Rio Puerco

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Environmental Impact Statement

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TABLE OF CONTENTS

4 ENVIRONMENTAL CONSEQUENCES OF PROPOSED PLAN AND DRAFT ALTERNATIVES 4-1
4.1 Introduction 4-1
4.1.1 Organization of Chapter 4-1
4.1.2 Analytical Assumptions 4-1
4.1.3 Assumptions and Methodology for Minerals Development Impacts 4-2
4.1.4 Types of Impacts to be Addressed 4-4
4.1.5 Incomplete or Unavailable Information 4-4
4.1.6 Cumulative Impacts 4-7
4.2 Environmental Consequences of Alternatives 4-11
4.2.1 Air Resources 4-11
4.2.2 Cave and Karst Resources 4-18
4.2.3 Cultural Resources 4-21
4.2.4 Fire Management 4-29
4.2.5 Forests and Woodlands 4-37
4.2.6 Health and Safety 4-46
4.2.7 Lands and Realty 4-48
4.2.1 Lands with Wilderness Characteristics 4-70
4.2.2 Livestock Grazing 4-73
4.2.3 Mineral Resources 4-83
4.2.4 Paleontological Resources 4-112
4.2.5 Recreation and Visitor Services 4-117
4.2.6 Renewable Energy 4-134
4.2.7 Riparian Resources 4-149
4.2.8 Social and Economic Resources 4-158
4.2.9 Soil and Water Resources 4-182
4.2.10 Special Designations 4-190
4.2.11 Special-Status Species 4-216
4.1.2 Travel Management 4-237
4.2.12 Vegetative Communities 4-244
4.2.13 Visual Resources 4-251
4.2.14 Wildlife and Fisheries 4-260
4.2.15 Unavoidable Adverse Impacts 4-281

5 CONSULTATION AND COORDINATION 5-1
5.1 Introduction 5-1
5.2 Public Scoping Meetings, Input, and Other Initial Meetings 5-1
5.2.1 Scoping Meetings 5-1
5.2.2 Planning Themes Raised in Scoping Comments 5-2
5.2.3 Economic Profile System Workshops 5-2
5.2.4 Training Sessions 5-3
5.2.5 Website 5-3
5.3 Description of Consultation and Collaborative Efforts 5-3
5.3.1 Cooperating Agencies 5-3
5.3.2 American Indian Entities 5-4
5.3.3 Federal Agencies and Members of Congress 5-5
5.3.4 State and County Agencies and Other Local Entities 5-5
5.3.5 Interest Groups 5-6

5.4 Lists of Preparers and Reviewers 5-7
5.5 Plan Evaluation 5-8

LIST OF TABLES

Table 4.1: RFD for Oil and Gas in the Planning Area 4-3
Table 4.2: RFD for All Minerals in on BLM lands in the Planning Area (acres) 4-4
Table 4.3: Reasonably Foreseeable Future Projects Relevant to the RMP/EIS 4-8
Table 4.4: Proposed Fire Management Treatments (acres), by Vegetation Type 4-14
Table 4.5: Leasable Fluid Mineral Stipulations (acres), by Alternative 4-15
Table 4.6: Parcels Identified for Disposal (acres) by Alternative 4-19
Table 4.7: Cultural Resource Site Density on BLM Lands in the Planning Area (acres) 4-23
Table 4.8: Proposed Fuel Treatment Areas (acres) within Low to High Cultural Site Density Locations 4-24
Table 4.9: Lands Identified for Disposal (acres), by Cultural Resource Site Density Level 4-24
Table 4.10: Proposed Special Designations (number and acres) within the Planning Area, by Alternative 4-25
Table 4.11: Cultural Resource Density Classes with the Proposed SRMA and ERMAs (acres) by Alternative 4-26
Table 4.12: Predicted Cultural Resource Site Densities within Forest Product Harvest Areas (acres) 4-27
Table 4.13: Proposed Travel Management Decisions on Predicted Cultural Resource Site Densities on BLM Lands within the Planning Area (acres) 4-28
Table 4.14: Forest Product Harvest Areas (acres) within RPFO Fire Management Units 4-30
Table 4.15: Proposed Fuel Treatment Areas (acres) by FRCC 4-31
Table 4.16: Parcels Identified for Disposal (acres) in FRCC 2 and 3 by Alternative 4-31
Table 4.17: Acres of Proposed Livestock Grazing (acres) within RPFO Fire Management Units 4-32
Table 4.18: Proposed Travel Management Decisions (acres), by Alternative 4-32
Table 4.19: Proposed Surface Restrictions (acres) to Protect Wildlife on BLM Lands within the Planning Area, by Alternative 4-33
Table 4.20: Potential Areas Open for Forest Product Harvesting (acres) with a List of Restricted Areas, by Alternative 4-37
Table 4.21: Forest and Woodlands (acres) Proposed as NSO, TL/CSU, or Closed to Oil and Gas Leasing, by Alternative 4-39
Table 4.22: Forest and Woodlands (acres) Proposed as Closed to Saleable Mineral Extraction, by Alternative 4-39
Table 4.23: Forest and Woodlands (acres) Proposed as Withdrawn from Locatable Mineral Entry, by Alternative 4-40
Table 4.24: Proposed Travel Management Decisions within Forest Product Harvest Areas (acres) 4-40
Table 4.25: Proposed Special Designations (quantity and acres) within the Planning Area, by Alternative 4-47
Table 4.26: Proposed Land Tenure Adjustments (acres and percent of BLM lands in the Planning Area), by Alternative 4-49

