing temporal trend from an average of more than 30 in early years to about 10 projects in later years, but the trend is not statistically robust.

Figure 2-21
Number of Sites Threatened but Avoided in Sierra and Otero County



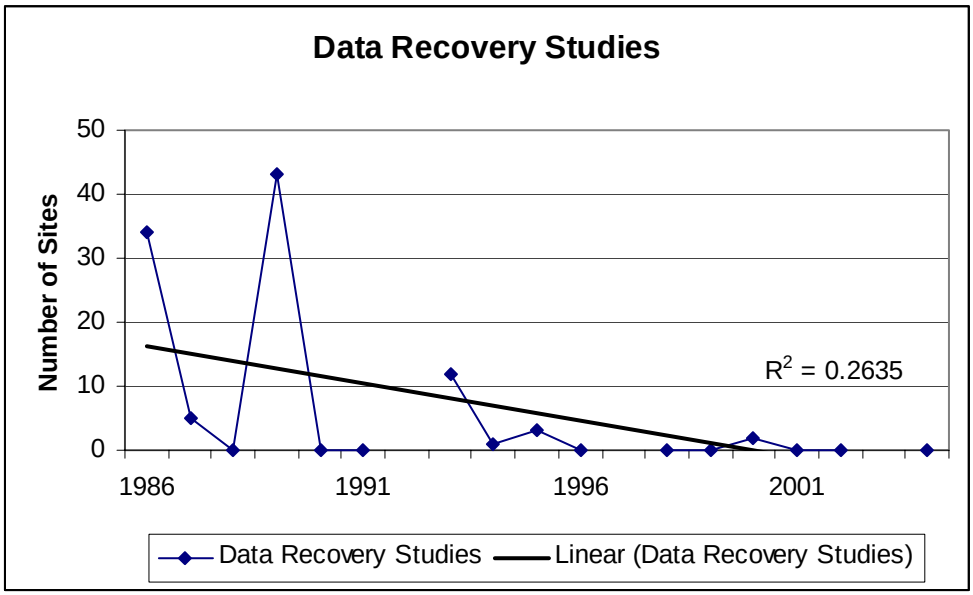
An estimated average of approximately 17 sites have been threatened but avoided each year in Doña Ana County since 1993, but has varied widely from year to year (Figure 2-22). The plotted data suggest a decreasing temporal trend, but the trend is not statistically robust.

Figure 2-22
Number of Sites Threatened but Avoided in Doña Ana Counnty



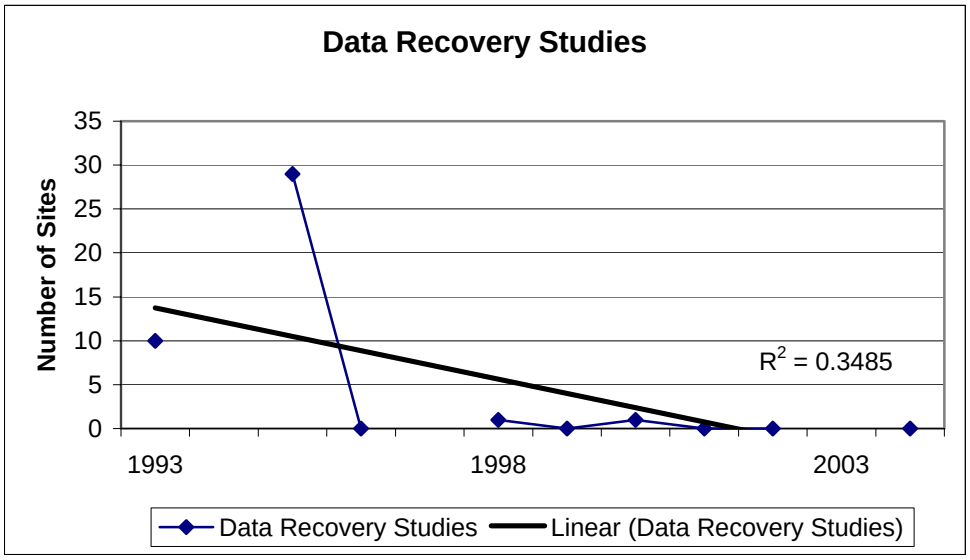
Another measure of threats to cultural resources and mitigative responses is the number of sites studied prior to disturbance or destruction by project development. Annual reports indicate that an average of approximately 6 sites have been studied annually in Otero and Sierra Counties since 1986, but the number has varied widely from year to year (Figure 2-23). The plotted data suggest a decreasing temporal trend, but the trend is not statistically robust.

Figure 2-23
Number of Data Recovery Studies in Sierra and Otero Counties



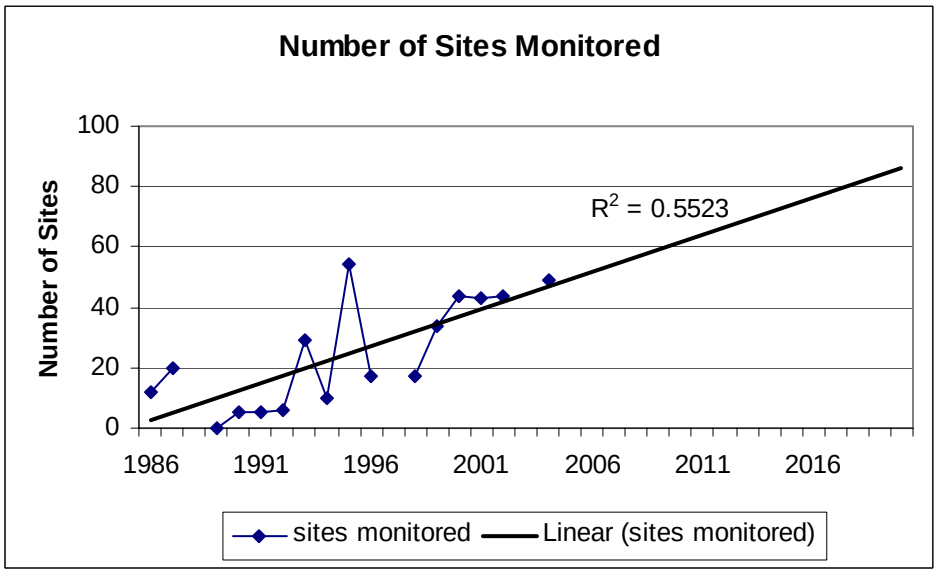
Annual reports indicate that an average of approximately 5 sites have been studied annually to mitigate project impacts in Doña Ana County since 1993, but the number has varied widely from year to year (Figure 2-24). The plotted data suggest a decreasing temporal trend, but the trend is not statistically robust.

Figure 2-24
Number of Data Recovery Studies in Doña Ana County



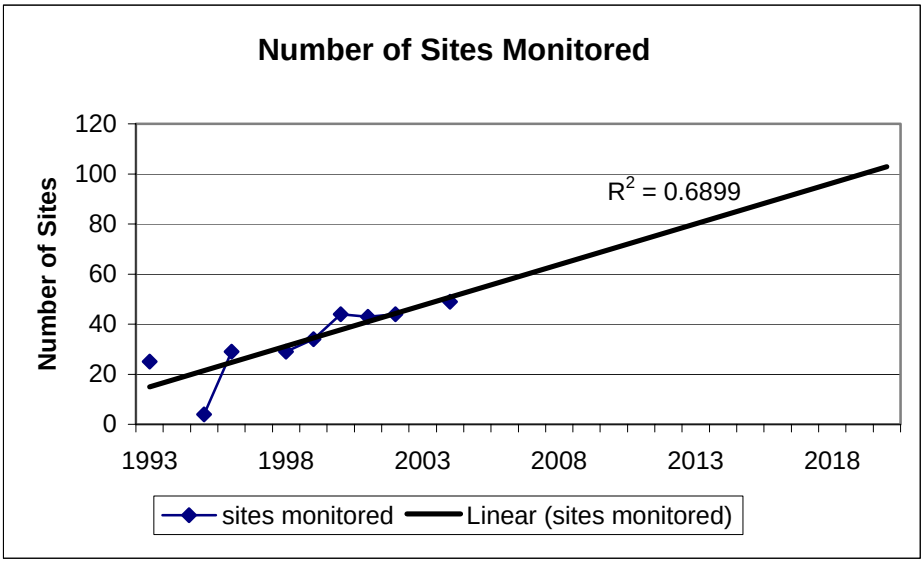
Another response to threats is the monitoring of site conditions. Annual reports indicate that an average of about 24 sites have been studied annually in Otero and Sierra Counties since 1986, but the number has varied widely from year to year (Figure 2-25). The plotted data indicate a moderately strong trend of monitoring more sites each year, with the current number being about 50 sites per year.

Figure 2-25
Number of Sites Monitored in Sierra and Otero Counties



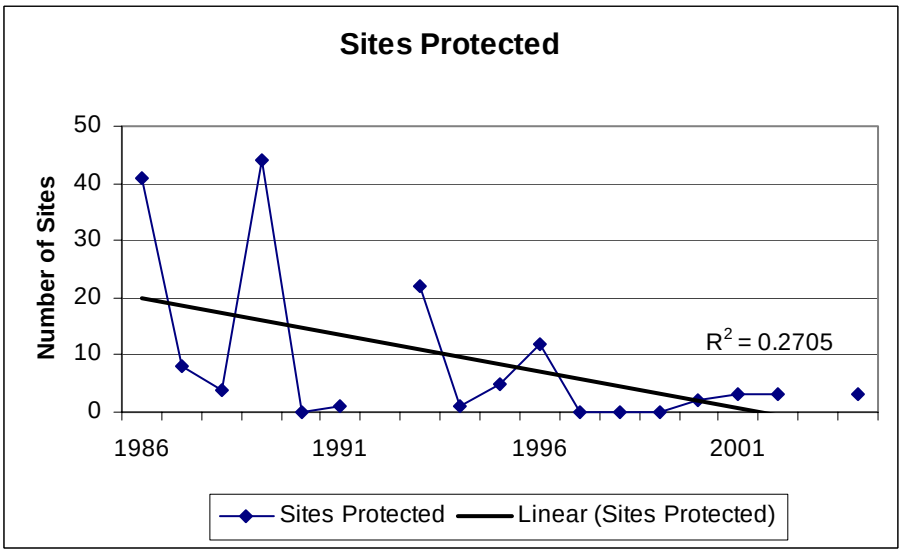
Annual reports indicate that an average of about 33 sites have been studied annually in Doña Ana County since 1993 (Figure 2-26). The plotted data indicate a moderately strong trend of monitoring more sites each year, with the current number being about 50 sites per year

Figure 2-26
Number of Sites Monitored in Doña Ana County



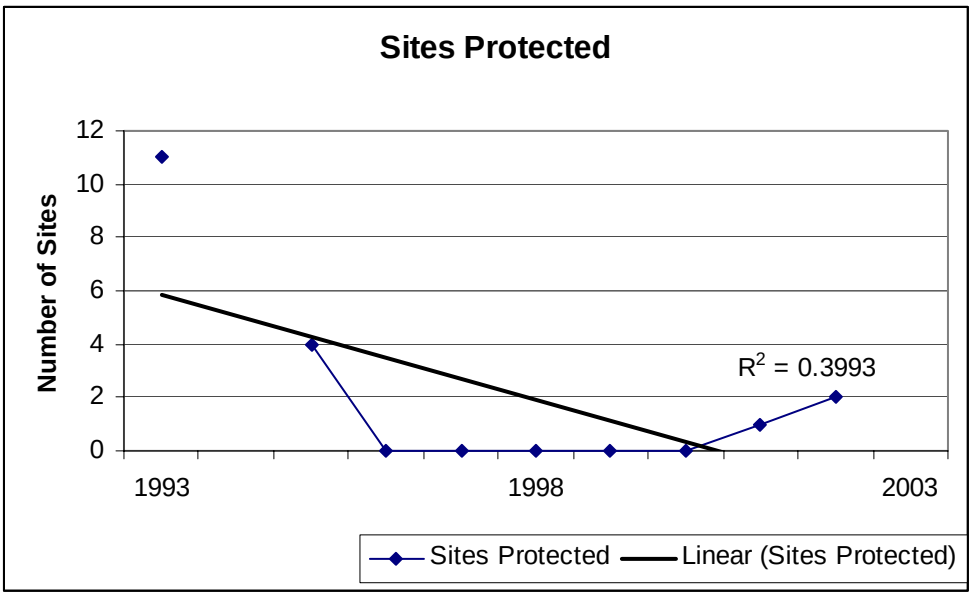
Another response to threats is the protection of sites by various physical means such as fencing, signing, and stabilization, or administrative measures. An estimated annual average of about 9 sites have been protected by these means in Otero and Sierra Counties since 1986, but the number has varied widely from year to year (Figure 2-27). The plotted data suggest that fewer sites are being protected each year, but the trend is not statistically robust.

Figure 2-27
Number of Sites Protected in Sierra and Otero Counties



An estimated annual average of about 2 sites have been protected by various physical or administrative measures in Doña Ana County since 1993, but the number has varied widely from year to year (Figure 2-28). The plotted data suggest that fewer sites are being protected each year but the trend is not statistically robust.

Figure 2-28
Number of Sites Protection in Doña Ana County



Extent of Interpretation of Resources

Efforts at professional and public interpretation and education have been ongoing in Otero and Sierra Counties since the White Sands RMP was completed in 1986 and in Doña Ana County since the Mimbres RMP was completed in 1993. However, the numbers of projects and the sizes of the audiences contacted have not been reported, and therefore there is no basis for assessing temporal trends. The available information suggests that interpretation efforts are a continuing, but episodic part of the cultural resource program with efforts in Otero and Sierra Counties focusing on the Three Rivers Petroglyph and Pueblo site and the historical mining town of Lake Valley. The efforts in Doña Ana County do not seem to have been as extensive and the only site developed for public interpretation is Dripping Springs within the Organ/Franklin Mountains ACEC.

2.1.12.2 Forecast

Extent of Inventory and Evaluation

There is no strong historical trend regarding the extent of cultural resource survey in Otero and Sierra Counties (refer to Figure 2-11, Figure 2-13, Figure 2-15, and Figure 2-17). The data available for surveys conducted since 1986, subsequent to the completion of the White Sands RMP, suggest that something on the order of 2 square miles of public land might be inventoried annually for cultural resources (excluding surveys on the McGregor Range) for a total of 20 to 30 square miles in the 10 to 15 years addressed by

the revised plan. The available data suggest that an average of about 25 archaeological and historical sites might be recorded annually for a total of 250 to 375 sites over the next 10 to 15 years.

There also is no strong historical trend regarding the extent of cultural resource survey in Doña Ana County (refer to Figure 2-12, Figure 2-14, Figure 2-16, and Figure 2-18). The data available for surveys conducted since 1993, subsequent to the completion of the Mimbres RMP, suggest that something on the order of 2 square miles of public land might be inventoried annually for cultural resources for a total of 20 to 30 square miles in the 10 to 15 years addressed by the revised plan. The available data suggest that an average of about 15 archaeological and historical sites might be recorded annually for a total of 150 to 225 sites over the next 10 to 15 years.

Almost all of the past survey on public land in the Planning Area has been driven by Section 106 compliance reviews. Major development projects or lack of such projects will undoubtedly continue to be the primary factor in determining how much area is surveyed in any given year, but Section 110 surveys planned to promote primary program goals may warrant relatively more effort than they have in the past.

Extent of and Responses to Threats

The number of projects reviewed generally reflects a major type of threats to cultural resources. The scope and scale of projects, and therefore the level of threats to cultural resources vary widely and there is not strong historical trend (refer to Figure 2-19). The data available since 1986, subsequent to the completion of the White Sands RMP, suggest that the BLM cultural resource program might review something on the order of 60 projects annually in Otero and Sierra Counties for a total of 600 to 900 projects in the 10 to 15 years addressed by the revised plan.

There also is no strong historical trend regarding the number of projects reviewed annually in Doña Ana County (refer to Figure 2-20). The data available since 1993, subsequent to the completion of the Mimbres RMP, suggest that the BLM cultural resource program might review something on the order of 30 projects annually in Doña Ana County for a total of 300 to 450 projects in the 10 to 15 years addressed by the plan revision.

There is no strong historical trend regarding the number of archaeological and historical sites threatened but avoided by projects on public land in Otero and Sierra Counties (refer to Figure 2-21). The data available since 1986, subsequent to the completion of the White Sands RMP, indicate that the number has fluctuated considerably from year to year but the average of 20 to 25 suggests that a total of 200 to 375 sites might be threatened but avoided during the 10 to 15 years addressed by the revised plan.

There also is no strong historical trend regarding the number of archaeological and historical sites that are threatened but avoided annually in Doña Ana County (refer to Figure 2-22). The data available since 1993, subsequent to the completion of the Mimbres RMP, suggest that something on the order of 15 to 20 sites on public land might be threatened but avoided annually by projects in Doña Ana County for a total of 150 to 300 sites during the 10 to 15 years addressed by the plan amendment.

There also is no strong historical trend regarding the number of archaeological and historical sites on public land that cannot be avoided and are studied to mitigate project impacts in Otero and Sierra

Counties (refer to Figure 2-23). The data available since 1986, subsequent to the completion of the White Sands RMP, indicate that data recovery studies have been conducted annually at an average of about 6 sites on public land in Otero and Sierra Counties. That suggests a total of about 50 to 100 sites might be studied before they are damaged or destroyed by projects during the 10 to 15 years addressed by the revised plan. This represents about 1 percent of the estimated 10,000 archaeological and historical sites on the public lands within Otero and Sierra Counties.

There also is no strong historical trend regarding the number of archaeological and historical sites on public land that cannot be avoided and are studied to mitigate project impacts in Doña Ana County (refer to Figure 2-24). The available data indicates an average of about 5 sites on public land have been studied annually to mitigate project impacts. That suggests a total of about 50 to 100 sites might be studied before they are damaged or destroyed by projects during the 10 to 15 years addressed by the plan amendment. This represents about 1 percent of the estimated 10,000 archaeological and historical sites on the public lands within Doña Ana County.

Another response to threats is to monitor archaeological and historical sites. A moderately strong historical trend indicates that about 50 sites currently are being monitored annually in Otero and Sierra Counties, and the number could increase to about 80 during the 10 to 15 years addressed by the revised plan (refer to Figure 2-25).

A moderately strong historical trend indicates that about 50 sites currently are being monitored annually in Doña Ana County, and the number could increase to about 100 during the 10 to 15 years addressed by the plan amendment (refer to Figure 2-25). Annual reports indicate that an average of about 33 sites have been studied annually in Doña Ana County since 1993 (Figure 2-26). The plotted data indicate a moderately strong trend of monitoring more sites each year, with the current number being about 50 sites per year.

There is no strong historical trend regarding the protection of archaeological and historical sites by various physical means or administrative measures on public land in Otero and Sierra Counties (refer to Figure 2-27). The data available since 1986, subsequent to the completion of the White Sands RMP, indicate that the number has fluctuated considerably from year to year but the average of about 9 sites protected annually suggests that a total of approximately 100 to 150 sites might be protected during the 10 to 15 years addressed by the revised plan.

There is no strong historical trend regarding the protection of archaeological and historical sites by various physical means or administrative measures on public land in Doña Ana County (refer Figure 2-28). The data available since 1993, subsequent to the completion of the Mimbres RMP, indicate that an average of about 2 sites have been protected annually by various means in Doña Ana County. This suggests that a total of approximately 20 to 30 sites might be protected during the 10 to 15 years addressed by the plan amendment.

Extent of Interpretation of Resources

Professional and interpretation and public education has been an ongoing but episodic element of the cultural resource program. The efforts have focused on two resources in Otero and Sierra Counties (Three

Rivers Petroglyph and Pueblo site and the historical mining town of Lake Valley) and one resource in Doña Ana County (Dripping Springs ranch, resort, and sanatorium within the Organ/Franklin Mountains ACEC). There are statistical trends on which to base forecasts regarding future professional and public interpretation efforts. Nationally, the BLM cultural resources program appears to be placing more emphasis on professional and public interpretation as a key element of the primary function of the program. Whether the size of the audiences reached by professional and public interpretation and education efforts will increase is likely to be dependent on levels of staffing and funding made available to the program.

Summary

Since the completion of the White Sands RMP in 1986 and the Mimbres RMP in 1993, the BLM cultural resource program for the Planning Area has been largely a reactionary effort directed at the secondary program goal of ensuring that other BLM programs and other authorized uses of the public land comply with cultural resource and historic preservation regulations. Thus it is the nature of other programs and projects that largely determine where the cultural resource program effort is focused. Program activities fluctuate substantially from year to year and there are few discernable temporal trends. Although no year may be "typical," an estimated "average" year in Otero and Sierra Counties has involved the following activities:

- survey and reporting of approximately 2 square miles of public land (5/100ths of 1 percent) and 1 square mile of non-public land (accomplished by a mixture of BLM staff and contractors)
- recording of 24 archaeological and historical sites on public land and 15 on non-public land and evaluating about 85 percent of those as eligible for the National Register and assigning them to BLM use categories
- reviewing 60 projects to assess potential impacts on cultural resources, and consulting with the State Historic Preservation Office and interested tribes
- working to avoid adverse effects on 25 archaeological and historical sites
- conducting or overseeing data recovery studies to mitigate impacts on 5 archaeological and historical sites that could not be avoided
- monitoring the condition of 25 archaeological sites (with the help of volunteers)
- implementing physical or administrative measures to protect 5 to 10 archaeological and historical sites
- pursuing some professional or public interpretation and education activities (such as coordinating field schools, guiding site tours, presenting talks to students or civic organizations, preparing curriculum materials or brochures, or enhancing sites for heritage tourism), focusing primarily on the Three Rivers Petroglyph and Pueblo Site or the historic mining town of Lake Valley.

An estimated "average" year in Doña Ana County has involved the following activities:

- survey and reporting of approximately 2 square miles of public land (1/10th of 1 percent) and 1 square mile of non-public land (accomplished by a mixture of BLM staff and contractors)
- recording of 16 archaeological and historical sites on public land and 14 on non-public land and evaluating about 80 percent of those as eligible for the National Register and assigning them to BLM use categories
- reviewing 30 projects to assess potential impacts on cultural resources, and consulting with the State Historic Preservation Office and interested tribes
- working to avoid adverse effects on 15 archaeological and historical sites
- conducting or overseeing data recovery studies to mitigate impacts on 5 archaeological and historical sites that could not be avoided
- monitoring the condition of 30 archaeological sites (with the help of volunteers)
- implementing physical or administrative measures to protect 1 to 2 archaeological and historical sites
- pursuing some professional or public interpretation and education activities (such as coordinating field schools, guiding site tours, presenting talks to students or civic organizations, preparing curriculum materials or brochures, or enhancing sites for heritage tourism).

After 35 years, the national BLM cultural resource program is beginning to put more emphasis on the primary program goals of (1) inventory and evaluation, (2) resource protection and conservation. (3) resource use (study and public interpretation), and (4) resource planning beyond the context of Section 106 project reviews, which has tended to dominate the program activities. Clearly, the work load for Section 106 project reviews fluctuate from year to year but they always require substantial efforts. Whether the shift in the national program emphasis will affect where staff efforts are focused on a day-to-day basis remains to be seen.

2.1.12.3 Key Features

Key features include cultural and heritage resources that are being interpreted for the public or protected by special designations. Key features in the TriCounty Planning Area include:

<u>Sierra and Otero Counties</u>

- El Camino Real de Tierra Adentro National Historic Trail
- Three Rivers Petroglyph and Pueblo site ACEC
- Lake Valley Mining District and Lake Valley Back-Country Byway
- Cornudas Mountain ACEC
- Alamo Spring Stage Station, Alamo Mountain ACEC, and Butterfield Overland Stage Route

- Wind Mountain ACEC (cultural and heritage resources are secondary)

Doña Ana County

- El Camino Real de Tierra Adentro National Historic Trail
- Los Tules ACEC
- Rincon ACEC
- San Diego Mountains ACEC
- Doña Ana Mountains ACEC (cultural and heritage resources are secondary)
- Organ/Franklin Mountains ACEC (cultural and heritage resources are secondary)
- Tortugas shrines on A Mountain

2.1.13 Paleontological Resources

2.1.13.1 Indicators

The fossils found on public lands are considered part of our national heritage and are therefore afforded protection. Vertebrate fossils or other noteworthy occurrences of invertebrate and plant fossils are considered significant by the BLM. Invertebrate and plant fossils are typically more abundant, and the BLM does not ordinarily consider them to be of significance.

Indicators for the condition of paleontological resources are as follows:

- Type of fossil resource present (vertebrate, invertebrate, or plant).
- Prevalence of the fossil resource in the area.
- Physical condition of the fossil.
- Scientific, educational, and/or recreational value of the resource.

2.1.13.2 Current Conditions

Paleontological resources constitute a fragile and nonrenewable record of the history of life on earth. Once damaged, destroyed, or improperly collected, their scientific and educational value may be greatly reduced or lost forever. In addition to their scientific, educational, and recreational values, paleontological resources can be used to understand the interrelationships between the biological and geological components of ecosystems over long periods of time.

Paleontological sensitivity is determined by the potential for a geologic unit to produce scientifically significant fossils. This potential is determined by the rock type, the past history of the rock unit in yielding fossil materials, and what fossil sites are recorded in the unit. Scientific significance is based on the fossils' importance in research and educational value. Fossil material is important if it contributes to the understanding of: taxonomy (the classification of organisms), phylogeny (evolutionary development of plants and animals), stratigraphy (the study of stratified rocks, including the age of the rock), tectonics

(the study of rock movement and relative time of occurrence), and paleoecology (the study of ancient environments).

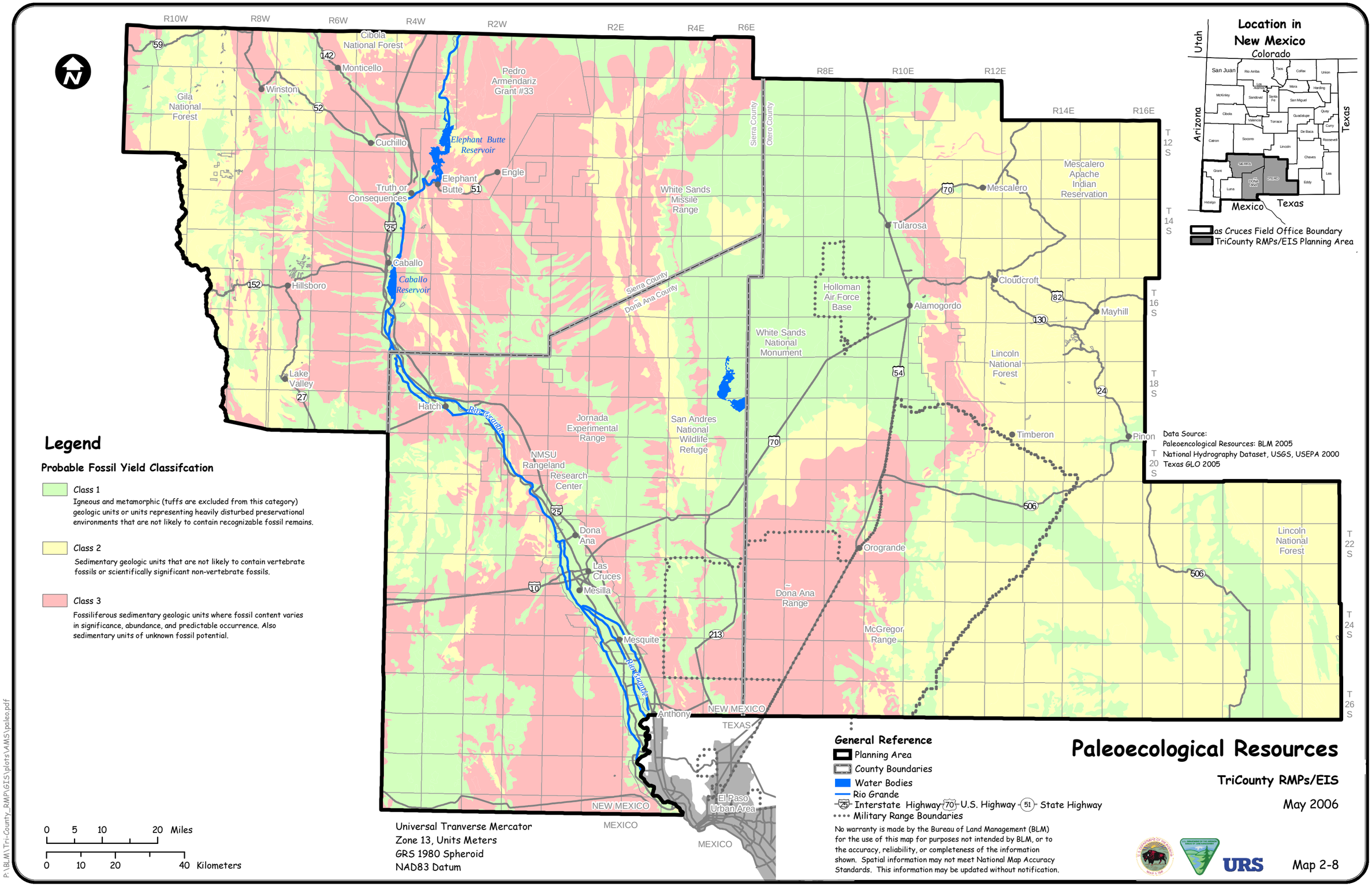
Many of the fossils in the extensive collection of the New Mexico Museum of Natural History and Science (NMMNHS) are from New Mexico lands managed by the BLM (NMMNHS 2005a). Portions of New Mexico have an abundance of fossils, some of which have been quite significant in documenting early life forms in the southwest. Numerous New Mexico fossils are also in the collections (and databases) of the University of California Museum of Paleontology, American Museum of Natural History, the Philadelphia Academy of Natural Sciences, and the Yale Peabody Museum (The Paleontology Portal 2005).

A determination of fossils that may be found in the Planning Area is based on the rock types and known paleontological resources found in those formations. Map 2-8 illustrates probable fossil yield based on the surface geology map (refer to Map 2-1). This paleoecological resources map was developed by the BLM and presents a probable fossil yield classification based on the bedrock geology and known or potential occurrences of paleontological resources in those geologic units. The geologic units range from almost two billion years old to the present. Almost all of the fossils are found in sedimentary deposits. Sedimentary rocks form in marine and nonmarine environments and include sandstone, siltstone, shale, and limestone. There is also an abundance of caves in lava tubes of the broad volcanic fields throughout New Mexico that have served as traps for hundreds of thousands of years and have preserved a record of the changing conditions through the ice ages. These caves have preserved giant ground sloths, dire wolves, camels, mammoths, saber-tooth cats, and numerous smaller animals (NMMNHS 2005b).

Sierra and Otero Counties

Sierra and Otero Counties have a broad range of geologic formations within their borders. The rocks of the Precambrian include a complex of gneiss with metasedimentary and metavolcanic rocks intruded by granites. These units are not fossil bearing. The formations of the Early Paleozoic (limestones, sandstones, shales, and conglomerates) are widespread in southern New Mexico, and represent nearly 320 million years of deposition of marine sediments with invertebrate fossils.

Rocks of the early Paleozoic crop out along escarpments of the Sacramento, San Andres, Oscura, Cornudas, Guadalupe, Caballo, and other mountains in southern New Mexico. A phosphatic dermal plate similar to that of a heterostracan fish has been found in the Cambrian Bliss Formation in the Mud Springs Mountains (Mack 2004). There have not been any confirmed reports of Ordovician or Silurian vertebrates in New Mexico. There are several reports of Devonian vertebrates (bone beds with abundant ichthyoliths and conodonts) in the Sacramento Mountains. The early Paleozoic rocks (pre-Mississippian) are generally sparsely fossiliferous. Fossil fish of the Pennsylvanian occur in the Sacramento Mountains, and few heterostracan tessarae were found in glauconitic sandstone in the Virginia Mine in the northern part of the mountains. The Permian Abo Formation has yielded a variety of reptiles, amphibians, insects, and



Paleoecological Resources

TriCounty RMPs/EIS

May 2006

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arthropods in the San Andres and Caballo Mountains, and vertebrate remains have been found in the Bursum Formation (NMMNHS 2005b; USDI, BLM 2003b; Zidek and Kietzke 1993).

The Mesozoic era is known as the Age of Reptiles, which included dinosaurs. Outcroppings of Triassic rocks are very minimal in southern New Mexico (Hunt and Lucas 1989). There are no Jurassic-aged rocks in southern New Mexico (Hunt and Lucas 1993a, b). The most extensive Cretaceous outcrops occur in northern New Mexico, but there are a few exposures in the Planning Area in the Caballo Mountains near Elephant Butte Reservoir, in the Mimbres Mountains and in the Capitan Mountains (Hunt and Lucas 1993c). A series of Tyrannosaurus rex fossils from the Cretaceous McRae Formation have been documented near Elephant Butte Reservoir. The McRae Formation also has yielded skeletal remains of Alamosaurus, Ankylosauria, and Ceratopsidae. Cretaceous marine and terrestrial fossils have been found in the Carthage area. The Atarque Sandstone Member (shoreline sandstone) of the Tres Hermanos Formation has yielded evidence of remnants of numerous varieties of chondrichtyes (cartilaginous fishes) and reptile (crocodile, plesiosaur, dinosaur, and turtles) (Hunt and Lucas 1993c; Lucas and Heckert 2000; Mack et al. 1998; NMMNHS 2005a, b).

Cenozoic rocks crop out extensively in the Planning Area. The Tertiary units consist of a complex suite of sedimentary and volcanic rocks. Cenozoic vertebrates have been located in several localities in Otero and Sierra Counties. Fossil vertebrates have been found in late Eocene deposits (Palm Park Formation) in the Caballo Mountains. The Miocene-Pliocene deposits (Camp Rice Formation and other Santa Fe Group formations) exposed along the Rio Grande from Albuquerque to Las Cruces have produced a diverse fossil fauna assemblage of mammals such as camels, gomphotheres (stegomastodons, mastodons), horses, antelope, and many more. There are several sites in the Palomas Formation and several fossil mammals have been found in the Rubio Peak Formation in the northern Black Range (NMMNHS 200a, b; USDI, BLM 2003b). A small limestone cave, located in the breaks of Otero Mesa on the McGregor Range, yielded more than 36,000 bones and bone fragments from the Pleistocene and Holocene, including turtles, toads, frogs, lizards, snakes, various birds (vultures, roadrunners, quail, owls, turkeys, falcons, and hawks), and mammals (bats, shrews, wolves, foxes, bears, ferrets, badgers, horses, camels, deer, antelope, bison, squirrels, mice, kangaroo rats, woodrats, voles, and rabbits). The species identified from this cave provide information on the climate and animals from the past (Harris 1995).

In 1998, a leaseholder of public land near Elephant Butte Reservoir discovered a Pliocene vertebrate site, and BLM and NMMNHS resource specialists conducted an investigation and collected fossils at the site. The Palomas Formation at this Silver Canyon site, has yielded a rodent jaw, horse bones, proboscidean teeth, and tusk fragments (NMMNHS 1999). There are several other documented localities in the Planning Area with a variety of Quaternary vertebrates.

Overall, the area of greatest potential for significant fossil finds in Otero County is in the southern Tularosa Valley (Doña Ana Range) and in portions of the Sacramento and Capitan Mountains. In Sierra County, the greatest potential is in the alluvial and terrace deposits (including the Santa Fe Group) along the Rio Grande, and in portions of the Caballo, Fra Cristobal, San Andres, and Mimbres Mountains, and the Jornada del Muerto area near Elephant Butte Reservoir (refer to Map 2-8). Fossils found in Sierra and Otero Counties are presented in Table 2-53.

Table 2-53
Fossils Found in Sierra and Otero Counties by Geologic Period and Formation

County	Geologic Period	Formation	Fossils
Sierra and Otero	Quaternary-Tertiary (Neogene)	Otero Formation	mammals (horse, camel, mammoths), reptiles
Sierra	Tertiary (Neogene)	Palomas Formation (Santa Fe Group)	charaphyta, gar fish, crustaceans, mammals (dogs, horses, camels, gomphotheres, coryphodons, leopards), reptiles
Sierra	Tertiary (Paleogene)	Jordan Canyon Formation	mammal - merycoidodontidae
Sierra	Tertiary (Paleogene)	Rubio Peak Formation	brontothere
Sierra	Tertiary (Paleogene)	Love Ranch Formation	reptile
Sierra	Tertiary (Paleogene)	Palm Park Formation	mammals (horses, brontotheres, hyracodotidae, hyaenodontidae), reptiles, plants
Otero	Cretaceous	Mesa Rica Sandstone	bivalves
Sierra	Permian	Abo Formation	amphibians, arthropods, conifers, plants, insects, invertebrates, reptiles, miscellaneous vertebrates
Sierra	Permian	Bursum Formation	vertebrates
Otero	Permian-Pennsylvanian	Laborcita Formation	amphigastropods, bivalves, cephalopods, crustaceans, gastropods, holothuroids, mollusks, ophiuroids, pelecypods, rhizopods
Otero	Pennsylvanian	Beeman Formation	vertebrates
Otero	Pennsylvanian	Holden Formation	bivalves, cephalopods, gastropods, mollusks
Sierra and Otero	Mississippian	Lake Valley Formation	anthozoa, brachiopods, cephalopods, chondrichthyes, crinoids, crustaceans, echinodermata, echinoids, gastropods, holothuroids, ophiuroids, polychaeta, trilobites
Otero	Mississippian	Caballero Formation	acanthods, agnathas, bivalves, brachiopods, chondrichthyes, conodonts, crustaceans, osteichthyes, vertebrates
Otero	Devonian	Percha Shale	algae, brachiopods, conodonts, placoderms, vertebrates, sharks teeth
Otero	Devonian	Sly Gap Formation	brachiopods, chondrichthyes, crinoids, osteichthyes, placoderms
Sierra and Otero	Cambrian	Bliss Formation	phosphatic dermal plates similar to heterostracan fish

SOURCE: New Mexico Museum of Natural History and Science 2005a

Doña Ana County

Doña Ana County also includes a broad range of geological formations. Rocks of the early Paleozoic crop out along escarpments of the San Andres, Organ, and other mountains in southern New Mexico. A phosphatic dermal plate similar to that of a heterstracan fish has been found in the Cambrian Bliss Formation (Mack 2004). There have not been any confirmed reports ofOrdovician or Silurian vertebrates in New Mexico. The early Paleozoic (pre-Mississippian) is generally sparsely fossiliferous. The Paleozoic Trackways site (part of the Robledo Trackways Research Natural Area and Robledo Mountains ACEC) is within the Permian Abo Formation and is located on public lands in the Robledo Mountains. The footprints and trackways of vertebrate and invertebrate animals that lived 240 to 280 million years ago are preserved in the limestone, siltstone and mudstone deposits. These footprints are considered by scientists to be one of the most important Paleozoic fossil footprint discoveries in the western United States and possibly the world. The trackways are extremely diverse and varied, and appear to represent a very broad spectrum of ancient animal life ranging from large reptiles through medium- and small-sized amphibians to insects and other invertebrate (USDI, BLM 1993a, 1990a).

The Mesozoic era is known as the Age of Reptiles, including dinosaurs. Outcroppings of Triassic rocks are very minimal in southern New Mexico. There are no Jurassic-aged rocks in southern New Mexico (Hunt and Lucas 1993a, b). The most extensive Cretaceous outcrops occur in northern New Mexico, but there are very few exposures in the Planning Area.

Cenozoic rocks crop out extensively in the Planning Area. The Tertiary units consist of a complex suite of sedimentary and volcanic rocks. Cenozoic vertebrates have been located in several localities. Fossil vertebrates have been found in late Eocene deposits in the Caballo Mountains in the northernmost part of the county (located predominantly in Sierra County). The Miocene-Pliocene (Camp Rice Formation) deposits and other Santa Fe Group formations exposed along the Rio Grande from Albuquerque to Las Cruces have produced a diverse fossil fauna assemblage of mammals such as bison, camels, gomphotheres (stegomastodons, mastodons), horses, antelope, and more. Late Pliocene deposits along the Rio Grande include several species of land tortoise, ground sloth, horse, camel, pronghorn, and proboscideans (NMMNHS 2005a; USDI, BLM 1990a). The Organ Mountains is the site of the 1929 discovery of human bones along with bones of camel, horse, ground sloth, antelope, wolf, bear, and condor. These were the first Pleistocene human skeletal remains found in southwestern North America (Mabry 2000). There are several other documented localities with a variety of Quaternary vertebrates in the Planning Area.

Overall, the greatest potential for fossils in Doña Ana County is in the Camp Rice Formation (Santa Fe Group) found along the alluvial and terrace deposits of the Rio Grande, in the Permian Abo and Hueco Formations, and in portions of the Robledo, San Andres and Organ Mountains (refer to Map 2-1 and Map 2-8). Fossils found in Doña Ana County are presented in Table 2-54 on top of next page.

2.1.13.3 Trends

Paleontological resources in southern New Mexico are typically found in the Camp Rice, Abo, and Hueco Formations, although other formations have yielded several varieties of fossils. Vertebrate fossils or other noteworthy occurrences of invertebrate and plant fossils are considered significant by the BLM and are

Table 2-54
Fossils Found in Doña Ana County by Geologic Period and Formation

County	Geologic Period	Formation	Fossils
Doña Ana	Quaternary-Tertiary (Neogene)	Camp Rice Formation (Santa Fe Group)	birds, bivalves, mammals (antelopes, dogs, foxes, horses, camels, gomphotheres, leopards, mammoths, glyptodons), reptiles, plants
Doña Ana	Quaternary-Tertiary (Neogene)	Otero Formation	mammals (horses, camels, elephants), reptiles
Doña Ana	Cretaceous	Del Norte Formation	anthozoa
Doña Ana	Cretaceous	Del Rio Formation	bivalves
Doña Ana	Cretaceous	Gallup Formation	bivalves
Doña Ana	Cretaceous	Mancos Shale	bivalves, cephalopods
Doña Ana	Cretaceous	Mesilla Valley Formation	anthozoa, cephalopods
Doña Ana	Cretaceous	Sarten Formation	bivalves, cephalopods, invertebrates
Doña Ana	Cretaceous	U-Bar Formation	bivalves
Doña Ana	Permian	Abo Formation	amphibians, reptiles, plants, invertebrates
Doña Ana	Permian	Hueco Formation	amphibians, bivalves, arthropods, plants, brachiopods, cephalopods, sponges, crinoids, echinoids, gastropods, insects, invertebrates, reptiles, trilobites, and miscellaneous vertebrates
Doña Ana	Permian	Robledo Mountains Formation	bivalves, brachiopods, gastropods, amphibians
Doña Ana	Permian	Shalem Colony Formation	brachiopods, gastropods, bivalves, bryozoa, cephalopods, crinoids
Doña Ana	Carboniferous	Panther Seep	anthoza, bivalves, brachiopods, bryozoa, echinodermata, gastropods, trilobites, invertebrates
Doña Ana	Cambrian	Bliss Formation	phosphatic dermal plates similar to heterostracan fish

SOURCE: New Mexico Museum of Natural History and Science 2005b

expected to remain as such. Since many of the fossils in the Planning Area are typically found in the Quaternary-Tertiary deposits, additional fossils may be found as a result of ground-disturbing activities or through naturally occurring surface erosion. The condition of the fossil is expected to vary from each discovery and will need to be assessed by a qualified paleontologist. Paleontological resources are assessed from a qualitative approach since it is the scientific significance of the fossil that is of importance upon discovery and not the number per se.

There are several notable paleontological resources in the Planning Area, particularly the Paleozoic Trackways site in the Permian Abo Formation, and the numerous discoveries in the Camp Rice Formation and Hueco Formation along the Rio Grande. The BLM has developed a paleoecological resources database for the entire State of New Mexico by which areas and geologic formations may be reviewed to

determine their potential fossil yield. This is an important step in affording discovery and proper curation of paleontological resources on public lands as related to various proposed project actions on those lands.

2.1.13.4 Forecast

Paleontological resources are subject to an active discovery process —although a specific area may not be known to contain fossil resources, new discoveries are made as related to surface disturbance of the land or as fossils become exposed through erosional processes. The remoteness of much of the Planning Area contributes to the lack of knowledge regarding the presence or absence of certain paleontological resources, simply because the area has not been surveyed or investigated. The geologic units in the Planning Area are indicative of what may be found (either vertebrates or invertebrates or plant), particularly when assessed with other paleontological discoveries in similar geologic units in the region. It is important to note that new species may be discovered at any time, and even fragments may yield important information. The scientific, educational, and recreational value of any discovered resource must be determined with each discovery and by careful examination and evaluation by a paleontological resource specialist.

2.1.13.5 Key Features

Sierra and Otero Counties

The Otero, Palomas, and Abo Formations and areas along the Rio Grande and near Elephant Butte Reservoir have yielded significant fossils and should continue to be closely evaluated for significant discoveries.

Doña Ana County

The significant trackways of the Paleozoic Trackways site in the Robledo ACEC should continue to be afforded protection Areas within the Camp Rice Formation and other Santa Fe Group formations should be closely evaluated for significant discoveries.

2.1.14 Visual Resources

Visual resources include natural and manmade physical features that give landscapes scenic quality and provide scenic views. Visual resources are interrelated with social and economic values, beliefs, and attitudes, lifestyle, quality of life, well-being, and place-based values, which all influence a viewer's perception of the scenic quality and importance of scenic resources. Social and place-based values are discussed further in Section 2.4. In addition, visual resources are interrelated with air quality and atmospheric resources in that viewsheds are influenced by visibility and long- and short-term climatic or weather conditions.

2.1.14.1 Indicators

Three indicators are used to characterize and determine the relative values of the visual resources within the Planning Area: (1) landscape scenic quality, (2) viewer sensitivity, and (3) distance zones.

Scenic quality is the first measure of the visual interest and appeal of a landscape. It is analyzed and rated by first performing an inventory of landform, vegetation, water, color, manmade or cultural-modification features, and the unique or scarce elements within the landscape. The variety and intensity of the landscape features evaluated for the four basic design elements of form, line, color, and texture determine the scenic quality of a particular landscape. These elements combine to give areas their distinctive qualities. The distribution of colors and textures associated with vegetation define the landscape character and scenic quality.

The second indicator is an evaluation of viewer sensitivity toward a landscape, determined by the type of users (viewers), the intensity of use of the area (from which the view is seen), public interest regarding the view, adjacent land uses, special designations or areas of the highest scenic value such as ACECs and WSAs, and other factors such as duration of view and user attitude (USDI, BLM 1986c). Based on analysis of these factors, the sensitivity level assigned to an area (expressed as high, medium, or low) is a measure of public concern for scenic quality in that area.

Distance zones are the third indicator. Distance zones are established based on perception thresholds (i.e., where perception of the details of form, line, color, and texture decrease as distance from a viewing area increases) and vary by element. For example, the elements of form and line become more dominant than color or texture at longer viewing distances. Distance zones are characterized as foreground-middleground, background, and seldom-seen, depending on viewing distances measured in miles.

2.1.14.2 Current Conditions

Landscape Scenic Quality

The Planning Area is primarily within the Basin and Range province, and includes a small portion of the Great Plains province in northeast Otero County and a small portion of a so-called Transition Zone in western Sierra County that has characteristics of the Colorado Plateau and the Basin and Range provinces (Chamberlin and Cather 1994; Grant and Foster 1989). The landscape setting within the Basin and Range province is characterized by isolated ranges, large dissected block mountains separated by aggregated desert plains, and broad basins (Fenneman and Johnson 1946). Within the Planning Area, the most prominent topographic features are the Brokeoff and Guadalupe Escarpment, Sacramento Mountains, and Tularosa Valley in Otero County, and the Caballo Mountains, Turtle Mountain, San Andres Mountains, and the Rio Grande River in Sierra County. Major topographic features in Doña Ana County include the Organ Mountains, West Potrillo Mountains, Robledo Mountains, Franklin Mountains, and valleys such as the Rio Grande and Mesilla Valley.

The Planning Area is characterized by influences from the Chihuahuan Desert, Sonoran Desert, Mexican Highlands, Southern Rocky Mountains, and Mogollon Plateau. Desert scrub vegetation, or vegetation with little diversity, such as creosote bushes, grasses, and cacti, dominate the landscape. The topography varies from high mountain peaks to low-level valleys with wide-open views. Elevations within the Decision Area range from 3,800 feet in the southern Mesilla Valley to 9,012 feet within the Organ Mountain range. The average elevation is about 5,000 feet above sea level. Vegetation is diverse and varied due to the vast differences in elevation, climate, soils, and topography.

Cultural modifications are defined as any human-caused change in the landform, water or vegetation, or the addition of a structure that creates a visual contrast when evaluated against the basic elements (form, line, color, texture) of the natural character of a landscape (USDI, BLM 1984a). This does not mean that manmade features within a landscape necessarily detract from the scenic value: manmade features that complement the natural landscape may enhance the scenic value (USDI, BLM 1986c). Much of the Planning Area retains its natural visual qualities, though numerous landscape modifications exist.

The introduction of new structures, or other manmade changes, into the landscapes of the Planning Area primarily occur near areas of urban and residential development, which are dispersed throughout the Planning Area. Existing changes (cultural modifications) in the Planning Area include the following:

- Access roads, ranging from highways to two-track roads
- Public utilities, including electric transmission lines and distribution lines, and gas, water, fiber optic, and telecommunication lines
- Agricultural fields, including range improvements
- Communication sites, particularly on mountaintops
- Residential, commercial, and industrial development
- Recreational development, including picnic areas, parking lots, visitor centers, and trails

Special management areas generally contain areas of high scenic quality. Special designations with landscapes of visual interest within the Planning Area, by county, include the Organ/Franklin Mountain WSA and ACEC, Robledo Mountains WSA and ACEC, Doña Ana Mountains ACEC, Rincon ACEC, San Diego Mountains ACEC, Sierra de las Uvas WSA, West Potrillo Mountain/Mount Riley WSA, Aden Lava Flow WSA, and Kilbourne Hole NNL located in Doña Ana County; Jornada del Muerto WSA in Sierra County; and Alamo Mountain ACEC, Cornudas Mountain ACEC, Wind Mountain ACEC, Brokeoff Mountains WSA, and Guadalupe Escarpment WSA in Otero County. These areas often attract public visitation and there is the desire and/or legal requirement to maintain the landscape in a natural condition. The specific management of visual resources within special management areas is described further in Chapter 3.

Viewer Sensitivity

Areas viewed by large numbers of people are generally considered to be of higher sensitivity than areas that are seldom seen. Types of users within the Planning Area include the following:

- Residential
- Urban
- Roadway travelers (e.g., on interstates, highways, state routes, scenic byways, local access roads)
- Recreational sightseers (e.g., on trails, in ACECs or developed recreation areas)

Residential dwellings located within the Planning Area are considered to be of high viewer sensitivity due to a high level of viewer concern and longer duration of views. Areas of urban growth could be considered high sensitivity where residential development occurs; however some urban land uses (e.g., commercial or industrial) are not as visually sensitive due to a lower level of viewer concern, shorter duration of time spent there, and moderate or low public interest.

Sierra and Otero Counties

In Sierra and Otero Counties, Elephant Butte and Truth or Consequences, and Alamogordo and Tularosa, respectively, are identified as residential areas of growth where viewer sensitivity and viewer concern is likely higher due to the numbers of viewers in the area.

Highly traveled roads in Sierra and Otero Counties include Interstate 25 (I-25) and the Lake Valley Back Country Byway, and State Route (SR) 70 and SR 54. Views from roadways are generally open and panoramic with mountains as dominant landforms. However, viewing durations along roadways are reduced compared to regional viewing durations. Therefore, a moderate viewer sensitivity level is assigned.

In Sierra County, the Lake Valley Back Country Byway is a designated scenic corridor that crosses Decision Area lands east along SR 152 and south along SR 27 between the Mimbres and Caballo Mountains. Other designated scenic byways or historic trails that traverse the Planning Area include the Geronimo Trail that loops through Sierra County along I-25, various State Routes, and the Sunspot Scenic Byway located along SR 6563 within the Lincoln National Forest in Otero County.

Recreational viewing opportunities in Sierra and Otero Counties include the Three Rivers Petroglyph Site, Lake Valley Back County Byway, Lake Valley Historic Townsite, and various hiking trails and equestrian trails. Viewing opportunities for recreationists tend to differ depending on the recreational activity, however, recreational views are generally considered to be high sensitivity.

Doña Ana County

The City of Las Cruces has a relatively high-density population compared to other developed areas within the Planning Area, thus; viewers tend to be highly sensitive and generally have concern for protecting scenic views.

Views from highly traveled roads such as I-10 and I-25 within Doña Ana County are considered to be of moderate sensitivity because of their proximity to scenic areas within the Planning Area. Viewing durations along roadways are reduced compared to residential viewing duration; therefore, a lower viewer sensitivity level is assigned.

Various recreational areas exist throughout Doña Ana County including the Dripping Springs Natural Area, Aquirre Spring Campground, and various hiking, equestrian, and OHV trails. Viewers or recreational sightseers are considered highly sensitive due to their interest in views and scenery within the Decision Area.

Distance Zones

Distance zones are established to assess relative visibility from travel routes, observation points, and cultural modifications. BLM uses the following distance zones to evaluate the potential visibility (USDI, BLM 1986a):

- Foreground-middleground – the area visible from a travel route, use area, or other observation point; the limit of a viewed area in which details are perceived and obvious; textural and other subtle aesthetic qualities are normally perceived within this zone. The outer boundary of this zone is defined as the point where details of foliage and fine textures cease to be perceptible. Vegetation begins to appear as outlines or patterns (0.0–0.5 mile to 3–5 miles). The foreground is generally defined as 0.0–0.25 mile to 0.5 mile.
- Background – those portions of the landscape where texture and color are subordinate and the landforms become the most dominant elements (3–5 to 15 miles).
- Seldom seen – portions of the landscape that are generally not visible from key observation points, or portions that are visible but more than 15 miles distance.

Distance zones are used to determine the proximity of cultural modifications to the viewer in relation to visible landscapes in order to determine how evident the cultural features are in the landscape. Cultural modifications on Decision Area lands mainly consist of fences, canals, and watering tanks. These features are noticeable in the foreground, but are either imperceptible or defined only by subtle lines or forms in the middle and distant landscape (i.e., background and seldom-seen zones). Larger cultural modifications on Decision Area lands include infrastructure such as roads and highways, communication facilities, pipelines, and transmission lines (115 kilovolts and higher), and developed visitors centers. These cultural modifications appear more noticeable at all viewing distances, depending on terrain and openness of some areas.

Mountain ranges dominate the foreground-middleground and background views from the Las Cruces metropolitan area due to their height and the surrounding low-lying desert landscape.

2.1.14.3 Trends

Landscape Scenic Quality

In the Planning Area, population growth has occurred and is projected to continue in areas near urban development, and the concurrent increase in cultural modifications has altered the natural landscape of seen areas. In areas of urban growth, these cultural modifications include transportation facilities, utilities, communication towers, and residential development. Cultural modifications may be evident in rural areas or along waterways where farming, ranching, flood control, diversionary dams, and altered vegetation growth have changed visual conditions within the area. However, cultural modifications tend to occur in developed areas rather than on lands untouched by development, and lands with cultural modifications added are generally considered to be of lower scenic quality and hence the visual conditions would not be significantly impacted by change.

Open space, parks, and recreational areas are commonly used within the Planning Area and the landscape character of these lands are valued by the community. Also, BLM and other Federal and State agencies have protected valuable landscapes of high scenic quality by designating specific lands as ACECs, WSAs, wildlife refuges, or scenic corridors. Typically, any special designation that regulates use of an area serves to preserve scenic views as well as natural vegetation, wildlife, and wildlife habitat.

Viewer Sensitivity

There is a trend toward increasing areas of high sensitivity within the Planning Area. Population growth typically results in (1) increasing urbanization and expansion of residential land use and local roads of importance to outlying areas closer to the Decision Area, which increases the level of viewer sensitivity from more locations, and (2) the establishment of additional recreation and preservation areas that provide solitude and scenic beauty outside the urbanized areas. Special designations create viewpoints of high sensitivity. Viewpoints of high sensitivity also increase in sensitivity as visitation intensifies. For example, more visitation to areas of interest increase sensitivity in those areas resulting in higher traffic volumes on access roads and a subsequent increase in viewer sensitivity from the road. Changes in the types of users and duration of view are not known specifically throughout the Planning Area, but it is likely that viewer sensitivity is increasing in some areas, such as recreational sites and growing residential communities.

Distance Zones

Trends related to distance zones are difficult to discern, due to the site specifity of distance zones and the consequent lack of comparable data. However, it is clear that as development draws close to the Decision Area, the details of new structures will become more apparent and will have greater potential impact to scenic quality.

2.1.14.4 Forecast

Landscape Scenic Quality

Forecasts about the visual impacts of development cannot be made at this time because of the general nature of land use plans. The BLM has the ability to plan with the jurisdictions to incorporate protection of visual resources within the Decision Area. The BLM can identify areas of high scenic quality by designating the appropriate visual resource management (VRM) class for Decision Area lands and manage future development in accordance with those classes and other management guidance (refer to Section 3.11for more information regarding VRM classes). Future development has the potential to impact views from and within the Decision Area positively, neutrally, or negatively, as interpreted by the viewer.

Viewer Sensitivity

Trends indicate an increase in viewpoints of high sensitivity within the Planning Area. The forecast from the U.S. Census Bureau predicts continuing population growth (refer to Section 2.4), which entails development of infrastructure (i.e., transmission lines and roads) and residential areas. Potential

viewpoints of high sensitivity can be protected within the Planning Area by designating appropriate VRM classes and adhering to management guidance.

Distance Zones

Future population growth within the Planning Area may change landscape character and scenic quality as well as viewpoints of high sensitivity. Cultural modifications to the landscape will potentially be increasingly apparent within the foreground–middleground distance zone.

2.1.14.5 Key Features

Mountains in the Planning Area, which are dominant within the landscape and can be viewed from great distances, are of abundant interest for recreational uses. The Rio Grande flows through the length of the Planning Area and is a recreational destination for area residents. North of the Planning Area, the Rio Grande is designated as a Wild and Scenic River; however, this designation does not apply to the portion that flows through Sierra and Doña Ana Counties. The following ACECs were designated by BLM during previous planning efforts and are managed, in part, to protect their scenic quality:

- Doña Ana Mountains ACEC
- Organ/Franklin Mountains ACEC
- Robledo Mountains ACEC
- Aden Lava Flow RNA
- Sacramento Escarpment ACEC
- Cornudas Mountain ACEC
- Alamo Mountain ACEC
- Wind Mountain ACEC
- Rincon ACEC
- San Diego Mountains ACEC
- Kilbourne Hole NNL

In addition to the previously mentioned ACECs, WSAs in the Planning Area are located throughout the three counties. However, these were not designated solely based on scenic quality. Though, the WSA landscapes do have unique aesthetic values. Management of these areas, which includes protection of visual resources, is described in Chapter 3.

The public, through scoping and through other interaction with BLM, and BLM visual specialists have identified the following as areas with additional key features of visual interest:

- Caballo Mountains
- Nutt Mountains

- Robledo/Sierra de Las Uvas Mountains
- East Potrillo Mountains
- Southern Sacramento Mountains
- Cornudas Mountains
- Brokeoff Mountains
- Guadalupe Escarpment

2.1.15 Wilderness Characteristics

2.1.15.1 Indicators

Wilderness characteristics are defined by naturalness and opportunities for solitude and primitive, unconfined recreation. “Naturalness” is measured of the degree to which the imprint of human activity is substantially unnoticeable (USDI, BLM 2003c). Evidence of human activity typically includes travel routes, trails, fences, or other landscape modifications. The presence of native vegetation communities and the degree to which an area contributes to the connectivity of habitat also determine the degree of an area’s naturalness.

Solitude exists in an area “when the sights, sounds, and evidence of human activity are rare or infrequent and where visitors can be isolated, alone, or secluded from others” (USDI, BLM 2003c). Characteristics of solitude include the presence of landforms of rugged relief or vegetation that may provide screening from other visitors, and the ability to enjoy the area without experiencing frequent contact with others or evidence of other visitors.

“Primitive” and “unconfined” recreation occurs in areas that can only be accessed by nonmotorized, nonmechanical means, where there are minimal or no developed recreational facilities. Areas that offer opportunities for primitive recreation are marked by the absence of developed recreational facilities, are sufficiently large to allow these types of outdoor recreational uses, and contain features or attractions that lend themselves to primitive and unconfined types of recreational uses.

To consider an area for management to protect and preserve wilderness characteristics, BLM Handbook H-1601-1 implies that all three of the above indicators should be present (USDI, BLM 2005c).

2.1.15.2 Current Conditions

Based on extensive inventory efforts conducted on public between 1978 and 1980, and additional inventories on acquired lands between 1986 and 1994, BLM designated 12 WSAs within Sierra, Otero, and Doña Ana Counties to protect and preserve wilderness characteristics. Each WSA is described in Section 2.3.1. Because management of the WSAs is guided by the Interim Management Policy and Guidelines for Lands Under Wilderness Review (USDI, BLM 1995b), BLM maintains primitive and natural conditions within WSAs.

2.1.15.3 Trends

Human activity and its effects in the TriCounty Planning Area have been heavily influenced by population growth. Growth within the Planning Area is not evenly distributed within the three counties, but is concentrated in several areas. In Doña Ana County, the Las Cruces metropolitan area is the fastest growing geographical location. Four WSAs are located near the City of Las Cruces (Robledo Mountains WSA, Organ Mountains WSA, Organ Needles WSA, and Peña Blanca WSA) and are thought to provide additional recreation opportunities to accommodate the increasing pressure on recreation areas from the rapidly expanding population associated with the metropolitan area.

2.1.15.4 Forecast

The increasing demands for and uses of public land may continue to diminish the potential for solitude and primitive, unconfined recreation. As a result of the lawsuit settlement between the Department of the Interior and the State of Utah, BLM no longer has authority to designate WSAs to be managed under the nonimpairment provisions of Section 603 of FLPMA, BLM does retain authority to inventory public land for resources and other values including wilderness characteristics under Section 201 of FLPMA. Management for the protection and preservation of wilderness characteristics may be accomplished through land use allocations such as VRM classes or OHV designations, or through the designation of ACECs or other special management areas. According to guidance provided in Instruction Memorandums 2003-274 and 2003-275, BLM will not manage those lands under a congressionally designated nonimpairment standard, nor manage them as if they are, or may become congressionally designated wilderness areas.

2.1.15.5 Key Features

The existing WSAs and ACECs within the Planning Area provide protection of public lands with certain resource values, including wilderness characteristics.

2.2 CURRENT RESOURCE USE AND TRENDS

2.2.1 Livestock Grazing

2.2.1.1 Current Use

Grazing allotments in the Planning Area may contain BLM-managed land, State Trust Land, and privately held or managed lands. Within these allotments, uncontrolled parcels of land may exist within a BLM allotment and may or may not be used or leased for grazing. In allotments where the State Trust Land is leased or permitted for grazing, the lessee is the same individual or entity that holds the BLM grazing permit within the allotment. When BLM grazing permits are renewed, transferred, or otherwise adjusted, BLM and the permittee (or allottee) are required to review any changes to ensure compatibility with those revisions. The BLM-administered and State Trust Land parcels may or may not be separated by fencing from each other or from private lands used for grazing.

Livestock Use of Grazing Allotments

Livestock grazing on public lands within Sierra, Otero, and Doña Ana Counties is managed by BLM's Las Cruces District Office under the 1986 White Sands RMP, 1993 Mimbres RMP, and the New Mexico Standards and Guidelines (refer to Section 3.13). Currently, the Las Cruces District Office authorizes 638,975 animal unit months (AUMs) in six counties (including the Planning Area), of which 634,350 are active and 4,625 are suspended. There are 592 total permits issued from the Las Cruces District Office, of which 368 are grazing permits issued under Section 3 of the Taylor Grazing Act and 211 are authorized by leases under Section 15 of the Taylor Grazing Act.

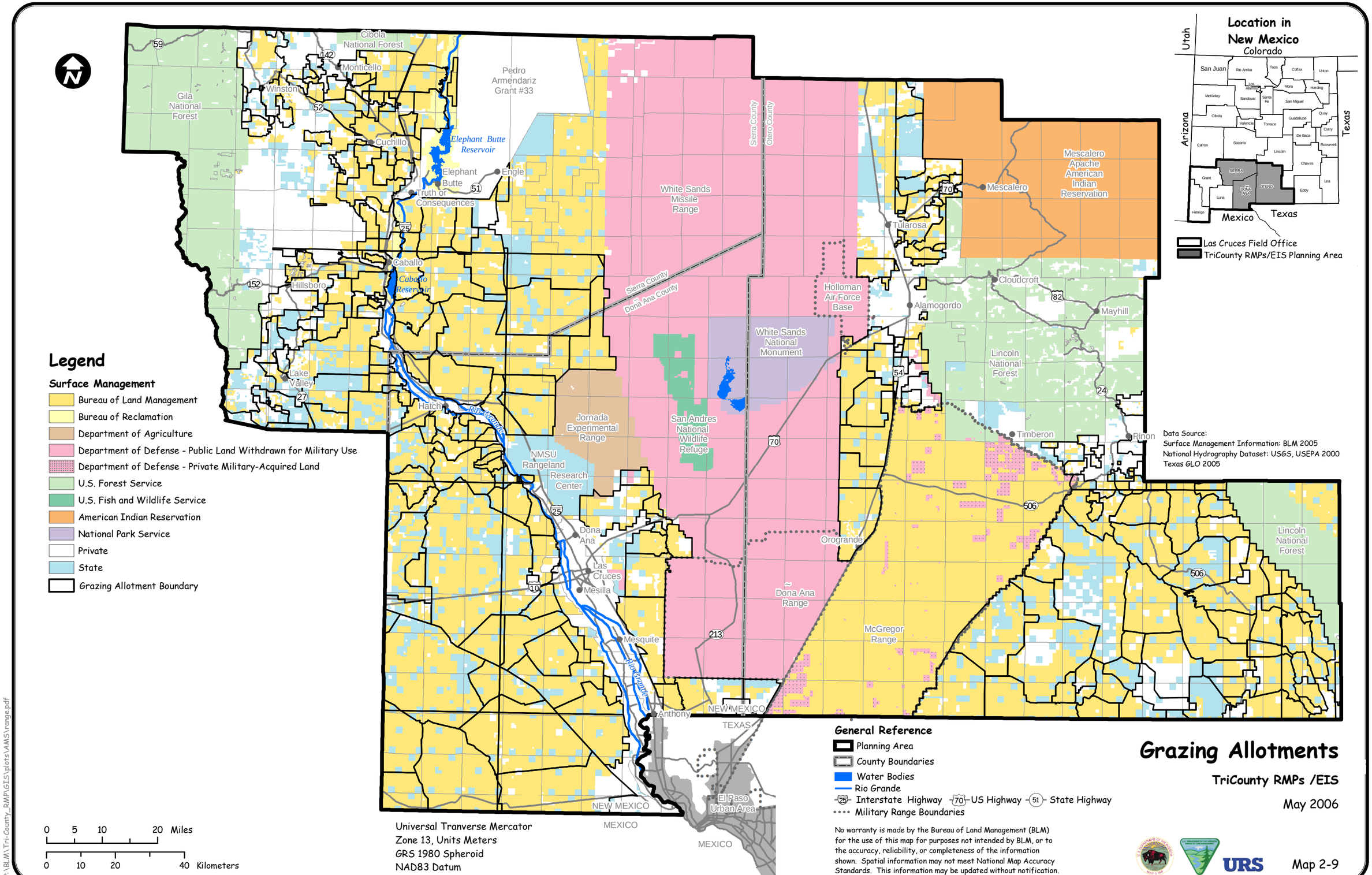
Of the six counties managed by the Las Cruces District Office, 284 allotments are located partially or entirely within the Planning Area; the boundaries of seven overlap both Sierra and Doña Ana Counties. The Las Cruces District Office is responsible for the administration of livestock grazing for the entire allotments, including the public land outside the Planning Area boundary. BLM authorizes livestock grazing on public lands on approximately 554,679 acres within Sierra County, 855,695 acres within Otero County, and 1,083,063 acres within Doña Ana County (Map 2-9 and Table 2-55). Limited unauthorized livestock grazing also may occur on these allotments from trespass cattle and horses originating from private properties.

Table 2-55
Grazing-Allotment Acreage by Owner/Jurisdiction

Ownership	Sierra County	Otero County	Doña Ana County
Federal			
Department of Agriculture	0	0	1,291
Department of Defense (withdrawn public land)	711	4,572	1,675
Department of Defense (fee-owned land)	0	721	0
Bureau of Land Management	554,679	855,695	1,083,063
Bureau of Reclamation	20,532	0	661
Forest Service	535	333	0
Fish and Wildlife Service	0	0	0
National Park Service	0	80	0
Total Federal Acreages	**576,457**	**861,321**	**1,085,399**
American Indian Reservation	0	53	0
State of New Mexico	195,658	273,130	201,203
Private	187,238	210,511	101,829
Total	**959,353**	**1,345,015**	**1,388,431**

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2005

Livestock use is generally measured in AUMs. An AUM is the amount of forage needed to sustain one animal unit (e.g., a 1,000-pound cow and calf, five sheep, or five goats) for one month (USDI, BLM 2000a). Table 2-56 shows the number of authorized AUMs by county between 1995 and 2005. The greatest number of AUMs were authorized in the 1999 grazing season, with a total of 265,228 AUMs authorized. The fewest were authorized in 2004, when 172,934 AUMs were authorized.



Grazing Allotments

TriCounty RMPs /EIS

May 2006

P:\BLM\Tri-County_RMP\GIS\plots\AMS\range.pdf

Table 2-56
Livestock Use of the Planning Area Between 1995 and 2005

Year	Authorized AUMs Sierra County	Authorized AUMs Otero County	Authorized AUMs Doña Ana County	Total AUMs Authorized
1995	67,258	51,937	104,241	223,436
1996	68,692	44,935	105,466	219,093
1997	73,077	65,655	116,475	255,207
1998	72,954	69,892	119,773	262,619
1999	73,976	61,450	129,802	265,228
2000	71,059	59,476	113,312	243,847
2001	77,620	61,458	101,234	240,312
2002	71,570	52,925	74,683	199,178
2003	67,145	49,960	77,321	194,426
2004	54,055	49,043	69,836	172,934
2005	41,721	46,305	87,496	175,522
11 yr average	67,193	55,731	99,967	222,891

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2005
NOTE: AUM = animal unit month
[a] Several allotments span across portions of both Sierra and Doña Ana Counties.

The number of cattle or AUMs within an allotment can vary each year depending on current range conditions and livestock management needs. The majority of allotments are grazed year-round, with some type of grazing system (pasture rotation, watering sites, salt placement, etc. in place) to reduce or disperse grazing impacts on soils and vegetation. Grazing systems can vary within the resource area, ranging from intensive management, where cattle are moved every couple of days, to a rotational grazing plan that provides grazing and deferment periods throughout the year (USDI, BLM 2000a).

In the 1980s, BLM developed classification criteria to assist field offices in identifying management priorities by allotment. Allotments are placed in one of three categories—Maintain, Improve, or Custodial—based on certain criteria, as follows (USDI, BLM 2000a):

Maintain (M) Category:

- Present range condition is satisfactory
- Allotments have moderate to high resource production potential, and are producing near their potential (or trend is moving in that direction)
- No serious resource-use conflicts and/or controversies exists
- Opportunities may exist for positive economic return from public investment
- Present management appears satisfactory
- Other local criteria

Improve (I) Category:

- Present range condition is unsatisfactory

- Allotments have a moderate or high resource production potential, and are producing at low to moderate levels
- Serious resource-use conflicts and/or controversy exist
- Opportunities exist for positive economic return for public investment
- Present management appears unsatisfactory
- Other local criteria

Custodial (C) Category:

- Present range condition is not a factor
- Allotments have a low resource production potential, and are producing at low to moderate levels
- Limited resource-use conflicts and/or controversy may exist
- Opportunities for positive economic return on public investments do not exist or are constrained by technological or economic factors
- Opportunities exist to achieve the allotments' potential through changes in management
- Other local criteria

Allotment categories enable BLM to direct attention to those areas in greatest need of management to improve a resource or resolve serious resource-use conflicts. Using management categories as a tool, BLM managers can create allotment management plans (AMPs) and cooperative management plans (CMPs). AMPs and CMPs are developed in efforts to help achieve the stated goals of RMPs. Specific methods for controlling when, where, and how much livestock grazing takes place are covered in both types of plans. AMPs promote the protection of resource values, such as water quality and riparian area resource management, and coordinate livestock grazing with other resource uses. Both plans also address needed rangeland improvements, monitoring methods, and implementation schedules.

The current uses and conditions of grazing allotments are described for each county below. Table 2-57 gives a general overview of the allotments within each county and the number of AUMs (also see Appendix C). Table 2-58 identifies the number of acres associated with each management category by county. Implemented plans are currently in use, while written and proposed plans are not. Written plans are further developed and more likely to be implemented than proposed plans.

Table 2-57
Summary of Existing Allotments by County

County	No. of Allotments	No. of AUMs	AMPs/CMPs			Number of Livestock				
			Imp.	Prop.	Written	Cattle	Horses	Sheep	Goats	Buffalo
Sierra	120	79,121	21	0	1	12,224	174	0	0	316
Otero	99	144,959	10	1	0	24,506	398	15,120	125	0
Doña Ana	58	117,411	7	0	0	20,624	104	0	0	0
Doña Ana/ Sierra	7	11,865	2	0	0	1,827	24	0	0	0
Total	284	353,356	40	1	1	59,181	700	15,120	125	316

SOURCES: U.S. Department of the Interior, Bureau of Land Management 2000b, 1993a
NOTES: Imp. = Implemented
Prop. = Proposed

Table 2-58
Distribution of Allotments, Acreages, and AUMs by Management Category and County

County	Maintain (M) Category			Improve (I) Category			Custodial (C) Category		
	Allotments	Acres	AUMs	Allotments	Acres	AUMs	Allotments	Acres	AUMs
Sierra	68	127,261	20,282	42	521,027	58,074	10	8,111	765
Otero	54	442,598	72,954	36	464,241	70,353	9	20,125	1,652
Doña Ana	16	86,825	10,593	27	916,052	88,830	15	248,968	17,988
Doña Ana/ Sierra	2	27,211	3,972	2	66,223	7,056	3	11,169	837
Total	140	683,895	107,801	108	1,967,543	224,313	37	288,373	21,242

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2000b, 1993a

Sierra County

BLM has issued permits to authorize grazing for 12,224 cattle, 174 horses, and 316 buffalo on 120 allotments within Sierra County; 79,121 AUMs have been apportioned for this purpose (refer to Table 2-57). Of the 120 allotments, 68 are classified as *Maintain*, 42 as *Improve*, and 10 as *Custodial* (refer to Table 2-58). They vary in size from about 30 acres to 39,970 acres, with grazing preferences ranging from less than 12 AUMs to 4,683 AUMs (see Appendix C). Twenty-one plans (AMPs/CMPs) have been implemented to help achieve management goals, and another plan has been written (refer to Table 2-57). Refer to Appendix C for an expanded description of the grazing allotments.

Otero County

BLM has issued permits to authorize grazing for 24,506 cattle, 398 horses, 15,120 sheep, and 125 goats on 99 allotments within Otero County; 144,959 AUMs have been apportioned for this purpose (refer to Table 2-57. Of the 99 allotments, 54 are designated as *Maintain*, 36 as *Improve*, and 9 as *Custodial* (refer to Table 2-58). They vary in size from about 40 acres to 57,427 acres, with grazing preferences ranging from less than 12 AUMs to 10,428 AUMs (refer to Appendix C). Ten plans (AMPs/CMPs) have been implemented to help achieve management goals, and one plan has been proposed. Refer to Appendix C for an expanded description of the grazing allotments.

Doña Ana County

BLM has issued permits to authorize grazing for 20,624 cattle and 104 horses on 58 grazing allotments within Doña Ana County; 117,411 AUMs have been apportioned for this purpose (refer to Table 2-57). Of the 58 allotments, 16 are designated as *Maintain*, 27 as *Improve*, and 15 are as *Custodial* (refer to Table 2-58. They vary in size from about 80 acres to 129,949 acres, with grazing preferences ranging from less than 12 AUMs to 13,860 AUMs (refer to Appendix C). Seven plans (AMPs/CMPs) have been implemented to help achieve management goals; no others have been written or proposed. Refer to Appendix C for an expanded description of the grazing allotments.

Doña Ana/ Sierra County

BLM has issued permits to authorize grazing for 1,827 cattle and 24 horses on 7 allotments occupying land in both Doña Ana and Sierra Counties; 11,865 AUMs have been apportioned for this purpose (refer to Table 2-57). Of the 7 allotments, 2 are classified as *Maintain*, 2 as *Improve*, and 3 as *Custodial* (refer to

Table 2-58). They vary in size from about 2,718 acres to 46,831 acres, with grazing preferences ranging from less than 20 AUMs to 5,532 AUMs (Appendix C). Two plans (AMPs/CMPs) have been implemented to help achieve management goals; no others have been written or proposed. Refer to Appendix C for an expanded description of the grazing allotments.

Rangeland Production and Utilization

Allowable livestock use on individual allotments depends on range production and the overall balance with management of other resources. Range production is the amount of actual forage a site can produce per year (Holechek, et al. 2001). In order to sustain grazing, consumption levels must be at rates equal to or less than the rate of production, allowing existing vegetation to reproduce and reestablish (Barbour et al. 1999). Utilization is defined as the degree of forage (grass, forbs, and shrubs) removed from rangelands by grazing animals, both domestic and wild. Livestock grazing in Sierra, Otero, and Doña Ana Counties is currently monitored to allow for an average of 40 to 60 percent utilization of most key forage species per year by domestic livestock (USDI, BLM 1993a, 1986a).

Public land health assessments have been completed on several allotments. These assessments are done in compliance with the New Mexico Standards and Guidelines (USDI, BLM 2000a) to determine the current condition of public land health within an allotment, and the need and/or extent of use adjustments (duration, season, etc.) required to achieve sustainable levels of public land health. To date, the analyses of these assessments and existing data have not been completed. Therefore, conclusions about public land health in the Planning Area are not available. Grazing Manual 4180 suggested offices schedule completion of public land health determinations within a ten-year timeframe. New Mexico's standards were finalized in 2001; therefore, Las Cruces District Office has a completion date of 2011. Allotments within the Planning Area have no specific completion date.

Range Improvements

The extent, location, and timing of range improvement projects and vegetation treatments are based on a cost-benefit analysis, which considers the following: range management categories, allotment-specific management objectives, interdisciplinary development and review of proposed actions, contributions from operators and others, and BLM funding capabilities. The analysis is used to develop a final priority ranking of allotments to commit the rangeland improvement funds that are needed to implement activity plans (USDI, BLM 1986a).

2.2.1.2 Forecast

Future livestock grazing management in all three counties will be determined according to precipitation and the corresponding condition of native and desirable upland and riparian species, riparian proper functioning condition, and overall biotic health. Increased demand from other resources may result in new challenges and opportunities in grazing management.

2.2.1.3 Key Features

In previous planning efforts, BLM identified "fragile land areas," which have critical soils on 0 to 10 percent slopes, as the first priority for land treatments and grazing management to reduce erosion and improve water quality. Slopes over 10 percent would be a priority for grazing management only to reduce erosion and improve water quality.

In addition, allotments within the "I" catetory would be considered key features, as additional management activities are required to improve the public land health in these areas.

2.2.2 Minerals (leasable, locatable, salable)

2.2.2.1 Description of Energy and Mineral Resources

There are three classifications for the disposition of the mineral estate on public lands: leasable, locatable, and salable. These classifications of minerals have been defined by Federal laws, regulations, and legal decisions (USDI, BLM 1997a). Federal mineral estate (ownership) is shown on Map 2-10.

Leasable minerals discussed in this section include the following:

- Nonrenewable energy fluid minerals – oil and gas, coalbed methane (CBM), and geothermal
- Nonrenewable nonenergy fluid minerals – carbon dioxide and helium
- Nonrenewable energy solid minerals – coal, potash, sulfur, and sodium

Locatable mineral resources discussed in this section include the following:

- metallic minerals – e.g., gold, silver, uranium
- nonmetallic minerals – e.g., gemstones, fluorspar, perlite

Salable mineral resources discussed in this section include sand, gravel, limestone, cinders, and building stone.

The resource discussions include known prospects, mineral occurrences, and mineralized areas; mining claims, leases, and material sites; and types of mineral deposits in the area of interest. Additional information regarding the reasonable foreseeable development is provided in Appendix D.

2.2.2.2 Leasable Minerals

The extraction of leasable minerals from public land requires a lease and payment of royalties. Leasable minerals include oil and gas, CBM, coal, oil shale and tar sands, potash, phosphate, sodium and geothermal steam. Leasing of public land for mineral development may be accomplished by competitive bid, as typically is the case for oil and gas in New Mexico. An oil and gas lease sale also may be initiated by an Expression of Interest nomination, wherein an interested party nominates a parcel for exploration and development, and the BLM announces that the parcel is available for competitive bid. If there is no interest in the competitive lease of a parcel, the interested party may obtain a noncompetitive lease.

Leasing of coal in New Mexico is by the Lease by Application procedure, wherein an interested party submits an application for a noncompetitive lease of a parcel.

Oil and gas leasing areas are offered through competitive oral auction. A winning bid shall be the highest oral bid by a qualified bidder equal to or exceeding the national minimum acceptable bid of $2 per acre (43 CFR 3120-2 and 3120.5-1). Lands offered at the oral auction that receive no bids shall be available for filing for noncompetitive lease for a two-year period. A successful bidder (lessee) for oil and gas leases is required to pay rent on the leased parcel. The annual rental for all leases issued subsequent to December 22, 1987, shall be $1.50 per acre or fraction thereof for the first five years of the lease term and $2.00 per acre or fraction for any subsequent year. The lessee also is required to pay royalties on the sale of oil and gas resources produced from the leased parcel. Oil and gas royalties are 12.5 percent of sales and are paid to the U.S. General Revenue Fund.

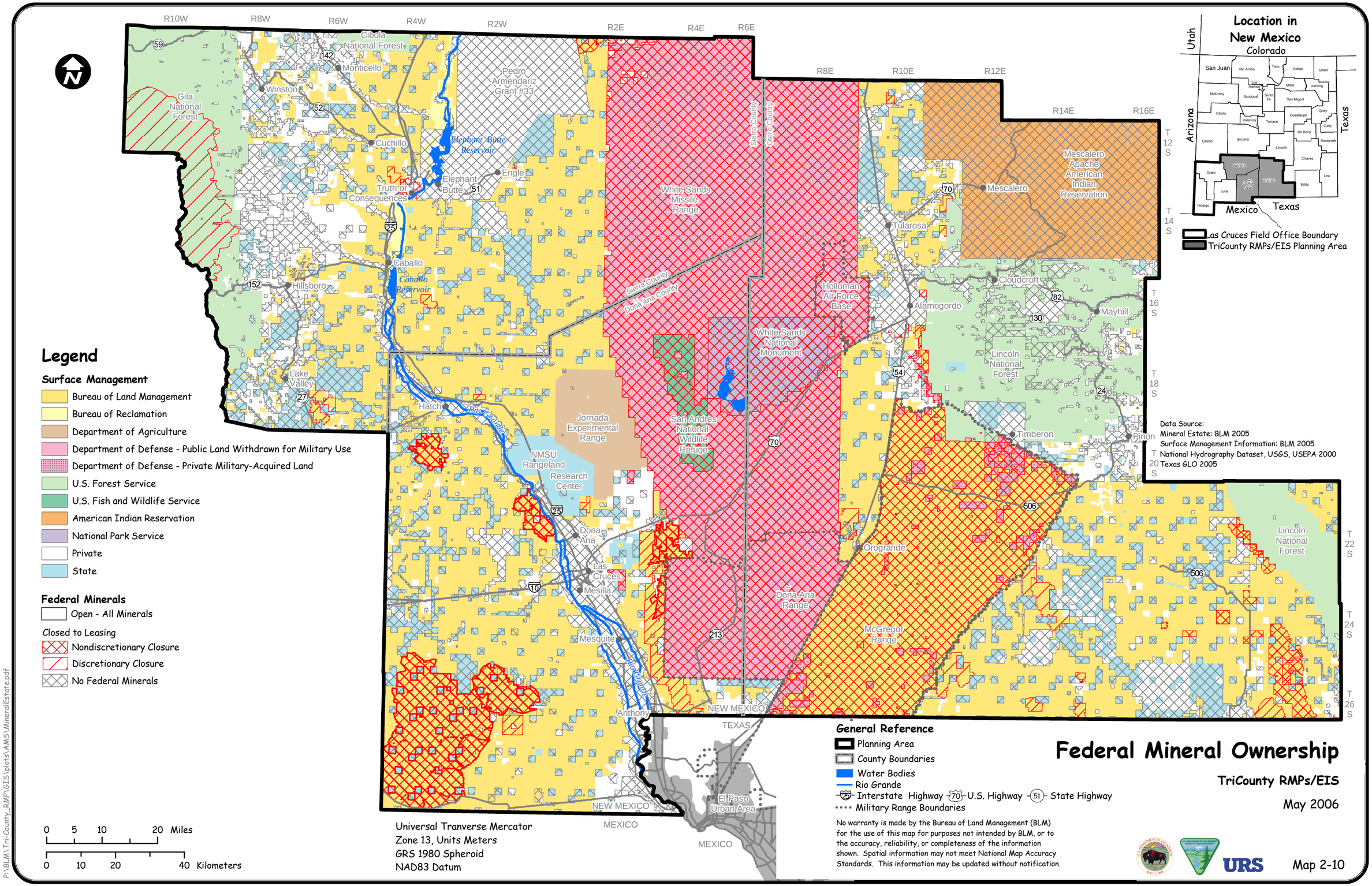
Because demand for new coal leasing is low, coal is leased by the Lease by Application procedure, wherein an interested public party nominates a particular tract of coal by submitting an application for the noncompetitive lease of a parcel. The BLM will review an application to lease a coal tract to ensure that it conforms to existing land-use plans and contains sufficient geologic data to determine the "fair market value" of the coal (43 CFR 3422.1). When the BLM accepts an application, the agency begins either an Environmental Assessment (EA) or EIS. As part of the EA or EIS process, the BLM seeks public comment on the proposed lease sale. Coal leases are granted on the condition that the lessee will obtain the appropriate permits and licenses from the BLM, the Office of Surface Mining and any affected State and local governments. A Federal coal lease has a term of 20 years, but it may be terminated in as few as 10 years if the coal resources are not adequately developed. The annual rental rate for coal leases is $3 per acre or fraction thereof. The royalty for surface-mined coal is 12 percent of the gross value of the coal produced. For coal mined by underground methods, the royalty is 8 percent. Royalty payments are paid to the U.S. General Revenue Fund. Lands offered at the oral auction that receive no bids shall be available for filing for noncompetitive lease for a two-year period.

Current Uses

Oil and Gas

Oil and gas are nonrenewable energy fluid mineral resources that typically are discovered and exploited by drilling exploratory and development wells into oil- and/or gas-bearing sedimentary rocks. Sedimentary rocks that have reservoir-quality porosity, are proximal to petroleum source rocks such as organic-rich shale or coal, and have formed a structural or stratigraphic trap may accumulate oil and/or gas. Oil and gas potential is shown on Map 2-11.

From the early 1920s to the present there have been 31 exploratory wells drilled in Sierra County, 60 exploratory wells drilled in Otero County, and 17 exploratory wells drilled in Doña Ana County (New Mexico Bureau of Geology and Mineral Resources [NMBGMR] 2005a; New Mexico Energy, Minerals and Natural Resources Department [NMEMNRD] 2005a) (Appendix E, Table E-1). Exploration wells have targeted porous sandstone and limestone formations ranging from Mississippian carbonate rocks to



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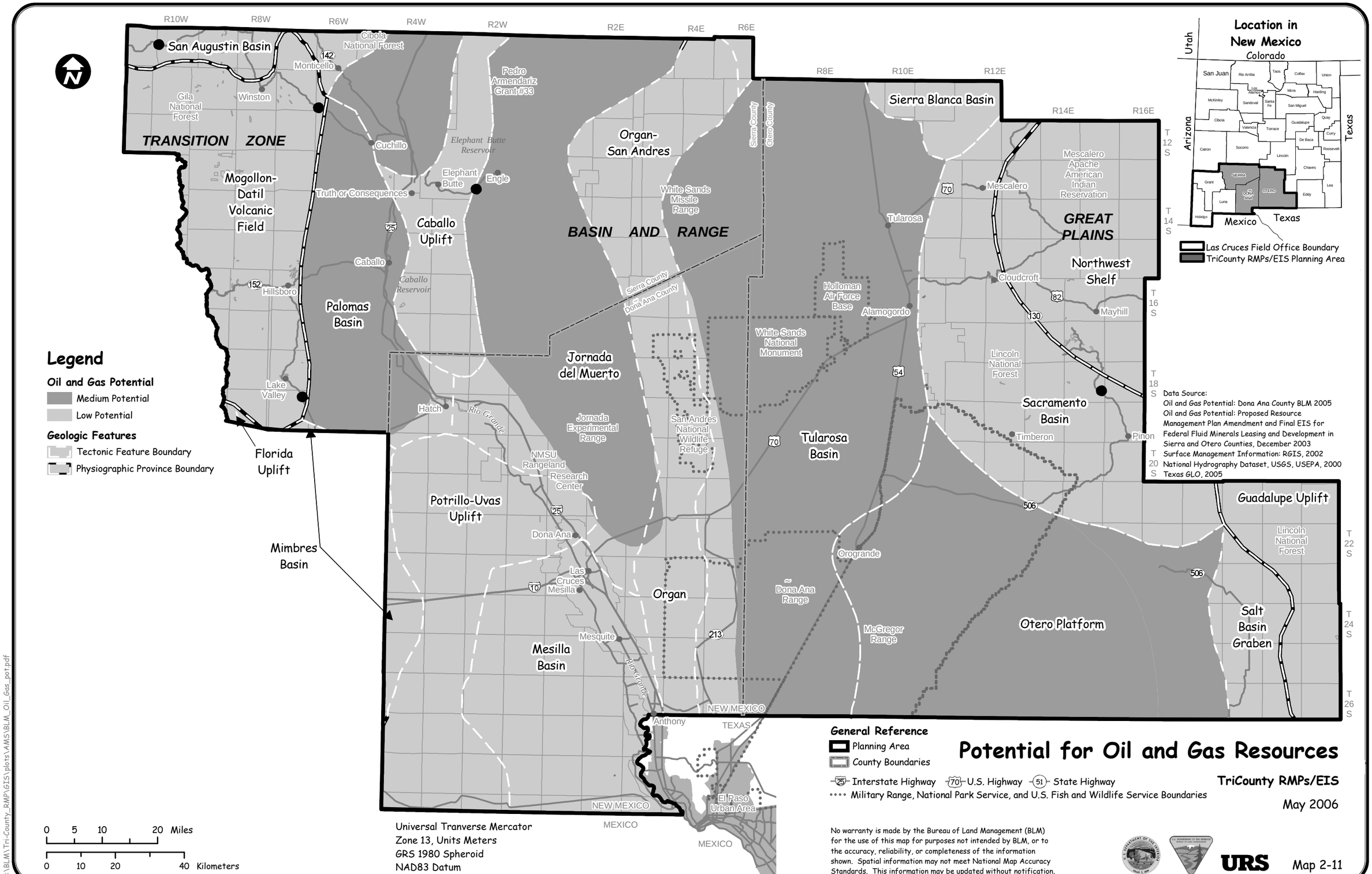
Potential for Oil and Gas Resources
TriCounty RMPs/EIS
May 2006
Map 2-11
Legend
Oil and Gas Potential
Medium Potential
Low Potential
Geologic Features
Tectonic Feature Boundary
Physiographic Province Boundary
General Reference
Planning Area
County Boundaries
Interstate Highway
U.S. Highway
State Highway
Military Range, National Park Service, and U.S. Fish and Wildlife Service Boundaries
Data Source:
Oil and Gas Potential: Dona Ana County BLM 2005
Oil and Gas Potential: Proposed Resource Management Plan Amendment and Final EIS for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties, December 2003
Surface Management Information: RGIS, 2002
National Hydrography Dataset, USGS, USEPA, 2000
Texas GLO, 2005
Location in New Mexico
Las Cruces Field Office Boundary
TriCounty RMPs/EIS Planning Area
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
0 5 10 20 Miles
0 10 20 40 Kilometers
TRANSITION ZONE
BASIN AND RANGE
GREAT PLAINS
San Augustin Basin
Mogollon-Datil Volcanic Field
Palomas Basin
Caballo Uplift
Organ-San Andres
Jornada del Muerto
Potrillo-Uvas Uplift
Mimbres Basin
Florida Uplift
Mesilla Basin
Organ
Tularosa Basin
Sierra Blanca Basin
Northwest Shelf
Sacramento Basin
Guadalupe Uplift
Otero Platform
Salt Basin Graben
Gila National Forest
Cibola National Forest
Pedro Armendariz Grant #33
Elephant Butte Reservoir
Caballo Reservoir
White Sands Missile Range
White Sands National Monument
Holloman Air Force Base
Jornada Experimental Range
San Andres National Wildlife Refuge
NMSU Rangeland Research Center
Dona Ana Range
McGregor Range
Mescalero Apache American Indian Reservation
Lincoln National Forest
Rio Grande
Sierra County
Otero County
Dona Ana County
Monticello
Winston
Cuchillo
Truth or Consequences
Elephant Butte
Engle
Caballo
Hillsboro
Lake Valley
Hatch
Dona Ana
Las Cruces
Mesilla
Mesquite
Anthony
El Paso Urban Area
Orogrande
Tularosa
Alamogordo
Mescalero
Cloudcroft
Mayhill
Timberon
Pinon
NEW MEXICO
TEXAS
MEXICO
Utah
Colorado
Arizona
Texas
Mexico
R10W
R8W
R6W
R4W
R2W
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Cenozoic sandstones. Although there have been shows of oil and gas reported in several of those wells in each county, there has been no economic production to date.

Coal beds are another source of gas from CBM. Approximately 5.5 percent of domestic natural gas in the United States is produced from coal-bearing geologic formations by tapping into porous rock that has trapped the methane generated in coalbeds (Rice et al. 2002). Prolific production of CBM in the San Juan Basin of New Mexico and in other coal-bearing regions of the United States has stimulated interest in this nonrenewable leasable energy resource. CBM is discovered and developed by drilling a well through the coal-bearing formation and completing the well in coal seams or other gas–bearing reservoir rocks. Typical CBM production requires removing the formation fluids (dewatering) to reduce the pressure within the coal seam, which then releases the gas within the coalbed. Late Cretaceous coal bearing rocks in the Planning Area are potential targets for development of CBM (Map 2-12).

Oil and gas exploration has been conducted in several basin plays (prospects) within the Planning Area since the 1920s. A total of 108 wells have been drilled in the Planning Area: 8 wells were drilled in the 1920s and 1930s, 35 wells in the 1940s through 1950s, 49 wells in the 1960s through 1970s, 12 wells in the 1980s and 1990s, and 4 wells from 2000 through 2003 (NMBGMR 2005; NMEMNRD 2005a) (Map B).

Sierra County – The Palomas Basin was tested by 6 wells in the 1940s and 1950s, and 2 wells in the late 1970s and early 1980s. One well had oil and gas shows but no production. The northern portion of the Jornada del Muerto Basin was tested by 20 wells from the 1920s to the 1980s. Three of those wells had oil and/or gas shows but there was no production. Three wells drilled and tested geologic features not associated with a sedimentary basin, and no shows were reported.

Otero County – The Tularosa Basin was tested by 12 wells from the 1950s to 1989. One well had a gas show and one well had an oil and gas show but there was no production. Between 1961 and 2000, six wells tested the Salt Basin graben in the southeastern part of the county. There was an oil show reported in one of those wells but no production. Nine wells tested the Pennsylvanian rocks in the Sacramento Basin from the 1950s to the 1980s and no shows were reported in those wells. The Hueco Basin was tested by 3 wells between 1942 and 1950 and one well reported an oil show, but there was no production. The Mississippian and Pennsylvanian rocks on the Otero Platform were tested by 30 wells. Three of those wells reported gas shows but there was no production.

Doña Ana County – The Hueco Basin was tested by 5 wells in the 1930s and 1940s. Three of those wells had oil shows and one well had oil and gas shows, but there was no production. Nine wells tested the Mesilla Basin from the 1940s to 1993. Two of those wells had oil and gas shows and 1 well had gas shows, but there was no production. Three wells drilled and tested geologic features not associated with a sedimentary basin, and no shows were reported.

Coalbed Methane

CBM resources generally are located sufficiently downdip from outcrops of coal resources and coal fields in Sierra and Otero Counties such that overlying rocks provide the pressure to trap CBM within the coal-

bearing formation. These coals generally are too deep to mine and therefore are valuable for the generation of methane gas only. Prospective areas for CBM development are shown on Map 2-12 and discussed below.

Sierra County – One known occurrence of coal resources is in the Engle coal field east of the Caballo Mountains. Prospects for CBM development are located south and east of the delineation of the Engle coal field where Cretaceous Mesaverde Group rocks dip into the Jornada del Muerto Basin (refer to Map 2-12). The limits of CBM prospects would include the deeper portions of the basin and extend east toward the San Andres Mountains. The deeper coal beds have been tested for CBM unintentionally by many exploration wells drilled in the Jornada del Muerto Basin to test oil and gas targets in traditional reservoir sandstones. A gas show was reported in one well and an oil show reported in a second well, but it is uncertain if the gas show occurred in the coal beds.

Otero County – One known occurrence of coal resources is in the Sierra Blanca field north of the Sacramento Mountains (refer to Map 2-12). Prospects for CBM development are located west of the delineation of the coal field where coal-bearing strata dip into the Tularosa Basin. There is no information that these subsurface coal beds have been tested for CBM.

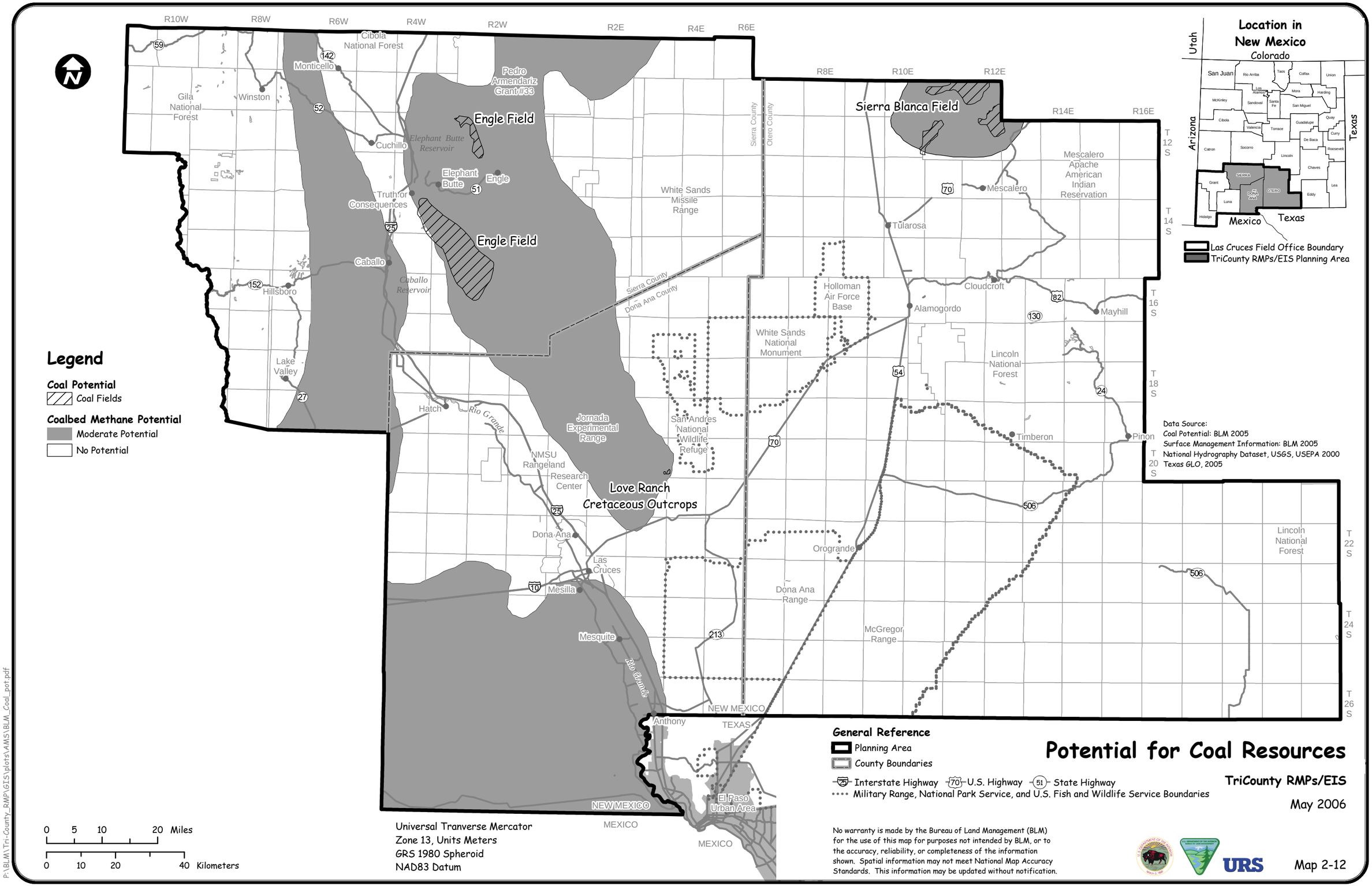
Doña Ana County – One known occurrence of coal resources is in Cretaceous-age outcrops on Love Ranch on the western slope of the San Andres Mountains (refer to Map 2-12). Prospects for CBM development are located west of the delineation of the outcrops where coal-bearing strata dip into the Jornada del Muerto Basin. There is no information that these subsurface coal beds have been tested for CBM.

Although there are existing leaseholds for oil and gas resource exploration in the Planning Area, no new oil and gas lease sales activity are reported in the Planning Area. There is no information that any existing leases will target CBM resources.

Carbon Dioxide and Helium

Carbon dioxide and helium are nonrenewable nonenergy fluid mineral resources typically discovered by exploratory oil and gas wells that encounter natural gas or nonflammable gas. Helium typically is associated with carbon dioxide gas and, for the purposes of this study, the two gases are considered one resource. If carbon dioxide and helium can be economically separated, collected, and delivered to a market, then a carbon dioxide and helium gas field is developed.

From the early 1920s to the present there have been 31 exploratory wells drilled in Sierra County, 60 exploratory wells drilled in Otero County, and 17 exploratory wells drilled in Doña Ana County (NMBGMR 2005; NMEMNRD 2005a) (refer to Appendix E, Table E-1). Discovery of carbon dioxide and helium resources is generally reported when an exploratory well is tested, and any gas recovered during the test is analyzed. Some of the exploratory wells had gas shows (refer to Appendix E, Table



Potential for Coal Resources

TriCounty RMPs/EIS

May 2006

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E-1). However, there is no information that the gas shows reported in those wells were analyzed for carbon dioxide and helium. The gas shows may contain carbon dioxide and helium and, for the purposes of this study, are considered as having carbon dioxide and helium potential.

Oil and gas exploration has been conducted in several basin prospects within the Planning Area since the 1920s. A total of 108 wells have been drilled in the Planning Area: 8 wells were drilled in the 1920s and 1930s, 35 wells in the 1940s through 1950s, 49 wells in the 1960s through 1970s, 12 wells in the 1980s and 1990s, and 4 wells from 2000 through 2003 (NMBGMR 2005; NMEMNRD 2005a) (refer to Appendix E, Table E-1).

Because carbon dioxide and helium are gases, only those exploratory wells that reported gas shows are discussed in this section. For this study, it is assumed that any gas show reported in the Planning Area may contain economic concentrations of carbon dioxide and helium.

Sierra County – The northern portion of the Jornada del Muerto Basin was tested by 20 wells from the 1920s to the 1980s. Two wells had gas shows but there was no production.

Otero County – The Tularosa Basin was tested by 12 wells from the 1950s to 1989. Two wells had gas show but there was no production. Between 1961 and 2000, 6 wells tested the Salt Basin graben in the southeastern part of the county. There were no gas shows reported in those wells. Nine wells tested the Pennsylvanian rocks in the Sacramento Basin from the 1950s to the 1980s, and no gas shows were reported in those wells. The Hueco Basin was tested by 3 wells between 1942 and 1950, and no wells reported gas shows. The Mississippian and Pennsylvanian rocks on the Otero Platform were tested by 30 wells. Three wells reported gas shows but there was no production.

Doña Ana County – The Hueco Basin was tested by 5 wells in the 1930s and 1940s. One well had gas shows but there was no production. Nine wells tested the Mesilla Basin from the 1940s to 1993. Three wells had gas shows but there was no production.

Although there are existing leaseholds for oil and gas exploration in the Planning Area, there is no new fluid mineral lease sales activity reported in the Planning Area.

Coal

Coal is a nonrenewable, leasable, solid energy mineral resource. Coal resources typically are exposed in outcrops of coal-bearing sedimentary formations. Locations where coal resources occur and can be mined are designated as coal fields. Coal deposits are ranked by the quality of the coal resource, which is based on the carbon content, volatile and water content, hardness, and heat released during burning. Coal resources ranked from highest quality to lowest quality are anthracite, bituminous, subbituminous, and lignite.

Coal resources are present in Late Cretaceous sedimentary rock in all three counties (refer to Map 2-12). Coal resources in the Planning Area range from bituminous to subbituminous (Table 2-59). There are no active coal mines in the Planning Area.

Table 2-59
Analysis of Coal Samples from Planning Area, New Mexico

Field	Engle Field	Sierra Blanca Field	Love Ranch
County	**Sierra**	**Otero**	**Doña Ana**
Coal Rank	**subbituminous**	**C-bituminous**	**unknown**
Analysis			
Moisture (%)	12	5.5	NR
Ash (%)	20.1	13.5	NR
Volatile matter (%)	24.4	31.4	NR
Fixed carbon (%)	43.5	47.2	NR
Sulfur (%)	0.4	0.75	NR
Calorific value (Btu/lb)	7,665	11,174	NR
Lbs of Sulfur/MBtu	NR	0.68	NR
Number of samples	1	12-15	NR

SOURCE: Hoffman 1996

NOTES: Btu = British thermal unit lb = pound
MBtu = thousand Btu NR = not reported

Sierra County – One known occurrence of coal resources is in the Engle coal field east of the Caballo Mountains where Cretaceous Mesaverde Group rocks outcrop on the western edge of the Jornada del Muerto Basin near Elephant Lake. The Engle coal field encompasses approximately 3.2 million acres in the center of the county. There are five known coal mines in the Engle coal field, none of which are active. The apparent maximum thickness of coal seams is 4 feet thick in the Crevasse Canyon Formation (Hoffman 1996). Shallow coal resources (0 to 200 feet deep) are estimated at 0.5 million short tons. Deep coal resources (200 to 1,000 feet deep) are estimated at 8.5 million short tons. The NMBGMR mines database lists a Granite Gap mine in the Caballo Mountain District as a coal mine. There are no Cretaceous outcrops reported at that location. Pennsylvanian rocks in that area may contain small, thin coal beds suitable for noncommercial mining.

Otero County – One known occurrence of coal resources is in the Sierra Blanca field north of the Sacramento Mountains where coal-bearing strata of the Mesaverde Group dip westward into the Tularosa Basin. The Sierra Blanca coal field covers approximately 450,000 acres along the northern border of the county, and the field extends north into Lincoln County. This coal field is within the Mescalero Apache Indian Reservation. Coal-bearing units are found in the Late Cretaceous Crevasse Canyon Formation. There are no coal mines reported in Otero County portion of the Sierra Blanca coal field, although Hoffman (1996) mentions there was a small coal mine open near Three Rivers for a short time, with no date given for the operation. The average thickness of coal seams is 4 feet thick (Hoffman 1996). Mining is difficult because of the steep bedding dips, thick overburden, and many faults and fractures that break up the section. The coal field also is intruded by dikes and sills from the adjacent Sierra Blanca igneous complex. Estimated shallow coal resources (0 to 200 feet deep) are estimated at 14 million short tons for the entire field, of which only a small portion is within the Planning Area.

Doña Ana County – One known occurrence of coal resources is in Cretaceous rock outcrops at Love Ranch on the western slope of the San Andres Mountains where coal-bearing strata of the Mesaverde Group dip westward into the Jornada del Muerto Basin. This coal outcrop is within the White Sands Missile Range. The coal occurrence covers approximately 10,000 acres. Coal-bearing units reportedly are

found in the Late Cretaceous Gallup Sandstone, and it was mined in the 1860s (Hoffman 1996). There is no additional information on this coal occurrence.

No leasing activity is reported for coal resources in the Planning Area.

Geothermal

A report prepared by the U.S. Department of Energy (USDOE) in cooperation with the BLM identified the Planning Area as having high potential for renewable power from geothermal resources (USDOE 2003). Geothermal resources are nonrenewable leasable energy fluid resources with a history of successful application in New Mexico. Current uses include residential and commercial space heating, greenhousing, aquaculture, crop and food processing, and heating for swimming pools and spas. Sources of geothermal energy include artesian hot springs and wells that tap into groundwater or dry rock at elevated temperatures resulting from high heat flow gradients in the subsurface. New sources of geothermal energy have been discovered by drilling exploratory wells in areas of known or suspected high temperature gradients, or by coincidence during drilling for oil and gas or water resources.

Information on the known occurrences of geothermal energy resources in the Planning Area is provided by the BLM and presented in Map 2-13 (also refer to Appendix E, Table E-2).

Sierra County - Geothermal energy resources have high potential throughout most of Sierra County, with one new geothermal lease pending near Hillsboro (refer to Map 2-13). There are no known Geothermal Resource Areas (KGRAs) in Sierra County.

Otero County - Geothermal energy resources have high potential in southwestern Otero County. There are no active geothermal leases or KGRAs in Otero County.

Doña Ana County - Geothermal energy resources have high potential throughout Doña Ana County (refer to Map 2-13). Geothermal energy resources are clustered at two KGRAs that were formed by a convective geothermal system (Witcher 2004): Radium Springs KGRA and the Las Cruces East Mesa KGRA. There are new geothermal leases pending north of Radium Springs KGRA.

Sodium

There is a reported occurrence of sodium in Permian-age evaporite rocks in southeastern Otero County. The area is a small continental basin, called the Salt Basin graben, where water collects and evaporates to form thin gypsum and halite (salt) beds interbedded with sandstone and shale (USDI, USGS 1983). No leasing activity is reported for sodium resources in the Planning Area.

Forecast

Oil and Gas

Oil and gas exploration activity is driven by the world market price for a barrel of crude oil that varies as a function of supply and demand for petroleum products. Significant increases in the crude oil price will

open up more areas for exploration as the cost to explore for and develop oil and gas fields in high-risk or logistically expensive remote locations is equalized by the higher oil prices. Under current management there will be more oil and gas lease sales of public land as risky exploration plays become economical and generate a greater demand to open up more public land for exploration. As a result, more oil and gas fields will be discovered and developed on public land.

Carbon Dioxide and Helium

The current market demand for carbon dioxide and helium favors development of those resources. Carbon dioxide is typically used in enhanced oil recovery processes in old oil fields and the demand for more oil and gas products will increase the demand for enhanced oil recovery projects. Helium is in great demand as a carrier or purge gas in manufacturing processes and other industrial applications. However, discovery of carbon dioxide and helium resources usually is serendipitous in association with oil and gas exploration.

Under current management it is possible there will be more carbon dioxide and helium discovered and developed on public land in association with increased fluid mineral lease sales of public land as risky oil and gas exploration plays become economical.

Coal

The construction and expansion of coal-fired power plants in the Southwest will increase the demand for coal. Although the increased demand for coal will likely result in the development of new coal mines, the limited coal resources present in the Planning Area are not suitable for economic development and probably will not be affected.

Geothermal

New Mexico is a proven leader in geothermal resource development and the current management trend is to increase development. Recent BLM designation of the Las Cruces KGRA will promote development of more geothermal resources on public land in the Planning Area.

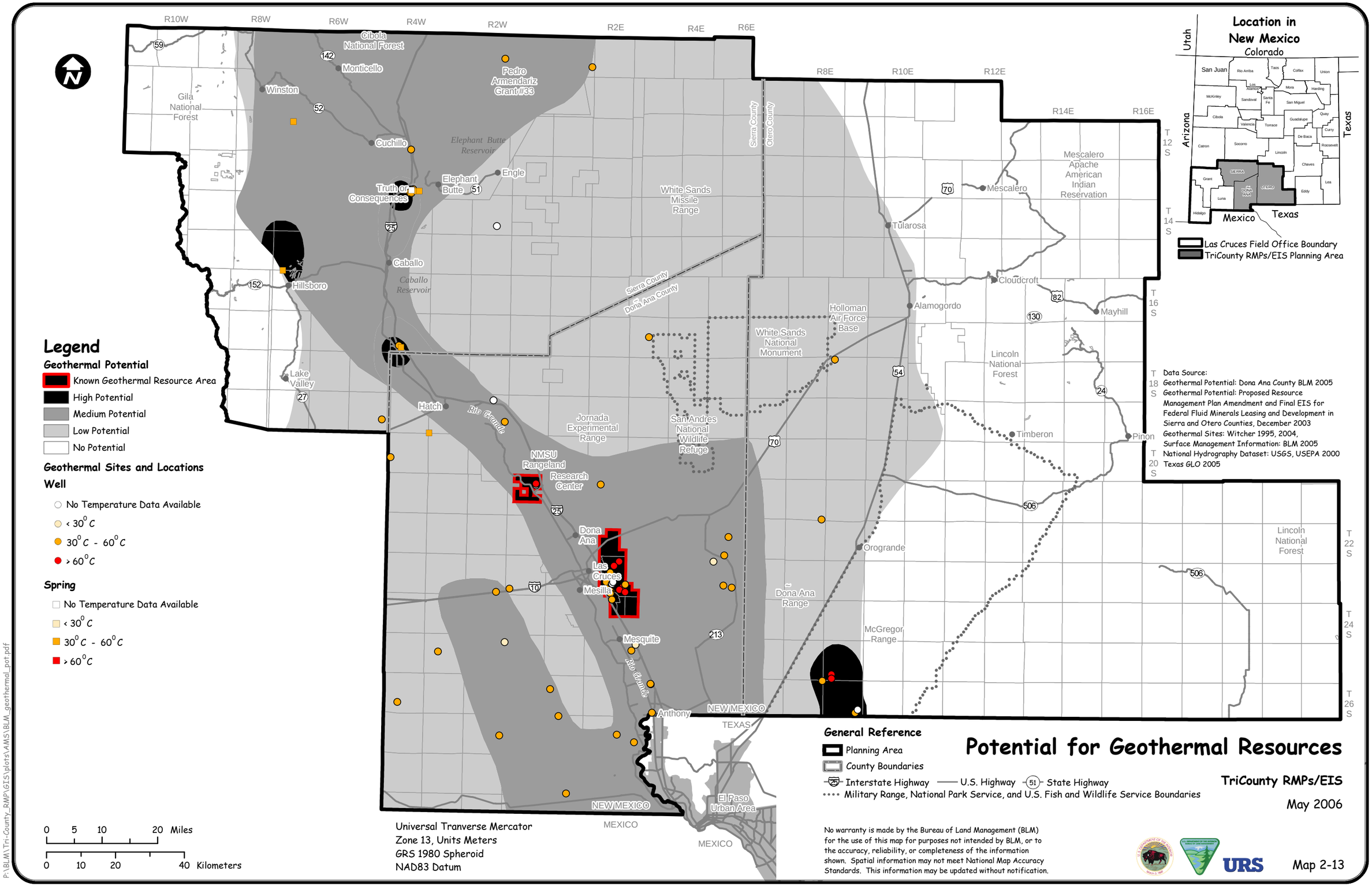
Sodium

The salt deposit is relatively thin, not laterally extensive and probably contains sufficient impurities to be a noncommercial deposit.

Key Features

Oil and Gas

The areas likely to be targeted for oil and gas exploration are sedimentary basins within the Basin and Range province and, more specifically, along the Rio Grande Rift trend. Public land suitable for oil and gas lease sales would be in the broad valleys between mountain ranges because those valleys coincide



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with the Palomas, Jornada del Muerto, Mesilla, Tularosa, and Hueco sedimentary basins. Oil and gas shows were reported in each of those basins.

Carbon Dioxide and Helium

The areas where carbon dioxide and helium are likely to be located coincide with targets for oil and gas exploration. Public land suitable for oil and gas lease sales would be in the broad valleys between mountain ranges because those valleys coincide with the Palomas, Jornada del Muerto, Mesilla, Tularosa, and Hueco sedimentary basins. Gas shows were reported in each of those basins.

Coal

Development of coal resources in the Planning Area probably is limited to the Engle coal field. Much of the field is on BLM-administered land and the coal beds are suitable for mining. In contrast, the Sierra Blanca field and Love Ranch outcrops are located in structurally complex areas with thin coal beds that would be difficult to mine. There also may be surface restrictions due to current land use management.

Geothermal

Although the western portion of the Planning Area is suitable for development of geothermal resources, areas having high potential are preferred targets for development. The Radium Springs and Las Cruces East Mesa KGRAs in Doña Ana County, and the Hillsboro area in Sierra County have high potential for geothermal resources.

2.2.2.3 Locatable Minerals

Locatable minerals are defined as those minerals that make the land more valuable because of their existence, are recognized as a mineral by the standard experts, and are not subject to disposal under some other law. Most solid minerals are locatable, but due to complexities in the law there are exceptions (such as coal, potash, sulfur, and sodium). Locatable minerals include both metallic minerals (e.g., gold, silver, lead) and nonmetallic minerals (e.g., gemstones, kaolin, perlite). Locatable minerals can be obtained by filing a mining claim and can be extracted by mining or quarrying methods.

Significant locatable mineral deposits are defined by McLemore (2005) as world-class or large deposits of economic importance today. Significant mineral deposits may attract mining companies to explore and develop theses resources. Sierra, Otero, and Doña Ana Counties have several locatable mining districts with significant mineral deposits, as shown on Map 2-14. There are four significnt metallic mineral districts in Sierra County, one district in Otero County, and one district in Doña Ana County.

Although there are many mining claims and inactive mines in the Planning Area, there is no information about whether any active mines exist in the Planning Area.

Current Uses

Historical reviews of mineral exploration and development in each county by NMBGMR have documented locatable mineral commodity types and production data for all of the districts. Most of these districts have been mined historically and are no longer active. Table E-3 in Appendix E lists each significant district name, commodities (metallic minerals) that have been mined, the dates the mineral district was active, commodities that are present (prospects), estimated cumulative value of production, and the classification of the deposits that characterize each district.

Sierra County – There are four mining districts in Sierra County: Chloride, Hermosa, Hillsboro, and Kingston (refer to Map 2-14). All four mining districts contain metallic mineral resources, and one mining district also contains nonmetallic mineral resources. Geologic conditions that account for the development of the mineral resources include volcanic-epithermal veins and replacement and skarn deposits.

Otero County – There is one significant mining district in Otero County: Orogrande (refer to Map 2-14). The mining district contains metallic and nonmetallic mineral resources. Geologic conditions that account for the development of the mineral resources include a Great Plains Margin skarn deposit.

Doña Ana County – There is one significant mining district in Doña Ana County: Organ Mountains (refer to Map 2-14). The mining district contains metallic and nonmetallic mineral resource. Geologic conditions that account for the formation of the mineral resources. These conditions include Rio Grande Rift deposits, volcanic-epithermal veins and replacement, and skarn deposits.

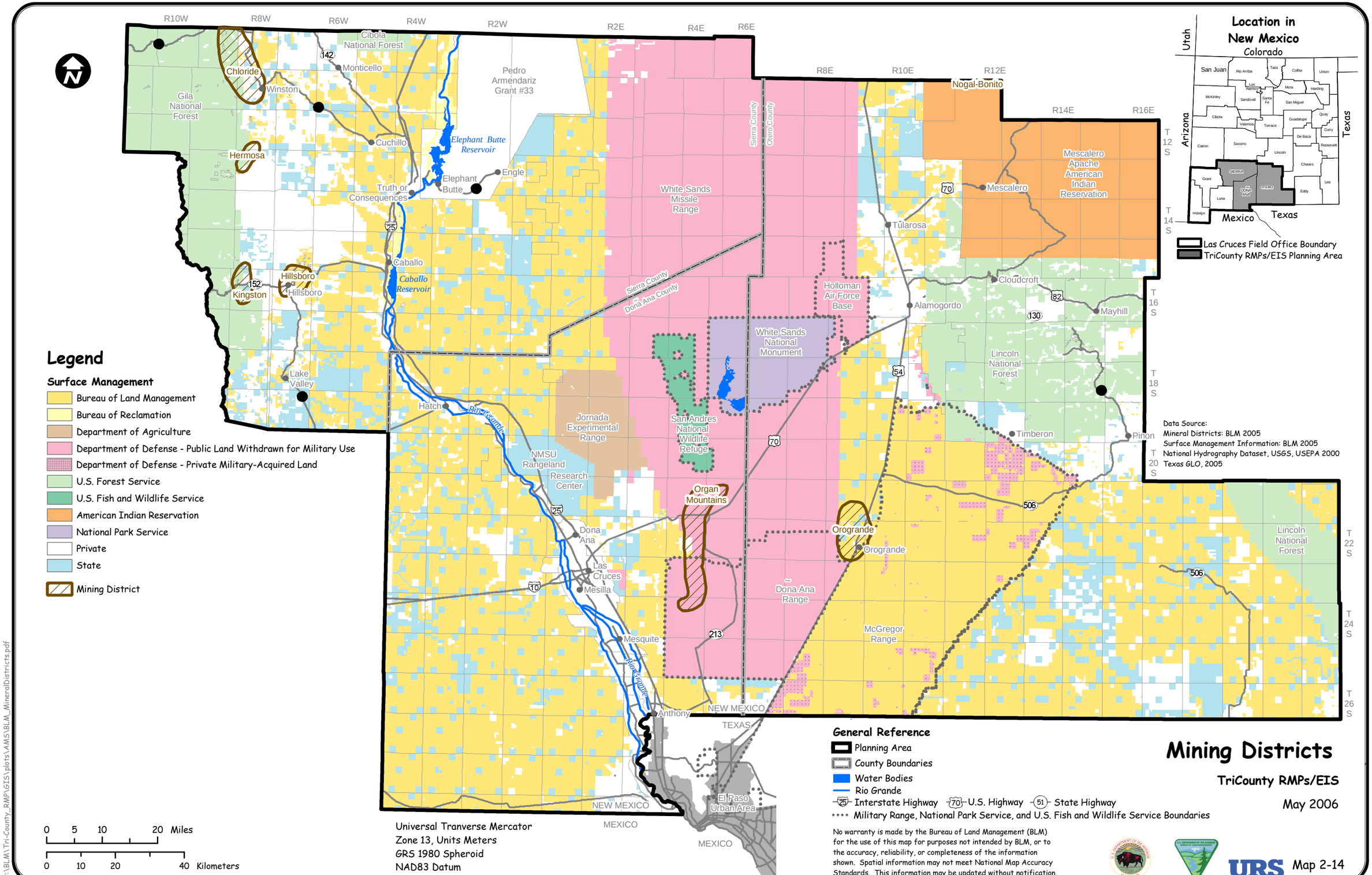
Forecast

Sierra, Otero, and Doña Ana Counties have significant metallic and nonmetallic mineral resources. The forecast is for continued development of world-class or large significant mineral deposits in the Planning Area. However, mining of metallic mineral resources is a supply and demand type of market. Prices of mineral resources have fluctuated significantly in the past. Development of overseas mineral resources has increased, removing the need to develop smaller ore bodies here in the United States. The trend for new prospects in the Planning Area has significantly decreased in the past 20 years. This indicates that the area is well surveyed and the mineral resources are well established.

With prospects for increasing demand for nuclear power plants, uranium deposits in the Planning Area may play a vital role in supplying nuclear fuel. In addition, rare earth element resource demand may increase in the future. This is due to the lack of significant sources of these mineral resources.

Key Features

The areas likely to be targeted for metallic and nonmetallic locatable minerals are the fault-block mountain ranges of the Basin and Range province. More specifically, mineral development will be concentrated along the mineralized trend near the edges of the Rio Grande Rift in Sierra and Doña Ana Counties. In southwestern Otero County, locatable minerals are likely to be targeted in the Tertiary



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intrusive body at the Orogrande Mountains and along the contact of the Middle Proterozoic granitic intrusive body.

2.2.2.4 Salable Minerals

BLM defines common varieties of sand, gravel, stone, pumice, pumicite, cinders, and ordinary clay as salable, not locatable (USDI, BLM 1997a). Salable minerals include materials used for building and construction, both commercially and privately. Sand, gravel, aggregate, lime (limestone), cinders, and building stone are the more common salable minerals. Use of salable minerals requires either a sales contract or a free-use permit. Sales are at the estimated fair-market value. The NMBGMR reports that many inactive or intermittently operated aggregate pits are located in the Planning Area (Barker 2002).

Most applications for mineral material sales and free use must go through the NEPA review process. The exceptions are sales and free use from community pits and common use areas. These sites have already been evaluated through NEPA review and have been designated as suitable for extraction of mineral materials. Permits for community pits and common-use areas are sold "over the counter" and do not require individual environmental assessments.

Current Uses

The known locations of salable minerals in the Planning Area are too numerous to discuss on an individual basis. Instead, Appendix E, Table E-4 lists the information available for known pits and the location of high to moderate salable mineral materials is posted on Map 2-15).

Sierra and Otero Counties

Sand, gravel, and stone are the most common salable mineral materials in Sierra and Otero Counties. They are generally found along mountain pediments, alluvial valley floors, and in arroyos adjacent to mountain uplifts. Eolian sand is found in the Tularosa valley. Cinders, fill material, building stone, and clay occur in minor amounts throughout the Planning Area.

Currently there are between two and seven active pits in Sierra County and between 6 and 9 pits in Otero County. Because of a lack of consistency in naming and cataloging mineral pits between agencies, it is difficult to generate an exact number. According to Pfiel and Leavitt (2001), there were 3 active aggregate and/or stone pits and 1 active industrial mineral pit in 2001 in Sierra County, and 7 active aggregate and/or stone pits and 1 active industrial mineral pit in Otero County. According to MSHA (2005) there are presently 7 total active or intermittent pits in Sierra County and 9 in Otero County. The NMBGMR database lists 2 active pits in Sierra County and seven in Otero County.

Doña Ana County

Sand, gravel, and stone are the most common salable mineral materials in the Planning Area although there has been some clay mined in the southeastern corner of the county. Historically there also was production of some metals including silver, copper, lead, and zinc (Dunham 1935). Sand and gravel deposits are most abundant along the Rio Grande valley (refer to Map 2-15). Sand and gravel west of the

Rio Grande predominantly consists of smaller aggregate than the coarser material found to the east. Locations with a wider range of aggregate size near the community of Las Cruces therefore lie east of the Rio Grande and closer to the Organ Mountains front (Austin et al. 1998). Volcanic cinders occur in the West Potrillo Mountains. The Robledo Mountains contain deposits of building stone. Clay deposits occur in southern Doña Ana County. Caliche is common throughout the Planning Area (USDI, BLM 1990a). There are only a few quality sand and gravel locations remaining close enough to the City of Las Cruces to be economically reasonable for use in construction.

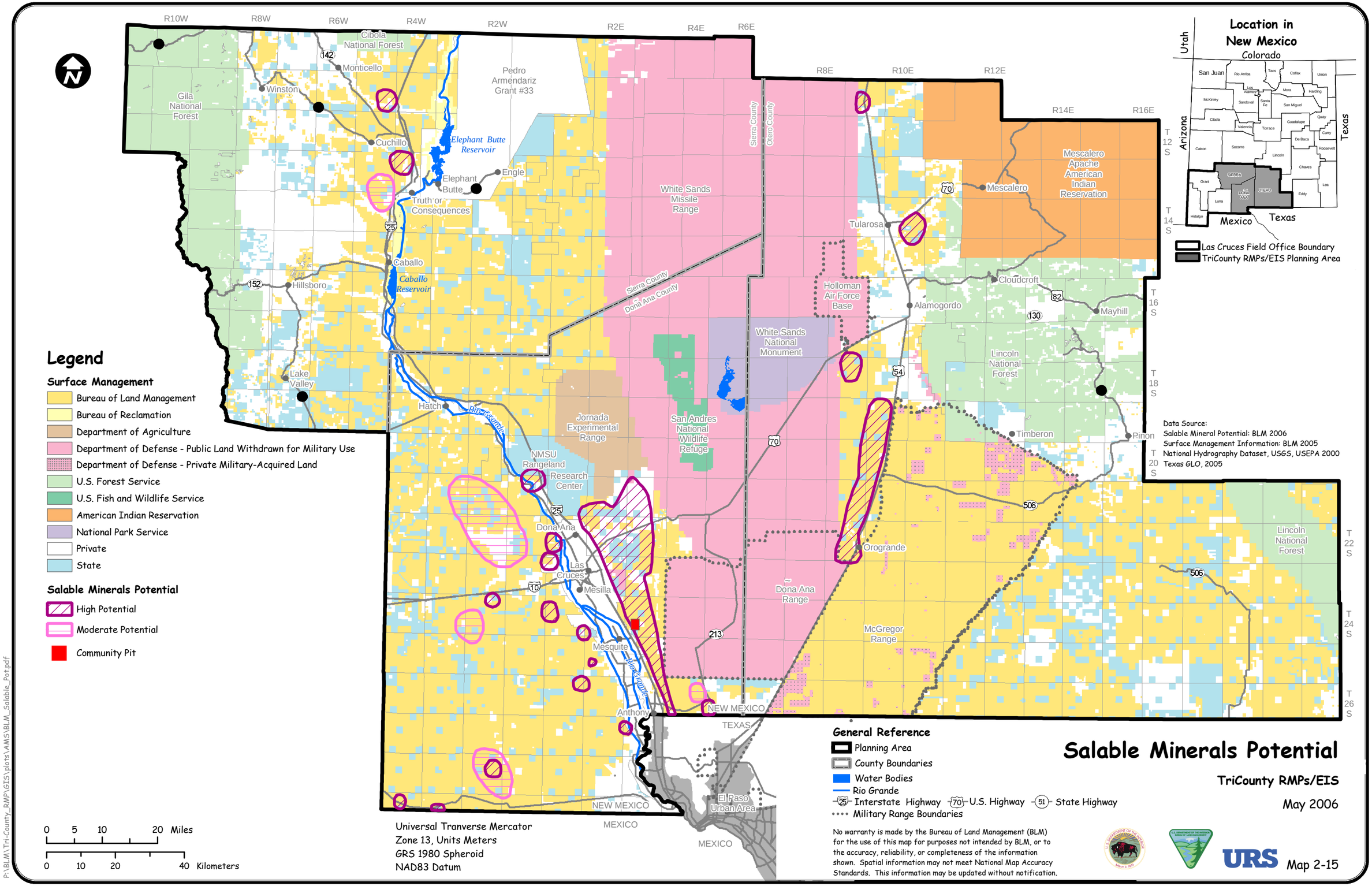
Currently there are between 23 and 28 active salable mineral pits in Doña Ana County. Because of a lack of consistency in naming and cataloging mineral pits between agencies, it is difficult to determine an exact number. According to Pfiel and Leavitt (2001), there were 26 active aggregate and/or stone pits and 3 active industrial mineral pits in 2001. According to U.S. Mine Safety and Health Administration (MSHA 2005) there are presently 23 total active or intermittent pits in Doña Ana County. The New Mexico Highway Department (NMHD) database lists 27 active pits and the NMBGMR mines database lists 28 active pits (NMBGMR 2002). Aggregate production in 2000 is shown in Table 2-60.

Table 2-60
Aggregate Production in Doña Ana County for 2000
(short tons)

Aggregate Type	Production for 2000
Base course	110,099
Caliche	475
Crushed rock	164,316
Fill dirt	29,009
Gravel	65,772
Sand	18,767
Other	195,842
Total	**584,280**

Forecast

There is sustained interest in development of salable mineral resources in the Planning Area. Demand for sand, gravel, and decorative rock continues to rise due to construction of new commercial and residential properties as the population increases. Because the demand for aggregate, stone and salable mineral materials is closely tied to development, one way to forecast future salable mineral demand is to link production to population and use population growth forecasts. Given the current annual production in Doña Ana County of 584,280 short tons/year (refer to Map 2-15) and the 2000 county population of 180,000 people, the ratio of product/person is 3.246 short tons/person/year. Using this ratio and predictions of the future population of Doña Ana County (280,000 people in 2020) the annual production demand will be 908,880 short tons in 2020. As mentioned in the above section, because there are only a few viable locations for sand and gravel production remaining in Doña Ana County, these sources will likely be strained in the future.



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Key Features

Sierra and Otero Counties

Characteristics of two of the existing community pits on BLM-administered land are described below:

- Community Pit No. 4 (Coyote Canyon) access is problematic, decreasing its viability as a source of sand and gravel.
- Community Pit No. 7 (Escondida) is an important source of blow sand; however, the eastern portion of the community pit area has been largely depleted.

In addition to the community pits, there are two established common use areas (CUAs), both in Sierra County:

- The 5-acre Green Canyon CUA, also known as the Garfield CUA due to its proximity to the town, is a source of red building stone. Material is extracted from the arroyo bottom and gravel bars without disturbing vegetation.
- The Apache Canyon CUA is a source of arroyo sand and building stone. The area is less than 1 acre. Material is extracted only from the arroyo bottom and gravel bars, without disturbing vegetation. No disturbance is allowed within 5 feet of the arroyo bank and vehicles are restricted to the road.

Doña Ana County

The Organ Mountains are an excellent source of granite rock, but the Organ/Franklin Mountains ACEC prevents the extraction of this resource. There is also high quality sand west of the Organ Mountains that would be good for future development. That location may be a good source for more sand in the future.

The area north of "A" Mountain is open to mineral development, but there are urban interface issues associated with this site. There is an active gravel pit northwest of "A" Mountain and an abandoned mine on the south side of the mountain slope.

2.2.3 Renewable Energy

A report prepared by the USDOE in cooperation with BLM identified the Planning Area as having high potential for development of renewable energy resources, including solar power (for concentrating solar power and photovoltaic solar power), wind power, and biomass power (USDOE 2003). Renewable energy resources in the Planning Area can be managed by promoting the construction of collection facilities to generate energy. The BLM issues right-of-way permits to allow construction and operation of renewable energy collection facilities on public land. The BLM general policy is to facilitate environmentally responsible commercial development of renewable energy projects on public lands where feasible. Applications for commercial renewable energy facilities will be processed as right-of-way authorizations under Title V of the Federal Land Policy and Management Act (FLPMA) and Title 43 CFR 2800.

2.2.3.1 Current Use

Solar Energy

The report prepared by the DOE and BLM identified the Planning Area as having a large total land area for high-potential concentrations of solar power and/or photovoltaic sites (DOE 2003). Solar energy is a renewable energy resource that has excellent potential for generating electricity in Sierra, Otero, and Doña Ana Counties. Solar energy resources are classified based on the amount of solar radiation that contacts the ground surface in a specified area. Solar radiation is measured in units of kilowatt-hours per square meter per day (kwh/sq.m/day). The amount of solar energy available at a specific location varies with the latitude of that location, the season, and the time of day. The resource also depends on the type of solar energy collector. There are two types considered for renewable solar energy generation: concentrating solar power (CSP) and photovoltaic (PV).

CSP plants are large systems that use mirrors to focus sunlight to create high temperatures. The high temperatures generated by focused sunlight are used to boil water to create steam to generate electricity. Facilities include a solar collection system, a system for transferring the collected energy to a working fluid or to a storage system, and a system for converting the thermal energy such as a turbo-generator. An application for a concentrating solar power facility on public lands will likely require an Environmental Impact Statement because of the amount of land needed for the solar energy collection facilities, the associated support facilities, and transmission lines.

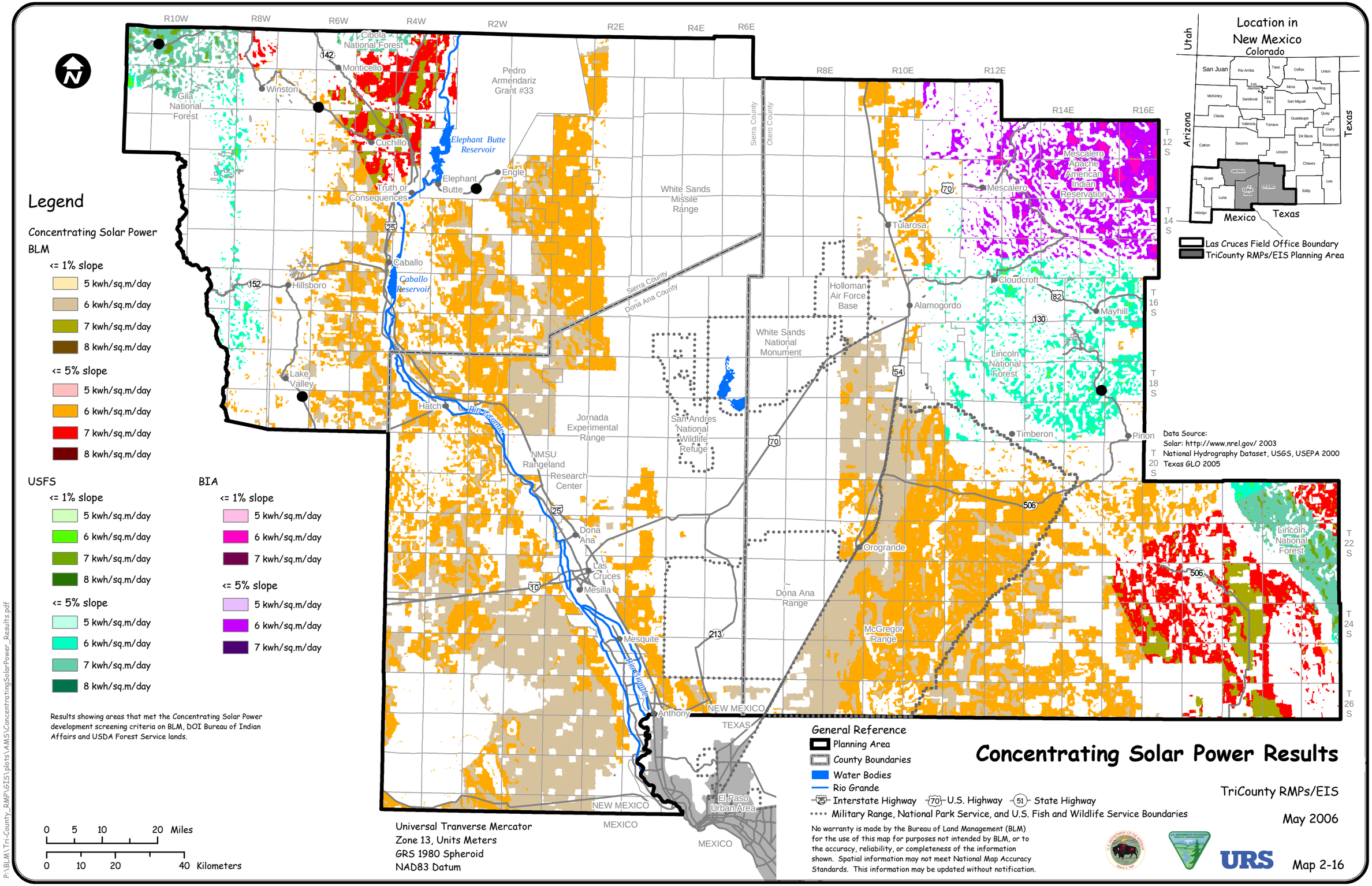
PV is a solar energy collection system consisting of flat plates of solar-energy-collecting PV cells. The collection system may be equipped to track the sun throughout the day. The PV cells are connected to storage batteries that are charged during daylight hours.

Applications for commercial solar energy facilities will be processed under Title V of the Federal Land Policy and Management Act and Title 43, Part 2800 and will be in conformance with the current land use plan. If the application is not located in an exclusion and/or avoidance area, it will treated as any other right-of-way application.

Sierra County

The CSP for Sierra County is presented on Map 2-16. The different color schemes display (1) the Federal agency responsible for surface estate management (either the U.S. Forest Service, Bureau of Indian Affairs [BIA], or BLM, and (2) the solar power available, depending on the slope of the land, either less than 5 percent or less than 1 percent. Areas not surveyed or withdrawn from designation for this resource are displayed in white on Map 2-16. The CSP available in Sierra County is relatively uniform and ranges from 6 to 7 kwh/sq.m/day. These data indicate that Sierra County is well-suited for development of CSP resources.

The PV for Sierra County is presented on Map 2-17. The different color schemes display the Federal agency responsible for surface estate management (either the U.S. Forest Service, BIA or BLM). Areas not surveyed or withdrawn from designation for this resource are displayed in white on Map 2-17. The PV available in Sierra County is a uniform 6 kwh/sq.m/day. These data indicate that Sierra County is well suited for development of PV resources.



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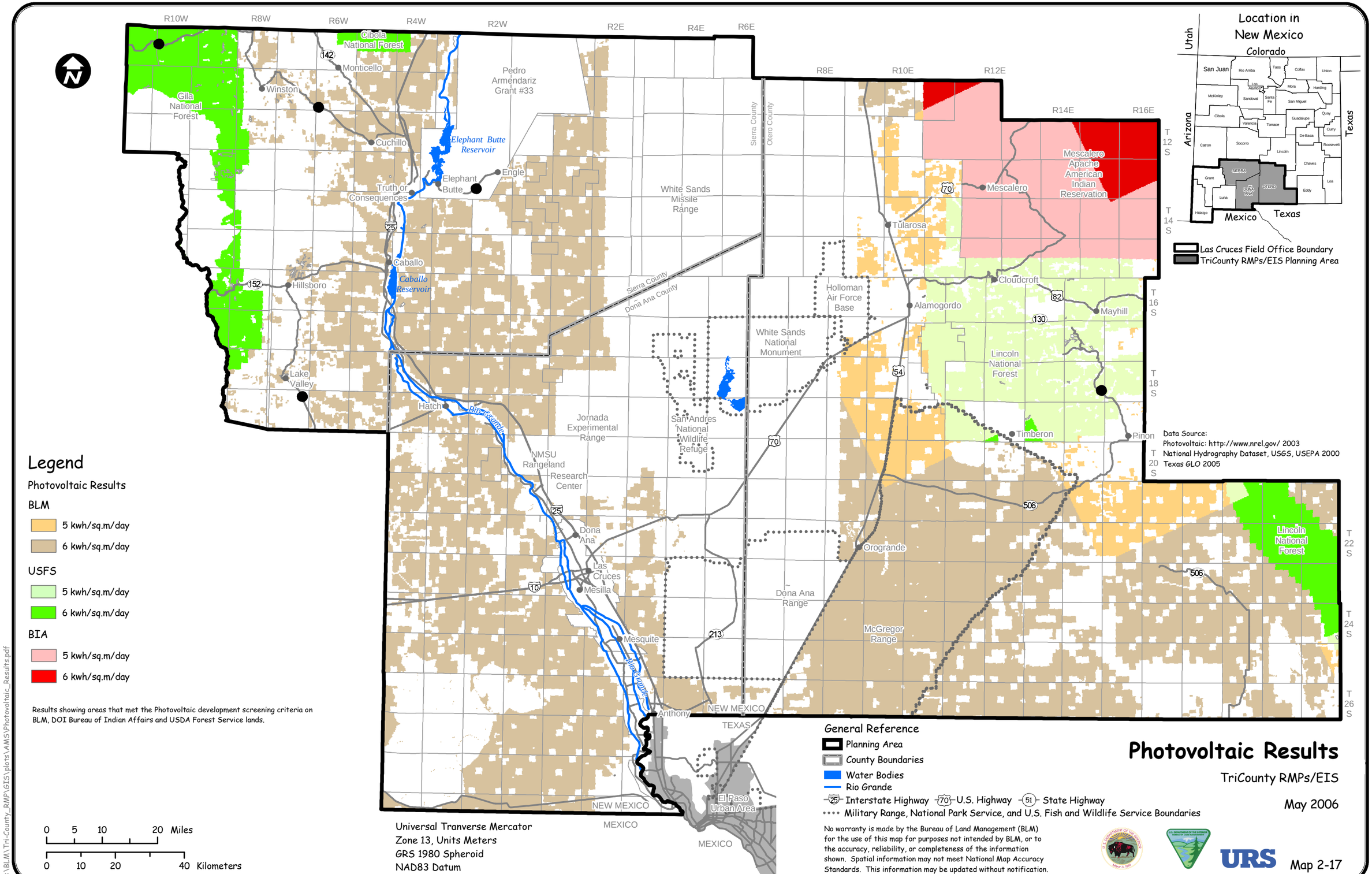
R10W
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T 16 S
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T 20 S
T 22 S
T 24 S
T 26 S
Cibola National Forest
Gila National Forest
Monticello
Winston
Cuchillo
Pedro Armendariz Grant #33
Elephant Butte Reservoir
Elephant Butte
Engle
Truth or Consequences
Caballo
Caballo Reservoir
Hillsboro
Lake Valley
Hatch
Rio Grande
Jornada Experimental Range
NMSU Rangeland Research Center
Dona Ana
Las Cruces
Mesilla
Mesquite
Anthony
NEW MEXICO
TEXAS
MEXICO
El Paso Urban Area
White Sands Missile Range
Sierra County
Otero County
Dona Ana County
White Sands National Monument
San Andres National Wildlife Refuge
Holloman Air Force Base
Tularosa
Mescalero
Mescalero Apache American Indian Reservation
Cloudcroft
Alamogordo
Mayhill
Lincoln National Forest
Timberon
Pinon
Orogrande
Dona Ana Range
McGregor Range
Lincoln National Forest
Location in New Mexico
Utah
Colorado
Arizona
Texas
Mexico
Texas
Las Cruces Field Office Boundary
TriCounty RMPs/EIS Planning Area
Data Source:
Photovoltaic: http://www.nrel.gov/ 2003
National Hydrography Dataset, USGS, USEPA 2000
Texas GLO 2005
Legend
Photovoltaic Results
BLM
5 kwh/sq.m/day
6 kwh/sq.m/day
USFS
5 kwh/sq.m/day
6 kwh/sq.m/day
BIA
5 kwh/sq.m/day
6 kwh/sq.m/day
Results showing areas that met the Photovoltaic development screening criteria on BLM, DOI Bureau of Indian Affairs and USDA Forest Service lands.
0 5 10 20 Miles
0 10 20 40 Kilometers
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
General Reference
Planning Area
County Boundaries
Water Bodies
Rio Grande
Interstate Highway
U.S. Highway
State Highway
Military Range, National Park Service, and U.S. Fish and Wildlife Service Boundaries
No warranty is made by the Bureau of Land Management (BLM) for the use of this map for purposes not intended by BLM, or to the accuracy, reliability, or completeness of the information shown. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.
Photovoltaic Results
TriCounty RMPs/EIS
May 2006
URS
Map 2-17
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Otero County

The CSP for Otero County is presented on Map 2-16. The CSP available in Otero County is relatively uniform and ranges from 6 to 7 kwh/sq.m/day. These data indicate that Otero County is well suited for development of CSP resources.

The PV for Otero County is presented on Map 2-17. The PV available in Otero County is a relatively uniform 5 to 6 kwh/sq.m/day. These data indicate that Otero County is well suited for development of PV resources.

Doña Ana County

The CSP for Doña Ana County is presented on Map 2-16. The CSP available in Doña Ana is relatively uniform and ranges from 6 to 7 kwh/sq.m/day. These data indicate that Doña Ana is well suited for development of CSP resources.

The PV for Doña Ana County also is presented on Map 2-17. These data indicate that Doña Ana County is well-suited for development of PV resources.

There is no reported activity on public land for the testing or exploitation of commercial-scale solar resources in the Planning Area.

Wind Energy

The report prepared by the USDOE and BLM identified the Planning Area as having a small total land area for high-potential wind power density (USDOE 2003). Wind energy is a renewable energy resource that has excellent potential for generating electricity in Sierra, Otero, and Doña Ana Counties. Wind resources are classified based on the wind power density at a location or area and is classified in units of watts per square meter of surface land area. Wind power also is dependent on the height of the wind turbine above ground level, and the standard of 50 meters (150 feet) is used for this study. Effective wind power classes range from lowest (Class 1) to highest (Class 7). Wind power is considered economic for large turbines (utilities-scale) at Class 4 and higher for short-term installation and operation and Class 3 and higher for long-term installation and operation, although a small non-commercial turbine can be used at Class 1.

The DOE and BLM survey of topographic and historical wind conditions has identified locations in the Planning Area where wind resources are available for development. The criteria for selecting those locations include the following:

- The wind resources are limited to areas in wind Class 3 and higher.
- The site is within 25 miles of transmission lines of 69 to 345 kV capacity.
- The site is within 50 miles of a major road or railroad.

The land use is compatible with BLM management of other resources.

A total of six wind power classes are present in the Planning Area (Map 2-18). The areas having the highest wind power class correspond to areas of higher elevation and higher relief as well as higher wind velocity. The higher classes of wind power occur at ridge crests where the local relief is greater than 1,000 feet.

Sierra County

Wind power classes range from Class 1 on the Rio Grande Valley and Jornada del Muerto Valley floors, and to Class 5 and Class 6 along the ridges of the Fra Cristobal and Black Ranges, the continental divide, and the Caballo and San Andres Mountains (refer to Map 2-18).

Otero County

Wind power classes range from Class 1 on the Tularosa Valley and Crow Flats (southeast portion of the county) to Class 5 and Class 6 along the ridges and highlands of the Sacramento and Guadalupe Mountains, and the higher elevations of Otero Mesa (refer to Map 2-18).

Doña Ana County

Wind power classes range from Class 1 on the Jornada del Muerto Valley and Tularosa Valley floors to Class 5 and Class 6 along the ridges of the Sierra de las Uvas, and the San Andres and Organ Mountains (refer to Map 2-18).

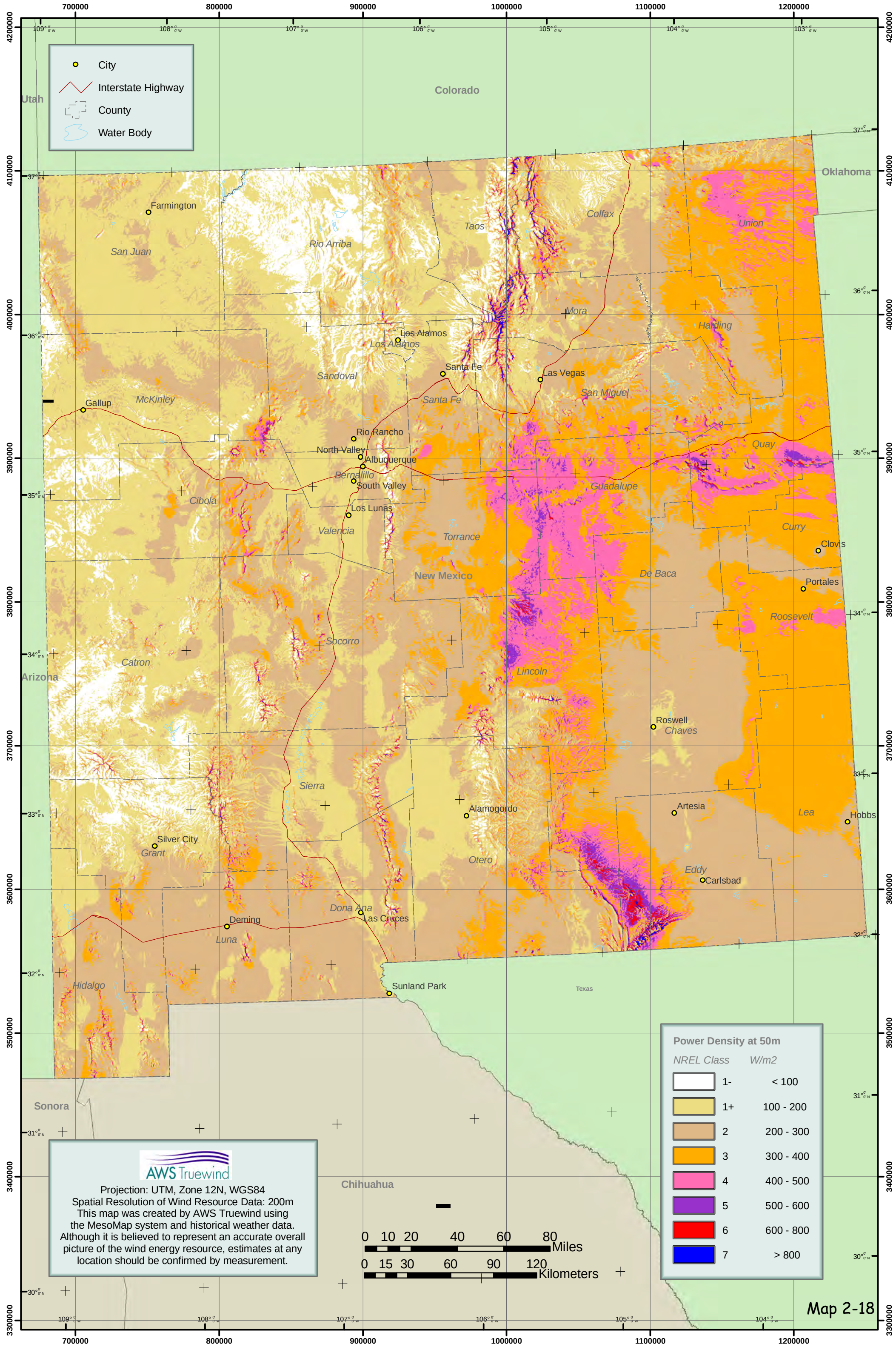
There are no commercial wind energy facilities in the Planning Area. The U.S. Army reportedly is planning a wind energy facility on Otero Mesa on the McGregor Range. No information was found on the proposed location of the facility. In January 2004, the BLM approved an Environmental Assessment for Seawest Wind Power to install and operate meteorological (MET) towers at two locations on Otero Mesa in eastern Otero County adjacent to McGregor Range. The MET stations will measure wind conditions as part of the process for siting a wind energy facility.

Biomass Energy

Biomass is material derived from trees, shrubs, plants, agricultural crops, agricultural or forestry residues, and other plant waste that can be burned or processed into fuel to produce energy. Biomass is a relatively untapped energy resource because there are few facilities to process and burn it. Substantial biomass material is placed in landfills or allowed to decompose unharvested in locations such as forests and scrubland. As the demand for biomass increases, fast-growing trees, shrubs, and grasses (so-called “energy crops”) will be grown to meet that demand and provide sustainable energy. In addition, collection and processing facilities will be constructed and use available biomass to produce electricity.

During a 2001 Biomass Technology meeting with the DOE and BLM, a new approach was offered to rate the biomass resources in a given area (DOE 2003). Areas are assessed for long-term sustainability to support biomass plants using satellite imagery. The assessment is based on the monthly Normalized Difference Vegetation Index (NDVI) developed by the National Aeronautics and Space Administration

Wind Power Density of New Mexico at 50 Meters



(NASA) for measurement of biomass using very high-resolution satellite data. The data have a resolution equivalent to an area of 64 square kilometers (25 square miles).

The monthly NDVI is calculated from the visible (VIS) and near-infrared (NIR) light reflected by vegetation. Vegetation appears very different at visible and near-infrared wavelengths. In visible light, vegetated areas are very dark while desert regions are light. At near-infrared wavelengths, the vegetation is brighter and deserts are about the same. The relative amount of vegetation is measured by comparing visible and infrared light. Healthy vegetation absorbs most of the visible light that hits it, and reflects a large portion of the near-infrared light. Unhealthy or sparse vegetation reflects more visible light and less near-infrared light. The formula for calculating the NDVI is NDVI = (NIR – VIS)/(NIR + VIS). Satellite images can be processed using this formula to calculate the NDVI for an area. Periodic images are used to calculate monthly NDVI values. Variables such as time of year and climate play important roles in data interpretation.

The report prepared by the DOE and BLM identified the Planning Area as having a fair biomass potential (DOE 2003). The biomass screening process used satellite data collected during 2000 to identify locations for biomass resources, and included these criteria:

- The NDVI was 0.4 or greater for at least 4 months between April and September 2000.
- The terrain slope is less than 12 percent.
- The site is within 50 miles of a town with at least 100 people.
- The land use is compatible with BLM management of other resources.

Sierra County

The NDVI for Sierra County is presented on Map 2-19. The different color schemes display (1) the Federal agency responsible for surface estate management (either the U.S. Forest Service, BIA, or the BLM) and (2) the number of months that the area has an NDVI greater than or equal to 0.4 between April and September 2000. Areas not surveyed or withdrawn from designation for this resource are displayed in white on Map 2-19. The NDVI indicates biomass resources are available at least 6 months in the forested areas of the Black Range and at least 4 months in a small scrubland area east of Lake Valley. These data indicate that Sierra County has a low capacity for development of biomass resources.

Otero County

The NDVI for Otero County is presented on Map 2-19. The NDVI indicates biomass resources are available at least 6 months in large forested areas of the Sacramento Mountains and at least 4 to 5 months on the scrubland slopes and lower elevations of the Sacramento Mountains. These data indicate that Otero County has moderate capacity for development of biomass resources.

Doña Ana County

The NDVI for Doña Ana County is presented on Map 2-19. The NDVI indicates biomass resources are available at least 4 to 6 months on a small area of East Mesa near Las Cruces. These data indicate that Doña Ana County has low capacity for development of biomass resources.

2.2.3.2 Forecast

Solar

The future development and use of the abundant solar resources in the Planning Area will be driven primarily by cost of solar technology. Those costs will continue to decrease as improvements to the technology make solar collection equipment more efficient, as mass production decreases the unit cost for solar equipment, and as the cost of nonrenewable energy resources increase. Under current management there will be more opportunities to develop solar energy resources in the Planning Area as solar technology becomes competitive with nonrenewable energy resources.

Wind

The future use of wind resources in the Planning Area will depend on the cost to install and operate wind farms on the mountain ranges classified as suitable for wind energy development. Under current management, continued technological advances are anticipated to decrease the unit costs for wind turbines and make wind energy facilities economically competitive with nonrenewable resources. However, requests for right-of-way permits to install wind farms on mountain ridges may encounter stipulations for management of other resources such as wildlife or visual resources.

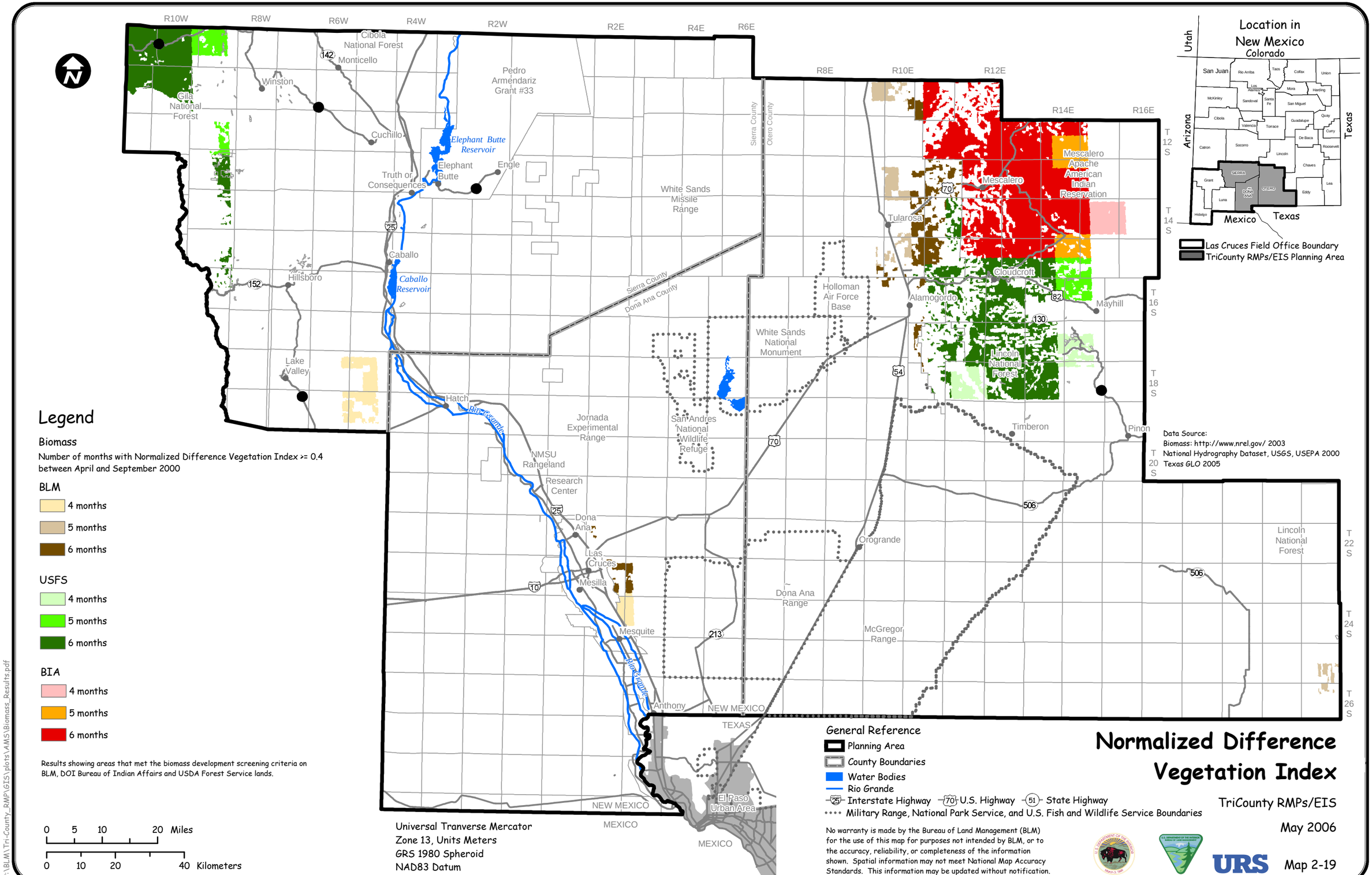
Biomass

The forecast for biomass resources anticipates that the demand for biomass energy will increase as the cost of nonrenewable energy resources increase. As the development and use of biomass resources becomes economically viable, new biomass energy facilities will be constructed to process and burn biomass. This will result in more harvesting of biomass resources, particularly in forested areas that have not been thinned or cleared of downed tree limbs and underbrush. Under current management, there will be more opportunities to develop biomass resources in the Planning Area as biomass energy resources become competitive with nonrenewable energy resources.

2.2.3.3 Key Features

Solar

The Planning Area is ideally located for development of both CSP and PV solar energy resources. Based on the ability of CSP and PV solar energy collectors to generate electricity at 6 kwh/sq.m/day or greater, much of the Planning Area has high potential for solar energy resource development and use.



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Wind

The areas having the highest wind resource classifications in the Planning Area (Class 4 through Class 6) are the crests and eastern slopes of the mountain ranges. Wind turbines would efficiently generate electricity at these locations because the wind is unimpeded by topographic obstructions.

Biomass

The forested areas within the Planning Area contain adequate biomass resources for energy production. The Gila National Forest in the mountainous Black Range of western Sierra County has an NDVI of 5 to 6 months. In northern Otero County, the forested Sacramento Mountains in Lincoln National Forest have an NDVI of 5 to 6 months. These areas can provide sustainable biomass for energy production.

2.2.4 Recreation

2.2.4.1 Current Use

Recreation Opportunities in the Planning Area

The TriCounty Planning Area offers a wide variety of recreational opportunities in diverse natural settings, including the Rio Grande River, mountain ranges, lakes, sand dunes, and forests. Public recreational opportunities located in south-central New Mexico occur on lands managed by U.S. Forest Service, BLM, Mescalero Apache Tribe, NMDGF and counties and cities. Recreation activities within the Planning Area include hiking, sightseeing, fishing, boating, scenic driving, wildlife viewing, hunting, boating, swimming, caving, picnicking, camping, and OHV use.

In addition to BLM-administered lands, regional attractions that provide recreational opportunities include the White Sands National Monument; New Mexico State Parks including Caballo Lake, Elephant Butte, Oliver Lee Memorial State Park, Leasburg Dam, and Percha Dam; and the Gila, Cibola, and Lincoln National Forests. Byways within the Planning Area that have been established by the State of New Mexico include the El Camino Real Scenic and Historic Byway, Geronimo Trail Scenic Byway, and Sunspot Scenic Byway (New Mexico Tourism Department 2005).

White Sands National Monument is a 144,000-acre park, within Otero and Doña Ana Counties (Map 2-20) managed by the National Park Service (USDI, NPS 2001). The park contains the world's largest gypsum dune field and is one of the most popular national parks in the southwestern United States (USDI, NPS 2001). Recreation opportunities provided by the park include picnicking facilities, hiking trails, ranger-guided activities, and primitive backcountry camping (USDI, NPS 2001).

Caballo Lake State Park is located south of Truth or Consequences in Sierra County and is managed by the State Parks Division of the NMEMNRD on lands leased from the Bureau of Reclamation. The park offers water-based recreation activities including swimming, water skiing, fishing, jet skiing, and windsurfing. Developed amenities include a visitor center, group picnic shelter, marina, playground, restrooms and showers, and campgrounds (NMEMNRD, New Mexico State Parks 2005b).

Elephant Butte Lake State Park is located north of Truth or Consequences in Sierra County and is managed by NMEMNRD on lands leased from the BOR. The park is characterized as having great views of the landscape and night sky. The primary recreation focus is water-based, and the area offers opportunities for fishing, boating, water skiing, and swimming, as well as other recreation uses such as hiking, biking, bird watching, and natural and cultural resources education. Park facilities include developed recreation areas such as campgrounds, day use areas for picnicking, a visitors center, and over 4.5 miles of trails for hiking (NMEMNR, New Mexico State Parks2005b).

Oliver Lee Memorial State Park is located south of Alamogordo in Otero County and is managed by NMEMNRD. Park facilities include campground, visitor center, three trails (including one interpretive trail), and the Oliver Lee Ranch House. Popular recreation activities at the park include viewing wildlife and bird watching within the riparian ecosystems (NMEMNRD 2000).

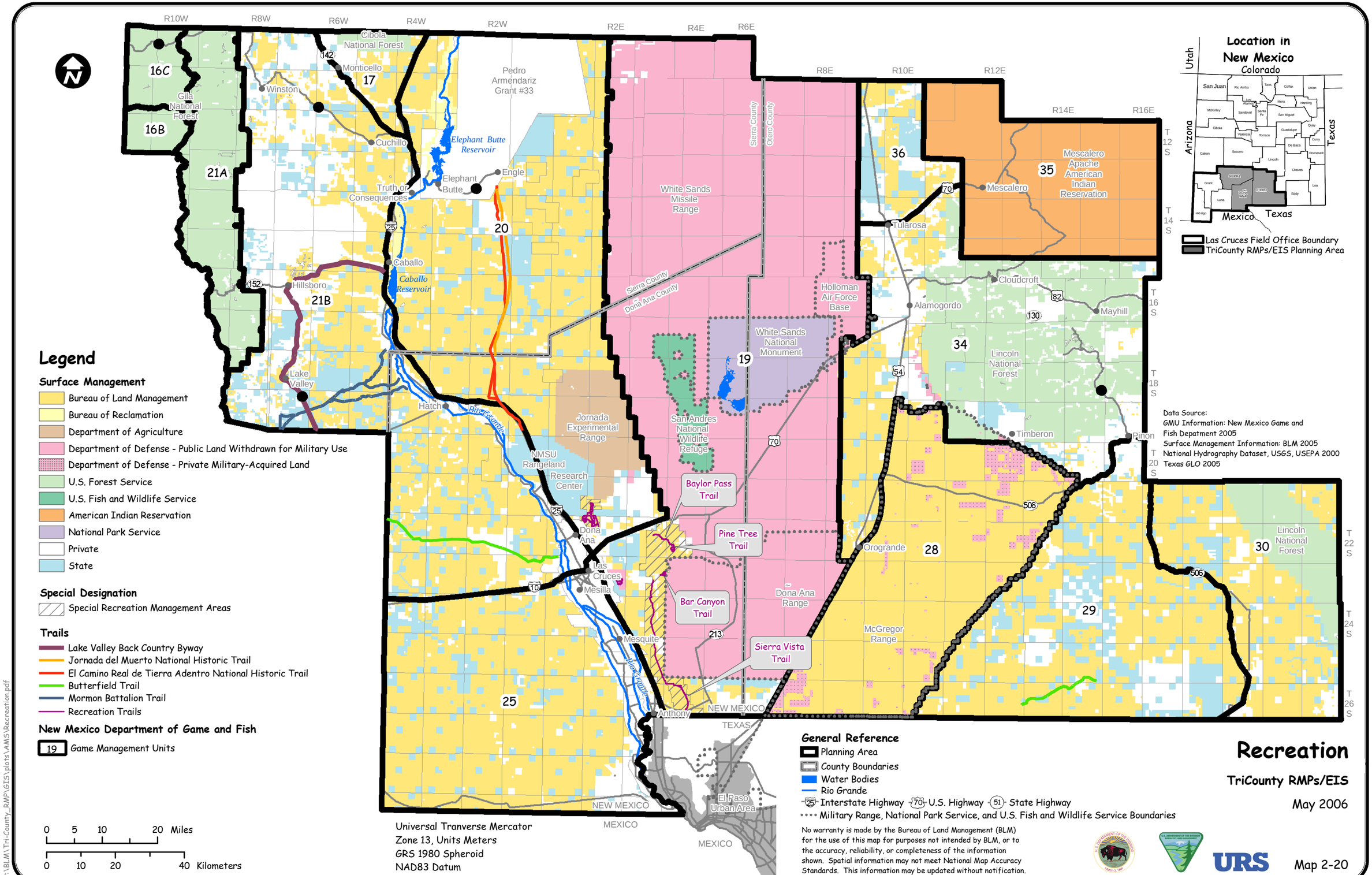
Leasburg Dam State Park is located north of Las Cruces in Doña Ana County and is managed by NMEMNRD. The park includes Broad Canyon and the Mesilla Valley Nature Center. The primary recreation activities include picnicking, hiking, camping (developed and primitive) bicycling, and night-sky viewing. Two-day use areas located along the Rio Grande River also provide opportunities for fishing, swimming, and canoeing (NMEMNRD 2003a).

Percha Dam State Park is located south of Truth or Consequences in Sierra County and is managed by State Parks. The park offers bird walks, birding classes, and demonstrations. Other recreational opportunities include fishing, picnicking, hiking and camping (NMEMNRD, New Mexico State Parks 2005b).

Gila National Forest is located west of Truth or Consequences in Sierra, Grant, and Catron Counties, New Mexico, and extends into Arizona. The forest is managed by the U.S. Forest Service, Black Range Ranger District. The district lies within the easternmost portion of the Gila National Forest in western Sierra County, and offers many dispersed recreation opportunities including hiking and camping. Developed areas include two designated campgrounds and approximately 263 miles of trails, including a portion of the Continental Divide National Scenic Trail. The majority of trails are in the Aldo Leopold Wilderness, which is located outside the Planning Area. In addition, a large portion of the Geronimo Trail Scenic Byway traverses the District (USDA, U.S. Forest Service 1986).

Cibola National Forest is located north of Cuchillo in Sierra County and is managed by the U.S. Forest Service. A portion of the forest is located in the Planning Area, but the majority is located in Socorro County. Recreational activities in the Magdalena Ranger District, which lies mostly in Socorro County, include hiking, camping, rock climbing, horseback riding, mountain biking, hunting, and four-wheeling. The district has five small developed campgrounds, but recreational activities typically are dispersed within primitive areas, accessed by about 190 miles of trails located throughout the district, primarily in the Magdalena and San Mateo Mountains (USDA, U.S. Forest Service 1985).

Lincoln National Forest is located north and east of McGregor Range in Otero County and is managed by the U.S. Forest Service. The Guadalupe Ranger District is located in southeastern Otero County and the


Legend
Surface Management
Bureau of Land Management
Bureau of Reclamation
Department of Agriculture
Department of Defense - Public Land Withdrawn for Military Use
Department of Defense - Private Military-Acquired Land
U.S. Forest Service
U.S. Fish and Wildlife Service
American Indian Reservation
National Park Service
Private
State
Special Designation
Special Recreation Management Areas
Trails
Lake Valley Back Country Byway
Jornada del Muerto National Historic Trail
El Camino Real de Tierra Adentro National Historic Trail
Butterfield Trail
Mormon Battalion Trail
Recreation Trails
New Mexico Department of Game and Fish
19 Game Management Units
0 5 10 20 Miles
0 10 20 40 Kilometers
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
Location in New Mexico
Las Cruces Field Office Boundary
TriCounty RMPs/EIS Planning Area
Data Source:
GMU Information: New Mexico Game and Fish Depatment 2005
Surface Management Information: BLM 2005
National Hydrography Dataset, USGS, USEPA 2000
Texas GLO 2005
General Reference
Planning Area
County Boundaries
Water Bodies
Rio Grande
Interstate Highway
U.S. Highway
State Highway
Military Range, National Park Service, and U.S. Fish and Wildlife Service Boundaries
No warranty is made by the Bureau of Land Management (BLM) for the use of this map for purposes not intended by BLM, or to the accuracy, reliability, or completeness of the information shown. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.
Recreation
TriCounty RMPs/EIS
May 2006
URS
Map 2-20
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Sacramento Ranger District is located in eastern Otero County, just east of Alamogordo. Dispersed camping is available in both Districts, but the majority of the developed campgrounds are located in the Sacramento Ranger District. Recreation activities in both districts include fishing, caving, and sightseeing, along with numerous opportunities for hiking, horseback riding, bicycling and OHV use. In winter, skiing (both downhill and cross-country) and snow play are common activities in the Sacramento Ranger District, near Cloudcroft. Scenic vista points are located along the Sunspot Scenic Road, which traverses the Sacramento Ranger District (USDA, U.S. Forest Service 1988).

The southern section of the El Camino Real Scenic and Historic Byway follows the Rio Grande River from the United States-Mexico border near Anthony to Santa Fe. The byway can be accessed from Interstate 25 and provides miles of sightseeing opportunities (U.S. Department of Transportation [USDOT] 2005). Many recreational areas within south-central New Mexico are accessible from the route.

The Geronimo Trail Scenic Byway is located in northwestern Sierra County and is managed by the Sierra County Historical Society. The trail offers scenic views of natural features, such as mountains and lakes, and provides opportunities for recreation on dispersed sites and sites developed with recreational facilities (New Mexico Tourism Department 2005). In addition, a Geronimo Springs museum is located along the byway and offers an interpretive visitor center.

Sunspot Scenic Byway is located south of Cloudcroft in Otero County and is managed by the New Mexico Department of Transportation. The byway is a 15-mile paved road that is designated as New Mexico 6563. The byway traverses the front rim of the Sacramento Mountains offering the traveler a variety of scenic opportunities and spectacular views of the Tularosa Basin and the sand dunes of the White Sands National Monument (New Mexico Department of Tourism 2005).

Recreation Opportunities in the Decision Area

Within the TriCounty Decision Area, *developed recreation* is centralized in recreation sites, campgrounds, and picnic areas, and *dispersed recreation* (e.g., recreational shooting [refer to section 2.4.2.2, Recreational Shooting and Hunting, for current conditions], camping, etc.) occurs over large areas encompassing most of the land, independent of developed facilities (USDI, BLM 1993a). The recreation setting ranges from areas with primitive, undisturbed characteristics in remote locations to modified and easily accessible natural areas near metropolitan areas.

In 2004, a BLM visitor survey study was conducted by the University of Idaho to determine visitor satisfaction associated with experiences on BLM lands. One of the 18 study sites was the Las Cruces District Office. The most commonly listed recreational activities at the selected study sites included camping, sightseeing, hiking and fishing. Overall, day trips accounted for most of the time spent visiting BLM lands, and accounted for 51 percent of all visits. Approximately 63 percent of visitors indicated a preference for more educational and interpretive material about the area (University of Idaho 2004).

A review of comments provided during the TriCounty scoping period indicated that the public enjoys a wide variety of activities on public lands in the Planning Area, including nonmotorized activities such as hiking, bird watching, wildlife viewing, horseback riding, and visits to areas that provide solitude, as well

as motorized activities. A majority of the comments expressed appreciation of the existing recreational opportunities on public lands, and a desire that additional recreational opportunities would be established (refer to Chapter 7 for more information regarding scoping).

The following sections describe OHV use, hunting, developed recreation sites, nonmotorized trails, special recreation management areas, and special recreation permits within Sierra and Otero Counties and Doña Ana County.

Sierra and Otero Counties

In general, dispersed and developed recreation opportunities exist on BLM-administered lands within Sierra and Otero Counties. Dispersed opportunities include wildlife viewing, sightseeing, rockhounding, rock climbing, horseback riding, hiking, and primitive camping. Two of the more popular undeveloped activities are OHV use and hunting.

OHV Use – OHV use occurs throughout the Planning Area and can be characterized as either a method of transportation or as a direct recreational use. As transportation, OHVs are used to transport recreationists, particularly hunters, to recreation sites. OHV use is subject to three designations on public land—areas open to OHV use, areas where OHV use is limited (to roads and trails), and areas closed to all OHV use. OHV use designations can vary in stipulations as either spatial or temporal restrictions. Refer to Section 2.2.6, Transportation and Access for information regarding the OHV area designations within the Decision Area. The second category, OHV as a recreation use, includes motorcycle races and hill climbing.

Areas not designated as limited or closed are considered open for OHV use. OHV use occurs near the population centers of Truth or Consequences and Alamogordo (USDI, BLM 2003b). Considerable OHV use occurs in the area known as Red Sands. This is approximately a 10-mile-by-10-mile area on the west side of Highway 54, midway between Alamogordo and Orogrande. An annual endurance race, the Tarantula 100, normally draws between 150 and 200 contestants from several states (USDI, BLM 2003b).

Hunting – Hunting within Sierra and Otero Counties is largely for small game and birds (waterfowl and upland game species) such as ducks, geese, dove, and quail; however, big game hunts also occur on Decision Area lands. Table 2-61 on the top of the next lists the most common upland species hunted and harvested and the projected number of hunters, based on small game harvest surveys provided by the NMDGF.

NMDGF manages big game hunting within New Mexico by dividing the State into game management units (GMUs) and antelope management units (AMUs). GMUs 16B, 16C, 17, 19, 20, 21A, 21B, 28, 29, 30, 34, 35, and 36, and AMUs 17, 19, 21, 29, 30, and 35 are located within Sierra and Otero Counties (refer to Map 2-20). AMUs were not mapped due to a lack of spatial data. Some of the GMUs and AMUs extend beyond the Planning Area. The primary big game species hunted within these GMUs include elk, deer, antelope, javelina, barbary sheep, oryx, bear, cougar, and turkey. Other species hunted within the GMUs may include: raccoon, badger, weasel, fox, ringtail, bobcats, muskrats, beaver, nutria, coyote, and skunk.

Table 2-61
Projected Number of Hunters and Number of Harvests for Upland Game Species in Sierra and Otero Counties

County	Game Species	NMGF Game Harvest Survey Year				
		1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
Sierra	***Projected Number of Hunters***					
	Abert's squirrel	30	34	206*	77	91
	Band tailed pigeon	0	10	0	33	0
	Blue grouse	0	0	0	0	17
	Gambel's quail	397*	273*	901*	1,025*	653*
	Montezuma quail	63	42	142	71	112
	Mourning dove	222*	288*	749*	820*	717*
	Pheasant	0	0	0	15	17
	Red squirrel	0	18	64	38	31
	Sandhill crane	11	0	0	0	0
	Scaled quail	326*	269*	678*	632*	531*
	White-winged dove	13	71	223*	360*	183*
	Harvests					
	Abert's squirrel	24	173	824	44	117
	Blue grouse	0	0	0	0	35
	Gambel's quail	2,952	2,810	7,176	1,362	2,201
	Montezuma quail	203	140	272	8	34
	Mourning dove	2,724	3,716	11,349	4,722	3,549
	Pheasant	0	0	0	21	6
	Red squirrel	0	33	219	0	16
	Sandhill crane	0	0	3,470	0	0
	Scaled quail	2,093	1,423	0	693	812
	White-winged dove	32	910	1,512	591	668
Otero	***Projected Number of Hunters***					
	Band-tailed pigeon	30	21	48	151	52
	Gambel's quail	247*	374*	451*	376*	408*
	Montezuma quail	11	18	51	18	33
	Mourning Dove	329*	532*	503*	392*	552*
	Northern bobwhite	0	0	0	15	0
	Pheasant	0	10	60	0	0
	Red squirrel	104	73	119	78	111
	Scaled quail	364*	419*	528*	322*	383*
	White-winged dove	115	108	176	126	160*
	Harvests					
	Band-tailed pigeon	70	50	145	196	38
	Gambel's quail	2,631	2,211	2,655	667	889
	Montezuma quail	0	0	30	3	39
	Mourning dove	9,575	13,205	6,310	2,199	2953
	Pheasant	0	0	147	0	0
	Red squirrel	685	309	1,604	237	402
	Sandhill crane	0	0	3,692	0	0
	Scaled quail	1,900	3,083	0	851	1,059
	White-winged dove	1,077	857	1,679	836	421

SOURCE: Mitchusson 2005
NOTES: (*) Denotes a statistical estimate that is significantly different from zero at the 5 percent level.

Developed Recreational Sites – Developed recreational sites in the Decision Area within Sierra and Otero Counties are limited to the Three Rivers Petroglyph Site ACEC and the Lake Valley Back Country Byway. However, various nonmotorized trails exist throughout the Decision Area for recreational uses such as hiking, biking, and horseback riding, among others.

The Three Rivers Petroglyph Site ACEC is located 17 miles north of Tularosa in Otero County. The site includes rock art and a Jornada Mogollon "pithouse village," and was made a recreation area in 1962. Facilities include a gravel parking lot, picnic shades, restroom, an interpretive trail through the petroglyphs, and an interpretive trail through the pithouse village. A cultural resource management plan was completed for the site in April 1992. The site is on the State Register of Cultural Properties and is eligible for the National Register of Historic Places (USDI, BLM 1997b).

The Lake Valley Back Country Byway is a paved two-lane highway spanning about 48 miles, with a point of origin located in southwestern Sierra County about 18 miles south of Truth or Consequences on I-25. It follows along New Mexico State Routes 152 and 27, and provides scenic views (e.g., mountain ranges and historic mining towns) through the towns of Hillsboro and Lake Valley. Recreation opportunities include wildlife viewing (mule deer, antelope, quail, roadrunners, red-tailed hawk), and scenic views of riparian habitats and several mountain ranges (USDI, BLM undated). The Lake Valley Historic Townsite is located along the byway and is open for visitation daily. The schoolhouse within the townsite has been restored to contain much of the original artifacts and furniture (USDI, BLM 2003b).

Table 2-62 shows the visitor use data for the Three Rivers Petroglyph Site and the Lake Valley Historic Townsite.

Table 2-62
Visitor-Use Data for Three Rivers Petroglyph Site and Lake Valley Historic Townsite

Fiscal Year	Three Rivers Petroglyph Site (visitors)	Three Rivers Petroglyph Site (revenue from visitors)	Lake Valley Historic Townsite (visitors)[a]
2000	22,223	$11,209	1,868
2001	20,238	$12,396	2,050
2002	18,663	$12,119	1,906
2003	18,511	$12,389	2,000
2004	18,824	$12,892	2,240

SOURCE: Sanchez 2005
NOTE: [a] No fee is required for visitors at the historic townsite.

Nonmotorized Trails – Nonmotorized trails in Sierra and Otero Counties include the El Camino Real de Tierra Adentro National Historic Trail, Jornada del Muerto National Historic Trail (which is a segment of the El Camino Trail that diverges for about 100 miles along the Rio Grande), Mormon Battalion Trail, and Butterfield Trail (refer to Map 2-20). Jornada del Muerto National Historic Trail runs north to south and parallels the El Camino Real de Tierra Adentro National Historic Trail in Sierra County. The Mormon Battalion Trail runs northeasterly and is located in southwestern Sierra County. A segment of the Butterfield Trail runs east to west and is located near the Alamo Mountain ACEC and the Cornudas Mountain ACEC in southern Otero County.

The El Camino Real de Tierra Adentro National Historic Trail passes through central Sierra County; however, BLM has not developed recreation areas associated with the trail in Sierra County. Refer to the Doña Ana County discussion for more information on developed recreation areas along the trail.

Special Recreation Management Areas (SRMAs) – No SRMAs exist within Sierra and Otero Counties; however, ACECs, WSAs, historic trails, and back county byways provide a diversity of recreation opportunities in dispersed areas within these counties. Table 2-63 shows the various recreational opportunities offered on BLM lands within the special management areas in Sierra and Otero Counties.

Table 2-63
Recreational Opportunities within Special Management Areas in Sierra and Otero Counties

Special Management Area	Wildlife Viewing	Sightseeing/Photography	Rockhounding	Geologic Features/ Sightseeing	Historic/Cultural Sightseeing	Bouldering/Rock Climbing	Horseback Riding	Hiking	Developed Camping	Primitive Camping	Big Game Hunting	Small Game Hunting	Mountain Biking	Developed Picnicking	Extreme Four-Wheel Drive
Alamo Mountain ACEC, Otero County	X	X		X	X			X		X	X	X			
Alkali Lakes ACEC, Otero County	X	X		X											
Brokeoff Mountains WSA, Otero County	X	X		X				X		X	X	X			
Cornudas Mountain ACEC, Otero County	X	X		X	X			X		X	X	X			
Cuchillo Mountains Piñon Nut Collection Area, Sierra County	X	X					X	X		X	X	X			
El Camino Real De Tierra Adentro National Historic Trail, Sierra and Doña Ana Counties					X										
Guadalupe Escarpment WSA, Otero County	X	X		X				X		X	X	X			
Jornada del Muerto National Historic Trail, Sierra County					X		X								
Jornada del Muerto WSA, Sierra and Socorro Counties	X	X		X			X	X		X	X	X			
Lakevalley Back Country Byway, Sierra County	X	X	X	X	X										
Mormon Batallion Trail, Sierra and Doña Ana Counties					X										
Sacramento Escarpment WSA, Otero County	X	X		X				X		X	X	X			
Sacramento Escarpment ACEC, Otero County	X	X		X				X		X	X	X			
Three Rivers Petroglyph ACEC, Otero County	X	X		X	X			X	X					X	
Wind Mountain ACEC, Otero County	X	X		X	X			X		X	X	X			

SOURCE: Hakkila 2005b
NOTES: SRMA = special recreation management area
ACEC = area of critical environmental concern
WSA = wilderness study area
OHV = off-highway vehicle

Special Recreation Permits – The Las Cruces District Office has issued three special recreation permits for outfitters that cover the entire area managed by the Las Cruces District Office (i.e., Hidalgo, Luna, Grant, Sierra, Otero, and Doña Ana Counties): Dennis Kauffman (expires March 2007), Down Home Outfitters (expires December 2005), and Back Country Hunts (expires December 2005).

Apart from the special recreation permits issued for the six-county Las Cruces District Office area, there are no other permits within Sierra County. There are two additional special recreation permits within Otero County: Tarantula 100 (expires March 2007) and the New Mexico Space History Shuttle Camp (expires September 2007).

Doña Ana County

In general, there are opportunities for recreation on both developed and dispersed sites on BLM-administered lands within Doña Ana County. According to the Mimbres RMP, BLM-administered land provides 47 percent of the dispersed recreational opportunities that are available within the county (USDI, BLM 1993a). Dispersed opportunities include wildlife viewing, sightseeing, rockhounding, rock climbing, horseback riding, hiking, and primitive camping. Two of the more popular undeveloped activities are OHV use and hunting.

OHV Use – Generally, OHV use is most prominent near populated cities (e.g., Las Cruces). The majority of OHV use within Doña Ana County occurs near the Las Cruces boundary. The southern Robledo Mountains have a system of moderate to extreme four-wheel drive (rock crawling) routes adjacent to Las Cruces. These trails are used for the annual Chile Challenge event. The area is designated as limited to existing roads and trails, as is most of Doña Ana County. There is a growing network of all-terrain and other vehicle trails radiating out from the City of Las Cruces, the Mesilla Valley, and the Village of Hatch.

Hunting – Hunting within Doña Ana County is largely for small game and birds (waterfowl and upland game species) such as ducks, geese, dove, and quail. Table 2-64 lists the most common upland species hunted and harvested and the projected number of hunters, based on small game harvest surveys provided by the NMDGF.

Table 2-64
Projected Number of Hunters and Number of Harvests for Upland Game Species in Doña Ana County

Game Species	NMGF Game Harvest Survey Year				
	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
Projected Number of Hunters					
Band tailed pigeon	0	8	22	20	34
Blue grouse	0	0	0	0	17
Gambel's quail	970*	1,127*	1,743*	1,912*	1,424*
Montezuma quail	45	42	60	286*	132
Mourning dove	1,796*	1,812*	3,332*	4,310*	3,669*
Northern bobwhite	15	0	0	0	0
Pheasant	38	16	14	0	135
Sandhill crane	0	0	0	39	0
Scaled quail	1,150*	1,257*	1,833*	2,134*	1,474*
White-winged dove	747*	835*	1,673	2,375	1,930*

Game Species	NMGF Game Harvest Survey Year				
	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
Harvests					
Band tailed pigeon	0		9	0	46
Gambel's quail	9,236		13,175	4,367	2,642
Montezuma quail	41		0	132	28
Mourning dove	46,779		74,838	44,283	32,044
Pheasant	40		98	0	112
Scaled quail	11,476		12,538	3,195	1,866
White-winged dove	6,204		26,393	13,044	13,518

SOURCE: Mitchusson 2005
NOTES: *Denotes a statistical estimate that is significantly different from zero at the 5 percent level.

NMDGF GMUs 19, 20, 21B, and 25, and AMUs 15, 17, 19, and 22 are located within Doña Ana County (refer to Map 2-20); AMUs were not mapped due to a lack of spatial data. Some of the GMUs and AMUs extend beyond the Planning Area. Primary game species hunted within the GMUs of Doña Ana County include elk, deer, antelope, javelina, barbary sheep, oryx, bear, cougar, and turkey. Other species hunted within the GMUs may include: raccoon, badger, weasel, fox, ringtail, bobcats, muskrats, beaver, nutria, coyote, and skunk.

Developed Recreation Sites – Recreation on developed sites within the Doña Ana County portion of the Decision Area is limited to the Aguirre Spring Campground and the Dripping Springs Natural Area, both within the Organ Mountains SRMA. However, various nonmotorized trails exist throughout the Decision Area for hiking, biking, horseback riding, and other recreational activities.

The Aguirre Spring Recreation Area, located east of Las Cruces in the Organ Mountains SRMA, has 57 camping/picnicking areas. Several trails within the Organ Mountains originate at the Aguirre Spring Campground, including two trails that are part of the National Recreational Trails System: the 6-mile Baylor Pass Trail and the 4.5-mile Pine Tree Trail.

The 2,852-acre Dripping Springs Natural Area is managed by BLM. The area features sheer canyons with permanent water sources and biologically diverse natural habitats (TNC 2004). Natural water sources provide unique environments that support flora such as velvet ash, net leaf hackberry, the endangered Organ Mountain evening primrose and fauna such as red-naped sapsuckers, prairie falcons, and canyon wrens (TNC 2004). Dripping Springs is a day-use area; it contains a visitor center, picnic area, and 4 miles of trails that are part of the National Recreation Trail System. The area does not provide for hunting activities.

La Cueva Picnic Area and the A.B. Cox Visitor Center both provide access trails to the Dripping Springs Natural Area in addition to several other hiking trails in the area. The La Cueva Picnic Area includes 23 picnicking sites and one group site.

Table 2-65 shows the visitor use data and the revenue gained for the Aguirre Spring Recreation Area and the Dripping Springs Natural Area.

Table 2-65
Visitor Use And Revenue Data for Aguirre Spring Recreation Area and Dripping Springs Natural Area

Fiscal Year	Aguirre Spring Recreation Area (visitors)	Aguirre Spring Recreation Area (revenue from visitors)	Dripping Springs Natural Area (visitors)	Dripping Springs Natural Area (revenue from visitors)
2000	59,950	$29,223	22,972	$17,924
2001	54,550	$21,375	22,118	$19,500
2002	54,139	$21,156	21,644	$17,484
2003	55,294	$23,015	21,260	$18,110
2004	58,891	$27,729	22,084	$20,418

SOURCE: Sanchez 2005

Nonmotorized Trails – Nonmotorized trails in Doña Ana County include the El Camino Real de Tierra Adentro National Historic Trail, Mormon Battalion Trail, Butterfield Trail, and other recreation trails (refer to Map 2-20). The Mormon Battalion Trail runs northeasterly and is located in southwestern Sierra County and a small portion of northwestern Doña Ana County. A segment of the Butterfield Trail runs east-west and is located north of I-10 in Doña Ana County. General recreation trails in Doña Ana County are located in the Organ/Franklin Mountains ACEC, Doña Ana Mountains ACEC, and the Tortugas Mountain.

Special Recreation Management Areas – The two SRMAs within Doña Ana County—the Organ/Franklin Mountains SRMA and the Doña Ana Mountains SRMA—provide opportunities for camping, hiking, and picnicking. The Organ/Franklin Mountains SRMA includes the two developed recreation sites (Aguirre Spring Campground and the Dripping Springs Natural Area) as well as various other hiking trails and primitive recreational opportunities.

The Doña Ana Mountains SRMA, located north of Las Cruces near the southeastern portion of the New Mexico State University Rangeland Research Center, lies in proximity to the City of Las Cruces. The SRMA boundary includes and extends beyond the Doña Ana Mountains ACEC boundary. The ACEC is managed for protection of biological, scenic and cultural values; however, recreational activities occur across the SRMA including the areas within the ACEC.

Table 2-66 shows the types of recreational opportunities that exist within special management areas in Doña Ana County.

Special Recreation Permit – In addition to the special recreation permits issued for use of public land managed by the Las Cruces District Office, BLM has issued nine other special recreation permits for lands within Doña Ana County. The permittees are as follows:

- Southern New Mexico Endurance Rides (expired May 2005, anticipated to be renewed after proponent submits for renewal)
- St. Luke's Charity Rides (expired May 2005, anticipated to be renewed after proponent submits for renewal)
- Border 100 (expires December 2005)

Table 2-66
Recreational Opportunities within Special Management Areas in Doña Ana County

Special Management Area	Wildlife Viewing	Sightseeing/Photography	Rockhounding	Geologic Features/ Sightseeing	Historic/Cultural Sightseeing	Bouldering/Rock Climbing	Horseback Riding	Hiking	Developed Camping	Primitive Camping	Big Game Hunting	Small Game Hunting	Mountain Biking	Developed Picnicking	Extreme Four- Wheel Drive
Aden Lava Flow RNA, Doña Ana County	X	X		X			X	X		X	X	X			
Butterfield Trail, Doña Ana County					X										
Doña Ana Mountains ACEC and SRMA, Doña Ana County	X	X		X		X	X	X		X	X	X	X		
El Camino Real De Tierra Adentro NHT, Sierra and Doña Ana Counties					X										
Kilbourne Hole NNL, Doña Ana County		X	X	X				X		X		X			X
Mormon Batallion Trail, Sierra and Doña Ana Counties					X										
Organ/Franklin Mountains ACEC and SRMA, Doña Ana County	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Organ Mountains WSA, Doña Ana County	X	X		X	X	X	X	X		X	X	X			
Organ Needles WSA, Doña Ana County	X	X		X	X	X		X		X	X	X			
Peña Blanca WSA, Doña Ana County	X	X		X	X		X	X		X	X	X			
Rincon Petroglyphs ACEC, Doña Ana County					X										
Robledo Mountains ACEC, Doña Ana County	X	X	X	X			X	X		X	X	X			
Robledo Mountains OHV Area, Doña Ana County	X	X	X	X			X	X		X	X	X	X		X
Robledo Mountains WSA, Doña Ana County	X	X	X	X				X		X	X	X			
San Diego Mountain ACEC, Doña Ana County (Proprietary)				X	X										X
Sierra de Las Uvas WSA, Doña Ana County	X	X		X			X	X		X	X	X			
West Potrillo Mountains/ Mount. Riley WSA, Doña Ana County	X	X		X			X	X		X	X	X			

SOURCE: Hakkila 2005b
NOTES: SRMA = special recreation management area
ACEC = area of critical environmental concern
OHV = off-highway vehicle
NNL = national natural landmark

- Corralitos 100 (expires December 2005)
- Baylor Pass Run (expires November 2006)
- Chile Challenge (expired February 2005, anticipated to be renewed after proponent submits for renewal)
- Doña Ana Mountain Bike Race (expires September 2005, anticipated to be renewed after proponent submits for renewal)
- Southwest Expeditions (expires December 2005)
- Tripoli Rocketry Association Inc. (expires December 2005)

Emerging Recreational Uses

Letterboxing is an outdoor game for global positioning system (GPS) users. It combines elements of hiking, treasure hunting, and creative expression. Participants seek out hidden letterboxes by following clues posted on the Internet, and then record their discovery in their personal journal with the help of a rubber stamp that's part of the letterbox (Silent 2002). Letterboxing occurs on the Decision Area near populated areas within the Planning Area.

Paintball is a war game played with guns that have been calibrated to safely shoot a water-soluble paint pellet at an opposing team. This recreation use occurs on Decision Area lands; however, the BLM requires a special recreation permit to ensure the natural resources are not in conflict with the use.

Rockcrawling is the use of modified four-wheel-drive vehicles for slow-speed challenging climbs of steep inclines, usually by a group of recreationists. Rockcrawling is known to occur in the southern Robledo Mountains, between Picacho Peak and the Robledo Mountains WSA/ACEC. The use also occurs near the Broad Canyon area located in the vicinity of Las Cruces.

Geocaching is an outdoor game for GPS users similar to letterboxing. BLM management policy has been established for geocaching. Instruction Memorandums Nos. 2002-017 and 2003-182 allow for geocaching to continue so long as it is not a commercial endeavor; the activity complies with land use decisions and designations; it does not award cash prizes; is not publicly advertised; poses minimal risk for damage to public land or related water resource values; and generally requires no monitoring. As use increases or becomes a management issue in a particular area, the Instruction Memorandums establish minimum steps that should be taken (USDI, BLM 2003e).

2.2.4.2 Forecast

BLM’s 2003 Priorities for Recreation and Visitor Services acknowledges that the ways in which people use public land is changing as a result of evolving values and advances in technology. For example, “baby boomers” have increasingly accessed BLM lands for traditional recreational purposes while younger generations commonly use new technologies, such as OHV equipment, for extreme sports like rockcrawling.

In addition, the demographics of people using local public lands for recreational purposes is changing. Within the Planning Area, the population of metropolitan areas is increasing between 14 and 29 percent annually, with growth primarily in Las Cruces (refer to Section 2.4). Growing populations tend to strain the land and its resources due to increased demand for recreation opportunities in the same areas. The proportion of the population that is of retirement age is relatively high in Sierra County (28 percent versus approximately 12 percent elsewhere in the Planning Area and statewide) and has been growing especially rapidly in Otero County. These demographic trends may have implications for the levels and types of recreational uses that are occurring on public land.

The changing demographic profile of recreation users in New Mexico was identified as a recreation planning issue in the 2004 Statewide Comprehensive Outdoor Recreation Plan (SCORP). Concern was expressed for the challenges of providing future recreational activities for both youth and the aging baby-boomers. Around the State of New Mexico, recreation is viewed as critical for youth development and plays an important role in providing youth with positive outlets for energy as well as instilling an environmental ethic at an early age. In addition, the existing recreation areas might need to be retrofitted to accommodate the needs of an active and growing senior population.

Future recreation planning is expected to address issues and opportunities that are identified for the Planning Area. Public meetings in support of the 2004 SCORP revealed statewide trends including access problems and a desire for urban and rural trail systems, and unique desires for an equestrian complex and a multi-sport complex (NMEMNRD 2004). In particular, two of the primary issues identified by the Las Cruces community were increased restrictions on access to outdoor recreation, and the lack of knowledge regarding which lands are available for public use.

The Recreation 2000 Strategic Plan recognizes that BLM's recreation program is an important part of the economic base of the western states, and helps to satisfy the growing public demand for outdoor recreation by providing tourism-related opportunities on BLM-administered lands. According to the plan, the demand for and access to available recreation resources will intensify the use of those resources, especially near urban centers. While land-based recreation opportunities are expected to remain in the largest demand overall, winter and water-based recreation opportunities are expected to have the greatest increase in demand. In addition, the BLM will need to provide for recreational activities involving new technological developments (e.g., recreational vehicles, new camping equipment) as they gain popularity among the public. According to the strategic plan, the primary concern in providing future recreation opportunities will include how to provide for resource protection, visitor services, and maintenance and effective management of the existing and future resources and facilities.

Some recreation activities currently supported by BLM-administered lands (including letterboxing, paintball, rockcrawling, and geocaching) posed no management concerns during prior planning efforts. These uses likely will increase as population in the Planning Area grows requiring additional planning and management activities by BLM.

2.2.4.3 Key Features

Key features in the Planning Area are areas or features that experience high demand for dispersed or developed recreational uses, have the potential to accommodate demand, or provide unique recreational amenities. These key features include areas that offer opportunities for recreational activity within special management areas (refer to Table 2-63 and Table 2-66). Key features or areas not listed in the referenced tables are listed below.

- Red Sands OHV Area
- Equestrian staging areas near trailheads
- Decision Area lands surrounding the City of Las Cruces, for local recreational opportunities
- Decision Area lands surrounding the Caballo and Elephant Butte Reservoirs, for dispersed activities including OHV use
- NASA withdrawn land currently used for OHV activities
- Rio Grande River, for various types of recreational uses including hiking, fishing, bird watching, and other activities
- Mesilla Valley Bosque, for recreational uses associated with the riparian habitat along the Rio Grande

2.2.5 Lands and Realty

2.2.5.1 Current Use

Land Status

The TriCounty Planning Area includes Sierra, Otero and Doña Ana Counties in south-central New Mexico. Generally, public land within the Planning Area covers much of central Sierra County, southern Otero County, and central and western Doña Ana County. Many isolated parcels of State Trust Land and private land are dispersed throughout the Planning Area and interspersed with the public land. The White Sands Missile Range lies in the center of the Planning Area, with portions in each of the three counties. Portions of the Gila National Forest, Cibola National Forest, and Pedro Armendariz Grant #33 lie in Sierra County; McGregor Range and portions of the Mescalero Apache Indian Reservation and Lincoln National Forest lie in Otero County; and the NMSU Rangeland Research Center, San Andres National Wildlife Refuge, and Jornada Experimental Range lie in Doña Ana County.

The existing surface management pattern within the Planning Area is shown on Map 2-21. Surface management within all three counties is summarized in Table 2-67. Table 2-67 indicates the acreage of public lands that have been withdrawn for particular uses and the existing surface administrator. For example, acreage withdrawn for military uses is indicated as under administration by the Department of Defense. Mineral estate is discussed in Section 3.14.

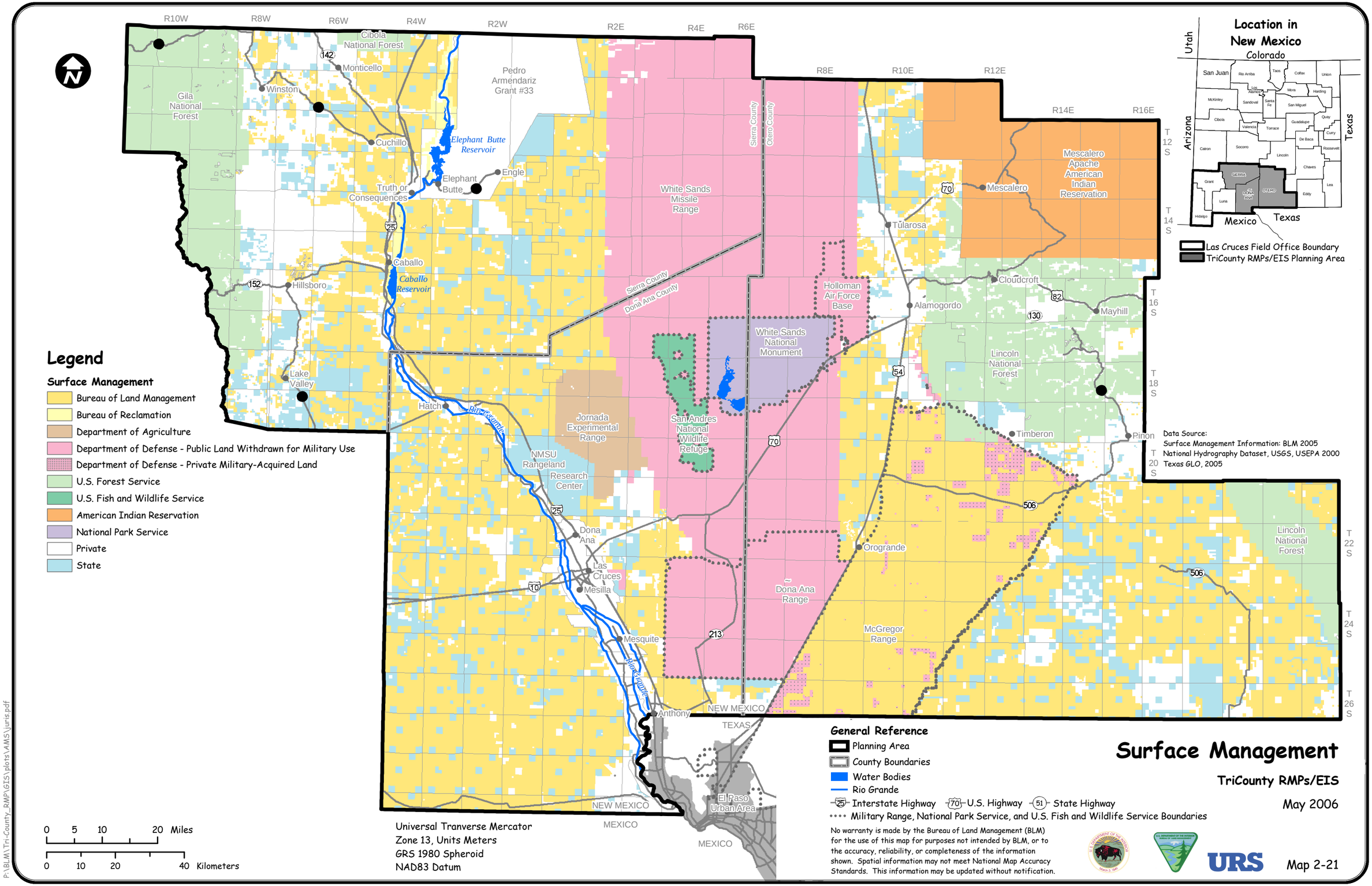

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Table 2-67
Surface Management in the TriCounty Planning Area

Surface Manager	Sierra County (acres)	Otero County (acres)	Doña Ana County (acres)	Total (acres)	Percent of Planning Area
Federal					
Department of Agriculture	0	0	109,462	109,462	1%
Department of Defense (withdrawn public land)	516,968	723,514	493,817	1,734,299	18%
Department of Defense (fee-owned land)	0	60,651	0	60,651	1%
Bureau of Land Management	780,980	1,536,256	1,103,917	3,421,153	36%
Bureau of Reclamation	36,770	0	661	371,431	0%
Forest Service	378,045	558,687	0	936,732	10%
Fish and Wildlife Service	0	0	56,774	56,774	1%
National Park Service	0	91,954	52,547	144,501	2%
American Indian Reservation	0	459,723	0	459,723	5%
State of New Mexico	285,251	338,171	275,241	898,663	10%
Private	712,744	469,758	317,556	1,500,058	16%
Total	***2,710,758***	***4,238,714***	***2,409,975***	***9,359,447***	***100%***

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2005

Land Tenure

The 1993 Mimbres RMP and the 1986 White Sands RMP designated areas for retention and areas for disposal to maintain lands of particular resource and/or use value and to provide for orderly disposition, respectively. Retention areas are generally relatively concentrated blocks of public land that include scattered or isolated parcels of State Trust Land, or special designations, such as WSAs and areas of ACECs. Disposal areas include tracts of land that are difficult and uneconomic to manage, and/or parcels that could serve important public objectives, including but not limited to, expansion of communities and economic development. Within Sierra County, disposal areas are concentrated along State Highway 27, near Lake Valley; along State Highway 152, east of Hillsboro; and along State Highway 52, near Winston. In Otero County, disposal areas are concentrated along U.S. Highways 54 and 70, near Tularosa. In Doña Ana County, disposal areas are concentrated along the east side of I-25, north and south of Las Cruces. Retention and disposal area acreages by county are listed in Table 2-68. Map 2-22 shows the disposal areas for the Decision Area.

Table 2-68
Retention and Disposal Areas in the Decision Area

	Sierra County (acres)	Otero County (acres)	Doña Ana County (acres)	Total Acres within the Decision Area	Percent of Decision Area
Retention	704,380	852,479	1,047,994	2,604,853	
Disposal	76,600	77,558	55,923	210,081	
Total BLM	780,980	930,037	1,103,917		
Total	**780,980**	**930,037**	**1,103,917**	**2,814,934**	

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2006

Since the 1993 Mimbres RMP and 1986 White Sands RMP were adopted, only minor adjustments to surface ownership have occurred as the result of certain realty actions including exchanges, sales, and

patents under the Recreation and Public Purposes (R&PP) Act. (Under the R&PP Act, BLM issues leases and patents of public land to governmental and non-profit entities for public purposes such as public parks, building sites, schools, and landfills [patent only].) Lands transferred out of BLM administration are not depicted as public land on Map 2-21 (surface management).