Table 4.27: Exclusion or Avoidance Areas for Transmission Line Rights-of-way (acres) on BLM lands within the Planning Area, by Alternative 4-49
Table 4.28: Exclusion or Avoidance Areas for Roads and Pipeline Rights-of-way (acres) on BLM lands within the Planning Area, by Alternative 4-50
Table 4.29: Exclusion or Avoidance Areas for Sites Rights-of-Way (acres) on BLM lands within the Planning Area, by Alternative 4-52
Table 4.30: Total Exclusion or Avoidance Areas for Rights-of-Way (acres), by Alternative .. 4-53
Table 4.31: Fuel Treatment Areas (acres) within Lands with Wilderness Characteristics 4-71
Table 4.32: Livestock Grazing Areas (acres) within Lands with Wilderness Characteristics ... 4-71
Table 4.33: Fuelwood Harvest Areas (acres) within Lands with Wilderness Characteristics ... 4-73
Table 4.34: Comparison of Proposed Livestock Grazing Alternatives 4-74
Table 4.35: Acres of Grazing Allotments and AUMs Lost by Proposed Land Disposals, by Alternative 4-75
Table 4.36: Proposed Fuel Treatments with RPFO Grazing Allotments (acres), by Alternative .. 4-77
Table 4.37: Proposed Forest Product Harvest Areas (acre), by Alternative 4-77
Table 4.38: Livestock Grazing Allotments (acres and AUMs) Impacted by Proposed Special Designations and Leasing Stipulations, by Alternative 4-78
Table 4.39: Proposed Travel Management Categories (acres), by Alternative 4-78
Table 4.40: Proposed Land Disposals (acres) with Moderate or High Mineral Potential, by Alternative 4-85
Table 4.41: Proposed Torreon Fossil Fauna ACEC and Bony Canyon ACEC (acres) with Moderate or High Mineral Potential, by Alternative 4-87
Table 4.42: Riparian Areas (acres) with Moderate or High Mineral Potential Protected by Proposed Oil and Gas Leasing Stipulations, by Alternative 4-88
Table 4.43: Sensitive Soils and Steep Slopes (acres) in Moderate and High Potential Areas Proposed for Protection from Oil and Gas Mineral Development, by Alternative 4-88
Table 4.44: Proposed Mineral Restrictions (acres of moderate and high potential areas) within Proposed ACECs, by Alternative 4-89
Table 4.45: Proposed Surface Restrictions (acres) on High and Moderate Mineral Potential Areas to Protect Wildlife, by Alternative 4-92
Table 4.46: Mineral Resource Development Restrictions (acres), by Mineral Type and Alternative 4-92
Table 4.47: Lands Identified for Disposal (acres), by PFYC and Alternative 4-113
Table 4.48: Proposed Special Designations (number and acres) within the Planning Area, by Alternative 4-113
Table 4.49: Proposed Special Designations (quantity and acres) within the Planning Area, by Alternative 4-118
Table 4.50: Proposed SRMA and ERMAs (acres) on BLM Lands in the Planning Area 4-118
Table 4.51: Cultural Resource Sites Proposed for Allocation for Public Use, by Alternative 4-120
Table 4.52: Proposed Travel Management Categories (acres), by Alternative 4-121
Table 4.53 Proposed Fuels Treatments (acres) within Proposed SRMA and ERMAs, by Alternative 4-122
Table 4.54: Proposed Forest Product Removal Areas (acres) within Proposed SRMA and ERMAs, by Alternative 4-123