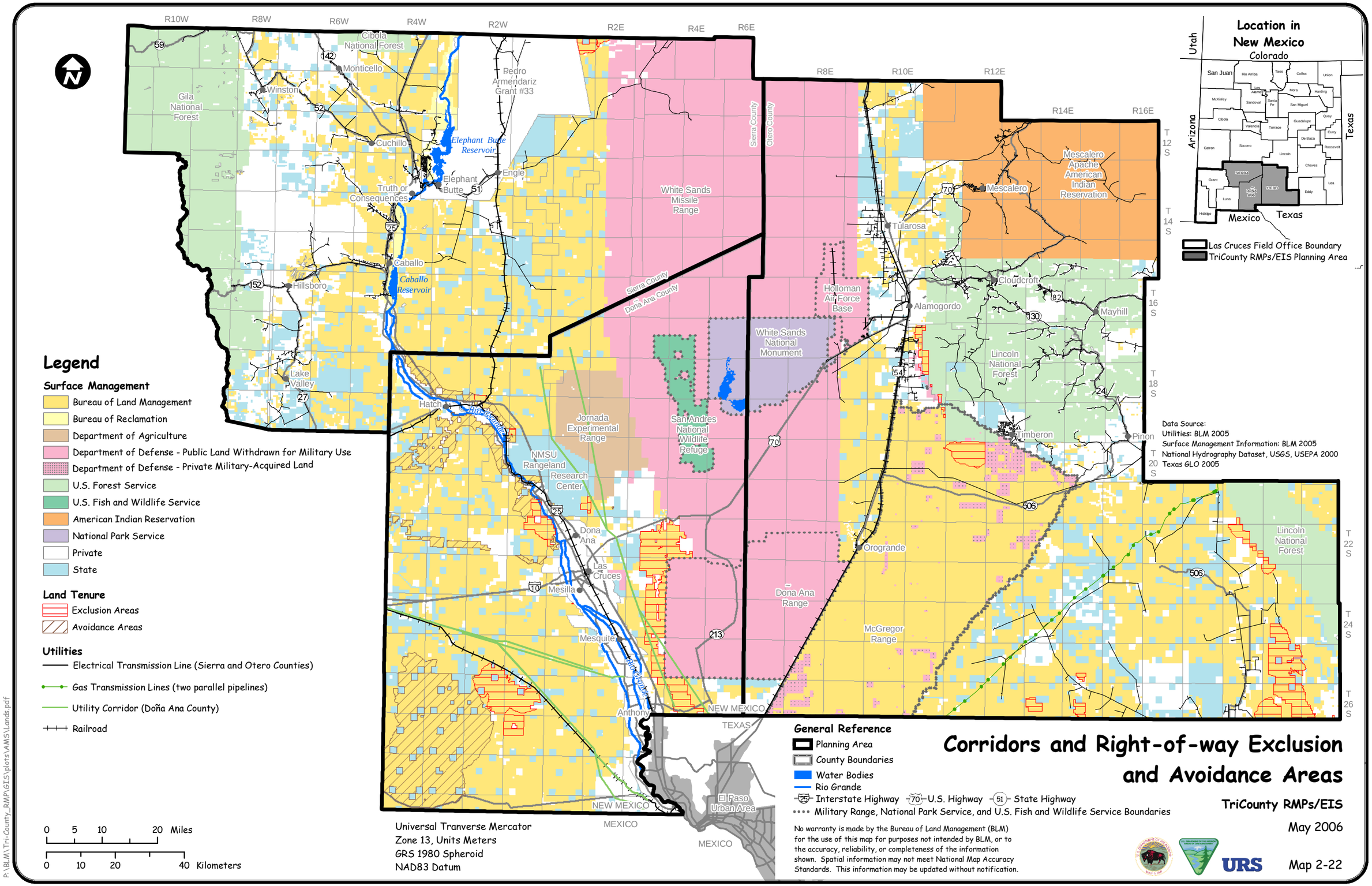
Two land exchanges have taken place since the 1993 Mimbres RMP—the Soledad Canyon Land Exchange and the Picacho Peak Land Exchange. The Soledad Canyon Land Exchange (NMNM-104095) was approved on December 31, 2001, for an exchange of land between the BLM and TNC. Through the exchange, the United States acquired approximately 113 acres of non-Federal land located in the Soledad Canyon area of the Organ Mountains in exchange for approximately 377 acres of Federal land in Doña Ana County, near Las Cruces, New Mexico. The land acquired by the United States in Soledad Canyon has "important historical and natural resource values, affords access into significant areas of the Organ Mountains, has outstanding outdoor recreation opportunities, [and] exceptional scenic values" (USDI, BLM 2001a).

The Picacho Peak Land Exchange (NMNM-106145) was approved on June 25, 2002, by the BLM for another exchange of land with TNC. The exchange involved the disposal of approximately 232 acres of Federal land located in the East Mesa area of Doña Ana County, east of Las Cruces, and the acquisition of approximately 420 acres of non-Federal land located in the Picacho Peak area of Doña Ana County, west of Las Cruces. Both surface and subsurface estates were included with this exchange. The lands acquired by the United States provide the BLM with an opportunity "to protect many visual, scenic, historical and cultural values of Picacho Peak" (USDI, BLM 2002a).

In addition to land transfers, BLM issues leases on public lands to authorize uses involving substantial construction, development, or land improvement and the investment of large amounts of capital. A lease conveys a possessory interest, not title. The public lands utilized for leasing purposes do not have to be identified for disposal.

Utility Corridors, Exclusion Areas, and Avoidance Areas

The BLM Las Cruces District Office manages rights-of-way through a system of designated corridors and designated right-of-way exclusion and avoidance areas. The Las Cruces District Office has encouraged the placement of new facilities within established corridors. Deviations from designated corridors have been permitted based on the type and need of the proposed facility, and lack of conflicts with other resource values and uses. Overlapping or adjacent rights-of-way are issued whenever possible. Within Doña Ana County, there are seven designated utility corridors that do not have predetermined widths, unless specified in the management prescriptions for ACECs. For example, within the Organ/Franklin Mountains ACEC, the corridors are restricted to a width of one-quarter mile. The corridor through the Anthony Gap area in this ACEC is restricted to a width of one-half-mile wide (USDI, BLM 1993a). Because corridors in Doña Ana County have no specified width in most areas, they are shown as lines on Map 2-23. Utility corridors have not been established for Sierra and Otero Counties. Generally, the use of designated right-of-way corridors for right-of-way grants are actively encouraged by the BLM; however, the presence of a designated right-of-way corridor or a system of right-of-way corridors does not preclude



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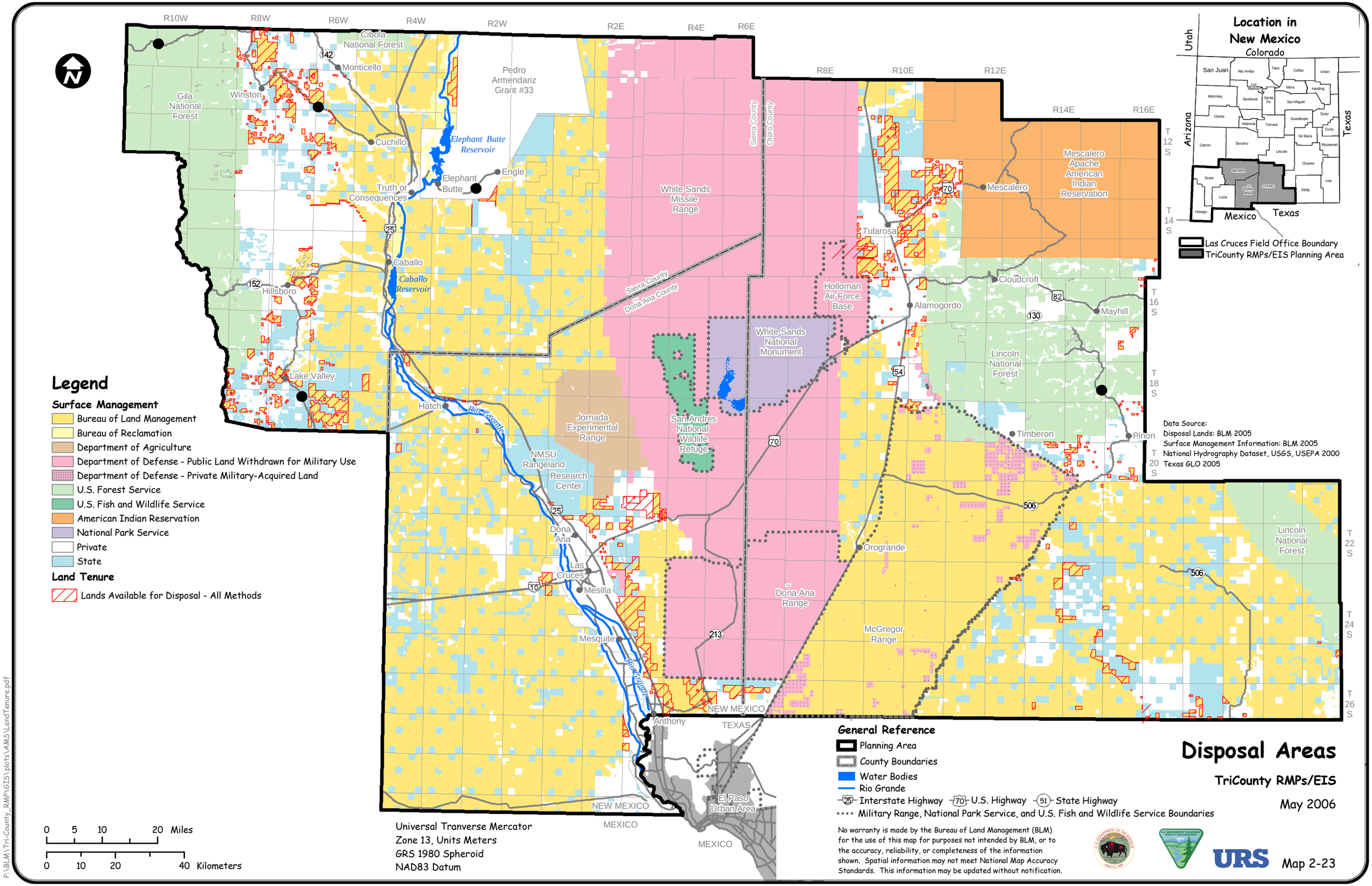

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In addition to designated corridors, the Western Utility Group (an ad hoc organization of major western gas, electric, and telecommunication companies) developed the Western Regional Corridor Study in 1992 to promote ongoing interagency dialogue regarding future utility corridor needs (USDI, BLM and USDI, U.S. Forest Service 1993). This reference document, which will be considered by the BLM and Forest Service during planning efforts, identifies the segments of eight potential utility corridors within the Planning Area. The first and second potential corridors enter western Doña Ana County near I-10 and travel east past the northern portion of the Aden Lava Flow WSA, where they break southeast and head into El Paso. The third and fourth corridors parallel the first two up to the Aden Lava Flow WSA, where they continue heading slightly southeast, crossing the Rio Grande between the towns of Anthony and Mesquite and continuing southeast into Texas; one of these corridors emerges into southwestern Otero County, where it travels northeast, skirting Doña Ana Range and turning east, where it travels roughly parallel to New Mexico State Highway 506. The fifth potential utility corridor enters Doña Ana County from the east and parallels I-10 east into Las Cruces and continues paralleling U.S. Highway 70 in Otero County northeast into Alamogordo, where it splits into two directions (one continues north past Tularosa and the Three Rivers Petroglyph ACEC, and the other heads east paralleling U.S. Highway 82 past Cloudcroft and Mayhill). A sixth corridor lies north of and parallel to the fifth corridor, from the western border of Doña Ana County to Las Cruces. The seventh and eighth corridors travel north to south between Doña Ana and Sierra Counties, passing through northwestern Doña Ana County past Las Cruces, and north through Sierra County, between Elephant Butte/Caballo Lake State Park and the White Sands Missile Range.

BLM may establish exclusion and avoidance areas to guide decisions about right-of-way locations. Right-of-way exclusion areas are areas where rights-of-way may be granted only when mandated by law (USDI, BLM 1993a). Right-of-way avoidance areas are areas where rights-of-way may be granted only when no feasible alternative route or designated right-of-way corridor is available (USDI, BLM 1993a). Within Sierra and Otero Counties, exclusion areas have been established for approximately 58,478 acres of public land and avoidance areas include approximately 1,034 acres of public land. For Doña Ana County, exclusion areas have been established for approximately 10,923 acres of public land and avoidance areas include approximately 216,248 acres of public land. These areas are shown on Map 2-23.

The Las Cruces District Office, which is responsible for a six-county area, receives requests for approximately 400 land use transactions each year; a majority of these are rights-of-way. Approximately 60 percent of the land use transactions are located within Doña Ana County, 15 percent for Sierra County, and 10 percent for Otero County. Generally, the most of the transactions involve land uses for roads, utilities, pipelines, and telecommunication facilities. The Las Cruces District Office processes an average of two “major” land use transactions per calendar year. “Major” transactions may include interstate pipelines or large fiber optic projects.

Communication Sites

As noted in the previous section, the BLM Las Cruces District Office issues rights-of-way for communication sites on public land. Within the six-county area managed by the Las Cruces District Office, there are approximately 26 communication site locations, which include over 156 individual site

leases or rights-of-way. Since the 1993 Mimbres RMP, 24 communication site rights-of way have been issued in Doña Ana County and since the 1986 White Sands RMP, 23 communication site rights-of-way have been issued in Sierra and Otero Counties, with 18 in Sierra County and 5 in Otero County.

A communication site plan for Tortugas Mountain, also called "A" Mountain in Doña Ana County, was developed in October 2004 (USDI, BLM 2004c); this site includes five existing facilities. The majority of "A" Mountain land is administered by the BLM, but withdrawn for use by the NASA through Public Land Order 3685. The withdrawal was originally intended to protect the New Mexico State University antenna range used for NASA testing when "A" Mountain was isolated from the community and offered a prime area free from interference (USDI, BLM 2004c). NASA never utilized the withdrawn area for the intended purposes; the antennas now belong to NMSU.

Renewable Energy Sites

There are two existing wind energy sites (meteorological masts) in the Moccasin Hills area of the Sacramento Mountains just south of Alamogordo in Otero County. These facilities were established under a right-of-way granted in 2004 to SeaWest Wind Power Inc. for approximately 25,974 acres in Sections 3 and 4, T. 21 S., R. 14 E. and Section 18, T. 21 S., R. 15 E. Though the meteorological masts themselves only occupy a small area, the right-of-way has been issued to accommodate a wind farm in the event that such a use proves feasible following testing (Phillips 2005a). The initial right-of-way has been issued for a 3-year term, which can be extended through renewal of the existing right-of-way if an amended right-of-way application and plan of development is submitted for a wind energy development project prior to the end of the 3-year term of the grant (USDI, BLM 2004d).

Existing Land Use

The Planning Area is characterized by rural qualities and open spaces with urban developments located along the Rio Grande and major transportation corridors. Primary land uses that occur within the Planning Area include military activities (e.g., at the White Sands Missile Range [WSMR] and McGregor Range); residential, commercial, and industrial development; and mining activities. Some areas have been specially designated for the preservation of natural or cultural resources (refer to Section 2.3, Special Designations, for more information). Recreation occurs in dispersed locations throughout the Planning Area and within specially designated areas (refer to Sections 2.2.4, Recreation, and 2.3, Special Designations, for more information).

Military activities are limited to the WSMR, McGregor Range, Holloman Air Force Base, and Doña Ana Range. These sites are closed to public access except during scheduled site tours and hunting seasons (depending on the site) regulated by the NMDGF in coordination with the Department of Defense (NMDGF 2005b). Missile firings and testing occasionally necessitate the closure and/or evacuation of areas outside the WSMR in Sierra County (U.S. Army Corps of Engineers 2000).

Residential, commercial, and industrial land uses are commonly concentrated within incorporated municipalities and unincorporated towns along the highways. These developed areas are most prevalent in Sierra and Doña Ana Counties, along I-25. In Sierra County, developed areas include the communities of Lake Valley, Hillsboro, Winston, Monticello, Cuchillo, Truth or Consequences, Elephant Butte, and

Caballo. In Otero County, residential developments are generally dispersed throughout the southern portion of the county between McGregor Range and Lincoln National Forest. The more developed portions of Otero County occur around the incorporated communities of Alamogordo and Tularosa, along U.S. Highways 54 and 70 (Otero County 2005). Other towns in Otero County include Mescalero, Cloudcroft, Mayhill, Timberon, and Orogrande. In Doña Ana County, developed uses occur in towns along I-25, generally from the Texas border to the NMSU Rangeland Research Center, including Anthony, Mesquite, Mesilla, Las Cruces, and Doña Ana. In northern Doña Ana County, some additional development occurs in Hatch, which is surrounded by predominantly agricultural uses. Agricultural and ranching activities occupy large portions of the Planning Area, particularly the public lands within each county.

Mining is only a minor land use within the Planning Area, partially due to the fact that the Organ Mountains, the primary source of granite rock within the Planning Area, are protected by an ACEC designation that prevents the extraction of minerals through surface mining. Despite this, there are many saleable mineral pits in Doña Ana County, with one prominent mineral pit on the western side of Anthony Gap owned by CMEX, a large concrete producer (refer to Section 2.2.2, Minerals for more information).

2.2.5.2 Forecast

Land tenure adjustment could change the amount of public land managed by BLM within the Planning Area, but based on past trends, changes to land tenure would not significantly increase or decrease the proportion of land that is administered by BLM. Future growth, particularly within the Las Cruces metropolitan area in Doña Ana County, is already increasing pressure on public land to provide for both community growth and open space; this trend is expected to continue. During this planning process, BLM intends to review which public lands currently are allocated for retention and which for disposal and determine whether those allocations are appropriate, or if those lands should be retained, recognizing that the supply of private land within the Planning Area is limited and that opportunities for growth and/or preservation may need to be accommodated through use of either State Trust Land or public land (refer to Table 2-67. Changes to the land tenure adjustment allocation would affect which public lands potentially could be developed and/or preserved as open space (through an R&PP lease or patent). Based on the projected growth of the communities in the Planning Area, particularly near Las Cruces, the number of land disposals likely will increase. Disposals could occur for various uses, particularly under R&PP leases and patents where public lands administered by BLM provide opportunities for uses such as schools and parks (New Mexico does not set aside State Trust Land for schools). In addition to more public land disposals for developed uses, more public land may be disposed of for parks and recreation areas as communities are seeking dedicated open space in perpetuity, rather than assuming that what now may appear as open space (i.e., State Trust Land or BLM-managed public land presently serving as de facto open space) will continue to be undeveloped in the future. As part of the lands and realty program, BLM will continue to coordinate disposals with State, county, and local agencies, as appropriate, to consider consistency with existing plans for the area.

Based on past trends, BLM anticipates that requests for land use authorizations, such as rights-of-way, will continue, with the greatest proportion of requests in designated corridors and developing areas.

Additionally, the projected population growth, will likely drive an increase in the demand for facilities to accommodate this growth, including transmission lines, communication sites, and other utilities.

The forecast for renewable energy sites is unclear because only one site exists on public land currently, but more may be developed, requiring additional rights-of-way from BLM. Additional discussion on the demand for renewable energy sites is included in Section 2.2.2, Energy and Minerals.

2.2.5.3 Key Features

- Areas of high potential for future developed land uses include public lands identified for disposal, designated corridors or existing utility alignments and/or rights-of-way, existing communication sites, and the existing renewable energy sites.

- Public lands in Doña Ana County that have been identified for disposal or as available for land use authorizations represent key features to accommodate demands related to expected growth pressures occurring in this county.

- The 1993 Mimbres RMP states that both the "A" Mountain site and the San Augustine Pass Area are some of the areas in highest demand for communication sites within Doña Ana County.

2.2.6 Transportation and Access

This section addresses transportation and access in the Planning Area for motorized surface travel and air transportation. Refer to Section 2.2.4, Recreation for information regarding nonmotorized surface travel.

2.2.6.1 Current Uses

Military operations and public and private airports are located within the Planning Area. The military operations include the White Sands Missile Range, Holloman Air Force Base, Fort Bliss Military Reservation, and McGregor Range. The military conducts low-level training exercises in restricted airspace reserved for that purpose. BLM does not have the authority to regulate airspace. Under the Federal Aviation Act of 1958 (PL 85-726), the authority to regulate the structure and use of American airspace rests with the U.S. Department of Transportation and the Federal Aviation Administration.

Two railroads cross the Planning Area, the Union Pacific and the Burlington Northern Santa Fe. The Union Pacific railroad extends north to south through Otero County paralleling State Route 54 and also traverses southern Doña Ana County. The Burlington Northern Santa Fe extends north to south through Doña Ana County and continues through Sierra County, generally paralleling County Road A13. The Federal Railroad Administration is the managing authority for railroads.

Current transportation and access within Sierra and Otero Counties is described in terms of (1) the existing route network, (2) access to BLM-administered lands, (3) route inventories that the BLM recently

completed, using aerial photography and GIS, for ACECs and WSAs, (4) off-highway vehicle (OHV) use[2] within the Decision Area, and (5) air transportation. A similar section follows for Doña Ana County.

Sierra and Otero Counties

Existing Route Network

The existing route network for Sierra and Otero Counties is illustrated on Map 2-24. Based on these data, approximately 7,826 miles of the existing routes in Sierra and Otero Counties are located on BLM-administered land: 3,949 miles on State Trust Land, and 6,065 miles on county or private lands. The BLM generally does not maintain routes within Sierra and Otero Counties.

Primary routes that extend through Otero County include U.S. Highways 54, 82, and 70. The primary route that continues through Sierra County is Interstate 25. Various State Routes pass through Sierra and Otero Counties connecting to cities outside the Planning Area. The majority of the routes that continue through the counties are regularly maintained; however, unimproved routes also extend from this main route network throughout the Sierra and Otero Counties.

Access

Due to the extensive route network throughout Sierra and Otero Counties, physical access to BLM-administered lands is generally feasible. Legal access may be gained through U.S. Highways, State Routes, and county roads. There is only one access route over which the BLM has maintenance responsibility and control; it is the 6.8-mile route to the radio communications site on Caballo Mountain in Sierra County. The BLM acquires very few easements each year in Sierra and Otero Counties for the purpose of providing access to public land.

Access to the White Sands Missile Range (WSMR), located within Sierra and Otero Counties, is restricted to protect public health and safety. In addition, WSMR administers a safety evacuation zone, located within Sierra County, that extend beyond the range boundary (refer to Map 2-24). This zone may be utilized as an impact area for missile and debris impacts, primarily in connection with the testing of military missiles, and only incidentally for military training purposes. Requests for access to this area during evacuation periods are denied, and all persons located in this area are required to vacate the zone when evacuation periods are in effect. When U.S. Government personnel access the safety evacuation zone during an evacuation period, they are required to use existing routes and gates, to the extent possible.

An agreement between the Federal Government and all owners of lands within the WSMR safety evacuation zone including BLM states that each firing period shall not exceed 12 consecutive hours and that firing periods will be limited to 25 per year, with at least 48 hours from the beginning of one firing

[2] There was a change in the terminology that is used regarding off-highway travel due to the differences in the definitions. Off-road vehicles (ORVs), according to 43 CFR 8340.0-05, are vehicles capable of or designed to be driven off of roads, while the term OHV is meant to describe motor vehicles that are used off of artificially surfaced roads or trails. The use of the term OHV is used throughout the section in place of ORV.

period to the beginning of the next, and not more than six firing periods in any one month (DOD, WSMR 2000). The agreement has been in effect since December 2000 and could expire in December 2005 upon written notice by the Federal Government of termination. Without written notice, the agreement remains in effect from year to year until written notice of termination is given (USDOD, WSMR 2000).

Operations on McGregor Range occasionally require the closure of New Mexico Highway 506, which traverses the Decision Area in Otero County, for safety reasons. Access to routes on McGregor Range, other than county routes, requires authorization by the U.S. Army. Typically, public access to McGregor Range is limited to existing routes.

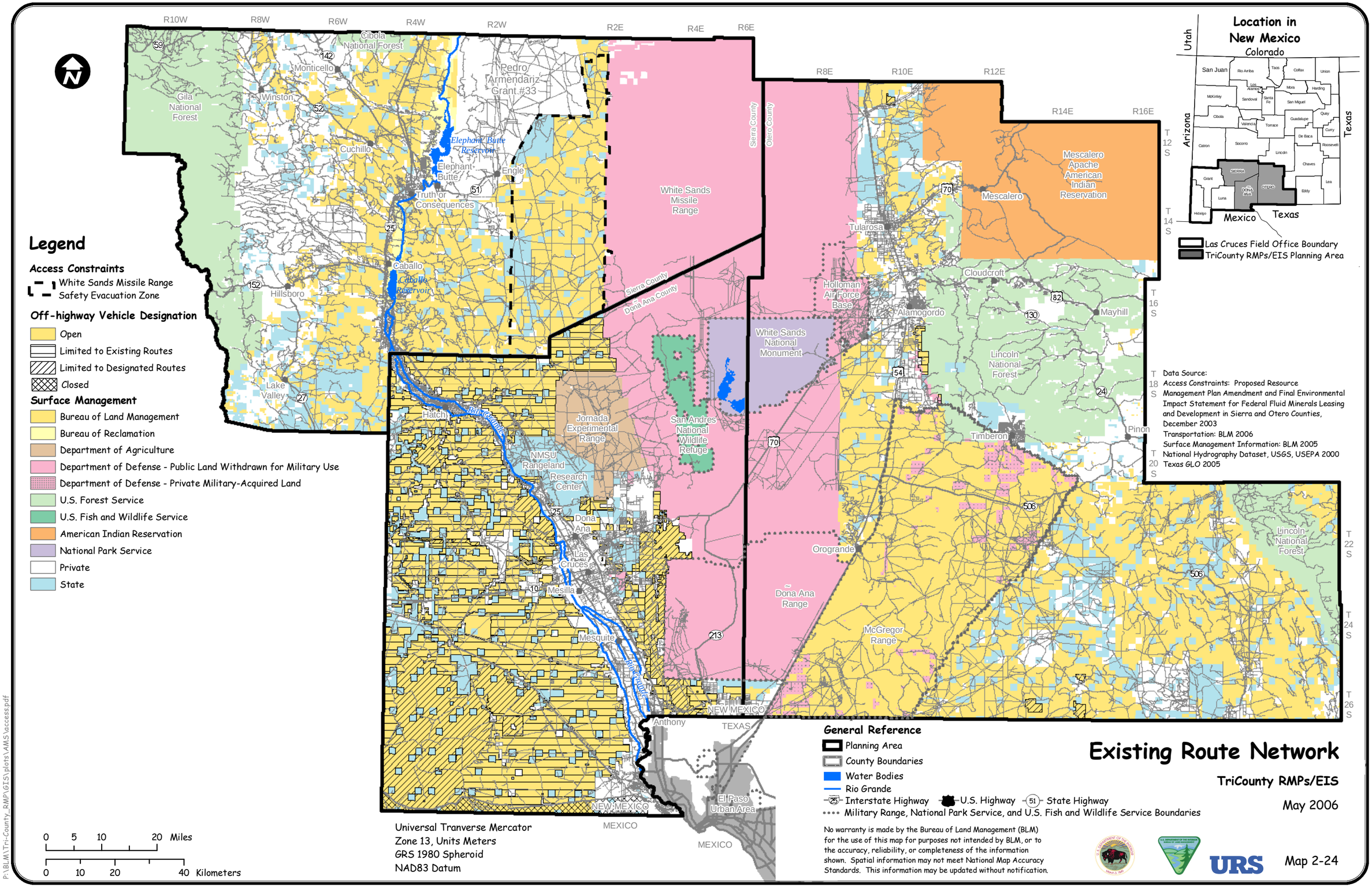
Route Designations

The White Sands RMP and the Otero County ACEC RMP Amendment designated or continued management of five ACECs and five WSAs within the two counties (not including SMAs within McGregor Range or the Lakevalley Back Country Byway). The Las Cruces District Office conducted route evaluations within these areas to determine designations in accordance with applicable regulations and policy, including 43 CFR 8340 and Instruction Memorandum No. 2004-005, Clarification of OHV Designations and Travel Management in the BLM Land Use Planning Process. Routes are shown on Map 2-24.

OHV Designations

The White Sands RMP designates a majority of the BLM-administered lands as open to OHV use (2,306,065 acres, or 99.5 percent of the public land within Sierra and Otero Counties). When the White Sands RMP was developed in the mid-1980s, the standard practice was to not restrict use on BLM-administered land; limitations on OHV use were considered inherent based on the difficulties of access posed by the natural environment (e.g., desert vegetation and terrain). OHV use was not an intense recreational activity in the mid-1980s due to the limited technology and design of the vehicles at that time. Potential impacts to natural resources were therefore considered limited. The open designation allows hunters general access to camp sites and game, and provides general access for other recreational uses.

Under the White Sands RMP, OHV access to about 4,447 acres of public land within Sierra and Otero Counties is limited to travel on existing roads and trails. This applies to the watershed treatment areas (62,586 acres) and the Percha Creek riparian area (280 acres) as a way to improve and protect the areas for wildlife habitat, watershed values, recreation, and visual quality. Access is also limited to existing roads and trails within the Sacramento Escarpment ACEC (5,365 acres) and the Cornudas Mountains Area (850 acres) for protection of visual resources, and within the Lone Butte Area for protection of cultural resources. The 1997 Otero County ACEC RMP Amendment further restricted access to the Three Rivers Petroglyph Site and Picnic Area—(6,724 acres) from travel limited to “existing roads and trails” to travel limited to routes posted as “designated roads and trails”—by erecting signs for protection of cultural resources.



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The OHV designations are not displayed on a map for Sierra and Otero Counties due to a lack of spatial data. However, Table 2-69 provides approximate acreages for the OHV designations on public lands within Sierra and Otero Counties.

Table 2-69
OHV Designations in Sierra and Otero Counties

County	Category	Acres of Public Land
Sierra	Open	780,980
	Limited to existing roads and trails	0
	Limited to designated roads and trails	0
	Closed	0
Otero	Open	1,525,085
	Limited to existing roads and trails	4,447
	Limited to designated roads and trails	6,724
	Closed	0

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2006

Air Transportation

Various regional, municipal, and private airports and airstrips are located within Sierra and Otero Counties; none are within the Decision Area. The Alamogordo-White Sands Regional Airport is owned by the City of Alamogordo and is located approximately 4 miles from Alamogordo in Otero County. The Truth or Consequences Municipal Airport is owned by the City of Truth or Consequences and is located approximately 6 miles from the City. Other private airports and airstrips used for passenger travel and agricultural uses also are located throughout Sierra and Otero Counties.

Doña Ana County

Existing Route Network

The existing route network is illustrated on Map 2-24. Based on these data, approximately 3,432 miles of the existing routes in Doña Ana County are located on BLM-administered land, 2,375 miles on State Trust Land, and 3,303 miles on county or private lands. BLM developed and maintains the 6.0-mile-long Aguirre Spring Recreation Area access route. BLM also maintains approximately 2.1 miles of routes in the Dripping Springs Natural Area and about 0.8 mile of La Cueva Road.

Primary routes that extend through Doña Ana County include two interstates (I-25 and I-10) and three U.S. Highways (U.S. 70, 80, and 180). Interstate 10 extends through Doña Ana County, linking the City of Las Cruces to the El Paso metropolitan area (located outside the Planning Area), and provides the primary access into New Mexico from Texas and the international border with Mexico.

Various State Routes (SR 9, 11, 26, 81, 90, 146, 338, and 464) and county routes pass through Doña Ana County, connecting cities inside and outside the Planning Area. The majority of the routes that continue through the county are regularly maintained. However, unimproved routes also extend from the main route network throughout Doña Ana County.

Access

Due to the extensive route network within Doña Ana County, physical access to BLM-administered lands is generally feasible. Legal access is available through Federal, State, and county route networks. Additional legal access is available along several pipeline and powerline roads.

Access-related concerns have increased as the demand for access and use of public land has increased (USDI, BLM 1993a). A majority of the BLM-administered land does not have legal access.

The BLM acquires very few easements each year in Doña Ana County to provide improved access to public land. As required by BLM policy, the easements acquired must provide legal access to serve at least one resource need. In the 1993 Mimbres RMP, the BLM provided general criteria for prioritization of access development (USDI, BLM 1993a):

- Public demand for access
- Administrative need for access
- Resource values and/or conflicts, where new or alternative access could remedy the conflicts
- Availability of existing access

The WSMR, which is partially located within Doña Ana County, limits access for the health and safety of the public.

Route Designations

Through the Mimbres RMP, BLM designated or continued management of five ACECs, seven WSAs, one RNA, one trail, and one NNL within Doña Ana County. The BLM completed a route inventory for these areas. Routes are included on Map 2-24.

OHV Designations

Under the Mimbres RMP, the Aden Hills area is designated as “open” for OHV use (8,700 acres). However, a majority of the BLM-administered lands are designated as “limited to existing roads and trails”[3]. OHV use in the following areas are limited to designated roads and trails:

- Aden Lava Flow WSA/RNA
- Butterfield Trail (also includes lands located in Luna, Grant, and Hidalgo Counties)
- Doña Ana Mountains ACEC
- Kilbourne Hole NNL
- Paleozoic Trackways RNA
- Part of the Organ/Franklin Mountains ACEC

[3] Existing roads and trails in Doña Ana County are defined as those in existence at the time of the 1993 Record of Decision (ROD) for the Mimbres RMP. Any road or trail created by the passage of vehicles after 1993 is unauthorized and subject to closure.

- Organ Needles WSA (except for the 8,840-acre scenic ACEC portion which is closed to vehicle use) (located within the Organ/Franklin Mountains ACEC)
- Organ Mountains WSA (located within the Organ/Franklin Mountains ACEC)
- Peña Blanca WSA (located within the Organ/Franklin Mountains ACEC)
- Rincon Petroglyphs ACEC
- Robledo Mountains WSA
- Robledo Mountains ACEC (located within the Robledo Mountains WSA)
- San Diego Mountain ACEC
- Sierra de Las Uvas Mountains WSA
- West Potrillo Mountains/Mt. Riley WSA (also includes lands located within Luna County)

Three areas are designated as "closed" to OHV use in Doña Ana County. These include the Los Tules ACEC (20 acres) designated for protection of cultural resources, and a portion of the Organ/Franklin Mountains ACEC that is considered scenic (8,840 acres). The scenic areas within the Organ/Franklin Mountains ACEC that are closed to OHV use are designated as VRM Class I (refer to Section 2.1.14 for additional information on visual resources) and have elevations of 5,000 feet or higher (USDI, BLM 1993a). The Mexican border area south of Anapra–Columbus Road and south of State Route 9, also is closed to OHV use (89,180 acres). (This acreage includes areas located in Luna County.) However, the BLM has not posted signs to implement the closure of Los Tules and the area near the Mexican border.

The OHV designations are not displayed on a map for Doña Ana County due to a lack of spatial data. Table 2-70 provides approximate acreages of the OHV designations within Doña Ana County.

Table 2-70
OHV Designations in Doña Ana County

County	Category	Acres
Doña Ana	Open	8,009
	Limited to existing roads and trails	799,855
	Limited to designated roads and trails	270,362
	Closed	25,691

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2006

BLM developed an implementation plan and issued a Federal Register notice to formally close vehicle trails in and near the Robledo Mountains WSA and ACEC and the Paleozoic Trackways RNA on February 18, 1998, in accordance with 43 CFR 8342.3 and BLM Policy 1990 (USDI, BLM 1993a). The following routes were identified for closure:

- The route originating in the SW 1/4 of Section 20, T. 22 S., R. 1 E. This route originates outside the SMAs, but enters the Paleozoic Trackways RNA within approximately a quarter-mile of its point of origin. It then enters the WSA and ACEC after another mile. Branches off this route have been extended, despite WSA interim management and scenic ACEC management, to create trails, which have caused new surface disturbance and visual impacts that must be reclaimed to comply

with BLM Manual H-8550-1-Interim Management Policy for Lands Under Wilderness Review and scenic ACEC (VRM Class I) guidelines.

- The route that enters the WSA in the southeast corner of Section 10, T. 22 S., R. 1 W. This route joins the Skyline Trail. It has been widened, and new branches extend inside the WSA. One branch drops into Indian Springs Canyon, and exits the WSA to the west.
- The route off the Skyline Trail that provides the exit point from the trails on the east side of the Skyline Trail in the southwest quarter of Section 11, T. 22 S., R. 1 W.
- The route off the east side of the Skyline Trail that provides access to a ridgetop in the northeast quarter of Section 10, T. 22 S., R. 1 W.
- The two routes off the west side of the Skyline Trail in the southeast quarter of Section 3, T. 22 S., R. 1 W.
- The route in Indian Springs Canyon that it enters the WSA in the northeast quarter of Section 9, T. 22 S., R. 2 W.

Air Transportation

Various international, municipal, and private airports and airstrips are located within the Doña Ana County; none are within the Decision Area. The Las Cruces International Airport is owned by the City of Las Cruces and is located approximately 8 miles from the city in Doña Ana County. The Hatch Municipal Airport is owned by the village of Hatch and is located approximately 3 miles from the village. The Doña Ana County Airport at Santa Teresa is located in the southern portion of the county. Private airports and airstrips used for passenger travel and agricultural uses are located within Doña Ana County.

2.2.6.2 Forecast

The Metropolitan Planning Organization is a multi-jurisdictional agency responsible for transportation planning in Las Cruces, Mesilla, and parts of Doña Ana County. The Metropolitan Planning Organization identified multiple new roads for construction and existing roads for improvement within the City of Las Cruces area. These new roads are planned to accommodate the expected population growth in the outlying areas of the city. New roads constructed by the State or counties may increase accessibility of public lands within Doña Ana County. In addition, changes in land use and the road network outside the Planning Area could affect shifts in the use levels on BLM-administered land.

The military operations at WSMR, Holloman Air Force Base, Fort Bliss, and McGregor Range are expected to continue and grow in terms of the number of troops training at these facilities. The military missions at these facilities are dynamic and could change as national needs and capabilities evolve. This could result in a subsequent increase in military air traffic, including low-level training flights. In addition, the public and private airports located within Doña Ana County are expected to experience increased use and air traffic in proportion to the projected population growth.

2.2.6.3 Key Features

The key features within Doña Ana County related to transportation and access are as follows:

- Urban areas such as the Cities of Las Cruces, Truth or Consequences, and Alamogordo provide key access points to BLM-administered lands. The growing populations in these urban areas may demand additional access to BLM-administered lands.
- The current checkerboard surface ownership pattern allows private entities to block access to some BLM-administered lands. Legal access has the potential to be illegally gated by the private landowners or permittees. Areas where access may be an issue extend throughout the Planning Area, and are not necessarily concentrated within a particular geographic area.
- Route inventories have been completed for ACECs and WSAs in the Planning Area. Designating routes in portions of the Decision Area as open or closed will assist BLM in managing transportation and access within and to special designations areas.
- "Open," "limited," and "closed" designations should be reevaluated to ensure that resources or resource uses that are sensitive to motorized travel have been adequately protected. OHV designations will also assist BLM in managing recreation-related transportation.
- Military facilities and operations within the Planning Area should be buffered with compatible surface uses on surrounding public lands, to the extent possible.

2.3 SPECIAL DESIGNATIONS

BLM, through previous inventory and land planning efforts, has identified public land for special designation including WSAs, ACECs, back country byway, and national historic or scenic trails.

The Planning Area includes 12 WSAs and 16 ACECs (including two RNAs and one NNL). The WSAs and ACECs overlap in certain areas. The Planning Area also includes one back country byway. These special designations are shown on Map 2-25. The acreage of specially designated public land within the Planning Area is presented in Table 2-71 (acreages were derived from GIS data; no acreage values have been associated with the byway). Note that Map 2-25 and Table 2-71 includes Culp Canyon WSA and Black Grama ACEC, which are on McGregor Range and not within the Decision Area for the TriCounty RMPs.

Table 2-71
Special Designations within the Planning Area[a]

Special Designation Name	County	Acres within the Planning Area[b]
WSAs		
Jornada del Muerto WSA	Sierra	4,214
Sacramento Escarpment WSA[c]	Otero	2,864
Guadalupe Escarpment WSA	Otero	6,952
Brokeoff Mountains WSA	Otero	31,288
Culp Canyon WSA[d]	Otero	11,268
Sierra de Las Uvas WSA	Doña Ana	11,086
Robledo Mountains WSA	Doña Ana	13,033
Organ Mountains WSA	Doña Ana	7,189
Organ Needles WSA	Doña Ana	5,955
Peña Blanca WSA	Doña Ana	4,518
Aden Lava Flow WSA	Doña Ana	25,879
West Potrillo Mountain/Mount Riley WSA	Doña Ana	149,416

Special Designation Name	County	Acres within the Planning Area[b]
ACECs		
Three Rivers Petroglyph ACEC	Otero	1,035
Sacramento Escarpment ACEC	Otero	4,447
Black Grama ACEC[d]	Otero	3,557
Cornudas Mountain ACEC	Otero	852
Alamo Mountain ACEC	Otero	2,528
Wind Mountain ACEC	Otero	2,309
Alkali Lakes ACEC	Otero	6,332
Organ/Franklin Mountains ACEC	Doña Ana	58,155
Los Tules ACEC	Doña Ana	23
Robledo Mountains ACEC	Doña Ana	8,695
Doña Ana Mountains ACEC	Doña Ana	1,427
Rincon ACEC	Doña Ana	856
San Diego ACEC	Doña Ana	622
Aden Lava Flow RNA	Doña Ana	3,742
Paleozoic Trackways RNA	Doña Ana	727
Kilbourne Hole NNL	Doña Ana	5,460

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2005d

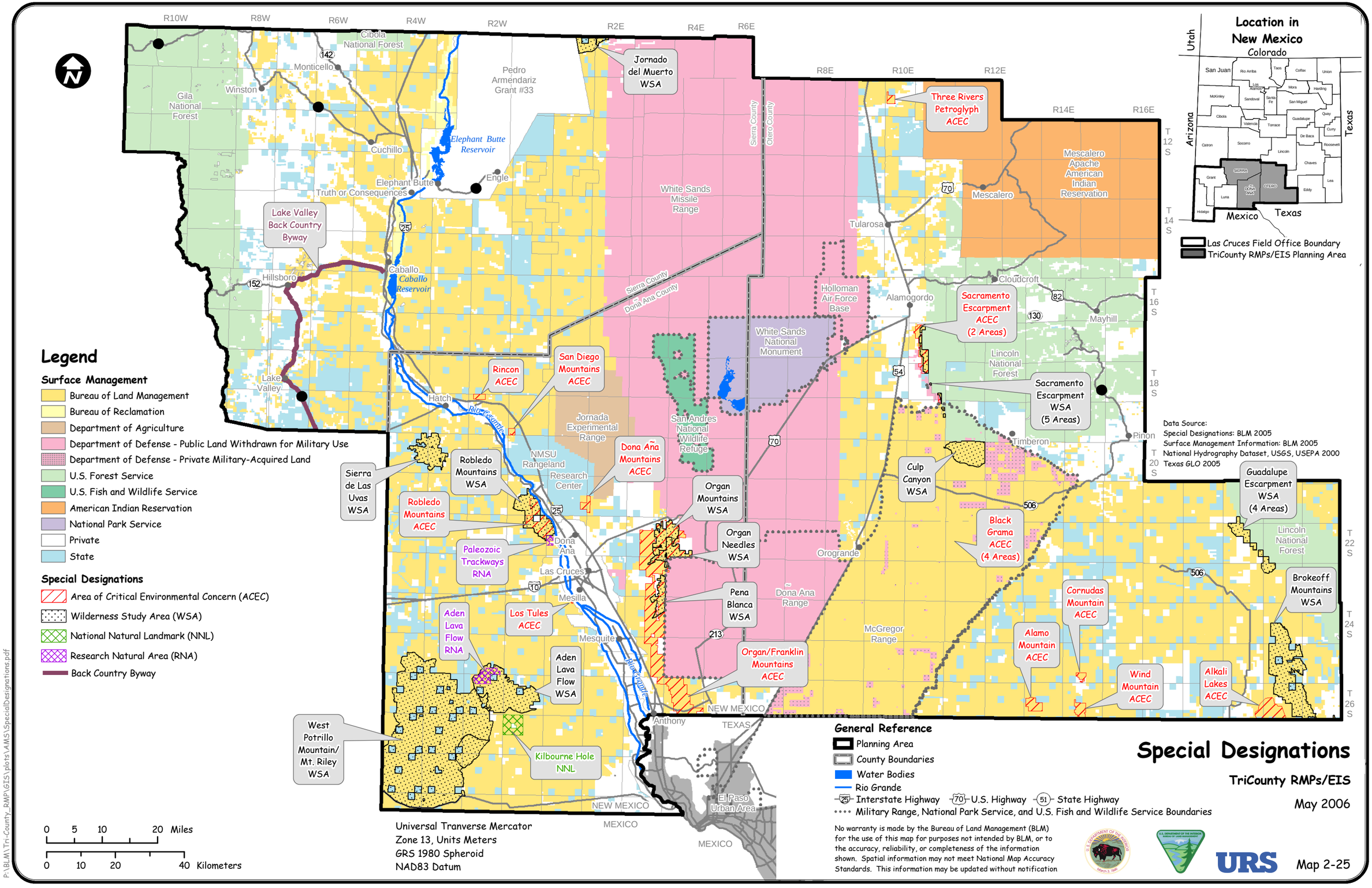
NOTES: [a] Except linear special designations, such as the Lake Valley Back Country Byway.
[b] Acreage values should not be summed within each county of the Planning Area because designations overlap in certain areas.
[c] A portion of this WSA is located on McGregor Range, which is not within the Decision Area.
[d] Located on McGregor Range, which is not within the Decision Area.

2.3.1 Wilderness Study Areas

A more complete description of each WSA and the evaluation of its wilderness values are contained in the New Mexico Statewide Wilderness Study, Volume 3: Wilderness Analysis Reports (USDI, BLM 1988). BLM's recommendations to Congress regarding which WSAs or portions of WSAs should be designated as wilderness are described in New Mexico Wilderness Study Report, Volume 1 – WSA Recommendations (USDI, BLM 1991a) and the Statewide Summary (USDI, BLM 1991b). The recommendation for each area is stated following the description of each WSA. A majority of the acreages included have been derived from GIS data; some acreages are referenced from previous documents, if it was the best available information.

2.3.1.1 Jornado del Muerto WSA

The Jornado del Muerto WSA includes 31,147 acres of public land located in Sierra and Socorro Counties, approximately 45 miles south-southeast of Socorro, New Mexico. Approximately 4,214 acres of the WSA are located within Sierra County (based on GIS data). The WSA is composed almost totally of lava flow, characterized by lava tubes, sink holes, pressure ridges, and other related volcanic features. Landscape contrasts between the dark rocky lava flow joining the surrounding light-colored desert present an interesting landscape mosaic. The imprints of man within the core of the WSA are minimal, allowing the naturalness values of the WSA to be of high quality (USDI, BLM 1988). The WSA lies in one of the most remote, infrequently visited regions of central New Mexico, providing outstanding opportunities for solitude. Opportunities for primitive and unconfined types of recreation exist (USDI, BLM 1988). BLM has recommended in the New Mexico Wilderness Study Report that the entire WSA (31,147 acres identified in the report) be designated as wilderness (USDI, BLM 1991a).



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2.3.1.2 Sacramento Escarpment WSA

The Sacramento Escarpment WSA is located southeast of Alamogordo within Otero County, New Mexico. The area encompasses approximately 2,864 acres of public land and includes a portion of the Sacramento Escarpment ACEC. The Sacramento Escarpment rises over 4,000 feet above the Tularosa Basin to an elevation of 8,100 feet. Four major canyons cut the Sacramento Escarpment, providing outstanding opportunities for solitude and primitive forms of recreation (USDI, BLM 1980). The cliffs also display unique geological features composed of Mississippian age limestones formed in a reef environment. This WSA was designated prior to the New Mexico Statewide Study conducted in the late 1980s; therefore, BLM did not develop a recommendation for Congress regarding how many acres to designate as wilderness and how many acres to release from further consideration.

A portion of this WSA is located within the McGregor Range, which is not included in the Decision Area.

2.3.1.3 Guadalupe Escarpment WSA

The Guadalupe Escarpment WSA consists of approximately 6,952 acres of public land located northeast of El Paso in Otero County, New Mexico. The Guadalupe Escarpment is the dramatic, steep western side of the Guadalupe Mountains and includes foothills and gently sloping alluvial fans (USDI, BLM 1980). The sparse vegetation includes grass and creosote associations in lower elevations and cacti and grass associations in the higher elevations (USDI, BLM 1980). The area offers significant scenic and natural values, ecological resources, and opportunities for solitude and/or primitive and unconfined-type recreation. This WSA was designated prior to the New Mexico Statewide Study conducted in the late 1980s; therefore, BLM did not develop a recommendation for Congress regarding how many acres to designate as wilderness and how many acres to release from further consideration.

2.3.1.4 Brokeoff Mountains WSA

The Brokeoff Mountains WSA consists of approximately 31,288 acres of public land located in the southeastern corner of Otero County, New Mexico. The Brokeoff Mountains WSA is located north of Guadalupe Mountains National Park, which is within the State of Texas. The WSA consists of a desert mountain range, which follows a north-south trend and abuts the southwestern wall of the Guadalupe Escarpment (USDI, BLM 1986b). Significant features of the WSA are its two canyons, each approximately 500 to 600 feet deep, and ridges. The area offers significant scenic and natural values, ecological resources, and opportunities for solitude and/or primitive and unconfined-type recreation. BLM has recommended that approximately 18,370 acres of land within the WSA not be designated as wilderness. The remaining land is considered suitable for wilderness designation due to its high wilderness values, fewer intrusions, and its location adjacent to the Guadalupe Mountains National Park (USDI, BLM 1986b).

2.3.1.5 Culp Canyon WSA

The Culp Canyon WSA consists of approximately 11,268 acres of land located in south-central Otero County, New Mexico, approximately 22 miles south-southeast of Alamogordo. The WSA is situated

within the northern end of the McGregor Range, which is utilized for military purposes. The WSA is bordered on the north by the Lincoln National Forest. The Culp Canyon area consists of alluvial fans and foothills of the Sacramento Mountains. The area is characterized by gently rolling to steep hills containing numerous canyons and arroyos (USDI, BLM 1986b). The Culp Canyon WSA is known for its naturalness, opportunities for solitude or primitive and unconfined-type recreation, and scenic and cultural values. BLM has recommended in the New Mexico Wilderness Study Report that this area (10,937 acres identified in the report) not be designated as wilderness (USDI, BLM 1986b).

Although the WSA is located within the BLM's Planning Area, it is not located within the Decision Area.

2.3.1.6 Sierra de Las Uvas WSA

The Sierra de Las Uvas WSA consists of approximately 11,086 acres located southwest of the Rio Grande River in northwestern Doña Ana County, New Mexico. The Las Uvas Mountains are composed of tilted bedded volcanic rock with a western slope and cliffs on the east side. The WSA is characterized by mesas, buttes, and canyons containing a diverse landscape along with various habitat types (USDI, BLM 1986b). The WSA provides opportunities for solitude or primitive and unconfined-type recreation. BLM has recommended in the New Mexico Wilderness Study Report that this area (11,067 acres identified in the report) not be designated as wilderness (USDI, BLM 1986b).

2.3.1.7 Robledo Mountains WSA

The Robledo Mountains WSA consists of approximately 13,033 acres of land located in central Doña Ana County and approximately 8 miles northwest of Las Cruces, New Mexico. The elevation in the area ranges from approximately 4,300 feet to 5,876 feet. The WSA contains most of the Robledo Mountains, which are characterized by rugged, steep canyons and southward dipping cuestas. The Robledo Mountains contain diverse landscape forms and habitats (i.e., igneous and volcanic cliffs, grass-covered mesas, rugged canyons, caves) due to its topography and geology. The bald eagle and the peregrine falcon are federally listed species that occasionally use the WSA. In addition, the Robledo Mountains WSA is considered a significant historical and archaeological resource. Approximately 20 prehistoric sites are known to occur within or adjacent to the WSA, including small caves and pithouse village sites, a 10-room pueblo, and a heliograph station (established in the early 1880s) (USDI, BLM 1986b). In addition, the Robledo Mountains WSA is known for its naturalness and opportunities for primitive and unconfined-types of recreation. BLM has recommended in the New Mexico Wilderness Study Report that this area (12,946 acres identified in the report) not be designated as wilderness (USDI, BLM 1986b).

A portion of the Robledo Mountains WSA also is designated as an ACEC (Robledo Mountains ACEC).

2.3.1.8 Organ Mountains WSA

The Organ Mountains WSA consists of approximately 7,189 acres of public land located in eastern Doña Ana County, New Mexico. The Organ Mountains are a north-south trending fault block mountain range characterized by extremely rugged terrain with steep crevices, canyons, and spires (USDI, BLM 1986b). The Organ Mountains WSA provides spectacular scenic views and is known for its naturalness and opportunities for solitude or primitive and unconfined-type recreation. BLM has recommended that 139

acres of land along the western edge of the WSA be excluded to eliminate an area of marginal wilderness value and potential conflict with anticipated mineral exploration (USDI, BLM 1986b). The remaining land has high-quality wilderness values including naturalness, excellent opportunities for solitude, a diversity of outstanding recreation opportunities, and high-quality scenic features. Therefore, the remaining area of the WSA has been recommended as suitable for wilderness.

The Organ Mountains WSA overlaps with portions of the Organ/Franklin Mountains ACEC.

2.3.1.9 Organ Needles WSA

The Organ Needles WSA consists of approximately 5,955 acres of public land located in eastern Doña Ana County, New Mexico. Organ Needles, located within the Organ Mountains, is the highest peak, reaching slightly over 9,000 feet in elevation. This WSA contains rugged and rocky canyons and steep ridges of quartz monzonite spires, which provide outstanding scenery. Aside from scenic value, the WSA also is known for its naturalness and opportunities for solitude and primitive and unconfined-type recreation. In addition, ecological and cultural features of interest occur within the WSA, such as habitat for rare species, and historic and archaeological sites. BLM established this WSA under the Mimbres RMP; these lands had not been considered for wilderness values under the New Mexico Statewide Study because the land was owned by the State of New Mexico at the time of that study (USDI, BLM 1993a).

The Organ Needles WSA overlaps with portions of the Organ/Franklin Mountains ACEC.

2.3.1.10 Peña Blanca WSA

The Peña Blanca WSA consists of approximately 4,518 acres of public land located in eastern Doña Ana County, New Mexico, within the Organ Mountains. The small, narrow, and rocky canyons of this WSA are interspersed with high, steep ridges, providing excellent opportunities for solitude and primitive and unconfined-type recreation. In addition, the WSA contains ecological and cultural features of interest, including springs that provide valuable habitat and rock shelters that provide historical and cultural values. Rocky outcrops within the WSA provide spectacular scenery. BLM established this WSA under the Mimbres RMP; these lands had not been considered for wilderness values under the New Mexico Statewide Study because the land was owned by the State of New Mexico at the time of that study (USDI, BLM 1993a).

The Peña Blanca WSA overlaps with portions of the Organ/Franklin Mountains ACEC.

2.3.1.11 Aden Lava Flow WSA

The Aden Lava Flow WSA includes approximately 25,879 acres of public land located in the southwestern corner of Doña Ana County, New Mexico. The WSA is composed almost totally of lava flow, characterized by steep-walled depressions, lava tubes, pressure ridges, and other related volcanic features. The most prominent features of the WSA are the Aden Crater and Afton volcanoes. The Aden Crater is located in the northwestern part of the WSA and is nearly circular with a depression about one-quarter mile in diameter. The Afton volcanoes are a cluster of three resurgent volcanoes located in the southeastern part of the WSA. The southern and central part of the WSA is generally flat with rolling

sand dunes. The WSA is easily accessible and provides exceptional naturalness and opportunities for solitude. Although opportunities for primitive and unconfined-types of recreation exist, the WSA contains special ecological and geological features making it an excellent resource for scientific study; a portion of the area was designated as the Aden Lava Flow RNA in 1978 (USDI, BLM 1988). BLM has recommended in the New Mexico Wilderness Study Report that the entire WSA (25,287 acres designated in the report) be designated as wilderness (USDI, BLM 1991a).

2.3.1.12 West Potrillo Mountain/Mount Riley WSA

The West Potrillo Mountain/Mount Riley WSA consists of approximately 149,416 acres of land located in southwestern Doña Ana County, New Mexico. The West Portillo Mountains are located approximately 30 miles southwest of Las Cruces. They are characterized by volcanic landscape consisting of 48 large cinder-cone mountains rising to an elevation of 5,400 feet (USDI, BLM 1986b). Wide basins covered with grasslands surround the area. Mount Riley, which is situated between the East and West Portillo Mountains, is the highest of three peaks in the area rising to an elevation of 6,000 feet (USDI, BLM 1986b). Prominent slopes and alluvial fans composed of natural vegetation surround the base of the peak. Among its scenic, biological, and cultural values, the West Portillo Mountain/Mount Riley WSA is known for its naturalness and opportunities for solitude and primitive and unconfined-type recreation. BLM has recommended that approximately 8,645 acres within the WSA not be designated as wilderness (USDI, BLM 1986b). The remaining land contains the area's highest wilderness values including naturalness and outstanding opportunities for solitude. Therefore, the remaining area has been recommended as suitable for wilderness.

2.3.2 Areas of Critical Environmental Concern

ACECs are designated by the BLM where special management attention is needed to protect and prevent irreparable damage to important historic, cultural, and scenic values; fish, wildlife resources, or other natural systems or processes; or to protect human life and safety from natural hazards (USDI, BLM 2003a). The 16 ACECs located within the Planning Area, including two RNAs and one NNL, are described below.

2.3.2.1 Three Rivers Petroglyph ACEC

The Three Rivers Petroglyph ACEC consists of 1,035 acres of public land in northern Otero County, New Mexico. The ACEC is located along the eastern edge of the Tularosa Basin. The terrain gently slopes to the west and a small ridge rises 150 feet above the valley floor. The area is reportedly representative of the Mogollon culture, with an estimated 5,000 carvings present along its ridges (USDI, BLM 1982). The numerous carvings make this one of the most significant petroglyph sites in the southwest. Three Rivers has been studied by archaeologists since the 1920s, and intensive cultural surveys and excavation and stabilization projects were conducted in the 1970s (USDI, BLM 1982). In addition, the petroglyphs have been the subject of numerous publications. The Three Rivers Petroglyph site is included on the State of New Mexico's Register of Historic Places. The ACEC serves to protect its cultural and scenic value.

2.3.2.2 Sacramento Escarpment ACEC

The Sacramento Escarpment ACEC is located within Otero County, New Mexico. The ACEC encompasses approximately 4,447 acres of public land and also overlaps the Sacramento Escarpment WSA. The Sacramento Escarpment rises over 4,000 feet above the Tularosa Basin to an elevation of 8,100 feet. It is known for its scenic value, with its deep canyons and high cliffs composed of sedimentary rock. The area is of natural value and has maintained its primitive character and influence due to its rugged nature (USDI, BLM 1997b). Based on its rugged nature, deep canyons, and uneven terrain, the Sacramento Escarpment offers outstanding opportunities for solitude and primitive and unconfined-types of recreation. In addition, the Sacramento Escarpment offers supplemental values including scenic, ecological (including special status species), historical, and archaeological qualities. There are known prehistoric sites; however, they have not yet been recorded. The ACEC serves primarily to protect scenic values and special status species.

2.3.2.3 Black Grama ACEC

The Black Grama ACEC consists of approximately 3,557 acres of land located within the McGregor Range. The ACEC consists of four separate areas consisting of black grama grasses located along the Otero Mesa escarpment and State Highway 506 (USDI, BLM 2005d). The ACEC serves to protect the area's natural values.

Although the ACEC is located within the BLM's Planning Area, it is not located within the Decision Area.

2.3.2.4 Cornudas Mountains ACEC

The Cornudas Mountains ACEC encompasses approximately 852 acres of public land located within southern Otero County, New Mexico. The igneous intrusions of the Cornudas Mountains emerge from Otero Mesa along the New Mexico–Texas border. They comprise the northern part of the Trans-Pecos alkaline magmatic province in southern New Mexico and southwestern Texas. The area contains spectacular formations and unique desert grasslands.

Three archaeological sites are known to exist in and around the ACEC, including the Butterfield Trail and Cornudas de los Alamos Stage Station (USDI, BLM 1997b). The Cornudas Mountains ACEC also provides habitat for various special status species. Due to its remote location, the site provides solitude and excellent opportunities for primitive and unconfined-type recreation. The ACEC serves to protect the Cornudas Mountains' scenic, biological, and cultural values (USDI, BLM 2005d).

2.3.2.5 Alamo Mountain ACEC

The Alamo Mountain ACEC consists of approximately 2,528 acres of public land within southern Otero County, New Mexico. The area encompasses a granitic mountain rising to approximately 6,670 feet in elevation. The Alamo Mountain area lies within BLM's Otero Mesa Habitat Area. Various special status species are likely to occur in the area. In addition, two archaeological sites are known to exist that include the Butterfield Trail Ojos de los Alamos Stage Station and the El Paso Phase Jornada Mogollon site

containing petroglyphs on the north-northwestern face of the mountain (USDI, BLM 1997b). The remote location, along with the canyons and uneven terrain, offer opportunities of solitude and primitive and unconfined-type recreation. The ACEC serves to protect cultural, visual, and biological resources.

2.3.2.6 Wind Mountain ACEC

The Wind Mountain ACEC is located approximately 60 miles northeast of El Paso, Texas, in southern Otero County adjacent to the New Mexico–Texas state border. The top of Wind Mountain is approximately 7,200 feet in elevation. The ACEC encompasses approximately 2,309 acres of public land primarily utilized for livestock grazing (USDI, BLM 1997b). The area also is known for its outstanding opportunities for solitude and primitive and unconfined-type recreation. In addition, four archaeological sites are known to exist in the area but have not been explored or inventoried (USDI, BLM 1997b). The ACEC serves to protect Wind Mountain's scenic, biological, and cultural values.

2.3.2.7 Alkali Lakes ACEC

The Alkali Lakes ACEC consists of approximately 6,332 acres of public land located in southeastern Otero County, New Mexico. Alkali Lake is located within the Greater Otero Mesa and can be accessed via State Highway 506 and County Roads G006 and G008, which extend through the site. In addition to several special status species, six archaeological sites are known to exist within the ACEC (USDI, BLM 1997b). Although only six known sites are said to exist for the ACEC, it is likely that the sites have not yet been documented due to lack of archaeological surveys (USDI, BLM 1997b). Due to the cultural resources, the ACEC is eligible for listing on the National Register of Historic Places. The ACEC serves to protect biological and cultural resources.

2.3.2.8 Organ/Franklin Mountains ACEC

The Organ/Franklin Mountains ACEC has been proposed for designation as a National Conservation Area. It consists of approximately 58,155 acres of public land containing mountains, which run north and south through southeastern Doña Ana County, New Mexico. The Organ Mountains are composed of quartz monzonite in the northern portion of the range and rhyolite interspersed with volcanic tuffs in the southern portion. The Franklin Mountains are composed of diverse limestone, which support a unique cactus community containing Federally listed and State listed endangered species (USDI, BLM 1993a). Springs occur in the area, which support valuable riparian ecosystems including rare endemic plants. The Organ/Franklin Mountains offer significant scenic values. The ACEC serves to protect the significant scenic values, various special status species, and biological and cultural resources.

2.3.2.9 Los Tules ACEC

The Los Tules ACEC consists of approximately 23 acres of BLM-administered and private land. Los Tules contains a large pithouse village situated on the western edge of Las Cruces. In 1940, Los Tules was partially excavated by Donald Lehmer of the University of Arizona. Los Tules became the type site for defining the Jornada Branch of the Mogollon culture. The ACEC serves to protect its significant cultural resource (USDI, BLM 1993a).

2.3.2.10 Robledo Mountains ACEC

The Robledo Mountains ACEC consists of approximately 8,695 acres of public land located 8 miles northwest of Las Cruces in central Doña Ana County, New Mexico. The mountains are composed of a massive block of Paleozoic sedimentary rocks and Cenozoic igneous rock. The Robledo Mountains ACEC is known for its scenic quality to the inhabitants of the northern Mesilla Valley. The Robledo Mountains provide a diversity of cacti including special status species. The mountains also provide an important habitat for uncommon reptiles including the Madrean alligator lizard and the Trans-Pecos rat snake. In addition, the Robledo Mountains contain some of the earliest known prehistoric habitation sites in southern New Mexico. The ACEC serves to protect the significant paleontological, cultural, and scenic values, and endangered plant species (USDI, BLM 1993a).

2.3.2.11 Doña Ana ACEC

The Doña Ana ACEC is located in the central Doña Ana Mountains, approximately 5 miles north of Las Cruces, New Mexico. The ACEC consists of approximately 1,427 acres of public land characterized by steep jagged peaks that rise from the desert floor. The peaks of the Doña Ana ACEC offer scenic value and are within view of most of the northern Mesilla Valley and the northeastern portion of Las Cruces. In addition, the area includes a diversity of cacti and special status species, including the Doña Ana Mountains tallussnail (land snail) (USDI, BLM 1993a). The ACEC serves to protect the area's scenic quality along with its biological and cultural resources.

2.3.2.12 Rincon ACEC

The Rincon ACEC contains approximately 856 acres of public land located in northwest Doña Ana County, New Mexico. The Rincon ACEC consists of numerous petroglyphs on large boulders on the south side of an unnamed mountain one mile north of Rincon, New Mexico. The petroglyphs are scattered and occasionally clustered in steep-sided canyon areas and at the top of the mountain (USDI, BLM 1993a). Damage to the petroglyphs caused by construction of communication sites has been identified. The petroglyphs are believed to be representative of the Jornada Mogollon culture. The ACEC serves to protect the petroglyphs, which are considered to be a significant cultural resource.

2.3.2.13 San Diego Mountain ACEC

The San Diego Mountain ACEC consists of approximately 622 acres of public land located on the north side of San Diego Mountain, approximately 7 miles north of Radium Springs. The ACEC contains several hundred petroglyphs (of animals, humans, fish, and abstract motifs) pecked into brown igneous boulders in a large canyon on the side of the mountain. The area (and rock art) is representative of the Jornada Mogollon culture (A.D. 200 to A.D. 1400), and is relatively undisturbed (USDI, BLM 1993). It can only be accessed on foot, due to its location within a rugged, narrow, boulder-strewn canyon. Several habitation sites are believed to be located near the petroglyphs, but an intensive archaeological survey has never been conducted. The ACEC serves to protect its significant research and cultural values. Due to the sensitivity of the resources being protected, this ACEC is not shown on Map 2-25.

2.3.2.14 Aden Lava Flow RNA

The Aden Lava Flow RNA consists of approximately 3,742 acres of land located in central Doña Ana County, New Mexico, approximately 20 miles southwest of Las Cruces. The lava flow is a nearly flat landform with steep walled depressions that vary in size and shape. The area also contains crevices, pressure ridges, and lava tubes. The most prominent feature of the lava flow is Aden Crater, located in the northwestern part of the area. The area has significant scenic and geologic values as well as interesting wildlife and wildlife habitat features (USDI, BLM 1993a).

2.3.2.15 Paleozoic Trackways RNA

The Paleozoic Trackways RNA is located in central Doña Ana County in south-central New Mexico. The RNA consists of approximately 727 acres of public land in the Robledo Mountains, approximately 5 miles northwest of Las Cruces. The Robledo Mountains are composed of Paleozoic, Cenozoic, intrusive, and volcanic rocks. Deposits of nonmarine sandstone, siltstone, and mudstone alternating with calcareous shale and limestone contain the footprints and trackways of vertebrate and invertebrate animals that lived approximately 280 million years ago (USDI, BLM 1993a). It is considered to be the most scientifically important Paleozoic fossil footprint discovery ever made in the Western United States, and possibly the world (USDI, BLM 1993a). These tracks are extremely diverse and varied and could produce new species information not yet discovered by scientists. The Paleozoic Trackways RNA is in critical need of protection and preservation.

2.3.2.16 Kilbourne Hole NNL

The Kilbourne Hole NNL is a volcanic maar located approximately 20 miles southwest of Las Cruces in Doña Ana County, New Mexico. The NNL encompasses 5,460 acres of land. Kilbourne Hole is a crater that formed when a volcanic bubble burst on the surface of the earth, and was designated as a NNL because it was considered the best example of a maar in the Chihuahuan Desert region (USDI, BLM 1993a).

2.3.3 Back Country Byway

A BLM back country byway is a component of the national scenic byway system, which focuses primarily on corridors along back country roads that have high scenic, historic, archaeological, or other public interest values (USDI, BLM 1993b). A “back country byway” differs from a “byway” in that it is usually not suitable for regular passenger cars and may require use of OHVs. The back country byway designated within the Planning Area is the Lake Valley Back Country Byway.

The Lake Valley Back Country Byway—the only one within the Planning area —is managed as a Type I back country byway (i.e., paved and has an all-weather surface). It extends along State Highways 152 and 27 beginning at the junction of Interstate 25 and State Highway 152 in western Sierra County, New Mexico. The back country byway extends 18 miles south of Truth or Consequences, New Mexico, and west toward the town of Hillsboro. From Hillsboro it extends south onto State Highway 27 towards Lake Valley and Nutt, New Mexico. The entire route is narrow and paved and easily accessible via Interstate 25 (USDI, BLM 1993b). The Lake Valley Back Country Byway provides an excellent opportunity for

scenic views and area recreation and tourism. Visible from the back country byway are the Black Range mountains, Caballo Mountains, Cooke's Peak, and Las Uvas Mountains. In addition, it is located in an area formerly utilized for mining and ranching purposes during a historic settlement period. Therefore, the byway is of historic value, promoting tourism to the area.

2.3.4 Nominated Special Designations

Areas nominated for special designation are shown on Map 2-26, including internal nominations made by BLM, as well as external nomination BLM received from individuals or organizations.

2.3.4.1 ACECs

BLM is evaluating various areas for consideration as ACECs, including areas nominated recently or during previous planning efforts, and through comments received from the public during scoping. Areas that have been or will be evaluated for possible designation include the following:

- Cornudas Mountains (nominated by Bobby Jones and overlaps and extends beyond what is currently designated as Cornudas Mountains, Wind Mountain, and Alamo Mountain ACECs)
- Black-tailed Prairie Dog Habitat
- Brokeoff Mountains
- Caballo Mountains
- Jarilla Mountains
- Mud Mountain
- Percha Creek
- Sacramento Mountains (north and south)
- Six Shooter Canyon
- Pup Canyon
- Badger area
- Broad Canyon
- Brokeoff Mountains–Guadalupe Escarpment (which includes a broader area than the Brokeoff Mountains alone)
- Cornudas Mountains (nominated by NMWA and overlaps and extends beyond what is currently designated as Cornudas Mountains, Wind Mountain, and Alamo Mountain ACECs)
- East Potrillo Mountain
- Greater West Potrillo Mountains Desert Plains Area
- Gyp Hills – Chalk Hills
- Nutt Mountain

- Otero Mesa
- Penasco Canyon
- Robledo Mountains – Sierra Las Uvas
- Southern Caballo Mountains
- Southern Sacramento Mountains
- Talavera

For any area that does not meet the relevance and significance criteria for designation as an ACEC (as outlined in BLM Manual 1613, Areas of Critical Environmental Concern [USDI, BLM 1988]), BLM may consider other resource-specific allocations, such as special recreation management areas (SRMAs), or other management prescriptions to protect various resources and/or resource uses.

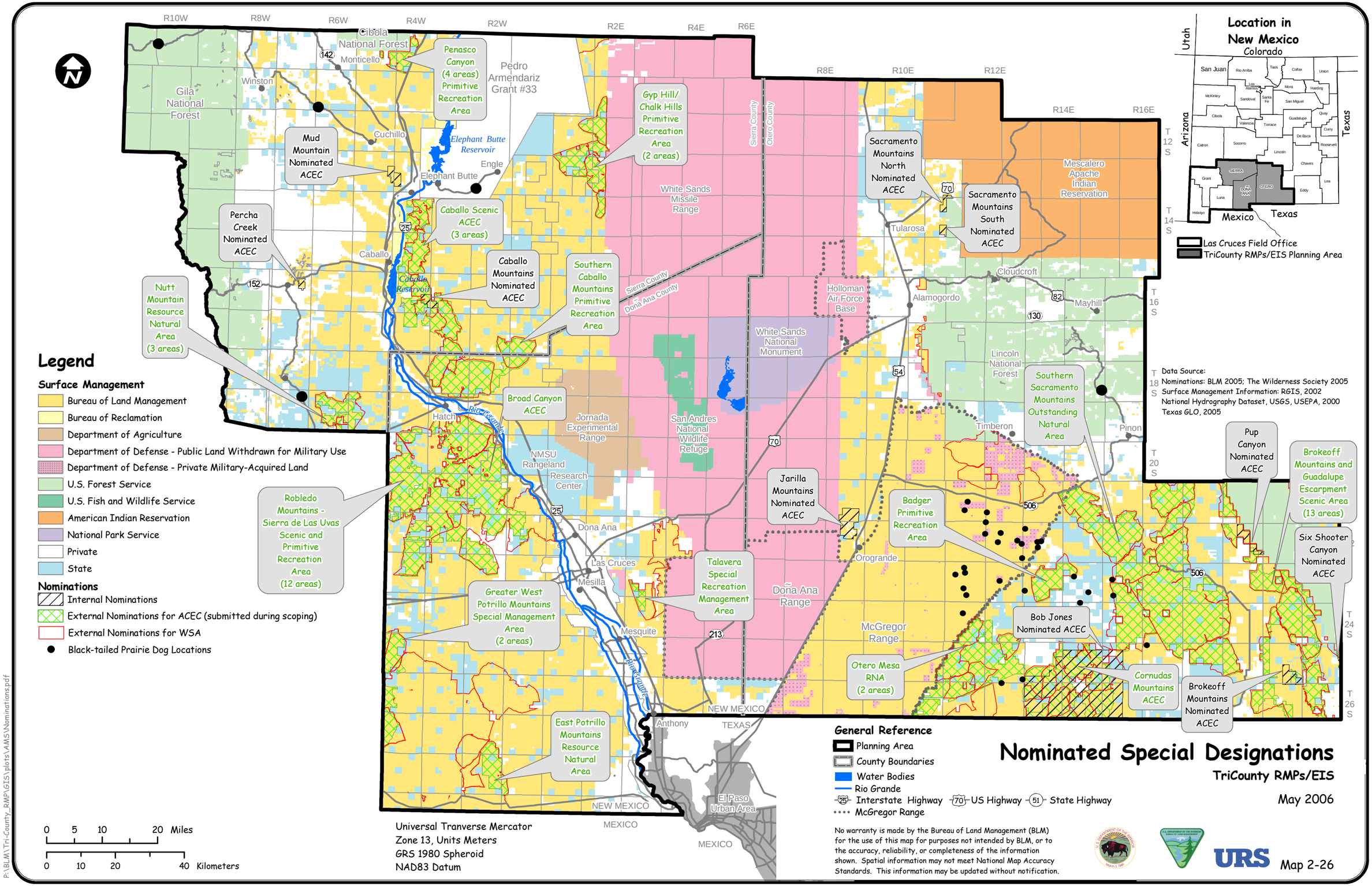
2.3.4.2 Areas with Wilderness Characteristics

In 1999, the New Mexico Wilderness Alliance (NMWA) and The Wilderness Society (TWS) conducted a field inventory of public wildlands throughout New Mexico to assess the suitability of public lands for wilderness designation using criteria set forth by the Wilderness Act of 1964. The NMWA/TWS proposed wilderness designations were submitted to the BLM during scoping for the TriCounty RMPs/EIS (NMWA and TWS 2005). Areas inventoried by TWS/NMWA for protection and preservation of wilderness characteristics primarily include areas within existing WSAs or ACECs; in some cases TWS/NMWA propose that additional adjacent lands be considered for similar special management because of their continuous unique landscape characteristics. Some of these areas are discontiguous, but similar in nature, and have been called a "complex." All of the areas recommended by NMWA/TWS for protection are within areas previously inventoried by the BLM for wilderness values, except Nutt Mountain (Hakkila 2006). The areas nominated for protection for wilderness characteristics, as identified by NMWA/TWS in their scoping comment submission, are described below.

Sierra and Otero Counties

Nutt Grasslands Complex

The Nutt Grasslands Complex, located in southwestern Sierra County, 30 miles northeast of Deming and 15 miles west of Hatch, includes up to 13,396 acres of public land suitable for management to protect and preserve wilderness characteristics. A prominent landform feature in the area is Nutt Mountain, surrounded by Chihuahuan desert terrain, grasslands, and drainages. The area also falls within the Cookes Range and Nutt Antelope areas, which are currently managed by BLM to improve deer and pronghorn habitat. The Nutt Grasslands Complex also provides a unique and outstanding opportunity for solitude, primitive recreational experience, and roadless landscapes that promote species habitat preservation. The complex also provides potential habitat for the northern aplomado falcon and black-tailed prairie dog (NMWA 2003a).


Nominated Special Designations
TriCounty RMPs/EIS
May 2006
Map 2-26
Legend
Surface Management
Bureau of Land Management
Bureau of Reclamation
Department of Agriculture
Department of Defense - Public Land Withdrawn for Military Use
Department of Defense - Private Military-Acquired Land
U.S. Forest Service
U.S. Fish and Wildlife Service
American Indian Reservation
National Park Service
Private
State
Nominations
Internal Nominations
External Nominations for ACEC (submitted during scoping)
External Nominations for WSA
Black-tailed Prairie Dog Locations
General Reference
Planning Area
County Boundaries
Water Bodies
Rio Grande
Interstate Highway
US Highway
State Highway
McGregor Range
Penasco Canyon (4 areas) Primitive Recreation Area
Mud Mountain Nominated ACEC
Percha Creek Nominated ACEC
Nutt Mountain Resource Natural Area (3 areas)
Caballo Scenic ACEC (3 areas)
Caballo Mountains Nominated ACEC
Southern Caballo Mountains Primitive Recreation Area
Broad Canyon ACEC
Robledo Mountains - Sierra de Las Uvas Scenic and Primitive Recreation Area (12 areas)
Greater West Potrillo Mountains Special Management Area (2 areas)
East Potrillo Mountains Resource Natural Area
Gyp Hill/ Chalk Hills Primitive Recreation Area (2 areas)
Talavera Special Recreation Management Area
Jarilla Mountains Nominated ACEC
Sacramento Mountains North Nominated ACEC
Sacramento Mountains South Nominated ACEC
Badger Primitive Recreation Area
Otero Mesa RNA (2 areas)
Bob Jones Nominated ACEC
Southern Sacramento Mountains Outstanding Natural Area
Pup Canyon Nominated ACEC
Brokeoff Mountains and Guadalupe Escarpment Scenic Area (13 areas)
Six Shooter Canyon Nominated ACEC
Cornudas Mountains ACEC
Brokeoff Mountains Nominated ACEC
Gila National Forest
Cibola National Forest
Pedro Armendariz Grant #33
White Sands Missile Range
Holloman Air Force Base
White Sands National Monument
San Andres National Wildlife Refuge
Jornada Experimental Range
NMSU Rangeland Research Center
Doña Ana Range
McGregor Range
Mescalero Apache Indian Reservation
Lincoln National Forest
Elephant Butte Reservoir
Caballo Reservoir
Rio Grande
Las Cruces
Mesilla
Dona Ana
Mesquite
Hatch
Anthony
Alamogordo
Tularosa
Cloudcroft
Mayhill
Timberon
Pinon
Orogrande
Winston
Monticello
Cuchillo
Engle
Elephant Butte
Caballo
Sierra County
Otero County
Dona Ana County
NEW MEXICO
TEXAS
MEXICO
El Paso Urban Area
Location in New Mexico
Las Cruces Field Office
TriCounty RMPs/EIS Planning Area
Data Source:
Nominations: BLM 2005; The Wilderness Society 2005
Surface Management Information: RGIS, 2002
National Hydrography Dataset, USGS, USEPA, 2000
Texas GLO, 2005
Universal Tranverse Mercator
Zone 13, Units Meters
GRS 1980 Spheroid
NAD83 Datum
0 5 10 20 Miles
0 10 20 40 Kilometers
No warranty is made by the Bureau of Land Management (BLM) for the use of this map for purposes not intended by BLM, or to the accuracy, reliability, or completeness of the information shown. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.
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San Mateo Mountains Complex

Located along the northern boundary of Sierra County, adjacent to the Cibola National Forest, a portion of the San Mateo Mountains Complex includes the Penasco Canyon/Penasco Peak area, which contains approximately 16,153 acres with exceptional scenic values and unique naturalness. The prominent landforms within the San Mateo Mountains Complex are Penasco Canyon and Penasco Peak, 20 miles north of Truth or Consequences, New Mexico. The landscape in this area is characterized as typical Chihuahuan desert vegetation, with volcanic plugs jutting out of alluvium covered by desert shrubs. Low visitor use and distinctive scenery allow for exceptional recreational opportunities, experiences of solitude, and protection of unique animal and plant species (NMWA 2003a).

Caballo Mountains Complex

The Caballo Mountains are located along the Rio Grande River primarily in Sierra County from Elephant Butte to Hatch, New Mexico. The 71,848-acre area with potential for management to protect and preserve wilderness characteristics includes Turtle Mountain, Timber Mountain, Brushy Mountain, Redhouse Mountain, and Point of Rocks. The Caballo Mountain Complex is characterized by rugged mountain terrain with vegetative and topographic screening that provides visitors with outstanding opportunities to experience solitude and primitive recreation (NMWA 2003a).

Jornada del Muerto Complex

A portion of the 33,956-acre Jornada del Muerto Complex is located in Sierra County and includes Dugout Canyon, Gyp Hills SW, Gyp Hills, and the Jornada del Muerto WSA. In Sierra County, vegetation in the Jornada del Muerto Complex is characterized by Chihuahuan desert grasslands, juniper savannah, and piñon-juniper woodlands. Maintained roads, functional livestock developments, and OHV trails are present, but are considered minor modifications according to TWS/NMWA. The area has landscapes of varied and diverse topography, deep canyons, arroyos, and lush vegetation. Topographic and vegetative screening and restricted access to the adjacent White Sands Missile Range provide enhanced opportunities for solitude and primitive recreational experiences (NMWA 2003a).

Greater Otero Mesa – Crow Flats Complex

Located largely in Otero County, the 394,892-acre Greater Otero Mesa – Crow Flats Complex comprises several distinct areas, including Badger, Shiloh Draw, Otero Mesa, Otero Mesa South, Otero Mesa East, Prairie Dog, Otero, Pronghorn, Flat Top, McVeigh Hills, Shiloh Hills, Night Hawk Ridge, Rough Draw, Collins Hills, Cornucopia Hills, Cornucopia Draw, Lewis Canyon, Boardwell Canyon, La Paloma Canyon, and Pup Canyon. Also, several previously designated ACECs exist within the complex including Alamo Mountain, Wind Mountain, Cornudas Mountain, and Black Grama. (The Black Grama ACEC is located within McGregor Range, outside of the TriCounty Decision Area.) The complex also is adjacent to several designated WSAs and ACECs including the Guadalupe Escarpment WSA, Brokeoff Mountains WSA, and Alkali Lakes ACEC (NMWA 2003a). The Greater Otero Mesa – Crow Flats Complex is typically characterized by gently rolling hills, creosote-dominated plant communities, and open grasslands with yuccas. Black grama grassland also is found within the wilderness unit along with various

shrubs, forbs, yucca, and cacti. Broad ridgelines and topographic screening provide much of the area with opportunities for solitude and primitive, unconfined recreational experiences. Wildlife within the area includes the desert box turtle, and multiple varieties of amphibians and reptiles. More than 200 bird species have been identified within the wilderness unit, including the American peregrine falcon and bald eagle (NMWA 2003a).

Sacramento Mountains

Located in Otero County, the Sacramento Mountains Complex comprises the Guadalupe Escarpment WSA, Brokeoff Mountain WSA, and Alkali Lakes ACEC, as well as several additional areas, such as the Sacramento Escarpment and Crest Garden. Wilderness within the Sacramento Mountains includes steep-walled, serpentine-shaped canyons, and unique geologic formations as well as the distinguished vegetation characteristics of the Chihuahuan desert including desert grasslands, dense arroyo riparian vegetation in canyon, and pinon-juniper woodlands and juniper savannah in higher elevations (NMWA 2003a).

Doña Ana County

Greater Potrillo Mountains Complex

The 279,062-acre Greater Potrillo Mountains Complex comprises wilderness units including the East Potrillo Mountains, Eagle Nest, Malpais Ridge, Luna Mesa, San Luis Lake, Cambray, and Providence Cone South. Protection of the Greater Potrillo Complex is particularly important for the long-term preservation of biological diversity as adjacent lands are being developed. Additionally, the West Potrillo Mountain/Mount Riley WSA is located adjacent to this complex. The Greater Potrillo Mountains Complex and the existing West Potrillo Mountain/Mount Riley WSA could provide a biotic link between species in New Mexico and the southwestern United States, potentially enhancing the biodiversity of the region. As adjacent urban communities expand, the Greater Potrillo Mountains could provide recreationists with opportunities that no longer exist due to sprawl and urbanization (NMWA 2003a).

Greater Robledo Mountains – Sierra de las Uvas Complex

Located between the communities of Deming and Las Cruces, New Mexico, in Doña Ana County, the Greater Robledo Complex is 202,284 acres and comprises several wilderness units including Sleeping Lady Hills, Goodsight Mountains, and Goodsight Peak. Within the Greater Robledo Mountains – Sierra de las Uvas Complex, the Sierra de Las Uvas WSA, Robledo Mountains WSA, and Robledo Mountains ACEC exist. The landscape is typically rugged terrain with opportunities for primitive and unconfined recreational opportunities. Unique landforms in the area include craters, volcanos, lava flows, prominent mountains, rolling creosote-covered plains, and mesquite dunes. Raptors, golden eagles, great-horned owls, Swainson's hawks, pronghorn, mule deer, coyote, and a high diversity of bats, amphibians, and reptiles, have also been recorded in the region (NMWA 2003a).

Organ Mountains Complex

The 27,416-acre Organ Mountains Complex, located in eastern Doña Ana County, is 15 miles east of Las Cruces and includes the Organ Mountains WSA, Organ Needles WSA, Peña Blanca WSA, and

Organ/Franklin Mountains ACEC and an additional inventoried wilderness unit, Talavera. The Organ Mountains are considered the steepest mountain ranges in the United States and the landscape is characterized by rugged terrain, such as steep-sided crevices, canyons, and spires. Vegetation in this wilderness unit includes mixed desert scrub, piñon-juniper woodlands, mixed mountain shrub, and ponderosa pine. Some historical mining sites, earthen dams, and fences are scattered throughout the proposed wilderness area, but the landscape remains primitive, allowing recreational opportunities for solitude as well as unique and outstanding scenery. The presence of springs within the Organ Mountains Complex makes the area critically important to wildlife such as golden eagles, mule deer, Montezuma quail, mountain lions, peregrine falcons, a unique species of chipmunk native to the Organ Mountains, and four species of endemic mollusks. Several unique vegetation types also have been inventoried in the area (NMWA 2003a).

2.4 CURRENT SOCIAL AND ECONOMIC CONDITIONS AND TRENDS

2.4.1 Tribal Interests

Refer to the discussion on Traditional Cultural Properties under Section 2.1.11.3, Cultural Resources.

2.4.2 Public Safety

Public safety issues can arise from a variety of circumstances ranging from natural to manmade hazards. In remote areas, natural environmental circumstances pose safety issues including extreme temperature variations, storms and inclement weather, flooding, debris flows, and the presence of aggressive or venomous animals. Manmade hazards include the presence of active or abandoned mines, unexploded ordnance (UXO) located in and near military training areas, recreational activities such as target shooting, and the presence of hazardous materials, hazardous wastes, and solid wastes. Public safety issues associated with specific geographic areas or BLM programs are described below.

2.4.2.1 Motor Vehicle Operations

The risk of a single- or multiple-vehicle accident, or a collision between a vehicle and a pedestrian or bicyclist, is potentially associated with any location where motor vehicles are operating. In 2003, over 48,000 crashes occurred in New Mexico with 439 fatalities. The percentage of traffic accidents that result in fatalities in New Mexico is much greater than the national average (23.4 percent versus 14.7 percent) (New Mexico State Highway and Transportation Department 2003). Table 2-72 shows vehicular accident statistics for Doña Ana, Otero, and Sierra Counties for 2003, and for the State as a whole.

Table 2-72
Vehicular Accident Statistics for 2003

Entity	Total Crashes	Total Property Damage[a]	Total Fatalities	Total Injuries	Number of Licensed Drivers	Total Population
Doña Ana County	4,080	$2,573	29	2,256	115,827	182,165
Otero County	1,149	$770	14	590	37,733	62,381
Sierra County	208	$145	6	84	9,273	13,125
New Mexico	48,128	$16,729	439	25,412	1,253,905	1,874,614

SOURCE: University of New Mexico 2003

NOTE: [a]Estimated costs of crashes, in thousands of dollars

The existing transportation network is described in Section 2.2.6, Transportation and Access. Safety issues associated with the use of these roadways may have implications for the management of or access to public lands.

OHV use occurs throughout the Planning Area for purposes of transportation as well as for recreation. OHVs are used to transport recreational visitors to recreation sites as well as for a recreational activity in itself for motorcycle races and hill climbing. This recreational activity has safety implications due to the nature of the vehicles, rough terrain, and potential risky behavior. Nationwide, data on OHV injuries and deaths are estimated by the Consumer Product Safety Commission. These statistics show that of the 4,541 OHV-related deaths that have been reported in the United States since 1982, 40 have occurred in New Mexico. Nationwide, the cumulative number of reported deaths associated with OHVs increased by 459 since the 2000 to 2001 report. This is partly attributable to more complete data on public road fatalities that have become available since 1999. The deaths reported represent a minimum count of OHV-related deaths. Using a statistical approximation method, an estimated 547 deaths occurred from OHVs in 2000; a 15.4 percent increase from the 1999 estimate of 474 deaths (Ingle 2002). Estimates of OHV injuries requiring an emergency room visit have more than doubled in recent years—from 54,700 in 1997 to 111,700 in 2001. There was a statistically significant increase in the estimated number of injuries for 2001, up about 17 percent from 2000. About a third of the victims injured in 2001 were younger than 16 years old (Ingle 2003).

2.4.2.2 Recreational Shooting and Hunting

All firearm use, including recreational target shooting and hunting, carries a certain degree of risk to both participants and nonparticipants. Recreational shooting occurs at organized shooting ranges; the Butterfield Trail Shooting Range is on public land leased to the City of Las Cruces under the Recreation and Public Purposes (R&PP) Act. Open shooting also occurs in dispersed, informal locations throughout the Planning Area. Dispersed recreational shooting is not prohibited from BLM-administered lands, although this activity has not been officially sanctioned. Shooting restrictions do not prohibit legitimate hunting activities except within one-half mile of developed recreational sites or areas (USDI, BLM 1995a).

Concerns were raised during public scoping regarding the safety of some recreational shooting and hunting activities. These concerns pertained principally to hunters and recreational shooters leaving trash, including homemade targets and empty cartridges that pose a safety or contamination hazard (USDI, BLM 2005e). “Unofficial” target ranges are known to occur within Doña Ana County primarily near the City of Las Cruces, however, one site was identified near Anthony. Five sites identified to have public safety issues in regards to target shooting are (1) East Mesa gravel pits, (2) La Union radio facilities, (3) northeast side of Twin Peaks, (4) Hill gravel pits, and (5) vicinity of Community Pit 1.

2.4.2.3 Other Recreational Activities

Almost any recreational activity may be hazardous to the participants and, in some circumstances, to nonparticipants. Exercising appropriate caution, using appropriate gear, and wearing the correct clothing helps to reduce the risk of injury.

2.4.2.4 Abandoned Mines and Prospects

A number of active and abandoned mines and prospects are located throughout the Planning Area. Visitors often find abandoned mines and prospects attractive to explore and may be exposed to hazards at these sites. Features that could pose public safety hazards at abandoned mining sites include, but may not be limited to the following:

- Open and unstable shafts, adits, drifts, pits, tailings piles, wells, or other excavations
- Dilapidated and unstable buildings or other structures
- Collapsed buildings or other structures
- Mining implements or construction debris
- Hazardous or toxic materials

On-the-ground abandoned mine lands inventories have been conducted under a 1993 BLM directive that established common data elements to ensure that AML information would be characterized consistently. To date, only a small percent of all public lands have been inventoried. The abandoned mine lands data collected have been compiled into an Abandoned Mine Lands Inventory System. Five mine inventories appear on the Abandoned Mine Lands Inventory System in Doña Ana County, 355 in Otero County, and 91 in Sierra County (USDI, BLM 2003f). Table 2-73 identifies the Metal Mining Districts and Subdistricts in Doña Ana, Otero, and Sierra Counties where concentrations of safety issues are more likely to occur (Besse 2005). Locatable, leasable, and saleable mining districts are shown on Map 2-10 through Map 2-16 in Section 2.2.2, Minerals.

Table 2-73
Metal Mining Districts and Subdistricts – TriCounty Planning Area

County	District Number	Districts and Subdistricts
Doña Ana	10	Black Mountain – Gold Camp
	11	Hembrillo – San Andrecito
	12	Organ (Modoc, Texas)
	13	Rincon Manganese
Otero	62	Orogrande (Jarilla, Silver Hill, Brice)
	63	Sacramento (High Rolls)
	64	Tularosa (Bent)
Sierra	90	Caballo Mountains
	91	Chloride (Apache, Black Range, Cuchillo Negro)
	92	Derry Manganese
	93	Fra Cristobal Range
	94	Goodfortune
	95	Grandview Canyon
	96	Hermosa (Palamas)

County	District Number	Districts and Subdistricts
	97	Hillsboro (Las Animas)
	98	Hot Springs (Mud Springs)
	99	Kingston (Black Range)
	100	Lake Valley
	101	Las Animas (Gold Dust) Placer
	102	Macho
	103	Pittsburg (Shandon) Placer
	104	Salinas Peak
	105	San Mateo Mountains
	106	Sulphur Canyon
	107	Tierra Blanca (Bromide)

SOURCE: New Mexico Bureau of Mines and Mineral Resources, New Mexico Institute of Mining and Technology, undated

While most mines are hazardous primarily in terms of public safety, the potential for hazardous material and solid waste dumping in old mine shafts exists. Mine tailings located at both active and closed mine sites pose additional potential hazardous effects, including leaching of chemicals into the soils and/or groundwater from mine tailing piles and airborne hazardous wastes.

2.4.2.5 Air Transportation and Military Operations

Military operations are conducted within the Planning Area at the White Sands Missile Range, Holloman Air Force Base, Fort Bliss Military Reservation (including McGregor and Doña Ana Ranges). These military operations use restricted airspace for low-level training exercises. While rare, there is a remote possibility of aircraft crashes during military training operations. In addition, restrictions on access are implemented to reduce risks related to potential missile or debris impacts from activities on McGregor Range, Doña Ana Range, or the White Sands Missile Range. These restrictions are described in Section 2.4.2.5.

2.4.2.6 Unexploded Ordnance

Live munitions are often used during military training operations. In most cases, these munitions detonate on impact, but there is the remote possibility that the ordnance would not explode. UXO, which represents an immediate public safety hazard, may be located on the ground surface or may be buried beneath the surface as a result of the momentum of impact. Training munitions may contain propellants (such as solid fuel rocket or missile motors or “live” ammunition propellant cartridges [cannon or machine gun rounds]), pyrotechnics (such as in flares), incendiaries (such as tracer rounds or white phosphorus), or other explosive agents. Training munitions also may include small explosive charges used to produce smoke to reveal the location hit when the bomb, rocket, or missile is delivered, but do not produce high-yield detonation, pyrotechnic, or incendiary effects. Expended training munitions that contain these substances because they failed to detonate, burn, or discharge retain the potential to cause severe injury or death if they are disturbed or mishandled. Expended “live” warfighting munitions that fail to detonate, burn, or discharge, or do so incompletely, retain a high potential to kill or injure over a large area of effect. In addition to being an explosive safety hazard, UXO is a potential chemical hazard. UXO that detonates upon delivery may contain unburned residues of chemical constituents and may produce combustion by-products.

2.4.2.7 Livestock Operations

Livestock grazing operations appear to present minimal risk to public visitors to public lands but potentially could impact public safety as a result of collisions between livestock and vehicles, encounters with agitated livestock, or visitor mishaps at range improvements such as stock ponds, fences, or wells. However, human and livestock encounters are becoming more common, particularly south of I-10, where undocumented immigrants are utilizing range improvements for water and shelter.

2.4.2.8 Crimes Against Persons and Property

Illegal dumping, vandalism, and discharging of firearms were listed as concerns during the scoping process (USDI, BLM 2005e). Based on a projected increase in population, it is anticipated that there will be a proportionate increase in the urban interface issues already facing the BLM in the Planning Area. Statewide, the Law Enforcement Program consists of 6 Special Agents (5 in New Mexico, 1 in Oklahoma), a State Staff Ranger, a Law Enforcement Technician, and 13 uniformed Rangers (12 in New Mexico, and 1 in Texas). Additionally, one Special Agent is devoted full time to Archaeological Resources Protection Act crimes. Investigations of paleontological thefts are on the rise, and agents also investigate incidents of vegetative theft, Wild Free-Roaming Horses and Burros Act violations, and hazardous materials violations (USDI, BLM 2005f).

BLM officers take an active role in hunting and fishing enforcement on public lands in the Planning Area. Other resource and recreation crimes occurring on public lands involve abandoned property, camping and fee violations, permitted or authorized use, health and safety, closures, traffic offenses, and occupancy trespass violations (USDI, BLM 2005f).

Much of the border with Mexico is BLM-administered land where there are numerous points of illegal entry used by drug and alien smugglers. Many of these ports of entry are on or near public lands. Resource damage and visitor, employee, and public safety are BLM law enforcement issues (USDI, BLM 2005f).

2.4.2.9 Wildfires

Wildfires have the potential to endanger persons or property. The density and types of vegetation and the consequent likelihoods of natural or human-caused fires vary greatly due to differences in elevation, climate, soils, and topography in the Planning Area.

2.4.2.10 Regulated Hazardous Materials/Hazardous Waste Sites

Federal, State, and local environmental agencies regulate the use, generation, storage, treatment, or disposal of hazardous materials and chemicals or the release of any materials in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and other applicable laws. The National Priorities List, maintained by the EPA and regulated under CERCLA, identifies uncontrolled or abandoned hazardous waste sites where priority remedial actions are performed under the Superfund Program (see Chapter 6 for more information). No Superfund sites are known to be located in BLM's Decision Area. However, one

site is located on private land near Las Cruces in Doña Ana County. This site, known as the Griggs and Walnut Groundwater Plume, is being investigated for the presence of Perchloroethyene in the groundwater. Since drinking water to the community is pumped from groundwater in the area, this contamination could potentially affect the area's drinking water supply (USEPA 2005f).

Potentially hazardous waste sites that have been reported to the EPA by States, municipalities, private companies, and private persons are identified in the CERCLA Information System. The sites that are located within the Planning Area are identified in Table 2-74. Some sites that are investigated require some degree of remedial action. Once it is determined that no further remedial action is necessary, it is identified in the CERCLIS database (column 2 Table 2-47). Listed sites showing no data are still under investigation to determine what remedial action will be required. The date of completion (column 3) indicates the date that all investigations were completed. Where no date is listed, the file remains active.

Table 2-74
CERCLA Information System Sites in the Planning Area

Site Name	No Further Remedial Action Pending Date	Date of Completion
Old Las Cruces Landfill		
Anthony Landfill	09/21/1992	
Chapparral Landfill	03/24/1993	
Cuchillo Landfill		
Garfield Landfill		
Derry Landfill		
Hatch Landfill	03/24/1992	
Hill Landfill	08/04/1992	
La Mesa Landfill	04/29/1992	
La Union Landfill	05/22/1992	
Las Cruces Landfill	06/22/1992	
Las Palomas		
Mesilla Dam		
Mesquite Landfill		
Monticello/Placitas Landfill		
Old La Union Landfill		
Rincon Landfill		
Virden North Landfill		
Tularosa Landfill		
Butterfield Park Landfill		
Orogrande Landfill	09/08/1992	06/09/1994
Truth or Consequences Landfill	10/02/2001	
Blue Canyon Trespass Dump	07/13/1992	06/26/1992
Blackhawk Mine		
NASA WS Test Facility		

SOURCE: U.S. Department of the Interior, Bureau of Land Management, undated

Facilities that are involved in the generation, transportation, storage, or disposal of hazardous materials are regulated under RCRA. RCRA facilities located within the Planning Area include the White Sands Missile Base and Holloman Air Force Base (Frischkorn 2005).

Leaking underground storage tanks have the potential of introducing contaminants into the groundwater or surrounding areas. Although some registered underground storage tanks and leaking underground

storage tanks are located on lands within the Planning Area, no active leaking underground storage tank cases have been reported within the Decision Area (NMED 2005, Phillips 2005b).

Several Formerly Used Defense Sites are located within the Planning Area. These sites are notable because of the potential for the presence of UXO and hazardous materials. The potential for the presence of hazards at each site is noted in column 4. All of the project files are completed and closed as shown in column 5. The status of each of these sites is listed on Table 2-75.

Table 2-75
Formerly Used Defense Sites 2005

Property Name	Property Number	County	Hazards Potential Found	Inventory Project Report Status
Fort Seldon (now Fort Seldon State Monument)	K06NM0418	Doña Ana	No	Closed
Deming AAF PBR #9	K06NM0393	Doña Ana	Yes	Closed
Deming AAF PBR #24	K06NM0410	Sierra	Yes	Closed
Karr Canyon ANX	K06NM0557	Otero	No	Closed
Holloman AFB Closed STA TRA AX	K06NM0428	Otero	No	Closed
Holloman AFB BEA CON AX	K06NM0427	Otero	No	Closed
HAFB Upper ARC	K06NM0432	Otero	Yes	Closed
Holloman AFB Four Bits AX	K06NM0430	Otero	No	Closed
Alamogordo Bombing Range	K06NM0006	Otero	No	Closed
Alamogordo Bombing Range	K06NM0330	Otero	No	Closed
White Sands Missile Range Turq. Inst. Site	K06NM0539	Otero	No	Closed
White Sands Solitaire Inst Site	K06NM0538	Otero	No	Closed
White Sands Missile Range Long Ridge Inst. Site	K06NM0536	Otero	No	Closed
White Sands Missile Range CAP Heliport #200	K06NM0533	Otero	No	Closed
White Sands Missile Range BMTS Inst. Site	K06NM0534	Otero	No	Closed
White Sands Missile Range ARPAT Inst. Site	K06NM0531	Otero	No	Closed
Las Cruces AFS M-95	K06NM0463	Otero	No	Closed
Las Cruces Waste ANX No. 1	K06NM0558	Otero	No	Closed
Las Cruces Waste ANX No. 2	K06NM0559	Otero	No	Closed

SOURCE: U.S. Army Corps of Engineers 2005

NOTES:
AAF = Army Air Field
AFB = Air Force Base
AFS = Air Force Station
ANX = Annex
ARPAT = Advanced Research Projects Army Training
AX = attack experimental
BEA = Budget Enforcement Act
BMTS = Basic Military Training System
CAP = Combat Air Patrol
CON = Control
HAFB = Holloman Air Force Base
INST = information standard
PBR = Precision Bombing Range
STA = surveillance and target acquisition
TRA = technical review authority

2.4.2.11 Regulated Landfills

The construction of landfills on BLM-administered public land has historically been accomplished under the R&PP Act (see Section 2.2.5). Thirty R&PP leases have been issued for landfill facilities in the Decision Area between 1961 and 1985. Of these, 5 leases in Doña Ana County went to patent, 11 were

not renewed, and 6 were authorized. In Otero County, 3 leases went to patent, and in Sierra County, 5 leases went to patent (USDI, BLM 2005g). BLM no longer has the authority to lease public land for landfills.

2.4.2.12 Trash Dumping

A significant issue related to hazardous and nonhazardous waste on public lands is the practice of abandoning solid and hazardous waste items. Unregulated sites include illegal "wildcat" dump sites, where solid and hazardous wastes are abandoned in locations other than established landfill facilities. These occurrences range in severity and volume from isolated episodes of individuals dumping household trash and appliances, to disposal of items by businesses. This issue was mentioned as a concern during the public scoping meetings (USDI, BLM 2005e).

2.4.3 Social and Economic Conditions

This section describes the social and economic conditions within the Planning Area in terms of (1) economic value of products and uses related to public land; (2) employment, income, and subsistence related to the resources and uses of public land; (3) public finance and government services; (4) social and demographic conditions; and (5) place-based values.

2.4.3.1 Economic Value

For the following discussion of economic value, the Study Area includes statewide and county-level data. Together, these data indicate how activities in the Planning Area contribute to the regional and statewide economic health and viability of a particular sector (e.g., mineral development, recreation).

Livestock

Current Use

The economic value of livestock is described as an integral part of the overall farming and ranching sector within the Planning Area and New Mexico. The number of cattle ranches in New Mexico has remained fairly steady over time—there were 8,500 ranches in both 1975 and 2001. The number did not fall below 8,500 throughout that time period, and the high point of 9,000 ranches occurred between 1990 and1995 (New Mexico Economic Development Department 2003).

Table 2-76 provides the most recent data available to characterize the size and market value earned by agricultural and ranching operations in the Planning Area. Of the three counties in the Planning Area, Doña Ana County has the greatest number of livestock. Based on the most recent figures available, Doña Ana County houses about 5 percent of the total number of cattle and calves in New Mexico. As shown in Table 2-76, the market value for livestock and related products, and for agricultural products generally, is largest in Doña Ana County. However, the Planning Area does not constitute a substantial contributor to the overall statewide industry.

Table 2-76
Key Agricultural and Livestock Statistics

	Doña Ana County	Otero County	Sierra County	New Mexico
Land in Farms, 2002 (acres)	580,769	1,207,598	1,362,866	44,810,083
Pasture	80.6%	(D)	98.4%	87.3%
Cropland	16.3%	(D)	(D)	5.8%
Other uses	3.1%	2.3%	1.2%	6.9%
Number of cattle and calves in 2004[a]	81,000	10,000	15,000	1,500,000
Number of sheep and lambs in 2004[a]	1,500	8,000	N/A	145,000
Market value of agricultural products sold, 2002 (total, in $1,000s)	$251,847	$10,544	$19,386	$1,700,030
Value of livestock, poultry, and their products, 2002 (in $1,000s)	$128,687 (51% of county total market value)	$4,944 (47% of county total market value)	$13,607 (70% of county total market value)	$1,302,773 (77% of state total market value)

SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service 2002a, unless otherwise noted
NOTES: [a] U.S. Department of Agriculture 2004
(D) Withheld to avoid disclosing data for individual farms or ranches

As indicated in Table 2-76, sheep and lambs are fewer in number in the Planning Area and statewide than cattle and calves. Between 1980 and 2005, the value per head of sheep and lambs has increased 55 percent (from $77 to $119 per head) and the inventory of sheep and lambs in New Mexico has fallen by 78 percent (from 660,000 head to 145,000 head) (USDA, National Agricultural Statistics Service [NASS] 2004).

An analysis of trends since 1997 indicates that the market value of agricultural products has increased the most dramatically in Sierra County (an increase of about 15 percent). In comparison, the market value of these products increased 4 percent in Doña Ana County during the same time period, and decreased slightly in Otero County (USDA, NASS 2002a). Additional information on trends in the agricultural sector is provided in the Socioeconomic Baseline Report.