Table 4.55: Exclusion or Avoidance Areas for Solar Energy Projects on BLM lands within the Planning Area, by Alternative 4-134
Table 4.56: Exclusion or Avoidance Areas for Wind Energy Projects on BLM lands within the Planning Area, by Alternative 4-136
Table 4.57: Exclusion or Avoidance Areas for Geothermal Energy Projects on BLM lands within the Planning Area, by Alternative 4-137
Table 4.58: Total Exclusion or Avoidance Areas for Renewable Energy Projects (acres), by Alternative 4-138
Table 4.59: Proposed Fuels Treatments (acres) in Riparian Areas 4-151
Table 4.60: Proposed Special Designations (acres) in the Planning Area, by Alternative 4-155
Table 4.61: Riparian Areas (acres) Located within Lands Proposed for Management for Wilderness Characteristics 4-156
Table 4.62: BLM Outputs, by Alternative 4-159
Table 4.63: Average Annual Employment Contribution (number of jobs), by Sector and Alternative 4-163
Table 4.64: Average Annual Labor Income Contribution (thousands of 2012 dollars), by Sector and Alternative 4-164
Table 4.65: Payments to Counties (2010 dollars), by Alternative 4-170
Table 4.66: Average Annual Employment[1] by Program (full and part-time jobs), by Alternative 4-171
Table 4.67: Average Annual Labor Income (thousands of 2010 dollars), by Program and Alternative 4-171
Table 4.68: ACECs, Lands Managed to protect Wilderness Characteristics, and VRM Class I and Class II Areas (acres), by Alternative 4-174
Table 4.69: Social Indicators, by Alternative 4-175
Table 4.70: Proposed Forest Product Removal Areas (acres) within Highly Erodible Soils, by Alternative 4-184
Table 4.71: Proposed Travel Management Designations (acres), by Alternative 4-186
Table 4.72: Proposed Special Designations (number and acres) within the Planning Area, by Alternative 4-190
Table 4.73: Proposed Special Designations (acres) in the Planning Area, by Alternative 4-190
Table 4.74: WSAs and Associated ACECs, by Alternative 4-191
Table 4.75: Livestock Grazing Areas (acres) within Wilderness Areas and WSAs, by Alternative 4-192
Table 4.76: Summary of Impact to the CDNST Trail 4-192
Table 4.77: VRM Classes (miles) along the CDNST 4-193
Table 4.78: Habitat Types and Associated Special-status Species 218
Table 4.79: Proposed Cultural Resource Areas with Surface Restrictions (acres), by Alternative 4-222
Table 4.80: Proposed Fire Management Treatments (acres), by Habitat Type 4-223
Table 4.81: Proposed Forest Product Harvest Areas (acres) within Habitat Types on BLM lands in the Planning Area, by Alternative 4-224
Table 4.82: Proposed Land Disposals (acres), by Alternative and Vegetation Type 4-225
Table 4.83: Habitat Type (acres) Proposed as NSO, TL/CSU, or Closed to Oil and Gas Leasing, by Alternative 4-227

Table 4.84: Habitat Type (acres) Proposed as Closed to Saleable Mineral Extraction, by Alternative 4-227
Table 4.85: Habitat Type (acres) Proposed as Withdrawn from Locatable Mineral Entry, by Alternative 4-228
Table 4.86: Vegetation/Habitat Types (acres) within the Proposed SRMA and ERMAs 4-228
Table 4.87: Proposed ACECs (acres) for the Protection of Special-Status Species, by Alternative 4-232
Table 4.88: Proposed ACECs (acres) on BLM Lands in the Planning Area, by Habitat Type and Alternative 4-233
Table 4.89: Lands with Wilderness Characteristics (acres), by Habitat Type 4-234
Table 4.91: Proposed VRM Classes (acres) for BLM Lands in the Planning Area 4-236
Table 4.92: Proposed Travel Management Categories (acres), by Alternative 4-238
Table 4.93: Proposed Special Designations (number and acres) with the Planning Area, by Alternative 4-245
Table 4.94: Proposed Travel Management Decisions (acres) on BLM Lands within the Planning Area, by Alternative 4-247
Table 4.95: VRI for BLM lands in the Planning Area (acres) 4-251
Table 4.96: VRM Classes (acres), by Alternative 4-252
Table 4.97: Alternative A VRM Decisions by VIR (acres and percent) 4-253
Table 4.98: Alternative B VRM Decisions by VRI (acres and percent) 4-253
Table 4.99: Alternative C VRM Decisions by VRI (acres and percent) 4-254
Table 4.100: Alternative D VRM Decisions by VRI (acres and percent) 4-254
Table 4.102: Proposed Cultural Resource Areas with Surface Restrictions (acres), by Alternative 4-263
Table 4.103: Proposed Fire Management Treatments (acres), by Habitat Type 4-263
Table 4.104: Proposed Forest Product removal Areas (acres) within Habitat Types on BLM lands in the Planning Area, by Alternative 4-265
Table 4.105: Proposed Land Disposals (acres), by Alternative and Vegetation Type 4-266
Table 4.106: Habitat Type (acres) Proposed as NSO, CSU, or Closed to Oil and Gas Leasing, by Alternative 4-269
Table 4.107: Habitat Type (acres) Proposed as Closed to Saleable Mineral Extraction, by Alternative 4-269
Table 4.108: Habitat Type (acres) Proposed as Withdrawn from Locatable Mineral Entry, by Alternative 4-270
Table 4.109: Vegetation/Habitat Types (acres) within the Proposed SRMA and ERMAs 4-271
Table 4.110: Proposed Special Designations (acres) in the Planning Area, by Alternative 4-274
Table 4.111: Proposed Lands Managed for Wilderness Characteristics (acres), by Alternative . 4-276
Table 4.113: Proposed VRM Classes (acres) on BLM Lands in the Planning Area 4-279
Table 5.1: Public Scoping Meetings 5-1
Table 5.2: Agencies Cooperating in the BLM Planning Process for this RMP Revision 5-3
Table 5.3: American Indian Entities Contacted for Plan Participation 5-4
Table 5.4: Federal Agencies Conctacted for Plan Participation 5-5
Table 5.5: State, County, Local, and Private Entities Contacted for Plan Participation 5-6
Table 5.6: Rio Puerco Field Office/NMSO Interdisciplinary Team 5-7
Table 5.7: Technical and Administrative Support Team 5-7