The economic viability of farming and ranching enterprises may be more than the cash receipts received from products would suggest; farm and ranch net income also is influenced by government payments, rent, the value of inventory change, and production expenses. In Doña Ana County, livestock and related products provided a greater share of gross farm income in 2002 (about 48 percent) than they did in 1970 (an overall increase of 12 percent), offsetting a decrease in receipts from the sale of crops. In Otero County, livestock and related products had provided 72 percent of gross farm income in 1992, but cash receipts from livestock products have dropped substantially since that time and in 2002 accounted for a 37 percent share of gross income. Although the share of gross farm income provided by crops generally is growing in Sierra County, livestock and related products still accounted for 64 percent of gross farm income in 2002 (U.S. Department of Commerce [USDC], Bureau of Economic Analysis [BEA] 2002). For additional information on the types of income, assets, and expenses that have factored into the economic viability of this sector within the Planning Area, refer to the Socioeconomic Baseline Report.

Table 2-77 indicates the total number of farms with grazing permits and the source of those permits. Permits issued under the Taylor Grazing Act are administered by the BLM. The BLM provides the majority of grazing permits to farms that are using them. Available data indicate that the overall number of grazing permits issued increased between 1987 and 1997 (USDA, NASS 1997).

Table 2-77
Farms with Grazing Authorizations in 1997 by Federal Agency

County	Farms with grazing permits	Grazing Authorizations			
		U.S. Forest Service Land	Taylor Grazing Act (BLM Land)	American Indian land	Other
Doña Ana County	64	10	45	1	18
Otero County	100	40	66	2	27
Sierra County	89	18	73	2	31
Total for Planning Area	253	68	184	5	76

SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Survey 1997

Grazing fees are received by the BLM according to the number of AUMs. Table 2-78 shows the total authorized AUMs by county within the Planning Area, and the established grazing fee for each year between 1995 and 2005. The largest number of authorized AUMs is in Otero County. Otero County also has the most productive rangeland, as determined by the rangeland production classes.

Table 2-78
Authorized AUMs by County and Grazing Fees, 1995-2005

Year	Authorized AUMs				Grazing fee per AUM
	Doña Ana County	Otero County	Sierra County	Total	
1995	51,937	104,241	67,258	223,436	$1.61
1996	44,935	105,466	68,692	219,093	$1.35
1997	65,655	116,475	73,077	255,207	$1.35
1998	69,892	119,773	72,954	262,619	$1.35
1999	61,450	129,802	73,976	265,228	$1.35
2000	59,476	113,312	71,059	243,847	$1.35
2001	61,458	101,234	77,620	240,312	$1.35
2002	52,925	74,683	71,570	199,178	$1.43
2003	49,960	77,321	67,145	194,426	$1.35
2004	49,043	69,836	54,055	172,934	$1.43
2005	46,305	87,496	41,721	175,522	$1.79
11-year average	55,731	99,967	67,193	222,891	$1.43

SOURCE: Cody 1996, USDA 2005, USDI BLM 2003c, Smith 2006.

Grazing on public land generates revenue through the grazing fees, surcharges on pasturing agreements, and penalties for unauthorized grazing use. Grazing fees are determined through a formula established in the Public Rangelands Improvement Act of 1978. Fifty percent of the revenue from grazing fees is returned to agencies through a range betterment fund and are used for range improvement. The remainder is allocated to the State or U.S. Treasury (Cody 1996). The formula used to calculate the grazing fee incorporates the ranchers' ability to pay, and therefore the current purpose of the fee is to not to recover agency expenditures or to capture the fair market value of forage (GAO 2005).

Forecast

Population growth—particularly in Doña Ana County—may trigger the transition of farm and ranch land to residential or other urban uses. The amount of land in farms has been decreasing since 1997. The reduction in the aquifer in rangeland areas and potential incompatibilities between urban land uses and farming and ranching operations may further erode the viability of the agricultural sector in some areas. However, relocation of farming and ranching to less populated counties, such as Otero County, may be occurring.

The forecast for AUM authorizations on BLM-administered land is contingent upon management direction regarding livestock use, which is typically determined based on forage consumption and range production (which are dependent on precipitation and rangeland conditions, among other factors), and the overall balance with management of other resources.

Key Features

- Within the Planning Area, Doña Ana County generates the greatest market value from agricultural products (about $252 million in 2002), and livestock and related products account for approximately half of that value.
- BLM generates revenue from grazing on a per AUM basis.
- The BLM provides approximately 73 percent of the grazing authorizations that are issued in the Planning Area, indicating links between existing ranchers and BLM management of livestock grazing.
- The largest number of AUMs authorized by BLM is in Otero County. Although the market value of agricultural products in Otero County is substantially less than that in Doña Ana County, the share of that value represented by livestock and related products is higher (about 70 percent).

Minerals

The minerals program manages a variety of resources: (1) leasable minerals (fluid minerals such as oil, gas, geothermal, coalbed methane, carbon dioxide and helium as well as solid minerals such as coal, potash, and sulfur), (2) locatable minerals (metallic and nonmetallic minerals that can be obtained by filing a mining claim (i.e., gold, silver, fluorspar, etc.), and (3) saleable minerals (e.g., sand and gravel).

Current Use

Leasable Minerals

Fluid Minerals – New Mexico is an important producer of extractive energy resources such as oil and gas, but the Planning Area is not a substantial contributor to the statewide industry. Exploratory wells have been drilled in the Planning Area as described in Section 2.2.2.1, but no oil and gas production has occurred. Gas detected at the surface from exploratory wells suggests the potential for economically viable concentrations of carbon dioxide and helium, but no gas production has occurred. Although there are leaseholds for oil and gas production in the Planning Area, there has been only one new fluid mineral leased parcel sold within the last ten years. There was a gas discovery on Otero Mesa in Otero County in

the mid-1990s. As a result, interest in exploration in that area increased substantially. However, it is still not clear that Otero Mesa is a high-potential area for energy resources.

Public land may be leased for development of fluid minerals. On public land, costs to the lessee include rental fees and competitive bids that are paid to the BLM and royalties that are paid to the U.S. General Revenue Fund. These costs are described in more detail in Section 2.2.2.1, Leasable Minerals.

There are two KGRAs located in Doña Ana County (USDI, BLM 2003) – Radium Springs and Las Cruces East. In addition, areas of high potential for geothermal resources have been identified in the Planning Area, as discussed in Section 2.2.2.2, Geothermal. Existing commercial uses of geothermal resources include (1) hot springs and mineral baths that are open to the public in the Truth Or Consequences area (Radium Springs KGRA), and (2) to heat greenhouses and for aquaculture Las Cruces East Mesa KGRA).

The royalty value of all Federal leases in Doña Ana County in Fiscal Year 2001 (the most recent available data) totaled slightly over $1,000, with geothermal-related revenues accounting for about half of the total. Royalty value generated from Federal leases in Otero County totaled over $36,000. Currently, there is no production occurring in Doña Ana or Otero Counties. There has been no leasing in Sierra County; therefore, royalty revenue has not been generated. The royalty value generated in Doña Ana and Otero Counties is miniscule compared to the overall royalty value in the State of New Mexico in Fiscal Year 2001, which was over $770 million (USDI, MMS 2005).

Solid Minerals – Federal coal leases are awarded through sealed competitive bid. On public land, lessee costs include the competitive bid and rental costs that are paid to the BLM, and royalties that are paid to the U.S. General Revenue Fund. These costs are further described in Section 2.2.2.2, Leasable Minerals.

Nationally, New Mexico ranks 12th in coal production and 3rd in coal reserves (NMEMNRD 2003b). However, there are no active solid mineral leases or leasing activity on BLM-administered land in the Planning Area. BLM earns rental fees associated with leases, but has not received royalties due to the lack of production. There are several occurrences of coal resources within the Planning Area, as described in Section 2.2.2.2, Current Uses, Coal, but overall the potential for development is considered low.

Locatable Minerals – Although there are many mining claims and inactive mines in the Planning Area, no large active mining operations exist at the time of this report. BLM does not earn substantial revenue from locatable mining activites.

Saleable Minerals – Saleable minerals that are commonly produced on BLM-administered land in the Planning Area include sand, gravel, and stone. There are more active pits, prospects, and inactive mines in Doña Ana County than in Sierra and Otero Counties. Table 2-79 provides the approximate number of registered operators that are mining mineral materials in the Planning Area, and how many extract resources from Federal land and/or mineral estate. Aggregate and stone mining of Federal minerals includes scoria, base course, and sand and gravel in Doña Ana County, and crushed rock and gravel in Otero County. Federal industrial minerals extracted by registered operators include gypsum and calcite. The metals extracted in Sierra County are precious metals (NMEMNRD et al. 2001).

Table 2-79
Registered Mines in the Planning Area, and Percent of Operators Extracting Federal Minerals[a]

Industry and County	Registered Operators	Operators that are Extracting Federal Minerals[b]	
		Number	Percent
Aggregate and stone mining			
Doña Ana County	26	12	46%
Otero County	7	1	14%
Sierra County	3	0	0
Industrial minerals mining and milling			
Doña Ana County	3	2	66%
Otero County	1	1	100%
Sierra County	1	0	0
Metals			
Doña Ana and Otero Counties	0	0	0
Sierra County	1	1	100%

SOURCE: Mexico Energy, Minerals and Natural Resources Department et al. 2001

NOTES: [a] There are some discrepancies between various sources on the number of active mines in the Planning Area. See Section 2.2.2.3. However, these figures still provide a sense for how much BLM-administered minerals contribute to the viability of the industry in the Planning Area.

[b] Some operators extract materials from a mix of Federal and privately owned minerals. Surface area could be managed by BLM or U.S. Forest Service.

Throughout New Mexico, there were 169 active stone and aggregate mining operations registered in 2002. Total production value for all aggregate and stone totaled $73.5 million in 2002, and it is estimated that stone, sand, and gravel account for 70 percent of all production value (NMEMNRD 2003b). Statewide sales value of sand totaled $12.2 million (approximately 2.5 million short tons); gravel, $12.5 million (2.4 million short tons); and crushed rock, $28.3 million (4.9 million short tons).

The BLM issues permits to other parties to dispose (sell) these mineral materials, and shares a portion of the revenues generated from sales with the State. The BLM also issues free-use permits to governments and potentially to some nonprofit organizations to use mineral materials for public use.

Forecast

Leasable Minerals

Fluid Minerals – It is possible that interest in oil and gas development in the Planning Area will increase as a result of higher prices, which would justify the development of higher-risk and more remote (therefore more expensive) prospects. Subsequent leasing activity would generate revenue for the BLM, U.S. General Revenue Fund, and State of New Mexico, as well as filter through the local economies. The development of geothermal resources will accelerate in parts of Sierra and Doña Ana Counties due to the high potential for geothermal resources and the BLM's designation of KGRAs.

Solid Minerals – Due to the lack of suitability for economic development of coal and other solid leasable minerals, the interest in developing these minerals in the Planning Area is expected to remain minimal.

Locatable Minerals –In general, production value and revenue generated by mineral commodities has been decreasing since 1998 (NMEMNRD 2003b). Mining activity typically is price driven, and the trends

suggest that the Planning Area is well surveyed and unlikely to be a target for new development. However, possible future prospects in the Planning Area could include uranium and rare earth elements.

Saleable Minerals – Demand for mineral materials is expected to grow as construction occurs to accommodate population growth. Expansion of saleable mineral development on BLM-administered land (and overall) is limited due to a lack of additional locations of high-quality sand and gravel, as well as special designations that are managed to limit surface disturbance in areas of resource potential (e.g., the Organ/Franklin Mountains ACEC). Particularly in the Las Cruces metropolitan area, where population growth projections are highest, costs for construction materials may increase as saleable resource sources are depleted and distances to transport materials increase.

Key Features

- There is limited development of leasable and locatable minerals in the Planning Area.
- Saleable mineral development feeds local demand for sand and gravel, building stone, and other materials used in construction to accommodate population growth.
- Projected population growth in combination with depleting saleable mineral resources may lead to increased costs for construction materials.

Renewable Energy

Current Use

The potential for wind, solar, and biomass energy development has been identified within the Planning Area (USDI, BLM 2003g). However, no commercial developments utilizing these resources have been proposed or constructed within the Planning Area. The BLM has approved the installation of meteorological towers in two locations southeastern Otero County; monitoring these towers is part of the process to assess the potential for siting a wind energy facility.

Geothermal resources are discussed above in Section 2.4.3.1, Current Use for Leasable Minerals.

Forecast

According to energy projections through 2025, strong growth in renewable electricity generation is expected, although grid-connected generators using renewable fuels are projected to remain minor contributors to the overall electricity supply. Biomass is forecasted to be the second largest source of renewable generation behind hydropower, which is the leading source of renewable generation. Geothermal and wind power also are projected to show significant production increases, especially in the West. The prospects for wind power likely will be tied to the continued extension of Federal production tax credits (as of August 2005 this credit is due to expire at the end of 2005), State incentive programs, technology improvements, transmission availability, and public interest (U.S. DOE 2005).

Renewable portfolio standards, which require investor-owned utilities to produce or procure a minimum amount or percentage of their electricity from renewable energy sources, exist in New Mexico and other western states, and may contribute to continued or increased renewable energy development. The

development of solar resources in the Planning Area is likely to be driven by the costs of solar technology, although the area has been identified as suitable for development of photovoltaic resources. The Final Programmatic EIS for Wind Energy Development on BLM-Administered Lands forecasts that New Mexico will experience moderate rates of wind-energy development (Argonne National Laboratory 2005). Locations in the Planning Area with greater potential for wind-power development are discussed in Section 2.2.3.

A biomass-fueled power plant has been proposed for Catron County, north of the Planning Area. This proposal, as well as any future projects, could require biomass harvesting from BLM-administered lands in the Planning Area. There may be future requests for land use authorizations for power plants, transmission lines, wind turbines, or other facilities associated with renewable power generation due to the availability of biomass resources and open space in the Planning Area.

Key Features

- BLM-administered lands may provide a future source of fuel for biomass-fueled power generation.
- In the future, BLM may be evaluating applications for land use authorizations related to renewable energy production, particularly meteorological masts, turbines, solar energy collectors such as photovoltaics, and transmission facilities.

Recreation

Current Use

The economic value of recreation on BLM-administered land may be characterized by (1) the revenue earned by BLM directly through visitation and permits, (2) revenue generated locally via visitor expenditures, and (3) the contribution that the amenity of recreation opportunities provide to economic development in local communities.

Revenue Earned by BLM

The BLM earns revenue from recreation from fees generated at selected sites. Currently, three fee areas exist within the TriCounty Planning Area: Dripping Springs Natural Area, Aquirre Spring Campground (both in Doña Ana County), and the Three Rivers Petroglyph Site (in Otero County). The fees for entry to these recreational areas have not been changed since they were established in 1989, and remain the least costly fee areas ($2 to $3 per car) in the State of New Mexico. In comparison, fees charged on public land elsewhere in New Mexico are typically $6 to $8 per vehicle. The revenue generated from fees is used primarily for janitorial services, new development, and upkeep of the recreational areas.

The total visitation and revenue associated with each fee site is summarized in Section 2.2.4 (specifically, Table 2-62 and Table 2-65). Visitation has been highest at the Aguirre Spring Campground since 2000, averaging about 56,500 visitors generating an average of about $24,500 annually. During the same time period, Dripping Springs Natural Area has averaged just over 22,000 visitors generating an average of about $18,700 annually. Since 2000, annual visitation to the Three Rivers Petroglyph Site ranged between

18,000 and just over 22,000, typically generating revenues between $11,000 and $13,000 annually. Visitation to Three Rivers has decreased overall since 2000 (Sanchez 2005).

Available data indicate that the true economic value of recreation to BLM may be larger than the revenue generated from fees would suggest. The 2004 BLM Visitor Study was conducted for the BLM by the University of Idaho to provide information on visitor satisfaction, expenditures, and demographic profiles (USDI, BLM 2004e). The study is a compilation of results from 18 selected BLM sites in 12 states, with 5,020 surveys distributed and 50 percent returned. Areas managed by the Las Cruces District Office were among the study sites. Of those surveyed, 83 percent agreed that the fees were "about right," and 85 percent agreed that the recreational opportunities and services were "at least equal to the fee they were asked to pay." About 43 percent of recreationists agreed that they would have paid more for their experience, and 61 percent agreed that they would have paid $1 more given that the fee revenue would be designated only for use at the site they were visiting.

BLM issues special recreation permits in accordance with 43 CFR 2930 (see Section 6.16). Commercial, competitive, and large group activities are among the uses that are likely to require a special recreation permit. Table 2-80 shows the number of special recreation permits issued by the Las Cruces District Office Office and the revenue generated from them over a 5-year period.

Table 2-80
Special Recreation Permits Issued by the Las Cruces District Office

	2000	2001	2002	2003	2004
Number of permits	17	18	14	13	15
Revenue generated	$7,059	$6,152	$5,700	$7,232	$6,181

SOURCE: Sanchez 2005

Local Expenditures

The SCORP states that outdoor recreation and tourism are of great importance to local and regional economies, in part because of indirect economic impacts resulting from local expenditures made by visitors to an area. Recreation opportunities provided on BLM-administered land attract visitors to the Planning Area.

According to the BLM Visitor Study, 45 percent of visitors reported traveling less than 100 miles to visit selected BLM sites. Approximately 44 percent traveled at least 3 hours to the BLM site or area. This suggests that revenue generated from many visitors represents an injection of outside money into local economies. This survey also indicated that 53 percent of visitors reported that the BLM destination was the "primary purpose of the trip," indicating that visitation on BLM lands brings people into local communities who would not otherwise be there, and that travel likely leads to expenditures in local restaurants, stores, hotels, and other businesses. Of all visitors, 72 percent spent more than one day in the local area (USDI, BLM 2004e).

The visitor study also estimated local expenditures by visitors results are listed in Table 2-81. These are considered to be conservative estimates because answers that were left blank on surveys were assumed to equal $0, resulting in a lower average expenditure.

Table 2-81
Average Local Expenditures by Visit to BLM Sites

Lodging	$284.60
Guide fees	$168.08
Equipment rentals	$127.74
Other expenses (not listed in this table)	$98.25
Shopping	$89.29
Restaurant dining	$89.16
Groceries	$74.33
Local transportation	$66.88
Camping fees	$24.90

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2004e

Outside fee areas, data on visitation to public lands in the Planning Area—which generates the local expenditures—are not available. However, recreational use on BLM-administered public lands in New Mexico is estimated to total almost 2.2 million visits and 1.77 million visitor days. About 56 percent of visits occur in dispersed areas (USDI, BLM 2004f).

Projected hunters and the types of species hunted are summarized in Table 2-64. The 2001 National Survey of Hunting, Fishing, and Wildlife-Associated Recreation is completed by the FWS every 5 years, and provides a sense of the local expenditures that are associated with this type of recreation. According to the most recent survey, 884,000 people recreated in New Mexico and spent over $464 million on hunting and fishing expenditures and $558 million on wildlife-watching expenditures, for a total of over $1 billion (USFWS 2001). These expenditures typically are made in the categories of outfitting, retail, food service, and lodging, and support local service industries.

The BLM also has estimated expenditures by hunters on BLM-administered lands on a state-by-state basis. It is estimated that over 22,000 hunters hunt on BLM-managed land, spending an average of $1,164 per hunter. Total expenditures in New Mexico related to hunting on public land are estimated to total over $26 million (USDI, BLM 2004f). The BLM also estimated a total of 113,733 wildlife viewers on BLM-administered lands in New Mexico, who spend an average of $832 per wildlife viewer. The total estimate for expenditures related to wildlife viewing on public lands is over $102 million (USDI, BLM 2004f).

Section 3.1.7.5 provides specific information on the currently active special recreation permits in the Planning Area. Permittees include organizers of equestrian endurance rides, motorcycle races, and a mountain bike race, among other events. These events may bring in visitors from outside the region for a short duration, resulting in local expenditures related to food, lodging, equipment, or other services. In addition, three current permittees are outfitters. These businesses provide employment in the local area and generate commercial revenue from the use of public lands that will be filtered through the local economies.

Recreation as an Inducement to In-Migration

Managing public land to maintain recreation opportunities, open space, and scenic resources contributes to local economies by perpetuating attractive quality-of-life amenities. The economic value that recreation opportunities help to create may be reflected in the economic activity generated by in-migration of people, employment, and non-labor income. Areas that are most likely to capitalize on recreation and

other amenities to stimulate economic development are rural areas that are connected to larger population centers (e.g., by proximity, or an airport) and have an educated workforce that is able to work in higher paying service industries (Rasker et al. 2004).

A typical theory of economic development is that jobs spur in-migration and subsequent economic development. However, research has shown that amenities such as recreation opportunities, scenic resources, and other facets of "quality of life" attract new residents (Rasker et al. 2004). Telecommunications technology allows businesses to operate outside urban areas, providing greater freedom in choosing rural residences and employer locations. Migration, in turn, creates economic development by triggering the expansion of retail, service, and construction industries. In addition, the growth of non-labor income indicates that retirees with nest eggs are supporting the growth of other economic sectors. Within the Planning Area, current and projected population growth is particularly notable in the Las Cruces metropolitan area, and the retiree population is growing throughout the Planning Area.

Forecast

As discussed in Section 2.2.4.2, Recreation Forecast, recreation use is expected to evolve to reflect the changing demographics of users and new technologies. In addition, population growth, which is projected for parts of the Planning Area, typically results in increased demand for recreation opportunities. BLM's efforts to manage recreation on public land to address new levels and types of demand would support the economic development efforts of local communities by promoting recreation amenities that draw revenue from outside the region, and by protecting the open space and recreation amenities that contribute to the unique character of the region.

It is difficult to forecast future visitation, due to a lack of comprehensive existing data and the fact that a variety of national and regional factors may influence the tourism economy (e.g., higher travel costs due to higher gasoline prices may affect regional tourism unpredictably). However, the New Mexico SCORP forecasts that tourism will remain a key component of its economy and that of the Planning Area.

Key Features

- Fees charged for use of some sites in BLM's Decision Area are substantially less that those charged on public lands elsewhere in New Mexico.
- The Aguirre Spring Campground receives substantially higher visitation than the other two fee sites that are monitored.
- Recreation opportunities provided by BLM generate tourism from areas outside the Planning Area, which results in local expenditures.

Lands and Realty

Current Use

The R&PP Act authorizes the BLM to lease and/or patent public lands for recreational or public purposes to State and local governments and to qualified non-profit organizations. Examples of typical uses

allowed under the Act are historic monument sites, campgrounds, schools, firehouses, law enforcement facilities, municipal facilities, landfills (patent only), hospitals, parks, and fairgrounds. The sale, exchange or lease of public lands may have positive effects on the local community due to the availability of public services, increased property values resulting from the community amenity, and tax revenue generation. The Mimbres RMP set aside several parcels in Doña Ana County for potential lease under the R&PP Act: school sites for future development by the Las Cruces School District (however, this is not likely to continue, as it is not an appropriate land use decision; the lands will merely be identified for disposal to make them available for R&PP application), and a 10,000-acre State Land Exchange Area.

The R&PP Act provides for a special pricing program for purchases of land that will be government-controlled, used for government purposes, and serve the general public. Examples include parks, educational facilities, public-health-related facilities, fire and law enforcement structures, courthouses, and administrative service facilities for States, counties, and communities. Regular pricing applies to publicly supported and operated uses that are not essential or customary to government and agency services. These uses include cemeteries, museums, community centers, tourist information facilities, and fairgrounds. Nonprofit organizations may lease or purchase land for uses consistent with their articles of incorporation or creating authority. Applicants also are required to file a $100 nonrefundable filing fee (USDI, BLM 1996).

Rights-of-Way – BLM issues rights-of-way over, upon, under, or through public lands. A right-of-way grant is an authorization to use a specific piece of public land for specific facilities for a certain period of time. Currently, the vast majority of the rights-of-way granted within the Las Cruces District Office are authorized under Title V of FLPMA (43 U.S.C.1761-1771). It is the policy of the BLM to authorize all right-of-way applications at the discretion of the authorized officer in the most efficient and economical manner possible. Rights-of-way authorized under FLPMA are typically for electrical power generation, transmission and distribution, pipelines and related facilities. Rights-of-way not authorized under oil and gas leases are processed under the Mineral Leasing Act. Rights-of-way authorized under the Mineral Leasing Act are typically for the transportation of hydrocarbon through pipelines, production systems, and related facilities.

Fees paid to BLM that are associated with a right-of-way grant include fees for processing the application and monitoring compliance with the terms and conditions of the grant and the annual rental costs, which are based on fair market value. Processing and monitoring fees for minor category projects are charged according to a schedule. Costs for major category projects vary depending on the scope of the project. BLM collects processing and monitoring fees for FLPMA and the Mineral Leasing Act major category rights-of-way projects. Major category projects applied for under the authorities of FLPMA or the Mineral Leasing Act require the payment of reasonable processing costs for rights-of-way. Project categories (major or minor) are based on the number of hours and other costs, including field trips to the right-of-way site, that are required to process applications. Categories range from Category 1 to 6, with 1 being of a “minor” nature and 6 requiring full cost reocvery. Minor category projects require no longer than 8 hours to process the application; Category 6, or a “major” category project, requires more than 50 hours to process and requires full cost recovery.

No fees or rental are required for:

- State or local agencies or instrumentalities thereof (except municipal utilities and cooperatives whose principal source of revenue is customer charges) where the land will be used for governmental purposes and the land resources will continue to serve the public interest
- Road use agreements or reciprocal road agreements

Other specific exemptions, waivers, or reductions in the application and/or rental may apply (e.g., due to hardship).

Permits, Leases, and Easements – Proposals for non-Federal use of public lands (for other than casual purposes) are outlined in 43 CFR 2920. Any use not specifically authorized under other laws or regulations and not specifically forbidden by law may be authorized under these regulations including residential, agricultural, industrial, and commercial uses and uses that cannot be authorized under Title V of the FLPMA or section 28 of the Mineral Leasing Act. Land use authorizations are categorized as leases, permits, and easements. Regulations for land use authorizations allow for the collection of rental fees as determined by the authorizing officer. The rent is to be based either upon the fair market value of the rights authorized in the land use authorization or as determined by competitive bidding. Rental fees for leases and easements may be adjusted every 5 years or earlier, as determined by the authorized officer, to reflect current fair market value. A non-refundable processing fee of $25 shall accompany each request for renewal, transfer, or assignment of a lease or easement. . The conditions for the applicant to reimburse the United States for costs are similar to those described for rights-of-way (43 CFR 2800).

Revenue received by BLM for special recreation permits is discussed above in Section 2.4.3.1.

Forecast

The BLM has identified lands that are suitable for disposal in the vicinity of growing areas such as Las Cruces. These lands could ultimately be transferred to non-Federal ownership or leased for public use and become developed, contributing to the tax base and infrastructure needs for the local jurisdiction. Leases or patents issued in accordance with the R&PP Act could allow local jurisdictions to provide public facilities with the benefit of special pricing.

The need for additional utilities is expected to occur if the population grows as projected, particularly in the Las Cruces area, and consequently applications for right-of-way grants for utilities or other land use authorizations (such as for communication sites) may be expected to increase. These authorizations generate some revenue for the BLM, but also support local community efforts to grow and improve services.

Key Features

- Disposal of public land in growing metropolitan areas may serve the needs of increasing populations and assist local jurisdictions in planning and providing public services and facilities.

2.4.3.2 Employment, Income, and Subsistence

Overview of Planning Area Employment and Income

This overview provides context for understanding the contribution of the individual sectors described below to overall employment and income in the Planning Area. Data are not specific to public lands within the Planning Area, as these data are not available. The discussion is focused on the most recent available data, although data have been analyzed back to 1970 to identify trends. The characteristics of the regional economy are described in terms of employment by industry, income and earnings, unemployment, and economic diversity and resiliency.

Employment by Industry

Table 2-82 provides data on the number of jobs and share of employment provided by each industry in the Planning Area, statewide, and nationally. Government and government enterprises currently provide the largest share of employment in the Planning Area (ranging from 20.2 percent in Sierra County to 39.5 percent in Otero County), as well as the largest share of employment statewide (21.2 percent). Approximately 40 percent of government-related employment in Otero County is with the military. Nationwide, government employment is less dominant.

In both the Planning Area and statewide, health care and retail trade are also large employment providers. Sierra County also has a relatively high share of employment in accommodation and food services, which may be a reflection of the importance of recreation to the local economy.

Table 2-82
2002 Employment by Industry

Category	Doña Ana County		Otero County		Sierra County		New Mexico		United States	
	Number of Jobs	Share	Number of Jobs	Share	Number of Jobs	Share	Number of Jobs	Share	Number of Jobs	Share
Forestry, fishing, and related activities	N/A	N/A	N/A	N/A	N/A	N/A	6880	0.7%	1,015,800	0.6%
Mining	N/A	N/A	N/A	N/A	N/A	N/A	17,883	1.8%	778,600	0.5%
Utilities	285	0.4%	77	0.3%	N/A	N/A	4,160	0.4%	618,600	0.4%
Construction	4,779	6.0%	1,338	4.9%	N/A	N/A	62,371	6.3%	9,815,300	5.9%
Manufacturing	3,326	4.2%	433	1.6%	N/A	N/A	43,549	4.4%	15,800,400	9.5%
Wholesale trade	1,335	1.7%	246	0.9%	N/A	N/A	28,255	2.8%	6,163,000	3.7%
Retail trade	7,892	10.0%	2,920	10.6%	515	11.3%	112,187	11.3%	18,384,900	11.0%
Transportation and warehousing	1,872	2.4%	731	2.7%	73	1.6%	23,589	2.4%	5,365,200	3.2%
Information	1,265	1.6%	296	1.1%	38	0.8%	19,225	1.9%	3,819,000	2.3%
Finance and insurance	2,002	2.5%	678	2.5%	115	2.5%	31,914	3.2%	7,929,500	4.7%
Real estate and rental and leasing	2,170	2.7%	947	3.4%	244	5.3%	34,303	3.5%	6,444,900	3.9%
Professional and technical services	3,769	4.8%	1,012	3.7%	150	3.3%	60,603	6.1%	10,448,600	6.3%
Management of companies and enterprises	89	0.1%	51	0.2%	0	0.0%	5,801	0.6%	1,772,000	1.1%
Administrative and waste services	3,473	4.4%	1,615	5.9%	104	2.3%	53,659	5.4%	9,545,200	5.7%
Educational services	625	0.8%	116	0.4%	N/A	N/A	12,166	1.2%	3,136,400	1.9%
Health care and social assistance	10,151	12.8%	2,349	8.5%	N/A	N/A	96,483	9.7%	16,124,600	9.7%
Arts, entertainment, and recreation	1,652	2.1%	232	0.8%	94	2.1%	19,335	1.9%	3,310,500	2.0%
Accommodation and food services	5,415	6.8%	1,481	5.4%	556	12.2%	78,015	7.9%	10,938,200	6.5%
Other services, except public administration	3,976	5.0%	1,294	4.7%	310	6.8%	51,006	5.1%	9,201,800	5.5%
Government and government enterprises	20,255	25.6%	10,862	39.5%	923	20.2%	209,955	21.2%	23,346,000	14.0%
Federal, civilian	3,394		1957		116		29,043		2,730,000	
Military	538		4,283		35		16,796		1,954,000	
State government	8,824		947		306		67,149		5,055,000	
Local government	7,499		3,675		466		96,967		13,607,000	
TOTAL EMPLOYMENT	79,256		27,515		4,570		992,611		167,033,504	

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis 2002

NOTE: N/A = Number not available
Numbers do not add to total employment figure because of data that has been suppressed for confidentiality reasons

Table 2-83 shows a comparison of the annualized rates of growth for each of the counties in the Planning Area and, for comparison, the median for all U.S. counties. Growth was faster for both population and employment in Sierra and Doña Ana Counties than the U.S. median. Although population growth exceeded the median in Otero County, the growth of employment did not keep pace.

Table 2-83
Population Growth and Employment Growth in the Planning Area

	Population Growth (Annualized rate, 1970–2002)	Employment Growth (Annualized rate, 1970–2002)
Doña Ana County	3.0%	3.4%
Otero County	1.3%	1.1%
Sierra County	1.9%	2.1%
Median of all counties in the United States	0.7%	1.4%

SOURCE: Sonoran Institute 2005

Between 1970 and 2000, the services and professional sector experienced the most dramatic increase in employment. In Doña Ana County, 65.5 percent of new employment between 1970 and 2000 occurred in the services and professional sector, particularly in the services category[4] (accounting for 37.4 percent of overall job growth) and retail trade (17.2 percent). In Otero County, 87.1 percent of new job growth occurred in the services and professional sector, with services accounting for 34.5 percent of overall job growth, and retail trade for 28.5 percent. Sierra County also shows growth of 36.3 percent in the services category and 19.5 percent in retail trade (USDC, BEA 2002).

Income and Earnings

Currently, government and government enterprises, the largest employer in each of the counties in the Planning Area, accounts for the largest share of labor income (Table 2-84). Between 1970 and 2000, the largest share of new labor income came from the services and professional sector, in particular in the services category. Specifically, income growth in the services and professional sector during this period totaled 29 percent in Doña Ana County and 16 percent in Otero County. Aggregate data for Sierra County was suppressed for this sector to ensure confidentiality, however the services category accounted for 13 percent of new income in Sierra County during this period (USDC, BEA 2002).

[4] This category was part of the SIC system until 2000. It is a catch-all category that includes employment related to health care, legal, business, and other services. The NAICS categories, which have been used since 2000 and are represented in **Table 2-82** [Employment by Industry], break services into smaller categories.

Table 2-84
2002 Personal Income and Earnings

	Doña Ana County		Otero County		Sierra County		New Mexico		United States	
Per capita income	20,573		19,459		19,207		24,823		30,906	
Earnings per job	29,428		31,380		22,219		33,461		40,758	
	Total	**Share**	**Total**	**Share**	**Total**	**Share**	**Total**	**Share**	**Total**	**Share**
Non-labor income (in millions)	**1,359**	**37.0%**	**453**	**37.6%**	**152**	**60.9%**	**16,029**	**34.9%**	**2842,330**	**31.9%**
Dividends, interest, and rent	606.0	16.5%	223	18.5%	63	25.3%	8,096	17.6%	1,550,330	17.4%
Transfer payments	753.4	20.5%	230.4	19.1%	89.5	35.9%	7,933	17.3%	1,292,000	14.5%
Government payments to individuals	706.4	19.2%	215.3	17.9%	86.1	34.5%	7,448.2	16.2%	1,221,000	13.7%
Age-related transfer payments	319.3	8.7%	119.6	9.9%	51.5	20.6%	3860.4	8.4%	710,309	8.0%
Labor income (in millions)	**2,315**	**63.0%**	**751**	**62.3%**	**97**	**38.9%**	**29,945**	**65.1%**	**6,057,677**	**68.1%**
Forestry, fishing, and related activities	N/A	N/A	N/A	N/A	N/A	N/A	128.9	0.3%	28,133	0.3%
Mining	N/A	N/A	N/A	N/A	N/A	N/A	1,084.1	2.4%	56,109	0.6%
Utilities	15.6	0.4%	4.5	0.4%	N/A	N/A	293.2	0.6%	69,891	0.8%
Construction	127.2	3.5%	36.6	3.0%	N/A	N/A	2,165.4	4.7%	418,382	4.7%
Manufacturing	114.9	3.1%	12.4	1.0%	N/A	N/A	1,994.7	4.3%	897,610	10.1%
Wholesale trade	39.6	1.1%	4.1	0.3%	N/A	N/A	1,100.3	2.4%	351,667	4.0%
Retail Trade	174.1	4.7%	57.9	4.8%	8.9	3.6%	2,629.3	5.7%	470,631	5.3%
Transportation and warehousing	58.5	1.6%	23.5	2.0%	1.3	0.5%	9,16.3	2.0%	230,060	2.6%
Information	40.8	1.1%	9.7	0.8%	1	0.4%	714.8	1.6%	255,972	2.9%
Finance and insurance	63.6	1.7%	17.4	1.4%	2.6	1.0%	1,264.4	2.8%	508,816	5.7%
Real estate and rental and leasing	23.4	0.6%	7.3	0.6%	1.4	0.6%	674.5	1.5%	170,804	1.9%
Professional and technical services	152.1	4.1%	29.8	2.5%	2.9	1.2%	3,032.1	6.6%	638,942	7.2%
Management of companies and enterprises	3	0.1%	1.7	0.1%	0	0.0%	280.3	0.6%	141,988	1.6%
Administrative and waste services	52.8	1.4%	38.1	3.2%	2.7	1.1%	1,261.1	2.7%	244,527	2.7%
Educational services	6.4	0.2%	2.4	0.2%	N/A	N/A	240.6	0.5%	86,689	1.0%
Health care and social assistance	284.1	7.7%	58	4.8%	N/A	N/A	3040.8	6.6%	627,922	7.1%
Arts, entertainment, and recreation	23.3	0.6%	1.6	0.1%	1	0.4%	247.3	0.5%	72,832	0.8%
Accommodation and food services	66.3	1.8%	15.6	1.3%	6.9	2.8%	1,101.3	2.4%	185,145	2.1%
Other services, except public administration	77.9	2.1%	19.8	1.6%	4	1.6%	982.8	2.1%	208,558	2.3%
Government and government enterprises	829.2	22.6%	518.3	43.0%	34.6	13.9%	9430.2	20.5%	1,105,776	12.4%
Federal, civilian	287.7		117.1		7.4		2157.7		212,945	
Military	11.7		256.2		0.6		863.9		89,127	
State government	245.2		27.3		9.9		2876		225,100	
Local government	284.6		117.8		16.7		35,32.6		578,604	
Total personal income	3,674		1204.7		249.4		45,974		8,900,007	

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis 2002

NOTES: Per capita income is the total personal income divided by population. Earnings per job is the total wages earned divided by the total number of workers. Transfer payments (under non-labor income) includes government payments to individuals (included in this table) as well as payments to nonprofit organizations and business payments to individuals.

N/A = Number not available.

As shown in Table 2-85, the per capita income and average earnings per job are lower in the Planning Area than they are in New Mexico and nationwide. Per capita income has grown since 1970 in the Planning Area, but at a slower rate than growth in New Mexico and the United States. In all three counties in the Planning Area, average earnings per job have fallen since 1970. This is inconsistent with the statewide trend; New Mexico earnings rose about 8 percent between 1970 and 2002.

Table 2-85
Trends in Per Capita Income and Average Earnings Per Job

	Per Capita Income			Average Earnings Per Job		
	1970	2002	% change	1970	2002	% change
Doña Ana County	$13,905	$20,573	+48	$31,571	$29,428	-7
Otero County	$14,976	$19,459	+30	$35,285	$31,380	-11
Sierra County	$12,319	$19,207	+56	$22,780	$22,219	-2
New Mexico	$14,781	$24,823	+68	$31,649	$33,461	+8
United States	$18,941	$30,906	+63	$35,002	$40,758	+16

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis 2002
NOTE: Figures are adjusted for inflation and are represented in 2002 dollars.

Several factors may be contributing to the downward trend in earnings per job. In the Planning Area, most job growth has occurred in retail and services employment since 1970 (USDC, BEA 2002). Current figures (refer to Table 2-82) indicate that the health care and social assistance, retail trade, and accommodation and food services industries are among the largest employers, and these jobs are typically lower paying than other service jobs such as those in finance and insurance. As a result, lower wages paid in growing service sectors such as retail are reflected in the overall averages. Data from 2004 that ranked 20 industries in terms of average weekly private sector wages indicate that these growing service sectors are in the bottom half of the rankings, indicating lower wages: health care was ranked 12th, retail trade was ranked 17th, and accommodation and food services was ranked 20th (New Mexico Department of Labor 2004).

The growth of non-labor income in the Planning Area also explains the condition of declining earnings per job while per capita income is increasing. Nonlabor income is personal income that is earned through investments (such as dividends, interest, and rent) or through transfer payments. Most transfer payments are from the government to individuals, including retirement-related payments, Medicare, disability insurance payments, and welfare. (Note: transfer payment figures do not include income from private pension plans or 401(k) plans.) Nonlabor income comprises a larger share of total personal income in all three counties within the Planning Area than it does on a statewide or national level (refer to Table 2-84). In particular, Sierra County has an exceptionally high percentage of personal income (almost 61 percent) derived from non-labor sources. Approximately a third of the transfer payments in Sierra County have been identified as age-related transfer payments.

Non-labor income provided 44 percent of new income between 1970 and 2000 in Doña Ana County. In Otero and Sierra Counties, the largest share of new income since 1970 by far is non-labor income (67

percent in each county). For comparison, nonlabor income provided 42 percent of new income in New Mexico between 1970 and 2000, and 38 percent nationwide during that time period.

Unemployment

In 2003, the unemployment rates in Doña Ana County (7.5 percent) and Otero County (7.1 percent) were higher than the rate in New Mexico (6.4 percent) or nationwide (6.0 percent). However, Sierra County's unemployment rate was lower (4.6 percent). The median unemployment rate for all U.S. counties was 5.8 percent (U.S. Department of Labor 2003).

Economic Diversity and Resiliency

Economic diversity is the lack of specialization within an economy. Resiliency is the ability of a local or regional economy to weather recessions or other economic and social changes. Economic diversity contributes to resiliency; communities that are heavily reliant on only a few industries are more susceptible to disruptions. Other considerations in assessing an area's resiliency are education rate (a better-educated population tends to be able to perform a variety of jobs and is therefore adaptable) and non-labor income (which can have a stabilizing effect on the economy).

Using 2000 Census employment data, an index to measure economic specialization versus diversity within U.S. counties may be generated based on the breadth of employment sectors that are active. According to these data, the economies of Doña Ana and Sierra Counties are at a roughly average level of diversity when compared to other U.S. counties. The economy of Otero County is slightly more diverse. Table 2-84 shows the variety of industries that are active in the three counties. The economy of New Mexico overall is one of the most diverse in the nation, ranking 48th (where number 1 is the most specialized) out of a group that includes the 50 states, Puerto Rico, and the District of Columbia (U. S. Census Bureau 2000).

In Doña Ana County, the share of the population of persons age 25 or over that hold college degrees is substantially above typical levels (22.3 percent in Doña Ana versus 14.5 percent, the median for all U.S. counties). The share of the population with a college degree is close to the median in Otero County (15.4 percent) and Sierra County (13.1 percent) (U.S. Census Bureau 2000).

Non-labor income comprises a much larger share of total income in Sierra County than elsewhere in the Planning Area (refer to Table 2-84). Since 1970, this income stream has sometimes countered the decreases in labor income associated with economic downturns (USDC, BEA 2002).

Livestock

Current Conditions

Much of the employment data related to farming and ranching is suppressed, as indicated in Table 2-82 (see forestry, fishing, and related activities sector). Available trend data for Doña Ana County suggest stable employment numbers but a drop in the share of total jobs provided by farms, from 9.1 percent in

1970 to 3.4 percent in 2000 (USDC, BEA 2002). Farm jobs grew in number in Otero County, from 385 in 1970 to 555 in 2000, but the share of total employment provided by farms remained stable at about 2 percent. Jobs on farms in Sierra County totaled about 330 in both 1970 and 2000, but the percentage of employment that these jobs represent fell from 14.4 percent in 1970 to 7.1 in 2000 (USDC, BEA 2002). In general, these figures suggest that overall employment related to farming and ranching is stable, but not growing, in the Planning Area.

Available 2002 data on hired farm labor and payroll, including labor for crop farming enterprises as well as livestock-related work, is provided in Table 2-86. Farm labor payroll totals approximately $37.5 million in Doña Ana County, $1.2 million in Otero County, and $2.8 million in Sierra County. Throughout the entire Planning Area, about 61 percent of all farm labor workers worked on a seasonal basis (less than 150 days per year).

Table 2-86
2002 Hired Farm Labor and Payroll

	Sierra County	Otero County	Doña Ana County	New Mexico
Hired farm labor workers	413	245	4,306	23,126
Number of farms	78	72	449	4,249
$1,000 payroll	2,824	1,172	37,541	182,380
Workers who worked for 150 days or more	170	55	1,709	8,637
Workers who worked fewer than 150 days	243	190	2,597	14,489
Percent of workers who worked fewer than 150 days	59%	78%	60%	63%
Number of farms with migrant farm labor – on farms with hired labor	8	2	45	272
Number of farms with migrant farm labor – on farms reporting only contract labor	4	0	30	88

SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service 2002b

NOTE: Migrant farm labor is defined as farm workers whose employment requires travel that prevents the worker from returning to his/her permanent place of residence the same day.

Table 2-87 indicates that the percentage of operators whose primary occupation is farming has increased in Doña Ana and Otero Counties and statewide, but has dropped quite a bit in Sierra County. These trends could reflect shifts in the economic viability of farming, or the presence of hobby farms or ranches in the Planning Area.

Table 2-87
Farm Operators by Primary Occupation

	1997			2002			
	Number of Operators	Operators Whose Primary Occupation is Farming		Number of Operators	Operators Whose Primary Occupation is Farming		% change
Sierra County	180	118	66%	460	238	52%	-13%
Otero County	417	200	48%	622	316	51%	+3%
Doña Ana County	1,290	521	40%	1,691	767	45%	+5%
New Mexico	14,094	7,197	51%	15,170	8,482	56%	+5%

SOURCES: U.S. Department of Agriculture, National Agricultural Statistics Service 2002, 1997

Forecast

The employment provided by the agriculture and ranching has remained steady, but generally has not been a source of new jobs, with the exception of Otero County. It is reasonable to expect that employment in this sector will remain stable within the Planning Area, but the geographic distribution of rural activities may shift as some metropolitan areas grow. BLM management decisions regarding livestock grazing management are not expected to result in significant shifts in rangeland production, and consequently to related employment. However, land disposal may affect the location and amount of lands available for grazing.

Key Features

- BLM livestock grazing management is not expected to have substantial effects on employment related to livestock and ranching, but future land use allocations may affect the location and levels of grazing on public land.
- As urban development expands in parts of Sierra and Doña Ana Counties, rural activities such as ranching may shift to more rural areas such as Otero County.

Minerals

Current Conditions

Mining has not represented a substantial share of employment or income in the Planning Area. In each of the three counties, mining employed fewer than 65 people in 1970 (USDC, BEA 2002). More recent data on mining employment has been suppressed to ensure confidentiality.

Growth in the construction sector suggests an increase in demand for sand and gravel resources. Actual employment in the construction sector grew in each of the three counties between 1970 and 2000. Table 2-82 indicates that the current share of employment provided by construction is 6.0 percent and 4.9 percent in Doña Ana and Otero Counties, respectively. The 2002 data for Sierra County is suppressed; however, 2000 figures indicate that 320 people were employed in construction, or 7.0 percent of overall employment (USDC, BEA 2002).

Forecast

Given the forecast of minimal development of leasable and locatable minerals in the Planning Area, it is expected that related employment and income will not increase appreciably.

It is expected that demand for saleable minerals will continue to increase. The relationship to construction and mining employment and income will be dependent on whether there is an increase in costs for sand and gravel due to the lack of suitable sources near fast-growing areas, and any subsequent effect on residential and commercial building costs that may in turn affect demand.

Key Features

- Mineral development does not represent a major source of employment in the Planning Area.
- Saleable minerals represent a more likely source of future employment and income in the Planning Area than leasable or locatable mineral development.

Renewable Energy

Current Use

Due to the lack of renewable energy development in the Planning Area, employment is minimal.

Forecast

See forecast and key features discussion for Section 2.4.3.1.

Recreation

Visitors to recreational opportunities within the Planning Area support employment in local economies. Recreational expenditures typically support jobs related to outfitting, retail and food and lodging services. Recreation-related employment may be seasonal, and can be irregular. Table 2-82 indicates that Sierra County, which includes popular recreational destinations such as Caballo and Elephant Butte Reservoirs and the Rio Grande, has a relatively large share of employment provided by the accommodation and food services categories. Trends in recreational expenditures are likely to be more influential in and around Elephant Butte and Truth or Consequences as a result. Additional information on the value of recreational expenditures is provided in Section 2.4.3.1.

Employment resulting directly from recreation on BLM-administered land in the Planning Area is limited and includes employment of park rangers and park maintenance/service workers.

The special recreation permit program issues permits for commercial uses that are linked to some local employment, particularly the three outfitters with current permits. There also are special recreation permits issued for events within the Planning Area that occur periodically. Income from these events benefits, but does not consistently sustain, local economies due to the short-term influx of visitors to an area.

Key Features

- A small amount of local employment is directly related to recreation on public land, and includes BLM employees who manage and maintain recreation areas, and permittees who rely on the availability of public land for commercial recreational use.
- Expenditures related to visitation induce or support local employment, particularly jobs related to outfitting, retail, lodging, and food services.

2.4.3.3 Public Finance and Government Services

Current Conditions

Regional Public Finance

In fiscal year 2004/2005, Doña Ana County's annual revenues totaled $91,186,348 and expenditures totaled $117,362,762; Sierra County's annual revenues totaled $13,383,201 and expenditures totaled $12,571,170; and Otero County's annual revenues totaled $10,286,145 and expenditures totaled $18,168,202.

PILT Payments – One source of government revenues is PILT (payment in lieu of taxes) payments, or Federal payments to local governments that help to offset losses in property taxes due to nontaxable Federal lands within their boundaries. Federal lands within county boundaries are not part of the county's tax base and, through PILT, the county is compensated for lost revenue opportunities in accordance with the Payment in Lieu of Taxes Act of 1976, as amended (31 U.S.C. 6901-6907). PILT payments are computed based on the number of acres of Federal entitlement land, as defined in 31 U.S.C. 6902, within each county. The number of qualified acres is multiplied by a dollar amount per acre set by law. Payments are subject to limitations based on population. Congress sets annual PILT program funding limitations that also may affect the amount of the payments under the program. Payment eligibility is reserved for local governments that provide services such as those related to public safety, the environment, housing, social services, and transportation, and that contain nontaxable Federal lands. PILT payments are made for tax-exempt Federal land administered by BLM, NPS, FWS (all Agencies of the Interior Department), U.S. Forest Service, and for Federal water projects and some military installations (USDI, BLM 2005h).

In 2005, public land under BLM management accounted for 94 percent of all entitlement acreage in Doña Ana County, 62 percent in Sierra County, and 64 percent in Otero County (Table 2-88) as compared to the 56 percent of the BLM share in the State of New Mexico. BLM-administered land accounts for the largest share of PILT payments in all three counties of the Planning Area. However, a large percentage of PILT payments is provided by the U.S. Forest Service and BOR in Otero County, and by the FS and NPS in Sierra County (USDI, BLM 2005h).

Table 2-88
PILT Acres by Agency

Area	BLM	FS	BOR	NPS	Total	BLM as Percentage of Total
Doña Ana County	1,131,740	0	8,701	52,606	1,193,047	94%
Sierra County	931,945	469,980	0	92,118	1,494,043	62%
Otero County	854,140	386,854	95,945	0	1,336,939	64%

In fiscal year 2005, PILT payments statewide were $22,386,899. Overall PILT payments in 2005 have increased by $387,440 or 2 percent since 2004, and by $988,956 or 4 percent since 2003 (USDI, BLM 2005b). As shown in Table 2-89, PILT payments in all three counties of the Planning Area have increased since 1999, even though the amount of entitled acreage decreased slightly in Doña Ana County (USDI, BLM 2005h).

Table 2-89
PILT Payment and Entitlement Acreage 1999-2005

	Doña Ana County		Otero County		Sierra County	
Fiscal Year	**$**	**Acres**	**$**	**Acres**	**$**	**Acres**
2005	1,694,351	1,193,047	1,855,662	1,494,043	762,903	1,336,939
2004	1,655,605	1,193,065	1,839,054	1,494,043	744,078	1,336,939
2003	1,611,642	1,193,065	1,790,542	1,494,043	723,243	1,336,939
2002	1,410,223	1,193,885	1,557,725	1,493,623	641,386	1,336,541
2001	1,340,949	1,194,075	1,483,335	1,493,633	608,801	1,336,541
2000	936,030	1,194,078	1,029,158	1,493,633	383,276	1,336,628
1999	887,713	1,194,284	976,173	1,493,632	363,073	1,336,628

BLM Budget – Nationwide, actual treasury receipts generated by BLM in fiscal year 2003 (excluding mining claim and helium collections) totaled $2.4 billion. These BLM-generated receipts are derived from activities on public land, including mineral leasing, grazing, rights-of-way across public land, and recreation (USDI, BLM 2005i).

The 2006 enacted budget for the entire USDI was approved in August 2005 and totals about $9.9 billion for USDI; a 1.3 percent increase over the fiscal year 2005 budget. The total budget for PILT has increased over the last few years, from about $224.7 million in 2004 to $234.9 million for 2006. The budget for BLM operations decreased from 2004 to 2005, but has been increased to over 2004 levels in the 2006 budget. Budgeted funding available for land acquisitions has dropped sharply since 2004, from about $18.4 million to $8.7 million for 2006 (USDI, BLM 2005i).

Forecast

As populations continue to grow in some parts of the Planning Area, it is expected that there will continue to be overall increases in the revenues and expenditures of county governments to reflect both a growing tax base and greater costs for infrastructure and services (e.g., transportation, health and welfare, and public safety programs). As communities incorporate, residents rely less on the county government for general government services.

Future PILT payments received by counties in the Planning Area will be a function of the number of Federal entitlement acres in each county, which may be affected by land acquisitions and disposals, population growth, or Congressional appropriations for PILT.

Budgets for USDI and BLM have remained fairly stable, and have increased since 1999. Trends in BLM budgets are influenced by priorities set by USDI, and legislative and executive branches of the Federal Government. However, due to large natural disasters and continued military needs, BLM is expected to see reduced budgets in the near-term.

Key Features

- In the TriCounty Planning Area, PILT payments paid to counties on entitlement acres managed by the BLM are substantial and have been slowly growing since 1999.

- Budget appropriations for BLM are expected to be stable or reduced slightly, although budgeted funding available for land acquisitions has been decreasing.

2.4.3.4 Social and Demographic Conditions

Current Conditions

The populations within the Planning Area are characterized below in terms of (1) demographic information on the size and composition of the population, (2) housing, (3) residential stability, and (4) educational attainment. Each topic area is discussed by county, unless conditions are similar enough to address together.

Demographic Information

Sierra County – Sierra County is the smallest county in the Planning Area, with a population of 13,270 in 2000, reflecting a 34 percent increase since 1990. Sierra County is typically rural, with historically large proportions of lands used for agriculture and ranching. The largest community in Sierra County is Truth or Consequences with a 2000 population of 7,289 people, which composes about 60 percent of the county's overall population. Growth is occurring in and around Elephant Butte, which abuts the Rio Grande. The county features two reservoirs (Elephant Butte and Caballo Reservoirs) used by both local and out-of-state visitors (U.S. Census Bureau 2000).

Sierra County, more than Doña Ana and Otero Counties, has a large retirement population that is projected to grow even more in the future. Residents of retirement age compose 28 percent of the county population (Table 2-90). People that are age 60 and older represent 34 percent of the population in Sierra County, which is significantly larger than the State of New Mexico figure of 15 percent (U.S. Census Bureau 2000).

Table 2-90
Population by Age

	Sierra County		Otero County		Doña Ana County		New Mexico		United States	
Median Age	48.9		35.8		30.2		34.6		35.5	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
0-14	2,161	16	15,227	24	43,519	25	419,108	23	60,253,375	23
15-64	7,402	56	39,910	64	112,428	64	1,187,713	65	186,176,778	65
65+	3,707	28	7,161	11	18,735	11	212,225	12	34,991,753	12
Total Population	13,270		62,298		174,682		1,819,046		281,421,906	

SOURCE: U.S. Census Bureau 2000

The largest racial group in Sierra County is White (87 percent, see Table 2-92). About 26 percent of the county population is Hispanic or Latino, which is a lower proportion than the other counties in the Planning Area and statewide.

Otero County – The population of Otero County in 2000 was 62,298, a 21 percent increase over 1990. The population density within Otero County continues to remain relatively sparse at nine people per

square mile. Alamogordo and Tularosa are the two largest communities, with a combined population of nearly 40,000 people, or about roughly 61 percent of the county's total population. Several smaller communities such as Cloudcroft and Timberon provide services for the rural population and the nearby Holloman Air Force Base. Holloman Air Force Base is a major feature within Otero County, and small communities adjacent to the base provide services to the military population.

The fastest growing age group in Otero County since 1990 is 45 to 49 year olds. The population of people within retirement age (65 and older) has grown nearly 53 percent since 1990, and currently stands at 11 percent of the county population. The median age of citizens of Otero County is 35.8 years old, slightly younger than the statewide and national averages (refer to Table 2-90).

The largest racial group in Otero County is White (73.7 percent). About 32.2 percent are Hispanic or Latino (U.S. Census Bureau 2000). Otero County includes the Mescalero Apache Reservation, and has a larger percentage of residents who are American Indian than the other counties in the Planning Area (Table 2-92).

Doña Ana County – The 2000 population of Doña Ana County was 174,682, a 29 percent population increase since 1990 (Table 2-91). About 42.5 percent of population growth occurring in Doña Ana County since 1990 is in the Las Cruces metropolitan area, and the remaining growth is occurring in outlying unincorporated communities. The population density per square mile has risen since 1990 from 36 to 46 people per square mile (US Census Bureau 2000).

Table 2-91
Population by County in the Planning Area

	1990 Population	2000 Population	% Change
Doña Ana County	135,510	174,682	29%
Otero County	51,928	62,298	21%
Sierra County	9,912	13,270	34%
Overall Planning Area	197,350	250,250	27%
New Mexico	1,515,069	1,819,046	20%
United States	248,709,873	281,421,906	13%

SOURCE: U.S. Census 2000

The largest age group in Doña Ana County is 15-19 year olds. People younger than 24 years old compose 43 percent of the Doña Ana County population, which is higher than the State of New Mexico figure of 38 percent. The median age in Doña Ana County is 30.2 years old, slightly younger than the median age of the State of New Mexico (34.6), and the Nation (35.5). About 11 percent of the population of Doña Ana County is of retirement age (over 65) (refer to Table 2-90).

Table 2-92
Race and Ethnicity in the Planning Area

Race	Doña Ana County	% of Total	Sierra County	% of Total	Otero County	% of Total	New Mexico	% of Total	United States
White	118,478	67.8	11,541	87.0	45,919	73.7	1,214,253	66.8	211,460,626
African-American	2,723	1.6	64	0.5	2,440	3.9	34,343	1.9	34,658,190
American Indian and Alaska Native	2,580	1.5	197	1.5	3,614	5.8	173,483	9.5	2,475,956
Asian	1,330	0.8	23	0.2	728	1.2	19,255	1.1	10,242,998
Native Hawaiian and other Pacific Islander	117	0.1	11	0.1	82	0.1	1,503	0.1	398,835
Some other race	43,209	24.7	1,097	8.3	7,273	11.7	309,882	17.0	15,359,073
Ethnicity									
Hispanic or Latino (of any race)	110,665	63.4	3,488	26.3	20,033	32.2	765,386	42.1	35,305,818
White alone	61,790	35.4	2,185	16.5	11,191	18.0	400,758	22.0	16,907,852
African-American alone	462	0.3	9	0.1	155	0.2	3,689	0.2	710,353
American Indian and Alaska Native alone	1,301	0.7	35	0.3	462	0.7	12,023	0.7	407,073
Asian alone	89	0.1	0	0.0	43	0.1	998	0.1	119,829
Native Hawaiian and other Pacific Islander alone	50	0.0	3	0.0	14	0.0	511	0.0	45,326
Some other race alone	42,601	24.4	1,083	8.2	7,168	11.5	306,873	16.9	14,891,303
Two or more races	4,372	2.5	173	1.3	1,000	1.6	40,534	2.2	2,224,082
Not Hispanic or Latino	64,017	36.6	9,782	73.7	42,265	67.8	1,053,660	57.9	246,116,088

SOURCE: U.S. Census Bureau 2000

Doña Ana County has a population of about 67.8 percent of people who identify their race as White (Table 2-92). About 63.4 percent of people are Hispanic or Latino, the majority of which identify themselves as White and Hispanic (about 35.4 percent of the total population). As compared to the State of New Mexico, Doña Ana County has a substantially larger share of the population that is Hispanic or Latino. Over the past several decades, the Hispanic or Latino proportion of the population has remained higher in Doña Ana County than the State and national share, due in part to agricultural work opportunities, proximity to the Mexican border, and the establishment of ethnic communities within the South Valley.

Housing

Sierra County – Sierra County has 8,727 housing units total, 70 percent of which are occupied and the other 30 percent are considered vacant (for rent, for sale, not occupied, or seasonal or recreational use, for or migrant workers). The average household size in Sierra County, is 2.1 persons, less than the statewide average of 2.7 persons (U.S. Census Bureau 2000).

A large portion of the housing stock in Sierra County is comprised of recreational homes or seasonal homes. In comparison to Doña Ana County, renters in Sierra County used significantly less of their household income to pay for housing expenses in 2000; 28 percent of the median household income was used for housing (U.S. Census Bureau 2000).

Otero County – In Otero County, there are 29,272 housing units, 78.5 percent of which are considered occupied and the remaining 21.5 percent are considered vacant (for rent, for sale, not occupied, seasonal, recreational, or for occasional use, or for migrant workers). The average household size in Otero County is 2.7 people. According to the Housing Affordability Index (refer to Table 2-93), housing in Otero County is more affordable than housing in the State of New Mexico and the Nation. Renters in Otero County typically spend about 25 percent of their household income for housing and 12 percent of renters spend more than 50 percent of their income on housing (U.S. Census Bureau 2000).

Doña Ana County – As of 2000, Doña Ana County had 68,129 total housing units, 61.7 percent of which are owner occupied or for sale, 33.1 percent are renter-occupied or for rent, and 0.8 percent are considered vacant or for recreational, seasonal, or occasional use (Doña Ana County 1994). The average household size in Doña Ana County is about 3.0 persons, slightly higher than the State of New Mexico average household size of 2.7 persons.

Housing affordability within Doña Ana County differs only slightly from national and State averages. According to the housing affordability index (Table 2-93), in Doña Ana County the median family can afford the median house. Housing was slightly more affordable in Doña Ana County than in the State of New Mexico.

Table 2-93
Housing Affordability Index

	Doña Ana County	Sierra County	Otero County	New Mexico	United States
Specified owner-occupied housing units: median value	$90,900	$77,800	$78,800	$108,100	$119,600
Percent of median income necessary to buy the median house	19%	18%	16%	19%	17%
Income required to qualify for the median house	$25,686	$21,984	$22,266	$30,546	$33,795
Housing Affordability Index (100 or above means that the median family can afford the median house[a])	131	135	156	129	148

NOTE: [a]The housing affordability figures assume a 20 percent down payment and that no more than 25 percent of a family's income goes to paying the mortgage. It is based on an interest rate of 8.03 percent in 2000. This statistic is to be used as a comparative, not an absolute, measure (U.S. Census Bureau 2000). Ratings over 100 reflect the increasing ability of a family with a median income to afford the median house.

In Doña Ana County, 21 percent of the households that pay rent spend more than 50 percent of their household income on housing. The median gross rent is about $58 less than the State of New Mexico median gross rent and $157 less than the national median gross rent. Thus, renters in Doña Ana County tend to spend proportionately more of their household income on housing than homeowners (U.S. Census Bureau 2000).

Residential Stability

Indicators of residential stability discussed in this section include: (1) the percentage of people within the Planning Area who are native New Mexicans, and (2) the percentage of people who have lived in the same household for the past 5 years. Generally, the longer people have lived in a community, the greater their connection to community and social groups as well as to the land (Harp et al. 2001). Positive benefits from residential stability may include social cohesion and the establishment of long-term relationships in a community.

Within each county of the Planning Area, the percentage of residents who are New Mexico natives ranges from 36 to 40 percent (U.S. Census Bureau 2000). In comparison, the statewide percentage of residents who are native to the state is 51 percent. Throughout the Planning Area, about 50 percent of residents lived in the same house in 2000 as they did in 1995. This is similar to the statewide figure of 54 percent.

Educational Attainment

Educational attainment levels in a community may affect per capita income and other economic indicators.

Sierra County – In Sierra County, 24 percent of residents 25 years and older have less than a high school degree, 31 percent are high school graduates, and 20 percent have an Associate degree or higher. Sierra County has the highest number of high school graduates and remains nearly on par with Otero County and the national averages in educational attainment.

Otero County – In Otero County, 19 percent of residents 25 years and older have less than a high school degree, 29 percent are high school graduates, and 24 percent have an Associate degree or higher. In addition, 51.8 percent of Otero County residents have some college education. Compared to the other counties within the Planning Area, Otero County has a slightly higher percentage of people with an Associates degree or "some college" (U.S. Census Bureau 2000).

Doña Ana County – In Doña Ana County, 30 percent of residents 25 years and older have less than a high school education, 22 percent are high school graduates, and 27 percent have an Associate degree or higher. Within the State of New Mexico, the high school graduate figure was slightly lower than Doña Ana County at 21 percent, but statewide, 30 percent of residents have an Associate degree or higher. The percentage of Doña Ana County residents with a Bachelor's degree is significantly higher (13 percent) than both Sierra and Otero Counties, most likely because Doña Ana County is home to a large university (New Mexico State University). However, Doña Ana County still is below the national average for college-educated residents (U.S. Census Bureau 2000).

Forecast

Doña Ana County's population is projected to increase at a higher rate than the other two counties in the area (Table 2-94), the State of New Mexico (20 percent), and the Nation (13 percent). Both Sierra and Otero Counties also are projected to experience population growth. The population of Doña Ana County is projected to reach over 250,000 people by 2015, and to nearly double by 2030. Population projections can be an indicator of anticipated development, demands on services, additional pressures on public lands for recreation, and increased value of open space to counter urbanization (Doña Ana County 1994).

Table 2-94
Population Projections for Counties

Year	Sierra County	Otero County	Doña Ana County	New Mexico
2005	11,926	59,472	202,430	1,956,725
2010	12,502	61,057	227,009	2,090,678
2015	12,972	62,700	253,548	2,232,424
2020	13,380	64,277	282,152	2,380,802
2025	13,729	65,481	313,073	2,534,964
2030	14,046	66,238	345,458	2,691,578

SOURCE: U.S. Census Bureau 2000

Urbanized and incorporated areas in Doña Ana County such as Las Cruces, Hatch, Mesilla, and Anthony were identified as growth centers (Table 2-95). Las Cruces remains the largest city within the County and is projected to reach a population of 112,000 by 2015, an increase of nearly 34,000 people. Hatch, Mesilla, and Anthony also are expected to grow in population within the next decade (Doña Ana County 1994).

Table 2-95
Doña Ana County Population Projections for Growth Centers

Year	Las Cruces	Hatch	Mesilla	Anthony
1990	62,126	1,136	1,968	5,160
2000	77,658	1,448	2,624	8,443
2010	98,626	1,886	3,473	12,931
2015	111,941	2,228	4,816	14,955

SOURCE: Doña Ana County 1994

As the population increases the home construction rate also rises; an increase in housing units is anticipated, particularly in and around the Las Cruces metropolitan area. As more homes are built, lands that were historically used for ranching and agriculture are often converted to residential developments.

Key Features

- Doña Ana County is growing in concentrated areas near the Las Cruces metropolitan area. A relatively large influx of people may result in greater demands for housing development, city and county services, and recreational opportunities.
- Otero County is growing at a much slower pace, and the size of its population is influenced by personnel activities at military facilities.
- Sierra County has a particularly large retirement-age population that is continuing to grow.
- The population of Doña Ana County includes a much larger percentage of Hispanic or Latino residents than the other counties in the Planning Area, or the State overall.

2.4.3.5 Place-Based Values

Galliano and Loeffler (1999) define a sense of place as a "link between social experiences and geographic areas." The purpose of addressing place-based values is to assist land managers in understanding resource and land use conflicts and how to approach them most effectively. Sense of place is subjective, and individual people may develop a sense of place based on perceptions about amenities (such as recreational opportunities), historic or symbolic activities and places, or landscape and scenic vistas.

Current Conditions

Doña Ana County is the most urbanized and has the largest population of the counties within the Planning Area. As the area continues to grow—particularly the Las Cruces metropolitan area—maintaining adequate open space seems to be a very important value, as evidenced by the ad hoc committee that developed an open space plan for the region and a recent public opinion survey (Citizens' Task Force for Open Space Preservation 2005; Public Opinion Strategies 2006). BLM-administered land is perceived by local communities in the County in several ways: as an opportunity to maintain open space amidst a growing population, a way to control the timing and location of development, and a source of land that could be available to accommodate growth through disposal (Phillips 2005c).

Otero County contains several military facilities including White Sands Missile Range, Holloman Air Force Base, Doña Ana Range, and McGregor Range, and Centennial Range. Alamogordo has strong economic and social links to Holloman Air Force Base. In addition, there is a tangible German influence in the area, as German Air Force personnel live and train in the area (Phillips 2005c). Farming and ranching are perceived to be important social and cultural assets in the county (URS 2005a). Key interests related to BLM-administered land in the county are hunting and OHV use—the Red Sands OHV Area is important to the local community as a recreation opportunity and a location for events that attract participants from outside the area (JKA 2003).

Sierra County—Truth or Consequences and Elephant Butte in particular—are heavily associated with a retiree population and visiting recreationists. These locations are identified locally and regionally as recreation destinations, particularly for water-related recreation. This constitutes a shift from a previous identity as primarily a ranching community (JKA 2003). Recreation is viewed as a potentially strong foundation for the growth of local economies in the County (URS 2005b).

Important revenue sources of the Mescalero Apache include timber, hunting, and tourism, underscoring the importance to the tribe of a functioning and scenic regional landscape with recreational opportunities. The Mescalero Apache also have raised concerns about maintaining opportunities to gather tribal foods on public lands and regarding the management of cultural resources (JKA 2003). In addition, the Ysleta del Sur Tribe, based in El Paso, also has historical interests in the Planning Area (Phillips 2005c).

The preservation of natural landscapes is an important value to some residents in the Planning Area (USDI, BLM 2005e). Local communities appear to have placed a great deal of value in the actions BLM has taken to acquire lands in the Organ Mountains and develop the Dripping Springs Natural Area (JKA 2003). The interest groups for conservation and recreation issues within the Decision Area are larger than the population of the Planning Area; recreation users come from around New Mexico and El Paso, Texas, as well as more distant places. Scenic or recreational resources often are linked with economic interests in local communities, as described in Section 2.4.3.1.

Interest groups have emerged to advocate OHV use, and interest in using public lands for recreational OHV use seems to be increasing. Retaining access to public lands for recreational use has been a theme in public input to the Las Cruces District Office (JKA 2003; USDI BLM 2005e). In addition, conflicts between OHV and motorized vehicle users and advocates for less intense uses on public land are common.

Several specific areas within the Planning Area were identified during scoping as areas of cultural, symbolic, and traditional significance (USDI, BLM 2005c). Some of the lands identified were as follows:

- The Tortugas Mountains (traditional uses and scenic values)
- Robledo Mountains (dinosaur tracks)
- The Petrified Forest near Truth or Consequences
- Otero Mesa
- Three Rivers Petroglyph site

Forecast

A key issue that is anticipated for the future is the potential for conflicts between various types of recreational activities in the Planning Area. This would occur particularly where the population is growing, and as the demand for public lands to support more users increases. In addition, conflicts between motorized and nonmotorized recreations or between other specific activities, may be expected to increase as the number of overall users increases and the types of off-road technology evolve.

In general, the Planning Area is expected to continue to evolve from a ranching and rural area to one that is more developed, and economically more reliant on the services sector rather than extractive industries. Recreation and open space appear to be important values of residents and strongly linked to local communities economically and socially. In addition, the BLM is still connected to more traditional uses such as grazing and mining. Although these uses may not appear to be the future foundations of local economies, some residents still view them as important historical and social contributors to the sense of place in the Planning Area, particularly in Otero County.

Key Features

- Recreation opportunities are a key part of the sense of place in the Planning Area. Residents want access to public land for both motorized and primitive recreation, and these activities support local economies.
- BLM management of land tenure, recreation opportunities, and scenic resources is connected to local economies and community goals.

3.0 CURRENT MANAGEMENT DIRECTION

Current management direction for the TriCounty Planning Area is based on existing land use plans and amendments. The two Resource Management Plans (RMPs) that include the current management direction are (1) the White Sands RMP that covers BLM-administered lands within Sierra and Otero Counties and (2) the Mimbres RMP that covers BLM-administered lands within Doña Ana County. The plans and amendments are summarized below:

White Sands RMP and Amendments

- White Sands Resource Area Management Plan (1986)
- Arizona Interconnection Project-Sierra County (1987)
- Otero County Areas of Critical Environmental Concern Resource Management Plan Amendment Decision Record (1997)
- New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management (2000)
- Record of Decision and Resource Management Plan Amendment for Federal Fluid Minerals Leasing and Development in Sierra and Otero Counties (2005)
- El Camino Real De Tierra Adentro National Historic Trail Plan (2004)
- Decision Record and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas (2004)

Mimbres RMP and Amendments

- Mimbres Resource Area Draft Resource Management Plan Environmental Impact Statement (1993)
- Land Ownership and Boundary Adjustment T. 25 S., R. 3 E., Section 13, S1/2 (1999)
- New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management (2000)
- El Camino Real De Tierra Adentro National Historic Trail Plan (2004)
- Decision Record and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas (2004)

One of the complexities of this evaluation is that the above plans apply to specific portions of the Planning Area. Some plans, such as statewide plans, apply to a broader area and others apply to certain counties or specific areas within a county. The Mimbres RMP includes land use plan decisions for other counties outside the Planning Area (i.e., Luna, Hidalgo, and Grant Counties) as well as for Doña Ana

County. However, the White Sands RMP includes land use plan decisions for Sierra and Otero Counties only.

BLM categorizes decisions as (1) land-use-plan-level (RMP-level) decisions and (2) implementation-level decisions. Land-use-plan-level and implementation-level decisions are defined in BLM Land Use Planning Handbook H-1601-1, Appendix C. Additionally, BLM follows Instruction Memorandum 2004-079: Land Use Plan Decisions, Implementation Decisions, and Administrative Remedies to provide further clarification regarding the distinction between land use plan decisions and implementation decisions as follows:

- Land-use-plan-level decisions consist of desired outcomes (goals, standards, and objectives) and the allowable uses (including allocations, levels of use, and restrictions on use) and management actions necessary to achieve those outcomes. Land use plan decisions provide management direction and guide future actions. When land use plan decisions are proposed, the public has an opportunity to protest them to the BLM Director prior to their approval, as set forth in the planning regulations (43 CFR 1610.5-2). The Office of Hearings and Appeals does not have jurisdiction to review land use plan decisions. Thus, there are no further administrative remedies.

- Implementation-level decisions generally constitute BLM's final approval allowing on-the-ground actions to proceed. These types of decisions require site-specific planning and National Environmental Policy Act (NEPA) analysis. For the most part, unlike land use plan decisions, implementation decisions are not subject to protest under the planning regulations. Instead, they are subject to various administrative remedies, primarily appeals to the Office of Hearings and Appeals. Where implementation decisions are made as part of the land use planning process, they are still subject to the appeals process or other administrative review as prescribed by specific resource program regulations after BLM resolves the protests to land use plan decisions and makes a decision to adopt or amend the RMP.

Land use planning decisions can be distinguished from implementation decisions in that, although they are themselves final and effective upon adoption, they normally require additional decision steps (such as permit approvals) before activities having on-the-ground impacts can be carried out.

Both planning-level and implementation-level decisions regarding resources are specifically dictated in the planning documents listed above. Generally, only planning-level decisions were identified in this analysis. However, for some resources, tracking the implementation actions identified in prior planning efforts was identified as potentially important in the planning effort; therefore, implementation-level decisions are included where they provide important information regarding activities that have occurred since the White Sands and Mimbres RMPs were completed. Administrative decisions do not require a plan, but can be addressed immediately through administrative action by BLM (e.g., developing interpretive material for distribution from the Las Cruces District Office).

Tables are included within each section to identify decisions related to particular plans associated with specific resources or management programs. Some resources or programs, including air quality, geology,

cave and karst resources, among others, do not have any existing management decisions that apply principally to that resource or program. However, existing management decisions may apply to resources or programs as secondary matters though the decisions are listed only with the primary resource or program to which they apply. (NOTE: Land use plan decisions from the Record of Decision and Resource Management Plan Amendment for Fluid Mineral Leasing and Development for Sierra and Otero Counties [USDI, BLM 2005j] are included under Section 3.14, Minerals, and not under each resource that could be affected as a result of each decision.)

3.1 AIR QUALITY

Existing land use plans provide no management guidance regarding air quality in the Planning Area. The air quality objective is to protect, maintain, and enhance air quality on public lands. Reduction of air quality impacts from activities on public land is accomplished by mitigation measures developed on a case-by-case basis through statutory or regulatory processes. These processes will generally be applicable to BLM or other federally sponsored activities in the Planning Area.

3.2 GEOLOGY

The current management direction does not specifically address geology resources, the management of which is typically encompassed in laws, regulations and policies for management of other resources. Regulations and policies exist for establishment and management of wilderness preserves, wilderness study areas (WSAs), or parks, in areas that will protect unique geologic features of interest or scenic value in addition to other resources.

3.3 CAVE AND KARST RESOURCES

There are no existing management decisions regarding cave or karst resources within the Decision Area. However, cave and karst resources are managed by the BLM according to the laws and regulations discussed in Chapter 6 of this document.

Upon discovery of a cave, the cave is evaluated for significance based on criteria from Southwestern Region of the National Speleological Society and BLM, and a management plan for the cave is developed. Some key aspects of the process that determines the significance and management of a cave include the following:

- Evaluations are carried out in consultation with knowledgeable representatives of the caving community.
- Caves can be determined as significant based on any of several criteria, including recreational, educational, biological, cultural, geological, and hydrological value.
- Locations may be kept confidential.

3.4 SOIL AND WATER RESOURCES

Table 3-1
Current Management Decisions for Soil and Water Resources

Decision Source	Decision	Status
Planning Decisions		
Mimbres RMP (Doña Ana County)	Critical soils on 0–10 percent slopes will be the first priority for land treatments and grazing management to reduce erosion and improve water quality. Critical soils on slopes over 10 percent will be a priority for grazing management to reduce erosion and improve water quality.	Ongoing management.
Mimbres RMP (Doña Ana County)	Watershed management plans will be developed for the following areas: • Corralitos • Rincon/Hatch (both sides of river) • Uvas Valley	Incomplete.
Mimbres RMP (Doña Ana County)	Provision for erosion control will continue to be incorporated into all surface-disturbing actions.	Ongoing management.
White Sands RMP (Sierra and Otero Counties)	W-1. A watershed activity plan will be developed on 23,236 acres in the area of Wind and Chess Draws in the Cornudas Mountains (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the long term. Off-highway vehicle (OHV) use will be limited to existing roads and trails on the 23,236 acres for protection of watershed values.	Incomplete.
White Sands RMP (Sierra and Otero Counties)	W-2. A watershed activity plan will be developed on 7,162 acres in the area of Moccasin and Otto Draws southwest of Piñon (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the long term. OHV use will be limited to existing roads and trails on the 7,162 acres for protection of watershed values.	Incomplete.
White Sands RMP (Sierra and Otero Counties)	W-3. A watershed activity plan will be developed on 10,742 acres in the area of unnamed watersheds east of Tularosa and south of the Tularosa River (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the long term. OHV use will be limited to existing roads and trails on the 10,742 acres for protection of watershed values.	Incomplete.
White Sands RMP (Sierra and Otero Counties)	W-4. A watershed activity plan will be developed on 21,446 acres in the Three Rivers watershed north of Tularosa (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the long-term. OHV use will be limited to existing roads and trails on the 21,446 acres for protection of watershed values.	Incomplete.
White Sands RMP (Sierra and Otero Counties)	W-5. A watershed activity plan will be developed on 11,015 acres in the area east of Crow Flats (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the	Incomplete.

Decision Source	Decision	Status
	long term. OHV use will be limited to existing roads and trails on the 11,015 acres for protection of watershed values.	
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 1 Upland Sites Standard–Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type, climate, and landform. The kind, amount, and/or pattern of vegetation provide protection on a given site to minimize erosion and assist in meeting State and tribal water quality standards.	Ongoing management.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 2 Biotic Communities Standard (includes Native, Endangered, Threatened, and Special Status Species)–Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities. Desired plant community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes.	Ongoing management.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 3 Riparian Sites Standard–Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide for groundwater recharge, provide habitat and assist in meeting State and tribal water quality standards.	Ongoing management.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 2001a, 1993a, 1986a

3.5 VEGETATIVE COMMUNITIES

This section presents the current management direction for vegetation resources based on existing land use plans. A list of management decisions related to vegetation resources is provided in Table 3-2.

Table 3-2
Current Management for Vegetation

Decision Source	Decision	Status
Planning Decisions		
White Sands Resource Area Resource Management Plan (RMP) (Sierra and Otero Counties)	Avoiding adverse effects on State listed or sensitive species through clearances and consultation.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero)	Designate 42 40-acre study plot exclosures, one for each of the 41 range sites and one of the standard habitat sites in Otero and Sierra Counties (1,680 acres and 42 miles of fence).	Ongoing management; however, no site-specific measures have been implemented.
Mimbres RMP (Doña Ana)	Grass bottomlands, mixed desert shrub (>10% slope), snakeweed, and mountain brush type will be treated with a combination of prescribed burning, prescribed natural fire, and prescribed grazing management.	Ongoing management.

Decision Source	Decision	Status
Mimbres RMP (Doña Ana)	Creosotebush, mesquite, and desert shrub (<10% slope) will be treated almost entirely by the use of herbicides. Areas over 10% slope and within ½ mile of a perennial stream will not be treated with herbicide. (Site-specific NEPA would be required)..	Ongoing management.
Mimbres RMP (Doña Ana)	All areas treated by prescribed burning, prescribed natural fire, or chemical herbicides would be rested from grazing for at least two years in areas where livestock use occurs, unless otherwise authorized.	Ongoing management.
Mimbres RMP (Doña Ana)	Chemical herbicides will be used for control of noxious weeds.	Ongoing management.
Mimbres RMP (Doña Ana)	Vegetation sale areas will be retained until the supply of plants is exhausted. Sale areas will then be expanded into adjacent lands identified for disposal.	Ongoing management.
Record of Decision- Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 1 Upland Sites Standard- Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type climate, and landform. The kind, amount, and/or pattern of vegetation provides protection on a given site to minimize erosion and assist in meeting State and Tribal water quality standards.	Ongoing management.
Record of Decision- Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 2 Biotic Communities Standard (Includes Native, Endangered, Threatened, and Special Status Species)- Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities including special status species, threatened, and endangered species appropriate to the site and species. Desired plant community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes.	Ongoing management.
Record of Decision- Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 3 Riparian Sites Standard- Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide fro groundwater recharge, provide habitat and assist in meeting State and Tribal water quality Standards.	Ongoing management.
Record of Decision- Standards for Public Land Health and Guidelines for Livestock Grazing Management	Restoration should first be achieved with native, and when appropriate non-native plants.	Ongoing management.
Implementation Decisions		
Environmental Assessment- Noxious Weed Control- Otero County Amendment to NM-037-97-001 (FONSI)	Amend existing noxious weed EA to allow for an expanded program that allows for the use of integrated methodology and alignment with the official NMDA Noxious Weed List for NM.	Ongoing management.

Decision Source	Decision	Status
Environmental Assessment- Noxious Weed Control for Sierra County (FONSI)	NM-030-2003-0031. Proposes the spraying of herbicides along roadways and rights-of-way to control African Rue and Russian Knapweed in Sierra County, NM. Allows for the usage of developed proven herbicides as they occur.	Ongoing management.
Environmental Assessment- Noxious Weed Control for Doña Ana County (FONSI)	NM-030-98-025. Addressing noxious weed control in Doña Ana County and to allow for an expanded program that allows for the use of integrated methodology and alignment with the official NMDA Noxious Weed List for NM.	Ongoing management.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 1986a, 1993a, 2001a

The following is a description of BLM management documents that resulted in management decisions directly related to vegetation and noxious weed species in the TriCounty Planning Area.

The White Sands Resource Area RMP (USDI, BLM 1986a) sets forth the land use decisions, terms and conditions for guiding and controlling future management actions in Sierra and Otero Counties. Vegetation objectives focus on avoiding adverse impacts to endangered, threatened, State listed, or sensitive species. Specific vegetation decisions proposed the designation of a study plot exclosures in all range sites found in the resource area. The rangeland management section of this document has many decisions and objectives that are closely tied to vegetation (see Section 3.13 for a detailed description).

The Mimbres RMP was prepared to provide a comprehensive framework for managing public land and allocating resources in four counties, including Doña Ana County, using the principles of multiple use and sustained yield. It is a management strategy based on achieving healthy ecosystems while providing for human values, products, and services. The objective of vegetation management in the Mimbres Resource Area was to maintain a desired plant community that produces the kind; proportion and amount of vegetation necessary for meeting or exceeding the land use plan goals and activity plan objectives established for each site. The vegetation program also establishes and processes vegetation sales, provides direction for land treatments and evaluates activities in fragile land areas. Objectives for the special status species program is to give priority to the protection and management of habitat for known populations of Federal or State listed species, to prevent the listing of Federal candidates, and to assist in the recovery of listed species.

An amendment of the existing Otero and Doña Ana County noxious weed Environmental Assessment (EA) provides for an expanded program that involves the integrated methodology and alignment with the official New Mexico Department of Agriculture noxious weed list for New Mexico. The EA for Sierra County outlines the usage of herbicides along roadways and rights-of-way.

A 2001 Statewide RMP Amendment adopted three standards and five guidelines for public land health and guidelines for grazing management on BLM-administered land in New Mexico. The standards or guidelines adopted were incorporated into eight existing RMPs covering public land in New Mexico (USDI, BLM 2001a).

3.6 FISH, WILDLIFE, AND HABITAT

The Wildlife Habitat section presents the current management direction of wildlife habitat based on existing land use plans. Responsibility for management of fish and wildlife resources on public lands in New Mexico is shared between the BLM and the New Mexico Department of Game and Fish (NMDGF), with the NMDGF responsible for species management and BLM responsible for habitat management.

Table 3-3
Current Management Direction for Fish, Wildlife, and Habitat

Decision Source	Decision	Status
PlanningDecisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-1. Sierra County: (1) Provide forage for 354 deer, which presently utilize habitats within the county. (2) Provide forage for a projected population increase of an estimated 261 deer by the year 2010. (3) Provide forage for 195 pronghorn, which presently utilize habitat within the county. Provide forage for an estimated 475 pronghorn. The forage provided will be dependent on the amount and success of the vegetation treatment described in decision RM-5. Otero County (except McGregor Range): Provide forage for 12,588 mule deer and 1,666 pronghorn (optimum numbers) in herd unit areas in the long-term (30,234 and 2,582 AUMs respectively, for a total of 33,086 AUMs). This will be an increase from the current 5,955 mule deer (14, 281 AUMs) and 731 pronghorn (1,247 AUMs).	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-2. Improve and protect the riparian area along Percha Creek (280 acres) for wildlife habitat, watershed values, recreation, and visual quality. Monitor riparian habitat condition and develop management objectives and planned actions for a HMP. Limit off-road vehicle (ORV) use to existing roads and trails. (Note: Percha Creek is an important area for special status species.)	Ongoing management. An exclosure was completed to protect Percha Creek and limt OHV traffic, but the HMP is incomplete.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-3. Improve and protect Lake Holloman and adjacent lands (1,160 acres) as a high-use area for waterfowl and shore birds. Habitat management proposals and subsequent plans and agreements will be coordinated with Holloman Air Force Base through the U.S. Army Corps of Engineers, NMDGF, USFWS, and other interest groups.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-4. A HMP (or CRMP) will be developed for the Alamo Mesa pronghorn area. The primary objective of the HMP will be to provide adequate habitat for pronghorn. A monitoring program will be established to ensure that objectives are met.	To be completed by September 2006.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-5. A HMP (or a CRMP) will be developed for the Caballo Mountain deer area. The primary objective of the HMP will be to provide adequate habitat for mule deer. A monitoring program will be established to ensure that HMP objectives are met.	Incomplete.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-6. A HMP (or a CRMP) will be developed for the Sacramento Escarpment deer area. The primary objective of the HMP will be to provide adequate habitat for mule deer. A monitoring program will be established to ensure that HMP objectives are met. (Note: The Sacramento Mountains are important documented areas for special status species including the endangered plant, Todsen's Pennyroyal.)	To be completed by September 2006.

Decision Source	Decision	Status
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-7. Additional HMPs are being considered for approximately 844 acres of riparian habitat within the Resource Area, which are located primarily north of Alamogordo in Otero County and along Percha Creek in Sierra County. (Note: Percha Creek is an important area for special status species.)	Incomplete.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-8. In coordination with the NMDGF, conduct studies to determine what biological factors are limiting the distribution and numbers of pronghorn in habitats in the Nutt and White Sands herd units (Jornada Plain).	Incomplete.
Mimbres RMP (Doña Ana County)	Develop Robledo Mountains HMP Priority species: deer/antelope/upland game Objectives: deer, improve habitat; antelope, transplant/introduce; upland game, improve and enhance habitat Population goals: deer, 400; antelope 50 Actions: fence modification; water development	Incomplete.
Mimbres RMP (Doña Ana County)	Develop Las Uvas Mountains HMP Priority species: deer Objectives: improve habitat Population goal: deer, 300 Actions: water development	Incomplete.
Mimbres RMP (Doña Ana County)	Develop West Potrillo Mountains HMP Priority species: deer/ upland game Objectives: deer, improve habitat; upland game, improve and enhance habitat Population goal: deer, 300 Actions: water development; exclosure near water	Incomplete.
Mimbres RMP (Doña Ana County)	It is intended that wildlife population goals can be reached without reduction of livestock numbers (through grazing management and land treatments). Population goals may be revised as necessary through the HMP monitoring and evaluation process.	Ongoing management.
Mimbres RMP (Doña Ana County)	All HMPs will incorporate the following: • Obtain production (population) data to correlate with monitoring (at a minimum, harvest information by area). • Monitoring emphasis will be on preferred habitats for wildlife. • Monitoring will incorporate browse utilization/condition/trend.	Ongoing management.
Mimbres RMP (Doña Ana County)	Animal damage control (ADC) actions will be conducted in accordance with annual ADC plans. The plan will specify times and conditions for control activities in accordance with management prescriptions, objectives, and goals.	Ongoing management.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 1 Upland Sites Standard- Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type climate, and landform. The kind, amount, and/or pattern of vegetation provides protection on a given site to minimize erosion and assist in meeting State and Tribal water quality standards.	Ongoing management.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 2 Biotic Communities Standard (Includes Native, Endangered, Threatened, and Special Status Species)- Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities including special status species, threatened, and endangered species appropriate to the site and species. Desired plant community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes.	Ongoing management.

Decision Source	Decision	Status
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 3 Riparian Sites Standard- Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide fro groundwater recharge, provide habitat and assist in meeting State and Tribal water quality Standards.	Ongoing management.
Implementation Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	Forage will be provided for big game species on herd unit areas for present populations as established jointly with the NMDGF.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Rangeland improvements will be designed to provide wildlife needs.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Livestock water developments will be designed to permit use and escape by wildlife species.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Where BLM controls the water source, water will be available yearlong.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	New fences will be constructed according to the guidance contained in New Mexico State Office Manual Supplement 1737, and the BLM 1741 Manual Handbook for Fencing, dated May 1985, which includes designs to permit free movements of big game animals in occupied and historic ranges.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Existing fences will be modified to permit free movement of big game animals, as the need is identified in activity plans, to conform with New Mexico State Office Manual Supplement 1737.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Vegetation treatment projects will be designed to minimize impacts on wildlife and to improve habitat, especially for pronghorn, whenever project and wildlife objectives are compatible.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	During nesting season, a raptor inventory will be conducted on areas proposed for vegetation treatment to identify and flag land within a 1/4 –mile radius of active nests so they will not be disturbed by the proposed treatment.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Animal damage control activities will be established in an annual plan completed for the Las Cruces District. The District Animal Damage Control Plan includes rodent and predator control activities conducted by the U.S. Fish and Wildlife Service (USFWS).	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	The policy given in Manual 6740-Wetland-Riparian Area Protection and Management will provide the basis for management of all riparian areas.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Arroyos and their associated vegetation should receive special consideration and protection to maintain them in their existing condition.	Ongoing management.
White Sands Resource Area	Water control structures will be allowed if it is determined that these structures are needed. Coordination will be required with the watershed	Ongoing management.

Decision Source	Decision	Status
RMP (Sierra and Otero Counties)	activity as to location of needed structures.	
White Sands Resource Area RMP (Sierra and Otero Counties)	Seasonal restrictions are sometimes necessary for site-specific activities, such as not allowing and action to occur within a specific area during raptor nesting season. These restrictions are determined on a case-by case basis and could consist of not allowing motor vehicles within ¼-mile of raptor nests, for example.	Ongoing management.
Mimbres RMP (Doña Ana County)	Prior to authorizing activities in crucial wildlife habitats such as winter ranges, raptor nests sites, and fawning habitat, considerations will be made to avoid or minimize disturbance to wildlife.	Ongoing management.
Mimbres RMP (Doña Ana County)	Grazing of domestic sheep and goats will not be allowed in bighorn sheep habitat areas. Existing guidance will also address buffer areas for grazing domestic sheep.	Ongoing management; current guidance establishes an 8-mile buffer
Mimbres RMP (Doña Ana County)	Prescribed burn projects will be designed to improve wildlife habitat.	Ongoing management.
Mimbres RMP (Doña Ana County)	Livestock grazing management will incorporate the needs of key plant species important to wildlife.	Ongoing management.
Mimbres RMP (Doña Ana County)	All new fences will be built to allow for wildlife passage in accordance with BLM fence standards. Any existing fences obstructing wildlife movements will be brought into conformance with the adopted standards. Wildlife escape devices will be installed on all new and existing water tanks or troughs within the Mimbres RA.	Ongoing management.
Mimbres RMP (Doña Ana County)	The construction of new roads into crucial wildlife habitats will be avoided. Permanent or seasonal road closures may be instituted where problems exist or are expected.	Ongoing management.
Mimbres RMP (Doña Ana County)	Raptor habitat will be improved by requiring all new power lines to be constructed to "electrocution proof" specifications. Any existing lines will be modified to be "electrocution proof".	Ongoing management.
Mimbres RMP (Doña Ana County)	As HMPs are developed and implemented, particularly where the use of Sikes Act funds are involved, attention will be given to the development of basic facilities for users such as parking lots and trailheads.	Ongoing management.
Mimbres RMP (Doña Ana County)	Sikes Act projects to maintain, improve, or enhance wildlife habitat will be developed and implemented throughout the Resource Area.	Ongoing management.
Mimbres RMP (Doña Ana County)	In WSAs and wilderness areas, animal damage control directed at individuals offending animals may be permitted, as long as this will not jeopardize the continued presence of any species in the area. Use of the minimum control measure necessary to achieve the objective is required.	Ongoing management.
Mimbres RMP (Doña Ana County)	Within the Doña Ana Mtns. ACEC; prescriptions applicable to wildlife habitat include: Exclude feral goats and other exotic animals. Close roads that provide access for illegal plant collecting.	Ongoing management; no roads have been closed.
Mimbres RMP (Doña Ana County)	The Organ and Franklin Mountains ACEC: Monitor the area in accordance with the concepts of limits of acceptable change with emphasis on the most biologically or culturally sensitive areas.	Ongoing management.
Robledo Habitat Management Plan	Manage the public land within the HMP area to provide habitat for a minimum of 150 pronghorn and 400 mule deer.	Ongoing management.
Robledo Habitat Management Plan	Participate in the revision of the existing Corralitos Ranch AMP and the development of an AMP for the Lazy E allotment.	Ongoing management.
Robledo Habitat Management Plan	Improve vegetative diversity and habitat conditions on approximately 60,000 acres of rangeland throughout the HMP area by using prescribed fire, chemical brush control, and improved grazing practices.	Ongoing management.

Decision Source	Decision	Status
Robledo Habitat Management Plan	Using rangeland and wildlife habitat management principles, protect and enhance the ecosystem of the HMP area.	Ongoing management.
Robledo Habitat Management Plan	In cooperation with the NMDGF, develop a watchable wildlife program for the HMP area.	Incomplete.
Robledo Habitat Management Plan	Develop wildlife waters in the HMP area to insure adequate water sources for wildlife.	Ongoing management.
Robledo Habitat Management Plan	In cooperation with allottees, construct exclosures to protect water sources and provide cover and feed sources for wildlife.	Ongoing management.
Robledo Habitat Management Plan	Maintain all wildlife water units and exclosures.	Ongoing management.
Robledo Habitat Management Plan	Develop and implement chemical brush control projects to improve wildlife habitat.	Ongoing management.
Organ/ Franklin Mountains HMP	Prescribe burning Water development Populations goals (min) of 500 deer and 100 bighorn sheep.	Ongoing management.
Otero County ACEC RMPA	Within the Sacramento Escarpment ACEC, prescriptions applicable to wildlife habitat include: Wildlife waters will be managed on a case-by-case basis. Management of wildlife and special status species will continue according to the existing RMP decisions to manage big game habitat, and compliance with special status species law and policy.	Ongoing management.
Otero County ACEC RMPA	Within the Cornudas Mountains ACEC, prescriptions applicable to wildlife habitat include: There will be no establishment of wildlife waters within the ACEC. Barbary sheep will be managed to prevent habitat degradation while providing hunting opportunities to the public. Monitoring to ensure protection of identified resource values.	Ongoing management.
Otero County ACEC RMPA	Within the Wind Mountain ACEC, prescriptions applicable to wildlife habitat include: Additional wildlife waters will be established within the ACEC to facilitate habitat management. Barbary sheep will be managed to prevent habitat degradation while providing hunting opportunities for the public. Monitoring to ensure protection of identified resource values.	Ongoing management.
Otero County ACEC RMPA	Within the Alkali Lakes ACEC, prescriptions applicable to wildlife habitat include: Management of wildlife and special status species will continue to be handled under the Continuing Management Guidance (White Sands RMP) and the Guadalupe Ranch CRMP to the extent consistent with existing RMP guidance. Monitoring to ensure protection of identified values.	Ongoing management.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 2001a, 1997b, 1994, 1993a, 1986a

3.7 SPECIAL STATUS SPECIES

Table 3-4
Current Management Decisions for Special Status Species

Decision Source	Decision	Status
Planning Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	Vegetation treatment projects will be designed to minimize impacts on wildlife and to improve habitat, especially for pronghorn, whenever project and wildlife objectives are compatible.	Ongoing management.

Decision Source	Decision	Status
White Sands Resource Area RMP (Sierra and Otero Counties)	During nesting season, a raptor inventory will be conducted on areas proposed for vegetation treatment to identify and flag land within a ¼ mile radius of active nests so they will not be disturbed by the proposed treatment.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Examine T&E species and their habitat when considering land disposal.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Multiple use management actions will be developed for each allotment in Category I (Improve) and selected M (Maintain) allotments. Activity plans would be prepared within constraints set by the RMP to resolve resource conflicts where they occur. The activity plan on an affected allotment would favor the development or enhancement of the significant values found to be in conflict with livestock grazing use. The significant values found within the area are (1) riparian areas; (2) areas where threatened or endangered species may occur; and (3) crucial mule deer or pronghorn habitat.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Wildlife habitat monitoring would be determined by budgetary constraints or limitations. The following is a list of situations, by priority in which habitats would be monitored (1) threatened or endangered species habitats with management problems; (2) big game habitats under management plans; and (3) other habitats.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	NMDGF, the New Mexico Heritage Program and USFWS will be consulted prior to implementing projects for wildlife that may affect listed species or their habitat. These consultations will be conducted according to the Endangered Species Act and management policy and guidelines.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Management activities in habitat for threatened, endangered, or sensitive species will be designed to benefit those species, or at least minimize any potential adverse influence of the activity on the species.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Listed species which occur within HMP areas, and for which management needs are known, will be included in the HMP as a featured species.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Forage will be provided for big game species on herd unit areas for present populations as established jointly with the NMDGF.	Ongoing management.
Mimbres RMP (Doña Ana County)	Management of special status species in the Organ Mountains will continue in accordance with the existing Organ Mountains Coordinated Resource Management Plan.	Ongoing management.
Mimbres RMP (Doña Ana)	Designate the Robledo Mountains ACEC to protect high diversity cacti location with endangered species present.	Completed.
Mimbres RMP (Doña Ana)	Designate the Organ/Franklin Mountains ACEC to protect endangered plant species.	Completed.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 1 Upland Sites Standard- Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type climate, and landform. The kind, amount, and/or pattern of vegetation provide protection on a given site to minimize erosion and assist in meeting State and Tribal water quality standards.	Ongoing management.

Decision Source	Decision	Status
Record of Decision- Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 2 Biotic Communities Standard (Includes Native, Endangered, Threatened, and Special Status Species)- Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities including special status species, threatened, and endangered species appropriate to the site and species. Desired plant community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes.	Ongoing management.
Record of Decision- Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 3 Riparian Sites Standard- Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide fro groundwater recharge, provide habitat and assist in meeting State and Tribal water quality Standards.	Ongoing management.
Implementation Decisions		
Mimbres RMP (Doña Ana County)	Within the Organ/Franklin Mountains ACEC: Monitor area in accordance with the concepts of limits of acceptable change with emphasis on most biologically sensitive areas. (Note: The Organ Mountains are important to special status mammals like the Desert Bighorn Sheep, and the Organ Mountain Colorado Chipmunk.)	Management prescriptions are in the Organ Mountains Coordinated Resource Management Plan (1989). New prescriptions were added in the Mimbres RMP. Implementation is 90 percent complete.
Mimbres RMP (Doña Ana County)	Within the Lordsburg Playa RNA: Manage to protect biological and research values. (Note: A State Sensitive Saltbush occurs on the Playa.)	Ongoing management.
Otero County ACEC RMPA	Within the Sacramento Escarpment: • No land disposal in area of ACEC would occur to minimize impact to the Peregrine falcon. • Road closures for protection of Peregrine falcon may be implemented. • Protect Sacramento Prickly Poppy by potentially implementing road closures.	Ongoing management. Off-road vehicle designation has been completed and signs posted. Expansion of boundaries in Fiscal Year 1998. Monitoring ongoing.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 2001a, 1997b, 1993a, 1986a

The objectives of BLM's special status species policy are to (1) conserve listed species and the ecosystems on which they depend, and (2) to ensure that actions requiring authorization or approval by the BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any special status species, either under provisions of the Endangered Species Act or other provisions of Special Status Species Management Policy.

According to this Policy, inventories of Federally and State-listed species are ongoing, and monitoring programs are implemented for known populations of these species (e.g., aplomodo falcon). Where monitoring identifies threats to these populations, appropriate actions are taken to control or eliminate the threat. Prior to authorizing activities in sensitive habitats (winter ranges, raptor nest sites, breeding

habitat, etc.), considerations are made to avoid or minimize disturbance to listed threatened and endangered species. Other special status species such as BLM Sensitive Species are included in management decisions. Consultation with the USFWS occurs prior to authorizing activities that may impact threatened and endangered species and their habitats. If applicable, conservation measures are implemented to lessen or avoid impacts from BLM approved actions.

3.8 WILDLAND FIRE ECOLOGY AND MANAGEMENT

The Review and Update of the 1995 Federal Wildland Fire Management Policy (National Interagency Fire Center 2001) included the following interagency fire management guidance:

- Use fire to restore and/or sustain ecosystem health.
- Identify appropriate management response (AMR) goals, objectives, and constraints by specific Fire Management Units (FMU) within the LCFO. All wildland fire management activities will be managed as described in the FMU guidance.
- Work collaboratively with communities at risk within the wildland/urban interface areas to develop plans for risk reduction.
- Work collaboratively with regional partners in fire and resource management across agency boundaries.
- Allow wildland fire to protect, maintain, and enhance resources. Allow fire to function in its ecological role when appropriate for the site and situation.
- Employ fire prevention strategies that reduce human ignition, with special emphasis in campgrounds and transportation corridors.
- Use fire as a management tool to improve the ecological condition of range ecosystems and maintain natural plant community diversity.

In addition to national policy, BLM has developed a Resource Management Plan Amendment (RMPA) for Fire and Fuels Management on Public Land in New Mexico and Texas. This RMPA modified all 9 RMPs (including White Sands and Mimbres RMPs) throughout New Mexico and Texas. General goals and objectives for fire management are listed below in Table 3-5. All of the goals and objectives are aimed at improving the implementation of the National Fire Plan and the Federal Wildland Fire Management Policy. The document also affirms the FMUs outlined in the Las Cruces District Office Fire Management Plan for 2004.

According to the Mimbres RMP, the objective of the fire management program is to enhance and protect the resources of the public land by preserving their capacity to contribute towards meeting resource needs. No specific objective for fire management was indentified in the White Sands RMP. Current management direction and decisions for fire and fuels management are listed in Table 3-5.

Table 3-5
Current Management for Wildland Fire Ecology and Management

Decision Source	Decision	Status
Planning Decisions		
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas	Use the Fire Management Unit Categories outlined in Table 2-34. The document also sets a fuels treatment goal of 73,000 acres per year for the Las Cruces District Office (40 percent mechanical, 40 percent prescribed fire, and 20 percent chemical).	Ongoing management.
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas	Goal: Reduce the risk to human life and property from wildland fire. Objective: Focus treatments on communities and surrounding areas with the potential for escaped fire or loss of life or property. Focus treatments on public land within the 18 wildland/urban interface (WUI) areas defined in cooperation with the New Mexico State Forestry Division (2003) and on other areas where public land is adjacent to communities.	Ongoing management.
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas	Goal: Reduce the risk and cost of fire suppression in areas of hazardous fuels buildup. Objective: Focus appropriate treatments on areas identified as containing hazardous fuels buildup, to reduce the risk and cost of fire suppression.	Ongoing management.
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas	Goal: Improve landscape health through returning fire to its natural role in the ecosystem. Objective: Focus treatments on improving landscape health through treating lands in Fire Regime Condition Classes 2 and 3. Maintain Fire Regime Condition Class 1. The Desired Future Condition of the landscape is Fire Regime Condition Class 1. This direction applies to threatened and endangered species, as well as cultural resources and other resources that could be affected by wildland fire suppression and fire and fuels management. This direction would be followed unless doing so would compromise protection of human life or property or the protection of special species habitat.	Ongoing management.
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas	The White Sands RMP has been amended to allow treatment projects (chemical, mechanical, and burning) on more than 241,576 acres in the long-term.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Sets suppression objective. The White Sands Resource Area (Sierra and Otero Counties) will provide initial attack on all wildfires on or threatening public land with the objective being to contain the fire during the first burning period.	Ongoing management.

Decision Source	Decision	Status
White Sands Resource Area RMP (Sierra and Otero Counties)	Provide for limited fire suppression action where associated expense is not warranted.	Ongoing management.
Implementation Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	Prescribed burns are conducted as part of rangeland, wildlife, and watershed improvement projects. Each burn must be analyzed on a project-by-project basis to comply with NEPA.	Ongoing management.
Mimbres RMP (Doña Ana County)	Use either prescribed fire, or wildland fire to treat specific acreage.	Ongoing management.
Mimbres RMP (Doña Ana County)	Developed prescribed fire plans for specific ACECs (areas applicable to the Planning Area include the Organ/Franklin Mountains and Robledo Mountains).	Ongoing management.
Las Cruces District Office Fire Management Plan 2004	Any fire must be suppressed if it threatens life, property, if smoke management becomes a problem, if the fire is human-caused, or if the area does not have the necessary planning documents completed for fire use to accomplish resource objectives.	Ongoing management.
Las Cruces District Office Fire Management Plan 2004	An adequately equipped, well-trained fire management staff is needed for management to make informed, knowledgeable decisions.	Ongoing management.
Las Cruces District Office Fire Management Plan 2004	No wildland fire situation, with the possible exception of threat to human survival, requires exposure of firefighters and equipment to life-threatening situations.	Ongoing management.
Las Cruces District Office Fire Management Plan 2004	A response to each fire needs to be evaluated based on safety, values at risk, burning conditions, and time of year and resource availability.	
Las Cruces District Office Fire Management Plan 2004	A Wildland Fire Situation Analysis will be prepared to govern suppression actions for wildfires, which escape initial attack or reach beyond two burning periods. All escaped fires need to have a resource advisor assigned.	Ongoing management.
Las Cruces District Office Fire Management Plan 2004	Fire suppression activities in wilderness or wilderness study areas (WSAs) will be conducted in accordance with guidance contained in field office wilderness fire plans. Wilderness not covered by a specific fire plan shall have fire managed in accordance with the Interim Guidance for Fire Suppression in Wilderness.	Ongoing management.
Las Cruces District Office Fire Management Plan 2004	Prescribed fires will be preplanned and approved by the Field Office Manager. Comply with the Federal Clean Air Act in cooperation with Federal, State and local agencies.	Ongoing management.

SOURCES: U. S. Department of the Interior, Bureau of Land Management 2004a, b, 1993a, 1986a

3.9 CULTURAL RESOURCES

3.9.1 Existing Management Decisions

The decisions regarding cultural and heritage resources that were made in prior RMPs are summarized in Table 3-6.

Table 3-6
Current Management Decisions for Cultural and Heritage Resources

Decision Source	Decision	Status
Planning Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-01. Fence an additional 120 acres (for total of 340 acres) to eliminate grazing at Three Rivers Petroglyph Site and Picnic Area, and restrict ORV use to existing roads and trails.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-02. Rattlesnake Hill Archaeological District is closed to OHV use and range improvements, prepare cultural resource management plan.	Ongoing management. Signs have been installed to inform visitors about laws protecting the site. Plan not prepared due to lack of staff and funding.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-03. Designate Alamo Mountain Petroglyphs (200 acres) for no surface occupancy and close to OHV use; prepare cultural resource management plan.	Ongoing management. Signs have been installed to inform visitors about laws protecting the site. Plan not prepared due to lack of staff and funding.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-04. OHV use in the Lone Butte archaeological area is limited to existing roads and trails; prepare cultural resource management plan.	Ongoing management. Plan not prepared due to lack of staff and funding.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-05. Jarilla Mountains is closed to OHV use to protect cultural resources.	Ongoing management. Area increased August 3, 1989, *Federal Register*.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-06. Do not permit surface-disturbing activities within ¼ mile of well-preserved segments of the Butterfield Overland Route (2,200 acres); prepare cultural resource management plan.	Ongoing management. Plan not prepared due to lack of staff and funding.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-07. Do not permit surface-disturbing activities within ¼ mile of well-preserved segments of the Jornada del Muerto Trail (1,252 acres); prepare cultural resource management plan.	Ongoing management. Plan prepared as component of Camino Real National Historic Trail Comprehensive Management Plan.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-08. Prepare plan of action for a sample survey of 10 percent of the public land, and initiate fieldwork.	Not implemented due to lack of staff and funding.
Otero County ACEC RMPA	Three ACECs are designated to protect archaeological resources: (1) Three Rivers Petroglyph Site (1,036 acres) that reflects the Jornada Mogollon culture including rock art and a pit house village, (2) Cornudas Mountain (850 acres) that includes rock art, Thorne's Well, and remnants of the Butterfield Overland Route and the Cornudas de los Alamos Butterfield stage station, and (3) Alamo Mountain (2,690 acres) that includes a prehistoric site, rock art, and remnants of the Butterfield Overland Route and the Ojos de los Alamos Butterfield stage station.	Ongoing management.
Otero County ACEC RMP Amendment	The Wind Mountain ACEC is designated (2,506 acres) to protect cultural resources values, including rockshelters and open sites related primarily to the Archaic era, in conjunction with managing the primary visual resource values.	Ongoing management.

Decision Source	Decision	Status
Mimbres RMP (Doña Ana County)	CU-01. Designate three ACECs to protect archaeological resources that reflect the Jornado Mogollon culture: (1) Lost Tules pit house village site (20 acres), (2) Rincon Petroglyph site (840 acres), and (3) San Diego Mountain petroglyphs (640 acres).	Ongoing management.
Mimbres RMP (Doña Ana County)	Designate two ACECs to protect archaeological sites in conjunction with managing their primary biological and scenic values: (1) Doña Ana Mountains (1,490 acres), and (2) Organ/Franklin Mountains (56,480 acres).	Ongoing management.
Mimbres RMP (Doña Ana County)	CU-02. Designate the Butterfield Overland Route as a historic trail.	Not implemented due to lack of staff and funding.
Mimbres RMP (Doña Ana County)	CU-03. Eliminate grazing at the Dripping Springs Natural Area to protect cultural resources.	Ongoing management.
Mimbres RMP (Doña Ana County)	CU-04. Intensively survey the San Diego Mountain and Rincon ACECs to document their cultural resources.	Not implemented due to lack of staff and funding.
Mimbres RMP (Doña Ana County)	CU-05. Research historical roads and trails (Camino Real, Spanish exploration routes, and historical wagon roads). Research historical mining towns and features.	Camino Real researched in conjunction with designation and interpretation as a National Historic Trail. Other research not implemented due to lack of staff and funding.
Mimbres RMP (Doña Ana County)	CU-06. Conduct field schools at Bruton Bead and East Potrillo sites.	Not implemented due to lack of staff and funding.
Mimbres RMP (Doña Ana County)	CU-07. Restrict public access to the rock shelters at Apache Box, Apache Cave, and elsewhere as needed.	Full closure not implemented. A seasonal closure occurred from March to May for the nesting of Peregrine falcons. The falcons remain on the State list and seasonal closure may continue.
Mimbres RMP (Doña Ana County)	CU-08. Acquire Butterfield Overland Route stage station sites through land exchanges, or purchases from willing sellers.	No opportunities for acquisition identified.
Mimbres RMP (Doña Ana County)	CU-09. Close the road to the Bruton Bead site.	Not implemented due to lack of staff and funding.
Mimbres RMP (Doña Ana County)	CU-10. Fence the Los Tules site or cover it with fill material to protect the site.	Not implemented due to lack of staff and funding.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 1997a, 1993a, 1986a

3.9.2 BLM CULTURAL RESOURCE PROGRAM GOALS AND COMPONENTS

The specific decisions regarding cultural and heritage resources are intended to implement the overall BLM cultural resource management program that is designed to be a comprehensive system for (1) identifying, (2) planning the appropriate use of, and (3) managing cultural resources on lands administered by the BLM or to the extent that effects stem from BLM decisions. The following policy objectives guide the program:

- Respond in a legally and professionally adequate manner to (1) the statutory authorities concerning historic preservation and cultural resource protection, and (2) the principles of multiple use and ecosystem management.
- Recognize the potential public and scientific use of, and the values attributed to cultural resources on public land, and manage the land and cultural resources so that these uses and values are not diminished, but rather are maintained and enhanced.
- Contribute to land use planning and the multiple use management of public land in ways that make optimum use of the thousands of years of land use history inherent in cultural resources information, and that safeguard opportunities for attaining appropriate uses of cultural resources.
- Protect and preserve in place representative examples of the full array of cultural resources on public land for the benefit of scientific and public use by present and future generations.
- Ensure that proposed land uses, initiated or authorized by BLM, avoid inadvertent damage to Federal and non-Federal cultural resources (BLM Manual 8100.02, Cultural Resource Management).

The cultural resource program has two main functions: (1) primary program management, and (2) support to ensure that other BLM programs and other authorized uses of the public land comply with cultural resource and historic preservation regulations. These are often referred to as Section 110 and Section 106 activities, respectively, because they address requirements stipulated by those sections of the National Historic Preservation Act. In the past, the support function has dominated the activities of the cultural resource program. In recent years, more effort has been devoted to the primary cultural resource program. The primary function of the cultural resource program includes the following four components.

1. Inventory and Evaluation. BLM undertakes surveys to inventory cultural resources, and maintains inventory data by participating in and providing funding for the New Mexico Cultural Resource Information System, a geographical information system (GIS) database maintained by the Historic Preservation Division of the Archeological Records Management Section, in cooperation with the State Historic Preservation Office and Museum of New Mexico. Inventory involves identification, recording, and evaluation of scientific, sociocultural, and public values of cultural resources. Inventory also can result in nominations of properties to the National Register of Historic Places (National Register), which enhances public recognition but does not necessarily convey more protection than determinations of eligibility. In the past, most cultural resource inventory and evaluation has been driven by project reviews in compliance with Section 106 as an aspect of the support function of the program. Recently, some efforts have been initiated to conduct inventories designed to enhance understanding of the resources on all public lands to meet requirements of Section 110 of the National Historic Preservation Act.
2. Resource Protection and Conservation. Measures to protect cultural resources are developed in response to allocated uses and degree of threat. Protection can be provided by both administrative and physical measures. Administrative measures include actions such as designation of no-

occupancy zones, camping closures, road closures, and closure to mineral entry. Physical measures could include fencing, stabilization, patrol, rehabilitation, and signing or other measures. Monitoring of cultural resource conditions is required to identify needs for resource protection.

3. Resource Use (Study and Public Interpretation). The value of cultural resources lies in their historic associations and tangible linkage to earlier times and earlier cultures. Cultural resources can enhance understanding and appreciation of the past, and provide perspective for planning the future. Unused cultural resources have little value, but because they are nonrenewable, and often fragile, cultural resources must be used judiciously. The National Cultural Programmatic Agreement and New Mexico Protocol stipulate that heritage education and public outreach be addressed.

4. Resource Planning. In accordance with BLM policy, cultural resources are routinely considered in the development and revision of RMPs. A challenge is to use approved plans to achieve program goals through development of a variety of more specific implementation plans, cultural resource management plans (which define more specific management strategies and prescriptions for special status cultural resources), and annual work plans.

The support function includes participation in environmental analyses and preparation of documents needed to comply with heritage preservation laws that must be addressed as BLM projects or other authorized activities on public land managed by BLM are planned and implemented. Enforcement of pre-construction and post-construction stipulations of use authorizations—as well as conditions of cultural resource use permits—also is an aspect of the support function. The goal of the support function is to implement projects in a manner that avoids adverse effects on significant cultural resources whenever feasible or mitigates adverse effects as warranted.

3.10 PALEONTOLOGICAL RESOURCES

Table 3-7
Current Management Decisions for Paleontological Resources

Decision Source	Decision	Status
Planning Decisions		
Mimbres RMP (Doña Ana County)	Management as directed by Federal Land and Policy Management Act and instruction memorandums; regulations being developed; resources managed through issuance of scientific permits.	Ongoing management; however, management requirements for paleontological resources have been revised and updated. Based on direction of Handbook 1601-1, Paleosensitivity maps have been developed to assist field offices in developing areawide criteria to be used in day-to-day management.

SOURCE: U.S. Department of Interior, Bureau of Land Management 1993a

The BLM continues to manage and protect paleontological resources based on the guidelines as set forth in the BLM's General Procedural Guidance for Paleontological Resource Management (BLM Manual H-8270-1), as described in Section 6.11.1 and in regard to the principles and recommendations of the Assessment of Fossil Management on Federal and American Indian Lands (USDI, Secretary of the Interior 2000) as described in Section 5.11.

BLM has developed an objective for paleontological resources (BLM Manual 8270, Paleontological Resource Management and Handbook H-8270-1, General Procedural Guidance for Paleontological Resource Management) (USDI, BLM 1998a, b), which is to provide protection of the resources. It is the policy of BLM to manage paleontological resources for these values and to mitigate adverse impacts on them. The BLM has recently developed and is continuing to update a paleosensitivity database and suggested management and mitigation guidelines program. From this database, a paleoecological resources map was developed by the BLM and presents a probable fossil yield classification based on the bedrock geology and known or potential occurrences of paleontological resources in those geologic units (Hester 2005). This information and program will allow better management of paleontological resources on public lands.

3.11 VISUAL RESOURCES

BLM is responsible for ensuring that RMPs consider the scenic values of public lands. BLM accomplishes this through the visual resource management (VRM) system that follows the management guidelines in BLM Manual Section 8400, Information Bulletin No. 98-135, and Instructional Memorandum No. 98-164. The objective of the VRM system is to manage public lands in a manner that will preserve the quality of the scenic (visual) values of those lands.

Current management decisions for visual resources within the TriCounty Planning Area have been described in preceding RMPs, as amended. Table 3-8 describes the existing management decisions for landscapes within the Decision Area.

Table 3-8
Current Management for Visual Resources

Decision Source	Decision	Status
Planning Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	VR-1. Designate 3,640 acres of the Sacramento Escarpment as an area of critical environmental concern (ACEC) for visual resources. Manage as VRM Class I.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage 159,310 acres according to VRM Class I guidelines.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage 744,621 acres according to VRM Class II guidelines. VRM Class II areas include the wilderness study areas, Organ and Franklin Mountains, and most mountain ranges and hills in the Mimbres Resource Area, especially along highways.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage 629,314 acres according to VRM Class III guidelines. VRM Class III areas are mainly the flatlands, uplands, and basin areas along highways.	Ongoing management.

Decision Source	Decision	Status
Mimbres RMP (Doña Ana County)	Manage 1,546,218 acres according to VRM Class IV guidelines. VRM Class IV areas comprise the nonhilly areas that are not visible from highways	Ongoing management.
Mimbres RMP (Doña Ana County)	The following areas are designated as Scenic ACECs and will be managed as VRM Class I areas: • Doña Ana Mountains (1,490 acres) • Organ/Franklin Mountains (56,480 acres) • Robledo Mountains (9,190 acres) NOTE: Only ACECs within the Planning Area are listed.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage the Los Tules ACEC as VRM Class II.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage the Organ/Franklin Mountains ACEC as VRM Class I, III, or IV. Manage mountainous portions (generally above 5,000 feet) as VRM Class I; manage other portions as VRM Class III or IV.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage the Rincon ACEC as VRM Class II.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage the San Diego Mountain ACEC as VRM Class II.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage the Butterfield Trail as VRM Class II.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage the Aden Lava Flow Research Natural area as VRM Class II.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage the Kilbourne Hole National Natural Landmark as VRM Class II.	Ongoing management.
Mimbres RMP (Doña Ana County)	Manage the Paleozoic Trackways RNA as VRM Class II.	Ongoing management.
El Camino Real de Tierra Adentro National Historic Trail Comprehensive Management Plan/Federal Environmental Impact Statement	The Mimbres and White Sands RMPs would be amended as follows: 97,873 acres of existing VRM Class IV public land to VRM Class II in the vicinity of high-potential historical segments and near select high-potential historical sites; amend 903 acres of VRM Class III public lands in the vicinity of high-potential historical trail segments and high-potential historic sites to VRM Class II.	Ongoing management.
Otero County ACEC RMPA	Manage Three Rivers Petroglyph Site ACEC as VRM Class III.	Ongoing management.
Otero County ACEC RMPA	Manage Sacramento Escarpment ACEC as VRM Class I, II, and III. Manage the existing as VRM Class I, expanded as VRM Class II, and retained as VRM Class III.	Ongoing management.
Otero County ACEC RMPA	Manage the Cornudas Mountain ACEC as VRM Class I.	Ongoing management.
Otero County ACEC RMPA	Manage the Alamo Mountain ACEC as VRM Class I.	Ongoing management.
Otero County ACEC RMPA	Manage the Wind Mountain ACEC as VRM Class I.	Ongoing management.
Otero County ACEC RMPA	Manage the Alkali Lakes ACEC as VRM Class III.	Ongoing management.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 2000e, 1997b, 1993a, 1986a

3.11.1 Visual Resources Inventory Process

The BLM visual resources inventory (VRI) provides land managers with a process for determining visual and aesthetic values. The inventory consists of an evaluation of landscape character and scenic quality,

and viewers (including number of and sensitivity of viewers), and visibility. Based on these indicators, sections of BLM-administered public land are assigned one of four VRI class ratings (Class I, II, III, IV). These inventory classes represent the relative values of the visual resources. Inventory classifications provide the basis for considering visual and aesthetic values in the RMP process. Inventory classes are used to describe baseline visual conditions, and may be adjusted to reflect other resource allocation decisions, such as an addition of adjacent cultural modifications that may detract from or enhance scenic value (USDI, BLM 1984b).

During the late 1970s and early 1980s, BLM developed VRIs for Sierra, Otero, and Doña Ana Counties, as discussed in the Mimbres RMP/EIS and White Sands RMP/EIS. However, detailed VRI data are not available for reference.

The VRI completed for Sierra and Otero Counties concluded that the primary character of the landscape should be retained regardless of landscape modification (USDI, BLM 1984a). Criteria also were developed to identify areas for designation as ACECs for the purpose of protecting visual resources. The criteria are as follows:

- The area rates high in scenic quality
- Rare or unique resources are prevalent within the region.

3.11.2 VRM Class Objectives

VRM classes are derived from the VRI classes (which describe the baseline visual conditions of a landscape—scenic quality and visibility—and the numbers and sensitivity of the viewers of that landscape) in combination with management decisions regarding other resources. That is, the VRM classes are an adjustment of the baseline VRM-class assignments to accommodate management or use of other resources. The VRM-class assignments provide management guidance about the level of rigor to be employed in maintaining the scenic quality of a particular landscape. For example, there may be a prescription to maintain a landscape as is, with no modifications allowed, or there may be a prescription to allow a modification as long as they are visually unobtrusive and blend in with the lines and forms within the landscape. There are four VRM classes. The management objectives for each are based on criteria identified within BLM Handbook H-8410-1, Visual Resource Inventory and are described below (USDI, BLM 1984b).

3.11.2.1 VRM Class I Objective

VRM Class I areas are landscapes that require protection as scenic resources (e.g., wilderness areas, scenic sections of National Wild and Scenic Rivers, and other Congressionally or administratively designated areas).

The management objective is to preserve the existing landscape character. Management under this class emphasizes restricting changes in the landscape to those brought about by natural ecological processes,

but also allows very limited surface-disturbing activities. The level of change to the landscape should be very low and must not attract attention.

3.11.2.2 VRM Class II Objective

On lands designated as VRM Class II, changes in any of the basic design elements (form, line, color, texture) caused by a management activity should not be evident in the landscape.

The objective of this class is to retain the existing character of the landscape. The level of change to the landscape should be low. Authorized activities and/ or uses may result in changes to the visual setting, but should not attract the attention of the casual observer. Any changes must repeat the basic design elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

3.11.2.3 VRM Class III Objective

On lands designated as VRM Class III, changes in the basic design elements (form, line, color, texture) caused by authorized activities and/or uses may be evident in the landscape, but the changes should be subordinate to the visual character of the existing landscape.

The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be restricted to moderate. Authorized activities and/or uses may result in visual changes that attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic design elements found in the predominant natural features of the characteristic landscape.

3.11.2.4 VRM Class IV Objective

On lands designated as VRM Class IV, changes may subordinate the original composition and character of the landscape but must appear as if they were brought about by a natural occurrence.

The objective of this class is to provide for management activities that require major modifications of the existing character of the landscape. The allowable level of change to the characteristic landscape can be high. The results of authorized activities and/or uses may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through strategic siting designed to minimize disturbance to the area and through repetition of the basic elements of form found in the landscape.

3.11.3 VRM Class Designations in the Decision Area

Dominant landforms with unique features located in ACECs within the Decision Area have been designated as VRM Class I. These features are primarily found in Otero and Doña Ana Counties. WSAs and other special management areas are primarily designated as Class II landscapes. The majority of the Decision Area is designated as VRM Class IV landscape interspersed with Class III landscapes located near roadways with open and panoramic scenic views. VRM classes are shown on Map 3-1. Table 3-9

and Table 3-10 summarize how much public land is within each VRM class (for Sierra and Otero Counties and Doña Ana County, respectively).

Table 3-9
Acres of Public Land Within Each VRM Class in Sierra and Otero Counties

VRM Class	Sierra County		Otero County	
	Acres	Percent of Public Land Within County	Acres	Percent of Public Land Within County
Class I	0	0	9,900	1.0
Class II	57,489	7.4	112,758	12.2
Class III	185,889	23.8	68,304	7.4
Class IV	537,351	68.8	735,968	79.4
Total	**780,729**	**100.0**	**926,930**	**100.0**

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2006

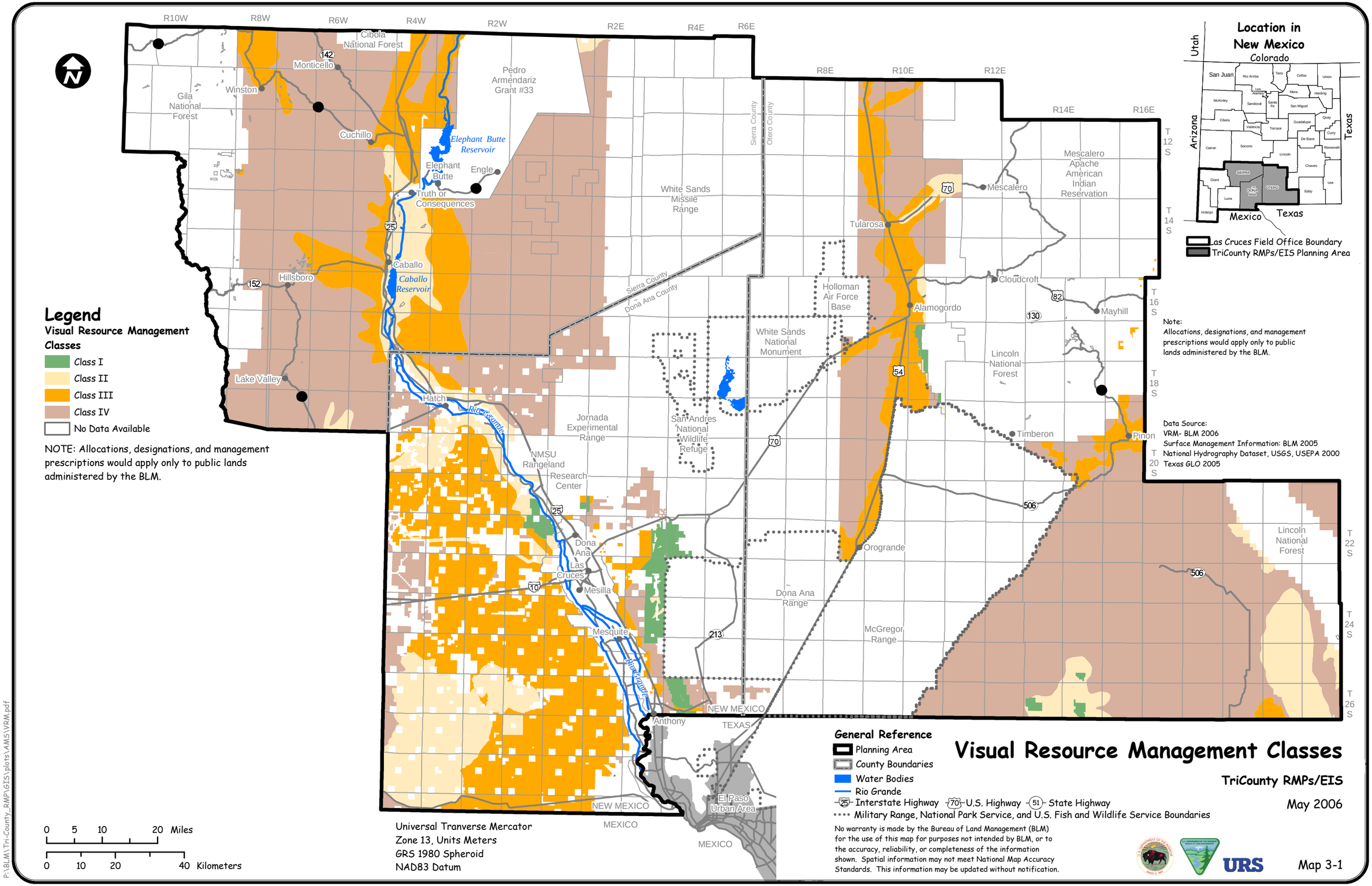
Table 3-10
Acres of Land Classified within each VRM Class in Doña Ana County

VRM Class	Doña Ana County	
	Acres	Percent of Public Land Within County
Class I	53,687	4.9
Class II	248,601	22.5
Class III	567,698	22.5
Class IV	233,384	21.1
Total	**1,103,370**	**100.0**

SOURCE: U.S. Department of the Interior, Bureau of Land Management 2006

3.12 WILDERNESS CHARACTERISTICS

Current management direction for wilderness character is to manage existing Wilderness Study Areas according to H-8550-01, Interim Management Policy and Guidelines for Lands Under Wilderness Review, so as to preserve Congress option to designate those areas as Wilderness. If Congress designates any of theses areas (see Section 2.3.1) as Wilderness, they will be managed according to the Wilderness Act, designating legislation, and a Wilderness Management Plan. If any of those areas are released from Wilderness Study, they will be managed according to the decisions in the appropriate land use plan. The 2005 BLM Land Use Handbook provides general guidance for management of areas with wilderness characteristics that are not previously designated WSAs or Wilderness.



P:\BLM\Tri-County_RMP\GIS\plots\AMS\VRM.pdf

3.13 LIVESTOCK GRAZING

This section presents the current management direction for livestock grazing. A list of management decisions related to livestock grazing is provided in Table 3-11.

Table 3-11
Current Management for Livestock Grazing

Decision Source	Decision	Status
Planning Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	Allotments will be managed for livestock grazing under the following categories: **M** - Maintain or improve existing situation (as described below): • Present ecological and management condition is satisfactory. • Moderate to high potential for vegetation production, and production is at or near potential. • Limited or no conflicts exist with livestock grazing. • Land status may or may not be considered. • Positive return on investment exists. **I** - Improve existing resource conditions (as described below): • Present ecological range condition is unsatisfactory with a downward trend. • Present management practices are inadequate to meet long-term objectives. • Vegetation production is producing at low to medium fair levels. • Resource conflicts are evident with livestock grazing. • Land status may or may not be considered. • Positive economic returns exist on public investments. **C** - Custodial Management; prevention of deterioration of current resource conditions (as described below): • Present ecological condition of range is variable. • Vegetation production is relatively low. • Limited potential for improvement. • Limited or no conflicts exist with livestock grazing. • No economic return on public investment is likely.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Multiple-use management actions will be developed for each allotment in Category I and selected Category M allotments. Activity plans will be prepared within the constraints of the RMP to resolve resource conflicts where they occur.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Grazing treatments will be incorporated into activity plans for Category I and selected Category M allotments to meet management objectives and goals established for each individual allotment.	Ongoing management.
Mimbres RMP (Doña Ana County)	Allotments will be managed for grazing under the same categories as the White Sands RMP (M, I, C - listed above).	Ongoing management.
Mimbres RMP (Doña Ana County)	Allotment management plans (AMPs) and other activity plans will continue to be developed for allotments to resolve resource problems or conflicts. Each will be coordinated, consulted, and cooperated	Ongoing management.

Decision Source	Decision	Status
	between permittees, other landowners, and affected interests. AMPs will normally include a grazing system, which will provide periodic rest from livestock grazing.	
Mimbres RMP (Doña Ana County)	A benefit-cost analysis will be used to help set improvement priorities on all new rangeland improvements. Rangeland improvements and vegetation treatments will be implemented to improve or maintain forage production and range condition.	Ongoing management.
Mimbres RMP (Doña Ana County)	On an allotment, adjustments can be made by changing one or more of the following: the kind and class of livestock, the season of use, the number of livestock, or the pattern of grazing use.	Ongoing management.
Mimbres RMP (Doña Ana County)	Monitoring studies have been or will be established on all Category I allotments in the Mimbres Resource Area. Category I allotments are monitored at a greater intensity that Category M or C allotments.	Ongoing management.
Mimbres RMP (Doña Ana County)	Fragile land areas will receive high priority for AMP and other activity plan revision or development, allotment monitoring, land treatments, allotment re-categorization, and possible reduction or exclusion of surface-disturbing activities, including range improvement development and livestock grazing use.	Ongoing management.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 1 Upland Sites Standard- Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type, climate, and landform. The kind, amount, and/or pattern of vegetation provide protection on a given site to minimize erosion and assist in meeting State and tribal water quality standards.	Ongoing management. Rangeland is managed to meet the standards.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 2 Biotic Communities Standard (includes native, endangered, threatened, and special status species)- Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities. Desired plant-community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes within the capability of the site.	Ongoing management. Rangeland is managed to meet the standards.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Standard 3 Riparian Sites Standard- Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide for groundwater recharge, provide habitat, and assist in meeting State and tribal water quality standards.	Ongoing management. Rangeland is managed to meet the standards

Decision Source	Decision	Status
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Livestock Grazing Guideline 1 Livestock Grazing Management Practices (LGMPs) will promote native plant health, soil stability, and micro-organisms, water quality, stream channel morphology and function, and habitat for native wildlife including special status, threatened and endangered species, by • Allowing for plant recovery and growth time • Allowing residual vegetation in both upland and riparian sites to protect the soil from wind and water erosion, support infiltration and soil permeability, maintain, improve, or restore riparian-wetland functions including energy dissipation, sediment capture, groundwater recharge, and stream bank stability, and prevent excessive evaporation • Using livestock to integrate organic matter into the soil, distribute seeds and establish seedings, prune vegetation to stimulate growth, and enhance infiltration.	Ongoing management.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Livestock Grazing Guideline 2 Season, duration, frequency and intensity of use should be flexible and consider climate, topography, vegetation, wildlife, and kind and class of livestock when developing and implementing livestock grazing management practices.	Ongoing management.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Livestock Grazing Guideline 3 Facilities are located away from riparian-wetland areas wherever they conflict with achieving or maintaining riparian-wetland function.	Ongoing management.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Livestock Grazing Guideline 4 Give priority to rangeland improvements and land treatments that offer the best opportunity for achieving standards.	Ongoing management.
Record of Decision-Standards for Public Land Health and Guidelines for Livestock Grazing Management	Livestock Grazing Guideline 5 Where LGMPs alone are not likely to achieve the desired plant community (including control of noxious weeds), land management practices including but not limited to and prescribed fire, and biological, mechanical, and chemical land treatments should be utilized.	Ongoing management.
Implementation Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	RM-1. The initial livestock grazing use on all allotments would approximate the 5-year average (227,759 AUMs) and not exceed preference (249,163 AUMs). The average license use will be used for negotiating initial stocking rates on individual allotments. This use would be mutually agreed upon if possible between the permittee and the BLM and could be up to preference.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	RM-2. There are presently 16 allotments (364,901 acres) with existing AMPs approved prior to 1975. All allotments have been prescribed grazing systems; the management plans for these will continue.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	RM-3. A rangeland-monitoring program will be initiated on 109 allotments covering 1,534,058 acres that have high potential for improvement and resolution of resource conflicts. Identified	Ongoing management.

Decision Source	Decision	Status
	allotments will be monitored for five years, depending on BLM budgeting constraints. The monitoring studies would provide information to establish the proper stocking rates, grazing treatments, rangeland developments, and vegetation treatments necessary to properly manage the renewable resources of the Resource Area.	
White Sands Resource Area RMP (Sierra and Otero Counties)	RM-4. Following completion of the RMP, a Rangeland Program Summary (RPS) outlining the rangeland management program for Otero County will be written and distributed to the public. Before adverse decisions are made, each adversely affected permittee will be contacted and the "section 8" Rangeland Consultation Policy will be followed. When adjustments are made through mutual agreement, they may be implemented once the RPS has been through a public review period. Subsequent information in the status of the WSRA will be contained in the ORS updates published annually.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	RM-5. Through land treatment projects (chemical, mechanical, and burning) on 241,576 acres, forage production will increase by 20,006 AUMs in the long term. Seeding is planned for 1,597 acres.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	RM-6. It is estimated that the following rangeland developments will be constructed in the short term: 142.9 miles of pipeline, 124.25 miles of fence, 34 wells with pumps or windmills, 36 storage tanks (20,000 gallons each), 148 drinking troughs, 16 dirt tanks, 74 erosion control dikes, and 1 catchment area.	Status uncertain.
Mimbres RMP (Sierra and Otero)	In the Afton allotment (No. 03056), a series of small exclosures will be constructed to provide ungrazed research sites.	Status uncertain.
Mimbres RMP (Sierra and Otero)	Livestock grazing will be eliminated on a total of 8,026 acres, including Red Rock Game Farm (1,100 acres), the Central Peloncillo Mountains ACEC (4,446 acres in the Scholes allotment and Owl Canyon), the Bear Creek ACEC (1,480 acres), and portions of the Organ Mountains (1,000 acres). All areas except Bear Creek currently are excluded from livestock grazing.	Status uncertain.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 2001a, 1993a, 1986a

3.13.1 New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management

The management direction provided in the 2001 Record of Decision (ROD) for the Standards for Public Land Health and Guidelines for Livestock Grazing Management applies throughout the Planning Area. Guidelines are reasonable and practical management options which, when applied, move public land towards statewide standards. This document proposed a set of livestock grazing guidelines that are characterized by the promotion of public land health by providing the basic requirements of rangeland ecological sites. These guidelines are used to describe the most beneficial approach to adjusting grazing management when it is determined that livestock grazing is preventing the range from meeting the standards.

Currently (2005), three standards are defined for the health and condition of public land associated with livestock grazing. Standard 1 refers to upland vegetation, Standard 2 refers to the biotic communities and their ecological processes, and Standard 3 refers to riparian and wetland areas. They are described below in the following sections.

3.13.1.1 Standard 1

Upland Sites Standard- Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type, climate, and landform. The kind, amount, and/or pattern of vegetation provide protection on a given site to minimize erosion and assist in meeting State and tribal water quality standards.

3.13.1.2 Standard 2

Biotic Communities Standard (includes native, endangered, threatened, and special status species)- Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities. Desired plant-community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes within the capability of the site.

3.13.1.3 Standard 3

Riparian Sites Standard- Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide for groundwater recharge, provide habitat, and assist in meeting State and tribal water quality standards.

3.14 MINERALS

The policy of the BLM is to make mineral resources available in accordance with the objectives of the Mining and Minerals Policy Act of 1970 and the National Materials and Minerals Policy Research and Development Act of 1980. These acts require the Federal Government to facilitate the development of mineral resources to meet national, regional, and local needs for domestic and defensive purposes. The BLM also is responsible for ensuring that mineral development is carried out in a manner that minimizes environmental damage and provides for the rehabilitation of affected land. Most of the public land in the Planning Area is available for mineral entry, except where restricted by withdrawals for military, flood control, conservation, or other specific purposes. The current management direction for minerals in the Planning Area is listed below.

Table 3-12
Current Management for Minerals

Decision Source	Decision	Status
Planning Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	LM-1. Lands are withdrawn from execution of the public land laws by such means as Public Land orders, Secretarial orders, and Executive orders.	Needs to be re-evaluated
White Sands Resource Area RMP (Sierra and Otero Counties)	MM-1. Needs for mineral materials will be based on public requests.	Ongoing management.

Decision Source	Decision	Status
White Sands Resource Area RMP (Sierra and Otero Counties)	MM-2. Roads can be constructed by the permittees, applicants, or contractors upon approval from the BLM.	Ongoing management.
Otero County ACEC RMPA	Three Rivers Petroglyph Site: Under the 1969 Segregation Notice, the ACEC is partially segregated from the sale of minerals. Minerals development and exploration is closed on the additional 105 acres of public land (Federal minerals). In addition, these lands are withdrawn from operation under the General Mining Laws. There will be no recreational gold panning.	Ongoing management.
Otero County ACEC RMPA	Sacramento Escarpment: The entire ACEC is closed to sale of minerals and non-energy mineral leasing. The entire ACEC is withdrawn from operation under the general mining laws.	Ongoing management.
Record of Decision and RMPA for Fluid Mineral Leasing and Development in Sierra and Otero Counties	Lands Closed to (Fluid Mineral) Leasing: • An old Air Force bombing and gunnery range • Air Navigation Site • Jornada del Muerto, Brokeoff Mountains, Guadalupe Escarpment, and Sacrament Escarpment WSAs • Six ACECs • Eight nominated ACECs • Three pristine portions of the Nutt and Otero Mesa desert grassland habitat (35,790 acres)	Ongoing management.
Record of Decision and RMPA for Fluid Mineral Leasing and Development in Sierra and Otero Counties	Lands Open to (Fluid Mineral) Leasing with Stipulation of No Surface Occupancy: • Rattlesnake Hill Archaeological District, Lone Butte, and Jarilla Mountains • Recreation and Public Purposes Act leases and patents • Community Pit 7 • Riparian areas and other wetlands and playas (extends 0.25-mile from sensitive area) • Six ecological study plots • Tularosa River Recreation Area • Lake Valley Historic Town site • Lake Valley Back Country Byway (extends 0.5-mile from byway)	Ongoing management.
Record of Decision and RMPA for Fluid Mineral Leasing and Development in Sierra and Otero Counties	Lands Open to (Fluid Mineral) Leasing with Stipulation to Control Surface Use: • Berrendo Administrative Camp Site • Highly erosive and fragile soils • Designated historic trails (i.e., Morman Battalion, Butterfield, and Jornada del Muerto) • VRM Class II areas • Special status species habitats	Ongoing management.
Record of Decision and RMPA for Fluid Mineral Leasing and Development in Sierra and Otero Counties	The remainder of the Nutt and Otero Mesa desert grassland habitat areas (exclusive of the northern aplomado falcon core areas) will be open to leasing, but with a stipulation that requires new lessees to form exploratory unit(s) prior to commencing drilling activity and that limits industry's disturbance to no more than 5 percent of the exploratory unit at any one time. The purpose is to protect remnant Chihuahuan Desert grassland habitat and associated special status wildlife species through greater planning of the future oil and gas development. These would be further accomplished through a Plan of Development for the unit(s).	Ongoing management.

Decision Source	Decision	Status
Record of Decision and RMPA for Fluid Mineral Leasing and Development in Sierra and Otero Counties	Lands Open to (Fluid Mineral) Leasing with a Lease Notice: • White Sands Missile Range Safety Evacuation Zone • Cuchillo Mountains Piñon Nut Collection Area • Red Sands Off-Road Vehicle Area	Ongoing management.
Record of Decision and RMPA for Fluid Mineral Leasing and Development in Sierra and Otero Counties	Lands Open with Standard Lease Terms and Conditions that were Previously Closed to Leasing or had Stipulations Applied: • Caballo Mountain Communication Site • Public Water Reserves (excepts springs or dirt tanks) • Unoccupied habitat suitable for Desert Bighorn Sheep • VRM Class III and IV areas	Ongoing management.
Record of Decision and RMPA for Fluid Mineral Leasing and Development in Sierra and Otero Counties	All (other) lands not specifically mentioned above will generally be made available for leasing under standard lease terms and conditions. (Standard terms of an oil and gas lease provided for protection to other resources, and site-specific environmental analysis as provided by NEPA.)	Ongoing management.
Mimbres RMP (Doña Ana County)	Leasable Minerals – Approximately 266,950 acres are closed to fluid mineral leasing. This includes all ACECs, research natural areas (RNAs), and a National Natural Landmark (NNL), in addition to closed areas.	Ongoing management.
Mimbres RMP (Doña Ana County)	Leasable Minerals – The current stipulations for fluid mineral leasing will continue (274,000 acres).	Ongoing management.
Mimbres RMP (Doña Ana County)	Leasable Minerals – About 65,000 acres are open to leasing with no surface occupancy. The remainder of the Mimbres resource area is open to mineral leasing, subject to standard terms and conditions: oil and gas, 3,532,300 acres; and geothermal and nonenergy leasable, 3,449,500 acres.	Ongoing management.
Mimbres RMP (Doña Ana County)	Salable Minerals – All ACECs, RNAs and an NNL and the Butterfield and Continental Divide National Scenic Trails are closed to mineral material disposals (331,950 acres).	Ongoing management.
Mimbres RMP (Doña Ana County)	Salable Minerals – A competitive sale program will be established; the site(s) will be determined based on mineral surveys and would probably be within 10 miles of Las Cruces.	Ongoing management.
Mimbres RMP (Doña Ana County)	Salable Minerals – Processing miscellaneous negotiated mineral material sales and Free-Use Permits will continue.	Ongoing management.
Mimbres RMP (Doña Ana County)	Salable Minerals – Riparian areas will not be disturbed.	Ongoing management.
Mimbres RMP (Doña Ana County)	Salable Minerals – Activities on critical slopes over 20 percent require special mitigation.	Ongoing management.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 2005j, 1997b, 1986a

3.15 RENEWABLE ENERGY

Existing management direction does not address solar, wind and biomass renewable energy resources. The White Sands RMP 15th Year Evaluation recognizes the need for renewable energy resource management and recommends that consideration of the renewable energy issue be included in future planning.

3.16 RECREATION

Direction for managing recreational uses in the TriCounty Planning Area is currently established in the White Sands RMP (for Sierra and Otero Counties) and the Mimbres RMP (for Doña Ana County), as amended. Table 3-13 presents the existing management decisions for recreation use in the TriCounty Planning Area. Refer to Section 3.19 for decisions regarding OHV management.

Table 3-13
Current Management for Recreation

Decision Source	Decision	Status
Planning Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	R-1. The road to Caballo Peak will be opened to casual recreation users.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	R-2. The present stand of piñon pine in the Cuchillo Mountains will be maintained as a piñon nut collection area.	Ongoing management. However, prescribed burns have taken place within the area since 1986.
White Sands Resource Area RMP (Sierra and Otero Counties)	Approximately 960 acres of surface and 840 acres of subsurface at the Three Rivers Petroglyph Sites and Picnic Area will continue to be withdrawn under the Classification and Multiple Use Act to protect cultural and recreational values.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	The area around the Jarilla Mountains will continue to be available for organized OHV events.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Sacramento Escarpment ACEC • Manage the 3,640-acre ACEC according to the Sacramento Escarpment ACEC Management Plan, to enhance, protect, and prevent irreparable damage to the scenic and recreational values of the escarpment.	Ongoing management.
Mimbres RMP (Doña Ana County)	RE-01. Designate Doña Ana Mountains SRMA. (Only SRMAs within the Planning Area are listed.)	Completed with Record of Decision for Mimbres RMP.
Mimbres RMP (Doña Ana County)	Organ Franklin Mountains ACEC: • Manage in accordance with the Organ Mountains Coordinated Resource Management Plan. • Prohibit dogs and pets and require hiking on designated trails only in upper Ice Canyon above the drift fence. • Manage for Recreation Opportunity Spectrum (ROS) primitive, semiprimitive nonmotorized, semi-primitive, and roaded natural classes.	Ongoing management.
Mimbres RMP (Doña Ana County)	Doña Ana Mountains ACEC: • Manage for primitive and semiprimitive recreational opportunities. • Develop primitive campsites in the “bowl” on the north side (10 acres). • Manage for ROS semiprimitive nonmotorized, semi-primitive motorized, and roaded natural classes.	Ongoing management.
Mimbres RMP (Doña Ana County)	Los Tules ACEC: • Manage for ROS semiprimitive nonmotorized class.	Ongoing management.
Mimbres RMP (Doña Ana County)	Rincon Petroglyphs ACEC: • Manage for semi-primitive nonmotorized class. • Evaluate potential to interpret the petroglyphs.	Ongoing management.

Decision Source	Decision	Status
Mimbres RMP (Doña Ana County)	Robledo Mountains ACEC: • Manage for primitive and semi-primitive recreational opportunities (no developed facilities). • Manage for ROS primitive and semiprimitive nonmotorized and semi-primitive motorized classes.	Ongoing management.
Mimbres RMP (Doña Ana County)	San Diego Mountain ACEC: • Manage for ROS semiprimitive nonmotorized class. • Manage for research rather than interpretive value.	Ongoing management.
Mimbres RMP (Doña Ana County)	Butterfield Trail: • Manage for ROS semiprimitive motorized class. • Interpret, with emphasis on passive interpretation such as signing.	Ongoing management.
Mimbres RMP (Doña Ana County)	RE-02. Designate Aden Lava Flow (3,930 acres) as a Research Natural Area and continue designation of Kilbourne Hole as a national landmark to protect geologic, scenic, and research values.	Completed with Record of Decision for Mimbres RMP.
Mimbres RMP (Doña Ana County)	Aden Lava Flow RNA: • Manage for ROS primitive and semiprimitive nonmotorized classes. • Designate parking area and trail to crater. • Research and interpret paleontological and geological features.	Ongoing management.
Mimbres RMP (Doña Ana County)	Kilbourne Hole National Natural Landmark: • Manage for ROS semiprimitive motorized class. • Interpret geological feature by signing. • Establish safety “no shooting” restriction within the rim. • Establish primitive facilities (parking area, tables, toilets) (2 acres).	Ongoing management.
Mimbres RMP (Doña Ana County)	Paleozoic Trackways: • Manage for ROS semiprimitive nonmotorized class. • Interpret in accordance with study legislation.	Ongoing management.
Mimbres RMP (Doña Ana County)	The remainder of the Mimbres Resources Area will be managed primarily for dispersed recreation opportunities.	Ongoing management.
Mimbres RMP (Doña Ana County)	Designate the Continental Divide National Scenic Trail Corridor.	Completed with Record of Decision for Mimbres RMP.
Otero County ACEC RMPA	Three Rivers Petroglyph ACEC: • The ACEC will continue to be closed to hunting and the use of firearms. • Resource values in the ACEC will continue to be interpreted for public information and education. • The ROS classes within the ACEC are roaded natural and semi-primitive nonmotorized.	Ongoing management.
Otero County ACEC RMPA	Sacramento Escarpment ACEC: • Interpretation of resource values for public information and education will be considered on a case-by-case basis. • The ROS classes within the ACEC are rural, urban, and semi-primitve nonmotorized.	Ongoing management.
Otero County ACEC RMPA	Cornudas Mountain ACEC: • Recreational access to Butterfield Trail will continue to be by permit. • There will be no camping within the ACEC. • There will be minimal BLM interpretation to provide for public information and education of resources values. • The ROS classes within the ACEC are roaded natural and semi-primitive nonmotorized.	Ongoing management.

Decision Source	Decision	Status
Otero County ACEC RMPA	Alamo Mountain ACEC: • There will be no camping within the cultural resource area. • There will be minimal BLM interpretation to provide for public information and education within the ACEC. • The ROS classes within the ACEC are roaded natural, semiprimitive motorized and semi-primitive nonmotorized.	Ongoing management.
Otero County ACEC RMPA	Wind Mountain ACEC: • Interpretation of resources values for public information and education will be considered on a case-by-case basis. • The ROS classes within the ACEC are roaded natural and, semiprimitive nonmotorized.	Ongoing management.
Otero County ACEC RMPA	Alkali Lakes ACEC: • There will be no camping or fires within the ACEC. • Interpretation of resource values for public information and education will be considered on a case-by-case basis. • The ROS classes within the ACEC are rural, semiprimitive motorized, and semi-primitive nonmotorized.	Ongoing management.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 1997b, 1993a, 1986a

Most recreation use management is considered administrative and consists of recreational services and use-supervision actions such as installing signs, picking up litter, patrolling and enforcing recreation use regulations, and assisting with arrangements for large group campsites. BLM rules of conduct (43 CFR 8365) establish a fundamental framework for the management of all recreation uses on public land. The emphasis of these rules of conduct is on the protection of public lands and resources, and they are for the protection, comfort, and wellbeing of the public. Beyond this, recreation management in the Planning Area is influenced by public demand, policy for certain types of recreation uses (e.g., hunting, OHV use, nonmotorized trails), and consistency with the existing management decisions.

BLM's general recreation management policy is described in BLM Manual parts 8300 and 8320, and National Landscape Conservation System policy. General objectives of BLM's recreation management program are to (1) provide a broad spectrum of recreation resources, dependent on recreation opportunities, to meet the needs and demands of public land visitors; (2) foster agency-wide efforts to improve service to the visiting public; (3) maintain high-quality recreation facilities to meet public needs and enhance the image of the agency; and (4) improve public understanding and support of BLM by effectively communicating the Agency's multiple-use-management programs to the recreation visitor.

BLM plans for outdoor recreation in response to issues and concerns identified in the resource management planning process. BLM also identifies and evaluates public recreation needs and available recreation resources on public lands to determine the appropriate allocation of resources for recreation and the extent of required services and management.

special recreation management areas (SRMAs) with distinct primary recreation-tourism markets may be designated in RMPs where congressionally recognized recreation values exist, or where significant public recreation issues or management concerns occur. Special or more intensive types of management actions are typically needed in SRMAs, including special use restrictions or permitting requirements. A recreation area management plan is developed for all SRMAs. This plan implements the decisions of the

RMP and describes the management direction for the area and addresses all recreation uses and potential recreation uses within the management area, including the level of development and the construction of major facilities to accommodate recreation users.

Extensive recreation management areas are areas of public land that are not delineated as SRMAs. In these areas, dispersed recreation is encouraged and visitors have freedom of recreational choice with minimal regulatory constraints. Public recreation issues or management concerns are limited and minimal management suffices, consistent with BLM's basic stewardship responsibility for resource protection and in issuing special recreation permits. Management in all Extensive recreation management areas is restricted to custodial actions only, and extensive recreation management areas are directly implemented from land use plan decisions, with no need for activity-level planning. Most of the land within the TriCounty Planning Area is managed as an extensive recreation management areas .

One of the tools used to describe recreation resource conditions and management objectives is the Recreation Opportunity Spectrum (ROS) framework. According to BLM Manual 8320, ROS is defined as a continuum used to characterize recreation opportunities in terms of setting, activity, and experience opportunities. ROS is a conceptual planning tool that applies a set of criteria to a land area's physical, social, and managerial settings to describe the existing conditions, which in combination define a land area's capability and suitability for providing a particular range of recreational experience opportunities. Per BLM Manual 8320, the ROS is subdivided into six classes that cover the full spectrum of experience opportunities: primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban. BLM currently does not have a ROS framework in place for the Planning Area to assist in recreation management.

The 2005 Land Use Planning Handbook (H-1601-1) developed a tool to identify and delineate areas offering discrete recreation opportunities within SRMAs; these areas are called recreation management zones. While SRMAs are defined to identify the primary recreation market, recreation management zones specify land use allocation objectives and prescribe specific recreation activities. Each recreation management zone has four defining characteristics: (1) it serves a different recreation niche within the primary recreation market, (2) it produces a different set of recreation opportunities and facilitates the attainment of different experience and benefit outcomes (to individuals, households, communities, economies, and the environment), (3) it has a distinctive recreation-setting character, and (4) it requires a different set of recreation-provider actions to meet strategically targeted primary-recreation-market demands. This management tool has not been implemented for the Planning Area because of its recent adoption in the 2005 Land Use Planning Handbook. However, recreation management zones will be a part of the ongoing planning process.

3.17 LANDS AND REALTY

Table 3-14 presents the land and realty decisions from previous BLM planning documents that are relevant to the TriCounty Planning Area. The following sections describe BLM's management of land tenure and realty actions within the TriCounty Planning Area.

Table 3-14
Current Management Direction for Lands and Realty

Decision Source	Decision	Status
Planning Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	LA-1. Review and take appropriate action on the following public water reserves: • T. 26 S., R. 10 E., Section 24 – Dirt Tank, Section 4, Permit No. 1238 • T. 24 S., R. 15 E., Section 5 – Well, Section 4, Permit No. 1721 • T. 26 S., R. 11 E., Section 26 – Dirt Tank, Section 4, Permit No. 2097 • T. 18 S., R. 1 W., Section 24 – Dirt Tank • T. 15 S., R. 1 W., Section 34.	Those public water reserves have been removed from the master title plats. Therefore, these are no longer public water reserves. Completed.
White Sands Resource Area RMP (Sierra and Otero Counties)	LA-2. Initiate action to remove the restriction prohibiting subsurface use of lands used as impact areas on the old U.S. Air Force bombing and gunnery range not opened by PLO 2569.	Not completed; military says such action would be cost prohibitive. Therefore, BLM has and will maintain this restricted management.
White Sands Resource Area RMP (Sierra and Otero Counties)	LA-3. Consider land tenure adjustments of lands (184,000 acres) (23,000 to be acquired and 161,000 to be disposed)	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Consider land tenure adjustments of lands for • Isolated and difficult to manage parcels • Lands needed for community expansion and public purposes • Lands where interest has been shown including lands identified by the State of New Mexico for possible exchange • Potential exchange lands • Potential acquisition lands (23,000 acres)	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Public land not identified for disposal will be retained in Federal ownership, except that within retention areas, only those parcels that will enhance overall consolidation of public land will be considered for exchange.	Ongoing management.
Mimbres RMP (Doña Ana County)	BLM will no longer address communication sites in the San Augustine Pass area so long as White Sands Missile Range (WSMR) is willing to consider communication site applications for that area. Should WSMR cease considering applications from private parties, the BLM will resume management of the area in accordance with provisions of the Mimbres RMP.	Ongoing management.
Mimbres RMP (Doña Ana County)	Certain parcels of land were set aside (reserved) by Memorandums of Understanding with the City of Las Cruces and the Las Cruces School District No. 2 for disposal and future development under the R&PP Act.	Ongoing management; set-asides were included within disposal areas.
Mimbres RMP (Doña Ana County)	Certain parcels were set aside within the 10,000-acre State Land Exchange Area for existing and potential R&PP lease and/or patent.	Ongoing management; set-asides were included within disposal areas.
Mimbres RMP (Doña Ana County)	Seven sections of land adjacent to the proposed Organ Mountains National Conservation Area were identified for disposal in the Southern Rio Grande Management Framework Plan will not be disposed: T. 22 S., R. 3 E Sections 16, 21, 28 and 33 T. 23 S., R. 3 E. Section 33 T. 25 S., R. 3 E. Section 35 T. 26 S., R. 5 E. Section 31	Completed with Mimbres RMP; these are now included in the retention area.

Decision Source	Decision	Status
Mimbres RMP (Doña Ana County)	Land to be retained: The specific land disposal area described as T. 20 S., R. 3 E. Sections 28 S½, 33, 34 T. 21 S., R. 3 E. Sections 3, 4, 7 SE¼, 8, 9, 10, 14, N½, 15 N ½, 17, 18	Completed with Mimbres RMP; these are now included in the retention area.
Mimbres RMP (Doña Ana County)	A right-of-way (NMNM66383) was granted to the National Aeronautics and Space Administration (NASA) and a subsequent Memorandum of understanding (NM-030-45) was signed in April 1990 reserving public land for groundwater monitoring wells. Based on groundwater studies, these lands may need to be withdrawn to protect public safety.	Ongoing management; however, 2,700 acres of the withdrawal are considered to be in excess of NASA's needs.
Mimbres RMP (Doña Ana County)	To facilitate orderly disposal on East Mesa, two disposal zones are delineated: • First priority is public land west of a north-south line, 1 mile east of the boundary between R. 2 E., and R. 3 E. • Second priority is public land east of the line described above	Ongoing management.
Mimbres RMP (Doña Ana County)	LA-02. A total of 2,896,080 acres of public land not identified for disposal will be managed in accordance with provisions of Section 102(a) of the Federal Land and Policy Management Act.	Ongoing management, though only a portion of this disposal area (those within Doña Ana County) are within the Planning Area.
Mimbres RMP (Doña Ana County)	No public land contiguous to U.S. Forest Service land will be disposed of regardless of parcel size. Coordination will take place with the U.S. Forest Service for reservation of easements on parcels adjacent to but not contiguous with U.S. Forest Service lands as they are disposed.	Ongoing management.
Mimbres RMP (Doña Ana County)	No public land within areas of critical environmental concern (ACECs) and other special management areas (SMAs) will be disposed.	Ongoing management.
Mimbres RMP (Doña Ana County)	Public land may be disposed of through exchange in order to consolidate other public land outside of disposal areas. Only lands within disposal areas will be exchanged for lands outside the Mimbres Resource Area.	Ongoing management.
Mimbres RMP (Doña Ana County)	LA-03. A total of 93,110 acres of State Trust Land and 56,210 acres of private land are identified for potential acquisition. All State Trust Land and private land will be acquired within ACECs and other SMAs through exchange or purchase at fair market value, provided the landowner is in agreement with such acquisition.	Acquisition of State or private lands has only occurred within the Organ Mountains ACEC, for a parcel of land located in Soledad Canyon.
Mimbres RMP (Doña Ana County)	Picacho Peak is identified for potential acquisition and will be managed with temporary special management (if acquired) until an RMP can be amended. Temporary special management includes: • Exclude right-of-way authorizations • Manage as visual resource management (VRM) Class II • Limit vehicles to designated roads and trails • Close to mineral material sales	Picacho Peak has been acquired and is managed under temporary special management.
Mimbres RMP (Doña Ana County)	The Doña Ana Recreation Area, Massacre Peak, Fort Cummings, and Granite Gap Recreation Area classifications will be terminated upon publication of a Federal Register notice following the completion of the (Mimbres RMP) Plan.	Completed.

Decision Source	Decision	Status
Mimbres RMP (Doña Ana County)	[Classifications for] Guadalupe Canyon, Organ Mountains Recreation Area, Baylor Recreation Area, and Needle's Eye Picnic Site will remain in effect until replaced by a protective withdrawal.	Withdrawal has not occurred; classifications still in effect.
Mimbres RMP (Doña Ana County)	No applications will be accepted for disposal under the Desert Land Act.	Ongoing management.
Mimbres RMP (Doña Ana County)	Right-of-way exclusion areas are established for 264,870 acres, and avoidance areas are established for 783,400 acres.	Completed with Mimbres RMP and management of avoidance and exclusion areas is ongoing.
Mimbres RMP (Doña Ana County)	Right-of-way exclusion areas include: • ACECs • Research Natural Areas • National Natural Landmarks	Ongoing management.
Mimbres RMP (Doña Ana County)	Right-of-way avoidance areas include: • Continental Divide National Scenic Trail • Butterfield Trail • Bighorn sheep areas • VRM Class II areas	Ongoing management.
Mimbres RMP (Doña Ana County)	The remainder of the resource area is open to the location of rights-of-way, subject to standard stipulations (1,970,180 acres)	Ongoing management.
Mimbres RMP (Doña Ana County)	The BLM will encourage new facilities to be located near existing sites or in existing corridors.	Ongoing management.
Mimbres RMP (Doña Ana County)	New linear rights-of-way that terminate on private inholdings within an exclusion area may be authorized within an exclusion area if no other reasonable alternative exists. Special stipulations for avoidance areas will also apply to these authorizations.	Ongoing management.
Mimbres RMP (Doña Ana County)	Existing rights-of-way within exclusion areas are recognized as grandfathered and operation, maintenance, and renewal of these facilities would be allowed to continue within the scope of the right-of-way grant.	Ongoing management.
Mimbres RMP (Doña Ana County)	The following stipulations apply to new facilities within avoidance areas: • Facilities will not be located parallel to the Continental Divide National Scenic Trail or Butterfield Trail. • Facilities will not be located within a quarter-mile of any stage station on the Butterfield Trail. • Facilities will not be located in riparian areas. • Access routes will be limited and considered on a case-by-case basis.	Ongoing management.
Mimbres RMP (Doña Ana County)	RW-03. A site management plan will be prepared (with NASA and New Mexico State University input) for "A" Mountain.	Completed.
Mimbres RMP (Doña Ana County)	Management will continue to authorize routine commercial realty actions under the authority of 43 CFR 2920 throughout the 20-year life of the RMP.	BLM policy; ongoing management.
Mimbres RMP (Doña Ana County)	The acquisition of nonpublic lands in SMAs or lands containing unique or unusual historic, cultural, mineral, recreational, scientific, scenic, or wildlife habitat values will be pursued as a first priority.	Ongoing management.
Mimbres RMP (Doña Ana County)	No sanitary landfill sites will be patented in the Mimbres Resources Area pursuant to the R&PP Act until regulations implementing the 1988 amendment to the R&PP Act are completed.	Completed; regulations in effect.
Mimbres RMP (Doña Ana County)	Organ Franklin Mountains ACEC lands and realty management prescriptions -	Ongoing management. The site-specific

Decision Source	Decision	Status
	• Retain all public land; acquire all state trust and private land inholdings through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Exclude authorizations for new rights-of-way in accordance with other lands decisions, except within existing utility corridors. The east-west corridor near Vado and the ones running north and south will be confined to a width of ¼ mile. The corridor in the Anthony Gap area will be confined to a width of ½ mile.	location of the ½-mile Anthony Gap corridor does not have identified boundaries.
Mimbres RMP (Doña Ana County)	Doña Ana Mountains ACEC lands and realty management prescriptions - • Retain all public land. • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	Ongoing management.
Mimbres RMP (Doña Ana County)	Los Tules ACEC lands and realty management prescriptions - • Retain all public land; acquire adjacent private land inholdings through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	Ongoing management.
Mimbres RMP (Doña Ana County)	Rincon Petroglyphs ACEC lands and realty management prescriptions - • Retain all public land; acquire all State Trust land in south half of section 32 through exchange or purchase at fair market value, provided the landowner is in agreement with such acquisition. • Exclude new right-of-way authorizations outside existing sites in accordance with other lands decisions.	Ongoing management.
Mimbres RMP (Doña Ana County)	Robledo Mountains ACEC lands and realty management prescriptions - • Retain all public land; acquire all state trust inholdings through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	Ongoing management.
Mimbres RMP (Doña Ana County)	San Diego Mountain ACEC lands and realty management prescriptions - • Retain all public land; acquire adjacent private land inholdings through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	Ongoing management.
Mimbres RMP (Doña Ana County)	Butterfield Trail lands and realty management prescriptions - • Retain all public land; acquire all State Trust and private land inholdings (with emphasis on Stage Stations) through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Restrict authorizations for rights-of-way.	Ongoing management.
Mimbres RMP (Doña Ana County)	Aden Lava Flow RNA lands and realty management prescriptions - • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	Ongoing management.
Mimbres RMP (Doña Ana County)	Kilbourne Hole NNL lands and realty management prescriptions - • Retain all public land; acquire all State Trust and private land inholdings through exchange or purchase at fair market value,	Ongoing management.

Decision Source	Decision	Status
	provided that the landowner is in agreement with such acquisition. • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	
Mimbres RMP (Doña Ana County)	Paleozoic Trackways RNA lands and realty management prescriptions - • Retain all public land. • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	Ongoing management.
Otero County ACEC RMPA	Three Rivers Petroglyph Site ACEC lands and realty management prescriptions - The BLM will continue to seek acquisition of State Trust land in T. 11 S., R 9½ E. Section 16 (as identified in the White Sands RMP), through a cooperative land exchange (Three Rivers Petroglyph ACEC). Private mineral estate will be acquired by BLM for 120 acres of reconveyed land from a willing seller or through a land exchange. Public land within the proposed ACEC will remain under BLM administration. No new realty actions or rights-of-way will be considered within the lands segregated under the 1969 Segregation Notice, except those needed for the maintenance and operation of the Three Rivers Petroglyph ACEC. On reconveyed land not subject to the 1969 Segregation Notice, new realty actions and rights-of-way could be considered with the addition of stipulations to protect resource values for which the ACEC is designated. In most cases the stipulations will require public land actions to be routed around the ACEC. Acquisition of access easements by the BLM will be considered on a case-by-case basis. State Trust and private lands identified for potential acquisition might have ACEC potential, so, if acquired those lands would be managed under temporary special management until a decision is made in an RMP amendment or revision. The temporary special management would include (1) incorporating protective stipulations into realty actions, (2) closing to mineral leasing, geophysical exploration, and mineral material sales, (3) managing under VRM Class III guidelines and (4) limiting vehicle use to designated roads and trails.	Ongoing management. No acquisitions have occurred.
Otero County ACEC RMPA	Sacramento Escarpment ACEC (with 1,725 additional acres added to the existing 3,640-acre ACEC) lands and realty management prescriptions - The added public land will be retained in BLM administration and will not be subject to exchange or sale. 320 acres immediately NW of the Sacramento Escarpment ACEC will be retained under BLM administration. There will be no new realty actions or rights-of-way in the existing Sacramento Escarpment ACEC. New realty actions will be subject to protective stipulations in the expansion area. rights-of-way will be excluded from the expansion area. Access easements for the Sacramento Escarpment ACEC may be acquired as needed for Arrow, Muleshoe, and San Andreas Canyons. Two private 40-acre parcels located adjacent to the ACEC may be acquired from willing sellers. The private land identified for potential acquisition might have ACEC potential so if acquired, those lands would be managed under temporary special management until a decision is made in an RMP amendment or revision. The temporary special management would include (1) incorporating protective stipulations into realty actions, (2) closing to mineral leasing, geophysical exploration, and mineral material sales, (3) managing under VRM Class III guidelines and (4) limiting vehicle use to designated roads and trails.	Ongoing management. No acquisitions have occurred.

Decision Source	Decision	Status
Otero County ACEC RMPA	Cornudas Mountain ACEC lands and realty management prescriptions – All public land within the Cornudas Mountain ACEC will remain under BLM administration. The area will be subject to new realty actions with stipulations to protect resources values. rights-of-way will be excluded from the ACEC. Acquisition of access easements by the BLM will be considered on a case-by-case basis. There will be no acquisition of surface or mineral estate by the BLM.	Ongoing management. No acquisitions have occurred.
Otero County ACEC RMPA	Alamo Mountain ACEC lands and realty management prescriptions - All public land within the ACEC will remain under BLM administration. The ACEC will be subject to new realty actions with stipulations to protect resource values. rights-of-way will be excluded from the ACEC. There will be no acquisition of access easements or surface or mineral estate by BLM.	Ongoing management.
Otero County ACEC RMPA	Wind Mountain ACEC lands and realty management prescriptions - All public land within the ACEC will remain under BLM administration. The area will be subject to new realty actions with stipulations to protect resource values. rights-of-way will be excluded from the ACEC. There will be no acquisition of access easements or surface or mineral estate by the BLM.	Ongoing management.
Otero County ACEC RMPA	Alkali Lakes ACEC lands and realty management prescriptions - A total of 543 acres of State Trust Land (surface and mineral estate) will be acquired by the BLM through a cooperative land exchange with the New Mexico State Land Office. Public land within the ACEC will remain under BLM administration. The area will be subject to new realty actions with stipulations to protect resource values. rights-of-way will be excluded from the ACEC (excluded means no rights-of-way will be granted unless mandated by law). Acquisition of access easements by the BLM will be considered on a case-by-case basis. The State Trust Land identified for potential acquisition might have ACEC potential, so, if acquired those lands would be managed under temporary special management until a decision is made in an RMP amendment or revision. The temporary special management would include (1) incorporating protective stipulations into realty actions, (2) closing to mineral leasing, geophysical exploration, and mineral material sales, (3) managing under VRM Class III guidelines and (4) limiting vehicle use to designated roads and trails.	Ongoing management. No acquisitions have occurred.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 1997b, 1993a, 1986a

3.17.1 Land Tenure

3.17.1.1 Sierra and Otero Counties

Though goals and objectives are not explicitly mentioned, the White Sands RMP provides general guidance to consolidate public land holdings in a blocked pattern based on multiple resource management and administrative considerations. Considerations include disposal of isolated parcels of land that are difficult and uneconomical to manage, or areas where disposal serves important objectives such as community expansion for economic development, which could not be achieved prudently on land other than public land.

General guidelines for land tenure adjustments outlined in the White Sands RMP are as follows:

- Public lands will be considered for disposal when (a) it has been determined the lands are no longer required for a Federal project or a resource management activity, (b) the disposal of the lands will serve important public objectives, or (c) the lands are isolated and difficult to manage under present BLM standards.

- Disposal of public land may be accomplished by sale, exchange, or Recreation and Public Purpose (R&PP) patent pursuant to applicable Federal authority such as Section 203 of the Federal Land Policy and Management Act of 1976 (Public Law 94-579) or the R&PP Act (43 United States Code 869 et. seq.).

- Items examined while considering the merits of any disposal or acquisition action include consistency and conformance, threatened or endangered plant/animal species and their habitat, wilderness values, prime and unique farmlands, floodplain/flood hazard evaluation, cultural and paleontological resource values, visual resources, areas of critical environmental concern, wetlands, existing rights and uses, controversy, health and safety, mineral resources, adjacent uses, and ownership.

- Additional conservation is given to whether the exchange is in the public interest, and, whether the lands offered are of comparable value to the public land selected.

Though the White Sands RMP identifies general areas for disposal and acquisition, the boundaries of those areas are flexible and may be adjusted in order to allow the BLM to efficiently carry out its management of public land, as long as the adjustments are consistent with the Memorandum of Understanding dated October 3, 1984, between the New Mexico State Land Office and BLM.

3.17.1.2 Doña Ana County

The Mimbres RMP sets the framework for BLM to make public land and its resources available for use and development to meet national, regional, and local needs, consistent with national objectives by making land ownership adjustments and land use authorizations. Consistent with this goal, the Mimbres RMP states that the objective of the lands program is to facilitate the acquisition, exchange, or disposal of public land in order to provide the most efficient management of public resources. Typical actions and authorizations required for management of BLM lands within the planning area are leases, permits, exchanges, easements, withdrawals, rights-of-way, and R&PP leases and patents.

Specific items to be examined while considering the merits of any disposal or acquisition action include: consistency and conformance with current planning; relative values; public interest; willingness to sell or exchange land on part of the landowner; prime and unique farmlands; floodplain/flood hazard evaluation, cultural and paleontological resource values, Native American religious values, visual resources, areas of critical environmental concern, wetlands and riparian areas, existing rights and uses, controversy, health and safety, adjacent uses and ownership, air resources, special status species plants or animals and their habitat, mineral resources, recreation and wilderness values.

The emphasis of the land exchange program stated in the Mimbres RMP is to acquire private and State Trust Lands in areas that have high resources values or unique characteristics that would enhance the management of public land, and dispose of public land that is valuable for urban expansion or other physical characteristics. Exchange is the preferred method of acquisition by the BLM, and every effort is made to avoid creating split-estate when exchanging land.

BLM has a specific agreement established with Doña Ana County regarding the disposition of public lands adjacent to the south Doña Ana County airport. Based on the agreement, BLM will consult with Doña Ana County prior to any disposition or use authorization on public lands in Sections 1, 3, 10, and 11 of T. 28 S., R. 2 E.

3.17.1.3 Withdrawals

BLM utilizes withdrawals for the purpose of withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of Federal land. Under Section 204 of the Federal Land Policy and Management Act (FLPMA), BLM has been given the responsibility of reviewing all land classifications and withdrawals on the BLM lands. The review ensures that the reasons for the withdrawal are still valid and that the smallest acreage possible is retained in withdrawal status (USDI, BLM 1986a). Withdrawals can be continued, modified, or revoked or terminated, consistent with the needs, as justified by the withdrawing agency. As withdrawals are revoked or terminated, the land use decisions in the RMP will apply to those areas. For withdrawals where BLM presently has management responsibility, all RMP decisions covering those areas apply (USDI, BLM 1993a). This management guidance applies in Sierra, Otero, and Doña Ana Counties.

3.17.1.4 Utility Corridors, Exclusion Areas, and Avoidance Areas

Currently, BLM grants use authorizations to qualified businesses, individuals, and governmental entities for the use of public land as well as to protect natural and cultural resources associated with public lands and adjacent lands. As a policy, new rights-of-way are issued within existing rights-of-way whenever possible to promote joint use. All right-of-way actions are coordinated to the fullest extent possible with Federal, State and local government agencies, adjacent landowners, and interested individuals and groups. In addition, all right-of-way applications are analyzed site-specifically on a case-by-case basis (BLM 1993a, 1986a).

Many of the linear facilities authorized under various right-of-way grants have led to the establishment of de facto right-of-way corridors. The corridor philosophy within BLM is to manage current and future uses of rights-of-way on public land through a system of designated corridors. However, the presence of designated right-of-way corridors does not preclude the granting of a right-of-way on public land outside a designated corridor (Mayes 2005).

The establishment of right-of-way exclusion and avoidance areas is intended to notify all public land users of the restrictions and limitations that exist in those areas. This management approach was established to protect special and sensitive resource values and limit or restrict development (USDI, BLM 1993a).

3.17.1.5 Communication Sites

The Mimbres RMP provides general direction for the collection of any new right-of-way to be located near existing sites or in existing corridors. As a result, many of the current right-of-way holders in these areas are authorized to sublease to other users.

3.18 TRANSPORTATION AND ACCESS

Direction for managing transportation and access in the TriCounty Planning Area is established primarily by the 1986 White Sands and 1993 Mimbres RMPs, as amended.

The general objectives of BLM's transportation management program are to provide adequate access for administrative purposes and to accommodate public use in support of BLM's multiple use programs. Various BLM manuals provide guidance regarding transportation management for public land, including BLM Manual 9113 (on roads), BLM Manual 9114 (on trails), and BLM Manual H-1601-1 (Appendix C, Section II on travel management). BLM transportation and travel management plans identify the following for each BLM-managed road or trail: management objectives for that road or trail, types of use allowed, functional class, road or trail standard, and maintenance level. In accordance with BLM Manual H-1601-1, Land Use Planning Handbook, travel in WSAs is limited to "ways" and trails existing at the time the area became a WSA, unless further restricted.

In accordance with 43 CFR 8340, all public land must be designated as "open," "limited," or "closed" to motorized vehicle use, and although cross-country OHV use is permitted in areas designated as "open," undue and unnecessary degradation of resources is not permitted on any area of public land. BLM's OHV area designations are defined as follows:

- Open – BLM designates areas as "open" for intensive OHV use where there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel.

- Limited – The "limited" designation is used where vehicular use must be restricted to meet specific resource management objectives. Limitations may include placing restrictions on the number or type of vehicles, limiting the time or season of use, allowing only permitted or licensed use, limiting the use to existing roads and trails, and limiting use to designated roads and trails. BLM may place other limitations, as necessary, to protect resources, particularly in areas used intensively by motorized-OHV enthusiasts, or where competitive events take place.

- Closed – BLM designates "closed" areas as necessary to protect resources, ensure visitor safety, or reduce user conflicts.

BLM guidance does not allow the operation of an OHV without full-time use of an approved spark arrester and muffler. The vehicle also must display the required State OHV registration. An OHV user is prohibited from operating, parking, or leaving a motorized vehicle in violation of posted restrictions, or in a manner or location that would result in any of the following (USDI, BLM 1995b):

- Creation of a safety hazard
- Interference with other authorized users or uses
- Obstruction or impediment of normal or emergency traffic movement
- Interference with or impediment of administrative activities
- Interfere with the parking of other vehicles
- Endangerment of property or any person

Acquisition of easements is often necessary to allow access to public lands, and acquisition needs are identified as part of BLM's travel management planning. It is BLM's policy that roads or trails should be constructed only where there is no access through existing roads and trails, or when off-road travel is not possible for any reason, such as (a) terrain, and (b) protection of a particular resource, etc. (USDI, BLM 1986a). The BLM developed no transportation plans for any of the BLM-managed land within the TriCounty Planning Area. Routes within the ACECs and WSAs will receive designations as part of the RMPs/EIS process that is currently underway.

A list of management decisions related to transportation and access is provided in Table 3-15.

Table 3-15
Current Management for Transportation / Access

Decision Source	Decision	Status
Planning Decisions		
White Sands Resource Area RMP (Sierra and Otero Counties)	A-1. Legal access will be provided to most of those public lands that currently have none, and roads will be provided across most of those public lands that currently have none.	Ongoing management; no specific actions have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	Acquire easements on 36 miles of existing non-Federal and nonpublic (i.e. private) roads (of which 16 miles will be improved to include grading and drainage).	Ongoing management; no specific actions have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	238 miles of new roads will be constructed (of which 70 miles will be built to primary road standards, and 168 miles will be built to secondary-road standards).	Ongoing management; no specific actions have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	R-4. For public land not designated as limited or closed, designate "open" to OHV use.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	R-4. The following areas will be "closed" to OHV use: • Study plot exclosures • Rattlesnake Hill Archaeological District • Jarilla Mountains	Ongoing management; no specific actions (e.g., signage) have been implemented.

Decision Source	Decision	Status
White Sands Resource Area RMP (Sierra and Otero Counties)	W-1. OHV use in the Wind and Chess Draw watershed area is limited to existing roads and trails.	Ongoing management; no specific actions (e.g., signage) have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	W-2. OHV use in the Moccasin and Otto Draw watershed area is limited to existing roads and trails.	Ongoing management; no specific actions (e.g., signage) have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	W-3. OHV use in the watershed area east of Tularosa and south of Tularosa River is limited to existing roads and trails.	Ongoing management; no specific actions (e.g., signage) have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	W-4. OHV use in the watershed area east of Crow Flats is limited to existing roads and trails.	Ongoing management; no specific actions (e.g., signage) have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-2. OHV use in the Percha Creek riparian area is limited to existing roads and trails.	Ongoing management; no specific actions (e.g., signage) have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	C-4. OHV use in the Lone Butte Area is limited to existing roads and trails.	Ongoing management; no specific actions (e.g., signage) have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	VR-2. OHV use in the Brokeoff Mountains is limited to existing roads and trails.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	VR-03. OHV use in the Cornudas Mountains is limited to existing roads and trails.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	VR-04. OHV use in the Cuchillo Mountains is limited to existing roads and trails.	Ongoing management; no specific actions (e.g., signage) have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	V-1. Vegetation study plot enclosures are closed to OHV use.	Ongoing management; no specific actions (e.g., signage) have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	OGG-5 and C-2. Rattlesnake Hill Archaeological District is closed to OHV use.	Ongoing management; no specific actions (e.g., signage) have been implemented.
White Sands Resource Area RMP (Sierra and Otero Counties)	C-5. Jarilla Mountains is closed to OHV use.	Ongoing management; no specific actions (e.g., signage) have been implemented. Area increased August 3, 1989, *Federal Register*
White Sands Resource Area RMP (Sierra and Otero Counties)	MM-2. Roads can be constructed by the mineral materials permittees, applicants, or contractors upon approval from the BLM. The BLM will be responsible for access if it is to a common use area or a community pit.	Ongoing management.

Decision Source	Decision	Status
White Sands Resource Area RMP (Sierra and Otero Counties)	Transportation plans will be developed on a county-by-county basis in the next few years.	Transportation plans have not been developed.
Mimbres RMP (Doña Ana County)	Community Pit No. 1 - Acquire legal access to public land from Shalem Colony Road (approximately 0.5 mile).	Legal access has not been acquired.
Mimbres RMP (Doña Ana County)	Organ Mountains - Acquire legal public access for vehicular use south of Soledad Canyon through private properties.	Legal access has not been acquired.
Mimbres RMP (Doña Ana County)	Restrict public access to the rock shelters at Apache Box, Apache Cave, and elsewhere as needed.	Full closure not implemented. A seasonal closure occurred from March to May for the nesting of Peregrine Falcons. The falcons remain on the State list and seasonal closure may continue. (Only areas within the Planning Area are listed.)
Mimbres RMP (Doña Ana County)	Robledo Mountains - Acquire legal public access across private land for vehicular use on the north end (via Fred Huff Road or Faulkner Canyon).	Legal access has not been acquired.
Mimbres RMP (Doña Ana County)	West Potrillo Mountains - Acquire legal public access to the north and west sides.	Legal access has not been acquired.
Mimbres RMP (Doña Ana County)	CU-09. Close road to Bruton Bead Site.	Not implemented due to lack of staff and funding.
Mimbres RMP (Doña Ana County)	The area open to OHV use is the Aden Hills Open Area (8,700 acres).	Ongoing management. (Only areas within the Planning Area are listed)
Mimbres RMP (Doña Ana County)	The areas limited to designated roads and trails for vehicle use are all SMAs not designated closed and the Broad Canyon competitive motorcycle area.	Ongoing management.
Mimbres RMP (Doña Ana County)	The areas closed to vehicle use are the Mexican border area south of Anapra–Columbus Road and south of State Route 9 in Doña Ana and Luna Counties (89,180 acres), and portions of the Organ/Franklin Mountains.	Not implemented due to hunter concerns regarding access.
Mimbres RMP (Doña Ana County)	In all other areas, OHV use is limited to existing roads and trails. Existing roads and trails are defined as those in existence at the time of designation.	Ongoing management; inventory being conducted.
Mimbres RMP (Doña Ana County)	Any road or trail created by the passage of vehicles after December 1993 will not be considered open and will be subject to closure.	Ongoing management; inventory being conducted.
Otero County ACEC RMPA	Three Rivers Petroglyph ACEC: • Vehicle use is limited to designated roads and trails. • Foot trails and signage will continue to be used and developed to guide and regulate public use. • The three rivers site is within two OHV designations. The established site is designated “limited” to designated roads and trails, and the rest of the proposed site is designated as “open”.	Ongoing management. The Three Rivers Petroglyph Site OHV designation in the 1997 Otero County ACEC RMP amendment amended the White Sands RMP from “limited to existing roads and trails” to “limited to designated roads and trails”. Signs were installed to indicate roads and trails.

Decision Source	Decision	Status
Otero County ACEC RMPA	Sacramento Escarpment ACEC: • Provide full recreational access to public lands, subject to the legal routes of access. • OHV use is limited to designated roads and trails.	Ongoing management. Sacramento Escarpment ACEC OHV designation amended the White Sands RMP from "limited to existing roads and trails" to "limited to designated roads and trails". Signs were installed to indicate roads and trails.
Otero County ACEC RMPA	Cornudas Mountain ACEC: • Recreational access to Butterfield Trail will continue to be by permit. • Access to the stage station also requires permission from the private land owner as private land must be crossed to access the station.	Ongoing management.
Otero County ACEC RMPA	Alamo Mountain ACEC: • Vehicle use is limited to designated roads and trails. • A parking turn around will be developed along the road on the west side of the ACEC. • The road to the stage stop will be closed to public use.	Ongoing management. Alamo Mountain ACEC OHV designation amended the White Sands RMP from "closed" to "limited to designated" roads and trails. Parking area developed in 1998.
Otero County ACEC RMPA	Wind Mountain ACEC: • Vehicle use is restricted to designated roads and trails. • Full recreational access is provided to public lands, subject to the legal routes of access.	Ongoing management.
Implementation Decision		
White Sands Resource Area RMP (Sierra and Otero Counties)	If new road construction crosses State or private lands, easements would need to be acquired in those areas.	Ongoing management; no easements have been acquired.
White Sands Resource Area RMP (Sierra and Otero Counties)	Road maintenance and easement acquisition will continue to be conducted in support of resource management objectives, subject to available funds.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Roads or trails will be constructed only where existing roads or trails cannot be used or where off-road travel is not possible because of topography or terrain.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Construction, maintenance, and easement acquisition requirements and priorities will be determined on a yearly basis, as part of the annual work-planning process.	New roads and trails have been created in conformance with this decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	Specific road construction and maintenance standards will be determined on a case-by-case basis, dependent on resources management needs, user safety, potential impacts to environmental values, and construction and maintenance costs.	Ongoing management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Support for access actions will include cadastral survey and appraisals.	Ongoing management.
Mimbres RMP (Doña Ana County)	Access will be developed by building new roads, adjusting land ownership, or acquiring easements.	Ongoing management.
Mimbres RMP (Doña Ana County)	Work with adjacent landowners and permittees to develop access.	Ongoing management.

Decision Source	Decision	Status
Mimbres RMP (Doña Ana County)	Prior to the development of access into any of the identified areas, a signage and patrol plan will be developed to address potential problems related to trespass onto private land, littering, and vandalism.	Ongoing management.
Otero County ACEC RMPA	Sacramento Escarpment ACEC: • Parking facilities and trail maintenance will be provided as needed. • Signage to indicate public land boundaries and regulate use will be established.	Ongoing management; no parking facilities, trail maintenance, or signage have been implemented.
Otero County ACEC RMPA	Cornudas Mountain ACEC: • Signage will be upgraded to reflect new designations.	Ongoing management.
Otero County ACEC RMPA	Alamo Mountain ACEC: • No parking will be allowed on or along the open road in the northern portion of the ACEC. • Signs will be placed to guide and regulate public use.	Completed in 1998.
Otero County ACEC RMPA	Wind Mountain ACEC: • Signage to guide and regulate public use will be established.	Ongoing management.
Otero County ACEC RMPA	Alkali Lakes ACEC: • Signage to regulate public use will be established.	Ongoing management.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 1997b, 1993a, 1986a

3.19 SPECIAL DESIGNATIONS

3.19.1 Wilderness Study Areas

All of the WSAs within the Planning Area are currently managed by BLM under the Interim Management Policy and Guidelines for Lands Under Wilderness Review (USDI, BLM 1995b). Each WSA will continue to be managed under the Interim Management Policy until added to the National Wilderness Preservation System or removed by Congress from further wilderness consideration. If any WSA is designated as wilderness, that area would be managed under the Wilderness Management Policy (USDI, BLM 1981), which would continue protection of the area and would prohibit use of motorized vehicles, landing aircraft, mechanized transport (e.g., bicycles), and structures or installations within the area. If the WSA were released from further consideration, the area would be managed under BLM management policies applicable to the area, which may include management as an ACEC in areas where the management designations overlap. Portions of WSAs that are not overlapped by another designation would be managed in accordance with the White Sands or Mimbres RMP, as appropriate, if released from the Wilderness Preservation System by Congress. In addition to this management, specific decisions were identified within the White Sands RMP for the Jornado del Muerto WSA and the Brokeoff Mountains WSA regarding minerals actions (refer to Section 3.14) (USDI, BLM 1986a). The only decisions that BLM made in the Mimbres RMP specifc to WSAs was the designation of four WSAs (in addition to those that already existed) including, the Peña Blanca WSA, Organ Needles WSA, Gray Peak WSA, and Apache Box WSA.

BLM manages WSAs to ensure that existing wilderness characteristics (naturalness, solitude, primitive and unconfined-type recreation opportunities) and special features are not impaired. Currently acceptable uses includes hiking, hunting, horseback riding, backpacking, biking, or vehicle use on primitive “ways”

established prior to enactment of FLPMA, and other activities that do not result in impairment of the wilderness values. Consistent with the Interim Management Policy, BLM does not maintain these primitive ways. In accordance with the Interim Management Policy, additional management of resources and uses within WSAs is described under the relevant resource programs throughout this chapter. Additional specific management stipulations imposed by BLM apply in areas where special designations overlap (e.g., where an area is designated as both a WSA and an ACEC). WSAs have been signed to identify boundaries and vehicle restrictions to the public with the exception of the Sacramento Escarpment WSA and Guadalupe Escarpment WSA. A volunteer crew patrols WSAs regularly.

3.19.2 Areas of Critical Environmental Concern

A brief description of BLM's current management of each ACEC is provided in the table below.

Table 3-16
Current Management of ACECs within the Decision Area[a]

Decision Source	Decision	Status
White Sands Resource Area RMP (Sierra and Otero Counties)	Designate 3,640 acres as the Sacramento Escarpment ACEC. Manage the ACEC according to the Sacramento Escarpment ACEC Management Plan to enhance, protect, and prevent irreparable damage to the scenic and recreational values of the escarpment.	Ongoing management; no specific management plan has been developed.
White Sands Resource Area RMP (Sierra and Otero Counties)	Develop a Cultural Resource Management Plan for the 200-acre Alamo Mountain Petroglyphs area.	Ongoing management.
Otero County ACEC RMPA	Designate 1,036 acres as the Three Rivers Petroglyph ACEC. Manage to protect cultural values using the Three Rivers Cultural Resource Management Plan. Continue to highlight public awareness of resource values.	Ongoing management.
Otero County ACEC RMPA	Add 1,725 acres to the 3,640-acre Sacramento Escarpment ACEC. ACEC Management Prescriptions guide the management of all resources within the ACEC. Actions remaining current in the existing ACEC plan for the Sacramento Escarpment have been brought forward to the proposed ACEC Management Prescriptions. Programs for public information and education of resource values are considered on a case-by-case basis	Ongoing management.
Otero County ACEC RMPA	Designate 2,690 acres as the Alamo Mountain ACEC. The ACEC management prescriptions will guide management of all other resources within the Alamo Mountain ACEC. Management of the Butterfield Trail within the ACEC will be guided by the Butterfield Trail Cultural Resource Management Plan. Programs for public information and education of resource values are minimized.	Ongoing management.
Otero County ACEC RMPA	Designate 850 acres as the Cornudas Mountain ACEC. The ACEC Management Prescriptions will guide management of all other resources within the Cornudas Mountains ACEC. Management of the Butterfield Trail within the ACEC will be guided by the Butterfield Trail Cultural Resource Management Plan. Programs for public information and education of resource values are minimized.	Ongoing management.
Otero County ACEC RMPA	Designate 2,506 acres as the Wind Mountain ACEC. The ACEC Management Prescriptions will guide management of all other resources within the Wind Mountain ACEC. Programs for public information and education of resource values are minimized.	Ongoing management.
Otero County ACEC	Designate 6,359 acres as the Alkali Lakes ACEC. Management of	Ongoing management.

Decision Source	Decision	Status
RMPA	the area is guided by the Guadalupe Ranch Coordinated Resource Management Plan and the decisions resulting from the Otero County ACEC RMPA. Programs for public information and education of resource values are minimal.	
Mimbres RMP (Doña Ana County)	Manage 840 acres as the Rincon Petroglyph ACEC. Manage for the protection of cultural values.	Ongoing management; no on-the-ground management has been implemented.
Mimbres RMP (Doña Ana County)	Manage 1,490 acres as the Doña Ana Mountains ACEC. Manage for the protection of biological, scenic, and cultural values.	Ongoing management; no on-the-ground management has been implemented.
Mimbres RMP (Doña Ana County)	Manage 9,190 acres as the Robledo Mountains ACEC. Manage to protect biological and scenic values and to protect, research, and interpret paleontological values.	Ongoing management; vehicle trails (except one) have been closed.
Mimbres RMP (Doña Ana County)	Manage 20 acres as the Los Tules ACEC. Manage to protect cultural values.	Ongoing management; no on-the-ground management has been implemented.
Mimbres RMP (Doña Ana County)	Manage 640 acres as the San Diego Mountain ACEC. Manage to protect and research cultural values. Manage for research rather than interpretive value. Encourage or conduct rock-art research.	Ongoing management; no on-the-ground management has been implemented.
Mimbres RMP (Doña Ana County)	Manage 56,480 acres as the Organ/Franklin Mountains ACEC. Manage to protect biological, scenic, riparian, special status species, and cultural values. Manage in accordance with the Organ Mountains Coordinated Resource Management Plan. Monitor the area in accordance with the concepts of limits of acceptable change with emphasis on the most biologically or culturally sensitive areas.	Ongoing management; no limits of acceptable change have been completed or implemented.
Mimbres RMP (Doña Ana County)	Manage 3,930 acres as the Aden Lava Flow research natural area (RNA). Manage to protect biological, scenic, geological, and research values. Research and interpret paleontological and geological features. Establish research permitting/information exchange process.	Ongoing management; no research or interpretation has occurred.
Mimbres RMP (Doña Ana County)	Manage 5,480 acres as Kilbourne Hole national natural landmark (NNL). Manage to protect geological values. Interpret geological features by signing and establish primitive facilities.	Ongoing management; signs were installed, but stolen. Interpretive brochure was developed.
Mimbres RMP (Doña Ana County)	Manage 720 acres of the Robledo Mountains as the Paleozoic Trackways RNA. Manage to protect, research, and interpret paleontological values. Manage in accordance with recommendations provided in trackways study legislation. Interpret in accordance with study legislation. Withdraw 720 acres from mineral entry under the 1872 mining law within the Paleozoic Trackway RNA.	Ongoing management.

SOURCES: U.S. Department of the Interior, Bureau of Land Management 1997b, 1993a, 1986a
NOTE: Resource-specific ACEC management prescriptions can be found under the appropriate resource section. Decisions for the Black Grama ACEC are not included because it is outside the Decision Area.

3.20 TRIBAL INTERESTS

Though there are no specific RMP decisions for tribal interests, BLM developed a lease stipulation that will be attached to the leases covered by the Record of Decision and Resource Management Plan Amendment for Fluid Mineral Leasing and Development in Sierra and Otero Counties (USDI, BLM

2005j). The stipulation is intended to cover the possibility that all Traditional Cultural Properties or Sacred Sites, or other historic properties may not have been identified during previous consultation efforts and that further consultation, regulatory compliance, and/or mitigation planning may be necessary prior to any ground-disturbing activities.

3.21 PUBLIC SAFETY

Public safety in the Planning Area generally has been addressed as a component of other management activities rather than as a separate issue. Various management decisions potentially impacting public safety are found in the Mimbres Resource Management Plan (USDI, BLM 1993a), the White Sands Resource Management Plan (USDI, BLM 1986a), the Otero County ACEC RMP Amendment (USDI, BLM 1997b), the Las Cruces Fire Management Plan (USDI, BLM 2004a), and the Statewide Fire and Fuels Management Plan Amendment (USDI, BLM 2004b), which prescribe the following:

- Improved interagency coordination for law enforcement, search-and-rescue response, firefighting activities, and communications
- Directives to suppress all wildfires while protecting the safety of firefighters and the public
- Proactive floodplain management

A primary objective of the 2004 Statewide Fire and Fuels Management Plan Amendment is to reduce the risk to human life and property from wildland fire (USDI, BLM 2004b). Treatments are focused on public land within wildland/urban interface areas. The 2004 Fire Management Plan prepared by the Las Cruces Field Office (USDI, BLM 2004a) calls for fire and resource personnel to improve protection of human life and property through aggressive fire protection, reduction of hazardous fuels, and restoration of fire-damaged ecosystems. Above all, firefighter and public safety is the first priority in every fire management activity (USDI, BLM 2004a). Additional information on related management decisions is provided in Section 3.8.

In addition, BLM's Instruction Memorandum (IM) 2000-182, Mitigating and Remediating Physical Safety Hazards at Abandoned Mine Land (AML) Sites, establishes policy, priorities, and plans to support the elimination or reduction of physical hazard and safety risks at abandoned mine lands. The long-term goal of the BLM is to eventually identify and address hazards at every known AML site on public lands. Since resources are unavailable to accomplish this goal in the short term, the immediate priority is to clean up those AML sites situated in locations where a death or injury has occurred and the site has not already been addressed, or at those sites that are situated on or in immediate proximity to developed recreation sites and areas with high visitor use (USDI, BLM 2000c).

In 1999, a Memorandum of Understanding/Joint Powers Agreement (MOU/JPA) between the NMEMNRD and the BLM New Mexico State Office established cooperative procedures to accomplish the reclamation of abandoned mine sites on BLM-administered lands and replaced the MOU/JPA that expired on August 31, 1995 (NMEMNRD 1999).

3.22 SOCIAL AND ECONOMIC CONDITIONS

Although there are existing management decisions with implications for social and economic conditions in the Planning Area, there are no decisions that are based solely on social or economic management. FLPMA requires that "management [of public lands] be on the basis of multiple use and sustained yield unless otherwise specified by law" (43 U.S.C. 1701 [a][7]). The definition of "multiple use" in FLPMA incorporates meeting the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for flexibility; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output (43 U.S.C. 1702 103[c]). The term "sustained yield" is defined as "the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use" (43 U.S.C. 1702 [h]).

Management direction is further provided in BLM's Land Use Planning Handbook (H-1601), particularly Appendix D: Social Science Considerations in Land Use Planning Decisions (USDI, BLM 2005c); BLM Instruction Memorandum No. 2002-167, Social and Economic Analysis for Land Use Planning (USDI, BLM 2002c); and BLM Instruction Memorandum No. 2002-164, Guidance to Address Environmental Justice in Land Use Plans and Related National Environmental Policy Act Documents (USDI, BLM 2002d).

4.0 MANAGEMENT ADEQUACY AND OPPORTUNITIES

4.1 AIR QUALITY

The RMPs should incorporate the objectives for air quality, describe the current condition of air resources within the Planning Area, provide actions or limitations to manage air resources, conduct appropriate analysis of impacts to air quality, ensure conformance with the State of New Mexico State Implementation Plan (SIP), and provide for collaboration on regional issues with local, state and federal agencies. The analyses of impacts on air quality as a result of activities on BLM-administered public lands should include recreational use of vehicles, construction activities, and oil and gas development.

Current plan decisions remain appropriate to achieve objectives. However, changes may be needed to reflect the expected future conditions in the Planning Area, and some standards and objectives may need to be clarified or adjusted.

4.2 GEOLOGIC, CAVE, AND KARST RESOURCES

No specific decisions exist for geologic, cave, and karst resources; therefore, management adequacy and opportunities should be evaluated such that new decisions may be developed for these resources, consistent with current policy.

Conservation of geologic features is largely accomplished through management prescriptions for other resources, such as soils, visual resources, etc., and through the designation of special management areas (e.g., the Organ Mountains ACEC). Additional management prescriptions specific to geologic resources may not be necessary.

Management decisions that could be developed for the TriCounty RMPs could include the identification of significant caves (as mandated by Federal Cave Resources Protection Act of 1988 using significant cave criteria as set forth in 43 CFR 37.11). Once identified and evaluated, management prescriptions for significant caves should be outlined; this may include designation of a special management area. The RMPs should include guidelines for management (resources, visitors, and facilities), marketing (outreach, information and education, promotion, interpretation, and environmental education), monitoring (social, environmental and administrative indicators and standards), and administration (regulatory, permit/fee/fiscal, data management, and customer liaison); though a more specific activity or implementation plan may be warranted.

4.3 SOIL AND WATERSHED RESOURCES

Chapter 4 combines soil, water and watershed resources to provide an integrated treatment of management decisions and developd watershed-based opportunities. The goal of the soil, water and watershed resources program is to manage and protect all water and soil resources (interpreted here to

include the protection of wetlands, riparian areas, watersheds, arroyos, fisheries, wildlife habitats, and aquifers) under BLM management.

Table 4-1
Adequacy of Current Management Direction and Options for Change for Soil and Water Resources

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Critical soils on 0–10 percent slopes will be the first priority for land treatments and grazing management to reduce erosion and improve water quality. Critical soils on slopes over 10 percent will be a priority for grazing management to reduce erosion and improve water quality.	No	Critical soils will be identified and managed on a watershed basis. Treatment of specific areas of concern could be detailed in an implementation decision that is tiered to the watershed planning process.
Mimbres RMP (Doña Ana County)	Watershed management plans will be developed for the following areas: • Corralitos • Rincon/Hatch (both sides of river) • Uvas Valley	No	Watershed planning could be accomplished as part of a priority watershed program.
Mimbres RMP (Doña Ana County)	Provision for erosion control will continue to be incorporated into all surface-disturbing actions.	No	This is not a land use plan decision; this can be addressed as continuing management guidance or Best Management Practices (BMPs).
White Sands Resource Area RMP (Sierra and Otero Counties)	W-1. A watershed activity plan will be developed on 23,236 acres in the area of Wind and Chess Draws in the Cornudas Mountains (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the long term. Off highway vehicle (OHV) use will be limited to existing roads and trails on the 23,236 acres for protection of watershed values.	No	Watershed planning could be accomplished as part of a priority watershed program.
White Sands Resource Area RMP (Sierra and Otero Counties)	W-2. A watershed activity plan will be developed on 7,162 acres in the area of Moccasin and Otto Draws southwest of Piñon (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the long term. OHV use will be limited to existing roads and trails on the 7,162 acres for protection of watershed values.	No	Watershed planning could be accomplished as part of a priority watershed program.

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	W-3. A watershed activity plan will be developed on 10,742 acres in the area of unnamed watersheds east of Tularosa and south of the Tularosa River (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the long term. OHV use will be limited to existing roads and trails on the 10,742 acres for protection of watershed values.	No	Watershed planning could be accomplished as part of a priority watershed program.
White Sands Resource Area RMP (Sierra and Otero Counties)	W-4. A watershed activity plan will be developed on 21,446 acres in the Three Rivers watershed north of Tularosa (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the long-term. OHV use will be limited to existing roads and trails on the 21,446 acres for protection of watershed values.	No	Watershed planning could be accomplished as part of a priority watershed program.
White Sands Resource RMP (Sierra and Otero Counties)	W-5. A watershed activity plan will be developed on 11,015 acres in the area east of Crow Flats (Otero County). The primary objectives of the watershed treatments will be to improve watershed values by reducing peak runoff rates, reducing sediment yields, improving water quality, and receiving better on-site utilization of runoff in the long term. OHV use will be limited to existing roads and trails on the 11,015 acres for protection of watershed values.	No	Watershed planning could be accomplished as part of a priority watershed program.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 1 Upland Sites Standard–Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type, climate, and landform. The kind, amount, and/or pattern of vegetation provide protection on a given site to minimize erosion and assist in meeting State and tribal water quality standards.	Yes	No change(s) necessary. Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 2 Biotic Communities Standard (includes Native, Endangered, Threatened, and Special Status Species)–Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities. Desired plant community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes.	Yes	No change(s) necessary. Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 3 Riparian Sites Standard–Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide for groundwater recharge, provide habitat and assist in meeting State and tribal water quality standards.	Yes	No change(s) necessary. Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.

Since the adoption of the previous RMPs, the passage and administration of State, Total Maximum Daily Load (TMDL) programs for the planning, assessment, and remediation of water-quality-impaired stream segments has impacted BLM management of the public lands. The State of New Mexico program, administered by NMED, is relevant only to parts of the Planning Area where there is discharge of surface water to the Rio Grande and Mimbres River.

Based upon the adequacy of the existing management discussion described above, there are a number of broad ways that the BLM can manage the Planning Area watershed resources in a way that improves overall conservation of and efficient use of the public land. In concert with grazing, wildlife and other natural resources, watershed decisions can be developed consistent with attainment of public land health standards.

During scoping, the public comments on water and soil resources identified the following issues BLM management should incorporate into RMPs/EIS:

- Include the protection, conservation, and availability of water in the arid region as a goal,
- Address impacts of watersheds and aquifer recharge when designating lands for disposal,
- Determine watersheds with soils and waters that are most vulnerable to current and future impact and adopt management actions necessary to protect, conserve and restore these resources,

- Ensure compliance with State water quality standards
- Protect the fragile and unique riparian ecosystems that provide critical habitat and support biodiversity in the Chihuahuan Desert,
- Address impacts of future water development on existing permittees water rights, and affected landowners.

The RMPs/EIS could provide management direction to plan and implement decisions based on watershed boundaries. The Las Cruces District Office could use the concept of priority watersheds to develop a methodology for integrating assessment of public land health standards and multiple use objectives identified through the RMP process. A priority watershed approach would be consistent with the Statewide Public Land Health Standards EIS/RMPA, which amended the Mimbres and White Sands RMPs to include public land health standards and guidelines for livestock grazing.

Within the Planning Area there are 9 watershed management units requiring analysis. A general priority for analysis (high and low) could be outlined in the RMPs based on issue-driven criteria (e.g., where soils are most susceptible to erosion, where threatened and endangered species key habitats are present, etc.). The watersheds analyzed in any given year would be determined administratively. Under a priority watershed approach, it is anticipated that the priorities would change as the Las Cruces District Office responds to on-the-ground resource management objectives such as ecological health, water quality protection, sensitive species requirements, fuel reduction, and fire restoration. Community needs, funding levels, and availability of inventory data and other resource information also could influence the order in which watersheds or portions of watersheds are assessed and prioritized.

Under a priority watershed approach, a public land health assessment would be completed for a watershed, and appropriate management changes could then be identified for all affected programs to ensure significant progress toward attainment of the land health standards. The RMPs would provide programmatic direction for maintaining conditions where the standards are being met, and management changes and/or treatments in areas where standards are not being met.

The watershed analysis would consist of four phases: (1) assessment phase, when the status of the watershed's physical and biological conditions and processes would be characterized and the health of the watershed established; (2) evaluation phase, when the condition of the watershed is evaluated against public land health standards; (3) determination phase, when a formal determination as to the causal factors for not achieving each standard is developed; and, (4) implementation phase, when the multiple use decision or restoration plan would be developed that would incorporate the logic and rationale for specific management changes.