Table 5.8: Managers and Reviewers – State Office Management Team 5-8
Table 5.9: Albuquerque District/Rio Puerco Field Office Management Team 5-8
Table 5.10: State Office Review Team 5-8

4 ENVIRONMENTAL CONSEQUENCES OF PROPOSED PLAN AND DRAFT ALTERNATIVES

4.1 Introduction

This chapter presents the assumptions, methodology, and types of impacts analyzed for each resource (or resource use) within the Planning Area. The following sections describe the expected impacts to each resource caused by each of the alternatives. A quantitative analysis of the impacts to each resource or resource use is provided where data are available to inform the analysis. If data were not available for the analysis, a comprehensive qualitative description of the impacts to a resource or resource use is provided.

This DRMP/DEIS provides a landscape-scale, "big picture" level of analysis, and in most cases the exact locations of projected development and other changes are not known or not discussed at this time. The appropriate level of NEPA analysis will be done when specific projects are proposed and the details of those projects is known. This chapter serves as an impact analysis of the alternative management actions and prescriptions as they impact the affected environment. Impacts are defined as modifications to the existing environment brought about by implementing an alternative. Impacts can be beneficial or adverse, can result from the action directly or indirectly, and can be long term, short term, temporary, or cumulative in nature.

For this analysis, BLM staff used existing data, science, current methodologies, professional judgment, and projected actions and levels of use to determine projected impacts from the proposed management decisions discussed in Chapter 2.

4.1.1 Organization of Chapter

Chapter 4 details the environmental consequences of program decisions on each listed resource or resource use. Resources and resource uses are presented in alphabetical order. The environmental consequences of the decisions imposed by other programs on a specific resource are delineated for each of the four alternatives. For the majority of resources, the organization of the section lists the impacts of each of the other programs' management decisions on the resource, and then lists impacts for each of the four alternatives. A quantitative analysis of the impacts to each resource or resource use is provided where data are available to inform the analysis. If data were not available for the analysis, a comprehensive qualitative description of the impacts to a resource or resource use is provided. Cumulative impacts are also discussed within each section following the discussion of direct and indirect impacts.

4.1.2 Analytical Assumptions

The following are the general assumptions used for analysis under all alternatives. Assumptions associated with a single issue (e.g., wildlife habitat) are included within the alternative discussion for that issue.

- All resource actions recognize valid existing rights.

- BLM lands in the Planning Area are assigned one of the following leasing categories for oil and gas development:
    - Open subject to Standard Lease Terms and Conditions
    - Open subject to TL and/or CSU stipulations
    - Open with a NSO stipulation
    - Closed
- The BLM would have the funding and workforce to implement the selected alternative.
- All lands identified for disposal meet FLPMA disposal criteria and can be considered for land tenure adjustments. Site-specific analysis is required for all parcels to determine that disposal is appropriate.
- Demand for recreational activities (both dispersed and concentrated), energy production, vegetative resources, and wildlife use would increase.
- Short-term impacts are those that would last for fewer than five years.
- Long-term impacts are those that would last for five years or more.
- State highways and Class B roads through the Planning Area would remain open.
- All decisions, projects, activities, and mitigation for the alternatives would be completed and/or implemented as described in Chapter 2 and Appendix H (Surface Stipulations Applicable to All Oil and Gas Development).
- Acreages were calculated using geographic information system (GIS) technology; there may be slight variations in total acres between disciplines. The variations are negligible and will not affect analysis.
- All acreages and percentages presented in this chapter pertain to either BLM lands within the Planning Area or the entire Planning Area, depending on the impact analysis. Most impacts analyses within the chapter, such as proposed fuel treatments, are calculated using only the BLM lands within the Planning Area. Some impact analysis calculations, such as those associated with special designations, are calculated within the entire Planning Area and therefore include both BLM and non-BLM lands.
- Non-BLM lands would have minimal direct impacts from RMP decisions since the BLM does not make land decisions or have jurisdiction on non-BLM lands.
- Reasonable access across BLM-administered lands to state lands would be provided under all alternatives.

4.1.3 Assumptions and Methodology for Minerals Development Impacts

Mineral resources management decisions impact almost all of the other resources and resource uses managed by the RPFO, mainly because of the surface disturbance associated with mineral activities. Because many of the surface-disturbing impacts analyzed in this chapter are related to mineral development, it is important to clarify the assumptions made for future mineral development in the Planning Area early in the document. The sections below identify the assumptions that were made for analyzing impacts from mineral resources to other resources throughout the document.

4.1.3.1 Leasable Minerals

There are currently 169 oil and gas wells within the Planning Area (BLM 2010a). Future oil and gas development over the next 20 years is projected to be no more than one well per county per year in Bernalillo, Cibola, Valencia, McKinley, and Torrance counties. Sandoval County could have up to three wells drilled per year. It is estimated that a maximum number of eight wells per year could be drilled in the Planning Area (Table 4.1), according to the RPFO Reasonably Foreseeable Development (RFD) scenario for oil and gas leasing (BLM 2010a). The RFD states that approximately 50% of the drilled wells would be successful, and therefore operate over the life of the RMP/EIS. This assumption projects a total number (over 20 years) of 160 wells and approximately 490 additional acres of disturbance (BLM 2010a). It can be assumed that the range of alternatives restricting oil and gas development areas would not influence the number wells drilled over the next 20 years, because the low number of wells predicted to be drilled could be moved to avoid conflicts with other resources. Therefore, the analysis in this chapter associated with leasable fluid mineral development assumes 80 wells would be producing and 245 acres of land disturbed over the next 20 years under all alternatives. Because the estimated growth of oil and gas wells is low (approximately 5% per year oil and gas development growth within Planning Area), and because the amount of disturbance associated with the future growth is approximately 0.02% of BLM lands in the Planning Area, it can be assumed that the mineral resources management decisions would have negligible impacts to resources analyzed in the RMP/EIS. Table 4.1 summarizes the predicted surface disturbance associated with oil and gas development within the Planning Area over the next 20 years. There is no predicted future development for coal within the Planning Area over the next 20 years (Intera 2010).

Table 4.1: RFD for Oil and Gas in the Planning Area

County within Planning Area	Maximum Number of Wells Drilled per Year	Maximum Total Disturbance (acres/year)
Bernalillo	0–1	3.5
Cibola	0–1	3.0
McKinley	0–1	3.0
Sandoval	1–3	9.0
Torrance	0–1	3.0
Valencia	0–1	3.0
Annual estimate	8 wells	24.5 acres
Estimated surface disturbance over 20 years (50% success rate)	80 wells	245 acres

4.1.3.2 Locatable Minerals

The RPFO Mineral Potential Report states that the RFD potential for locatable minerals is expected to be flat or slightly increasing (Intera 2010). Based on historic production in the Planning Area, it can be estimated that the area disturbed by development of locatable minerals would expand by approximately 30 acres per year for a total of 600 acres over 20 years. The impacts analysis for mineral development in this chapter assumes 600 acres of surface disturbance would occur on BLM lands within the Planning Area in moderate or high potential

areas for locatable materials. It should be noted that locatable mineral development is estimated to occur on approximately 0.08% of BLM lands in the Planning Area.

4.1.3.3 Saleable Minerals

The RPFO Mineral Potential Report states that the RFD potential for aggregate, sand, gravel, stone, and c is expected to be flat or slightly increasing (Intera 2010). Based on historic production in the Planning Area, it can be estimated that the area disturbed by development of saleable minerals would expand by approximately 388 acres per year for a total of 7,760 acres over 20 years. The impacts analysis for mineral development in this chapter assumes 7,760 acres of surface disturbance would occur within the Planning Area in moderate or high potential areas for saleable materials. It should be noted that saleable mineral development is estimated to occur on approximately 1% of BLM lands in the Planning Area (Table 4.2).