Given that many activity plans were identified in the existing RMPs and not implemented, an adaptive-management approach could be more efficient than writing different activity plans (AMPs, HMPs, etc). For example, if livestock grazing were the significant causal factor in non-attainment of a particular standard, the needed management change could be implemented through the issuance of a grazing

decision (i.e., change in grazing permit terms and conditions); the grazing regulations become the regulatory leverage to initiate a change in management right away without the creation of an additional planning document. Other on-the-ground management actions determined by the analysis to be necessary (e.g. watershed improvement structures, vegetation treatments, road improvements, etc.) to maintain or improve resource conditions could be outlined in a multiple-use decision or restoration plan decision. The multiple-use decision or restoration plan decision also would replace the need for development of individual activity plans (i.e. AMPs, HMPs, watershed plans, etc.).

Once the RMPs are completed and approved, all existing activity plans would be reviewed for conformance with the approved RMPs. Those in conformance would continue to provide management direction for program-specific actions. Those activity plans not in conformance with the approved RMPs would either be updated or replaced, as needed, to provide appropriate management direction. If new activity plans were needed, they would be developed in accordance with the approved RMPs.

In addition to development of a priority watershed approach, the BLM Las Cruces District Office may consider the following land use plan decisions related to water and soil resources:

- Identify additional soil/watersheds/riparian areas for specific management or management criteria designation
- Identify measures for securing water rights, where needed for multiple use management

4.4 VEGETATIVE COMMUNITIES

Table 4-2
Adequacy of Current Management Direction and Options for Change for Vegetative Communities

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	Avoiding adverse effects on State listed or sensitive species through clearances and consultation.	Yes	This is not a land use plan decision. This is a BLM regulation and has to be followed regardless of the RMP. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	Designate 42 40-acre study plot exclosures, one for each of the 41 range sites and one of the standard habitat sites in Otero and Sierra Counties (1,680 acres and 42 miles of fence).	No	This is not a land use plan decision, rather a site-specific action that needs an EA. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	Grass bottomlands, mixed desert shrub (>10% slope), snakeweed, and mountain brush type will be treated with a combination of prescribed burning, prescribed natural fire, and prescribed grazing management.	No	This decision is too specific to community type and restricts BLM ability to do treatment on other communities. Generalize BLM's treatment options.

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Creosotebush, mesquite, and desert shrub (<10% slope) will be treated almost entirely by the use of herbicides. Areas over 10% slope and within ½ mile of a perennial stream will not be treated with herbicide. (Site-specific NEPA would be required).	No	Same as above. In addition, if necessary during alternatives development, check the literature and with the experts to validate the slope and distance from water limitations.
Mimbres RMP (Doña Ana County)	All areas treated by prescribed burning, prescribed natural fire, or chemical herbicides would be rested from livestock grazing for a minimum of two years in areas where livestock use occurs, unless otherwise authorized.	No	Add a statement regarding recreation and other human uses, not just grazing. There should be a required minimum perennial grassland density and cover in the proposed treated areas as well. The grazing deferment period should be an extended growing season (june 1-nov30) for the 2nd and 3rd or more years depending on rainfall. Soil type, in addition to pre-existing perennial grass cover, should be considered to achieve cost-effective results.
Mimbres RMP (Doña Ana County)	Chemical herbicides could be used for control of noxious weeds.	No	This could be included under a more general decision regarding the vegetation treatment options.
Mimbres RMP (Doña Ana County)	Vegetation sale areas will be retained until a minimum in reached where the amount of residual vegetation is left is sufficient for natural regeneration. Sale areas will then be expanded into adjacent lands identified for disposal.	No	Needs further discussion among managers whether this program will continue, because there is not much evidence that plant poaching is reduced as a result of this program, and financial revenue and number of issued permits alone do not justify continuing the program. Free Use Permits for plant collection used in ceremonial/religious events also needs further attention from management on how to provide the public with this non-sustainable resource.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 1 Upland Sites Standard- Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type climate, and landform. The kind, amount, and/or pattern of vegetation provides protection on a given site to minimize erosion and assist in meeting State and Tribal water quality standards.	Yes	No change(s) necessary. Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 2 Biotic Communities Standard (Includes Native, Endangered, Threatened, and Special Status Species)- Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities. Desired plant community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes.	Yes	No change(s) necessary. Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 3 Riparian Sites Standard- Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide fro groundwater recharge, provide habitat and assist in meeting State and Tribal water quality Standards.	Yes	No change(s) necessary. Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Restoration should first be achieved with native, and when appropriate non-native plands.	No	The wording should be more specific on when non-natives, and what type of non-native can be used.

General management opportunities for the RMPs could include identification of desired outcomes for vegetative resources (i.e., Desired Plant Communities), including the desired mix of vegetative types, structural stages, and landscape and riparian functions. The RMPs also could designate priority plant species, including Special Status Species and plant species recognized as significant for at least one factor. Once this is determined, actions and areawide use restrictions needed to achieve desired vegetative conditions could be identified. The Standards and Guidelines initiate monitoring and evaluation cycle to assess the condition of desired plant communities, determine if management changes are needed to achieve resource objectives, and adjust management prescriptions as necessary. BLM has conducted this monitoring and evaluation cycle concurrently with permit/lease renewals. This information, as well as other data, also is used to make adjustments in grazing permits and leases.

Forests and woodlands within the Decision Area have become more susceptible to disease, insects and population encroachment. Much of this is due to factors such as drought, modification of the natural fire regime from past fire suppression strategies and introduced species. Management direction for forest and woodland resources could be changed to focus on identifying Desired Plant Communities objectives, prioritizing areas that require intensive management, and identifying management actions needed to achieve desired conditions. For example, the RMPs could identify areas at risk from insects, disease and conversion of vegetation cover type that require revised management actions and land use restrictions.

4.5 FISH, WILDLIFE, AND HABITAT

Table 4-3
Adequacy of Current Management Direction and Options for Change for Fish, Wildlife, and Habitat

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-1. Sierra County: (1) Provide forage for 354 deer, which presently utilize habitats within the county. (2) Provide forage for a projected population increase of an estimated 261 deer by the year 2010. (3) Provide forage for 195 pronghorn, which presently utilize habitat within the county. Provide forage for an estimated 475 pronghorn. The forage provided will be dependent on the amount and success of the vegetation treatment described in decision RM-5. Otero County (except McGregor Range): Provide forage for 12,588 mule deer and 1,666 pronghorn (optimum numbers) in herd unit areas in the long-term (30,234 and 2,582 AUMs respectively, for a total of 33,086 AUMs). This will be an increase from the current 5,955 mule deer (14, 281 AUMs) and 731 pronghorn (1,247 AUMs).	No	The exact population numbers for specific species should be deleted and the text could read, "BLM will provide forage, water availability, and general habitat quality to sustain healthy populations of deer and pronghorn."
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-2. Improve and protect the riparian area along Percha Creek (280 acres) for wildlife habitat, watershed values, recreation, and visual quality. Monitor riparian habitat condition and develop management objectives and planned actions for a HMP. Limit off-road vehicle (ORV) use to existing roads and trails. (Note: Percha Creek is an important area for special status species.)	No	Delete exact acres and add protection and monitoring of aquatic habitat, in addition to riparian habitat.

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-3. Improve and protect Lake Holloman and adjacent lands (1,160 acres) as a high-use area for waterfowl and shore birds. Habitat management proposals and subsequent plans and agreements will be coordinated with Holloman Air Force Base through the U.S. Army Corps of Engineers, NMDGF, USFWS, and other interest groups.	No	Lake Holloman was sold to Holloman AFB and is no longer under the management of the BLM. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-4. A HMP (or CRMP) will be developed for the Alamo Mesa pronghorn area. The primary objective of the HMP will be to provide adequate habitat for pronghorn. A monitoring program will be established to ensure that objectives are met.	Yes	No change(s) necessary.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-5. A HMP (or a CRMP) will be developed for the Caballo Mountain deer area. The primary objective of the HMP will be to provide adequate habitat for mule deer. A monitoring program will be established to ensure that HMP objectives are met.	Yes	No action on the HMP has been undertaken at this time.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-6. A HMP (or a CRMP) will be developed for the Sacramento Escarpment deer area. The primary objective of the HMP will be to provide adequate habitat for mule deer. A monitoring program will be established to ensure that HMP objectives are met. (Note: The Sacramento Mountains are important documented areas for special status species including the endangered plant, Todsen's Pennyroyal.)	No	Sacramento Escarpment could be managed through an ACEC designation.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-7. Additional HMPs are being considered for approximately 844 acres of riparian habitat within the Resource Area, which are located primarily north of Alamogordo in Otero County and along Percha Creek in Sierra County. (Note: Percha Creek is an important area for special status species.)	No	This is not a land use plan decision. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-8. In coordination with the NMDGF, conduct studies to determine what biological factors are limiting the distribution and numbers of pronghorn in habitats in the Nutt and White Sands herd units (Jornada Plain).	No	This is not a land use plan decision. Drop decision.

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Develop Robledo Mountains HMP Priority species: deer/antelope/upland game Objectives: deer, improve habitat; antelope, transplant/ introduce; upland game, improve and enhance habitat Population goals: deer, 400; antelope, 50 Actions: fence modification; water development	Yes	Robledo Mountain HMP and Uvas Mountains HMP could be combined into a single HMP.
Mimbres RMP (Doña Ana County)	Develop Las Uvas Mountains HMP Priority species: deer Objectives: improve habitat Population goal: deer, 300 Actions: water development	Yes	Robledo Mountain HMP and Uvas Mountains HMP could be combined into a single HMP.
Mimbres RMP (Doña Ana County)	Develop West Potrillo Mountains HMP Priority species: deer/ upland game Objectives: deer, improve habitat; upland game, improve and enhance habitat Population goals: deer, 300 Actions: water development; exclosure near water	No	West Portillo Mountains is located within a wilderness study area (WSA). Future management would depend on wilderness designation status.
Mimbres RMP (Doña Ana County)	It is intended that wildlife population goals can be reached without reduction of livestock numbers (through grazing management and land treatments). Population goals may be revised as necessary through the HMP monitoring and evaluation process.	No	This is not a land use plan decision. Drop decision.
Mimbres RMP (Doña Ana County)	All HMPs will incorporate the following: Obtain production (population) data to correlate with monitoring (at a minimum, harvest information by area). Monitoring emphasis will be on preferred habitats for wildlife. Monitoring will incorporate browse utilization/ condition/trend.	No	This is not a land use plan decision. Drop decision.
Mimbres RMP (Doña Ana County)	Animal damage control (ADC) actions will be conducted in accordance with annual ADC plans. The plan will specify times and conditions for control activities in accordance with management prescriptions, objectives, and goals.	No	This is not a land use plan decision.

Decision Source	Decision	Is Decision Adequate?	Remarks/ Options for Change
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 1 Upland Sites Standard- Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type climate, and landform. The kind, amount, and/or pattern of vegetation provides protection on a given site to minimize erosion and assist in meeting State and Tribal water quality standards.	Yes	Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 2 Biotic Communities Standard (Includes Native, Endangered, Threatened, and Special Status Species)- Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities. Desired plant community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes.	Yes	Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 3 Riparian Sites Standard- Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide fro groundwater recharge, provide habitat and assist in meeting State and Tribal water quality Standards.	Yes	Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.

Most of the management decisions related to fish and wildlife in the previous RMPs can be categorized as decisions to collect additional data, cooperate with other agencies, provide/protect habitat for specific species or populations, or improve habitats for particular species. Additional decisions to consider, as appropriate, could include (1) setting desired outcomes (i.e., goals and objectives) for habitat (consistent with watershed and/or vegetation goals), (2) identifying additional priority wildlife species and habitat, and/or (3) areawide use restrictions, which might be specific to key habitats, such as northern aplomado falcon habitat.

Previous evaluations of RMP decisions determined that certain wildlife objectives and management prescriptions (e.g., development of stocking rates for wildlife) are no longer applicable or practical due to

changes in wildlife habitat conditions and population numbers. The evaluations also determined that wildlife mitigation measures have been effective in preventing significant impacts to wildlife and wildlife habitat. As wildlife data are updated as part of this RMP process, it is recommended that the Las Cruces District Office determine if the new information results in needed modifications to existing management prescriptions.

Management opportunities for the RMPs could include identifying desired habitat conditions and/or population objectives for major habitat types that support a wide variety of game and non-game species. Priority species and habitats also could be designated, including Special Status Species, and populations of fish or wildlife species recognized as significant for at least on factor. Once this is determined, actions and areawide use restrictions needed to achieve desired population and habitat conditions could be identified.

Coordinating with other groups and agencies that are collecting regional data and using their data as a framework in which to interpret habitat provision and/or protection needs could enhance BLM's responsiveness toward maintaining desired habitat conditions. For example, the Ecoregional Assessment of the Arizona-New Mexico Mountains by The Nature Conservancy provides data on regional populations and regional conservation goals that might provide a larger context for BLM to evaluate its desired habitat conditions and habitat management decisions.

4.6 SPECIAL STATUS SPECIES

Table 4-4
Adequacy of Current Management Direction and Options for Change for Special Status Species

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	Vegetation treatment projects will be designed to minimize impacts on wildlife and to improve habitat, especially for pronghorn, whenever project and wildlife objectives are compatible.	Yes	This is not a land use plan decision. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	During nesting season, a raptor inventory will be conducted on areas proposed for vegetation treatment to identify and flag land within a ¼ mile radius of active nests so they will not be disturbed by the proposed treatment.	Yes	This is not a land use plan decision. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	Examine T&E species and their habitat when considering land disposal.	Yes	This is not a land use plan decision. This is a legal requirement for the BLM to comply with the Endangered Species Act. Drop decision.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	Multiple use management actions will be developed for each allotment in Category I (Improve) and selected M (Maintain) allotments. Activity plans would be prepared within constraints set by the RMP to resolve resource conflicts where they occur. The activity plan on an affected allotment would favor the development or enhancement of the significant values found to be in conflict with livestock grazing use. The significant values found within the area are (1) riparian areas; (2) areas where threatened or endangered species may occur; and (3) crucial mule deer or pronghorn habitat.	No	New guidance for land and watershed health assessment is under development and should replace this decision when completed.
White Sands Resource Area RMP (Sierra and Otero Counties)	Wildlife habitat monitoring would be determined by budgetary constraints or limitations. The following is a list of situations, by priority in which habitats would be monitored (1) threatened or endangered species habitats with management problems; (2) big game habitats under management plans; and (3) other habitats.	Yes	This is not a land use plan decision. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	NMDGF, the New Mexico Heritage Program and USFWS will be consulted prior to implementing projects for wildlife that may affect listed species or their habitat. These consultations will be conducted according to the Endangered Species Act (ESA) and management policy and guidelines.	Yes	This is not a land use plan decision. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	Management activities in habitat for threatened, endangered, or sensitive species will be designed to benefit those species, or at least minimize any potential adverse influence of the activity on the species.	Yes	This is not a land use plan decision. This is a legal requirement for the BLM to comply with the Endangered Species Act. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	Listed species which occur within HMP areas, and for which management needs are known, will be included in the HMP as a featured species.	Yes	This is not a land use plan decision; it is BLM policy. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	Forage will be provided for big game species on herd unit areas for present populations as establishing jointly with the NMDGF.	No	Multi-species and habitat management approach used by BLM includes management of big game species; therefore, a separate decision for big game species is not necessary.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Management of special status species in the Organ Mountains will continue in accordance with the existing Organ Mountains Coordinated Resource Management Plan.	Yes	Though adequate, this is not a land use plan decision.The CRMP is an implementation plan and in the absence of this as a decision, BLM would manage in accordance with that plan.
Mimbres RMP (Doña Ana County)	Designate the Robledo Mountains ACEC to protect high diversity cacti location with endangered species present.	Yes	This decision has been implemented. Continue decision/designation.
Mimbres RMP (Doña Ana County)	Designate the Organ/Franklin Mountains ACEC to protect endangered plant species.	Yes	This decision has been implemented. Continue decision/designation.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 1 Upland Sites Standard- Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type climate, and landform. The kind, amount, and/or pattern of vegetation provides protection on a given site to minimize erosion and assist in meeting State and Tribal water quality standards.	Yes	Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 2 Biotic Communities Standard (Includes Native, Endangered, Threatened, and Special Status Species)- Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities. Desired plant community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes.	Yes	Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.
Proposed Statewide RMP Amendment/Final Environmental Impact Statement - Standards for Public Land Health and Guidelines for Livestock Grazing Management Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 3 Riparian Sites Standard- Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide fro groundwater recharge, provide habitat and assist in meeting State and Tribal water quality Standards.	Yes	Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.

Similar to vegetation management and fish and wildlife habitat management, management opportunities for the RMPs could include identifying desired habitat conditions and/or population objectives for Special Status Species and identifying priority species that require immediate, intensive management. Once this is determined, actions and areawide use restrictions needed to achieve desired population and habitat conditions could be identified. Additional decisions to consider, as appropriate, could include (1) setting desired outcomes (i.e., goals and objectives) for species (consistent with recovery and/or populations goals set by U.S. Fish and Wildlife Service [USFWS] and New Mexico Department of Game and Fish [NMDGF], and/or (2) areawide use restrictions, which might be specific to habitats utilized by special status species, such as northern aplomado falcon habitat, which has been identified through specific modeling.

4.7 WILDLAND FIRE ECOLOGY AND MANAGEMENT

Table 4-5
Adequacy of Current Management Direction and Options for Change for Wildland Fire Ecology and Management

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas.	Use of the Fire Management Unit Categories outlined in Table 2-34. The document also sets a fuels treatment goal of 73,000 acres per year for the LCFO (40 percent mechanical, 40 percent prescribed fire, and 20 percent chemical).	Yes	Funding may not be adequate to accomplish every year. Wildland Fire Use (WFU) events may make up for lack of fuel treatment funding in later years. Allow WFU in a greater majority of areas in order to allow for fuel treatment goals to be met.
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas	Goal: Reduce the risk to human life and property from wildland fire. Objective: Focus treatments on communities and surrounding areas with the potential for escaped fire or loss of life or property. Focus treatments on public land within the 18 wildland/urban interface (WUI) areas defined in cooperation with the New Mexico State Forestry Division (2003) and on other areas where public land is adjacent to communities.	Yes	Consider whether these goals and objectives should become Continuing Management Guidance in the draft RMPs/EIS. WUI areas should be addressed; however, these are evolving areas and may not be appropriate to specify WUIs in a long-term planning document. WUIs are best dealt with in annual Fire Management Plans (FMPs), which are tiered to the long-term RMPs.
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas	Goal: Reduce the risk and cost of fire suppression in areas of hazardous fuels buildup. Objective: Focus appropriate treatments on areas identified as containing hazardous fuels buildup, to reduce the risk and cost of fire suppression.	Yes	Appropriate treatments could include prescribed fire, chemical, biological, and mechanical treatments.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas	Goal: Improve landscape health through returning fire to its natural role in the ecosystem. Objective: Focus treatments on improving landscape health through treating lands in Fire Regime Condition Classes 2 and 3. Maintain Fire Regime Condition Class 1. The Desired Future Condition of the landscape is Fire Regime Condition Class 1. This direction applies to threatened and endangered species, as well as cultural resources and other resources that could be affected by wildland fire suppression and fire and fuels management. This direction would be followed unless doing so would compromise protection of human life or property or the protection of special species habitat.	Yes	The decision is adequate and could gain persistence if placed into the RMPs. It is general enough to allow BLM flexibility.
Decision Record for the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas	The White Sands RMP has been amended to allow treatment projects (chemical, mechanical, and burning) on more than 241,576 acres in the long-term.	Yes	The decision is adequate and allows managers to meet fuel treatment projects.
White Sands Resource Area RMP (Sierra and Otero Counties)	Sets suppression objective. The White Sands Resource Area (Sierra and Otero Counties) will provide initial attack on all wildfires on or threatening public land with the objective being to contain the fire during the first burning period.	Yes	The objective may not be to suppress during the first burn period unless the fire is in an area that threatens critical resources or life and property; this should be clarified and/or modified.
White Sands Resource Area RMP (Sierra and Otero Counties)	Provide for limited fire suppression action where associated expense is not warranted.	No	Drop this decision because the RMPA for Fire and Fuels in New Mexico and Texas assigned Fire Management Categories that indicate priority suppression areas. The Fire and Fuels document sets priority suppression areas versus areas that BLM may manage fires for resource benefits.

In formulating management actions for fire management, including watershed and vegetation management, BLM should consider the decisions made in the Environmental Assessment and Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas. However, these need to be generalized in the RMPs (i.e., Best Management Practices for vegetation treatment methods) because Fire Management Units could change over time based on unrealized future circumstances. All the decisions made in the Resource Plan Amendment for Fire and

Fuels Management on Public Land in New Mexico and Texas 2004 are adequate for managing fire in the Decision Area. The fire plan implements the RMP and provides the latitude for suppression adjustments to meet changing resource conditions. Additional maintenance may be necessary to reflect current fire management terminology.

The RMPs could provide a decision to set priority areas for hazardous fuels treatments and encourage cooperation between Federal, State, and local land managers to manage surface fuels as outlined in the Statewide Fire Amendment.

4.8 CULTURAL AND HERITAGE RESOURCES

Table 4-6
Adequacy of Current Management Direction and Options for Change for Cultural and Heritage Resources

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-01. Fence an additional 120 acres (for total of 340 acres) to eliminate grazing at Three Rivers Petroglyph Site and Picnic Area, and restrict ORV use to existing roads and trails.	Yes	A total of 900 acres were fenced as part of the Three Rivers ACEC designation. Continue decision to maintain fencing.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-02. Rattlesnake Hill Archaeological District is closed to OHV use and range improvements, prepare cultural resource management plan.	Yes	No change(s) necessary.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-03. Designate Alamo Mountain Petroglyphs (200 acres) for no surface occupancy and close to OHV use; prepare cultural resource management plan.	Yes	No change(s) necessary.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-04. OHV use in the Lone Butte archaeological area is limited to existing roads and trails; prepare cultural resource management plan.	Yes	No change(s) necessary.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-05. Jarilla Mountains is closed to OHV use to protect cultural resources.	Yes	No change(s) necessary.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-06. Do not permit surface-disturbing activities within ¼ mile of well-preserved segments of the Butterfield Overland Route (2,200 acres); prepare cultural resource management plan.	Yes	No change(s) necessary.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-07. Do not permit surface-disturbing activities within ¼ mile of well-preserved segments of the Jornada del Muerto Trail (1,252 acres); prepare cultural resource management plan.	Yes	No change(s) necessary.
White Sands Resource Area RMP (Sierra and Otero Counties)	CU-08. Prepare plan of action for a sample survey of 10 percent of the public land, and initiate fieldwork.	No	This is not a land use plan decision. Drop decision.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Otero County ACEC RMP Amendment	Three ACECs are designated to protect archaeological resources: (1) Three Rivers Petroglyph Site (1,036 acres) that reflects the Jornada Mogollon culture including rock art and a pit house village, (2) Cornudas Mountain (850 acres) that includes rock art, Thorne's Well, and remnants of the Butterfield Overland Route and the Cornudas de los Alamos Butterfield stage station, and (3) Alamo Mountain (2,690 acres) that includes a prehistoric site, rock art, and remnants of the Butterfield Overland Route and the Ojos de los Alamos Butterfield stage station.	Yes	Maintain ACEC designations.
Otero County ACEC RMP Amendment	The Wind Mountain ACEC is designated (2,506 acres) to protect cultural resources values, including rockshelters and open sites related primarily to the Archaic era, in conjunction with managing the primary visual resource values.	Yes	Maintain ACEC designations.
Mimbres RMP (Doña Ana County)	CU-01. Designate three ACECs to protect archaeological resources that reflect the Jornado Mogollon culture: (1) Lost Tules pit house village site (20 acres), (2) Rincon Petroglyph site (840 acres), and (3) San Diego Mountain petroglyphs (640 acres).	Yes	Maintain ACEC designations.
Mimbres RMP (Doña Ana County)	Designate two ACECs to protect archaeological sites in conjunction with managing their primary biological and scenic values: (1) Doña Ana Mountains (1,490 acres), and (2) Organ/Franklin Mountains (56,480 acres).	Yes	Maintain ACEC designations.
Mimbres RMP (Doña Ana County)	CU-02. Designate the Butterfield Overland Route as a historic trail.	Yes	No change(s) needed.
Mimbres RMP (Doña Ana County)	CU-03. Eliminate grazing at the Dripping Springs Natural Area to protect cultural resources.	Yes	Continue management of area with grazing eliminated.
Mimbres RMP (Doña Ana County)	CU-04. Intensively survey the San Diego Mountain and Rincon ACECs to document their cultural resources.	No	This is not a land use plan decision. Drop decision.
Mimbres RMP (Doña Ana County)	CU-05. Research historical roads and trails (Camino Real, Spanish exploration routes, and historical wagon roads). Research historical mining towns and features.	No	This is not a land use plan decision. Drop decision.
Mimbres RMP (Doña Ana County)	CU-06. Conduct field schools at Bruton Bead and East Potrillo sites.	No	This is not a land use plan decision. Drop decision.
Mimbres RMP (Doña Ana County)	CU-07. Restrict public access to the rock shelters at Apache Box, Apache Cave, and elsewhere as needed.	Yes	Add additional specific areas.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	CU-08. Acquire Butterfield Overland Route stage station sites through land exchanges, or purchases from willing sellers.	Yes	No change(s) needed.
Mimbres RMP (Doña Ana County)	CU-09. Close the road to the Bruton Bead site.	Yes	Designate road as closed in route designations.
Mimbres RMP (Doña Ana County)	CU-10. Fence the Los Tules site or cover it with fill material to protect the site.	No	This is not a land use plan decision. Drop decision.

The RMPs process could provide for the development of a proactive cultural resources management framework that incorporates changes in BLM policy and law. If a Cultural Resources Management Plan (CRMP) were still desired, this planning effort could provide interim guidance for the cultural resources program and framework direction for the CRMP by allocating cultural resources to use categories and establishing criteria for management of sites yet to be identified. Use allocations also could provide a framework for priority cultural resource areas or site types. This could allow managers to "know in advance how to respond to conflicts that arise between specific cultural resources and other land uses" (BLM-M-8110.4).

4.9 PALEONTOLOGICAL RESOURCES

Table 4-7
Adequacy of Current Management Direction and Options for Change for Paleontological Resources

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Management as directed by Federal Land and Policy Management Act and instruction memorandums; regulations being developed; resources managed through issuance of scientific permits.	Yes	This is not a land use plan decision. This is BLM policy. Drop decision.

Management decisions that could be developed for the TriCounty RMPs could include the identification criteria or use restrictions to ensure that areas containing, or are likely to contain, vertebrate or noteworthy occurrences of invertebrate or plant fossils are identified and evaluated prior to authorizing surface-disturbing activities.

Changes in paleontological resources management policy and increases in paleontological resource data should be incorporated into the RMPs. Decisions for inventory and management of paleontological resources could be determined based on fossil diversity, distribution, and reasons for their importance to science. Priority areas for inventory could be identified, along with future research needs.

4.10 VISUAL RESOURCES

Table 4-8
Adequacy of Current Management Direction and Options for Change for Visual Resources

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	VR-1. Designate 3,640 acres of the Sacramento Escarpment as an area of critical environmental concern (ACEC) for visual resources. Manage as VRM Class I.	Yes	Visual resource decisions could be simplified by combining all VRM Class designations into a single decision (or one for each class, similar to the Mimbres RMP), which includes a bulleted list of geographic areas that are within each class.
Mimbres RMP (Doña Ana County)	Manage 159,310 acres according to VRM Class I guidelines.	Yes	Consider modifying the acreage, if warranted/appropriate.
Mimbres RMP (Doña Ana County)	Manage 744,621 acres according to VRM Class II guidelines. VRM Class II areas include the wilderness study areas, Organ and Franklin Mountains, and most mountain ranges and hills in the Mimbres Resource Area, especially along highways.	Yes	Consider modifying the acreage, if warranted/appropriate.
Mimbres RMP (Doña Ana County)	Manage 629,314 acres according to VRM Class III guidelines. VRM Class III areas are mainly the flatlands, uplands, and basin areas along highways.	Yes	Consider modifying the acreage, if warranted/appropriate.
Mimbres RMP (Doña Ana County)	Manage 1,546,218 acres according to VRM Class IV guidelines. VRM Class IV areas comprise the nonhilly areas that are not visible from highways.	Yes	Consider modifying the acreage, if warranted/appropriate.
Mimbres RMP (Doña Ana County)	The following areas are designated as Scenic ACECs and will be managed as VRM Class I areas: • Doña Ana Mountains (1,490 acres) • Organ/Franklin Mountains (56,480 acres) • Robledo Mountains (9,190 acres) NOTE: Only ACECs within the Planning Area are listed.	Yes, partially	Visual resource decisions could be simplified by combining all VRM Class designations into a single decision (or one for each class, similar to the Mimbres RMP), which includes a bulleted list of geographic areas that are within each class. Separate decisions for each special designation would not be necessary.
Mimbres RMP (Doña Ana County)	Manage the Los Tules ACEC as VRM Class II.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage the Organ/Franklin Mountains ACEC as VRM Class I, III, or IV. Manage mountainous portions (generally above 5,000 feet) as VRM Class I; manage other portions as VRM Class III or IV.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage the Rincon ACEC as VRM Class II.	Yes	Same as above.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Manage the San Diego Mountain ACEC as VRM Class II.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage the Butterfield Trail as VRM Class II.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage the Aden Lava Flow Research Natural area as VRM Class II.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage the Kilbourne Hole National Natural Landmark as VRM Class II.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage the Paleozoic Trackways RNA as VRM Class II.	Yes	Same as above.
El Camino Real de Tierra Adentro National Historic Trail Comprehensive Management Plan/ Federal Environmental Impact Statement	The Mimbres and White Sands RMPs would be amended as follows: 97,873 acres of existing VRM Class IV public land to VRM Class II in the vicinity of high-potential historical segments and near select high-potential historical sites; amend 903 acres of VRM Class III public lands in the vicinity of high-potential historical trail segments and high-potential historic sites to VRM Class II.	Yes	Consider modifying the acreage, if warranted/appropriate.
Otero County ACEC RMP Amendment	Manage Three Rivers Petroglyph Site ACEC as VRM Class III.	Yes	Visual resource decisions could be simplified by combining all VRM Class designations into a single decision (or one for each class, similar to the Mimbres RMP), which includes a bulleted list of geographic areas that are within each class. Separate decisions for each special designation would not be necessary.
Otero County ACEC RMP Amendment	Manage Sacramento Escarpment ACEC as VRM Class I, II, and III. Manage the existing as VRM Class I, expanded as VRM Class II, and retained as VRM Class III.	Yes	Same as above.
Otero County ACEC RMP Amendment	Manage the Cornudas Mountain ACEC as VRM Class I.	Yes	Same as above.
Otero County ACEC RMP Amendment	Manage the Alamo Mountain ACEC as VRM Class I.	Yes	Same as above.
Otero County ACEC RMP Amendment	Manage the Wind Mountain ACEC as VRM Class I.	Yes	Same as above.
Otero County ACEC RMP Amendment	Manage the Alkali Lakes ACEC as VRM Class III.	Yes	Same as above.

The existing management decisions established through the White Sands and Mimbres RMPs adequately serve as sufficient guidelines specific to the Planning Area. Opportunities for changes in management include changes to the VRM classes based on boundary changes to special designations or the establishment of new special designations, and making management of acquired lands subject to management guidelines (i.e., the same VRM class) as adjacent lands.

4.11 WILDERNESS CHARACTERISTICS

The current management of the 12 WSAs in the Planning Area has been adequate to protect the wilderness characteristics of those areas. However, increased OHV use throughout the Decision Area could threaten the wilderness characteristics within WSAs. The revised RMP should address this issue through route designations and travel management decisions for these areas in order to continue to protect the wilderness characteristics of the WSAs.

4.12 LIVESTOCK GRAZING

Table 4-9
Adequacy of Current Management Direction and Options for Change for Livestock Grazing

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	Allotments will be managed for livestock grazing under the following categories: **M** - Maintain or improve existing situation (as described below): • Present ecological and management condition is satisfactory. • Moderate to high potential for vegetation production, and production is at or near potential. • Limited or no conflicts exist with livestock grazing. • Land status may or may not be considered. • Positive return on investment exists. **I** - Improve existing resource conditions (as described below): • Present ecological range condition is unsatisfactory with a downward trend. • Present management practices are inadequate to meet long-term objectives. • Vegetation production is producing at low to medium fair levels. • Resource conflicts are evident with livestock grazing. • Land status may or may not be considered. • Positive economic returns exist on public investments.	No	This is BLM policy, not a planning decision. However, it could be incorporated into a prioritization process as criteria for watershed evaluation and Standards and Guidelines assessments.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
	C - Custodial Management; prevention of deterioration of current resource conditions (as described below): • Present ecological condition of range is variable. • Vegetation production is relatively low. • Limited potential for improvement. • Limited or no conflicts exist with livestock grazing. • No economic return on public investment is likely.		
White Sands Resource Area RMP (Sierra and Otero Counties)	Multiple-use management actions will be developed for each allotment in Category I and selected Category M allotments. Activity plans will be prepared within the constraints of the RMP to resolve resource conflicts where they occur.	No	This is not a land use plan decision as currently stated. The statement should be changed so that it reflects management under Standards and Guidelines.
White Sands Resource Area RMP (Sierra and Otero Counties)	Grazing treatments will be incorporated into activity plans for Category I and selected Category M allotments to meet management objectives and goals established for each individual allotment.	No	This is not a land use plan decision. It seems as if "Grazing Treatments" means Best Management Practices here, which will help BLM work toward meeting the Standards for Public Land Health.
Mimbres RMP (Doña Ana County)	Allotments will be managed for grazing under the same categories as the White Sands RMP (M, I, C - listed above).	No	This is BLM policy, not a planning decision. However, it could be incorporated into a prioritization process as criteria for watershed evaluation and Standards and Guidelines assessments.
Mimbres RMP (Doña Ana County)	A benefit-cost analysis will be used to help set improvement priorities on all new rangeland improvements. Rangeland improvements and vegetation treatments will be implemented to improve or maintain forage production and range condition.	Yes	Suggest deleting the first sentence and changing the last sentence to "Rangeland…implemented to ensure achievement of the standards or make significant progress toward achievement of the standards."
Mimbres RMP (Doña Ana County)	On an allotment, adjustments can be made by changing one or more of the following: the kind and class of livestock, the season of use, the number of livestock, or the pattern of grazing use.	No	This is not a land use plan decision. This is BLM policy. Drop decision.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Monitoring studies have been or will be established on all Category I allotments in the Mimbres Resource Area. Category I allotments are monitored at a greater intensity that Category M or C allotments.	No	Monitoring should be driven by health assessment and evaluation; therefore, the decision should read that priority would be given to Category I, then M, then C.
Mimbres RMP (Doña Ana County)	Fragile land areas will receive high priority for AMP and other activity plan revision or development, allotment monitoring, land treatments, allotment re-categorization, and possible reduction or exclusion of surface-disturbing activities, including range improvement development and livestock grazing use.	Yes	Delineation and assessment of areas with soils that are highly susceptible to erosion from surface disturbances should be identified through the planning decisions, possibly in the Vegetative Communities section.
Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 1 Upland Sites Standard- Upland ecological sites are in a productive and sustainable condition within the capability of the site. Upland soils are stabilized and exhibit infiltration and permeability rates that are appropriate for the soil type, climate, and landform. The kind, amount, and/or pattern of vegetation provide protection on a given site to minimize erosion and assist in meeting State and tribal water quality standards.	Yes	No change(s) necessary. Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.
Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 2 Biotic Communities Standard (includes native, endangered, threatened, and special status species)- Ecological processes such as hydrologic cycle, nutrient cycle, and energy flow support productive and diverse native biotic communities. Desired plant-community goals maintain and conserve productive and diverse populations of plants and animals, which sustain ecological functions and processes.	Yes	No change(s) necessary. Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.
Record of Decision- Standards for Rangeland Health and Guidelines for Livestock Grazing	Standard 3 Riparian Sites Standard- Riparian areas are in a productive, properly functioning, and sustainable condition, within the capability of that site. Adequate vegetation of diverse age and composition is present that would withstand high stream flow, capture sediment, provide for groundwater recharge, provide habitat, and assist in meeting State and tribal water quality standards.	Yes	No change(s) necessary. Public Land Health Standards could be addressed under Continuing Management Guidance and would not change under any alternative.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Record of Decision-Standards for Rangeland Health and Guidelines for Livestock Grazing	Livestock Grazing Guideline 1 Livestock Grazing Management Practices (LGMPs) will promote native plant health, soil stability, and micro-organisms, water quality, stream channel morphology and function, and habitat for native wildlife including special status, threatened and endangered species, by • Allowing for plant recovery and growth time • Allowing residual vegetation in both upland and riparian sites to protect the soil from wind and water erosion, support infiltration and soil permeability, maintain, improve, or restore riparian-wetland functions including energy dissipation, sediment capture, groundwater recharge, and stream bank stability, and prevent excessive evaporation • Using livestock to integrate organic matter into the soil, distribute seeds and establish seedings, prune vegetation to stimulate growth, and enhance infiltration.	Yes	No change(s) necessary. Livestock Grazing Guidelines could be addressed under Continuing Management Guidance and would not change under any alternative.
Record of Decision-Standards for Rangeland Health and Guidelines for Livestock Grazing	Livestock Grazing Guideline 2 Season, duration, frequency and intensity of use should be flexible and consider climate, topography, vegetation, wildlife, and kind and class of livestock when developing and implementing livestock grazing management practices.	Yes	No change(s) necessary. Livestock Grazing Guidelines could be addressed under Continuing Management Guidance and would not change under any alternative.
Record of Decision-Standards for Rangeland Health and Guidelines for Livestock Grazing	Livestock Grazing Guideline 3 Facilities are located away from riparian-wetland areas wherever they conflict with achieving or maintaining riparian-wetland function.	Yes	No change(s) necessary. Livestock Grazing Guidelines could be addressed under Continuing Management Guidance and would not change under any alternative.
Record of Decision-Standards for Rangeland Health and Guidelines for Livestock Grazing	Livestock Grazing Guideline 4 Give priority to rangeland improvements and land treatments that offer the best opportunity for achieving standards.	Yes	No change(s) necessary. Livestock Grazing Guidelines could be addressed under Continuing Management Guidance and would not change under any alternative.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Record of Decision-Standards for Rangeland Health and Guidelines for Livestock Grazing	Livestock Grazing Guideline 5 Where LGMPs alone are not likely to achieve the desired plant community (including control of noxious weeds), land management practices including but not limited to and prescribed fire, and biological, mechanical, and chemical land treatments should be utilized.	Yes	No change(s) necessary. Livestock Grazing Guidelines could be addressed under Continuing Management Guidance and would not change under any alternative.

The current decisions and management directive address key issues. However, the applicable sections of the RMPs should be reviewed to determine if the current Standards and Guidelines processes adequately addresses these issues and whether additional RMP decisions are required. In addition, management guidelines need to address increased habitat fragmentation for wildlife associated with increased development of property adjacent to public lands and increased development a management directives could address development of properties adjacent to, or that indirectly affect livestock grazing allotments.

4.13 MINERALS

Table 4-10
Adequacy of Current Management Direction and Options for Change for Minerals

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	LM-1. Lands are withdrawn from execution of the public land laws by such means as Public Land orders, Secretarial orders, and Executive orders.	No	This is not a land use plan decision. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	MM-1. Needs for mineral materials will be based on public requests.	Yes	Possibly reword decision to comply with BLM's Land Use Planning Handbook, Appendix C, which reads, "areas open or closed to mineral material disposal" should be identified in the RMPs.
White Sands Resource Area RMP (Sierra and Otero Counties)	MM-2. Roads can be constructed by the permittees, applicants, or contractors upon approval from the BLM.	No	This is not a land use plan decision. Drop decision.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Otero County ACEC RMP Amendment	Three Rivers Petroglyph Site: Under the 1969 Segregation Notice, the ACEC is partially segregated from the sale of minerals. Minerals development and exploration is closed on the additional 105 acres of public land (Federal minerals). In addition, these lands are withdrawn from operation under the General Mining Laws. There will be no recreational gold panning.	?	Possibly list decision under the appropriate category of Fluid Minerals/Locatable Minerals headings (according to BLM's Land Use Planning Handbook, Appendix C): Coal Fluid minerals Locatable minerals Mineral materials Non-energy leasables Put recreation management prescription in the recreation section.
Otero County ACEC RMP Amendment	Sacramento Escarpment: The entire ACEC is closed to sale of minerals and non-energy mineral leasing. The entire ACEC is withdrawn from operation under the general mining laws.	?	Possibly list decision under the appropriate category of Fluid Minerals/Locatable Minerals headings (according to Appendix C): Coal Fluid minerals Locatable minerals Mineral materials Non-energy leasables
Record of Decision and RMPA for Fluid Minerals Leasing and Development in Sierra and Otero Counties	Lands Closed to (Fluid Mineral) Leasing: • An old Air Force bombing and gunnery range • Air Navigation Site • Jornada del Muerto, Brokeoff Mountains, Guadalupe Escarpment, and Sacrament Escarpment WSAs • Six ACECs • Eight nominated ACECs • Three pristine portions of the Nutt and Otero Mesa desert grassland habitat (35,790 acres)	Yes	Incorporate decisions for Doña Ana County into this list, if decisions should cover the entire Planning Area (else, keep separate by county).

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Record of Decision and RMPA for Fluid Minerals Leasing and Development in Sierra and Otero Counties	Lands Open to (Fluid Mineral) Leasing with Stipulation of No Surface Occupancy: • Rattlesnake Hill Archaeological District, Lone Butte, and Jarilla Mountains • Recreation and Public Purposes Act leases and patents • Community Pit 7 • Riparian areas and other wetlands and playas (extends 0.25-mile from sensitive area) • Six ecological study plots • Tularosa River Recreation Area • Lake Valley Historic Town site • Lake Valley Back Country Byway (extends 0.5-mile from byway)	Yes	Incorporate decisions for Doña Ana County into this list (i.e., major constraints), if decisions should cover the entire Planning Area (else, keep separate by county).
Record of Decision and RMPA for Fluid Minerals Leasing and Development in Sierra and Otero Counties	Lands Open to (Fluid Mineral) Leasing with Stipulation to Control Surface Use: • Berrendo Administrative Camp Site • Highly erosive and fragile soils • Designated historic trails (i.e., Morman Battalion, Butterfield, and Jornada del Muerto) • VRM Class II areas • Special status species habitats	Yes	Incorporate decisions for Doña Ana County into this list (i.e., major constraints), if decisions should cover the entire Planning Area (else, keep separate by county).
Record of Decision and RMPA for Fluid Minerals Leasing and Development in Sierra and Otero Counties	The remainder of the Nutt and Otero Mesa desert grassland habitat areas (exclusive of the aplomado falcon core areas) will be open to leasing, but with a stipulation that requires new lessees to form exploratory unit(s) prior to commencing drilling activity and that limits industry's disturbance to no more than 5 percent of the exploratory unit at any one time. The purpose is to protect remnant Chihuahuan Desert grassland habitat and associated special status wildlife species through greater planning of the future oil and gas development. These would be further accomplished through a Plan of Development for the unit(s).	Yes	Make decision language clear that this area falls under "Lands Open to (Fluid Mineral) Leasing with Stipulation to Control Surface Use" or another category.
Record of Decision and RMPA for Fluid Minerals Leasing and Development in Sierra and Otero Counties	Lands Open to (Fluid Mineral) Leasing with a Lease Notice: • White Sands Missile Range Safety Evacuation Zone • Cuchillo Mountains Piñon Nut Collection Area • Red Sands Off-Road Vehicle Area	Yes	Incorporate decisions for Doña Ana County into this list if decisions should cover the entire Planning Area (else, keep separate by county).

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Record of Decision and RMPA for Fluid Minerals Leasing and Development in Sierra and Otero Counties	Lands Open with Standard Lease Terms and Conditions that were Previously Closed to Leasing or had Stipulations Applied: • Caballo Mountain Communication Site • Public Water Reserves (excepts springs or dirt tanks) • Unoccupied habitat suitable for Desert Bighorn Sheep • VRM Class III and IV areas	No	Remove the wording "that were Previously Closed to Leasing or had Stipulations Applied" or combine the bulleted areas with the below decision and list more relevant information (i.e., sites that will be open to leasing as a result of this RMP).
Record of Decision and RMPA for Fluid Minerals Leasing and Development in Sierra and Otero Counties	All (other) lands not specifically mentioned above will generally be made available for leasing under standard lease terms and conditions. (Standard terms of an oil and gas lease provided for protection to other resources, and site-specific environmental analysis as provided by NEPA.)	Yes	Could possibly combine the decision above with this decision.
Mimbres RMP (Doña Ana County)	Leasable Minerals – Approximately 266,950 acres are closed to fluid mineral leasing. This includes all ACECs, research natural areas (RNAs), and a National Natural Landmark (NNL), in addition to closed areas.	Yes	Adjust acreages to reflect current data. Possibly combine with Fluid Minerals Decisions.
Mimbres RMP (Doña Ana County)	Leasable Minerals – The current stipulations for fluid mineral leasing will continue (274,000 acres).	Yes	Adjust acreages to reflect current data. Possibly combine with Fluid Minerals Decisions.
Mimbres RMP (Doña Ana County)	Leasable Minerals – About 65,000 acres are open to leasing with no surface occupancy. The remainder of the Mimbres resource area is open to mineral leasing, subject to standard terms and conditions: oil and gas, 3,532,300 acres; and geothermal and nonenergy leasable, 3,449,500 acres.	Yes	Adjust acreages to reflect current data. Possibly combine with Fluid Minerals Decisions. The Known Geothermal Resource Area "KGRA" should be reduced in size to truly reflect what is economic from what is not. Approximately one-half of the acreage that exists today could be eliminated. The remaining KGRA acreage should be protected from land disposal and made available for geothermal use.
Mimbres RMP (Doña Ana County)	Salable Minerals – All ACECs, RNAs and an NNL and the Butterfield and Continental Divide National Scenic Trails are closed to mineral material disposals (331,950 acres).	Yes	Adjust acreages to reflect current data. Add decisions for Sierra and Otero Counties. Add terms or conditions to protect other resource values while operating under mineral material regulations.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Salable Minerals – A competitive sale program will be established; the site(s) will be determined based on mineral surveys and would probably be within 10 miles of Las Cruces.	No	This is not a land use plan decision. Drop decision.
Mimbres RMP (Doña Ana County)	Salable Minerals – Processing miscellaneous negotiated mineral material sales and Free-Use Permits will continue.	No	This is not a land use plan decision. This is a standard operating procedure. Drop decision.
Mimbres RMP (Doña Ana County)	Salable Minerals – Riparian areas will not be disturbed.	Yes	Possibly combine with other "salable minerals" decisions/mgmt prescriptions together, using bullets to separate.
Mimbres RMP (Doña Ana County)	Salable Minerals – Activities on critical slopes over 20 percent require special mitigation.	Yes	Possibly combine with other "salable minerals" decisions/mgmt prescriptions together, using bullets to separate.

Existing management is adequate to achieve objectives for minerals management. However, the RMP process should serve to resolve resource conflict and management inconsistencies and incorporate best management practices and best available technology in minerals development. The following are management issues related to minerals development (fluids and non-fluids) within BLM administered lands of the Planning Area that need to be addressed in the RMPs:

- Current lease stipulations and Conditions of Approval for oil and gas development should be reviewed to ensure they are consistent with resource management objectives.

- CBM development has not been addressed in previous plans. Resource development potential, drilling, operational requirements, spacing, and conflict with other uses should be addressed in detail in the revised RMP. Requirements for production water disposal in each area and possibly from each producing interval (if constituents are different) should also be addressed.

- Use conflicts among coal production, CBM development, and conventional oil and gas development were not addressed in the previous RMPS and should be addressed in detail in the revised RMP.

- In areas of high erosion potential, reclamation has generally taken more time than specified in the lease or Condition of Approval. The revised RMP should address this issue to minimize resource impacts.

- The Known Geothermal Resource Area "KGRA" should be reduced in size to truly reflect what is economic from what is not. Approximately one-half of the acreage that exists today could be eliminated. The remaining KGRA acreage should be protected from land disposal and made available for geothermal use.

Additional decisions to consider, as appropriate, could include (1) identifying mineral material disposal areas for Sierra and Otero Counties, if appropriate, and/or (2) making recommendations for areas closed to mining of locatable minerals.

4.14 RENEWABLE ENERGY

No specific decisions exist for renewable energy use; therefore, management adequacy and opportunities should be evaluated such that new decisions may be developed for this use, consistent with current policy. Decisions established in the RMPs relevant to renewable energy generally would fall under Lands and Realty, as use of public lands for renewable energy projects would require realty or land use authorizations.

4.15 RECREATION

Table 4-11
Adequacy of Current Management Direction and Options for Change for Recreation

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	R-1. The road to Caballo Peak will be opened to casual recreation users.	Yes	This decision can be carried forward through route designations.
White Sands Resource Area RMP (Sierra and Otero Counties)	R-2. The present stand of piñon pine in the Cuchillo Mountains will be maintained as a piñon nut collection area.	No	Possibly include the decision in the vegetation section and continue to apply prescribed burning treatments to promote the regeneration of pinon in the area.
White Sands Resource Area RMP (Sierra and Otero Counties)	Approximately 960 acres of surface and 840 acres of subsurface at the Three Rivers Petroglyph Sites and Picnic Area will continue to be withdrawn under the Classification and Multiple Use Act to protect cultural and recreational values.	Yes	Decision is still valid and will be carried forward into the new RMP for the long-term protection of resource values in the Special Management Areas.
White Sands Resource Area RMP (Sierra and Otero Counties)	The area around the Jarilla Mountains will continue to be available for organized OHV events.	Yes	Possibly change wording from “the Jarilla Mountains” to “Red Sands OHV area.”
Mimbres RMP (Doña Ana County)	Sacramento Escarpment ACEC • Manage the 3,640-acre ACEC according to the Sacramento Escarpment ACEC Management Plan, to enhance, protect, and prevent irreparable damage to the scenic and recreational values of the escarpment.	No	Possibly remove decision, since it is repetitive (it is listed in the Special Designations Table) – it seems more like a goal/objective for the ACEC, and management prescriptions should then follow from that.
Mimbres RMP (Doña Ana County)	RE-01. Designate Doña Ana Mountains SRMA. (Only SRMAs within the Planning Area are listed.)	No	Keep the SRMA with expanded boundaries (to include mountain biking trails in the south). Possibly establish recreation management zones for the SRMA.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Organ Franklin Mountains ACEC: • Manage in accordance with the Organ Mountains Coordinated Resource Management Plan. • Prohibit dogs and pets and require hiking on designated trails only in upper Ice Canyon above the drift fence. • Manage for Recreation Opportunity Spectrum (ROS) primitive, semiprimitive nonmotorized, semi-primitive, and roaded natural classes.	Yes	Incorporate ACEC into SRMAs and possibly use the recreation opportunities present in the area to identify the recreation management zones under the new guidance in BLM Land Use Planning Handbook, Appendix C.
Mimbres RMP (Doña Ana County)	Doña Ana Mountains ACEC: • Manage for primitive and semiprimitive recreational opportunities. • Develop primitive campsites in the "bowl" on the north side (10 acres). • Manage for ROS semiprimitive nonmotorized, semi-primitive motorized, and roaded natural classes.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Los Tules ACEC: • Manage for ROS semiprimitive nonmotorized class.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Rincon Petroglyphs ACEC: • Manage for semi-primitive nonmotorized class. • Evaluate potential to interpret the petroglyphs.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	San Diego Mountain ACEC: • Manage for ROS semiprimitive nonmotorized class. • Manage for research rather than interpretive value.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Butterfield Trail: • Manage for ROS semiprimitive motorized class. • Interpret, with emphasis on passive interpretation such as signing.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	RE-02. Designate Aden Lava Flow (3,930 acres) as a Research Natural Area and continue designation of Kilbourne Hole as a national landmark to protect geologic, scenic, and research values.	No	Options for change might include keeping the RNA and NNL designations with expanded or reduced boundaries, or dropping designations altogether, and/or designation as SRMAs if appropriate.
Mimbres RMP (Doña Ana County)	Aden Lava Flow RNA: • Manage for ROS primitive and semiprimitive nonmotorized classes. • Designate parking area and trail to crater.	No	Options for change might include keeping the RNA designation or dropping designations altogether, and/or designation as an ACEC if appropriate.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
	• Research and interpret paleontological and geological features.		
Mimbres RMP (Doña Ana County)	Kilbourne Hole National Natural Landmark: • Manage for ROS semiprimitive motorized class. • Interpret geological feature by signing. • Establish safety "no shooting" restriction within the rim. • Establish primitive facilities (parking area, tables, toilets) (2 acres).	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Paleozoic Trackways: • Manage for ROS semiprimitive nonmotorized class. • Interpret in accordance with study legislation.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	The remainder of the Mimbres Resource Area will be managed primarily for dispersed recreation opportunities.	No	This is not a land use plan decision. Drop decision.
Otero County ACEC RMPA	Three Rivers Petroglyph ACEC: • The ACEC will continue to be closed to hunting and the use of firearms. • Resource values in the ACEC will continue to be interpreted for public information and education. • The ROS classes within the ACEC are roaded natural and semi-primitive nonmotorized.	Yes	Incorporate ACEC into SRMAs and possibly use the recreation opportunities present in the area to identify the recreation management zones under the new guidance in BLM Land Use Planning Handbook, Appendix C.
Otero County ACEC RMPA	Sacramento Escarpment ACEC: • Interpretation of resource values for public information and education will be considered on a case-by-case basis. • The ROS classes within the ACEC are rural, urban, and semi-primitve nonmotorized.	Yes	Same as above.
Otero County ACEC RMPA	Cornudas Mountain ACEC: • Recreational access to Butterfield Trail will continue to be by permit. • There will be no camping within the ACEC. • There will be minimal BLM interpretation to provide for public information and education of resources values. • The ROS classes within the ACEC are roaded natural and semi-primitive nonmotorized.	Yes	Same as above.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Otero County ACEC RMPA	Alamo Mountain ACEC: • There will be no camping within the cultural resource area. • There will be minimal BLM interpretation to provide for public information and education within the ACEC. • The ROS classes within the ACEC are roaded natural, semiprimitive motorized and semi-primitive nonmotorized.	No	The following text is no longer needed in the decision: "There will be no camping within the cultural resource area."
Otero County ACEC RMPA	Wind Mountain ACEC: • Interpretation of resources values for public information and education will be considered on a case-by-case basis. • The ROS classes within the ACEC are roaded natural and, semiprimitive nonmotorized.	Yes	Incorporate ACEC into SRMAs and possibly use the recreation opportunities present in the area to identify the recreation management zones under the new guidance in BLM Land Use Planning Handbook, Appendix C.
Otero County ACEC RMPA	Alkali Lakes ACEC: • There will be no camping or fires within the ACEC. • Interpretation of resource values for public information and education will be considered on a case-by-case basis. • The ROS classes within the ACEC are rural, semiprimitive motorized, and semi-primitive nonmotorized.	Yes	Same as above.

Although certain aspects of the recreation management program are functioning well under the management direction provided in the current RMPs, some issues will need to be addressed in this RMP process. As recreation use has increased across the Planning Area, some of the SRMA areas may not be adequate for managing the more concentrated use, and may need to be reassessed for SRMA designation. SRMA designations would allow the BLM to allocate funding for management, improvements, and/or developments in those areas.

- Portions of the Planning Area may benefit from increased management that could be provided by SRMA designation. In addition, given the increasing use of trails in BLM-administered lands of the Planning Area from both motorized and non-motorized recreationists, alternatives could be considered that establish motorized route designations that determine the appropriate amount, type, and season of use.

4.16 LANDS AND REALTY

Table 4-12
Adequacy of Current Management Direction and Options for Change for Lands and Realty

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	LA-1. Review and take appropriate action on the following public water reserves: • T. 26 S., R. 10 E., Section 24 – Dirt Tank, Section 4, Permit No. 1238 • T. 24 S., R. 15 E., Section 5 – Well, Section 4, Permit No. 1721 • T. 26 S., R. 11 E., Section 26 – Dirt Tank, Section 4, Permit No. 2097 • T. 18 S., R. 1 W., Section 24 – Dirt Tank • T. 15 S., R. 1 W., Section 34	No	This is not a land use plan decision. Decision is no longer relevant because the cases have been reviewed and closed. Drop decision.
White Sands Resource Area RMP (Sierra and Otero Counties)	LA-2. Initiate action to remove the restriction prohibiting subsurface use of lands used as impact areas on the old U.S. Air Force bombing and gunnery range not opened by PLO 2569.	Yes	This decision is valid, and can be carried forward as is. The decision could be modified based on wording in the PLO.
White Sands Resource Area RMP (Sierra and Otero Counties)	LA-3. Consider land tenure adjustments of lands (184,000 acres) (23,000 to be acquired and 161,000 to be disposed).	Yes	This decision could be modified to show adjusted acreages and locations to reflect desired management in these two counties. When developing alternatives, disposal lands identified before July 25, 2000 should be kept separate from newly identified disposal lands (i.e., using GIS data and appropriate mapping). Perhaps remove specific acreages for acquisition, as particular lands/parcels do not need to be identified; only criteria for acquisitions need to be outlined.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	Consider land tenure adjustments of lands for • Isolated and difficult to manage parcels • Lands needed for community expansion and public purposes • Lands where interest has been shown including lands identified by the State of New Mexico for possible exchange • Potential exchange lands • Potential acquisition lands (23,000 acres)	Yes	The decision could be modified to include the following: Acquisition criteria (e.g., on public benefits, management considerations, and public access needs). Criteria for when BLM may consider lands for disposal that were not identified for disposal in the LUP (through sale, exchange, R&PP Patent, transfer of jurisdiction to another federal agency, color-of-title, and to resolve cloud on title) Revised agreement with the State of New Mexico, if applicable/appropriate.
White Sands Resource Area RMP (Sierra and Otero Counties)	Public land not identified for disposal will be retained in Federal ownership, except that within retention areas, only those parcels that will enhance overall consolidation of public land will be considered for exchange.	Yes	The decision is unnecessary and could be consolidated with the above decision/criteria.
Mimbres RMP (Doña Ana County)	BLM will no longer address communication sites in the San Augustine Pass area so long as White Sands Missile Range (WSMR) is willing to consider communication site applications for that area. Should WSMR cease considering applications from private parties, the BLM will resume management of the area in accordance with provisions of the Mimbres RMP.	Yes	More research is needed to determine if San Augustine Pass is located on BLM lands. If so, the decision is valid and will be carried forward.
Mimbres RMP (Doña Ana County)	Certain parcels of land were set aside (reserved) by Memorandums of Understanding with the City of Las Cruces and the Las Cruces School District No. 2 for disposal and future development under the R&PP Act.	No	This decision could be removed because most of these lands have been “used” and any remaining could be included on a list of lands identified for disposal. That is, the overall decision for disposals will say how many acres are identified for disposal and have an associated map. This would consolidate all the specific disposal decisions into one decision. When developing alternatives, disposal lands identified before July 25, 2000 should be kept separate from newly identified disposal lands (i.e., using GIS data and appropriate mapping).

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Certain parcels were set aside within the 10,000-acre State Land Exchange Area for existing and potential R&PP lease and/or patent.	No	The overall decision for disposals will say how many acres are identified for disposal and have an associated map. This would consolidate all the specific disposal decisions into one decision. When developing alternatives, disposal lands identified before July 25, 2000 should be kept separate from newly identified disposal lands (i.e., using GIS data and appropriate mapping).
Mimbres RMP (Doña Ana County)	Seven sections of land adjacent to the proposed Organ Mountains National Conservation Area were identified for disposal in the Southern Rio Grande Management Framework Plan will not be disposed: • T. 22 S., R. 3 E Sections 16, 21, 28 and 33 • T. 23 S., R. 3 E. Section 33 • T. 25 S., R. 3 E. Section 35 • T. 26 S., R. 5 E. Section 31	No	This decision is no longer relevant; it was completed with the Mimbres RMP. Drop decision.
Mimbres RMP (Doña Ana County)	Land to be retained: The specific land disposal area described as • T. 20 S., R. 3 E. Sections 28 S½, 33, 34 • T. 21 S., R. 3 E. Sections 3, 4, 7 SE¼, 8, 9, 10, 14, N½, 15 N ½, 17, 18	No	This decision is no longer relevant; it was completed with the Mimbres RMP. Drop decision.
Mimbres RMP (Doña Ana County)	A right-of-way (NMNM66383) was granted to the National Aeronautics and Space Administration (NASA) and a subsequent Memorandum of understanding (NM-030-45) was signed in April 1990 reserving public land for groundwater monitoring wells. Based on groundwater studies, these lands may need to be withdrawn to protect public safety.	Yes	This decision could be modified to indicate that this is a proposed withdrawal area, and that in the interim the land should be retained in federal ownership.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	To facilitate orderly disposal on East Mesa, two disposal zones are delineated: First priority is public land west of a north-south line, 1 mile east of the boundary between R. 2 E., and R. 3 E. Second priority is public land east of the line described above	No	The overall decision for disposals will say how many acres are identified for disposal and have an associated map. This would consolidate all the specific disposal decisions into one decision. There is no need to set priorities this way in the RMP, rather BLM will work closely with county and city officials and determine the best course of action.
Mimbres RMP (Doña Ana County)	LA-02. A total of 2,896,080 acres of public land not identified for disposal will be managed in accordance with provisions of Section 102(a) of the Federal Land and Policy Management Act.	No	This is not a land use plan decision. Drop decision.
Mimbres RMP (Doña Ana County)	No public land contiguous to U.S. Forest Service land will be disposed of regardless of parcel size. Coordination will take place with the U.S. Forest Service for reservation of easements on parcels adjacent to but not contiguous with U.S. Forest Service lands as they are disposed.	No	This could be moved to "disposal criteria" or added to list of a list of lands for disposal. Additional coordination should take place with the Forest Service to see if other changes might be appropriate.
Mimbres RMP (Doña Ana County)	No public land within areas of critical environmental concern (ACECs) and other special management areas (SMAs) will be disposed.	Yes	This could be moved to "disposal criteria" or added to a list of lands for disposal.
Mimbres RMP (Doña Ana County)	Public land may be disposed of through exchange in order to consolidate other public land outside of disposal areas. Only lands within disposal areas will be exchanged for lands outside the Mimbres Resource Area.	No	Parts of this decision could be consolidated with "disposal criteria" for all 3 counties, but the wording should be adjusted to make the intent of the decision clear.
Mimbres RMP (Doña Ana County)	LA-03. A total of 93,110 acres of State Trust Land and 56,210 acres of private land are identified for potential acquisition. All State Trust Land and private land will be acquired within ACECs and other SMAs through exchange or purchase at fair market value, provided the landowner is in agreement with such acquisition.	Yes	Identify "acquisition criteria" rather than stating specific parcels or acreages.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Picacho Peak is identified for potential acquisition and will be managed with temporary special management (if acquired) until an RMP can be amended. Temporary special management includes: • Exclude right-of-way authorizations • Manage as visual resource management (VRM) Class II • Limit vehicles to designated roads and trails • Close to mineral material sales	No	Picacho Peak has been acquired; management prescriptions will be developed as part of the RMP. Drop decision.
Mimbres RMP (Doña Ana County)	The Doña Ana Recreation Area, Massacre Peak, Fort Cummings, and Granite Gap Recreation Area classifications will be terminated upon publication of a Federal Register notice following the completion of the (Mimbres RMP) Plan.	Yes	Further research is needed to determine if protective withdrawal occurred and whether the decision should be carried forward.
Mimbres RMP (Doña Ana County)	[Classifications for] Guadalupe Canyon, Organ Mountains Recreation Area, Baylor Recreation Area, and Needle's Eye Picnic Site will remain in effect until replaced by a protective withdrawal.	Yes	Further research is needed to determine if protective withdrawal occurred, if it has not then the decision should be carried forward.
Mimbres RMP (Doña Ana County)	No applications will be accepted for disposal under the Desert Land Act.	No	This is not a land use plan decision. Drop decision.
Mimbres RMP (Doña Ana County)	right-of-way exclusion areas are established for 264,870 acres, and avoidance areas are established for 783,400 acres.	Yes	Adjust acreages to reflect desired management for Doña Ana County.
Mimbres RMP (Doña Ana County)	right-of-way exclusion areas include: • ACECs • Research Natural Areas • National Natural Landmarks	Yes	These could be used as criteria for the exclusion and avoidance areas and one decision could capture the overall acres designated as "exclusion" and/or "avoidance" area within each county (with associated maps); that is, separate decisions would not be needed for each special management designation.
Mimbres RMP (Doña Ana County)	right-of-way avoidance areas include: • Continental Divide National Scenic Trail • Butterfield Trail • Bighorn sheep areas • VRM Class II areas	Yes	These could be used as criteria for the exclusion and avoidance areas and one decision could capture the overall acres designated as "exclusion" and/or "avoidance" area within each county (with associated maps); that is, separate decisions would not be needed for each special management designation.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	The remainder of the resource area is open to the location of rights-of-way, subject to standard stipulations (1,970,180 acres).	Yes	These could be used as criteria for the exclusion and avoidance areas and one decision could capture the overall acres designated as "exclusion" and/or "avoidance" area within each county (with associated maps); that is, separate decisions would not be needed for each special management designation.
Mimbres RMP (Doña Ana County)	The BLM will encourage new facilities to be located near existing sites or in existing corridors.	Yes	No change(s) needed.
Mimbres RMP (Doña Ana County)	New linear rights-of-way that terminate on private inholdings within an exclusion area may be authorized within an exclusion area if no other reasonable alternative exists. Special stipulations for avoidance areas will also apply to these authorizations.	Yes	No change(s) needed.
Mimbres RMP (Doña Ana County)	Existing rights-of-way within exclusion areas are recognized as grandfathered and operation, maintenance, and renewal of these facilities would be allowed to continue within the scope of the right-of-way grant.	Yes	No change(s) needed.
Mimbres RMP (Doña Ana County)	The following stipulations apply to new facilities within avoidance areas: • Facilities will not be located parallel to the Continental Divide National Scenic Trail or Butterfield Trail. • Facilities will not be located within a quarter-mile of any stage station on the Butterfield Trail. • Facilities will not be located in riparian areas. • Access routes will be limited and considered on a case-by-case basis.	No	The four decisions listed here should be separated and have more information presented to clarify the restrictions with respect to rights-of-way (e.g., whether utilities would be allowed to span riparian areas with overhead lines).
Mimbres RMP (Doña Ana County)	RW-03. A site management plan will be prepared (with NASA and New Mexico State University input) for "A" Mountain.	No	This plan has been completed. Drop decision.
Mimbres RMP (Doña Ana County)	Management will continue to authorize routine commercial realty actions under the authority of 43 CFR 2920 throughout the 20-year life of the RMP.	No	This is not a land use plan decision. Include as Continuing Management Guidance. Drop decision.
Mimbres RMP (Doña Ana County)	The acquisition of nonpublic lands in SMAs or lands containing unique or unusual historic, cultural, mineral, recreational, scientific, scenic, or wildlife habitat values will be pursued as a first priority.	Yes	Add to a list of "acquisition criteria."

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	No sanitary landfill sites will be patented in the Mimbres Resources Area pursuant to the R&PP Act until regulations implementing the 1988 amendment to the R&PP Act are completed.	No	This is not a land use plan decision. This is BLM policy. Drop decision.
Mimbres RMP (Doña Ana County)	Organ Franklin Mountains ACEC lands and realty management prescriptions - • Retain all public land; acquire all state trust and private land inholdings through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Exclude authorizations for new rights-of-way in accordance with other lands decisions, except within existing utility corridors. The east-west corridor near Vado and the ones running north and south will be confined to a width of ¼ mile. The corridor in the Anthony Gap area will be confined to a width of ½ mile.	No	The element of the decision regarding excluding authorizations should be reviewed to consider the Baylor Canyon Road area. Also, clarification and expansion of the Anthony Gap corridor may be useful. Decision can be incorporated into the decisions listed below in order to consolidate information at a programmatic level: • Retention and disposal areas • Acquisition criteria (e.g. pursue ACEC in holdings first) • right-of-way avoidance and exclusion areas • Corridor designations • Temporary special management for acquired lands in ACECs (Note: Management prescriptions could be outlined for special designations in an appendix or separate table from land use plan decisions to group them geographically for easier interpretation by the general public.)
Mimbres RMP (Doña Ana County)	Doña Ana Mountains ACEC lands and realty management prescriptions - • Retain all public land. • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	Yes	See comment above.
Mimbres RMP (Doña Ana County)	Los Tules ACEC lands and realty management prescriptions - • Retain all public land; acquire adjacent private land inholdings through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Exclude authorizations for new rights-of-way in accordance with other land decisions.	Yes	See comment above.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Rincon Petroglyphs ACEC lands and realty management prescriptions - • Retain all public land; acquire all State Trust land in south half of section 32 through exchange or purchase at fair market value, provided the landowner is in agreement with such acquisition. • Exclude new right-of-way authorizations outside existing sites in accordance with other lands decisions.	Yes	See comment above.
Mimbres RMP (Doña Ana County)	Robledo Mountains ACEC lands and realty management prescriptions - • Retain all public land; acquire all state trust inholdings through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	No	See comment above and consider whether changes are necessary to accommodate routes identified by the Municipal Planning Organization (MPO).
Mimbres RMP (Doña Ana County)	San Diego Mountain ACEC lands and realty management prescriptions - • Retain all public land; acquire adjacent private land inholdings through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	Yes	See comment above. (NOTE: ACEC boundaries are proprietary and are not mapped for public review.)
Mimbres RMP (Doña Ana County)	Butterfield Trail lands and realty management prescriptions - • Retain all public land; acquire all State Trust and private land inholdings (with emphasis on Stage Stations) through exchange or purchase at fair market value, provided that the landowner is in agreement with such acquisition. • Restrict authorizations for rights-of-way.	No	See comment above and include the Butterfield Trail lands on a map so that restrictions can be managed.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Aden Lava Flow RNA lands and realty management prescriptions - • Exclude authorizations for new rights-of-way in accordance with other lands decisions.	No	See comment above, but also address that this decision could be modified because in Section 36, T. 25 S., R. 2 W., S1/2 there is split estate and the federal government does not own the minerals. Add verbage to a list of acquisition criteria such as, "BLM will pursue acquisitions of surface and subsurface estate in special management areas."

Although land exchanges and other land tenure adjustment actions completed by the Las Cruces District Office conform to previous RMPs, several areas should be addressed to facilitate implementation of the lands and realty program. Criteria concerning land retention, disposal, and acquisition should be reviewed to ensure they provide adequate opportunity to accomplish appropriate land tenure actions. Section 205 of the Federal Land Policy and Management Act of 1976, authorizes the BLM to acquire land or interests in land for all purposes related to its mission as long as there acquisition are consistent with applicable land use plans. Land acquisitions support the BLM strategic goals by providing opportunities for environmentally responsible recreation and preservation of our natural and cultural heritage.

The following management decisions regarding rights-of-way should be addressed during this RMP process:

- The RMPs should consider the designation of major right-of-way corridors.
- The previous RMPs identify specific areas as suitable, unsuitable and sensitive for siting rights-of-way. These decisions may be outdated because changes in data and resource uses, conditions and needs have occurred; therefore, these decisions may be modified to identify areas where surface disturbing activities are suitable, not suitable, or should be restricted.

Previous evaluations of RMP decisions resulted in the following suggestions to improve management direction for lands and realty:

- The RMPs should include language that addresses land use planning for lands acquired through exchange.
- Lands acquired since approval of the previous RMP may not have land use plan decisions applied to them. Therefore, the RMPs may need to assess the need for updated decisions regarding these areas.

4.17 TRANSPORTATION/ACCESS

Table 4-13
Adequacy of Current Management Direction and Options for Change for Transportation/Access

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	A-1. Legal access will be provided to most of those public lands that currently have none, and roads will be provided across most of those public lands that currently have none.	Yes	This is an implementation decision and can be dropped from the RMP; instead criteria should be developed for prioritizing access needs.
White Sands Resource Area RMP (Sierra and Otero Counties)	Acquire easements on 36 miles of existing non-Federal and nonpublic (i.e. private) roads (of which 16 miles will be improved to include grading and drainage).	Yes	This is an implementation decision and can be dropped from the RMP; instead criteria should be developed for prioritizing access needs.
White Sands Resource Area RMP (Sierra and Otero Counties)	238 miles of new roads will be constructed (of which 70 miles will be built to primary road standards, and 168 miles will be built to secondary-road standards).	Yes	This is an implementation decision and can be dropped from the RMP; instead criteria should be developed for prioritizing access needs.
White Sands Resource Area RMP (Sierra and Otero Counties)	R-4. For public land not designated as limited or closed, designate "open" to OHV use.	Yes	The acreages designated as open, limited, and closed could change based on resource values and uses.
White Sands Resource Area RMP (Sierra and Otero Counties)	R-4. The following areas will be "closed" to OHV use: • Study plot exclosures • Rattlesnake Hill Archaeological District • Jarilla Mountains	Yes	List and/or add additional closures.
White Sands Resource Area RMP (Sierra and Otero Counties)	W-1. OHV use in the Wind and Chess Draw watershed area is limited to existing roads and trails.	Yes	Designations for open, limited, and closed areas can be combined into one decision, with a bulleted list of specific areas (e.g., ACECs listed under each).
White Sands Resource Area RMP (Sierra and Otero Counties)	W-2. OHV use in the Moccasin and Otto Draw watershed area is limited to existing roads and trails.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	W-3. OHV use in the watershed area east of Tularosa and south of Tularosa River is limited to existing roads and trails.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	W-4. OHV use in the watershed area east of Crow Flats is limited to existing roads and trails.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	WL-2. OHV use in the Percha Creek riparian area is limited to existing roads and trails.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	C-4. OHV use in the Lone Butte Area is limited to existing roads and trails.	Yes	Same as above.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	VR-2. OHV use in the Brokeoff Mountains is limited to existing roads and trails.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	VR-03. OHV use in the Cornudas Mountains is limited to existing roads and trails.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	VR-04. OHV use in the Cuchillo Mountains is limited to existing roads and trails.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	V-1. Vegetation study plot enclosures are closed to OHV use.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	OGG-5 and C-2. Rattlesnake Hill Archaeological District is closed to OHV use.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	C-3. Alamo Mountains petroglyph area is closed to OHV use.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	C-5. Jarilla Mountains is closed to OHV use.	Yes	Same as above.
White Sands Resource Area RMP (Sierra and Otero Counties)	MM-2. Roads can be constructed by the mineral materials permittees, applicants, or contractors upon approval from the BLM. The BLM will be responsible for access if it is to a common use area or a community pit.	Yes	No change(s) necessary.
White Sands Resource Area RMP (Sierra and Otero Counties)	Transportation plans will be developed on a county-by-county basis in the next few years.	Yes	Designate routes for WSAs and ACECs as part of RMP, and outline priorities for completing route inventories and designations.
Mimbres RMP (Doña Ana County)	Community Pit No. 1 - Acquire legal access to public land from Shalem Colony Road (approximately 0.5 mile).	Yes	This is an implementation decision and can be dropped from the RMP; instead criteria should be developed for prioritizing access needs.
Mimbres RMP (Doña Ana County)	Organ Mountains - Acquire legal public access for vehicular use south of Soledad Canyon through private properties.	Yes	This is an implementation decision and can be dropped from the RMP; instead criteria should be developed for prioritizing access needs.
Mimbres RMP (Doña Ana County)	Restrict public access to the rock shelters at Apache Box, Apache Cave, and elsewhere as needed.	Yes	This could be designated as “closed” to vehicle travel; else, implementation decisions and actions can be taken to restrict access to protect resources and/or public safety.
Mimbres RMP (Doña Ana County)	Robledo Mountains - Acquire legal public access across private land for vehicular use on the north end (via Fred Huff Road or Faulkner Canyon).	Yes	This is an implementation decision and can be dropped from the RMP; instead criteria should be developed for prioritizing access needs.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	West Potrillo Mountains - Acquire legal public access to the north and west sides.	Yes	This is an implementation decision and can be dropped from the RMP; instead criteria should be developed for prioritizing access needs.
Mimbres RMP (Doña Ana County)	CU-09. Close road to Bruton Bead Site.	Yes	No change(s) needed; ensure closure has been mapped.
Mimbres RMP (Doña Ana County)	The area open to OHV use is the Aden Hills Open Area (8,700 acres).	Yes	Designations for open, limited, and closed areas can be combined into one decision, with a bulleted list of specific areas (e.g., ACECs listed under each).
Mimbres RMP (Doña Ana County)	The areas limited to designated roads and trails for vehicle use are all SMAs not designated closed and the Broad Canyon competitive motorcycle area.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	The areas closed to vehicle use are the Mexican border area south of Anapra–Columbus Road and south of State Route 9 in Doña Ana and Luna Counties (89,180 acres), and portions of the Organ/Franklin Mountains.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	In all other areas, OHV use is limited to existing roads and trails. Existing roads and trails are defined as those in existence at the time of designation.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Any road or trail created by the passage of vehicles after December 1993 will not be considered open and will be subject to closure.	Yes	Roads and trails over 10 years old may be well established, consider changing the date, particularly with use of more current data and inventories for route designations.
Otero County ACEC RMPA	Three Rivers Petroglyph ACEC: • Vehicle use is limited to designated roads and trails. • Foot trails and signage will continue to be used and developed to guide and regulate public use. • The three rivers site is within two OHV designations. The established site is designated “limited” to designated roads and trails, and the rest of the proposed site is designated as “open”.	Yes	Designations for open, limited, and closed areas can be combined into one decision, with a bulleted list of specific areas (e.g., ACECs listed under each).
Otero County ACEC RMPA	Sacramento Escarpment ACEC: • Provide full recreational access to public lands, subject to the legal routes of access. • OHV use is limited to designated roads and trails.	Yes	Same as above.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Otero County ACEC RMP Amendment	Cornudas Mountain ACEC: • Recreational access to Butterfield Trail will continue to be by permit. • Access to the stage station also requires permission from the private landowner as private land must be crossed to access the station.	Yes	Same as above.
Otero County ACEC RMPA	Alamo Mountain ACEC: • Vehicle use is limited to designated roads and trails. • A parking turn around will be developed along the road on the west side of the ACEC. • The road to the stage stop will be closed to public use.	Yes	Same as above.
Otero County ACEC RMPA	Wind Mountain ACEC: • Vehicle use is restricted to designated roads and trails. • Full recreational access is provided to public lands, subject to the legal routes of access.	Yes	Same as above.

Transportation and access is addressed in the previous RMP by identifying the need for an access/transportation plan to identify routes, road closures, and support needs. However, this plan has not been developed. The RMP process should develop direction for assessing and making changes to the road and trail system that would continue to allow for adequate public access to public lands, while mitigating resource and use impacts. Additionally, the previous RMPs designated areas as open, limited or closed to OHV use. These OHV designations should be re-evaluated to determine if they are still valid.

4.18 SPECIAL DESIGNATIONS

Table 4-14
Adequacy of Current Management Direction and Options for Change for ACECs within the Decision Area

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
White Sands Resource Area RMP (Sierra and Otero Counties)	Designate 3,640 acres as the Sacramento Escarpment ACEC. Manage the ACEC according to the Sacramento Escarpment ACEC Management Plan to enhance, protect, and prevent irreparable damage to the scenic and recreational values of the escarpment.	Yes	The removal of this designation is not being considered; however, the boundaries of the areas may change based on BLM's evaluation of nominated ACECs and consideration for multiple-use management.
White Sands Resource Area RMP (Sierra and Otero Counties)	Develop a Cultural Resource Management Plan for the 200-acre Alamo Mountain Petroglyphs area.	Yes	Same as above.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Otero County ACEC RMPA	Designate 1,036 acres as the Three Rivers Petroglyph ACEC. Manage to protect cultural values using the Three Rivers Cultural Resource Management Plan. Continue to highlight public awareness of resource values.	Yes	Same as above.
Otero County ACEC RMPA	Add 1,725 acres to the 3,640-acre Sacramento Escarpment ACEC. ACEC Management Prescriptions guide the management of all resources within the ACEC. Actions remaining current in the existing ACEC plan for the Sacramento Escarpment have been brought forward to the proposed ACEC Management Prescriptions. Programs for public information and education of resource values are considered on a case-by-case basis.	Yes	Same as above.
Otero County ACEC RMPA	Designate 2,690 acres as the Alamo Mountain ACEC. The ACEC management prescriptions will guide management of all other resources within the Alamo Mountain ACEC. Management of the Butterfield Trail within the ACEC will be guided by the Butterfield Trail Cultural Resource Management Plan. Programs for public information and education of resource values are minimized.	Yes	Same as above.
Otero County ACEC RMPA	Designate 850 acres as the Cornudas Mountain ACEC. The ACEC Management Prescriptions will guide management of all other resources within the Cornudas Mountains ACEC. Management of the Butterfield Trail within the ACEC will be guided by the Butterfield Trail Cultural Resource Management Plan. Programs for public information and education of resource values are minimized.	Yes	Same as above.
Otero County ACEC RMPA	Designate 2,506 acres as the Wind Mountain ACEC. The ACEC Management Prescriptions will guide management of all other resources within the Wind Mountain ACEC. Programs for public information and education of resource values are minimized.	Yes	Same as above.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Otero County ACEC RMPA	Designate 6,359 acres as the Alkali Lakes ACEC. Management of the area is guided by the Guadalupe Ranch Coordinated Resource Management Plan and the decisions resulting from the Otero County ACEC RMPA. Programs for public information and education of resource values are minimal.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage 840 acres as the Rincon Petroglyph ACEC. Manage for the protection of cultural values.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage 1,490 acres as the Doña Ana Mountains ACEC. Manage for the protection of biological, scenic, and cultural values.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage 9,190 acres as the Robledo Mountains ACEC. Manage to protect biological and scenic values and to protect, research, and interpret paleontological values.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage 20 acres as the Los Tules ACEC. Manage to protect cultural values.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage 640 acres as the San Diego Mountain ACEC. Manage to protect and research cultural values. Manage for research rather than interpretive value. Encourage or conduct rock-art research.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage 56,480 acres as the Organ/Franklin Mountains ACEC. Manage to protect biological, scenic, riparian, special status species, and cultural values. Manage in accordance with the Organ Mountains Coordinated Resource Management Plan. Monitor the area in accordance with the concepts of limits of acceptable change with emphasis on the most biologically or culturally sensitive areas.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage 3,930 acres as the Aden Lava Flow research natural area (RNA). Manage to protect biological, scenic, geological, and research values. Research and interpret paleontological and geological features. Establish research permitting/information exchange process.	Yes	Same as above.
Mimbres RMP (Doña Ana County)	Manage 5,480 acres as Kilbourne Hole national natural landmark (NNL). Manage to protect geological values. Interpret geological features by signing and establish primitive facilities.	Yes	Same as above.

Decision Source	Planning Decision	Is Decision Adequate?	Remarks/ Options for Change
Mimbres RMP (Doña Ana County)	Manage 720 acres of the Robledo Mountains as the Paleozoic Trackways RNA. Manage to protect, research, and interpret paleontological values. Manage in accordance with recommendations provided in trackways study legislation. Interpret in accordance with study legislation.	Yes	Same as above.

The main opportunities for changing special designations should result from an evaluation of nominated ACECs for relevance and importance based on the criteria set forth in 43 CFR 1610.7-2(a). BLM is in the process of evaluating the nominated ACECs, including those nominated by the public, and those nominated by the BLM. In addition, the current ACECs will be evaluated to determine maintenance of relevant and important values and whether ACEC designation is still necessary to protect these values. Management prescriptions for these areas also will be reviewed to ensure they can protect the identified relevant and important values. Upon completion of the evaluation, areas suitable for consideration as ACECs can be carried forward into alternatives for consideration in the draft RMPs/EIS, where the environmental consequences of making such a designation will be analyzed.

5.0 CONSISTENCY/COORDINATION WITH OTHER PLANS

Plans completed by Federal and State agencies, local jurisdictions, and organizations were reviewed to determine whether policies and decisions are consistent or interdependent with resource management in the TriCounty Planning Area. The following sections highlight the Federal (other than BLM), State, and local agency and organization policies, regulations, and planning efforts that may impact BLM decision-making for each resource, or provide opportunities for coordination towards shared or interdependent goals.

The discussion for each resource may include plans completed by other Federal and State agencies, including the U.S. Environmental Protection Agency (EPA), U.S. Forest Service, U.S. Fish and Wildlife Service, New Mexico Environment Department, New Mexico State Land Office, New Mexico Department of Game and Fish, and New Mexico State Parks. In accordance with applicable Federal, State, and local laws, regulations, and policies, these Resource Management Plans (RMPs) will be consistent with other RMPs being developed or recently developed by other BLM field offices throughout the State.

5.1 AIR QUALITY

Conformity with the applicable State Implementation Plan (SIP) must be demonstrated whenever a new project or activity proposed for location in a nonattainment area will be developed as part of a Federal action, and has the potential to emit greater than 100 tons per year of the nonattainment pollutant. Conformity to an implementation plan, as defined by the EPA, means the following (USEPA 2005e):

- Conforming to a plan's purpose of eliminating or reducing the severity and number of violations of national ambient air quality standards and of achieving expeditious attainment of such standards; and
- Activities will not
    - cause or contribute to any new violation of any standard in any area;
    - increase the frequency or severity of any existing violation of any standard in any area; or
    - delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

When determining whether or not a project or activity conforms with an SIP, a complete inventory of primary and secondary emissions resulting from the project must be considered, including projections of vehicle travel and congestion, as determined by a metropolitan planning organization or other agency that is authorized to make such estimates (USEPA 2005e).

Since a portion of the Planning Area is designated as a nonattainment area for particulate matter equal to or less than 10 microns in diameter and ozone, the BLM must consider conformity analyses as part of the planning process for substantial new projects. Examples of such projects include construction of new

facilities, road expansions or improvements, and prescribed range management burns for wildfire mitigation.

5.2 GEOLOGY, MINERALS, AND RENEWABLE ENERGY

The consistency and coordination of the TriCounty RMP with plans outside the Planning Area was evaluated by reviewing management plans for municipal, county, state and Federal agencies, where those plans were available. The majority of the plans reviewed did not specifically address the management of geology and mineral resources. Those agencies that discussed mineral resource management are presented below.

5.2.1 State of New Mexico

The New Mexico State Land Office is responsible for energy and mineral resource activities on State Trust land. The primary obligation of the New Mexico State Land Office is to maximize revenues for the Trust from the disposition and management of mineral commodities while considering the long-term best interest of the Trust. The right to explore for and develop mineral commodities on State Trust land is accomplished by obtaining one of the following:

- Oil and gas lease, for energy minerals such as oil, gas and geothermal resources. Oil and gas leases also must be coordinated with the State of New Mexico Oil and Gas Division of the New Mexico Energy, Minerals and Natural Resources Department (NMEMNRD).
- Mineral exploration permit, primarily for leasable base and precious metals as well as unique and distinct industrial minerals. Mineral exploration permits also must be coordinated with the State of New Mexico Mining and Minerals Division of the NMEMNRD.
- Mineral lease, primarily for leasable base and precious metals as well as unique and distinct industrial minerals. Mining permits also must be coordinated with the State of New Mexico Mining and Minerals Division of the NMEMNRD.
- Common variety mineral lease/sale for common variety minerals, also known as salable minerals or mineral materials.

Classification of mineral resources (leasable, locatable and salable minerals) by the New Mexico State Land Office and their development is comparable to the BLM. A lease or permit must be obtained for mineral exploration and development on State Trust land. An application for a permit or lease must include maps of the subject property; a report that presents a detailed assessment of the geology, environment, and mine operations and closure plans; permits from other regulatory agencies; insurance; and fees. The New Mexico State Land Office coordinates development of state mineral resources with the Federal Government only in so far as requiring a prospective applicant to obtain applicable Federal permits.

5.2.2 County Plans

There is no information that Sierra County has a management plan. Doña Ana County established a Comprehensive Plan in 1995, but it does not address geology, mineral, and energy resource management.

The Otero County Comprehensive Plan includes goals related to the sustainable use and conservation of natural resources (including scenic geologic resources) for future generations, including: Goal 1 - to conserve and utilize natural resources in a matter that will sustain them for use by future generations; NR Goal 2 - to protect the quality of the environment through good stewardship practices and through a balanced management approach using natural resources; and, NR Goal 3 - to protect Otero County's natural resources (including minerals). Scenic geographic features include the Sacramento Mountains and the gypsum sand dunes of White Sands National Monument. The plan notes that oil and gas drilling on Otero Mesa has been a focus of controversy.

The plan states that Otero County "may develop procedures in site-specific plans that provide for the long-term availability and responsible development of its hydrocarbon and mineral resources" in order to support the State and National need to obtain abundant hydrocarbon and mineral resources. Otero County endorses the following policies related to mineral resources, as listed in the plan:

- Promote the exploration and enhance the development of its hydrocarbon and mineral resource.
- Support retention of and compliance with the 1872 Mining Law.
- Adopt the Otero County Hydrocarbon and Mineral Resources Extraction Rights Protection Ordinance to protect the majority of the local tax base.

Further the plan states that, "…decisions made by Federal agencies concerning the extractive industries that have an economic impact on the citizens of Otero County must be reviewed by, and coordinated with, the County Commission or their designee prior to implementation."

5.3 CAVE AND KARST RESOURCES

Caves may be evaluated for significance under cultural, biological, geological, hydrological, educational and recreation significance. Caves typically have not been addressed as part of city/county or state land planning documents in the Planning Area.

5.4 SOILS

There are no specific plans at the Federal, State, or county level that detail soil condition goals and objectives. The state nonpoint-source pollution plan addresses the transport of sediment from a water quality goal, as described in the Water Resources Section (Section 3.4). While excess soil erosion, transport, and deposition are undesirable conditions under county ordinances and building standards,

these ordnances and standards address the built environment and would only be relevant to road or structural design projects.

5.5 WATER AND WATERSHED RESOURCES

The primary water planning mechanisms in New Mexico are the regional water plans initiated by the Office of the State Engineer (OSE) in conjunction with the Interstate Streams Commission. The original impetus for regional water planning came when a Federal court ruled that the State's prohibition against out-of-state transfer of New Mexico groundwater was unconstitutional. The 1987 legislation was enacted authorizing the Interstate Streams Commission to fund regional water planning efforts. Sixteen water-planning districts have since been recognized by the Interstate Streams Commission.

5.5.1 New Mexico State Water Plan

The Interstate Stream Commission adopted the New Mexico State Water Plan in December 2003 with input from the OSE, Water Trust Board, public, State agencies, tribal governments, and other interested stakeholders. The plan identifies priorities, goals and objectives for water management in New Mexico, which have an impact on the public welfare of the State. It contains policy statements, implementation strategies, a brief background discussion and summary of public input. The 2003 State Water Plan was developed as strategic management tool for

(1) promoting stewardship of the State's water resources;

(2) protecting and maintaining water rights and their priority status;

(3) protecting the diverse customs, culture, environment, and economic stability of the State;

(4) protecting both the water supply and water quality;

(5) promoting cooperative strategies, based on concern for meeting the basic needs of all New Mexicans;

(6) meeting the State's interstate compact obligations;

(7) providing a basis for prioritizing infrastructure investment; and

(8) providing statewide continuity of policy and management relative to our water resources.

The plan does not attempt to identify and resolve region-specific water management issues. Of the sixteen water-planning districts, the OSE has prepared plans for seven critical basins in the State, including the Lower Middle Rio Grande planning region.

5.5.2 Lower Rio Grande Regional Water Plan

The Planning Area includes parts of three of the sixteen water-planning districts; the Lower Rio Grande planning region (one of the three districts) encompasses Doña Ana County and that portion of Sierra County composed of the boundaries of the Elephant Butte Irrigation District. The principal river basin is the Rio Grande River. The principal aquifers are the Jornada del Muerto, Mesilla, Palomas, and Hueco

Bolson acquifers. The region is bounded on the north by Sierra County, on the west by Luna County, on the south by Mexico and Texas, and on the east by Otero County. The authoring body of the plan is the Lower Rio Grande Water Users' Organization, which is composed of the following:

- Anthony Water and Sanitation District
- City of Las Cruces
- Doña Ana County
- Doña Ana Mutual Domestic Water Consumers Association
- Elephant Butte Irrigation District
- New Mexico State University
- Town of Mesilla
- Village of Hatch.

The New Mexico Lower Rio Grande Water Plan acknowledges that many aspects of the regions water planning are inflexible. Court decisions have established that groundwater can be exported out of state and that surface water delivery guarantees are set by compact and treaty. Further, hydrology dictates that the Jornada del Muerto and Huerco Bolson groundwater basins are not being recharged at a sustainable rate. Alluvial aquifers of the Rio Grande are directly tied to stream flow and, by that, to long-term changes in stream flow. This suggests that the region has limited options in water resources despite projecting a relatively rapid population growth over the next 50 years.

The plan concludes that the City of Las Cruces' demand for water will exceed its total water rights (for both the Mesilla and Jornada del Muerto basins) by the year 2012 for a high-growth scenario, by the year 2016 for a medium-growth scenario, and by the year 2030 for a low-growth scenario. The Village of Hatch will exceed its total water rights to the Rincon Basin by the year 2020 for a high-growth scenario, by the year 2029 for a medium-growth scenario, and after the year 2040 under the low-growth scenario. Based on the estimated total water users, the Doña Ana Mutual Domestic Water Consumers' Association will exceed its total water rights by the year 2025.

The plan suggests extending the period through public education, water conservation, and reuse. New water development options include:

- Watershed management
- Desalination
- Underground Aquifer Storage and Recovery
- Residential/commercial water conservation
- Leasing of agricultural water

- Surface-water capture
- Importation of water

While all of these options could have implications for the management of public lands, the first, watershed management, is a clear intersection of this plan with the RMP process. The plan notes that BLM administers 1,756 square miles in the region and five flood control dams (Alameda Arroyo Dam, and Las Uvas Dams Nos. 1, 4, 5, and 6). Clearly, an expectation exists for BLM to work in concert with the regional water plan to maximize the supplies of clean surface water for direct use and aquifer recharge.

5.5.3 Socorro-Sierra Regional Water Plan

The Socorro-Sierra water-planning region encompasses Socorro and Sierra Counties. The principal river basin is again the Rio Grande. The principal aquifers are the Quaternary alluvium (Rio Grande) and the Santa Fe Group as well as parts of aquifers in the eight declared groundwater basins in the region. The region is bounded on the north by Torrance, Valencia, and Cibola Counties, on the west by Catron and Grant Counties, on the south by Luna and Doña Ana Counties, and on the east by Torrance and Otero Counties. The Socorro Soil and Water Conservation District is the author of the plan.

The plan is similar in its conclusions as to the current state of water scarcity in the Sierra County portion of the Planning Area. It projects a net mean modeled deficit of approximately 77,900 acre-feet per year. The authors point out that obtaining the supply to overcome the deficit is problematic. The Rio Grande, including the aquifers that are connected to this river, is a fully appropriated system. Endangered species and Rio Grande Compact obligations place significant constraints on the system. Groundwater resources that are connected to the Rio Grande have not been fully developed and increased groundwater pumping from these resources is possible. However, development of stream-connected groundwater is constrained by water rights: to increase depletions of groundwater, water rights must be transferred from existing surface water or groundwater resources. Importation of water into the basin is deemed economically unfeasible.

The role of the public lands in assisting or supporting this plan is not addressed. conservation plans and programs, reduced urban and agricultural water demand, and water-use efficiency are offered as the major solutions. However, clearly the impact of land management decisions on the amount of surface water runoff and infiltration will support these solutions

5.5.4 Tularosa, Great Salt, and Sacramento River Basin Regional Water Plan

The Otero County portion of the Planning Area is covered by the Tularosa, Great Salt and Sacramento River Basins water-planning region, which encompasses parts of Lincoln, Otero, and Chavez Counties. The principal rivers are Tularosa Creek and the Sacramento River. The principal aquifers are located in the Tularosa Basin. The region is bounded on the north by Torrance County, on the west by Socorro, Sierra and Doña Ana Counties, on the south by Texas, and on the east by Lincoln, Chavez and Eddy

Counties. The plan was written by the South Central Mountain Resource, Conservation, and Development Council, Inc., of Carrizozo, New Mexico.

In the absence of any stream flow equal to the Rio Grande, this part of the Planning Area has even greater water supply problems than the other regions. The plan determines that the current City of Alamogordo water supply is about 14,460 acre-feet/year, a rate which is only slightly above the estimated annual average water demand of about 11,424 acre-feet/year for the year 2000 and below the estimated need of 15,007 acre-feet/year for the year 2040. The villages of Tularosa, Timberton, and Orogrande are in similar condition.

Orogrande is uniquely tied to BLM management decisions through its reliance on a pipeline to the Sacramento River. McGregor Range has surface water rights, granted by the State of New Mexico, to 60,000 gallons per day from the Sacramento River and 50,000 gallons per day from Carriza Spring, located near the village of Timberton. Flow is diverted from the Sacramento River and delivered by gravity feed pipeline as municipal drinking water to the village of Orogrande, which is noted in the plan.

The solutions to these problems, as outlined by the Tularosa Valley plan, are not different from the previously described regional plans. Once again, public land as a source of runoff for these supplies is an important contributor to this solution.

5.5.5 Source Water Assessment and Protection Program

In 1999, the EPA approved the New Mexico Source Water Assessment and Protection Program, under programs implemented for compliance with the Safe Drinking Water Act. According to NMED, the objectives of the New Mexico Source Water Assessment and Protection Program are the following:

- Determining the source water protection area for the water system
- Taking inventory of actual and potential contaminant sources within the source water protection area
- Determining the susceptibility of the source area and water system to contamination
- Reporting the Source Water Assessment and Protection Program findings to the water utility, its customers, and the community
- Working with the community and other stakeholders to implement source water protection measures that safeguard and sustain the water supply into the future

5.5.6 Otero County Comprehensive Plan

The Otero County Comprehensive plan supports the New Mexico Office of the State Engineer (OSE) regional water supply and acknowledges the critical nature of water sustainability to the growth of the county. The desired future water supply conditions listed in the plan emphasize a sustainable, potable water system and include a reduction in the depletion rate from 2.5 acre-feet per year to one acre-foot per

year, developing a watershed management plan, desalinating the Tularosa Basin Aquifer, establishing leak proof storage catchments at the base of canyons with perennial streams and flood flows and reclaiming water. Specifically, water supply goals listed in the plan include the following:

- Optimize the function of the existing watershed and water resources.
- Develop new sources of water.
- Be proactive in the addressing of water issues to insure long-term sustainability for future generations.
- Promote water conservation at all levels of the region.
- Obtain a better understanding of the hydrogeology of Otero County.

The Otero County plan recognizes that the "protection and development of its water resources are essential to its short and long-term economic, recreational and cultural viability." Otero County supports the following policies related to water resources:

- The protection of existing water rights is of primary importance to the County's economic and cultural well-being. Therefore, transfers in water use should be carefully considered in relationship to the history, traditions and culture of Otero County. Any Federally proposed designation of Wild and Scenic Rivers and all Federal policies regarding riparian management in Otero County shall be coordinated with the County and Water Users Groups in the County, and will be jointly planned with all County water use plans. In addition, Otero County, at its option, may prepare plans for the protection of all aquatic threatened and endangered species within its boundaries. Federal agencies managing waterways and wetlands containing such species will coordinate their management activities and plans with the County Commission.

- Otero County may promote or pursue development of water markets for existing, as well as future, water rights for agricultural, municipal, industrial, and domestic purposes. In addition, Otero County may explore and promote alternative uses of water.

- Otero County may promote water-based recreation within the County.

- Otero County, if deemed necessary, may initiate a process for establishing geologic, hydrologic and biologic databases within the County. The County may acquire, develop, and synthesize, alone or in coordination with other government agencies, drilling information, water well testing information, riparian vegetation information and all other information necessary for the County. The County also may develop a definition of "natural" hydrologic environment so as to assess the use of water in the County by man, vegetation, livestock and wildlife within the context of current and historical use. The County shall base its water use relationship between precipitation, surface water, groundwater saline water, evapo-transpiration and water use within the County.

- The Otero County government will be notified of all State, Interstate, and Federal actions that have any impact on the water of the County prior to such actions being initiated. In addition, such proposed actions, including Federally Proposed Wild and Scenic River designations, will be coordinated with the Otero County Commission, and appropriate water use groups, and the County water and land use plans prior to adoption and implementation. It is the intent of the County to guide Federal and State agencies in the planning and management of the County's natural, cultural, and economic resources.

- Otero County recognizes the principles contained in the State Water Law as they exist at this time.

- Otero County will develop its water use policy to ensure both water quality and quantity to ensure that such policy does not adversely impact water users within the County.

- Otero County may develop Wild and Scenic River Designations, at its option. Federal agencies will consult and coordinate all actions with respect to the intent of local government efforts in the acceptance and enforcement of such designations. In addition, the County may, at its option, develop riparian management planning in concert with and coordinated with landowners, ranchers, the appropriate State and Federal agencies and other interested parties as long as those specific riparian issues meet National Riparian definitions.

- The New Mexico OSE must demonstrate a diminishing water supply in specific areas before it can stop the drilling of irrigation wells.

5.5.7 Doña Ana County Comprehensive Plan

The Doña Ana County Comprehensive plan addresses water in several sections in the plan. For example, the plan calls for the following actions:

Goal Statement: Encourage the expansion and improvement of existing water and wastewater systems.

Policies:

- Support the development of water and wastewater systems for all of Doña Ana County.
- Coordinate wastewater and water systems management with appropriate agencies.

Actions:

- Design, implement and manage funding mechanisms for improving substandard water and wastewater systems.

In addition the plan has text stating that it is particularly critical that groundwater be protected from both point and nonpoint source pollution. The regional water plan is cited and endorsed. Recharge of the regional aquifers is cited as a critical issue. The plan calls for protection of acquifers through the following measures:

Goal Statement: Protect the quality and supply of water resources in the county.

Policies:

- Encourage the development of efficient and economical water systems in Doña Ana County.
- Encourage the development of sewage collection and treatment systems, especially for developments located in areas of moderate and high aquifer sensitivity.
- Encourage water conservation policies and programs.

Actions:

- Develop a countywide plan for wastewater treatment facilities and sludge disposal.
- Modify ordinances to include water conservation.

5.6 VEGETATIVE COMMUNITIES

No specific plans provide guidance for management of vegetative communities. Plans related to special status species are mentioned in Section 5.8, Special Status Species.

5.7 FISH, WILDLIFE, AND HABITAT

The common goal in the management of fish, wildlife, and habitat on lands administered by local, state, and other federal agencies within the Planning Area is very similar to that on BLM-administered lands. Each agency's goals are to protect and enhance wildlife and their habitat, comply with federal laws and policies, and ensure species do not become listed in the future.

5.7.1 Federal Agencies

The Strategic Plan for White Sands National Monument establishes goal, objectives and plans for achieving preservation of the monuments resources. The plan establishes a goal to completely remove the African oryx population from the monument. BLM has the opportunity to enhance coordination of oryx population with the White Sands National Monument by examining and addressing oryx herbs on BLM property to ensure that these animals are not entering the White Sands National Monument.

Three National Forests in the Planning Area (Cibola National Forest, Gila National Forest, and Lincoln National Forest) are managed under their respective Land and Resource Management Plan (Forest Plan). These Forest Plans defines the long-term direction for managing the Cibola National Forest, Gila National

Forest, and Lincoln National Forest. The purpose of these Forest Plans is to provide for multiple use and sustained yield of goods and services from the Forest in a way that maximizes long-term net public benefits in an environmentally sound manner. These Forest Plans have identified two issues of common concern with the BLM: (1) deterioration of riparian habitat, and (2) coordination of timber harvest activities with standards and guidelines for wildlife habitat diversity. The BLM has the opportunity to enhance cooperation with National Forest in the Planning area through the (1) coordination of common resource activities, (2) combining and coordinating common habitat improvement projects, and (3) combining, coordinating, and sharing resource monitoring initiatives.

5.7.2 State Agencies

New Mexico Department of Game and Fish (NMDGF) has published the draft of a Comprehensive Wildlife Conservation Strategy for wildlife in the state as part of the Federal State Wildlife Grants Program. The Comprehensive Wildlife Conservation Strategy will be developed to ensure that funds provided through the program are spent wisely and effectively on restoration and enhancement of wildlife populations and habitat. Projects supported by State wildlife grants can include restoration of degraded habitat, reintroduction of native wildlife, development of partnerships with private landowners, education of the public, and collection of data to find out more about declining species.

The Plan for the Recovery of Desert Bighorn Sheep in New Mexico: 2003-2013 is a guide for the NMDGF in recovering desert bighorn sheep. Issues and strategies are identified in the plan that will contribute to achieving the goal of effectively managing desert bighorn sheep to increase population numbers such that they may be removed from the state endangered species list. The plan identifies two areas of cooperation with the BLM. Disease - Bighorn are particularly sensitive to diseases carried by domestic sheep and typically develop fatal bacterial pneumonia following contact. For this reason, the BLM has adopted strict guidelines for separating wild and domestic sheep. Mining, and Oil and Gas Exploration - bighorn sheep may temporarily abandon habitat while it is being mined, which could be critical if mining occurs on lambing grounds or near water sources. BLM has the opportunity to enhance coordination of bighorn sheep management with the NMDGF by examining and addressing mineral exploration and leasing issues in desert bighorn sheep habitat.

NMDGF management of sandhill cranes in the Planning Area is guided by the Long-Range Plan for the Management of Sandhill Cranes in New Mexico 2003-2007. This plan establishes the goal that the NMDGF's management of sandhill cranes satisfies the recreational and ecological interests of the citizens of New Mexico and results in successful resolution of related issues. Because sandhill crane occur on BLM land in the Planning, the BLM has the opportunity to coordinate management with the NMDGF to enhance sandhill crane and their habitat.

5.7.3 County and Municipal Plans

County, municipal, and tribal plans that occur within the Planning Area are fairly uniform in their approach to the management of wildlife resources and maintaining open space. Each plan recognizes that

growth is occurring within each jurisdiction and the need to protect and preserve the native wildlife, habitat, and wildlife corridors to provide a diverse wildlife assemblage within the communities. Each plan provides general goals and objectives to maintain open space, preservation of mountainous areas, and protection of habitat. Avoiding or reducing adverse impacts to the natural environment is an important goal identified inmost comprehensive and general plans.

5.8 SPECIAL STATUS SPECIES

The U.S. Fish and Wildlife Service (USFWS) is required under Section 4(f)(1) of the Endangered Species Act to prepare recovery plans for newly-listed species, unless it is determined that the plan will not promote the recovery of the species. Recovery plans are not regulatory documents, but are guidance documents intended to assist agencies in prioritizing, delineating, justifying, and scheduling management actions necessary to support the recovery of a species. Within the Planning Area, 11 federally listed species have recovery plans. Table 5-1, found in Chapter 5 shows the species with plans, dates the plans were finalized, and the counties within the Planning Area affected by the plans.

Table 5-1
Recovery Plans and Conservation Plans for Federally-listed Species Potentially Occurring in the Planning Area

Common Name Scientific Name	Plan Name	Plan Date	Listed As	County
Black-footed Ferret *Mustela nigripes*	Black-footed Ferret	08/08/1988	ESA Endangered	Otero Sierra
Least Tern--interior pop. *Sterna anttillarum*	Least Tern (Interior Pop.)	09/19/1990	ESA Endangered	Otero Doña Ana
Mexican Spotted Owl *Strix occidentalis lucida*	Mexican Spotted Owl	10/16/1995	ESA Threatened	Otero, Sierra Doña Ana
Northern Aplomado Falcon *Falco femoralis septentrionalis*	Aplomado Falcon (Northern)	06/08/1990	ESA Endangered	Otero, Sierra Doña Ana
Southwestern Willow Flycatcher *Empidonax traillii extimus*	Southwestern Willow Flycatcher	08/30/2002	ESA Endangered	Otero, Sierra Doña Ana
Gila Trout *Oncorhynchus gilae*	Gila Trout	09/10/2003	ESA Endangered	Sierra
Rio Grande Silvery Minnow *Hybognathus amarus*	Rio Grande Silvery Minnow	07/08/1999	ESA Endangered	Otero, Sierra
Kuenzler Hedgehog cactus *Echinocereus fendleri var. kuenzleri*	Kuenzler Hedgehog Cactus	03/28/1985	ESA Endangered	Otero
Sacramento Mountains Thistle *Cirsium vinaceum*	Sacramento Mountains Thistle	09/27/1993	ESA Threatened	Otero
Sacramento Prickly Poppy *Argemone pleiacantha ssp. pinnatisecta*	Sacramento Prickly-Poppy	08/31/1994	ESA Endangered	Otero
Sneed Pincushion Cactus *Coryphantha sneedii var. sneedii*	Sneed/Lee Pincushion Cactus (2 spp.)	03/21/1986	ESA Endangered	Doña Ana
Desert Bighorn Sheep *Ovis Canadensis mexicana*	Plan for the Recovery of Desert Bighorn Sheep in New Mexico 2003-2013.	August 2003	NM- Endangered	Otero, Sierra Doña Ana

Common Name Scientific Name	Plan Name	Plan Date	Listed As	County
Rio Grande Silvery Minnow *Hybognathus amarus* Southwestern Willow Flycatcher *Empidonax traillii extimus*	Middle Rio Grande Endangered Species Act Collaborative Program	2004	ESA Endangered; NM Sensitive ESA Endangered NM Endangered	Apparently extirpated in Doña Ana and Sierra Counties

SOURCE: U.S. Fish and Wildlife Service 2005b
NOTE: ESA = Endangered Species Act

The Otero County Comprehensive Plan endorses the following policies related to biolgical resources on public lands, as listed in the comprehensive plan:

- Otero County shall be consulted with and may oversee the formulation of plans for the recovery of all Federal and State-listed threatened or endangered species. Otero County requires notification from agencies on recovery plans. State and Federal agencies must prove a species is endangered or threatened with full counts and historical data in Otero County.

- Federal and State wildlife management and enforcement agencies will coordinate and consult with the County Commission relative to controversial matters regarding wildlife and resources. All wildlife management plans will be reviewed by the County Commission prior to finalization or initiation of actions.

5.9 WILDLAND FIRE ECOLOGY AND MANAGEMENT

5.9.1 Joint Powers Agreements/Operating Plans

The boundaries of the Las Cruces District Office include parts of two Fire Management Zones (Gila-Las Cruces Zone and Lincoln Zone), lands of five Federal agencies, as well as State and private lands. While these areas are not all in the Planning Area, fire management resources from all areas may be utilized within the TriCounty Planning Area. An effective fire management program requires close coordination among local and regional jurisdictions. Information in the Las Cruces District Office Fire Management Plan will refine and strengthen the ongoing fire management coordination efforts of all of the related agencies.

Two Joint Powers Agreements/Operating Plans are currently utilized to coordinate the fire management program of the Las Cruces District Office within the Gila-Las Cruces Zone and the Lincoln Zone. The Joint Powers Agreement/Operating Plan outlines agreements and commitments among Federal agencies and the State of New Mexico for wildland fire protection, joint fire management, and large-fire support. The agencies jointly conduct mutual interest projects, within their authority, to maintain or improve fire management capability. For instance, the Las Cruces District Office, Gila National Forest, Lincoln National Forest, and officials of Grant, Sierra, and Otero Counties are collaborating to complete community wildfire protection plans. These efforts are part of the community assistance /protection planning efforts developed through public meetings with the County Wildland/Urban Interface working groups in these counties. Future projects may involve such activities as prescribed fire/fuels management,

suppression, preparedness, rehabilitation, prevention education, public affairs, rural fire assistance, and fire planning.

The Las Cruces District Office and the Gila National Forest have an intra-agency agreement to co-fund the position of the Gila Interagency Zone Urban Interface/Prevention Coordinator. In addition, the Las Cruces District Office provides a full-time dispatcher to the Gila-Las Cruces Interagency Zone Dispatch Center. A number of agencies have been consulted and are considered partners in the fire management program within the area administered by the Las Cruces District Office. Major partners include are as follows:

- Gila National Forest (Gila National Forest Fire Management Plan)
  The BLM funds the Fire Prevention Education position in the Gila National Forest.
- Lincoln National Forest
- Coronado National Forest (Coronado Forest Land and Resource Management Plan is currently being amended to comply with Federal Fire Policy)
- U.S. Fish and Wildlife Service: San Andres National Wildlife Refuge
- Natural Resource Conservation Service
- New Mexico State Forestry: Capitan and Socorro Districts
- U.S. Dept of Defense: Fort Bliss, White Sands Missile Range and Holloman Air Force Base
- U.S. National Park Service: White Sands National Monument
- U.S. Bureau of Reclamation
- U.S. Bureau of Indian Affairs: Mescalero Agency
- County Governments of Grant, Hidalgo, Luna, Sierra, Doña Ana and Otero Counties.

Collaborative efforts to create countywide fire risk and hazard mitigation plans have started with Grant, Sierra and Otero Counties. In Fiscal Year 2004, the Las Cruces District Office entered into an Assistance Agreement with Grant County and its Fire Mitigation Specialist to do project inspection work on fuels work done by contractors on BLM lands around the village of Pinos Altos.

- U.S. Department of Agriculture: Jornada Experimental Range
- New Mexico State University
- The Animas Foundation
- The Turner Foundation

In the future, it is anticipated that the Las Cruces District Office Fire Management Plan will be amended as opportunities to collaborate with interagency partners in the area of shared suppression resources, facilities, cooperative agreements, stewardship, prevention, and education and training become available.

5.9.2 Review and Update of the 1995 Federal Wildland Fire Management Policy and National Fire Plan

The Review and Update of the 1995 Federal Wildland Fire Management Policy (National Interagency Fire Center 2001) provides the philosophical and policy foundation for Federal interagency fire management activities conducted under the National Fire Plan. The National Fire Plan is not a single, cohesive document. Rather, it is composed of various documents, including (1) a September 8, 2000, report—Managing the Impact of Wildfires on Communities and the Environment—from the Secretaries of the Interior and Agriculture to the President of the United States, in response to the wildland fires in 2000; (2) congressional direction accompanying substantial new appropriations for wildland fire management for Fiscal Year 2001; (3) the 1999 Forest Service–released Protecting People and Sustaining Resources in Fire-Adapted Ecosystems: A Cohesive Strategy, in response to the U.S. General Accounting Office Report, Western National Forests: A Cohesive Strategy is Needed to Address Catastrophic Wildfire Threats (U.S. General Accounting Office /RCED-99-65); and (4) several approved and draft strategies to implement all or parts of the plan.

The 2001 Federal Wildland Fire Management Policy directs Federal agencies to achieve a balance between suppression to protect life, property, and resources, and fire use to regulate fuels and maintain healthy ecosystems. The policy provides nine guiding principles that are fundamental to the success of the Federal wildland fire management program:

- Firefighter and public safety is the first priority in every fire management activity.
- The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process.
- Fire management plans, programs, and activities support land and resource management plans and their implementation.
- Sound risk management is a foundation for all fire management activities.
- Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives.
- Fire management plans and activities are based upon the best available science.
- Fire management plans and activities incorporate public health and environmental quality considerations.
- Federal, State, tribal, local, interagency, and international coordination and cooperation are essential.
- Standardization of policies and procedures among Federal agencies is an ongoing objective.

5.10 CULTURAL AND HERITAGE RESOURCES

Federal, State, and local government agencies, as well as tribal governments, manage lands within and adjacent to the Planning Area and have completed several planning documents for areas within the TriCounty planning area that address cultural resources. Review of these plans identified no inconsistencies with the BLM cultural resources program. Most of the plans include only general statements regarding consideration of heritage resources during the planning and review of specific projects and a commitment to comply with applicable Federal, State, and local government historic preservation regulations and ordinances. Close coordination with agencies that manage lands adjacent to the public lands certainly is appropriate, particularly for individual cultural resources that overlap jurisdictional boundaries.

5.10.1 Other Federal Agencies

Other Federal agencies that manage lands or administer units within or adjacent to the TriCounty Planning Area include the U.S. Army (White Sands Missile Range, McGregor Range, Fort Bliss Training Area, Holloman Air Force Base), National Park Service (White Sands National Monument), U.S. Forest Service (Cibola, Gila, and Lincoln National Forests), Bureau of Reclamation (Elephant Butte and Caballo Reservoirs), and USFWS (San Andres National Wildlife Refuge). These Federal agencies have cultural resource programs similar to those of the BLM to address Federal cultural resource protection mandates, and it is appropriate for the BLM Las Cruces Field Office to coordinate with those agencies, as well as other BLM field offices that manage adjacent public lands. The Bureau of Indian Affairs also has Federal Trust responsibilities for the Mescalero Apache Tribe reservation lands within the TriCounty Planning Area. The Mescalero Apache Tribe has developed a program to manage heritage resources on their lands, and it is appropriate for BLM to coordinate with this program about the management of specific heritage resources that overlap boundaries with adjacent public lands.

NPS and BLM prepared a comprehensive management plan and final environmental impact statement for El Camino Real Tierra Adentro National Historic Trail (the Royal Road of the Interior) in 2004 (USDI 2004). The plan envisions a multi-use recreational retracement trail and venue for public interpretation of the broad themes of history of the region traversed by the trail. NPS and BLM will provide leadership for Federal, State, regional, and local government, private landowners, non-profit organizations, non-government organizations, and individuals to create, mark, and interpret the trail. Approximately 29 miles of the trail are on public land in Sierra County and Doña Ana County. These segments constitute only about 7 percent of the total 404-mile-long route. Of the 29 miles within the Planning Area, 9.3 miles have been identified as a high potential route. The portions of the trail on public land within the TriCounty planning area are the Jornada del Muerto portion of the trail. Seven interpretive sites have been proposed on BLM-administered land within the planning area, including automobile pullouts with interpretive signs, short trails, and overlooks. BLM is working with the State of New Mexico to develop a visitor center north of the Planning Area.

5.10.2 State Agencies

In 2001, the New Mexico Historic Preservation Plan was approved. The plan presents goals, objectives, challenges, and opportunities for preservation within the State. The State plan outlines strategies for expanding public knowledge about historic preservation, improving knowledge about preservation funding, incorporating historic preservation into community planning, strengthening legal protections for historic properties, and expanding the number of historic preservation organizations throughout the State.

The plan also includes an overview of New Mexico's cultural resources, the identification of local, State, and Federal agencies included in the New Mexico preservation network, and preservation accomplishments from 1996 to 2001. The New Mexico Historic Preservation Plan recognizes that BLM, as a Federal land managing agency, is an important partner in the State's historic preservation network.

5.10.3 City and County Plans

The Rio Grande Riparian Ecological Corridor Project report developed by the City of Las Cruces in 2004 was reviewed. One of the city's goals for the project is to educate the public about the cultural and historic importance of the Rio Grande corridor. As part of the project, the city proposes to create a Rio Grande Cultural Complex, which would include Centers for Public Archaeology and Public History, and develop a multipurpose pathway that would preserve culturally and historically significant areas. Heritage resource sites such as the Butterfield Trail, El Camino Real, and the Los Tules site that are located or partially located on public land were mentioned in the plan as cultural assets located along the Rio Grande corridor that could be publicly interpreted as part of the project.

The Doña Ana County Comprehensive Plan acknowledges the values of cultural and archaeological resources and states Doña Ana County's commitment to identify and preserve historic resources. The county also plans to develop a historic preservation plan and integrate historic preservation into their land use plan to protect historical resources from incompatible uses.

The Otero County Comprehensive Plan identifies heritage resources as factors to be considered when developing land use plans. The plan recognizes that the recognition of historic sites is important to the documentation and preservation of sites and facilities in which tourists are usually very interested. Specific cultural resource goals found in the plan are as follows:

- CR1. Continue to offer tax benefits to privately owned cultural properties that are listed on the State Register and area available for educational purposes.

- CR2. Establish a policy that no natural artifacts from Otero County may leave the County without the consent of the Otero Board of County Commissioners.

- Encourage valuable historic material from Otero County to be returned and placed in the Tularosa Basin Historical Museum.

The County also endorses the following policies related to cultural resources on public lands, as listed in the plan:

- There shall be no additional special designated areas, in Otero County without the consideration of the Board of County Commissioners of Otero County. Public lands will be managed under the multiple use theory to provide opportunities for all users of public lands.

- Cultural resources will be reviewed by the County Commission or their designee to determine their value as a resource in the customs and cultures of the people of Otero County.

5.11 PALEONTOLOGICAL RESOURCES

After many of the RMPs were completed and the BLM General Procedural Guidance for Paleontological Resources Management (USDI, BLM 1998b) was completed, the USDI prepared an Assessment of Fossil Management on Federal and American Indian Lands (USDI, Secretary of the Interior 2000) in response to Congress's request for an assessment of the need for a unified Federal policy on the collection, storage and preservation of fossils, and for standards that would maximize the availability of fossils for scientific study. The BLM, and other Federal agencies including the Bureau of Indian Affairs, Bureau of Reclamation, U.S. Fish and Wildlife Service, U.S. Forest Service, National Park Service, Smithsonian Institution, and U.S. Geological Survey contributed to this study. In the assessment it was determined that "fossils are nonrenewable and (except for microfossils and those that make up the energy minerals) relatively rare resources with significant scientific, educational, and commercial and recreational values. . . . Fossils on Federal lands . . . are managed for their scientific, educational and, where appropriate, recreational values"(USDI, Secretary of the Interior 2000). The Assessment of Fossil Management on Federal and American Indian Lands (USDI, Secretary of the Interior 2000) presents the following principles and recommendations for administrative and Congressional actions pertaining to fossils:

- Principle 1: Fossils on Federal lands are a part of America's heritage. Recommendation: Future actions should reaffirm the current use of Federal fossils for their scientific, educational and where appropriate, recreational values.

- Principle 2: Most vertebrate fossils are rare. Recommendation: Future actions should reaffirm the restriction of vertebrate fossil collection to qualified personnel, with fossils remaining in Federal ownership in perpetuity.

- Principle 3: Some invertebrate and plant fossils are rare. Recommendation: Future actions should reaffirm mission-specific agency approaches to the management of plant and invertebrate fossils.

- Principle 4: Penalties for fossil theft should be strengthened. Recommendation: Future actions should penalize the theft of fossils from Federal lands in a way that maximizes the effectiveness of prosecutions and deters future thefts. Penalties should take into account, among other factors, the value of the fossils themselves, as well as any damage resulting from their illegal collection. Future program strategies should emphasize education of Federal managers, prosecutors, law

enforcement personnel, and the judiciary regarding the value of fossils and the techniques for the appropriate protection of fossil resources.

- Principle 5: Effective stewardship requires accurate information. Recommendation: Future actions should acknowledge the need for gathering and analyzing information about where fossils occur, in particular the critical role of inventory in the effective management of fossil resources. Increased emphasis on fossil inventory should take into consideration, where possible, regional approaches across agency lines, using modern technology such as geographic information systems. Such work could also address specific issues such as the impact of erosion on the loss of resources.
- Principle 6: Federal fossil collections should be preserved and available for research and public education. Recommendation: Future actions should reaffirm the importance of curating scientifically valuable fossils as Federal property, often in partnership with non-Federal institutions. Future program approaches should emphasize the use of modern technology to improve curation and access, as well as the sharing of information between and among government agencies and other institutions.
- Principle 7: Federal fossil management should emphasize opportunities for public involvement. Recommendation: Future actions should include an emphasis on public education and participation in the stewardship of fossil resources. Future program approaches should emphasize the use of technology to increase public education and awareness of the importance and benefit of fossil resources.

5.12 VISUAL RESOURCES

There are no formal plans for managing visual resources on State, private, or tribal lands. Also, there are no formal or specific visual resource management guidelines for Bureau of Reclamation lands, or goals or policies related to visual resources in plans for Doña Ana and Sierra Counties.

5.12.1 Federal

The TriCounty Planning Area includes a total of 856,834 acres of Forest Service land. Portions of the Cibola and Gila National Forests are located in Sierra County, and Lincoln National Forest is located in Otero County. Similar to the BLM Visual Resource Management System, the Forest Service has prescribed visual quality objectives to manage Forest Service lands through the Scenery Management System. Forest Service plans such as the Cibola National Forest Land and Resource Management Plan, the Gila National Forest Plan, and the Lincoln National Forest Plan state that visual quality, as inventoried and mapped, is the baseline for visual quality objectives.

Forest Service lands are managed for visual quality objectives as defined in the USDA Forest Service Agriculture Handbook, National Forest Landscape Management, Volume 2 Series (1970), succeeded by the USDA Forest Service Agricultural Handbook Number 701, Landscape Aesthetics: A Handbook for Scenery Management (1995).

5.12.2 Local

Two local jurisdictions have identified goals or policies related to visual resources in current plans.

The 2005 Otero County Comprehensive Plan addresses visual (scenic) resources in the issues and future goals for transportation and private land use. The plan recognizes that the local scenic byways attract recreational vehicles and tourism traffic to the area and that recreational vehicle scenic routes, easy access to trails, and other commercial services related to transportation should be a priority for continued growth and economic development within the County. The plan also notes that the County can use special zoning districts to protect scenic areas.

The City of Las Cruces, New Mexico, located within Doña Ana County, indicated a goal in the Comprehensive Plan to preserve desirable vistas/views and open space as appropriate (City of Las Cruces 1999).

5.13 WILDERNESS CHARACTERISTICS

Wilderness characteristics may be evaluated for significance under visual and biological resources or under recreational resource use. Wilderness characteristics typically have not been addressed as part of State or city/county planning documents applicable within the Planning Area.

5.14 LIVESTOCK GRAZING

The Otero County Comprehensive Plan notes that livestock grazing and ranching are historic land uses throughout the County. Specific goals found in the plan that addresses grazing are as follows:

- NR Goal 2. Protect the quality of the environment through good stewardship practices and through a balanced management approach to using natural resources.
    - Strategy a. Coordinate Federal/State agency management to consider entire watershed/ecosystems in relation to landscapes (grazing, soil conservation, preservation of agricultural land etc.).
- PLU Goal 2. Provide for land use sustainability on public lands to maintain the custom/culture of our citizens.
    - Strategy b. Support cattle grazing.
    - Strategy i. Consider designating or mapping prime agriculture or grazing lands, based on soil type and availability, to aid in their preservation.

The County also endorses the following policies related to livestock grazing on public lands, as listed in the comprehensive plan:

- Opportunities for grazing livestock on Federal land shall be continued at sustainable levels consistent with proper range management custom, culture and the protection of equitable property rights.

- Otero County may establish a Grazing Advisory Board to help advise the Otero County Commission of equitable and feasible grazing fees, which are paid to Federal agencies, based on New Mexico State University and other economic data. These fees are to be reviewed for formula fluctuation based on cattle prices and Executive Order #12548. Federal Regulation #5985 requires under Public Rangeland Improvement Section 1, the protection of personal property grazing rights and civil rights of local citizens against any adverse economic impact. Livestock grazing on Federal lands shall continue at present levels, and where conditions justify AUMs will be increased. Federal land managing agencies shall coordinate with the County Commission on any matter affecting livestock grazing on public lands.

- Otero County will support any agencies' continued desire to explore market and incentive systems to reduce administrative and grazing cost on Federal lands.

- Otero County may monitor, as needed, through the appropriate land user or agency, the condition of grazing lands, woodlands, wildlife, and wetlands. Federal and State agencies subject to NEPA shall provide to the County upon request any resource data in the subsequent analysis of all resource conditions.

5.15 RECREATION

5.15.1 Federal

5.15.1.1 United States Department of Agriculture, Forest Service

The U.S. Forest Service management plans provide for integrated multiple use and sustainable yield or goods and services from the forest in a way that maximizes long-term net public benefits in an environmentally sound manner (USDA, U.S. Forest Service 1988, 1986, 1985). Recreation is managed using the Recreation Opportunity Spectrum, Visual Quality Objectives, and any additional management prescriptions outlined in management plans.

Gila National Forest Plan

According to the 1986 Gila National Forest Plan, the projected need for dispersed recreation opportunities is increasing. The U.S. Forest Service will continue to provide various recreation opportunities for hiking, backpacking, horseback riding, hunting, fishing, and snow play. The plan’s goals for recreation are as follows:

- Maintain a full spectrum of trail opportunities.
- Provide a balanced level of developed and dispersed recreation experiences.

Cibola National Forest Land and Resource Management Plan

The 1985 Cibola National Forest Land and Resource Management Plan predicts that recreation needs will increase with population increases. In order to satisfy future conditions, the plan states that new developed recreation sites will be constructed, and that the U.S. Forest Service will provide for dispersed recreation needs by constructing roads and trails.

Lincoln National Forest Plan

The 1988 Lincoln National Forest Plan states that the demand for developed recreation facilities exceeds the existing supply and is still increasing. New trailheads will be constructed to provide access to the wilderness for dispersed recreation, and campgrounds, picnic areas, and snowplay areas will be constructed to augment existing facilities. The plan's goals for recreation are as follows:

- Manage for a variety of developed and dispersed recreation experiences, while maintaining the current spectrum of opportunities.
- Encourage opportunities for the private sector to meet part of recreation demand.
- Provide a system of roads and trails for motorized recreation use, while protecting other resources.
- Preserve and protect cave resources to provide a wild caving experience and provide quality information and interpretive services related to this unique resource.
- Protect and manage historical and cultural resources.
- Emphasize visual resources through the application of landscape management principles.
- Coordinate with the New Mexico Natural Resources Department to contribute to goals and objectives specified in the Statewide Comprehensive Outdoor Recreation Plan (SCORP).

5.15.1.2 Fort Bliss, Texas, and New Mexico Mission and Master Plan Final Environmental Impact Statement

Fort Bliss comprises a Main Cantonment Area in El Paso County, Texas, and extensive training ranges to the north of the cantonment area. Two of these ranges contain withdrawn public land—McGregor Range and Doña Ana Range-North Training Areas. The public has limited access to some of this land for recreation, hunting, and cattle grazing, to the extent that it does not conflict with military uses. However, interested parties must obtain annual recreation access permits from either the Army or BLM, and coordinate access and use with the Army to ensure safety and to avoid interference with military missions. Approximately 1,000–1,700 recreation permits are issued annually for hunting, hiking, livestock management, and guided tours. Most recreational usage occurs during the hunting season; during the off-season, public access to the ranges for recreation is infrequent. Although concurrent use by the military and the public is allowed, the entire training area is closed to public access when military activities are incompatible with public use (U.S. Army Corps of Engineers 2000). Special management

areas within McGregor Range include the Black Grama Grassland ACEC and Culp Canyon WSA. McGregor Range provides opportunities for isolation and interaction with natural areas; most areas that are open to recreation are categorized as semiprimitive, nonmotorized (U.S. Army Corps of Engineers 2000).

5.15.1.3 San Andres National Wildlife Refuge

San Andres National Wildlife Refuge, located approximately 30 miles northeast of Las Cruces in Doña Ana County in the southern portion of the San Andres Mountain Range, was established in 1941 by Executive Order 8646 for the "conservation and development of natural wildlife resources" (USFWS 1998). The 57,215-acre refuge is completely surrounded by the White Sands Missile Range and is not open to the public due to security restrictions established for the military defense weapons testing (USFWS Undated). However, the USFWS maintains contact with the public through exhibits in high profile locations (e.g., malls, banks etc.) and provides educational presentations to schools, civic clubs, and other groups. Also, the USFWS may develop and construct an interagency international visitor center on I-10 near NMSU for public education and to provide biology research office space (USFWS 1998).

5.15.1.4 National Management Strategy for Mountain Biking

The National Management Strategy for Mountain Biking provides guidance to BLM field offices for developing a proactive management approach that is supported by the BLM Washington Office. To promote consistency agency-wide and locally for successful nonmotorized trail management, BLM field offices are directed to coordinate at the national level and with States, local organizations, and volunteers.

5.15.2 State and Local Plans

5.15.2.1 New Mexico Statewide Comprehensive Outdoor Recreation Plan 2004-2009

SCORP exists to provide state-level recreational use and area information (an analysis of supply and demand for recreational opportunities, public input, a list of current trails and wetlands) to the Land and Water Conservation Fund to establish priorities for funds allocations for land acquisitions to serve the outdoor recreation requirements of the people of New Mexico. The plan is the primary means by which the State of New Mexico and the U.S. Department of the Interior, via the National Park Service, cooperate to provide for the outdoor recreation needs of the State. SCORP uses Regional Planning Districts to support the outdoor recreation planning and economic strategies of concentrated areas throughout the State to allow greater efficiency in tying together quality of life, issues, economic development, and protection of natural systems. According to SCORP, the economy of Region VII, which includes Doña Ana and Sierra Counties, largely revolves around recreation and tourism. Regional issues identified in the SCORP include access problems, lack of resources for maintenance, and the desire for urban and rural trail systems. In addition, the public expressed a desire for equestrian and multi-sport complexes. SCORP identifies the most important issue as the need to "expand and develop new urban/multi-use/open space trails," followed by other issues related to conflicts between OHV use and other uses, protecting access to public land, and promoting recreation that positively impacts economies.

5.15.2.2 Doña Ana County Comprehensive Plan

The 1994 Doña Ana County Comprehensive Plan states that the quality of life in Doña Ana County is characterized by a strong sense of community that is strengthened by the rural lifestyle. Community residents have identified parks and recreation as a high priority for improvement, and about 80 acres of additional park space would be needed each year to meet the needs of county residents (based on national standards). As a result, the plan's Primary Goal 3 is to "enhance the quality of life for county residents by providing adequate parks and recreational facilities," with a specific action item to "identify sites for future recreational facilities which can be acquired from the BLM and other public and private agencies" (Doña Ana County 1995 as amended).

5.15.2.3 Otero County Comprehensive Plan

The Otero County Comprehensive Plan recognizes tourism and recreation as one of Otero County's largest industries and an asset to the economic development of the county. One of the plan's stated goals for economic development is to "promote tourism in the county." The industry provides tourists and residents opportunities to "visit, explore, and enjoy the major recreation attractions in the area," which include La Luz, Tularosa, Cloudcroft, the Mescalero Apache Reservation, New Mexico Museum of Space History, White Sands National Monument, Lincoln National Forest, Valleys of Fire Recreation Area, Oliver Lee Memorial State Park, Bonito Lake, Alameda Park Zoo, Founders Park, Alamogordo Airborne Museum, Kids Kingdom, Fickinger Center for Performing Arts, Tularosa Basin Historical Museum, Sacramento Mountains Museum, White Sands Balloon Invitational, High Rolls Cherry Festival, Tularosa Vineyards and Winery, The Toy Train Depot, Apache Point Observatory and National Solar Observatory, Eagle Ranch Pistachio Groves, McGinn's Pistachio Tree Ranch and Arena Blancha Winery, Sertoma Speedway, and various golf courses.

The plan addresses the use of public lands within the county for recreation purposes. It states that Otero County "will promote and facilitate public and private recreational, cultural, wilderness, and wildlife opportunities compatible with local custom and culture and within the constraints of private property rights and local self- determination." The county supports the following goals, policies and implementation measures related to recreation on public lands:

- There shall be no additional federal wilderness or park areas, or special designated areas, in Otero County without the consideration of the Board of County Commissioners of Otero County. Public lands will be managed under the multiple use theory to provide opportunities for all users of public lands.

- Maintain current information on proposed actions on public lands in the County participate in decisions related to the use of public lands. Continue and expand County involvement in project planning, for example, recreation facility master planning.

- CFS Goal 2. Provide for various recreational activities of County residents, which include the following (recreation and hiking trails, open space, and multiple use parks).

- The County will develop a recreation master plan that will coordinate the joint use of existing facilities, locate and plan new facilities, and develop access to public land for recreation.

5.15.2.4 City of Las Cruces Comprehensive Plan

The 1999 City of Las Cruces Comprehensive Plan contains a vision for the preservation of desirable views and open space as appropriate. A core environmental goal of the plan is to protect and maintain the existing and natural environment (air, water, soil, flora, fauna, etc.) from development and human activities that contribute to pollution, erosion and deterioration. References to open space, recreation, and tourism are found in the plan in the following sections:

- Land Use Element Objective 11 seeks to establish urban and rural open space networks in the area. The plan states that the need for open space must be examined on a citywide basis, establishing open space systems with arroyos, irrigation channels, parks and recreation facilities, and schools, as well as within private development. Policies 11.1–11.8 address the creation and preservation of open space networks in the area. In particular, Policies 11.2 and 11.7 state that the city shall work with the BLM and the State of New Mexico to preserve arroyos on the east and west mesas as open space and to support the establishment of the Rio Grande Corridor Recreation Area.

- Urban Design Element Goal 2 is to preserve and enhances Las Cruces' natural, visual, historic and cultural resources while reinforcing the overall form and character that communicates sensitivity to its physical setting. Objective 5 is to protect those natural resources and features that are unique to the region.

- Tourism Element Goal 3 seeks to promote and enhance Las Cruces and Mesilla Valley as a tourist destination by continuing to promote existing (as well as creating new) tourist activities and events in Las Cruces.

5.15.2.5 The Extraterritorial Zone Comprehensive Plan

The Extraterritorial Zone Comprehensive Plan addresses issues relevant to the development of property along the river, open space concerns, and the preservation of natural resources. Goal 3 Objective 3.2 promotes a coordinated open space and recreational program for long-range provision of region-serving recreation, open space, and scenic-lands protection. Policy 3.2.2 provides for the linkage of multi-use parks and open space parks to support development of a plan for regional parks, trails, and open-space activities and facilities. Goal 4 supports the protection of the Extraterritorial Zone's natural resources relative to the preservation of unique natural areas, native vegetation, and wildlife. Policy 4.4.4 assures

the county's assistance in development and implementation of plans for the preservation, protection, and management of habitat areas along the Rio Grande River.

5.15.2.6 City of Las Cruces 2003 Zoning Code

The 2003 Open Space Zoning Code establishes two zoning districts for open space: Open Space Recreation, and Open Space – Natural/Conservation. The districts are intended to allow both public and private lands to serve as areas that provide opportunities for active and passive recreation in either developed (modified) or natural setting: to protect, preserve, and/or restore open spaces; and to establish buffer areas to mitigate potential incompatible land uses (City of Las Cruces 2004).

5.15.2.7 City of Las Cruces Rio Grande Riparian Ecological Corridor Project Comprehensive Plan

The City of Las Cruces Rio Grande Riparian Ecological Corridor Project Comprehensive Plan "seeks to create a guide for future development of the Rio Grande River corridor which will be sustainable and non-polluting." The plan, created through a Sustainable Development Challenge Grant from the EPA, is for the development of an 11-mile corridor of the Rio Grande River in the City of Las Cruces. The goals of the plan, which are directly related to recreation and maintaining open space, are as follows:

- Preserve, enhance, and restore native riparian and aquatic habitat diversity in limited project areas
- Preserve farmland and open space adjacent to the Rio Grande River
- Create a multi-use trail system for the 11-mile corridor
- Promote ecotourism by supporting small businesses and advertising the Rio Grande River Corridor as a destination point
- Expand recreational opportunities by building two additional parks and providing access points to the river
- Educate the public about the ecological, cultural, and historical importance of the Rio Grande River Corridor

5.15.2.8 2004 Town of Mesilla Comprehensive Plan

One of the key features of the plan's land use goals is to designate greenbelts and promote open space areas within subdivisions. Recreational and cultural facilities and opportunities are thought to benefit the community by contributing to the economic, environmental, and social qualities of the community. Dispersed recreation activities that do not require a high level of organization or facility (such as walking, jogging, and horseback riding) are common along ditch banks within the town. Residents of the town have expressed a desire for a formal, regularly maintained, and signed trail system to accommodate passive recreation activities along the ditches. The Rio Grande River corridor is expected to become a destination for dispersed recreation in the future. The community services goal of the plan is to provide a

diversity of dispersed and active recreational activities and opportunities for all residents, regardless of age.

5.15.2.9 El Paso Comprehensive Plan

El Paso is situated adjacent to public lands in southeastern Doña Ana County. As a result, public lands are likely to be affected by the growing needs of the El Paso metropolitan area. This El Paso Comprehensive Plan includes a goal to protect and promote ecologically sensitive areas such as aquifer recharge zones, hillsides, bosques, arroyos, and wetlands through adopted policies such as planning "new parks and open spaces to preserve ecologically sensitive areas." The General Land Use Map is used as a major implementation tool for laying out city zoning. Along El Paso's northern border (with New Mexico), large amounts of land are allocated to parks and open space land use, located in and near the Franklin Mountains State Park.

5.15.2.10 City of Truth or Consequences Comprehensive Plan

Although the City of Truth or Consequences Comprehensive Plan indicates the most pressing issue is infrastructure development, one of the four main objectives of plan is to "continue to welcome tourists and seasonal visits by recreational vehicle enthusiasts and others who appreciate the Truth or Consequences' natural beauty, hot springs and affordable lifestyle." Recreation areas mentioned in the plan mostly pertain to community centers and city-built infrastructure. Tourism from regional attractions such as Elephant Butte State Park, Caballo Lake State Park, Gila National Forest, Bosque del Apache Wildlife Preserve, Geronimo Trail Scenic Byway, and hot baths, provide economic benefits to the city.

5.15.2.11 Mesilla Valley Bosque State Park Draft Master Plan for Public Comment

State Parks has proposed the Mesilla Valley Bosque located near Las Cruces in Doña Ana County as a State Park. It is proposed as a day-use park that would emphasize the bosque setting, as an educational and resource protection effort. Developed areas would include an access road, a visitors' center, an educational building, picnic areas, a small gift shop, and an administration building at the north end; viewing blinds, signs, shade structures, tables, benches, and miles of trails at the south end (State Parks 2005a). The proposed parklands are currently popular for fishing, hunting, bird watching, wildlife viewing, and OHV use. The park is located near and will incorporate BLM-administered lands in the southwest part of the trail system. Hunting will be prohibited within the park and fishing will be limited to a designated area (State Parks 2005a).

5.15.2.12 A Vision: Open Space and Trail System For Doña Ana County, New Mexico

This plan ("Vision") was developed by citizens that propose a network of open space throughout Doña Ana County, with core natural areas and links between sites. The plan has been endorsed by the City of Las Cruces and Doña Ana County; however, it is not an official or adopted plan. It is designed to conserve and enhance the natural and cultural heritage of the region and promotes three key elements: preservation of diverse landscapes and natural habitats; connectivity between sites that is crucial to the

creation of an interconnected open space and trail system; and cooperation among numerous stakeholders for the protection and management of the areas.

5.16 LANDS AND REALTY

5.16.1 Federal and Military

5.16.1.1 McGregor Range Resource Management Plan Amendment

The Record of Decision for the McGregor Range RMPA is anticipated to be completed in 2006. The objective of the lands program for the withdrawn public land on McGregor Range is to "consider those uses that are compatible with the McGregor Range withdrawal (PL 106-65) and if compatible, make selected withdrawn land and its resources on McGregor Range available for the public to meet National, regional, and local needs while maximizing public land health" (USDI, BLM 2005b). Disposal of withdrawn public land through sales, recreation and public purposes patents, and exchanges are not allowed by BLM and leases, easements, and rights-of-ways or other authorizations are issued by the Secretary of the Interior, with the concurrence of the Secretary of the Army (USDI, BLM 2005b).

5.16.1.2 San Andres National Wildlife Refuge

San Andres National Wildlife Refuge is located approximately 30 miles northeast of Las Cruces in Doña Ana County. It was established in 1941 by Executive Order 8646 for the "conservation and development of natural wildlife resources" (USFWS 1998). The refuge encompasses 57,215 acres of the southern portion of the San Andres Mountain Range and is completely surrounded by the White Sands Missile Range (WSMR). The refuge is not open to the public due to security restrictions established for the military defense weapons testing that is conducted on WSMR (USFWS n.d.). The Jornada Experimental Range retains research rights on approximately 40 percent of the western half of the refuge (USFWS 1998).

5.16.1.3 U.S. Forest Service

The U.S. Forest Service plans provide for integrated multiple use and sustainable yield of goods and services from the forest in a way that maximizes long-term net public benefits in an environmentally sound manner (USDA, U.S. Forest Service 1985, 1986, undated).

Gila National Forest Plan

One of the goals stated in the Gila National Forest Plan is to "conduct land ownership adjustment, right-of-way acquisition, land line location, and special use programs to promote efficient management." The plan recognizes that communities surrounded by national forest lands have consequent limits to growth, and as a result, conflicts arise regarding the amounts and the locations of lands provided for community expansion. One specific BLM-related land-management prescription that addresses the problem directs the National Forest Service to "request BLM resurveys where section corners haven't been brass capped. Highest priority is complex land patterns where development is taking place."

Cibola National Forest Land and Resource Management Plan

Utility communication facilities, recreation residences, concessions, and rights-of-way are authorized on the forest by special use permits. Disposal of land is usually accomplished by exchange, but sale is permitted under certain circumstances.

Lincoln National Forest Plan

The Lincoln National Forest Plan prescribes the following management of national forest land:

- Use land ownership adjustment to accomplish resources management objectives and respond to public needs. Provide identifiable property boundaries.
- Authorize, by means of permit, use of national forest land by private or commercial interests when private land is not available and the requested use is compatible with other resources and activities.

5.16.2 County and City

5.16.2.1 Doña Ana County Comprehensive Plan

The Doña Ana County Comprehensive Plan indicates that the primary areas of future growth will be in the Las Cruces metropolitan area and the southern part of Doña Ana County. As such, the plan's goals and policies encourage the development of urban centers for rapid growth, while allowing for mixed use in rural areas. One of the primary goals of the plan is to encourage cooperation among local, State and Federal agencies, in order to provide for orderly growth and infrastructure for public health, safety, and welfare. The plan's Primary Goal 3 is to "enhance the quality of life for county residents by providing adequate parks and recreational facilities," with a specific action item to "identify sites for future recreational facilities which can be acquired from the BLM and other public and private agencies" in many areas of the county. Primary Goal 5 encourages the "use of the comprehensive plan to guide locations for land exchange and disposal of BLM and State lands," as well as the establishment of a buffer zone along the mountain ranges through acquisition or exchange of BLM and State lands in this area. Most private lands along the Rio Grande throughout the county are zoned for agricultural use. BLM lands in southern Doña Ana County near the towns of Anthony and Chaparral are planned for urban land use, but the majority of public lands in the county are planned for low-intensity uses, such as grazing livestock or low density residential

5.16.2.2 Otero County Comprehensive Plan

The Otero County Comprehensive Plan addresses land use on both private and public lands. It states that the county is somewhat constrained in its efforts to diversify the economy away from its economic dependence on U.S. military bases, due to the small amount of private land available for development (only about 11 percent of the area). According to the plan, the most important privately owned areas for growth are those in the Alamogordo-La Luz-Tularosa urbanizing area. The second most important area

for residential development will be the mountain area, while the third will be the very southwest corner of the County, the Orogrande areas, and other isolated private ownerships. The southeasterly portion of the County has been developing into agriculture uses.

The following land use goals, as stated in the plan, address both public and private land use in Otero County:

- PLU 1: The County Commission recognizes all private property rights as guaranteed by the U.S. Constitution and defined by Federal and State law. The goal is to protect these property rights, while protecting the public health, safety and welfare of County residents.
    - Strategy a. Review and refine the Interim Land Use Policy to clarify the County's goals and actions to be taken by the Public Land Use Action Committee.
    - Strategy b. Develop a process within the County government to maintain current information regarding planning processes and proposed actions on public lands in and adjacent to Otero County.
    - Strategy c. Actively participate in planning processes and decision making for public lands in and adjacent to Otero County.
- PLU Goal 2. Provide for land use sustainability on public lands to maintain the custom/culture of our citizens.
- LU Goal 1. The County Commission recognizes all private property rights as guaranteed by the U.S. Constitution and defined by Federal and State law. The goal is to protect these property rights, while protecting the public health, safety and welfare of County residents. The County's concern with private property rights encompasses two major issues. First, the goal is to include the interests of Otero County residents in all decisions regarding the use of Federally and State-owned lands. Second, the County's goal is to ensure the rights of private property owners.
- LU Goal 5. Ensure Holloman Air Force Base Mission is not jeopardized by incompatible growth. Holloman AFB is a significant contributor to the County's economy.
- LU Goal 6. Support traditional land uses to maintain the County's custom and culture. (Strategy a. Respect traditional uses (i.e., ranching and agriculture) when there are conflicts between established agricultural uses and new adjoining landowners).

The plan states that Otero County expects Federal and State agencies to coordinate with the County Commission in planning and managing Federal lands within the geographic boundaries of Otero County. Land is recognized as being essential to local industry and residents, so the County supports policy that states "the design and development of all Federal land transactions, including land adjustments,

purchases, disposals and exchanges, should be carried out to the benefit of Otero County citizens." The County supports the following policies specifically relating to lands and realty actions on public lands:

- Increase opportunities for local economic developments by increasing the amount of patented and non-Federal land within the County.
- Federal land agencies shall not acquire any private land or rights in private lands within Otero County without first ensuring that private property interests are protected and enhanced.
- Federally managed lands that are extremely difficult to manage, particularly those that lie in isolated tracts, will be targeted for disposal.
- Otero County will be notified of and consulted about all Federal land adjustments in Otero County.
- Before Federal Land agencies can change the local historic customs, culture and community stability of land use, the Otero County Commission may require adverse impact studies as outlined in Presidential Executive Order 12630 which requires that all Federal agencies complete a takings implication assessment to evaluate the effect of their rules, regulations and decisions on: (1) private property, (2) private property rights, and (3) the investment-backed expectations of private citizens. These requirements shall be conducted and mitigation measures adopted with concurrence from Otero County. Adverse impact studies shall also address all classes of grazing rights, floodplain areas and public access.

5.16.2.3 City of Las Cruces Comprehensive Plan

The 1999 City of Las Cruces Comprehensive Plan identifies goals and policies for land uses. It contains a core land use goal of achieving an urban form that enhances the unique environment. Written policy is to support and address the goal through (1) mixed land uses and compatibility issues and (2) orderly growth through sound growth management principles. The plan encourages the establishment of open space and rural networks through cooperation with the BLM and State are encouraged by the Plan. In this Plan, the City discourages "leap-frog growth."

Land Use Goal 1, Objective 2 seeks to establish policies to support the viability of agriculture and the co-existence of agriculture with other land uses. According to the Plan, Mesilla Valley is one of the most productive agricultural areas in the United States due to its extensive irrigation channel system and long growing season. Agriculture is recognized as an important economic sector of the local economy, as well as a valuable contribution to open space, and is encouraged in the fringe areas of the City of Las Cruces. Objective 3 establishes policy to support the unique lifestyles associated with urban and rural residential areas.

5.16.2.4 City of Las Cruces Rio Grande Riparian Ecological Corridor Project Comprehensive Plan

The City of Las Cruces Rio Grande Riparian Ecological Corridor Project Comprehensive Plan emphasizes the importance of enlisting the collaboration of stakeholders and the public regarding increased development near the Rio Grande. According to this plan, the population of Las Cruces is expected to increase by 20 percent in the next ten years (City of Las Cruces 2004). The plan states, "As new residents and industries arrive in the region, the economic benefits of open space become increasingly valuable." The plan recognizes that open space provides the following economic benefits:

- Creates a visually aesthetic community
- Attracts investment
- Revitalizes cities and attracts people
- Enhanced and protected natural resources are magnets for tourists
- Safeguards the agricultural economy and provides scenic vistas
- Provides a cost-effective solution to expensive flood control measures

5.16.2.5 2004 City of Mesilla Comprehensive Plan

The Town of Mesilla Comprehensive Plan builds upon previous planning documents prepared for the town. A central theme of the plan is preservation of the town's character by protecting open space (agricultural) areas from development. Existing land use is centered on the area's agriculture with large parcels of land and diverse crops located closest to the river, and most development within the Historic District. Land use goal 1 seeks to "achieve protection of Mesilla's agriculture" (Town of Mesilla 2004). Land use objectives that pertain to this goal are as follows:

a. Promote agriculture as a long-term use of land and water in Mesilla by incorporating it in its planning activities including zoning ordinance, subdivision regulations, and enforcement.

b. Identify the greenbelt on a map and designate land uses within the greenbelt for very low residential development, agriculture, and open space through zoning.

c. Permit the use of cluster design in new subdivisions that contain a variety of lot sizes, open space, and which establish conditions of approval that conserve agricultural resources.

d. Explore the use of agricultural preservation tools such as the purchase or transfer of development rights, land banking, and other conservation techniques that can be used as protections from development.

e. Promote the use of agricultural land for related industry (Town of Mesilla 2004).

Land Use Goal 2 seeks to "achieve an efficient and orderly pattern of land use development in Mesilla and its surrounding areas." Land use objectives that pertain to this goal are as follows:

a. Accommodate new commercial and residential development through infill development on vacant lots and/or renovation of vacant abandoned structures throughout Mesilla.

b. Pursue annexation as a means of increasing the supply of residential properties as long as newly annexed areas can be serviced in a reasonable time period.

c. Reevaluate the Mesilla zoning code, map, and enforcement and revise if necessary in order to ensure that zoning reflects current land use.

d. Communicate regularly with Doña Ana County and the City of Las Cruces to ensure that these entities respect and comply with land use decisions in Mesilla.

e. Evaluate non-conforming uses that exist within each Town zone category and consider revising the Amortization Clause/Ordinance that regulate their use (Town of Mesilla 2004).

5.16.2.6 The Truth or Consequences Comprehensive Plan

The City of Truth or Consequences Comprehensive Plan is intended to enhance the quality of life for all residents. The most pressing issue indicated by the plan is infrastructure development, but plan objectives also include enhancing the city's aesthetics, encouraging economic development, and promoting tourism. Land use within the plan is addressed by goals and policies, most which pertain to economic development, infrastructure development, redevelopment, and the aesthetic appearance of the town. Other land use policies included in the plan are related to the goal of coordinating land use decisions with other jurisdictions: Policy 2.12 indicates that the city is to collaborate with the Village of Williamsburg regarding the Village's plans for growth. Policy 2.13 indicates that the city is to work with the county (Sierra County) to ensure that community uses adjacent to the municipal boundary are compatible with uses in the city (City of Truth or Consequences undated).

5.16.2.7 El Paso Comprehensive Plan

The City of El Paso is situated adjacent to Doña Ana County, near the towns of Anthony, New Mexico and Sunland Park, Texas. The 1999 Comprehensive Plan lays the framework to "achieve urban development to economically, socially, physically, and environmentally benefit those who live, work and visit in the city" and to "develop partnerships that will attain regional cooperation." The 2025 Projected Land Use Map plans for mostly residential land use along the New Mexico/Texas Border from Anthony south to Sunland Park. Along El Paso's northern border, there are large amounts of land planned for parks and open space near the Franklin Mountains. On the eastern side of the mountains, the New Mexico/Texas border area is planned for residential uses, and on the eastern side, land is planned for industrial and residential uses.

5.16.2.8 The Extraterritorial Zone Comprehensive Plan

In 1989, the City of Las Cruces and Doña Ana County established an ETZ for joint city and county planning, zoning and subdivision approval. The ETZ was developed by the Extraterritorial Zoning Authority (ETA) of the City of Las Cruces and Doña Ana County, as authorized by New Mexico Statutes Annotated 1978, Sections 3-21-1 et seq. (1995). The ETA developed the ETZ Plan to guide development on approximately 343 square miles.

The ETZ Plan provides goals, objectives, and policies that will be used to promote development, and provide for the health, safety and welfare of the community for the next twenty years in a manner that is consistent with the community's goals (ETA of Las Cruces and Doña Ana County 2000). The area covered by the ETZ, which extends 5 miles out in all directions from the corporate limits of the City of Las Cruces, is expected to increase in population by 46 percent from 2000 to 2020. The plan recognizes that the major challenges facing local governments in Doña Ana County are the result of past and future population growth, and the demands for various types of public services. The plan includes land use goals from the City of Las Cruces Comprehensive Plan, including the goal to "achieve an urban form, that supports and enhances our unique environment" through mixing land use and compatibility, orderly growth, and encouraging an urban form that supports and enhances the built and natural environment. Furthermore, the plan identifies a policy to encourage cooperation among local, State, and Federal agencies to improve intergovernmental relations (ETA of Las Cruces and Doña Ana County 2000). Public ownership accounts for the majority of land ownership in the ETZ, with public or government entities overseeing approximately 65 percent of the land located in the ETZ. The BLM holds properties to the east of the State Trust Lands in the ETZ as the Organ Mountains ACEC. This designation prevents the development of the mountains and higher mesa areas, thereby protecting the fragile environment and the aesthetic mountain views. However, according to the plan, "the most desirable properties for development are those adjacent to the City of Las Cruces and for which the city could make utilities and transportation available," which are located on private and State Trust Lands.

5.16.2.9 A Vision: Open Space and Trail System For Doña Ana County, New Mexico

The Vision was developed by citizens to propose a network of open space throughout Doña Ana County, with core natural areas and links between sites. Although this is not an official or adopted plan, it has been endorsed by the City of Las Cruces and Doña Ana County. Several of the core areas lie on BLM lands within the county, and the Vision proposes that they would remain under BLM management. Several recommendations listed in the plan are relevant to the BLM Las Cruces District Office lands program, and are listed below by geographic area.

Organ Franklin Mountains –

- Remove the "disposal" designation from all BLM land within the area labeled as "Expanded Organ Mountains Recreation Area," located west of the Organ Mountains and south of Soledad Canyon Road on the Las Cruces Detail Map.

- Remove the "disposal" designation from all BLM land within the area labeled as "San Andres Foothills," located north of the Organ Mountains ACEC and west of the Doña Ana Mountains ACEC on the Vision maps.
- Work with the State Land Office to develop land exchanges that would allow BLM to acquire State Trust lands within the "Expanded Organ Mountains Recreation Area" and "San Andres Foothills."

Doña Ana Mountains –

- Work with willing sellers to acquire (via BLM purchase or exchange) private lands within the proposed Doña Ana Mountains Recreation Area, which surrounds the existing Doña Ana Mountains ACEC. Or, alternatively, support private partnerships that could facilitate the donation of conservation easements for private land within the boundaries.
- Work with the State Land Office to develop land exchanges that would allow BLM to acquire State Trust lands within the boundaries of the proposed Doña Ana Mountains Recreation Area.

West Mesa Escarpment –

- Remove the "disposal" designation from all BLM land within the area boundaries (west of the Rio Grande between Las Cruces and the Town of Mesilla).
- Revisit plan for West Mesa Regional Park together with Doña Ana County and the City of Las Cruces.

Tortugas Mountain –

- Remove the "disposal" designation from all BLM lands within the Tortugas Corridor that is located north and east of Tortugas Mountain and west of the Organ Mountains ACEC on the Vision maps, or other lands as recommended by the advisory committee.

5.17 TRANSPORTATION AND ACCESS

5.17.1 State of New Mexico Plans

5.17.1.1 New Mexico Department of Transportation Fiscal Year 2003-Fiscal Year 2008 Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program is the State's multi-modal transportation preservation and capital improvement program, listing projects for the three-year period from Fiscal Year (FY) 2006 to FY 2008. The document becomes a pre-scheduling and funding document. Various local, State, and Federal transportation corridors have been identified for improvement within the Planning Area. Future improvements have been identified along U.S. 70, I-10, I-25, and various State Routes and local roads (New Mexico Department of Transportation [NMDOT] 2003).

5.17.2 Local County and City Plans

5.17.2.1 Otero County Comprehensive Plan

The Otero County Comprehensive Plan states that the County recognizes the need for an adequate transportation system and adequate routes to transport the natural resources produced within the County as well as a need for tourism enhancement. The County has developed and will maintain a transportation network that optimizes accessibility and intends to "maintain and improve its valid existing rights-of- way across public and private lands accepted pursuant to the grant under Federal Revised Statute 2477, in accordance with appropriate safety standards." The plan also notes that costs and environmental degradation from movement between communities and across public lands will be minimized.

Specific goals related to transportation are found in the plan as follows:

- TG 1. Provide a safe, realistic, efficient and integrated transportation system to serve the present and future mobility needs of all the residents of Otero County.
    - Objective 1. Provide an efficient network of streets and roadways that will allow for a smooth flow of vehicular traffic (NMDOT designation Level of Service C). Roads should be designed to meet the needs of the residents without detracting from the rural character of the County.
    - Objective 4. Air Travel: Provide for safe air travel to and from the County Seat and surrounding communities.
    - Objective 5. Promote transportation alternatives to the automobile. Strategies include accommodating bicycle use on roads as alternative transportation (by incorporating bike lanes or shoulders into road repaving and re-striping roads with adequate widths to accommodate bike lanes), working with NMDOT to establish a bike route to Holloman AFB, and coordinating with responsible entities: County Commission, State government, Federal government, local organizations and people.
- TG 2. Generate sufficient resources to enable the building and maintenance of infrastructure and to ensure that the proper infrastructure accommodates growth as it expands into outlying areas.

5.17.2.2 Doña Ana County Comprehensive Plan

The Doña Ana County Comprehensive Plan is written in accordance with New Mexico State Statute 3-21-5, revised 1978. One of the purposes of the plan is to encourage the design of efficient transportation systems in order to improve traffic circulation on streets and public ways. The plan identified the transportation system as a key element in the quality of life of Doña Ana County. Improvement to Federal, State, and county highways is a priority to accommodate growth and economic development. An

action identified to meet a primary goal is to coordinate with Federal, State, and local governments to provide transportation services throughout Doña Ana County (Doña Ana County 1994).

5.17.2.3 City of Las Cruces Strategic Plan 2005-2009

The City of Las Cruces' Strategic Plan identified one of the City's objectives as the timely development and protection of parks and open space. A planned action to achieve the objective is to "review, evaluate, and amend City policies, plans, and documents as appropriate to maintain consistency and cohesion between the [Metropolitan Planning Organization] MPO transportation plan…" (City of Las Cruces 2005)

5.17.2.4 City of Las Cruces Rio Grande Riparian Ecological Corridor Project Comprehensive Plan

One of the goals of the City of Las Cruces' Rio Grande Comprehensive Plan is the creation of a multi-use trail system for an 11-mile development corridor along the Rio Grande. The trail, which would accommodate all types of nonmotorized transportation, would be an extension of an existing pathway, and would provide further linkage to other modes of transportation, in response to public interest in expanded transportation options. The trail system will help integrate public transportation, Park-and-Ride centers, bike routes, and walking routes into a citywide transportation network (City of Las Cruces 2004).

5.17.2.5 Las Cruces Metropolitan Planning Organization Transportation Plan

Federal regulations require the designation of a metropolitan planning organization (MPO) to carry out a coordinated, continuing, and comprehensive transportation planning process for urbanized areas with populations of more than 50,000. The Las Cruces MPO annually establishes project priorities for consideration by the NMDOT when programming transportation funds. The MPO also is responsible for planning all aspects of the transportation system, including roads, bicycle and pedestrian facilities, public transit, and the airport (Las Cruces MPO 2005).

The MPO initially adopted a Transportation Plan on August 10, 1994. An updated plan was adopted on June 14, 2000. The City of Las Cruces, the Town of Mesilla, and Doña Ana County jointly form the MPO. The MPO planning area includes the ETZ lands. This plan establishes a framework for future transportation networks in the Las Cruces metropolitan area.

The Transportation Improvement Program identified various improvements for local and county roads as well as U.S. Highway 70 and the portion of I-10 and I-25 located in the Planning Area.

5.17.2.6 City of Las Cruces Extraterritorial Zoning Comprehensive Plan 2000-2020

The New Mexico State Legislature enacted a State statute that allows any municipal governing body or the board of county commissioners of any county to create extraterritorial zones (ETZs) around cities to regulate development in growing areas (Doña Ana County 2000). In this plan, the citizens, MPO, and New Mexico State Highway Department identified the goal of improving the existing Las Cruces and

Doña Ana County transportation network area, inclusive of the ETZ. The goal established is to "Provide for coordinated planning and development of a transportation network tailored to meet ETZ sub area needs that will serve to:

- Develop an efficient, effective and economical thoroughfare system.
- Establish design criteria and funding procedures for intermodal development, facilities and services to all users."

Pedestrian and bicycle systems are evolving in the City of Las Cruces, primarily near the New Mexico State University. No plans have been developed for bike lanes in unincorporated areas. However, the banks of the Rio Grande offer excellent recreational bicycle and pedestrian development potential, as does the Organ Mountain Wilderness and Recreation Area, which would require coordination between the BLM, the Elephant Butte Irrigation District, and other Federal and local agencies.

5.18 SPECIAL DESIGNATIONS

The Otero County Comprehensive Plan addresses federal special management areas on public lands. It states that the County "will promote and facilitate public and private recreational, cultural, wilderness, and wildlife opportunities compatible with local custom and culture and within the constraints of private property rights and local self- determination." The county supports the multiple-use management of public lands and the policy that no additional federal wilderness or park areas, or special designated areas should be established in Otero County without the consideration of the Board of County Commissioners.

5.19 PUBLIC SAFETY

5.19.1 State Plans and Programs

According to the NMDOT, New Mexico participates in highway-related safety programs such as Project Lifesaver, and the federally sponsored State Safety Participation Program (NMDOT 2005). The New Mexico Highway Safety Improvement Program Section of NMDOT provides engineering services to accomplish the following:

- Develop, prioritize, and select roadway safety improvement projects on a statewide basis.
- Coordinate with the Transportation Programs Division, Traffic Safety Bureau to administer a statewide transportation safety management system.
- Assist other groups within NMDOT and other agencies in highway safety-related matters.

5.19.2 Military Plans

The Commanding General of the Army established the UXO Hazards and Munitions Management Team in 1998 to develop an integrated, comprehensive plan to address the management of UXO hazards, military munitions, and waste military munitions at the White Sands Missile Range. As a result, the White

Sands Missile Range Unexploded Ordnance Hazards and Munitions Management Plan and the Unexploded Ordnance Hazards and Munitions Management Plan and Implementation Guide were released in 1999 (U.S. Army 1999). In addition to these documents, a historical record is being compiled to document completed actions and serve as an official record of program status (U.S. Army 1999).

In the unlikely event of an aircraft crash, crash response plans established by the U.S. Air Force and the U.S. Army would dictate appropriate protocol for cleanup of the crash sites, including any hazardous waste spills. The emergency response and cleanup is conducted by the Installation Operations Center at the various military facilities in coordination with city and state Installation Operations Centers as needed (Kelley 2005).

5.20 SOCIAL AND ECONOMIC CONDITIONS

5.20.1 State Plans

The New Mexico Economic Development Office for Space Commercialization and the Federal Aviations Administration Office of Commercial Space Transportation have both published preliminary planning information for facilities to support commercial space travel. The proposed Southwest Regional Spaceport would be located in Upham, New Mexico, about 45 miles north of Las Cruces and 30 miles east of Truth or Consequences. The spaceport would include a launch complex, a 12,000-foot runway and aviation complex, a payload assembly complex, a support facilities complex, a system development complex, and site infrastructure. It is estimated that this project could potentially generate over $500 million annually with a weekly commercial launching. This figure includes annual tax revenues that could reach $20 million, which would be a significant boon to Sierra County's economy (NMED 2005). The feasibility or timing of this proposal is unclear; however, planning efforts include an ongoing EIS and coordination with the White Sands Missile Range. In addition, the FAA Office of Commercial Space Transportation currently is sponsoring The Ansari X Prize competition to promulgate the development of a commercial spaceship (FAA 2005).

5.20.2 Local Plans

Several local land use plans include goals or objectives related to economic or community development. The Doña Ana Comprehensive Plan identifies economic development and promoting employment opportunities as primary goals of the County. The City of Las Cruces identifies increasing ecotourism as a goal in its Comprehensive Plan for a Rio Grande Riparian Ecological Corridor Project (City of Las Cruces 2004).

The Otero County Draft Comprehensive Plan includes an Economic Development Element to address important aspects of the County's economy including income levels of residents, jobs and employment, the inventory of existing businesses, and recreation and tourism opportunities, as well as identifying "obstacles hindering the expansion of business activity in the community" (Otero County 2005). The U.S. military is "a major economic engine" for the County; the major employers are the White Sands Missile

Range, Holloman Air Force Base, German Air Force Base and the Naval Air Welfare Center. Future goals for the county include full use of federal entities in the county as well as diversifying the economic base from the large dependence on the military for economic strength by offering good jobs with attractive salaries for its citizens, promoting tourism as a major role in the economy, attracting retirees, helping filmmaking become an established sector, and reestablishing sustainable oil and gas extraction and logging as profitable industries.

Specific goals related to economic development as stated in the plan are as follows:

- ED Goal 1. Support existing businesses and encourage their expansion.
- ED Goal 2. Continue to diversify the economy by attracting or growing additional businesses and industries with attractive employment and wages.
- ED Goal 3. Support the development of industrial / business parks that will be attractive to new and expanding business.
- ED Goal 4. Promote tourism in the County.
- ED Goal 5. Support and promote the full use of Otero County's Federal facilities/entities; Holloman Air Force Base, White Sands RMP Missile Range, the Lincoln National Forest, White Sands National Monument and the Sunspot and Apache Point observatories.

6.0 SPECIFIC MANDATES AND AUTHORITY

BLM manages public land in accordance with a variety of Federal and State laws, Presidential Executive orders and proclamations, cooperative agreements, strategic plans, and resource management plans (RMPs). Listed below are the mandates and authorities that guide and govern BLM's management of public land, presented in hiearchial order (Presidential proclamations are not applicable in the TriCounty Planning Area):

- Federal, State, and county laws and administrative codes
- Presidential Executive orders and proclamations
- Federal manuals and handbooks
- Memorandums of agreements and understanding and cooperative agency agreements
- RMPs
- Strategic Plans
- Activity Plans

BLM develops manuals and handbooks establishing regulations designed to uphold the Federal laws, Executive orders, and Presidential proclamations. Memorandums of Agreements and Understanding are additional levels of authority that BLM develops with other Federal and State land managing agencies to ensure cooperative management of similar or shared resources. RMPs are developed to provide a framework for local level decision-making action, and activity plans are then written to implement the RMPs. BLM also creates strategic plans to provide management guidance for particular resources (e.g., species and habitat types).

This chapter briefly describes the legal mandates and authorities that direct BLM in its land use planning process. When combined with the purpose and need for action, these laws and authorities establish the scope of the land use plan and set the framework for the decisions to be made in the TriCounty RMPs and Environmental Impact Statement.

Various Federal statutes and other legal mandates have been enacted over time to establish and define the authority of BLM to make decisions on the management and use of resources on public land. Following are a few of the overarching mandates and authorities relevant to BLM's land use planning efforts and resource management of the TriCounty Planning Area.

- The Federal Land Policy and Management Act of 1976 (FLPMA), as amended, Title 43, United States Code, Section 1701 et seq. (43 U.S.C. 1701 et seq.), provides land use planning authority for BLM. FLPMA is an Act "to establish public land policy; to establish guidelines for its

administration; to provide for the management, protection, development, and enhancement of the public land; and for other purposes."

- The National Environment Policy Act of 1969 (NEPA), as amended, 42 U.S.C. §4321 et seq., requires the consideration and public availability of information regarding the environmental impacts of major Federal actions significantly affecting the quality of the human environment. Consideration of alternatives and mitigation of impacts are included in the NEPA process.

- The National Landscape Conservation System (NLCS): The land use planning process is the key tool used by BLM, in coordination with interested publics, to protect resources and designate uses on NLCS lands managed by BLM. BLM has developed guidance for preparing and amending land use plan decisions through the planning process, for maintaining both RMPs and Management Framework Plans, and for public involvement. These plans help ensure that the NLCS lands are managed in accordance with the FLPMA, other applicable laws and regulations, and legislation, orders, and administrative actions establishing management units.

- Council on Environmental Quality Regulations, Title 40, Code of Federal Regulations, Section 1500 et seq. (40 CFR 1500 et seq.), implements the NEPA. Its purpose is to advise Federal agencies on how to comply with the NEPA procedures and achieve the goals for enforcing the Act.

- 43 CFR 1600 establishes the "process for development, approval, maintenance, amendment and revision of resource management plans, and the use of existing plans for public lands administered by the Bureau of Land Management."

- BLM Land Use Planning Handbook 1601-1 provides further guidance to BLM on the requirements of Sections 201 and 202 of FLPMA, the BLM's Planning Regulations (43 CFR 1600), and NEPA. The handbook provides guidance to BLM for preparing RMPs, plan revisions, plan amendments, plans adopted from other agencies, and subsequent implementation-level plans.

The remainder of this section discusses the mandates and authorities relevant to each of the resources, resource uses and other features of the Planning Area to be addressed in the RMPs planning efforts. Though a majority of these are managed according to Federal, State, and county regulations, only the applicable resource-specific mandates and authorities are addressed in each discussion.

6.1 AIR QUALITY

6.1.1 Federal Laws and Regulations

Since 1970, the Federal Clean Air Act and subsequent amendments have provided the authority and framework for the U.S. Environmental Protection Agency's (EPA's) regulation of air emission sources. The EPA regulations promulgated pursuant to the authority provided in the Clean Air Act serve to establish requirements for the monitoring, control, and documentation of activities that will affect ambient

concentrations of certain pollutants that may endanger public health or welfare. In particular, these regulations have the overall objective of achieving and maintaining adherence to appropriate standards for ambient air quality.

6.1.1.1 National Ambient Air Quality Standards

National Ambient Air Quality Standards (NAAQS) have historically applied to six criteria pollutants—sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter equal to or less than 10 microns in diameter (PM_{10}), ozone (O_3), and lead (Pb). More recently, the NAAQS have been expanded to include particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$) and a new standard for O_3. The standards are defined in terms of threshold concentration (e.g., micrograms per cubic meter) measured as an average for specified periods of time (averaging times). Short-term standards (i.e., 1-hour, 8-hour, or 24-hour averaging times) were established for pollutants with acute health effects, while long-term standards (i.e., annual averaging times) were established for pollutants with chronic health effects. Standards for averaging times of 24-hours or less can be exceeded once per year without a violation. However, a single exceedance of a standard, on an annual average, during a given year would constitute a violation.

Under the Federal Clean Air Act, each State or delegated permitting authority has the responsibility to achieve and maintain air quality that meets the NAAQS. The NAAQS are established for two classes of ambient air quality levels—primary and secondary. The primary standards are concentration levels of pollutants in ambient air, averaged over a specific time interval, designed to protect public health with an adequate margin of safety. The secondary standards are concentration levels judged necessary to protect public welfare and other resources (e.g., crops) from known or anticipated adverse effects of air pollution.

Table 6-1
National Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS	
		Primary	***Secondary***
Sulfur Dioxide (SO_2)	3-Hour	—	0.5 ppm
	24-Hour	0.14 ppm	—
	Annual	0.03 ppm	—
Particulate Matter equal to or less than 10 Microns in Diameter (PM_{10})	24-Hour	150 µg/m^3	150 µg/m^3
	Annual	50 µg/m^3	50 µg/m^3
Particulate Matter equal to or less than 2.5 Microns in Diameter ($PM_{2.5}$)	24-Hour	65 µg/m^3	65 µg/m^3
	Annual	15 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)	1-Hour	35 ppm	—
	8-Hour	9 ppm	—
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm	0.053 ppm
Lead (Pb)	Quarterly	1.5 µg/m^3	1.5 µg/m^3
Ozone (O_3)	1-Hour	0.12 ppm	0.12 ppm
	8-Hour	0.08 ppm	0.08 ppm

SOURCE: U.S. Environmental Protection Agency 2005h, 2005i, 2005j, 2005k, 2005l, 2005m, 2005n, 2005o, 2005p, 2005q
NOTES: ppm = parts per million
mg/m3 = micrograms per cubic meter
NAAQS = National Ambient Air Quality Standards

6.1.1.2 Attainment, Nonattainment, and Unclassified Areas

Geographic areas, which may not coincide with political boundaries, are designated as "attainment," "nonattainment," or "unclassified" for each of the criteria pollutants with respect to the NAAQS. If sufficient monitoring data are available, the EPA may designate an area as attainment if air quality is shown to meet the NAAQS. Areas in which air pollutant concentrations exceed the NAAQS are designated as nonattainment for specific pollutants and averaging times. Typically, nonattainment areas are urban regions and/or areas with higher-density industrial development. An unclassified designation indicates that the status of attainment has not been verified through data collection. When permitting new sources, an unclassified area is treated as an attainment area.

Because the status of an area is designated separately for each criteria pollutant, one geographic area may have all three classifications. EPA's Green Book defines each of the areas as follows (USEPA 2005c):

- Attainment Area – An area that meets a Federal primary or secondary ambient air quality standard for the pollutant.
- Nonattainment Area – An area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) any of the Federal primary or secondary ambient air quality standards for the pollutant.
- Unclassified Area – An area that cannot be classified on the basis of available information as meeting or not meeting the Federal primary or secondary ambient air quality standard for the pollutant.

For the specific portions of Sierra, Otero, and Doña Ana Counties within the Planning Area, only Doña Ana County contains a nonattainment area, with respect to the PM_{10} NAAQS and 1-hour O_3 NAAQS. The remainder of the Planning Area is designated as attainment or unclassified.

6.1.1.3 Class I, Class II, and Class III Areas

Before the Clean Air Act was passed in 1990, the Wilderness Act of 1964 established a National Wilderness Preservation System that manages federally owned "wilderness areas" so that they can be used and enjoyed by present and future generations (Wilderness.net 2005). A wilderness area is defined as an undeveloped area, uninhabited by people, that is protected and managed to preserve natural conditions and which has these characteristics:

- Generally appears to have been affected primarily by the forces of nature, with the imprint of people substantially unnoticeable
- Has outstanding opportunities for solitude or a primitive and unconfined type of recreation
- Has at least five thousand acres of land or is of sufficient size to make protection practicable

- May contain ecological, geological, or other features of scientific, educational, scenic, or historical value (Wilderness.net 2005)

Under the Clean Air Act, areas meeting similar criteria for relatively pristine air quality may be designated as Class I areas. The Act defines Class I areas as certain wilderness areas greater than 5,000 acres, national memorial parks greater than 5,000 acres, national parks greater than 6,000 acres, and international parks that were in existence on or before August 7, 1977. Specific provisions are included in Federal, State, and county air quality regulations to preserve the pristine air quality in Class I areas. Four pristine quality airsheds are located just outside the Planning Area – Guadalupe Mountains National Park, Carlsbad Caverns National Park, White Mountain Wilderness, and Gila Wilderness.

All areas not designated as Class I areas are, by default, identified as Class II areas. There are no Class I areas within the Planning Area, and the entire Planning Area is designated as a Class II area. Certain areas deserving of preservation may be designated as Class II wilderness areas, and State and county requirements or permitting policies may be promulgated to protect the air quality resources in these areas.

Class III areas are specially designated areas where a greater amount of new air pollution is allowed. As of the time of this report, there are no designated Class III areas in the United States.

6.1.2 New Mexico Laws and Regulations

New Mexico air quality regulations are provided in the New Mexico Administrative Code (NMAC), Title 20, Chapter 2. These regulations include promulgated emission limits, permitting requirements, and work practice standards for specific source categories. In addition, the NMAC establishes ambient air quality standards that are in addition to, or more stringent than, the NAAQS, as shown in Table 6-2.

Table 6-2
New Mexico Ambient Air Quality Standards

Pollutant	Averaging Period	Ambient Air Quality Standard
Total Suspended Particulates (TSP)	24-Hour	150 µg/m^3
	7-Day	110 µg/m^3
	30-Day	90 µg/m^3
	Annual	60 µg/m^3
Sulfur Dioxide (SO_2) [a]	24-Hour	0.10 ppm[c]
	Annual	0.02 ppm[c]
Hydrogen Sulfide (H_2S) [b]	1-Hour	0.010 ppm
Total Reduced Sulfur	½-Hour	0.003 ppm
Carbon Monoxide (CO)	1-Hour	13.1 ppm[c]
	8-Hour	8.7 ppm[c]
Nitrogen Dioxide (NO_2)	24-Hour	0.10 ppm
	Annual	0.05 ppm[c]

SOURCE: New Mexico Environment Department Air Quality Bureau 2003c
NOTES: ppm = parts per million
mg/m3 = micrograms per cubic meter
[a] This standard applies to the State, with the exception of the Pecos-Permian Basin Intrastate Air Quality Control Region.
[b] This standard applies to the State, with the exception of the Pecos-Permian Basin Intrastate Air Quality Control Region, and does not apply to hydrogen sulfide.
[c] These standards are more stringent than the National Ambient Air Quality Standards (NAAQS).

The following section evaluates specific regulations that impact air quality management in the Planning Area including open burns, fugitive dust, and operating permits.

6.1.2.1 Open Burning/Smoke Management Program

Open burning regulations are included in Title 20, Chapter 2, Part 60 of the NMAC. These regulations apply to situations where no more than 10 acres of vegetative material (or 1,000 cubic feet, if piled) will be burned in a day. If greater amounts will be burned in a single day, the Smoke Management Program (SMP) becomes applicable, which has regulations under Title 20, Chapter 2, Part 65 of the NMAC. If open burning is not allowed, prohibited, or otherwise specifically addressed in either of these regulations, then the burn must be conducted pursuant to Title 20, Chapter 2, Part 72 of the NMAC, upon issuance of a construction permit (New Mexico Environment Department [NMED] Air Quality Bureau [AQB] 2003c).

Open Burning Regulations

Under Part 60 of the NMAC, unrestricted open burning is allowed for recreational and ceremonial purposes, barbecuing, heating purposes in fireplaces, noncommercial cooking of food for human consumption, and for warming by small fires at construction sites (NMED AQB 2003c). Open burning of vegetative material is prohibited in nonattainment areas. Outside of nonattainment areas, open burning of vegetative material must meet the following requirements (NMED AQB 2003c):

- Burning must be conducted at least 300 feet from any occupied dwelling, workplace, or place where people congregate.
- Burning must begin no earlier than one hour after sunrise and must be extinguished no later than one hour before sunset.
- Burning must be attended at all times.
- The appropriate local firefighting authority must be notified prior to the burning.
- For burns exceeding one acre per day or 100 cubic feet of pile volume per day, prior notice of the date and location of the burn must be provided to all households within one-quarter mile of the burn.
- Burning must comply with Title 20, Chapter 9, Part 1 of the NMAC (Solid Waste Management).
- Burning must not be conducted when an air pollution episode is in effect.
- Auxiliary fuel or incendiary devices may be used to ignite the burning, provided that no oil heavier than number two diesel is used and no more than the minimum amount of fuel needed to complete the burn is used.
- Material must be as dry as practicable.

Emergency open burning is allowed if necessary to eliminate an imminent danger to public health, safety, or the environment, provided that (NMED AQB 2003c)

- no other practical and lawful method of abatement or disposal is available;
- an emergency response specialist has determined the situation requires immediate and expeditious action;
- the burning is in compliance with all other applicable State laws and regulations; and
- notice is provided to the NMED AQB as soon as practical, but within at least 2 weeks after the burn.

Smoke Management Program

The SMP has divided burns into level I and level II burns, dependent on the amount of material being burned or the amount of potential PM_{10} emissions calculated using emission factors from the SMP Program Guidance Document, Appendix J. Whether a burn classifies as an SMP I burn or an SMP II burn is defined below (NMED AQB 2004):

- SMP I burns have vegetative material amounts less than the amounts specified under Table 6-3, or emit less than one ton of PM_{10} per day.
- SMP II burns have vegetative material amounts greater than or equal to the amounts specified under Table 6-3, or emit at least one ton of PM_{10} per day.

Table 6-3
Smoke Management Plan Vegetative Material Limits

Vegetation Type	Acreage or Pile Volume to Produce One Ton of PM_{10}
Field Crops	65 acres
Shrub Land	34 acres
Forest	23 acres
Grass	100 acres
Piled Material	5,000 cubic feet

SOURCE: New Mexico Environment Department Air Quality Bureau 2004
NOTES: PM_{10} = particulate matter equal to or less than 10 microns in diameter

The following requirements apply to SMP I burns (NMED AQB 2004):

- An SMP I registration form must be submitted to the NMED AQB at least one business day prior to the start day of the planned burn.
- Burn only between one hour after sunrise and one hour before sunset.
- Do not burn within 300 feet of an occupied dwelling, office, school, campground, etc.
- Notify the local fire authority before starting the burn.

- If the burn will be within 1 mile of other people, they must be notified no later than two days prior to beginning burning.
- If the burn will be within 1 mile of other people, the smoke from the burn must be visually monitored using a worksheet available from the NMED AQB.
- If the burn is not completed within the initial seven days noted on the registration form, a burn continuation notification form must be submitted to the NMED AQB within one business day prior to the start of that continued seven day period.
- Within two weeks following the end of the burn, a tracking form must be submitted to the NMED with the information on the amount actually burned and whether any emission reduction techniques were used.

The following requirements apply to SMP II burns (NMED AQB 2004):

- An SMP II registration form must be submitted to the NMED AQB no later than two weeks prior to the start day of the planned burn.
- The registration form must include documentation that alternative disposal methods were considered.
- At least one emission reduction technique must be used unless a waiver is obtained.
- Notify the NMED AQB by 10:00 a.m. at least one business day prior to beginning the burn.
- Burn only when the ventilation category for that day is good or better unless a waiver is received.
- The smoke from the burn must be visually monitored using a worksheet available from the NMED AQB.
- Notify the local fire authority before starting the burn.
- If the burn will be within 15 miles of other people, they must be notified no later than two days prior to beginning burning.
- If the burn is not completed within the initial seven days noted on the registration form, a burn continuation notification form must be submitted to the NMED AQB within one business day prior to the start of that continued seven day period.
- Within two weeks following the end of the burn, a tracking form must be submitted to the NMED AQB with the information on the amount actually burned and whether any emission reduction techniques were used.

6.1.2.2 Fugitive Dust Emissions

A statewide dust regulation is currently under consideration by the NMED AQB, but drafting of such a regulation had not yet commenced as of the time of this AMS (NMED AQB 2005). The NMED AQB identified the following types of sources and activities that may need dust control: construction projects,

work on paved or unpaved roads, use of unpaved parking lots, work on vacant land or disturbed areas, use of equipment/material storage yards, and agricultural operations (NMED AQB 2005).

The NMED AQB also recognizes that natural events, such as high winds, can affect overall air quality. In response to this problem, Doña Ana County issued a Natural Events Action Plan for High Wind Events on December 22, 2000. The Natural Events Action Plan (NEAP) was developed due to the fact that Doña Ana County recorded several exceedances of the 24-hour PM_{10} NAAQS during the period from 1994 to 1997 that were mostly attributed to high winds (NMED AQB 2000). The NEAP is designed to protect public health, inform the public about high wind events, mitigate the health impacts on the community during future events, and identify and implement best available control measures for manmade sources of windblown dust (NMED AQB 2000).

On December 15, 2000, the Doña Ana County Board of Commissioners voted to adopt Doña Ana County Ordinance No. 194-2000, Erosion Control Regulations, which became effective on January 19, 2001. Its purpose is to protect and maintain the natural environment and to reduce the health effects caused by the creation of fugitive dust, consistent with the policies of the NEAP for Doña Ana County (NMED AQB 2000). The ordinance applies to any human activity, operation, and/or practices, or any condition caused by human activity that generates dust, causes water erosion, or makes the land more vulnerable to erosion by natural forces, with the following exceptions (NMED AQB 2000):

- regular agricultural operations
- governmental activities during emergencies
- operations conducted by essential service utilities
- temporary use of unpaved roads and parking lots (less than 20 vehicle trips per day for less than 3 consecutive days)

Any grading, construction, demolition, or other development requiring a permit or other form of approval under any Doña County ordinance (except for a single-family dwelling unit) must have an approved Erosion Control Plan in place prior to receiving a permit (NMED AQB 2000). An Erosion Control Plan must identify the types of erosion control measures that will be used to minimize fugitive dust. Even if an ECP is not required, the following provisions still apply to all activities within Doña Ana County (NMED AQB 2000):

- Topsoil or ground cover cannot be removed unless reasonable actions are taken to prevent dust generation.
- Weed eradication is limited to the removal of specific weeds. Clearing of an entire lot is prohibited.
- Expansion of natural vegetation areas is encouraged.

- Actions must be taken to ensure that areas or uses with the potential of becoming or generating fugitive dust must be covered, moistened, compacted, or otherwise treated to prevent fugitive dust creation.

An Erosion Mitigation Plan is required for property that is determined to pose a significant health threat due to the nature or extent of existing development making the property vulnerable to natural erosion forces, or due to its location near concentrations of vulnerable populations, such as school children or ill/elderly persons (NMED AQB 2000).

The City of Las Cruces also has an Erosion Control Ordinance (No. 1789), which was approved by the Las Cruces City Council on April 3, 2000. This ordinance is similar to the Doña County ordinance except that it requires a control plan for any activity, equipment, operation, and/or practice, man-made or man-caused, capable of generating fugitive dust (NMED AQB 2000). Also, instead of calling the control measures "erosion control measures," this ordinance refers to them as "reasonably available control measures."

As Las Cruces is located within Doña Ana County, both ordinances apply to activities occurring within the Las Cruces city limits.

6.1.2.3 Air Quality Operating Permits

There are four types of air quality operating permits issued by the NMED AQB for new or modified stationary sources, as described below.

Construction Permit

A construction permit, which is described under 20.2.72 NMAC, must be obtained under the following circumstances:

- The source has the potential to emit more than 10 pounds per hour or 25 tons per year of any regulated contaminant with a NAAQS or New Mexico Ambient Air Quality Standard.
- The source has equipment subject to 20.2.77 NMAC (New Source Performance Standards), 20.2.78 NMAC (Emission Standards for Hazardous Air Pollutants), or any other New Mexico air quality control regulation that contains an emission limit for any regulated contaminant.
- The source has the potential to emit a toxic air pollutant in excess of the emission level specified under 20.2.72.502 NMAC and one or more of the conditions listed under 20.2.72.402.B are met.
- The source has the potential to emit more than 5 tons per year of lead.
- Sources that are major sources of hazardous air pollutants per the definitions in 20.2.83 NMAC (Construction or Modification of Major Sources of Hazardous Air Pollutants).

Operating Permit

An operating permit, which is described under 20.2.70 NMAC, must be obtained under these circumstances:

- The source is classified as a major source.
- The source is subject to a standard or other requirement promulgated under Section 111 (Standards of Performance for New Stationary Sources) or Section 112 (Hazardous Air Pollutants) of the Clean Air Act.
- The source is an acid rain source.
- The source is in a source category so designated by the EPA Administrator, in whole or part, by regulation, after notice and comment.

Prevention of Significant Deterioration Permit

A prevention of significant deterioration permit, which is described under 20.2.74 NMAC, must be obtained if the source is a major source that emits or will emit regulated pollutants in an attainment or unclassified area.

Nonattainment Area Permit

A nonattainment area permit, which is described under 20.2.79 NMAC, must be obtained under these circumstances:

- The source is a major source that will emit a regulated pollutant for which it is major and for which the area is designated nonattainment.
- The source is a major source located in an area designated as attainment or unclassifiable that will emit a regulated pollutant for which it is major and the ambient impact of that pollutant would exceed any of the significance levels in 20.2.79.119 NMAC at any location that does not meet any NAAQS for the same pollutant.

6.2 GEOLOGY

No specific Federal or State mandates or authorities for geology resources are identified.

6.3 CAVE AND KARST RESOURCES

6.3.1 Federal

Caves are protected under several legislative acts including the National Park Services Act of 1916, Federal Cave Resources Protection Act of 1988, NEPA, and the National Cave and Karst Research Institute Act of 1998. These Acts specifically protect caves on Federal lands for the perpetual use, enjoyment, and benefit of all people.

The U.S. Department of Interior (USDI) is responsible for enforcement of the Federal Cave Resources Protection Act of 1988 (Public Law [PL]100-691). The Act defines caves as "any naturally occurring void, cavity, recess, or system of interconnected passages which occurs beneath the surface of the earth or within a cliff or ledge .....which is large enough to permit an individual to enter.... Such term shall include any natural pit, sinkhole, or other feature, which is an extension of the entrance..." The Act mandates an inventory of all significant Federally owned caves, many of which have not been fully explored and thus could be threatened with harm from surface activities.

The National Antiquities Act (PL 59-509), as written, applies to any area of historic or scientific interest, including caves (U.S. Code Title 16, Chapter 1, National Parks, Military Parks, Monuments and Seashores). The implementing rule found in Part 37, Subtitle A, Title 43 establishes criteria to be considered in the identification of significant caves, including scientific and recreational value criteria. The criteria also call for the integration of cave management into existing planning and management processes, and for the protection of cave resource information to prevent disturbance of significant caves and vandalism.

Information on specific caves is exempt from the Freedom of Information Act in accordance with the Federal Cave Protection Act of 1988. Cave inventories are to be conducted using the BLM Cave Inventory and Classification System. The system requires inventories for cave flora and fauna, geology, mineralogy, archaeological and paleontological material, rare or delicate speleothems, and hazards to cavers.

Another important act is the National Cave and Karst Research Institute Act of 1998 (PL 105-325). The purpose of this Act is to

- further the science of speleology,
- centralize and standardize stereological information,
- foster interdisciplinary cooperation in cave and karst research programs,
- promote public education,
- promote national and international cooperation in protecting the environment for the benefit of cave and karst landforms, and
- promote and develop environmentally sound and sustainable resource management practices.

There are Memorandums of Understanding (MOUs) between the BLM, National Speleological Society (NSSSWR), and the Cave Research Foundation (dated June 11, 1984) for caves throughout the United States. There is also a Cooperative Agreements between the New Mexico BLM and the Southwestern Region of the NSSSWR (#GDA 000010) and a Cooperative Management Agreement between New Mexico BLM and the Southwestern Region of the NSSSWR (Agreement No. BLM-CMA-NM-2002-005). These MOUs and Cooperative Agreements will help carry out the responsibilities under the 1988 Federal Cave Resources Protection Act to preserve our Nation's significant caves, and to improve

cooperation between cavers, cave researchers, and the Federal Government. Through these cooperative efforts, the BLM and NSSSWR will work together to maintain and improve cave resources within BLM public lands, and to develop and implement cave management and conservation efforts. Some of these MOUs may be applicable for potential caves in the Decision Area.

In BLM Handbook H-1601-1, Land Use Planning (USDI, BLM 2005c) (Appendix C, Subsection L, Cave and Karst Resources) the BLM is directed to identify significant caves as mandated by the Federal Cave Resources Protection Act of 1988 and use criteria for identification of significant caves as set forth in 43 CFR 37.11(c). If determined that it meets these criteria, a cave must be designated as significant, as set forth in 43 CFR 37.11(f). Four basic but broad types of cave and karst resource management actions for all significant caves are to be addressed:

- Management (resources, visitors, and facilities)
- Marketing (outreach, information and education, promotion, interpretation, and environmental education)
- Monitoring (social, environmental and administrative indicators and standards)
- Administration (regulatory, permit/fee/fiscal, data management, and customer liaison).

6.3.2 State of New Mexico

In the State of New Mexico there are no specific regulations related to caves and the protection of caves. Cultural resources that may be found in caves are afforded protection through various New Mexico State rules and regulations.

6.4 SOIL RESOURCES

6.4.1 Federal Regulations

Soil loss and soil health are not addressed in Federal regulations. The only exception is the Federal Surface Mining Control and Reclamation Act, which prohibits excessive topsoil loss but applies only to coal surface mines. When it becomes water pollution, sediment is covered by numerous Federal water quality regulations. These are discussed in Sections 6.5 of the AMS. Policy and guidance for the management of soil resources associated with public land are included in BLM Manuals 7000 and 7100.

6.4.2 State Regulations

Similar to Federal regulations, there are no general State of New Mexico regulations covering soil loss. However, the New Mexico mine reclamation regulations (New Mexico Mining Act NMSA 1978, Section 69-36-1 et. seq. and New Mexico Surface Mining Act, NMSA 1978, Sections 69-25A-1 et. seq. (1979)), administered and enforced by the New Mexico Department of Energy, Minerals, and Natural Resources, Mining and Minerals Division, do address soil resources and extend to all minerals. These regulations have specific prohibitions against excessive soil erosion or topsoil loss at revegetated mine sites. The

regulations include soil standards that are optimized to the reestablishment of vegetation and establishment of the post-mining land use, which frequently is grazing.

6.4.3 County Regulations and Ordinances

Municipal ordinances supporting the county land use plan discussed in Chapter 5 do not, in general, exist for rangeland or open space. Any BLM-constructed facilities would have to conform to appropriate county or municipal construction codes, such as review and approval site plans, grading plans, and other engineering design work that would need to limit the off-site transport and deposition of sediment from the envisioned facility.

6.5 WATER AND WATERSHED RESOURCES

The specific regulations and policy applicable to water resources of the Planning Area include BLM and Department of Interior policy, Federal and State regulations, and county or municipal codes and ordinances.

6.5.1 Federal and State Laws and Regulations – Water Quantity

Ground- and surface-water quantity is governed at the State level by the system of water rights developed through historical convention and precedent. In New Mexico, Federal laws have intervened in the establishment of reserved water rights for American Indian tribes and communities that stem from the settled or decided court cases.

Water rights for the use of groundwater in New Mexico are administered by the Office of the State Engineer (OSE). To ensure orderly development of groundwater resources within the State, the OSE designates groundwater basins as declared or undeclared. Within a declared groundwater basin, an application to appropriate groundwater must be filed with and approved by the OSE. In an undeclared groundwater basin, water is not appropriated and wells may be drilled without approval from the OSE.

Surface water rights in New Mexico are based upon the principle of beneficial use and first appropriation, meaning that water rights are ranked in priority according to first beneficial use. All unappropriated water belongs to the public.

OSE assists the court in the testing of surface water priority and use and administers water conservation programs. The office also conducts technical inspection of surface water impoundments. The District 4 Office in Las Cruces administers water rights in the Lower Rio Grande, Tularosa, Hueco, Las Animas Creek, Hot Springs, and Salt undergroundwater basins and the surface water rights associated with those basins.

6.5.2 Federal and State Laws and Regulations – Water Quality

OSE has long claimed that the State has the legal responsibility to limit the "wasting" of surface water in New Mexico and that this applies to artificial impoundments of water that are subject to excessive evaporation. This claim has been applied to sedimentation ponds. OSE policy on specific water conservation requirements is still evolving.

Groundwater quality is regulated through EPA or NMED administration of several hazardous waste regulations, including, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA). These two regulatory tools, jointly administered by EPA and NMED, control groundwater pollution sources at abandoned and active landfills and hazardous waste sites. Additional Federal regulatory control of ground and surface-water pollution is administered by the USDI, Office of Surface Mining through the Surface Mining Control and Reclamation Act. The Safe Drinking Water Act is used to prevent the contamination of source waters and to keep contaminated water from being distributed to the public. The Clean Water Act (CWA) covers a very broad range of surface water pollution and is intended to return the waters of the United States to a presumed previous level of unimpaired usability. The CWA covers both point and nonpoint sources of surface water pollution. The Endangered Species Act also has water resources implications when critical habitat is aquatic or dependent upon clean ground and/or free flowing surface water.

Section 303(d) of the CWA stipulates the treatment of surface waters that, despite meeting the effluent limitations prescribed by the NPDES program, are still not meeting water quality standards. Such waters appear on a list, formerly published biennially, by the individual States and a TMDL and other water quality reports are required to be written that spell out a procedure for bringing the water body under the appropriate standard. The NMED is the regulating authority for Section 303(d) list. The current 303(d) list includes several of the streams originating on or passing through the Planning Area (King 2004). These listed segments are discussed in detail in Chapter 2 of the AMS.

Statewide water quality in New Mexico is largely planned as part of the previously described 305(b) report to Congress by the NMED. The State of New Mexico water-quality-control strategy is described in the draft Statewide Water Quality Management Plan. Although the State does not have primacy under the 402(b) program to administer its own program, NMED and other agencies do consult with EPA, Region IX on certain pending NPDES permits. Under Section 401 of the CWA, the State has the authority to, in effect, deny most Federal permits if water quality impacts are not mitigated.

In addition to point sources, the CWA also extends to nonpoint source pollution under Section 319 and each State is obligated to provide a nonpoint source pollution assessment and management plan. In January 2000, EPA approved New Mexico's NPS assessment and management plan. The plan assigns regulatory authority to NMED and details consultation requirements under the 401 certification and 404 dredge and fill (see below) permitting process. Compliance with the plan is assured by the application of best management practices.

Specific State agencies have consultation duties to support NMED, including New Mexico Energy and Minerals and Natural Resources Department (NMNRD) for mining; State Forestry for timber and silviculture industries; New Mexico State Highway and Transportation for road building; and so forth. In addition, the various State soil and water conservation districts (SWCDs) are authorized under State law to work on a voluntary basis to control nonpoint source pollution within their district boundaries.

Federal agencies also are called out as nonpoint source control partners and BLM is charged with a significant level of responsibility. Nonpoint source control on BLM lands is directed by the State plan to be accomplished by the RMP and NEPA process. For this reason, the TriCounty RMPs are the primary document for BLM compliance with the New Mexico nonpoint source management plan in the Planning Area.

The State non-point source management plan (NMWQCC 1998) also relies upon the Department of the Army responsibilities under Section 404 of the CWA. This section controls the dredging and filling of channels conveying waters of the U.S., and includes almost any modifications to surface water bodies in the State. The Secretary of the Army, delegated to the Chief of Engineers of the U.S. Army Corps of Engineers has the authority to issue dredge and fill permits under Section 404.

In addition to the CWA, activity in the Planning Area is expected to comply with the Safe Drinking Water Act (SDWA).

6.5.3 BLM and Department of the Interior Manual 7200

Water Resources includes subsections on watershed condition analysis, watershed activity planning, floodplain management, groundwater, water quality, water rights, and floodplain management. Elsewhere, BLM water resource policy is dispersed within the manuals for rangeland health, minerals management, mining, special-status plants and animal management, fishery management, recreation engineering, habitat management, and general program management and administration. In 1998, BLM adopted as policy a portion of the larger Federal Clean Water Action Plan. The plan called out existing BLM activity in three management areas: riparian restoration and management, abandoned mine lands, and rangeland health. The plan also committed to a watershed approach in monitoring, assessing, reclaiming, and maintaining water resources.

Rangeland health, specifically public land health, is directed by the New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management (Standards and Guidelines) (USDI, BLM 2000a). The document discusses in a number of places the need for the prevention of nonpoint source pollution as a consequence of livestock management. Nonpoint source pollution is seen as most optimally controlled by a spectrum of management controls called “best management practices,” or BMPs. The document discusses example BMPs that are relevant to livestock management, particularly BMPs that protect riparian areas.

The Standards and Guidelines reported that all of the examined planning strategies would accomplish BLM's responsibilities for nonpoint source management. Given this, it is expected that the use of these Standards and Guidelines for the grazed lands in the Planning Area would result in excellent control of nonpoint source pollution in general, and limit the potential for erosive and sedimentation damage to the desert wash riparian areas.

Riparian restoration, where not driven by the Endangered Species Act, is primarily accomplished under a variety of state-regulated CWA programs. However, BLM is also a major independent contributor to CWA-related restoration projects. BLM is one of four Federal agencies authorized to utilize Land and Water Conservation Fund moneys to acquire private land for conservation of habitat and restoration of streams. In 1996, DOI was authorized to expend money under the Recreation Fee Demonstration Program. This funding source has also been applied to restoration of streamside and riparian habitat. The Watershed Protection and Flood Prevention Act of 1954, Public Law 83-566 (Small Watershed Program), provides broad authority to Federal and State agencies to cooperate in watershed planning, surveys, and investigations. These funds are commonly administered by NRCS, in cooperation with local soil and water conservation districts and BLM.

6.5.4 County Regulations and Ordinances

The three counties are authorized by the State to regulate numerous water resource concerns within their boundaries. All have developed pollution prevention ordinances regarding individual septic systems, including permitting of construction. NMED has also delegated enforcement authority for Public Water Systems that operate inside the planning area to the county level. Through solid-waste programs, the counties issue permits and conduct compliance inspections on refuse hauling vehicles, nonhazardous-liquid-waste-hauling vehicles, chemical toilets, and construction-debris landfills, and investigate permit-related complaints and citizens complaints of illegal dumping. The three countries also implement vector control for water-borne insects.

6.5.5 Municipal Ordinances

There are several municipalities throughout the Planning Area. However, with the exception of the Mesilla Valley, very few of these communities interact directly with the Decision Area. The City of Las Cruces has a very strong planning connection to the BLM, mostly regarding land-tenure adjustments in the East Mesa and Organ Mountain foothills area. Although the City is primarily concerned about the changes in demographics and other socioeconomics, the implications of these changes for the surface and groundwater regime in this area might also be critical. However, currently there are few city ordinances that specifically impact the water resources decisions on the public land.

In the eastern Tularosa Valley, many of the municipalities are strongly dependent upon surface water originating on the public lands. Once again however, there are no municipal ordinances that directly address decisions on these public lands.

6.6 VEGETATIVE COMMUNITIES

6.6.1 Federal Laws and Regulations

Under FLPMA, BLM is responsible for the balanced management of the public land and resources including biological resources. BLM's authority to manage biological resources is derived from a series of Federal laws, executive orders, and Federal regulations and policy Statements. Some of the more important regulatory guidance include the FLPMA, NEPA, ESA, Migratory Bird Treaty Act (MBTA) of 1989, the Sikes Act, Carson Foley Act, Public Rangelands Improvement Act, various laws and executive orders addressing invasive species, Executive Order 11990 Wetlands, Executive Order 11988 Floodplains, and 43 CFR Part 24 (USDI, Fish and Wildlife Policy).

The Public Rangelands Improvement Act of 1978 requires BLM to manage, maintain, and improve the condition of the public rangelands so that they become as productive as is feasible.

The Carlson-Foley Act of 1968 directs agencies to destroy noxious weeds and provides for the authorization for reimbursement of expenses to State or local agencies for weed control on Federal lands.

The Federal Noxious Weed Control Act of 1974 (7 USC §§2801-2814, January 3, 1975, as amended 1988 and 1994) provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. No person may import or move any noxious weed identified by regulations of the Secretary of Agriculture into or through the United States except in compliance with the regulations, which may require that permits be obtained. The Act requires that each Federal agency: (1) develop a management program to control undesirable plants on Federal lands under the agency's jurisdiction; (2) establish and adequately fund the program; (3) implement cooperative agreements with State agencies to coordinate management of undesirable plants on Federal lands; and (4) establish integrated management systems to control undesirable plants targeted under cooperative agreements. The Act directs the Secretary of Agriculture to coordinate programs for control, research, and educational efforts associated with noxious weeds. The Secretaries of Agriculture and the Interior must identify regional control priorities and disseminate technical information to interested State, local and private entities.

Executive Order 13112, Invasive Species, directs Federal agencies to identify actions that may affect invasive species; use relevant programs to prevent introduction of invasive species; detect, respond and control such species; monitor invasive species populations; provide for restoration of native species; conduct research on invasive species; and promote public education. An invasive species, as defined in Executive Order 13112, is a non-native species whose introduction does or is likely to cause economic or environmental harm or harm to human health. The term noxious weed, as defined in the Federal Noxious Weed Control Act, is any living stage of any parasitic or other plant which is of foreign origin; is new to or not widely prevalent in the United States; and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish and wildlife resources of the United States or the public health.

Title 43 CFR §8365.1-5, Property and Resources, states that on all public land, unless otherwise authorized, no person shall willfully remove or destroy plants or their parts except it is permissible to collect from the public land reasonable amounts of commonly available renewable resources such as flowers, berries, nuts, and seeds. However, collection of renewable resources may be precluded based on the need to protect monument resources. The USDI's Fish and Wildlife Policy: State-Federal Relationships (43 CFR Part 24) recognizes that the effective stewardship of fish and wildlife requires Federal-State cooperation. The purpose of the policy is to reaffirm the basic role of the States in fish and resident wildlife management.

6.6.2 BLM Policy

BLM has developed policies, which are outlined in a series of BLM manuals for various program activities related to biological resources. BLM Manual 6840 provides guidance for the management of special status species within BLM-administered land. BLM policy and guidance established that State listed species or sensitive species must receive the same consideration as federally listed species (BLM Manuals 6480 and 6602).

BLM currently manages public land resources under the 2000 New Mexico's Standards for Public Land Health and Guidelines for Livestock Grazing Management. The standards apply to all programs and establish a required level of health of public land.

BLM has entered into a cooperative agreement with the U.S. Forest Service and U.S. Fish and Wildlife Service to promote conservation of migratory birds and minimize potential adverse effects of takings under the MBTA. The goal of the memorandum of understanding among the agencies is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize adverse impacts on migratory birds through collaboration among the cooperating agencies. BLM also has entered into a cooperative memorandum of agreement with the U.S. Forest Service, National Marine Fisheries Service, and U.S. Fish and Wildlife Service (USFWS) to improve Section 7 consultations under the ESA. The goal of the memorandum of agreement is to improve the efficiency and effectiveness of project and programmatic level Section 7 consultation processes and enhance conservation of listed species while delivering appropriate goods and services provided by lands and resources managed by the signatory agencies.

BLM Manual 1745, Introduction, Augmentation, and Reestablishment of Fish, Wildlife, and Plants, establishes the BLM policy and guidance on the introduction of exotic species and the transplant, augmentation, and reestablishment of native species and naturalized exotic species. The objectives are as follows: (1) ensure that the management of native, naturalized, and exotic species enhances, restores, and does not reduce the biological and genetic diversity of natural ecosystems and provides for the protection of soil resources; (2) ensure that the introduction of exotic species is ecologically sound and will not adversely impact natural ecosystems and their biological diversity; (3) ensure that appropriate planning, coordinating, monitoring, and evaluating for introductions and transplants are performed; and (4) ensure full compliance with applicable State and Federal laws, Executive Orders, and regulations.

BLM Manual 9011 and Handbook H-9011-1 provide policy for conducting chemical pest control program under an integrated pest management approach. BLM Manual 9014 provides guidance and procedures for planning and implementing biological control in integrated pest management programs. BLM Manual 9015 provides policy relating to the management and coordination of noxious weed activities among BLM, organizations, and individuals. BLM Manual 6840 provides policy and guidance, consistent with appropriate laws, for the conservation of special status species of plants and animals, and the ecosystems upon which they depend.

Department of the Interior Manual 609 prescribes policy to control undesirable or noxious weeds on the lands, waters, or facilities under its jurisdiction to the extent economically practicable, and as needed for resource protection and accomplishment of resource management approach. Department of the Interior Manual 517 prescribes policy for the use of pesticides on the lands and waters under its jurisdiction, and for compliance with the Federal Insecticide, Rungicide, and Rodenticide Act, as amended.

6.6.3 New Mexico Public Land Vegetation Management

District Managers and the Surface Division in Santa Fe monitor proper vegetation use and livestock carrying capacity on State public lands in the Planning Area. Public land livestock users are required to apply responsible management and appropriate use of vegetation. If problems with carrying capacity compliance or vegetation use occur, it is resolved cooperatively between the lessee and the State, or the lease is terminated. In some cases, problems are solved cooperatively with the BLM and other State and Federal agencies to resolve resource issues and/or create AMPs for individual ranches.

The New Mexico Noxious Weed Management Act provides legislative authority for the management of noxious plant species in New Mexico. The specific goals are to improve the state economy and environment by managing noxious weeds in NM. A Memorandum of Understanding (MOU) has been established in Sierra, Otero, and Doña Ana Counties to coordinate participation between State, Federal and private entities for the joint management and responsibility to eradicate noxious species on public and private land.

6.7 FISH, WILDLIFE, AND HABITAT

6.7.1 Federal Laws and Regulations

Under FLPMA, BLM is responsible for the balanced management of the public land and resources including biological resources. The states, acting through their respective wildlife management agencies, are responsible for managing all resident wildlife. Federal land management agencies, such as the BLM are responsible for managing habitat on lands under their respective jurisdiction. Similarly, other land owners or administrators who manage the lands they own or control may have specific responsibilities related to wildlife and wildlife habitat. BLM's authority to manage biological resources is derived from a series of Federal laws, executive orders, and Federal regulations and policy statements. Some of the more important regulatory guidance includes the FLPMA, NEPA, ESA, Migratory Bird Treaty Act (MBTA) of 1989, the Sikes Act, Carson Foley Act, Public Rangelands Improvement Act, various laws and executive

orders addressing invasive species, Executive Order 11990 Wetlands, Executive Order 11988 Floodplains, and 43 CFR Part 24 (USDI, Fish and Wildlife Policy).