Table 4.2: RFD for All Minerals in on BLM lands in the Planning Area (acres)

Mineral Type	Annual Surface Disturbance (acres)	20-year Surface Disturbance (acres)
Leasable minerals*	24.5	245
Locatable minerals	30	600
Saleable minerals	388	7,760
Total	442.5	8,605
Percent of BLM lands in Planning Area	0.06%	1.1%

*The RFD states that approximately 50% of the drilled wells would be successful, therefore operating over the life of the RMP/EIS.

4.1.4 Types of Impacts to be Addressed

A direct impact is attributed to implementation of an alternative that affects a specific resource and generally occurs at the same time and place. Indirect impacts can result from one resource affecting another (e.g., soil erosion and sedimentation affecting water quality) or can be later in time or removed in location, but are still reasonably foreseeable. Long-term impacts are those that would substantially remain for many years or for the life of the project. Temporary impacts are short-term or ephemeral changes to the environment that return to the original condition once the activity is stopped, such as air pollutant emissions caused by earthmoving equipment during construction. Short-term impacts result in changes to the environment that are stabilized or mitigated rapidly and without long-term impacts. Cumulative impacts could also occur as the result of past, present, and reasonably foreseeable future actions by federal, state, and local governments; private individuals; and entities in or near the Planning Area. Cumulative impacts could result from individually minor but collectively significant actions that take place over time.

4.1.5 Incomplete or Unavailable Information

Existing data were used for preparation of the DRMP/DEIS and are sufficient for supporting RMP-level decisions, in most cases. Project-specific information on future activities and uses in

the Planning Area are unknown at this time. As activities and uses are proposed throughout the life of the plan, it is assumed that subsequent NEPA analysis would occur as appropriate to evaluate the types of impacts that could occur on a site-specific basis. According to the CEQ regulations (40CFR 1502.22), for unavailable/incomplete information, the agency must provide:

1. A statement that such information is incomplete or unavailable
2. A statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment
3. A summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment
4. The agency's evaluation of such impacts based upon theoretical approaches or resource methods generally accepted in the scientific community

The following resources have incomplete or unavailable information; therefore, impacts analysis is limited:

- A transportation inventory is not complete for BLM lands in the Planning Area. Information on levels of use in the Planning Area is limited. What is known is based on interviews with field staff or permitted users in these areas. The RPFO has completed an inventory of most of the motorized roads and trails in the Planning Area capable of providing access for full-size vehicles. The RPFO is deferring the development of a travel management plan (TMP) until after the RMP/EIS is complete, as described in the draft Travel and Transportation Management Manual (BLM 2010b). At that time, the RPFO would designate specific roads, primitive roads, and trails (routes) available for public and administrative travel, along with specific limitations on such travel. For this DRMP/DEIS, OHV area designations ("open," "limited," and "closed") are listed by alternative. Within the "limited" designation, routes would be limited to existing roads, primitive roads, and trails. It is possible that field staff knowledge and/or information from the public would not encompass all areas with high demand for access. However, the field staff and the public are aware of the areas where vehicle travel is common, and where it may be presenting resource conflicts. As such, it is unlikely that having a completed transportation inventory would change the results of this impact analysis. Existing scientific evidence that is relevant to evaluating reasonably foreseeable impacts, and the evaluation of those impacts, is contained in the individual sections in section 4.2.
- The locations and extent of potential renewable energy projects on BLM-administered lands are largely unknown, but are likely to occur in areas of high potential for various types of renewable energy (wind, solar, and geothermal). Likewise, forecasts for potential future oil and gas development in the area are based on the best available information, which is limited by the potential for oil and gas development in the Planning Area. For both of these resource uses, only generalized effects are described based on typical surface-disturbing scenarios experienced by the BLM in similar developments. Knowing the precise location and size of future development projects would not likely change the reasonably foreseeable significant adverse impacts because wind, solar, geothermal, and fluid mineral development are most likely to occur where potential for these resources is high, and that is how the impacts of these developments were evaluated. The resources that could be impacted by these developments, such as wildlife, have a sufficiently broad distribution in the Planning Area that moving a development

from one site to another would not change the impacts significantly. Existing scientific evidence that is relevant to evaluating reasonably foreseeable impacts, and the evaluation of those impacts, is contained in the individual sections in section 4.2.