The ESA of 1973, as amended, directs that special protection and management be afforded to Federally-listed threatened and endangered species, or species proposed to be listed as threatened and endangered. BLM also manages a large number of sensitive species that are not covered under the ESA (e.g., BLM Sensitive Species) in order to use a broad range of management options to protect species and avoid the need to institute the Federal listing process. The Federal MBTA and the Bald Eagle Protection Act also may apply to some species. The Sikes Act provides for the conservation, restoration, and management of species and their habitats in cooperation with State wildlife agencies.

According to Executive Order 11988 and Executive Order 11990, management activities in floodplains must be consistent with Executive Order 11988, and management activities for wetlands and riparian areas must be consistent with Executive Order 11990.

The USDI's Fish and Wildlife Policy: State-Federal Relationships (43 CFR Part 24), recognizes that the effective stewardship of fish and wildlife requires Federal-State cooperation. The purpose of the policy is to reaffirm the basic role of the States in fish and resident wildlife management.

6.7.2 BLM Policy

BLM has developed policies, which are outlined in a series of BLM manuals for various program activities related to biological resources. BLM Manual 6840 provides guidance for the management of special status species within BLM-administered land. BLM policy and guidance established that State-listed species or sensitive species must receive the same consideration as Federally-listed species (BLM Manuals 6480 and 6602). Regarding candidate species, the BLM Special Status Species Management Manual specifies "… the BLM shall implement management plans that conserve candidate species and their habitats and shall ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed" (section 6840.06C).

BLM has entered into a cooperative agreement with the U.S. Forest Service and USFWS to promote conservation of migratory birds and minimize potential adverse effects of takings under the MBTA. The goal of the memorandum of understanding among the agencies is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize adverse impacts on migratory birds through collaboration among the cooperating agencies. BLM also has entered into a cooperative memorandum of agreement with the U.S. Forest Service, National Marine Fisheries Service, and USFWS to improve and streamline Section 7 consultations under the ESA. The goal of the memorandum of agreement is to improve the efficiency and effectiveness of project and programmatic level Section 7 consultation processes and enhance conservation of listed species while delivering appropriate goods and services provided by lands and resources managed by the signatory agencies.

BLM Manual 9011 and Handbook H-9011-1 provide policy for conducting chemical pest control program under an integrated pest management approach. BLM Manual 9014 provides guidance and procedures for planning and implementing biological control in integrated pest management programs. BLM Manual 6840 provides policy and guidance, consistent with appropriate laws, for the conservation of special status species of plants and animals, and the ecosystems upon which they depend.

6.7.3 New Mexico Laws and Regulations

At the State level, Chapter 17 MNSA 1978 directs the responsibility for maintenance and management of the State's wildlife resources to the New Mexico Game and Fish Commission and the New Mexico Department of Game and Fish. It is the policy of the State to provide a system for the protection of the game and fish of New Mexico and for their use and development for public recreation and food supply, and to provide for their propagation, planting, protection, regulation and conservation to the extent necessary to provide and maintain an adequate supply of game and fish within the state (17-1-1). The State legislature declares that: species and subspecies of wildlife found to be endangered should be managed and, to the extent possible, enhanced in number within the carrying capacity of the habitat. The State also has the obligation to assist in the management of wildlife deemed to be endangered elsewhere by prohibiting the taking, possession, transportation, or exportation of Federally listed wildlife. Endangered and threatened wildlife is protected under sections 17-2-37 through 17-2-46, of the New Mexico Wildlife Conservation Act.

6.8 SPECIAL STATUS SPECIES

6.8.1 Federal Laws and Regulations

6.8.1.1 Endangered Species Act (ESA) of 1973

The Act provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered in the U.S. or elsewhere. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The Act outlines procedures for Federal agencies to follow when taking actions that may jeopardize listed species, and contains exceptions and exemptions. The ESA also is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora, commonly known as CITES. Criminal and civil penalties are provided for violations of the Act and the Convention.

6.8.1.2 National Environmental Policy Act (NEPA) of 1969

This Act establishes a national policy for the environment, to provide for the establishment of a Council on Environmental Quality, and for other purposes. For special status species the act ensures that BLM "preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice." It requires a detailed analysis of environmental impact of a project that has a Federal action component. It identifies adverse

environmental effects which cannot be avoided should the proposal be implemented and identifies alternatives to the proposed action.

6.8.1.3 Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act, as amended, implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the Act, killing or possessing migratory birds is unlawful.

6.8.1.4 The Sikes Act, as Amended through 2003

The Sikes Act, as amended 1960, provides for the cooperation by the Department of the Interior and Defense with State agencies in the planning, development and maintenance of fish and wildlife resources on military reservations throughout the United States. Various amendments have extended the authorization of authority and appropriations. This amendment ensures that coordination between Federal and State agencies properly considers fish, wildlife, and their habitats.

6.8.1.5 Bald Eagle Protection Act of 1940

This law provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leafing to arrest and conviction for violation of the Act.

6.8.2 State Laws, Regulations, and Policies

6.8.2.1 The New Mexico Wildlife Conservation Act of 1974

The Wildlife Conservation Act is the New Mexico Endangered Species Act. New Mexico's Wildlife Conservation Act covers all animal species and distinct populations, except for insects whose protection would present an overwhelming and overriding risk to humans.. In addition,. Listing is based on science and affected landowners and resource managers must be consulted during the listing process. Species are listed as “endangered” if their survival or reproduction within New Mexico is in jeopardy, due to several factors including, habitat modification, over-utilization, predation, disease, and/or other human-caused factors.

6.8.2.2 The New Mexico Endangered Plant Species List and Collection Permits of 1995

The New Mexico Endangered Plant Species List and Permits (Section 75-6-1) directs the New Mexico Energy, Minerals and Natural Resources Department (NMEMNRD) to establish a list of endangered plant species. Plants are included if they are listed under ESA or the plant is rare across its range within the state, and of such limited distribution and population size that unregulated taking could adversely impact it and jeopardize its survival in New Mexico. It also authorizes NMEMNRD to prohibit the taking of

endangered species, with the exception of permitted scientific collections or propagation and transplantation activities that enhance the survival of endangered species.

6.9 WILDLAND FIRE ECOLOGY AND MANAGEMENT

Current Las Cruces District Office policy regarding fire management activities is consistent with Departmental Manual 910 and BLM Manual 9200 direction.

The Interior and Related Agencies Appropriations Act significantly increased funds for the wildland fire agencies in Fiscal Year 2001. The Act authorizes the use of contracts, grants, and cooperative agreements to accomplish fuels reduction, rehabilitation, and restoration treatments, and for training and monitoring of these activities on Federal land or on adjacent non-Federal land that benefits resources on Federal land. These authorities are provided "notwithstanding Federal Government procurement and contracting laws."

FLPMA (Public Law 94-579; 43 U.S.C. 1701) establishes the primary authority and provides guidance for how the public lands are to be managed by the BLM. In managing public lands on the basis of multiple use and sustained yield, FLPMA requires that the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values be protected.

Additional authorities applicable to the TriCounty Planning Area include the following:

- Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66; 42 U.S.C. 1856, 1856a)
- Annual Appropriations Acts for the Department of the Interior
- 1995 Federal Wildland Fire Management Policy
- 2001 Updated Federal Wildland Fire Management Policy (1995 Federal Wildland Fire Management Policy Update)
- 1998 Departmental Manual 620 Chapter 1, Wildland Fire Management General Policy and Procedures
- National Environmental Policy Act of 1969 and Title 40 CFR Part 1500
- National Historic Preservation Act 1966, as amended

6.10 CULTURAL AND HERITAGE RESOURCES

6.10.1 Federal Laws and Regulations

Cultural resources are one of the more highly regulated resources that BLM manages. A considerable body of law, implementing regulations, policy manuals and handbooks, and other management guidance compose the basic set of rules that guide the cultural resource program for the Planning Area.

The BLM cultural resource management program has been developed to comply with numerous Federal laws, regulations, Executive orders, and a White House memorandum related to cultural resources and historic preservation, including the following:

- American Antiquities Act of 1906
- Historic Sites Act of 1935
- Reservoir Salvage Act of 1960
- National Historic Preservation Act of 1966
- Executive Order 11593 of 1979, Protection and Enhancement of the Cultural Environment
- Archaeological and Historic Preservation Act of 1974
- Federal Land Policy and Management Act of 1976
- American Indian Religious Freedom Act of 1978
- Archaeological Resources Protection Act of 1979
- Native American Graves Protection and Repatriation Act of 1990
- Curation of Federally Owned and Administered Archaeological Collections, Title 36, Code of Federal Regulations, Part 79 (36 CFR 79)
- White House Memorandum on Government-to-Government Relations with Native American Tribal Governments of 1994
- Executive Order 13007 of 1996, Sacred Sites

Although the Federal Government first initiated measures to protect and preserve elements of the Nation's heritage more than a century ago, it was the passage of the National Historic Preservation Act of 1966 that stimulated BLM to develop a cultural resource management program in the early 1970s. (The BLM was created in 1946 through the merger of the General Land Office [established in 1812] and the U.S. Grazing Service [established in 1934].) The requirement to appropriately manage cultural resources was incorporated in the Federal Land Policy and Management Act of 1976, which remains the primary basis for the BLM program for managing cultural resources in conjunction within the mandate to promote multiple, sustainable uses of resources on public lands.

Section 106 of the National Historic Preservation Act stipulates that Federal agencies take into account historic properties (defined as resources listed in or eligible for the National Register of Historic Places) as Federal undertakings (defined as projects implemented by Federal agencies or funded, licensed, or approved by Federal agencies) are planned and implemented. Regulations for Protection of Historic Properties (36 CFR 800) define a process for demonstrating such consideration by consulting with State Historic Preservation Officers (SHPOs), the Federal Advisory Council on Historic Preservation, and other interested organizations and individuals.

In 1997 BLM executed a Section 106 Nationwide Programmatic Agreement and State implementation protocols as a substitute for those regulations, to give more autonomy to BLM in complying with Section 106. (The nationwide agreement replaced a similar agreement that BLM had executed in 1982 for its program in New Mexico.) BLM now reviews potential effects on historic properties of activities on public land or the Federal mineral estate in accordance with the Nationwide Programmatic Agreement and New Mexico protocol.

The programmatic agreement allows BLM to make routine day-to-day decisions regarding cultural resources without consulting SHPOs. Consultations with SHPOs are limited primarily to annual reviews of the program rather than Section 106 project-by-project reviews. The BLM continues to consult with the SHPOs and the Advisory Council on Historic Preservation about specific projects that are (1) non-routine interstate or interagency projects or programs, (2) undertakings adversely affecting National Historic Landmarks or National Register–listed properties of national significance, and (3) highly controversial undertakings. In accordance with the implementing New Mexico protocol, BLM also consults with the New Mexico SHPO about (1) undertakings that would have adverse effects on historic properties, and (2) projects for which BLM plans to conduct less than a total, intensive (Class III) survey.

Because most of the cultural resources on public land in the Planning Area are archaeological sites, the Archaeological Resources Protection Act is an important basis for the BLM management of cultural resources in the Planning Area. The Act and its implementing regulations (43 CFR 296) give BLM authority to restrict access to archaeological resources on public land by requiring permits that are issued only for scholarly research or resource preservation. Additionally, the Act requires that permit applicants meet specific professional standards, that all recovered archaeological materials be curated at a facility that meets specific standards, and that all cultural materials recovered under a permit remain Federal property in perpetuity.

Human remains, funerary objects, sacred objects, and objects of cultural patrimony affiliated with American Indians are sometimes associated with archaeological sites. In accordance with the Native American Graves Protection and Repatriation Act, BLM consults with related or affiliated tribes to determine how such remains and objects found on Federal lands are to be treated.

6.10.2 BLM Policy

BLM has developed policies to provide guidance for the cultural resource management program. In December 2004, the following policy manuals were revised:

- 8100 – The Foundations for Managing Cultural Resources
- 8110 – Identifying and Evaluating Cultural Resources
- 8120 – Tribal Consultation under Cultural Resource Authorizations
- 8130 – Planning for Uses of Cultural Resources
- 8140 – Protecting Cultural Resources

- 8150 – Permitting Uses of Cultural Resources
- 8170 – Interpreting Cultural Resources for the Public

Another policy manual for preserving museum collections (8160) is being prepared. Handbook H-8120-1, Guidelines for Conducting Tribal Consultation, provides additional guidance to supplement Manual 8120. The New Mexico State BLM Office also has issued Manual H-8100-1, Procedures for Performing Cultural Resource Fieldwork on Public Lands in the Area of New Mexico State BLM Responsibilities.

BLM applies a "rule of reason" in considering how potential effects of BLM actions on cultural resources on non-Federal lands will be considered (BLM Manual 8100.07). Under this policy, BLM inventories, evaluates, and assesses potential effects on cultural resources located on nonpublic lands to the extent that effects stem from BLM decisions. These situations could include BLM grants of right-of-way for linear projects that also cross nonpublic lands, or for permits issued to drill for minerals on "split estate" lands (that is, where BLM manages subsurface mineral rights but surface rights are held by private landowners or managed by other agencies). Any such applications are coordinated with compliance with the New Mexico Cultural Properties Act, which address cultural resources on State lands and unmarked burials on State and private lands.

In addition, BLM has issued specific policy for addressing cultural resources in RMPs (Cultural Resource Considerations in Resource Management Plans, Information Bulletin 2002-101 and Land Use Planning Handbook, H-1690-01-1, Appendix C). Those guidelines address requirements for identifying cultural resources, defining management goals, allocating uses of cultural resources, and defining management actions to support the plan goals.

6.10.3 State

BLM applies a "rule of reason" in considering how potential effects of BLM actions on cultural resources will be considered on non-Federal lands (BLM Manual 8100.07 and nationwide programmatic agreement). Under this policy, BLM inventories, evaluates, and assesses potential effects on cultural resources on nonpublic land to the extent that effects stem from BLM decisions. These situations may arise for linear projects that require rights-of-way across lands of various jurisdictions, including public land, or issuance of permits to drill on "split estate" lands. Any such applications are cognizant of the New Mexico Cultural Properties Act, which protects cultural properties on State lands by making it illegal to collect, excavate, damage, or destroy those properties without a permit. In addition, unmarked burials on State and private lands are afforded the protection of law.

6.11 PALEONTOLOGICAL RESOURCES

6.11.1 Federal

The management of paleontological resources is directed principally by FLPMA and NEPA. The Antiquities Act of 1906, National Natural Landmarks Program under the Historic Sites Act of 1935,

Executive Order 11593 of 1971 (Protection and Enhancement of the Cultural Environment), National Historic Preservation Act of 1966 (as amended), Federal Cave Resources Protection Act of 1988 (PL 100-691), and Secretarial Order 3104 also afford protection of paleontological resources. Various subparts of Title 43 CFR address the collection of invertebrate fossils, fossil plants, and protection of paleontological resources from operations authorized under the mining laws.

FLPMA requires that the public land be managed in a manner that protects the "quality of scientific" and other values. NEPA requires that "important historic, cultural and natural aspects of our national heritage" be protected, and that " a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences in planning and decision making" be followed. Therefore, all land and mineral disposals, exchanges, withdrawals, or other actions within the Decision Area require an assessment of paleontological resource values as part of any proposed action's analysis.

The BLM State Office has a Cooperative Agreement with the New Mexico Museum of Natural History and Science (NMMNHS) and the New Mexico Museum of Natural History Foundation to ensure the care, protection, and storage of paleontological resources collected from public land in New Mexico. Fossil resources encountered on public land will be provided to paleontologists from NMMNHS for professional evaluation, care, and management. NMMNHS holds a statewide permit with the BLM for the collection of vertebrate fossils from public land. The vertebrate paleontologists at the museum collect and study these fossils. In addition, any vertebrate fossil discovered on public lands during the course of a permitted activity or reported by a citizen would be collected and curated at the NMMNHS.

BLM has developed objectives for paleontological resources to provide protection of the resources (BLM Manual 8270, Paleontological Resource Management and Handbook H-8270-1, General Procedural Guidance for Paleontological Resource Management) (USDI, BLM 1998a, b) . It is the policy of BLM to manage paleontological resources for these values and to mitigate adverse impacts on them. Adherence to the guidelines as set forth in the BLM Handbook H-8270-1 is expected to reduce or eliminate adverse impacts on paleontological resources from surface-disturbing activities. Paleontological resources constitute a fragile and nonrenewable scientific record of the history of life on earth. Once damaged, destroyed, or improperly collected, its scientific and educational value may be reduced greatly or lost forever. In addition to their scientific, educational, and recreational values, paleontological resources can be used to understand interrelationships between the biological and geological components of ecosystems over long periods of time. The BLM has recently developed, and is continuing to update, a Paleosensitivity database and suggested management and mitigation guidelines program. The Paleoecological Resources map was developed by the BLM and presents a probable fossil yield classification based on the bedrock geology and known or potential occurrences of paleontological resources in those geologic units (Hester 2005). This program will allow better management of paleontological resources on public lands.

Table 6-4
Summary of Authorities for BLM Management of Paleontological Resources

Federal Land Policy and Management Act of 1976 (P.L. 94-579)	Requires that the public lands be managed in a manner that protects the ". . . quality of scientific . . ." and other values. The Act also requires the public lands to be inventoried and provides that permits may be required for the use, occupancy and development of the public lands.
National Environmental Policy Act of 1969 (P.L. 91-190)	Requires that ". . . important historic, cultural and natural aspects of our national heritage . . ." be protected, and that ". . . a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences . . . in planning and decision making. . . ." be followed.
Title 43 CFR, Subpart 8365	Addresses the collection of invertebrate fossils and, by administrative extension, fossil plants.
Title 43 CFR, Subpart 3622	addresses the free use collection of petrified wood as a mineral material for non-commercial purposes.
Title 43 CFR Subpart 3621	Addresses collection of petrified wood for specimens exceeding 250 pounds in weight.
Title 43 CFR, Subpart 3610	Addresses the sale of petrified wood as a mineral material for commercial purposes.
Title 43 CFR, Subparts 3802 and 3809	Addresses protection of paleontological resources from operations authorized under the mining laws.
Title 43 CFR, Subpart 8200	Addresses procedures and practices for the management of lands that have outstanding natural history values, such as fossils, which are of scientific interest.
Title 43 CFR, Subpart 1610.7-2	Addresses the establishment of Areas of Critical Environmental Concern for the management and protection of significant natural resources, such as paleontological localities.
Title 43 CFR Subpart 8364	Addresses the use of closure or restriction of public lands to protect resources. Such closures or restrictions may be used to protect important fossil localities.
Title 43 CFR Subpart 8365.1-5	Addresses the willful disturbance, removal and destruction of scientific resources or natural objects and 8360.0-7 identifies the penalties for such violations.
Title 36 CFR, Subpart 62	Addresses procedures to identify, designate and recognize National Natural Landmarks, which include fossil areas.
18 U.S.C. Section 641	Addresses the unauthorized collection of fossils as a type of Government property.
Secretarial Order 3104	Grants to BLM the authority to issue paleontological resource use permits for lands under its jurisdiction.
Offer to Lease and Lease for Oil and Gas Form 3100-11	Provides for inventories and other short term studies to protect objects of scientific interest, such as significant fossil occurrences, and requires that operations conducted under oil and gas leases minimize adverse impacts to natural and cultural resources.
Federal Cave Resources Protection Act of 1988 (P.L. 100-691) and Title 43 CFR Subpart 37	Addresses protection of significant caves and cave resources, including paleontological resources.

The recently released BLM Handbook H-1601-1, Land Use Planning Handbook (USDI, BLM 2005c) addresses paleontology. In the handbook, BLM is directed to identify criteria or use restrictions to ensure that (a) areas containing fossils, or that are likely to contain vertebrate or noteworthy occurrences of invertebrates or plant fossils are identified and evaluated prior to authorizing surface-disturbing activities; (b) management recommendations are developed to promote scientific, educational, and recreational uses of fossils; and (c) threats to paleontological resources are identified and mitigated as appropriate.

6.11.2 State of New Mexico

In the State of New Mexico, there are no laws protecting paleontological resources on State Trust Lands; however, the State Parks and Recreation Division of the Department of Energy, Minerals, and Natural Resources governs the discovery and collection of fossils on State Park lands. It is an offense to "cut, break, injure, destroy, take, or remove any tree, shrub, timber, plant, or natural object (includes paleontological resources) in any State park or recreational area" (Regulation 16-2-32 "Criminal Offenses"). Penalties range from petty misdemeanor to 4th-degree felony. This statute is reflected in State parks regulations. Also, a Special Use Permit is required to collect resources from State parks; collection without the permit would allow for action on the part of State parks. The second and last statute is NMSA 1978 30-16-1 "Larceny," which allows for prosecution for anything of a value of $2,500, but not more than $20,000 (3rd-degree felony) and for anything over $20,000 (4th degree felony). Excavations for fossils on State Trust Lands do require a lease from the New Mexico State Land Department. Normally, permission is not granted to private citizens but is given to public institutions, such as museums and universities, that have the professional expertise and equipment to properly collect the fossils for education, research, or for exhibit purposes. Fossils found on privately owned lands in New Mexico are the property of the landowners (Lucas and Heckert 2000; Nelson 2005).

6.12 VISUAL RESOURCES

6.12.1 Federal Laws and Regulations

FLPMA includes the following four sections that refer to the management of visual resources:

- Section 102 (A) (8) "…public lands be managed in a manner which will protect the quality of the scenic values…"
- Section 103 (C) "…scenic values as one of the resources for which public land should be managed…"
- Section 201 (A) "The secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including scenic values).
- Section 501 (A) requires that "each right-of-way shall contain terms and conditions which will minimize damage to the scenic and aesthetic values…"

NEPA Section 101 (b) states that measures should be taken to "assure for all Americans aesthetically pleasing surroundings…"

6.12.2 BLM Policy

BLM's policy, described in BLM Manual Section 8400 – Visual Resource Management, explains that BLM has a basic stewardship responsibility to identify and protect visual values on all BLM-administered land (USDI, BLM 1984b). To accomplish this, BLM shall do the following:

- Prepare and maintain on a continuing basis an inventory of visual values on all public land.
- Develop visual management objectives (classes) through the RMP process that conform to the resource allocation decisions made in the RMP.
- Incorporate visual design considerations into all surface-disturbing projects.

Instruction Memorandum No. 98-164 provides additional guidance on the management of visual resources. It states, "(1) when VRM is addressed during the RMP process, and VRM management decisions are made, the implementation of those decisions is mandated just as they are for any other resource allocation decisions. The implementation of those decisions is not at the discretion of the Field Manager, and (2) the current BLM VRM Manuals and Handbooks dictate how we conduct VRM business."

6.12.3 State and Local Laws and Regulations

The Legislature of the State of New Mexico enacted the Night Sky Protection Act in 1999. The purpose of the Act is "to regulate outdoor night lighting fixtures to preserve and enhance the state's dark sky while promoting safety, conserving energy and preserving the environment for astronomy" (State of New Mexico 1999). The Act does not allow outdoor recreational activity (public or private) to be illuminated after 11:00 p.m. except for a national or international tournament, or to conclude any recreational or sporting event or other activity that has been in progress prior to 11:00 p.m. at a ballpark, outdoor amphitheater, arena, or similar facility.

6.13 WILDERNESS CHARACTERISTICS

6.13.1 Federal Laws and Regulations

BLM no longer has authority to designate new wilderness study areas (WSAs) administratively or to manage additional land under the non-impairment standard prescribed by Section 603 of FLPMA. Instruction Memorandums 2003-274–BLM Implementation of the Settlement of Utah vs. Norton regarding Wilderness Study (USDI, BLM 2003c), and 2003-275 – Change 1 Consideration of Wilderness Characteristics in Land Use Plans (USDI, BLM 2003d), state that the management of WSAs that have already been established through the Section 603 and Section 202 processes and recommended by the President to Congress, or of WSAs that were established legislatively, are unaffected. However, existing

Section 202 WSAs that are identified and designated in a current land use plan may be changed through the land use planning process and need not continue to be subject to the non-impairment standard and other provisions of the 1995 Interim Management Policy and Guidelines for Lands Under Wilderness Review.

In accordance with Instructional Memorandum 2003-275 – Change 1 Consideration of Wilderness Characteristics in Land Use Plans, wilderness characteristics may be protected administratively through the establishment of VRM classifications to guide the placement of roads, trails, and other facilities; protective conditions of use on permits, leases, or other use authorizations; or designating land as open, closed, or limited to off-highway vehicle (OHV) use. If appropriate, BLM also may designate back country byways, watchable wildlife viewing sites, or other BLM administrative designations through the land use planning process.

Federal regulations for exchanges, 43 CFR Part 2200.0-6, states that "lands acquired by exchange that are located within the boundaries of areas of critical environmental concern or any other areas having an administrative designation established through the land use planning process shall automatically become part of the unit or areas within which they are located."

6.14 LIVESTOCK GRAZING

6.14.1 Federal Laws and Regulations

BLM administers the grazing program in the Decision Area under provisions of the Taylor Grazing Act, FLPMA, Public Rangelands Improvement Act of 1978, and the regulations developed to implement those laws. These laws direct BLM to authorize and manage livestock grazing on public land under the principles of multiple use and sustained yield and to prevent the degradation of the rangeland resources by providing for their orderly use, improvement, and development. In 1994, BLM, through its Rangeland Reform Initiative, began developing new regulations for grazing administration. Through this process, which included extensive public involvement, BLM launched its "Rangeland Health" initiative and finalized the new regulations for grazing administration in Title 43 of the Code of Federal Regulations Part 4100 (43 CFR Part 4100; 60 FR 9894), which were adopted by the Department of the Interior and became effective August 21, 1995.

The Taylor Grazing Act authorizes the Secretary of the Interior to establish grazing districts in any part of the public domain of the United States (exclusive of Alaska), to regulate and administer grazing use of the public lands, and to improve the public rangelands. The Act states that the privileges recognized and acknowledged shall be adequately safeguarded, but the creation of a grazing district or the issuances of a permit pursuant to the provisions of the Act shall not create right, title, interest, or estate in or to the lands. Section 3 of the Taylor Grazing Act concerns grazing permits issued on public lands within the grazing districts established under the Act. It initially gave leasing preference to landowners and homesteaders in or adjacent to the grazing district lands. Permits were issued for not more than 10 years. Section 15 of the Taylor Grazing Act covers grazing leases on public lands outside the original grazing district boundaries.

The original law directed different levels of management on Section 3 and Section 15 lands, but that direction has been removed.

FLPMA was passed to establish policy for managing BLM-administered public lands. To ensure long-term stability and use of BLM-administered public land by the livestock industry, FLPMA authorized 10-year grazing permits and required a two-year notice of cancellation. The Act also directed grazing advisory boards (formed under the Taylor Grazing Act) to guide the BLM in developing allotment management plans and allocating range betterment funds.

The primary component of the Public Rangelands Improvement Act addressed grazing fees, but it also established a national policy and commitment to improve the conditions on public rangelands, required national inventory, ensured consistent Federal management policies, and provided funds for range improvement projects. The Public Rangelands Improvement Act established the formula by which fees were to be charged for domestic livestock grazing on public rangeland for the grazing years 1979–1985. Executive Order 12548, signed February 14, 1986, extended the use of this formula beyond 1985. The PRIA specified that no less than 80 percent of funds appropriated for the Act must be used for on-ground range rehabilitation, construction and maintenance of range improvements, and training of personnel. Congress, in Section 201(a) of FLPMA, mandates natural resource inventories. Congress reaffirmed this mandate in Section 4 of the Public Rangelands Improvement Act—in particular, to develop and maintain an inventory of range condition and trends on public rangelands, and to keep that inventory updated on a regular basis.

To implement the various laws that are passed, BLM has developed a number of regulations. The Grazing Administration Regulations (43 CFR 4100) are updated regularly to incorporate the changes necessary to remain current. The regulations, combined with the BLM handbooks and manuals provide BLM staff the direction they need in making their management decisions.

6.14.2 State of New Mexico

The New Mexico Noxious Weed Management Act provides legislative authority for the management of noxious plant species in New Mexico. The specific goals are to improve the State economy and environment by managing noxious weeds in New Mexico. A Memorandum of Understanding has been established in Sierra, Otero, and Doña Ana Counties to coordinate participation and responsibilities between State, Federal and private entities in an effort to manage noxious plants on public and private land. Noxious plant control and/ or eradication methods are addressed and analyzed on a site-specific basis and may differ between counties and individual projects.

6.15 MINERALS AND RENEWABLE ENERGY

6.15.1 Federal Laws, Regulations and Policy

In addition to the mandates and guidance for planning and environmental resources management, such as NEPA (1969), the FLPMA (1976), and the Energy Policy Act (1992), the authority to make decisions

regarding leasing, sale and development of energy and mineral resources on BLM lands is assigned to the Secretary of the Interior by a series of Federal laws and regulations.

- The General Mining Law of 1872 (30 U.S.C. 22-54) governs mining activity on public land, including entry and mine claims, and claims for oil and gas. So many claims were filed under this law that in 1909 President Theodore Roosevelt issued a Proclamation withdrawing public land from claims until such land could be protected. That protective legislation was enacted with the Mineral Leasing Act of 1920.

- The Mineral Resources on Weeks Law Lands Act of 1917 (39 Stat. 1150, as supplemented; 16 U.S.C. 520) authorizes the Secretary of the Interior to prescribe general regulations for permitting prospecting, development, and use of the mineral resources of the lands acquired for the best interests of the United States under the Weeks Law (Act of March 1, 1911).

- The Mineral Leasing Act of 1920 amended the General Mining Law of 1872 to give the Federal Government authority to lease the majority of Federal onshore minerals, and gave the BLM responsibility for leasing (30 U.S.C. 226-3).

- The Mineral Leasing Act (Ch. 513, 61 Stat. 913; 30 U.S.C. 351, 352, 354, 359) of 1947 provides for leasing of all deposits of oil, gas, oil shale, coal, sulfur, phosphate, sodium, and potassium on Federal land. These deposits may be leased by the Secretary of the Interior under the same conditions provided in the leasing provisions of the mineral leasing laws.

- The Mining and Minerals Policy Act of 1970 (30 U.S.C. 219) declares that it is the continuing policy of the Federal Government to foster and encourage private enterprise in the development of a stable domestic minerals industry and the orderly and economic development of domestic mineral resources.

- The Geothermal Steam Act of 1970 (30 U.S.C. 1001 et seq.) and Geothermal Resources Operational Orders issued under that Act give the BLM the authority to issue leases for the development of geothermal resources on Federal lands and provides guidance for the exploration, testing, and development of geothermal resources.

- Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 181, et seq.; PL 100-203) requires that the BLM offer all lands available for leasing competitively prior to leasing noncompetitively. The Act was promulgated to address concerns that leasing of Federal lands was occurring at below-market rates. The Act includes provisions for environmental protection of leased lands, and provides for inspections and enforcement of rules regarding operational activities. Leasing for oil and gas on U.S. Forest Service lands must have the prior consent of the Forest Service.

- Geothermal Resources Leasing and Operations: Final Rule (43 CFR Part 3200 et al.) issued in 1998 reaffirmed the authority for the BLM to issue geothermal leases and revises rules regarding leasing, exploration, and development of geothermal resources.

- Mining Claims Under the General Mining Laws; Surface Management (43 CFR Part 3800 et al.) amends the regulations governing mining operations involving metallic and some other minerals on public lands to prevent unnecessary or undue degradation of BLM-administered lands by mining operations authorized under the mining laws.

- Department of the Interior and Related Agencies Appropriation Act of 2001 relates to the management of public lands and their resources under the BLM, including the assessment of mineral potential of public lands.

- Other Acts, including:
    - The Federal Coal Leasing Amendments Act of 1976 (30 U.S.C. 201)
    - The Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.)
    - The Research and Development Act of 1980
    - The Federal Oil and Gas Royalty Management Act of 1982

Regulations specific to the BLM include the following:

- BLM Manual 1601 and Handbook H-1601-1 (2005), Land Use Planning
- BLM Manual Section 1624-2, Supplemental Program Guidance for Fluid Minerals, and associated BLM Handbook H-1624-1, Planning for Fluid Minerals Resources
- BLM Manual Series 3031, Energy and Mineral Resource Assessment
- BLM Manual Series 3100, Onshore Oil and Gas Leasing
- BLM Manual Series 3200, Geothermal Resource Leasing
- BLM Manual Series 3400, Coal Resource Leasing

The following BLM Instruction Memorandums (IM) provide updates, clarifications, or revisions to existing Federal and BLM policies applicable to geology and minerals:

- IM No. 2002–061 provides information on the BLM's Implementation Plan for NEPA and requests that certain States submit plans showing how geothermal leasing applications will be processed to lease issuance. This IM also requests resource information that will be used to complete the BLM's Renewable Energy Strategy for Geothermal Resources.

- IM No. 2002-174 restates and clarifies existing oil and gas lease stipulation policy and provides new guidance for the use of stipulations and notices for threatened, endangered, and other special status species.

- IM No. 2002-222 provides the internet link for access to the Draft Solid Minerals Reclamation Handbook, September 9, 2002.

- IM No. 2003-020 provides interim guidance on processing right-of-way applications for wind-energy-site testing and monitoring facilities, and applications for wind-energy development projects on BLM-administered lands.

- IM No. 2003-059 reissues policy guidance on appraisals for the mineral materials program after making corrections in citations necessitated by the new 43 CFR 3600 regulations published November 23, 2001.

- IM No. 2005-06 establishes policy for the processing of right-of-way applications for solar energy development projects on BLM-administered land.

6.15.2 State Laws, Regulations and Policy

The following State of New Mexico statutes are relevant to energy and mineral resource development, but may not apply to the BLM:

- New Mexico Geothermal Resources Act (Chapter 75, Article 15 NMSA 1973)

- New Mexico Geothermal Resources Conservation Act (Chapter 71, Article 5 NMSA 1978)

- New Mexico Oil and Gas Act (Chapter 70, Article 2 NMSA 1978), which includes oil, gas, CO_2, helium, and geothermal energy

- New Mexico Surface Mining Act (Chapter 69, Article 25 NMSA 1978), which permits and regulates mining on State, Federal and private land in New Mexico

- New Mexico Water Quality Act (Chapter 74, Article 6 NMSA 1978)

- State Trust Land Leasing (Chapter 18, Article 8 NMSA 1978)

6.16 RECREATION

6.16.1 Federal Laws and Regulations

FLPMA as amended, requires that management of public land be based on the idea of multiple use and sustained yield and that public land be managed in a manner that will provide for outdoor recreation and human occupancy and use. FLPMA states that “land use plans [should] … coordinate the land use

inventory, planning, and management activities of or for such lands with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located, including … the statewide outdoor recreation plans …"

The National Trails System Act of 1968, as amended, provided for establishment of National Recreation and National Scenic Trails to closely follow original routes of national historic significance. The purpose of the Act is to provide for the ever-increasing outdoor recreation needs of an expanding population and to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas, and historic resources of the Nation.

The Americans with Disabilities Act of 1990 protects civil rights for people with disabilities. Titles II and III of the Act require newly constructed and altered State and local government facilities, places of public accommodation, and commercial facilities to be readily accessible and useable by individuals with disabilities. Recreation facilities are among the types of facilities covered by Titles II and III of the Americans with Disabilities Act.

Regulation and policy regarding OHV use is described in Section 6.18, Transportation and Access.

Special Recreation Permits are authorizations in accordance with the Land and Water Conservation Fund Act to allow specified recreational uses of the public land. They are issued as a means to manage visitor use, protect natural and cultural resources, and provide a mechanism to accommodate commercial recreational uses.

43 CFR 2930 requires special recreation permits for non-commercial, non-competitive organized group activities that meet specified criteria. These regulations are implemented in accordance with BLM Handbook 2930-1. BLM can waive the requirement for a special recreation permit pursuant to 43 CFR 2932.12. Special recreation permits are issued under 43 CFR 2930 to authorize use of BLM land in connection with (1) commercial, (2) competitive, (3) vending, (4) individual or group use in special areas, and (5) organized group activity and event use. Each of these is described briefly below.

- "Commercial Use" is defined as recreational use of public land and related waters for business or financial gain. When any person, group or organization makes or attempts to make a profit, receive money, amortize equipment, or obtain goods or services, as compensation from participants in recreational activities occurring on public land, the use is considered commercial. Examples include outfitters and guides, scenic tours, trail rides, cattle drives, and photography associated with a recreational activity. It also includes use by scientific, educational, and therapeutic or nonprofit organizations when certain criteria are met.

- "Competitive Use" means any organized, sanctioned, or structured use, event, or activity on public land in which two or more contestants compete and either (1) participants register, enter, or complete an application for the event, or (2) a predetermined course or area is designated. Examples include OHV races, horse endurance rides, and mountain bike races.

- Vendor permits are temporary, short-term, nonexclusive, revocable authorizations to sell goods or services on public land in conjunction with a recreation activity. Examples include T-shirt sales in conjunction with an OHV race, a hot dog stand at a motorcross event, and firewood sales in a BLM campground.

- "Special Areas" are areas officially designated by statute or Secretarial order. For permitting purposes, special areas officially designated through an RMP and require special permitting requirements (e.g., private or individual recreational use).

- Organized Group Activity and Event Use permits are for noncommercial and noncompetitive group activities and recreation events. Examples include large scout campout, a school group activity, or a large family reunion.

Objectives of the BLM recreation permitting system are to satisfy recreational demand within allowable use levels in an equitable, safe, and enjoyable manner while minimizing adverse resource impacts and user conflicts. In issuing recreation permits to recreational users of public land, BLM authorizes permittees use of the land for permitted purposes. This represents a privilege to use public land that is subject to the terms and conditions of the permits (USDI, BLM 2002b).

Recreation permits are managed in a manner that is consistent with management objectives determined in resource management plans, recreation area management plans, or in their absence, through recreation management objectives resulting from analysis of resources and visitor use for each area. The criteria for which BLM may waive a permit requirement are: (a) the use or event begins and ends on nonpublic lands or related waters, traverses less than one mile of public lands or one shoreline mile, and poses no threat of appreciable damage to public land or water resource values; (b) BLM sponsors or co-sponsors the use (this includes any activity or event that BLM is involved in organizing and hosting, or sharing responsibility for, arranged through authorizing letters or written agreements); or (c) the use is a competitive event that is not commercial, does not award cash prizes, is not publicly advertised, poses no appreciable risk for damage to public land or related water resource values, and requires no specific management or monitoring; (d) the use is an organized group activity or event that is not commercial, is not publicly advertised, poses no appreciable risk for damage to public land or related water resource values, and requires no specific management or monitoring.

The Recreational Fee Demonstration Program was authorized by Congress in Section 315 of the Omnibus Consolidated Rescissions Act of 1996 (PL 104-134) and amended the program under PL 104-208, 105-18, 105-83, 105-277, and 106-291. Four Federal land management agencies—the NPS, USFWS, BLM, and the Forest Service—were mandated to implement a Recreational Fee Demonstration Program. This project allowed these agencies to test new fees that represent the geographic and programmatic spectrum of sites that they manage. Under the program, the agencies retain all of the new fees, with at least 80 percent of the retained fees to be used at the sites where they were collected. Up to 20 percent of the fee revenues may be used at other sites under the administrative jurisdiction of the collecting agency (USDI, BLM 2003h).

43 CFR 8360 addresses Visitor Services. Section 8364.1 addresses closure and restriction orders and provides BLM with the authority to issue an order to close or restrict use of designated public lands to protect persons, property, and public lands and resources. The CFR addresses the specific requirements of the orders.

Section 8365 establishes the Rules of Conduct for the protection of public land and resources, and for the protection, comfort and well-being of the public in its use of recreation areas, sites and facilities on public land. The objective of the rules of conduct is to ensure that public land, including recreation areas, sites and facilities, can be used by the maximum number of people with minimum conflict among users and minimum damage to public land and resources. The Section 8365.1 rules apply to use and occupancy of all public land under the jurisdiction of BLM.

6.16.2 BLM Policy

BLM's general recreation management policy is pursuant to BLM Manual 8300. Parts 8310 and 8320 provide the parameters to plan for outdoor recreation activities on BLM land. In addition, the recent NLCS policy addresses the management of outdoor recreation in areas that have already received special recognition and protection through congressional or presidential conservation designations (e.g., National Conservation Areas, National Monuments, Wilderness Areas, Wilderness Study Areas, Wild and Scenic Rivers, and National Historic and Scenic Trails) within a single organized system with the goal to increase public awareness of these areas' scientific, cultural, educational, ecological and other values.

Manual 8300 on recreation is BLM's administrative authority for outdoor recreation planning, enabling BLM to (1) address issues identified in the RMP, (2) use ROS as a conceptual framework for inventory, planning, and management of recreation resources, (3) engage in different levels of planning such as resource management plans, activity plans, recreation area management plans, and project plans, (4) collect visitor use statistics, and (5) inventory recreation use. According to the manual, BLM will plan for its recreation resources consistent with the State Comprehensive Outdoor Recreation Plan (USDI, BLM 1981, Undated).

Dispersed camping is allowed on BLM-administered lands in New Mexico for no more than a period of 14 days within any period of 28 consecutive days. The 28-day period begins when a camper initially occupies a specific location on public lands. The 14-day limit may be reached either through a number of separate visits or through 14 days of continuous occupation. After the 14th day of occupation, the camper must move outside of a 25-mile radius of the previous location until the 30th day since initial occupation (USDI, BLM 1995a). The BLM prohibits the parking of any motor vehicle for longer than 30 minutes, or camp within 300 yards of any spring, manmade water hole, water well, or watering tank used by wildlife or domestic stock (USDI, BLM 1995a).

Recreational shooting is not prohibited from BLM-administered lands, but has not been sanctioned either. Shooting restrictions do not prohibit legitimate hunting activities except within ½ mile of developed

recreational sites or areas. Recreational shooters are encouraged to use public lands where restrictions do not apply and the use does not significantly conflict with other uses (USDI, BLM 1995a).

6.16.3 New Mexico Laws and Regulations

The NMDGF manages wildlife and wildlife hunts on Decision Area lands. Hunter use is managed through regulation of annual harvest through harvest limits and season lengths in the GMUs. NMDGF manages wildlife for recreation according to the State of New Mexico Statutes Chapter 17.

The New Mexico Big Game and Furbearer Rules and Information provides rules and regulations regarding hunting, trapping, and fishing on land in New Mexico, including public lands. In addition, under New Mexico Big Game and Furbearer Rules and Information, "it is illegal to drive a motorized vehicle off established roads in a hunting, trapping, or angling area if the vehicle bears a person licensed to hunt, trap, or fish for species on which season is open in that area." However, "on certain public lands, it is legal to take vehicles off established roads to retrieve legally taken and tagged big-game carcasses, provided that State or Federal regulations do not prohibit such use" on those lands (NMDGF 2005a). The regulations note "although wilderness and wilderness study areas are open to hunting, vehicles are prohibited in wilderness areas" and vehicle use in other areas including WSAs is "limited to protect natural resources, [so] vehicles may not be taken of road to retrieve game in WSAs." Furthermore, the regulations state that BLM lands in Doña Ana County are "closed to all off-road travel," and that no shooting is allowed within a half-mile of the fenced boundary or a quarter-mile of the hiking trails located at Aguirre Spring Campground, Dripping Springs Natural Area, and Three Rivers Petroglyph Site.

6.17 LANDS AND REALTY

6.17.1 Federal Land Policy and Management Act

FLPMA provides authority for land ownership adjustments through acquisitions and disposals and the Recreation and Public Purposes (R&PP) Act of 1954. Under FLPMA, BLM is authorized to sell public land where, as a result of land use planning, it is determined that the sale of such tracts meets specified disposal criteria which includes: that the tract is difficult and uneconomic to manage, the tract is no longer required for the Federal purpose, and that the disposal of the tract will serve important public objectives. The Act also requires that management activities, such as ownership adjustments made by the BLM, be in compliance with existing land use plans. Property selected for sale must be identified as being potentially suitable for disposal in an approved land use plan and must meet one or more of the criteria outlined in FLPMA Sections 203 and 209. The land must be sold for no less than fair market value. Prior to any land disposal, a "mineral potential report" will be prepared. The mineral potential report will analyze the minteral potential of the subject property.

Section 503 of FLPMA allows BLM to designate a potential right-of-way corridor (an existing transportation or utility right-of-way route with potential for at least one additional facility) as a

designated right-of-way corridor in order to minimize adverse environmental impacts and the proliferation of separate rights-of-ways (43 CFR 2806).

6.17.2 Federal Land Transaction Facilitation Act

The Federal Land Transaction Facilitation Act of 2000 allows BLM to retain receipts from land sales of lands identified for disposal prior to July 25, 2000, which would be used to cover administrative costs and to acquire properties that would improve the Nation's land management pattern (USDI, BLM 2000b).

6.17.3 Recreation and Public Purposes Act

BLM is authorized to issue leases and patent public land to State and local governments and qualified nonprofit organizations for public parks, recreational sites, and historical sites under the R&PP Act. The R&PP Act applications for lands outside disposal areas that meet the criteria outlined in 43 CFR 2740 and are consistent with management objectives are considered. Conveyance of property under the R&PP Act to governmental entities will be under special pricing schedules. Special pricing applies to land that will be government-controlled, used for government purposes, and serve the general public.

6.17.4 Desert Land Act

The Desert Land Act of 1877 promotes the economic development of the arid and semiarid public lands of the western United States. Through the Act, individuals may apply for a desert-land entry to reclaim, irrigate, and cultivate arid and semiarid public lands. No applications are accepted for disposal under the Desert Land Act in Doña Ana County per the Mimbres RMP (USDI, BLM 1993a). The White Sands RMP does not prohibit applications under the Desert Lands Act in Sierra and Otero Counties.

6.17.5 Bureau of Land Management

BLM's resource-specific guidance, described in BLM Handbook H-1601-1, Land Use Planning Handbook, states that right-of-way corridors, avoidance areas, and exclusion areas be identified for the Planning Area, consistent with natural-resource goals and objectives (USDI, BLM 2005c).

BLM's policy, described in BLM Handbook H-2200-1, Land Exchange Handbook, states that land exchange is BLM's preferred method of land disposal (USDI, BLM 1997c). All land and mineral disposal actions within the Planning Area will be in conformance with the criteria established in the Lands and Minerals Disposal Policy.

BLM's Handbook H-2801-1, Right-of-Way Handbook, identifies numerous right-of-way-grant guide stipulations commonly used to mitigate resource impacts on public land (USDI, BLM undated).

6.18 TRANSPORTATION AND ACCESS

6.18.1 Federal Laws and Regulations

Under Section 501 (a) of FLPMA, the Secretary of the Interior is "authorized to grant, issue, or renew rights-of-way over, upon, under, or through such lands for … (6) roads, trails, highways, railroads, canals, tunnels, tramways, airways, livestock driveways, or other means of transportation except where such facilities are constructed and maintained in connection with commercial recreation facilities on lands in the National Forest System; or (7) such other necessary transportation or other systems or facilities which are in the public interest and which require rights-of-way over, upon, under, or through such lands…"

Section 502 of FLPMA grants the authority to acquire, construct, and maintain roads "within and near the public lands in locations and according to specifications which will permit maximum economy in harvesting timber from such lands tributary to such roads and at the same time meet the requirements for protection, development, and management of such lands for utilization of the other resources thereof." This section goes on to address cost sharing for financing such actions. To meet the goals of multiple use and resource protection, there are close connections between regulation of access and many other resource objectives in FLPMA. Authorities that affect planning, design, construction, and maintenance of roads include the following:

- Federal Highway Act of 1962, as amended
- Highway Beautification Act of 1965
- Highway Safety Act of 1966, as amended
- Surface Transportation Act of 1978
- Surface Transportation Assistance Act of 1982

The authority to regulate access to achieve resource goals is addressed in several mandates. The Endangered Species Act (ESA), as amended, provides authority for protecting habitat values. The Archaeological Resources Protection Act and National Historic Protection Act Section 106 regulate protection of cultural resources.

Executive Order 11644, Use of Off-Road Vehicles on the Public Lands (as amended by Executive Order 11989) was signed by Richard Nixon in 1972 and codified in 43 CFR 8340 to ensure that the use of off-road vehicles on public land would be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands. This Executive order required Federal agencies to designate specific areas where OHV use would be permitted and areas where OHV use would be prohibited.

PL 106-65 allows the Secretary of the Army to close withdrawn lands, roads, or trails from public use based on needs for public safety, military operations, or national security. Closures are to be limited to the

minimum areas and periods that the Secretary determines necessary. Additionally, this law specifies that appropriate warning be posted and that appropriate steps be taken to notify the public.

6.18.2 BLM Policy

Overall BLM policy, as described in BLM Handbook H-1601, Land Use Planning Handbook, states that, comprehensive travel management planning should address all resource use aspects (such as recreational, traditional, casual, agricultural, commercial, and educational) and accompanying modes and conditions of travel on public lands, not just motorized or OHV activities.

BLM Manual 9113 provides direction for the inventory of, functional classification of, sufficiency analyses of, and establishment of maintenance levels for BLM roads, for incorporation into the BLM Planning System and the Transportation Facilities Management Plan; road standards; and for road project planning, design, construction, maintenance, and record keeping activities. Overall objectives for managing BLM's road system are the following:

- Provide adequate information for BLM planning and operations.
- Provide coordination with other organizations.
- Provide safe and adequate BLM roads for users.
- Protect scenic, cultural, and historic values and conserve resources.
- Ensure that design, construction, maintenance activities, and record-keeping for road projects meet BLM's needs and are performed in an acceptable manner.

Under BLM policy, BLM roads must be designed to an appropriate standard no higher than necessary to accommodate their intended functions adequately (i.e., administrative access, public travel), and design, construction, and maintenance activities must be consistent with national policies of safety, aesthetics, protection and preservation of cultural, historic, and scenic values, and accessibility for the physically handicapped.

BLM roads are for the use, development, protection, and administration of public lands and resources. Although generally open to use by the public, BLM roads are not public roads. Roads may be closed or use-restricted to fulfill management objectives such as protecting public health and safety or preserving resources. BLM roads that no longer support a management objective (timber sale, range management, etc.) are obliterated and revegetated.

The location, design, construction, and maintenance of roads crossing public lands must comply with all applicable Federal laws. In addition, all roads controlled by BLM must meet appropriate BLM road standards, whether or not they are constructed by BLM initiative.

The acquisition of easements for existing roads may not be initiated until a route analysis has been completed and has determined that an existing facility is sufficient for BLM needs or, if new construction

or reconstruction is required, until an approved design has been developed to the point where the actual easement can be dimensioned.

Additional information and guidance on road program management is provided in BLM Manual 9113. Trails are addressed in BLM Manual 9114, which includes location and design guidelines, design standards, and guidance for construction and maintenance.

BLM defines the steps for transportation plan development in BLM Manual H-9110-1. RMPs provide the first portrayal of the existing transportation system, and an activity plan for transportation then would be developed to respond to RMP decisions and/or land and resource activity plans.

BLM defines appropriate access to public lands in the land use planning process described in Section 202 of FLPMA. Specific management direction associated with access is intended to protect unique resources or values as determined necessary through the planning process. Guidance for OHV designations in the land use planning process is incorporated in the Land Use Planning Handbook, H-1601 Recreation Section (Appendix C, Section II.D), and are consistent with 43 CFR 8340 et seq.

43 CFR 8340 authorizes BLM to designate areas and trails as open, limited, or closed to off-road vehicle use for the purpose of protecting resources, promoting safety, or minimizing conflicts among the various uses on public land. Under 43 CFR 8341.2(b), "each State director is authorized to close portions of the public lands to use by off-road vehicles, except those areas or trails which are suitable and specifically designated as open to such use pursuant to subpart 8342 of this part." Subpart 8342 provides designation criteria and procedures. Specific criteria for open, limited and closed designations are provided in definitions outlined in 43 CFR 8340.0-5(f), (g) and (h). Additional criteria are provided by existing law, proclamation, executive order, regulation or policy.

Instruction Memorandum No. 2004-005, Clarification of OHV Designations and Travel Management in BLM Land Use Planning Process, clarifies how to implement the guidance in BLM Handbook H-1601, Land Use Planning Handbook, as outlined below:

- Road and trail access (and OHV management) guidance will be incorporated into every RMP to ensure public and resource needs are met. At a minimum, each RMP will divide planning areas into OHV area designations that are open, limited or closed. The RMP will include a map of area designations.

- Selection of a network of roads and trails should be performed for all limited areas in each RMP. This requires establishment of a process that includes selecting specific roads and trails within the limited area or sub-area and specifying limitation(s) placed on use. The RMP will include a map of the roads and trails open and available in each area.

- If complexity, controversy, or incomplete data make it impossible to complete the selection of a road and trail network for any area designated as limited within reasonable timeframes or budget

availability, BLM will perform the selection process for all limited areas that can be completed. For any limited area or sub-area that cannot be completed in the RMP, BLM will, to the extent possible:

- incorporate a map of a preliminary road and trail network, including known roads or trails that are expected to be included in the final network;
- define short-term management guidance for road and trail access and activities, including interim management guidelines for proper identification of the preliminary road and trail network, including signing and maintenance of open roads and trails;
- outline additional data needs and a strategy to collect needed information;
- establish a clear planning sequence, including public collaboration, criteria, and constraints for subsequent road and trail selection and identification;
- produce a schedule to complete the limited area or sub-area road and trail selection process. Normally, this process should not exceed five years; and
- install signs, and in some cases, construct barriers or perform restoration on closed roads and trails.

6.18.3 Air Transportation

Various mandates and regulations apply to aviation activities, including the Federal Aviation Act of 1958 (PL 85-726), which assigns the U.S. Department of Transportation the authority to regulate the structure and use of the National Airspace System in the United States. Title 14 of the United States Code (U.S.C.) contains the Federal Aviation Regulations. Federal Aviation Regulations Order 7400.2E addresses Procedures for Handling Airspace Matters including general procedures applicable to airspace management and policy and procedures unique to obstruction evaluation, airport airspace analysis, terminal and en route airspace, and special use airspace.

6.18.4 New Mexico Laws and Regulations

Chapter 2 Title 19 Part 19 of the New Mexico Administrative Code (NMAC) states that, “the use of motorized vehicles or any mechanical form of transportation for recreational access is restricted to public highways and roads, as defined by Section 67-2-1 NMSA 1978, that traverse or adjoin lands open to recreational access and to established roads that traverse lands open to recreational access. When lands open to recreational access are fenced, however, and no gate in the fence provides vehicle access to the lands or a gate across the road providing vehicle access is locked, recreational access shall be limited to travel by foot beyond the fence.”

Under the Off-Highway Motor Vehicle Act of 1978, the State of New Mexico requires the registration of OHVs that are not legally equipped for operation on highways of the State, which includes motorcycles, snowmobiles, dune buggies, and all-terrain vehicles (ATVs) with three, four, or six wheels. OHVs must be registered within 30 days after purchase. The provisions of the Off-Highway Motor Vehicle Act do not apply to the motor vehicles that are: (a) owned and operated by an agency or department of the United States, New Mexico, or any political subdivision of New Mexico, (b) operated exclusively on lands privately held by the OHV owner, (c) owned by nonresidents of the State, provided that use in New Mexico is for competition purposes only, use does not exceed 15 days, and use is not on a rental basis, (d) brought into the State by manufacturers or distributors for wholesale purposes and not used for demonstrations, (e) in the possession of dealers or stock-in-trade and not used for demonstration purposes, or (f) farm tractors.

According to NMAC Title 19 Part 19, activities that are not allowed on lands open to recreational access include, but are not limited to…crossing private land to gain access to State Trust lands; conducting off-road vehicle activities; violating any applicable law, statute, regulation, ordinance or rule enacted by a governmental entity; interfering with the authorized activities of other land users. Title 19 Part 20 states that, "…Roads built on state trust land that will cross adjacent land administered by the BLM will be constructed and maintained in concert with the BLM new road policy effective January 1, 1988."

6.19 SPECIAL DESIGNATIONS

FLPMA states that "public lands will be managed in a manner that … where appropriate, will preserve and protect certain public lands in their natural condition," and that "regulations and plans for the protection of public land areas of critical environmental concern be promptly developed." (USDI, BLM 2001d).

The Wilderness Act of 1964 (PL 88-577) provides for the establishment of wilderness areas (designated by Congress) that are administered for the use and enjoyment of the American people in such a manner that they are left unimpaired for future use and enjoyment as wilderness.

Federal regulations for BLM's planning, programming, and budgeting, 43 CFR Part 1610.7-2, require that areas having potential for ACEC designation and protection management be identified and considered throughout the planning process. These regulations outline the criteria of relevance and importance that an area must meet in order to be considered as a potential ACEC. These criteria, as well as the process for designating an ACEC, are described in BLM Manual 1613 (USDI, BLM 1988)

Federal regulations for exchanges, 43 CFR Part 2200.0-6, states that "land acquired by exchange that are located within the boundaries of areas of critical environmental concern or any other areas having an administrative designation established through the land use planning process shall automatically become part of the unit or areas within which they are located …".

BLM policy, described in H-8550-1 – Interim Management Policy and Guidelines for Lands Under Wilderness Review requires that lands under wilderness review be managed so as not to impair their suitability for preservation as wilderness (USDI, BLM 1995b).

6.20 PUBLIC SAFETY

6.20.1 Federal Laws and Regulations

The National Priorities List for hazardous waste sites is regulated under the CERCLA, which identifies uncontrolled or abandoned hazardous waste sites where priority remedial actions are performed under the Superfund Program. To be included on the National Priorities List, a site must meet or surpass a predetermined hazard ranking system score, must be chosen as a State's top-priority site, or must be the subject of all three of the following actions: (1) the U.S. Department of Health and Human Services issues a health advisory recommending that people be removed from the site to avoid exposure, (2) the EPA determines that the site represents a significant threat, and (3) the EPA determines that remedial action is more cost-effective than removal action.

Under the RCRA, hazardous waste is tracked from the point of generation to the point of disposal. To track this, the EPA compiles databases of facilities that are involved in the generation, transportation, storage, or disposal of hazardous materials. These databases are maintained to identify facilities that treat, store, or dispose hazardous materials. Other lists are maintained to track facilities that are currently undergoing or have undergone "corrective action." A "corrective action order" is issued pursuant to RCRA, Section 3008 (h) when there has been a release of hazardous waste or constituents into the environment from a RCRA transportation, storage, or disposal facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates the RCRA.

6.21 SOCIAL AND ECONOMIC CONDITIONS

6.21.1 Federal Mandates and Authority

Several legal mandates require that BLM consider social and economic information to ensure informed, legally defensible land use planning decisions. Section 202 of the Federal Land Policy and Management Act of 1976 (FLPMA) requires BLM to "…use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences…" in the development and revision of land use plans (43 U.S.C. 1712[c][2]). In addition, Section 102 of the National Environmental Policy Act (NEPA) requires Federal agencies to "…utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decisionmaking which may have an impact on man's environment "(42 U.S.C. 4332[2][A]).

Federal agencies are required to address environmental justice concerns in accordance with Executive Order 12898, Environmental Justice. Specifically, agencies must "identify and address…disproportionately high and adverse human health or environmental effects of its programs,

policies, and activities on minority populations and low-income populations in the United States." The Council on Environmental Quality has issued guidance for addressing environmental justice under NEPA (CEQ 1997).

6.21.2 BLM Policy

Policy guidance for completing socioeconomic analyses required under FLPMA and NEPA is provided by BLM Handbook H-1601-1 (or Land Use Planning Handbook, USDI BLM 2005c). Appendix D specifically addresses Social Science Considerations in Land Use Planning Decisions, and provides guidance for data collection and impact analysis. The breadth of social science information to be incorporated into the planning process includes economic, political, social, and cultural considerations. BLM Instruction Memorandum No. 2002-167, Social and Economic Analysis for Land Use Planning (USDI, BLM 2002c) also provides guidance on approaches to analyses to support land use plans.

BLM's Land Use Planning Handbook directs that all potential social and economic effects on any distinct group be considered. The incorporation of environmental justice concerns into a planning effort is not limited to impact analyses; collaborative efforts throughout the planning process should be designed to include all potentially affected groups, communities, and agencies in the identification of issues, data collection, and mitigation development. In addition, BLM has issued Instruction Memorandum No. 2002-164, Guidance to Address Environmental Justice in Land Use Plans and Related National Environmental Policy Act Documents (USDI, BLM 2002d).

7.0 SCOPING REPORT OR SUMMARY OF SCOPING REPORT

The TriCounty Scoping Report, which was completed in June 2005, documents the issues and concerns identified by the public, government agencies and other organizations during the public scoping phase of the project. The scoping report also identifies BLM management concerns that were not identified by the public, in order to assess all of the issues that will be considered as part of the development and analysis of the environmental impact statement (EIS) alternatives.

The planning and environmental process, as well as scoping for TriCounty, commenced on January 28, 2005 with the publication in the Federal Register of a Notice of Intent to prepare the RMPs/EIS and conduct public scoping meetings. BLM's intent during the scoping process was to inform agencies, tribes, and the public about the TriCounty planning process and solicit their comments to identify issues and questions to consider when developing the RMP/EIS.

The scoping report provides the following information:

- Background information on the purpose and need for the RMPs/EIS and on the Planning Area, and a brief summary of BLM's collaborative planning process.
- Scoping procedures, including the techniques that were used to notify the public about their opportunity to be involved in scoping.
- A brief summary of the public scoping meetings.
- The planning criteria developed by BLM to guide and direct the plan.
- Issues identified by the public, and additional BLM management concerns.
- Types of decisions to be made.
- Identification of existing data available for the studies and analyses, and data needs.
- A brief summary of future steps in the RMPs/EIS process.

BLM hosted four public scoping meetings during March 2005 that were attended by approximately 187 people. The scoping meetings were conducted in an open house format with a brief presentation by the BLM team lead, who provided an overview of the Planning Area and the process to be conducted. Four public scoping meetings were held in the New Mexico communities of Las Cruces, Alamogordo, Truth or Consequences, and Anthony. The RMPs/EIS public scoping meetings were announced through the Federal Register, a mailed newsletter, BLM Web site, and media releases.

Comment worksheets and maps of the Planning Area were available for the community members as handouts at each scoping meeting. A third handout was the initial Las Cruces District Office newsletter announcing the TriCounty planning effort and scoping meetings. In addition, BLM invited community members to submit comments in letter or electronic mail (e-mail) message format.

During the scoping period, which ended on March 28, 2005, BLM received approximately 320 comments from various agencies, businesses, individuals, and special interest groups. The letters, comment forms, and the oral comments captured at the scoping meetings by a designated team scribe were compiled, reviewed, and analyzed to identify the preliminary issues to address in the RMPs/EIS, as documented in the TriCounty Scoping Report.

The scoping comments received addressed a variety of resources and resources uses, as well as collaboration and the RMPs/EIS process issues. Each comment worksheet or letter was coded and entered into an electronic database system that facilitates organization, sorting, and management of the comments in several different ways. In the database, letters/comments could be sorted by (1) submitter (e.g., agency, organization, group, or individual), (2) geographic location of submitter, and (3) type of issue. Each comment was reviewed and analyzed together with the other comments on that particular issue. Though more specific issues were identified, the general topics that were identified as issues in the comment letters included the following:

- Air quality
- Biological resources
- Cultural resources and tribes
- Education and scientific research
- Energy and minerals
- Fire management
- Hazardous materials
- Lands and realty
- Livestock grazing
- Paleontology and geology
- Proposed special designations (including nominations) and recommended management
- Public Safety, law enforcement, and illegal activities
- Recreation
- Social and economic conditions
- Soils
- Special management designations
- Transportation
- Visual resources
- Water resources

The comments and issues identified through scoping and the subsequent discussions will continue to determine the extent of the studies to be completed and addressed in the RMPs/EIS. BLM will continue to collaborate with relevant agencies, tribes, and interested public throughout the RMPs/EIS process. The approved scoping report should be referenced for details of the preliminary issues and management concerns; it is available in the Las Cruces District Office, located at 1800 Marquess, Las Cruces, New Mexico 88005.

8.0 LIST OF PREPARERS

Name	RMP/EIS Responsibility	Qualifications	BLM Personnel Coordination
NATURAL RESOURCES			
Paige Rhodes	Team lead for natural and biological resources	M.S. Environmental Science B.S. Biology	None
Mark Murphy	Principal investigator for ground and surface water, soil and watershed resources	Ph.D. Geology M.S. Geology B.S. Geology	Bruce Call, Soil Scientist
David Palmer	Principal investigator for geology, energy and mineral resources	M.A. Geology B.S. Geology	Buzz Todd, Geology and Minerals Specialist
Anne Tillery	Assisted with energy and mineral resources	M.S. Earth and Planetary Sciences B.S. Geology	None
Adam Kneeling	Assisted with energy and mineral resources	B.S. Geology	None
Barbara Garrison	Lead reviewer for biological resources (vegetation; fish and wildlife; and habitat) and principal investigator for special status species	B.S. Wildlife and Fisheries Science	Margie Guzman, Wildlife, Threatened and Endangered Species Specialist
Jean Paul Charpentier	Assisted with wildlife resources	M.S. Wildlife Ecology B.S. Wildlife Management	Margie Guzman, Wildlife, Threatened and Endangered Species Specialist
Charles Baun	Principal investigator for livestock grazing and vegetation resources	M.S. Natural Resource Management B.S. Biology/ Chemistry	Lane Hauser, Rangeland Management Specialist; Quinn Young, Rangeland Management Specialist; Leticia Lister, Biological Resource Specialist; Ray Lister, Supervisory Biological Resource Specialist
Jarod Blades	Assisted with vegetation resource	M.S. Biology (In progress) B.S. Biology in Environmental Science	Rich LaCasse, Noxious and Invasive Weeds Specialist
Julie Kutz	Assisted with special status species resource	B.S. Biology	None
Kavi Koleini	Principal investigator for fire ecology and management resource	B.S. Environmental Science	Ryan Whitaker, Fuels Management Specialist
Dautis Pearson	Independent technical reviewer for fire ecology and management	B.S. Biology Fire Ecology Training Forest Service - 12 years	None
Barbara H. Murphy	Principal investigator for paleontology and cave and karst resources	B.A. Geology	Patricia Hester, Regional Paleontologist; Mark Hakkila, Natural Resource Specialist

Name	RMP/EIS Responsibility	Qualifications	BLM Personnel Coordination
Bob Farmer	Provide oversight for air quality resource	Ph.D. Chemical Engineering B.S. Chemical Engineering P.E. Chemical Engineering	None
Barbara Sprungl	Principal investigator for air quality resource	M.B.A. Business Administration B.S. Chemical Engineering	None
Jane Yang	Assisted with air quality resource	M.E. Master of Environmental Engineering B.S. Environmental Chemistry	None
CULTURAL RESOURCES			
Gene Rogge	Team lead for cultural resources	Ph.D. Anthropology M.A. Anthropology B.A. Anthropology	Pam Smith, Archaeologist
Kirsten Erickson	Assisted with cultural resources	M.A. United States History and Public History B.A. History	Pam Smith, Archaeologist
Amanda Van Gorder, Archaeologist	Assisted with cultural resources	B.A. Anthropology	Pam Smith, Archaeologist
Jack L. Young II, Archaeologist	Assisted with cultural resources	M.A. Archaeology B.A. History	Pam Smith, Archaeologist
HUMAN RESOURCES			
Jennifer Pyne	Team lead for human resources and principal investigator for social and economic resources	M.E.P. Environmental Planning B.S. Government	Tom Phillips, RMP Team Leader; Jeannette Pranzo, Socioeconomic Specialist
Katherine "Sunny" Bush	Principal investigator for public safety and hazardous materials resources	M.S. Hazardous Materials Management B.A. English	Tom Phillips, RMP Team Leader; John Besse, Acting Hazardous Materials Specialist
Jennifer Frownfelter	Review and coordination of document and principal investigator for lands and realty, special designations, and wilderness characteristics	M.E.M. Environmental Management M.P.P. Public Policy B.A. Biology and Environmental Conservation	Tom Phillips, RMP Team Leader; Angel Mayes, Realty Specialist
Jaime Wood	Coordination of document and principal investigator for recreation, visual, and transportation / access resources	M.E.P Environmental Planning B.S. Geography / Environmental Studies	Tom Phillips, RMP Team Leader; Mark Hakkila, Recreation Specialist; Joe Sanchez, Trans-portation Specialist; Jim Talent, Transportation Specialist
Ginger Torres	Assisted with lands and realty and recreation resources	B.S. Earth Systems Science	Angel Mayes, Realty Specialist
Pamela Cecere	Assisted with social and economic conditions, wilderness characteristics and visual resources	M.P.S. Environmental Planning B.A. Political Science/ Environmental Studies	Mark Hakkila, Recreation Specialist
Lisa Gregory	Assisted with special designations	B.S. Life Science	None

Name	RMP/EIS Responsibility	Qualifications	BLM Personnel Coordination
GEOGRAPHIC INFORMATION SYSTEMS			
Jen Wennerlund	Coordination of geographic information system database management.	B.S. Geography, Cartography, Remote Sensing, Land Use Planning	Tom Phillips, RMP Team Leader; Rusty Stovall, GIS; Bette Parker, GIS; Various Resource Specialists
Glenn Emanuel	GIS map creation, spatial analysis and intranet application development of comment tracking database and administrative record	B.S. Business Administrations / Management Information Systems	Rusty Stovall, GIS
TECHNICAL REVIEW, EDITING, AND DOCUMENT PRODUCTION			
Cindy Smith	Principal-in-Charge, Public Participation	B.S. Liberal Arts and Sciences	Tom Phillips, RMP Team Leader
Jennifer Frownfelter	Project Manager	M.E.M. Environmental Management M.P.P. Public Policy B.A. Biology and Environmental Conservation	Tom Phillips, RMP Team Leader
Wendy Gabriel	Technical Editor	M.E.P. Environmental Planning B.A. Psychology	None
Colleen Mahoney	Word Processor	12 years of experience editing technical and environmental documents	None

9.0 GLOSSARY

A

Activity Plan: A detailed and specific plan for managing a single resource program or plan element undertaken as needed to implement the more general resource management plan decisions. An activity plan is prepared for specific areas to reach specific resource management objectives within stated timeframes.

Agency: Any Federal, State, or county government organization participating with jurisdictional responsibilities.

Air Quality: A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

Air Quality Class I and II Areas: Regions in attainment areas where maintenance of existing good air quality is of high priority. Class I areas are those that have the most stringent degree of protection from future degradation of air quality, such as national parks. Class II areas permit moderate deterioration of existing air quality, such as lands administered by the Bureau of Land Management (BLM).

Allocated Uses: BLM allocates cultural resources to one of five categories including (1) scientific use, (2) conservation for future use, (3) traditional use, (4) public use, or (5) experimental use. If cultural resources are evaluated as lacking significant values, they are categorized as discharged from management.

Allotment Management Plan (AMP): A written program of livestock grazing management including supportive measures, if required. An AMP is designed to attain specific management goals in a grazing allotment and is prepared cooperatively with the permittee(s) or lessee(s).

Allotment (range): A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under management of an authorized agency.

All-Terrain Vehicle (ATV): A small, amphibious motor vehicle with wheels or tractor treads for traveling over rough ground, snow, or ice, as well as on water. For the purposes of this document, an all-terrain vehicle is defined as a motor vehicle that: (a) is designed primarily for recreational nonhighway all-terrain travel, (b) is fifty or fewer inches in width, (c) has an unladen weight of eight hundred pounds or less, (d) travels on three or more low pressure tires, and (e) has a seat designed to be straddled by the operator, and handlebars for steering control.

Alluvial Deposit: Sedimentary matter, such as sand and mud, deposits by flowing water, generally of comparatively recent times.

Ambient (air): The surrounding atmospheric conditions to which the general public has access.

Analysis: An examination of existing and/or recommended management needs and their relationships in order to discover and display the outputs, benefits, effects, and consequences of initiating a proposed action.

Analysis of the Management Situation (AMS): Assessment of the current management direction. It includes a consolidation of existing data needed to analyze and resolve identified issues, a description of current BLM management guidance, and a discussion of existing problems and the opportunities for solving them.

Appropriate Management Response (AMR): Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

Aquifer: A groundwater bearing rock unit (unconsolidated or bedrock) that will yield water in a usable quantity to a well or spring.

Archaeological Site: A discrete location that provides physical evidence of past human use.

Archaeology: The scientific study of the life and culture of past, especially ancient, peoples, by excavation of ancient cities, relics, artifacts, etc.

Area of Critical Environmental Concern (ACEC): An area of public lands designated by BLM for special management attention to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life/provide safety from natural hazards.

Artifact: A human-made object.

Attainment Area: An area that meets a Federal primary or secondary ambient air quality standard for the pollutant.

B

Basin: A depressed area having no surface outlet (topographic basin); a physiographic feature or subsurface structure that is capable of collecting, storing, or discharging water by reason of its shape and the characteristics of its confining material (water); a depression in the earth's surface, the lowest part often filled by a lake or pond (lake basin); a widened part of a river or canal (drainage, river, stream basin).

Basin and Range: Topography characterized by a series of tilted-fault block mountain ranges and broad intervening basins.

Best Management Practices (BMPs): Activities that are added to typical operation, construction, or maintenance efforts that help to protect environmental resources by avoiding or minimizing impacts of an action.

Biodiversity: The variety of life and its processes, and the interrelationships within and among various levels of ecological organization. Conservation, protection, and restoration of biological species and genetic diversity are needed to sustain the health of existing biological systems. Federal resource management agencies must examine the implications of management actions and development decisions on regional and local biodiversity.

Biological Community: The living part of an ecosystem. Communities change with succession, thereby forming distinctive ecological units both in time and space. The plant community and the animal community together form the biotic community. Size is not implied (i.e., organisms associated with a decaying log or with an entire forest each represent communities).

Bureau of Land Management (BLM): An agency of the U.S. Department of the Interior responsible for managing most Federal Government subsurface minerals. It has surface management responsibility for Federal lands designated under the Federal Land Policy and Management Act of 1976.

Burning Period: The part of each 24-hour period when fires spread most rapidly; typically from 10:00 AM to Sundown.

C

Carbon Monoxide: A colorless, odorless, poisonous gas, produced by incomplete burning of carbon-based fuels including gasoline, oil and wood. Carbon monoxide is also produced from incomplete combustion of many natural and synthetic products.

Cave: Any naturally occurring void, cavity, recess, or system of interconnected passages which occurs beneath the surface of the earth or within a cliff or ledge [including any cave resource therein, but not including any vug (a small cavity in a rock), mine, tunnel, aqueduct, or other manmade excavation] which is large enough to permit an individual to enter, whether or not the entrance is naturally formed or manmade. Such term shall include any natural pit, sinkhole, or other feature that is an extension of the entrance.

Class I Area (for air quality): Certain wilderness areas greater than 5,000 acres, national memorial parks greater than 5,000 acres, national parks greater than 6,000 acres, and international parks that were in existence on or before August 7, 1977.

Class II Area (for air quality): By default, all areas not designated as Class I areas.

Class II Wilderness Area (for air quality): Areas deserving of preservation, including wilderness areas established by the Wilderness Act.

Clean Air Act: Federal legislation governing air pollution. The Clean Air Act established National Ambient Air Quality Standards for carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, and lead. Prevention of Significant Deterioration classifications define the allowable increased levels of air quality deterioration above legally established levels. They include the following:

- Class I – minimal additional deterioration in air quality (certain national parks and wilderness areas)
- Class II – moderate additional deterioration in air quality (most lands)
- Class III – greater deterioration for planned maximum growth (industrial areas)

Clean Water Act (CWA): Federal legislation governing water quality enforced by the U.S. Environmental Protection Agency.

Cohesive Strategy (Current) Condition Classes: The Cohesive Strategy for national fire planning defines three current condition classes as follows:

Condition Class 1 – Fire regimes are within a historical range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within an historical range.

Condition Class 2 – Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from their historical frequencies by one or more return intervals (either increased or decreased). This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.

Condition Class 3 – Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, and severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range.

Cohesive Strategy (Historical Natural) Fire Regimes: The Cohesive Strategy for national fire planning defines historical natural fire regimes as follows:

- Fire regime I: 0 to 35-year frequency, nonlethal
- Fire regime II: 0 to 35-year frequency, lethal
- Fire regime III: 35 to 100+ year frequency, mixed

- Fire regime IV: 35 to 100+ year frequency, lethal
- Fire regime V: 200+ frequency, lethal

Community: The living part of an ecosystem. Communities change with succession, thereby forming distinctive ecological units both in time and space. The plant community and the animal community together form the biotic community. Size is not implied (i.e. organisms associated with a decaying log or with an entire forest each represent communities).

Conodont: A microfossil occuring in various jagged or toothlike shapes and constituting the hard remains of an extinct marine animal of the order Conodonta.

Conserve/Conservation Strategy: A strategy outlining current activities or threats that are contributing to the decline of a species, along with the actions or strategies needed to reverse or eliminate such a decline or threats. Conservation strategies are generally developed for species of plants and animals that are designated as BLM Sensitive species or that have been determined by the Fish and Wildlife Service or National Marine Fisheries Service to be Federal candidates under the Endangered Species Act.

Corridor: A wide strip of land within which a proposed linear facility (e.g., pipeline, transmission line) could be located.

Corrosivity: A characteristic defining a hazardous waste. A solid waste that is defined as corrosive demonstrates the capability to destroy gradually by chemical action.

Critical Habitat: Areas designated for the survival and recovery of Federally listed threatened or endangered species.

Cubic Feet Per Second (cfs): As a rate of stream flow, a cubic foot of water passing a reference section in one second of time. One cfs flowing for 24 hours will yield 1.983 acre-feet of water.

Cultural Resources: A cultural resource is any definite location of past human activity, occupation, or use, identifiable through inventory, historical documentation, or oral evidence. Cultural resources include archaeological, historic, or architectural sites, structures, places, objects, and artifacts.

Cumulative Impacts: Additional and interactive combinations of activities that are not necessarily individually quantitatively different, but together require different management techniques and applications. Cumulative impacts occur when there are multiple infringements on the same values.

D

Decision Area: Public land (BLM-administered) and private split-estate (i.e., private surface acreage overlying Federally owned minerals) within the Planning Area are referred to in this document as BLM's Decision Area.

Desired Future Condition: Desired land use planning outcomes in terms of specific goals, standards, and objectives for resource protection.

Desired Plant Community: An objective for a group of compatible plant species, including the desired percentage of occurrence, considered ideal to meet land management goals for the area.

Detrimental Soil Disturbance: Detrimental soil disturbance is the alteration of natural soil characteristics that results in immediate or prolonged loss of soil productivity and soil-hydrologic conditions. At least 85 percent of an activity area should be in a non-detrimentally disturbed condition. Stated another way, no more than 15 percent of an activity area should have detrimentally disturbed soil after the management activity is completed. Detrimental soil disturbance can occur from soil that has been displaced, compacted, puddled or severely burned on an area of 1 meter by 1 meter or greater. Determination of detrimental soil disturbance excludes existing or planned classified transportation facilities, dedicated trails, and landings, mining dumps or excavations, parking areas, developed campgrounds, and other dedicated facilities. However, the impacts of these actions are considered total soil resource commitment. Detrimental soil disturbance is represented by any or all of the four characteristics described below.

- Soil Displacement. Loss of either 5 centimeters (cm) or one-half of the humus-enriched top soil (A-horizon), whichever is less, or the exceedance of the soil loss tolerance value for the specific soil type.
- Detrimental Soil Compaction. Soil compaction is generally evaluated from 5 to 30 cm below the mineral soil surface. Specific depths for measurement are dependent upon soil type and management activities. Detrimental soil compaction is increased soil density (weight per unit volume) and strength that hampers root growth, reduces soil aeration, and inhibits water movement. Measurements of potential detrimental soil compaction may be qualitative or quantitative. Refer to the Region 4 Soil Quality Handbook for methods related to measuring/determining soil compaction.
- Soil Puddling. Puddling is generally evaluated at the mineral soil surface. Visual indicators of detrimental puddling include clearly identifiable ruts with berms in mineral soil, or in an Oa (decomposed) horizon of an organic soil. Detrimental puddling may occur in conjunction with detrimental compaction. The guidelines for soil compaction are to be used when this occurs. Detrimentally puddled soils are not always detrimentally compacted. Infiltration and permeability are affected by detrimental soil puddling. Puddling can also alter local groundwater hydrology and wetland function, and provide conduits for runoff.
- Severely Burned Soil. The severely burned soil guideline applies to fire use and wildfires. Severely burned soils are determined by ratings of fire severity and its effects on the soil. A severely burned soil is generally soil that is within a high fire severity burn. Soil humus losses, structural changes, hydrophobic characteristics, and sterilization are potential effects of burning. A high fire severity rating should be developed for each fire activity area, as local soils and

vegetation types respond differently to the effects of fire. An example of a high fire severity rating is given below.

A high fire severity area generally incorporates severely burned soils. These areas should be identified when over 40 percent or more of an area has site factors indicating high intensity fire. These zones may cross over watershed boundaries, vegetation types, and topographic features. Severely burned soil site factors include but are not limited to:

- Depth and Color of Ashes - High soil heating, or deep ground char occurs where the duff is completely consumed and the top of the mineral soil is visibly reddish or orange on severely burned sites. Color of the soil below 1 cm is darker or charred from organic material that has heated or burned. The char layer can extend to a depth of 10 cm or more.
- Size and Amount of Live Fuels Consumed - When fuels greater than ¾ inch in diameter and more than 80 percent of the plant canopy have been consumed. Logs can be consumed or deeply charred, and deep ground char can occur under slash concentrations or under burned logs. All shrub stems are consumed and only the charred remains or large stubs may be visible.
- Litter Consumption – No residue, or only a few ashes remain on the soil surface.
- Plant Root Crowns – Root crowns of sprouting brush and grasses consumed or heavily damaged by the fire.
- Soil Crusting – baking of the soil surface where it is crusted is an indicator of high intensity and long duration fire. Soil texture in the surface layers is changed and fusion evidenced by clinkers can be observed locally. Soil temperatures at 1 cm are greater than 250 degrees Celsius. Lethal temperatures for soil organisms occur down to depths of 9 to 16 cm.

Developed Recreation: Recreation that requires facilities that result in further concentrated use of the area. For example, off-road vehicles require parking lots and trails. Campgrounds require roads, picnic tables, and toilet facilities.

Dispersed Recreation: Recreation that does not occur in a developed recreation site, such as hunting, backpacking, and scenic driving.

E

Easement: A right or privilege one may have on another's land.

Ecosystem: Any area or volume in which there is an exchange of matter and energy between living and nonliving parts; that is, the biotic community together with soil, air, water, and sunlight form an ecosystem. Ecosystems are the best units for studying the flow of energy and matter.

Endangered Species: A plant or animal that is in danger of extinction throughout all or a significant portion of its range.

Environmental Impact Statement (EIS): A document prepared to analyze the impacts on the environment of a proposed action and released to the public for review and comment. An EIS must meet the requirements of the National Environmental Policy Act, the Council on Environmental Quality, and the directives of the agency responsible for the proposed action.

Eolian: Relating to, caused by, or carried by the wind.

Ephemeral Stream: A stream that flows only in direct response to precipitation, and its channel is at all times above the water table.

Equestrian: Of horses, horsemen, or horseback riding.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geologic agents, and by such processes as gravitation creep.

Evaporation: Conversion of water from the liquid phase to the gaseous phase.

Exclusion Area: An environmentally sensitive area where rights-of-way would be granted only in cases where there is a legal requirement to provide such access.

F

Federal Lands: Lands, or interests in lands (such as easements and rights-of-way), owned by the United States.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather, and topography.

Fire Frequency: A general term referring to the recurrence of fire in a given area over time. It is sometimes stated as number of fires per unit time in a designated area. It is also used to refer to the probability of an element burning per unit time.

Fire Intensity: The effects of fire on the above-ground vegetation generally described in terms of mortality.

Fire Regimes: The characteristics of fire in a given ecosystem, including factors such as frequency, intensity, severity, and patch size. The terms used for the different fire regimes are: Nonlethal, Mixed1, Mixed2, and Lethal. Nonlethal fires are generally of the lowest intensity and severity with the smallest patches of mortality, while lethal fires are generally of the highest intensity and severity with the largest patches of mortality. The others fall in between.

Fire Regime Condition Class (FRCC): Fire Regime Condition Classes are a qualitative measure describing the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. One or more of the following activities may have caused this departure: fire exclusion, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, introduced insects and disease, or other management activities.

Fire Severity: Fire effects at and below the ground surface. Describes the impacts to organic material on the ground surface, changes to soils, and mortality of below-ground vegetative buds, roots, rhizomes, and other organisms.

Fire Suppression Tactics: The tactical approaches regarding suppression of a wildland fire. These range from Control, Confine, Contain, and Monitor. Control is the most aggressive tactic, while Monitor is the least.

Fire Use: The combination of wildland fire use and prescribed fire application to meet resource objectives.

Floodplain: The area that borders a water body and is subject to flooding on a periodic basis.

Floodprone Area Width: The area that would be expected to be covered by water if the wetted stream depth were twice as high as the full bank height, determined at the deepest part on a given transect. This width is then extrapolated over the length of the stream reach by averaging several random transects taken within the project area.

Fluid Minerals: In this case, oil, gas, and geothermal resources.

Fugitive Dust: Airborne particles emitted from any source other than through a stack or vent.

Fuel Model: A set of fuelbed inputs such as load, bulk density, fuel particle size, heat content, and moisture of extinction used to predict the potential behavior and effects of wildland fire.

Fuel Moisture Content: The quantity of moisture in fuel expressed as a percentage of the weight.

G

Game Species: Any species of wildlife or fish that is managed for hunters.

Grazing Allotment Categories: Direction under which all grazing allotments are categorized for management purposes into three groups with the following, (1) maintain the current resource conditions, (2) improve the current resource conditions, and (3) custodial manage the existing resource values.

Grazing Lease: an authorization that permits the grazing of livestock on public lands outside of the grazing district during a specified period of time.

Grazing Permit: An authorization that permits the grazing of a specified number and class of livestock on a designated area of grazing lands during specified seasons each year.

Grazing Permit Value: BLM allocated animal unit months may be transferred from one operator to another. The dollar value given by one operator (buyer) to induce a present permit holder (seller) to transfer his permit is known as the "permit value" of an animal unit month. This "permit value" may have a significant bearing on the rancher's capital value.

Grazing Preference: The amount of forage on public lands attached to a ranchers base property, which can be land or water. This has both a quantitative, forage amount (AUMs), and qualitative, priority of position "in line" for grazing privileges, components.

Grazing System: A prescribed method of grazing a range allotment having two or more pastures or management units to provide periodic rest for each unit.

H

Habitat: A specific set of physical conditions in a geographic area(s) that surrounds a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

Habitat Corridors: A strip or block of habitat connecting otherwise isolated units of similar habitat that allows the dispersal of organisms and the consequent mixing of genes.

Habitat Fragmentation: The disruption (by division) of extensive habitats into smaller habitat patches. The effects of habitat fragmentation include loss of habitat area and the creation of smaller, more isolated patches of remaining habitat.

Habitat Management Plan (HMP): A written and officially approved plan for a specific geographical area of public land that identifies wildlife habitat and related objectives, establishes the sequence of actions for achieving objectives, and outlines procedures for evaluating accomplishments.

Hazardous Materials: Substances or mixtures of substances that have the capability of either causing or significantly contributing to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or posing a substantial present or potential risk to human health or the environment. Hazardous wastes are defined as wastes or combination of wastes that, because of quantity, concentration, or physical, chemical, or infectious characteristics, may either cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or

otherwise managed. Hazardous wastes are products or by-products of hazardous materials. In order to be classified as hazardous, wastes must either appear on a series of lists compiled by the United States Environmental Protection Agency (USEPA) or demonstrate the characteristics of ignitability, corrosivity, reactivity, or toxicity.

Hazardous Waste: The Resource Conservation and Recovery Act defines hazardous waste as a solid waste that may cause an increase in mortality or serious illness or pose a substantial threat to human health and the environment when improperly treated, stored, transported, disposed of, or otherwise managed. A waste is hazardous if it exhibits characteristics of ignitability, corrosivity, reactivity, and/or toxicity.

Haze: An atmospheric aerosol of sufficient concentration to be visible. The particles are so small that they cannot be seen individually, but are still effective in scene distortion and visual range restriction.

Historic Fire Regime (HFR): A classification of the effects of ecosystem disturbance caused by fire over time and space. Generally encompasses the period between 1500 to late 1800, before extensive settlement by European-Americans in many parts of North America, before intense conversion of wildlands for agricultural and other purposes, and before fire suppression effectively reduced fire frequency in many areas. Sometimes referred to as “presettlement” fire regimes.

I

Ichthyoliths: Fish microfossils and fragments (including fish teeth and scales).

Ignitability: A characteristic defining a hazardous waste. A solid waste that is defined as ignitable is one that exhibits any of the capability to ignite under certain regulatory circumstances.

Indian Sacred Sites: Defined in Executive Order 13007 as “any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.”

Indian Trust Assets: Legal interests in property held in trust by the United States for Indian tribes or individuals, such as lands, minerals, hunting and fishing rights, and water rights.

Interim Management Policy: An interim measure governing lands under wilderness review. This policy protects wilderness study areas from impairment of their suitability as wilderness.

Invasive Species: An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

J

Jurisdiction: The legal right to control or regulate use of land or a facility. Jurisdiction requires authority, but not necessarily ownership.

K

Karst: a type of landscape formed by the dissolution of soluble carbonate rocks (limestone, dolomite, marble) or evaporites (gypsum, anhydrite).

L

Landscape: An aggregate of different but interacting landforms, sometimes united by a cultural attribute (e.g., a mosaic of farmland, including tilled fields, woodlots, stock ponds, swales, and fencerows). Landscape ecology generally operates at a scale of at least many hectares or, more often, several square kilometers.

Lease: An authorization or contract by which one party (lessor) conveys the use of property, such as real estate, to another (lessee) in return for rental payments. In addition to rental payments, lessees also pay royalties (a percentage of value) to the lessor from resource production.

Leasable Minerals: Those minerals or materials designated as leasable under the Mineral Leasing Act of 1920. They include coal, phosphate, asphalt, sulfur, potassium and sodium minerals, and oil, gas, and geothermal resources.

Lentic: Of or relating to or living in still waters (as lakes or ponds).

Locatable Mineral: Any valuable mineral that is not saleable or leasable including gold, silver, copper, uranium, etc., that may be developed under the General Mining Law of 1872.

Lotic: Of, relating to, or living in actively moving water.

M

Maar: A flat-bottomed, roughly circular volcanic crater of explosive origin that is often filled with water.

Meteorological Masts: Structures that are installed to monitor wind resources prior to developing wind energy facilities in an area. These structures are typically guyed masts or lattice towers, and record weather information (such as wind speed, gusts, temperature) that will be used to determine the appropriate turbines to be used at the site, the optimal turbine layout, and potential energy production.

Mineral Entry: The location of mining claims by an individual to protect his/her right to a valuable mineral.

Mineral Potential:

- High: Those lands currently producing oil or gas or having high current industry interest.
- Moderate: Those lands, which have demonstrated oil and gas potential based on favorable geologic environments.
- Low: Those lands where either the geologic environment appears to be favorable for the accumulation of oil and gas, or where little or no information is available to evaluate the oil and gas potential.

Mineral Rights: Outstanding third-party rights or an interest in minerals not owned by the person or party conveying the land to the United States. Mineral rights are an exception in a deed that is the result of prior conveyance separating title of certain minerals from the surface estate.

Mineral Withdrawal: A withdrawal for public lands, which are potentially valuable for leasable minerals. This precludes the disposal of the lands except with a mineral reservation, or unless the lands are found to not be valuable for minerals.

Multiple Use: Multiple use as defined by the Multiple Use – Sustained Yield Act 1960 means, (1) the management of all the various renewable surface resources so that they are used in the combination that will best meet the needs of the American people, (2) making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions, (3) that some land will be used for less than all of the resources, and (4) and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will be given the greatest dollar return or the greatest unit output.

N

National Ambient Air Quality Standards (NAAQS): The allowable concentrations of air pollutants in the air specified by the Federal Government. The air quality standards are divided into primary standards (based on the air quality criteria and allowing an adequate margin of safety and requisite to protect the public health) and secondary standards (based on the air quality criteria and allowing an adequate margin of safety and requisite to protect the public welfare) from any unknown or expected adverse effects of air pollutants.

National Environmental Policy Act of 1969 (NEPA): An Act that encourages productive and enjoyable harmony between man and his environment and promotes efforts to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; enriches understanding of the ecological systems and natural resources important to the Nation, and established the Council on Environmental Quality.

National Fire Danger Rating System (NFDRS): The National Fire Danger Rating System is a set of computer programs and algorithms that allow land management agencies to estimate today's or tomorrow's fire danger for a given rating area. NFDRS characterizes fire danger by evaluating the approximate upper limit of fire behavior in a fire danger rating area during a 24-hour period. Calculations of fire behavior are based on fuels, topography and weather, or what is commonly called the fire triangle.

National Register of Historic Places (National Register): A listing of architectural, historical, archaeological, and cultural sites of local, State, or national significance. The list of sites was established by the Historic Preservation Act of 1966 and is maintained by the National Park Service.

Native Species: With respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

Nitrogen Oxides: Produced from burning fuels, including gasoline and coal. Nitrogen oxides are smogformers, which react with volatile organic compounds to form smog. Nitrogen oxides are also major components of acid rain.

Nonattainment Area: An area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) any of the Federal primary or secondary ambient air quality standards for the pollutant.Noxious Weed: An undesirable weed species that can crowd out more desirable species.

Noxious Weed: A non-native weed arbitrarily defined by law as being especially undesirable, troublesome, and difficult to control. Weeds are designated “Noxious” by the New Mexico Department of Agriculture for the State of New Mexico.

O

Off-Highway Vehicle (OHV): A vehicle (including four-wheel drive, trail bikes, all-terrain vehicles, and snowmobiles but excluding helicopters, fixed-wing aircraft, and boats) capable of traveling off road over land, water, ice, snow, sand, marshes, and other terrain.

OHV Designations:

- Closed – Applies to areas and trails where the use of OHVs is permanently or temporarily prohibited. Emergency use of vehicles is allowed.

- Limited – Applies to areas and trails where the use of OHVs is subject to restrictions such as limiting the number or types of vehicles allowed, dates and times of use (seasonal restrictions), limiting use to existing roads and trails, or limiting use to designated roads or trails. Under the designated roads and trails designation, use is allowed only on roads and trails that are signed for use. Combinations of restrictions, such as limiting use to certain types of vehicles during certain times of the year, are possible.
- Open – Applies to areas and trails where OHVs may be operated subject to operating regulations and vehicle standards set forth in BLM Manual parts 8341 and 8343.

Ozone (O3): A gas which is a variety of oxygen. The oxygen gas found in the air consists of two oxygen atoms stuck together; this is molecular oxygen. Ozone consists of three oxygen atoms stuck together into an ozone molecule. Ozone occurs in nature; it produces the sharp smell you notice near a lightning strike. High concentrations of ozone gas are found in a layer of the atmosphere–the stratosphere–high above the earth. Stratospheric ozone shields the earth against harmful rays from the sun, particularly ultraviolet B. Smog's main component is ozone; this ground-level ozone is a product of reactions among chemicals produced by burning coal, gasoline and other fuels, and chemicals found in products including solvents, paints, hairsprays, etc.

P

Paleontology: the science of animal and plant fossil remains.

Particulate Matter: Includes dust, soot, and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources, including burning of diesel fuels by trucks and buses, incineration of garbage, mixing, and application of fertilizers and pesticides, road construction, industrial processes such as steel making, mining operations, agricultural burning (field and slash burning), and operation of fireplaces and woodstoves.

Permit: Permits are one of three forms of a land use authorization (the others are leases and easements). Permits are short-term, revocable authorizations to use public lands for specific purposes that involve either little or no land improvement, construction, or investment which can be amortized within the term of the permit. A permit conveys no possessory interest. The permit is renewable at the discretion of the authorized officer and may be revoked in accordance with its terms and applicable regulations.

Permitted Livestock Use: The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease and is expressed in animal unit months (AUMs).

pH: A number used by chemists to express the acidity of solutions, including water. A pH value lower than 7 indicates an acidic solution, a value of 7 is neutral, and a value of higher than 7 indicates an alkaline solution. Most groundwater in the United States have pH values ranging from about 6.0 to 8.5.

Planning Area: As used in this document, includes all land within the Planning Area boundaries regardless of jurisdiction or ownership.

Polychlorinated Biphenyls (PCBs): Synthetic organic compounds that can accumulate in the bodies of fish and other organisms and cause death with enough exposure. Probable human carcinogen.

Potable Water: Water that is suitable for drinking.

Prescribed Fire: Fire set intentionally in wild land fuels under prescribed conditions and circumstances. Prescribed fire should be used to mitigate the suppression of natural fires.

R

Raptors: Birds of prey, such as the eagle, falcon, hawk, owl, or vulture.

Reactivity: A characteristic defining a hazardous waste. A solid waste that is defined as reactive is one that is normally unstable and reacts violently without detonating, reacts violently with water, forms an explosive mixture with water, or generates toxic gases, vapors, or fumes when mixed with water, and is capable of detonation under proscribed circumstances.

Reclamation: The process of converting disturbed land to its former use or other productive uses.

Reserved Mineral Rights: The retention of ownership of all or part of the mineral rights by a person or party conveying land to the United States. Conditions for the exercising of these rights have been defined in the Secretary of the Interior's "Rules and Regulations to Govern Exercising of Mineral Rights Reserved Conveyance to the United States" attached to and made a part of deeds reserving mineral rights.

Resource Management Plan (RMP): A land use plan that establishes land use allocations, multiple-use guidelines, and management objectives for a given planning area. The RMP planning system has been used by the BLM since 1980.

Resource Management Plan Amendment (RMPA): A modification of one or more parts (e.g., decisions s about livestock grazing) of an existing RMP.

Resource Management Plan Revision (RMPR): A complete or near-complete rewrite of an existing RMP.

Restore/Restoration: The process of restoring site conditions as they were before land disturbance. Note: restoration involves restoring a site to a specific point in time.

Right-of-way: Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, pursuant to a right-of-way authorization.

Riparian: Situated on or pertaining to the bank of a river, stream, or other body of water. Normally used to refer to the plants of all types that grow along, around, or in wet areas.

Riparian Habitat: Riparian habitat is defined as an area of land directly influenced by permanent (surface of subsurface) water. They have visible vegetation or physical characteristics reflective of permanent water influence.

Roadless: Refers to the absence of roads constructed and maintained by mechanical means.

Roads: Vehicle routes that are improved and maintained by mechanical means to ensure relatively regular and continuous use. (A way maintained strictly by the passage of vehicles does not constitute a road.)

Route: A road, course, or way, for travel from one place to another.

S

Saleable Minerals: Minerals that may be sold under the Material Sale Act of 1947, as amended. Included are common varieties of sand, stone, gravel, and clay.

Saturated: When referring to soil, the maximum amount of water that can be held either when the soil is frozen or the spaces between the soil particles are filled with water. Any additional seepage over saturated soil will result in runoff.

Scoping: A term used to identify the process for determining the scope of issues related to a proposed action and for identifying significant issues to be addressed in an EIS.

Sensitive Species: Species not yet officially listed but that are undergoing status review for listing on the U.S. Fish and Wildlife Service official threatened and endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.

Significant Cultural Resource: Significances at the local, State, or national level is evaluated using criteria for listing on the National Register of Historic Places. To be eligible, a property must ordinarily be at least 50 years old, and must be important in American history, architecture, archaeology, engineering, or culture. It must possess integrity of location, design, setting, materials, workmanship, feeling, or association. In addition, properties must meet at least one of the following four criteria:

Criterion A: are associated with events that have made a significant contribution to the broad patterns of our history

Criterion B: are associated with the lives of persons significant in our past

Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction

Criterion D: have yielded or may likely yield information important in prehistory or history

Special Status Species: Wildlife and plant species either Federally listed or proposed for listing as endangered or threatened; State-listed or BLM determined priority species.

Speleology: The scientific study of caves (from the Greek words spelaion for cave and logos for study); a composite science based on geology, hydrology, biology, and archaeology.

Speleothems: Dripstone features including stalagmites and stalactites

Split Estate: Refers to land where the mineral rights and the surface rights are owned by different parties. Owners of the mineral rights generally have a superior right.

Stakeholders: Means, but is not limited to, State, tribal, and local government agencies, academic institutions, the scientific community, nongovernmental entities including environmental, agricultural, and conservation organizations, trade groups, commercial interests, and private landowners.

Sulfur Dioxide: A gas produced by burning coal, most notably in power plants. Some industrial processes, such as production of paper and smelting of metals, produce sulfur dioxide. Sulfur dioxide is closely related to sulfuric acid, a strong acid. Sulfur dioxide plays an important role in the production of acid rain.

Sustained yield: The concept of steady-state management of timber, wildlife, and many other natural resources, but most often applied to forest management. Consumption is matched by production.

T

Threatened Species: Any animal or plant species likely to become endangered within the foreseeable future throughout all of a significant portion of its range. These species are listed by the U.S. Fish and Wildlife Service.

Total Dissolved Solids (TDS): The total quantity (reported in milligrams per liter) of dissolved materials in water.

Toxicity: A characteristic defining a hazardous waste. Toxicity refers to the ability of a material to produce injury or disease on exposure, ingestion, inhalation, assimilation by a living organism.

Transportation Right-of-way: Land associated with highways and railroads authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, pursuant to a right-of-way authorization.

U

Uncharacteristic Wildfire Hazard: Conditions with the potential to lead to an uncharacteristic wildfire.

Unclassified Area: An area that cannot be classified on the basis of available information as meeting or not meeting the Federal primary or secondary ambient air quality standard for the pollutant.

Underground Storage Tanks: A tank with at least 10 percent of its volume beneath the ground, including attached pipes, that is or has been used to contain hazardous substances or petroleum products.

Utility Corridor: A linear corridor usually designated for facilities such as power lines, pipelines, fiber optic cables, roads, etc.

V

Viable: A [wildlife] population that has the estimated numbers and distribution of reproductive individuals to insure its continued existence.

Visual Resources: The visible physical features of a landscape (topography, water, vegetation, animals, structures, and other features) that constitute the scenery of an area.

Visual Resource Management (VRM): The inventory and planning actions taken to identify visual resource values and to establish objectives for managing those values. Also, management actions taken to achieve the established objectives.

Visual Resource Management Classes: VRM classes identify the visual quality objectives as the degree of acceptable visual change within a particular landscape. A classification is assigned to public lands based on guidelines established for scenic quality, visual sensitivity, and visibility.

- VRM Class I – This classification preserves the existing characteristic landscape and allows for natural ecological changes only. Includes Congressionally authorized areas (wilderness) and areas approved through an RMP where landscape modification activities should be restricted.

- VRM Class II – This classification retains the existing characteristic landscape. The level of change in any of the basic landscape elements (form, line, color, texture) due to management activities should be low and not evident.

- VRM Class III – This classification partially retains the existing characteristic landscape. The level of change in any of the basic landscape elements due to management activities may be moderate and evident.

- VRM Class IV – This classification applies to areas where the characteristic landscape has been so disturbed that rehabilitation is needed. Generally considered an interim short-term classification until rehabilitation or enhancement is completed.

Volatile Organic Compounds (VOCs): Organic chemicals all contain the element carbon. Organic chemicals are the basic chemicals found in living things and in products derived from living things, such as coal, petroleum, and refined petroleum products. Volatile chemicals produce vapors readily; at room temperature and normal atmospheric pressure, vapors escape easily from volatile liquid chemicals. Volatile organic chemicals include gasoline, industrial chemicals such as benzene, solvents such as toluene and xylene, and tetrachloroethylene (perchloroethylene, the principal dry cleaning solvent). Many volatile organic chemicals are also hazardous air pollutants.

Volcanic Plug: The fossilized innards of a volcano. Plugs are commonly funnel shaped and taper downward into bodies increasingly elliptical or elongated in shape.

W

Water Table: The surface in a groundwater body where the water pressure is atmospheric. It is the level at which water stands in a well that penetrates the water body just far enough to hold standing water.

Watershed: The land area that drains water to a particular stream, river, or lake. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge.

Weed: A undesirable plant that disrupts or has the potential to disrupt or alter the natural ecosystem function, composition, and diversity of the site it occupies. Its presence deteriorates the health of the site, it makes efficient use of natural resources difficult, and it may interfere with management objectives for that site.

Wetlands: Lands including swamps, marshes, bogs, and similar areas, such as wet meadows, river overflows, mud flats, and natural ponds.

Wilderness Area: An area officially designated as wilderness by Congress. Wilderness areas will be managed to preserve wilderness characteristics and shall be devoted to “the public purposes of recreation, scenic, scientific, educational, conservation, and historical use.”

Wilderness Study Area (WSA): Areas under study for possible inclusion as a Wilderness Area in the National Wilderness Preservation System.

Wildfire: An unwanted wildland fire. Wildfires can be further described by two basic categories:

- **Characteristic:** Fire that produces effects similar to those that occurred in the historical fire regime.
- **Uncharacteristic:** Fire that produces effects much different than those in the historical fire regime.

Wildfire Risk: Wildfire risk comprises the probability of an undesired wildfire event and the outcome of it. The undesired event realizes a hazard.

Wildland Fire: Any fire not involving a home or other structure, other than prescribed fire, that occurs in the wildland.

Wildland Fire Use (for resource benefits): The management of naturally ignited wildland fires to accomplish specific prestated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

Wildland-Urban Interface: The line, area, or zone where structures and other human developments meet or intermingle with wildland or vegetative fuel. Interface is further delineated into the following types:

- Developed areas with residential structures where many structures border wildland on a broad front.
- Developed areas with private residential structures where developments are few in number scattered over a large area surrounded by wildland.

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