- A comprehensive inventory of invasive species has not been completed for the RPFO. Aquatic and terrestrial invasive species are known to occur in the Planning Area, and certain areas have been inventoried and recorded. This incomplete information is relevant to reasonably foreseeable significant adverse effects if land use planning decisions allocate land uses that would promote or enhance the spread or introduction of invasive species. This incomplete information is, however, not essential for a reasoned choice among alternatives. Potential impacts of invasive species are similar among all action alternatives because other environmental laws and regulations (State and Federal) would greatly reduce the potential for significant adverse effects under each alternative, and because site-specific NEPA analysis would be required prior to implementation of land use planning decisions that would prescribe best management practices (BMPs). Existing scientific evidence that is relevant to evaluating reasonably foreseeable impacts, and the evaluation of those impacts, is contained in the individual sections in section 4.2.
- No formal surveys of visitors regarding their preferences for recreation settings and experiences have been conducted. This information would be relevant to the evaluation of reasonably foreseeable significant adverse impacts if there were significant demand for particular recreation types on BLM lands in the Planning Area that our office was unaware of. This information may have changed the estimated impacts of land use plan decisions to particular types of recreation. However, it is unlikely that field staff would be unaware of the type and extent for demand of recreational opportunities on the lands we administer. Interaction with the public inquiries, special recreation permittees, and user groups has given the RPFO a reasonable understanding of the desired recreational opportunities in the area. Existing scientific evidence that is relevant to evaluating reasonably foreseeable impacts, and the evaluation of those impacts, is contained in the individual sections in section 4.2.
- The archeological inventory for the RPFO is incomplete and existing inventories cover approximately 11.9% of BLM lands in the Planning Area. This incomplete information is relevant to reasonably foreseeable significant adverse effects, given the possibility that land use planning decisions would allocate land uses to activities that would irreversibly damage currently unknown sites, which would constitute a significant adverse effect. This incomplete information is, however, not essential for a reasoned choice among alternatives. Potential impacts to cultural resources are similar among all action alternatives because other environmental laws and regulations (Section 106 of the NHPA, ARPA) would greatly reduce the potential for significant adverse effects under each alternative, and because site-specific NEPA would be required prior to implementation of land use planning decisions. Incomplete information regarding the location of cultural resources is in this sense less useful to the decision maker, who is assured that no matter which alternative he or she selects, significant adverse effects to cultural resources will be avoided. Existing scientific evidence that is relevant to evaluating reasonably foreseeable impacts, and the evaluation of those impacts, is contained in the individual sections in section 4.2.

- Wildlife surveys during reproductive periods are incomplete. At this time, the exact areas and timing are not known. This information would assist the RPFO in evaluating reasonably foreseeable significant adverse impacts because it would allow quantification of the impacts of limiting oil and gas development and other activities within big game habitat during gestation and lactation periods. This information would alter our estimation adverse impacts of limiting development in these areas. Similarly, this information would alter our estimation beneficial impacts to big game populations. However, the qualitative impacts to these resources would not change. Existing scientific evidence that is relevant to evaluating reasonably foreseeable impacts, and the evaluation of those impacts, is contained in the individual sections in section 4.2.

4.1.6 Cumulative Impacts

Cumulative impacts occur when there are multiple impacts to the same resources. These are incremental impacts of proposed activities or projects when combined with past, present, and future actions. As stated in 40 CFR 1508.7 (1997), a cumulative impact is the impact to the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Resource decisions from this RMP/EIS could combine with other past, present, and reasonably foreseeable future actions to produce cumulative impacts to resources within the Planning Area. Concurrent planning projects in the region that would contribute to cumulative impacts include the Santa Fe National Forest and the BLM Taos, Farmington, and Socorro RMPs. Also, management direction and resource uses would occur in the adjacent BLM Field Offices in Arizona. Activities on New Mexico State Land Office (SLO) lands, private lands, and city and county use plans for surrounding communities could have cumulative impacts where land is developed adjacent to BLM lands.

Past and present actions are development, projects, events, or other actions that have occurred and accumulated to create the existing conditions in the Planning Area. The cumulative impacts analysis assumes that the affected environment, described in Chapter 3, incorporates the past and present actions that have occurred within the Planning Area; there, the past and present cumulative impacts have been analyzed in the previous sections in this chapter.

Reasonably foreseeable future actions are uses and activities that are planned to occur within the Planning Area in the foreseeable future. The RMP/EIS takes into account those proposed actions that are actively being proposed by other agencies, organizations, or governments that would impact resources within the Planning Area (Table 4.3). The projects were primarily identified through public scoping, internal scoping with BLM resource specialists, input from cooperating agencies, and BLM review of existing planning documents from other organizations. Examples include travel management plans from neighboring U.S. Forest Service Ranger Districts and proposed actions documented in county land use plans. The BLM considered those projects that were within or near the Planning Area and of sufficient scope to impact the resources discussed in this RMP at similar spatial and temporal scales as the direct and indirect impacts. That is, the reasonably foreseeable future projects listed in Table 4.4 are proposed actions that could result in

additional impacts to the same resources evaluated in the RPFO RMP/EIS. The projects were limited to those within the geographic and temporal scope in which direct and indirect impacts would occur. All sources consulted for Proposed Action details are referenced in the text and contained within the References Cited section of the RMP.

Table 4.3: Reasonably Foreseeable Future Projects Relevant to the RMP/EIS

Project Proponent	Brief Description
Desert Rock Power Plant	
Diné Power Authority Desert Rock Energy Company BHP Navajo Coal Company	The proposed power plant would produce 1,500 megawatts of electric capacity. BHP Navajo Coal Company is proposing to expand a surface coalmine entirely on the Navajo Nation. The proposed mine is located 30 miles southwest of Farmington and San Juan County and would occupy 150 acres (URS Corporation 2007).
N55 Road Improvement	
Bureau of Indian Affairs	The 31-mile road improvement project, including the 150-foot buffer and potential borrow pit locations for construction material, would encompass approximately 550 acres. The project is in the southeast portion of Cibola County and crosses BLM land within the Planning Area. The entire length of the proposed project would be fenced in order to prevent livestock from entering the right-of-way. Livestock tanks within proximity of the right-of-way fencing would be relocated. The finished roadway would be paved with asphalt and signs would be installed along with pavement markings (Bureau of Indian Affairs 2010).
Placitas Master Plan	
City of Albuquerque Open Space	The Placitas open space encompasses an area of 640 acres, 560 of which is actively being pursued for a recreational site. The project is located 3 miles northwest of the village of Placitas in Sandoval County. The City of Albuquerque's Environmental Planning Commission and the Sandoval County Commission are the two organizations that have prepared the Placitas Open Space Master Plan (Sites Southwest, LLC 2002).

Project Proponent	Brief Description
Southwest Jemez Mountains Restoration Project	
U.S. Forest Service Valles Caldera Trust New Mexico Forest and Watershed Restoration Institute The Nature Conservancy	The Southwest Jemez Mountains Restoration Project is a long-term collaborative effort to restore sustainable ecological forest conditions on a landscape of approximately 210,000 acres in the southwest Jemez Mountains. The project involves several phases, including strategic-level planning, project-level planning, implementation, and monitoring. The area comprises primarily the entire upper Jemez River watershed, including nearly 86,000 acres of the Valles Caldera National Preserve, a portion of the Santa Fe National Forest (110,000 acres), and some state, private, and tribal lands (U.S. Forest Service 2010a).
Valles Caldera National Preserve Landscape Restoration and Management Plan	
Valles Caldera Trust	The Valles Caldera Trust, a wholly owned government corporation empowered to provide management and administrative services for the Valles Caldera National Preserve, intends to prepare an EIS to analyze and disclose potential impacts of a proposed Landscape Restoration and Management Plan, which includes mechanical treatments, prescribed burning, management of lightning-caused wildland fires, restoration of riparian areas, closure and maintenance of roads, and eradication of noxious weeds and invasive plants (Valles Caldera Trust 2010).

Table 4.4. Reasonably Foreseeable Future Projects Relevant to the RMP/EIS

Project Proponent	Brief Description
U.S. Forest Service Travel Management Plans	
Santa Fe National Forest Cibola National Forest	The Santa Fe National Forest's Travel Management Draft EIS is currently in development. The Proposed Action, as currently described, would open 186 miles of road that is currently not open, close 2,469 miles of road to motorized use, allow for dispersed camping on 423 miles of road, and add 23 miles of new routes (U.S. Forest Service 2010b). The Mt. Taylor Ranger District in the Cibola National Forest is the Ranger District located within the Planning Area. The Proposed Action in the Travel Management Environmental Assessment would prohibit cross-country motorized travel in the district, open 98 miles of road that are currently closed or unauthorized, close 465 miles of road to motorized use, and allow for dispersed camping on 127 miles of road (U.S. Forest Service 2010c).
Fire and Fuels Treatments in New Mexico	
BLM U.S. Forest Service Bureau of Indian Affairs USFWS National Park Service State of New Mexico	The BLM estimates that federal and state agencies with jurisdiction in New Mexico would treat up to 206,800 acres with prescribed fire, 35,900 acres with mechanical treatments, and 10,000 acres with chemical treatments over the next 20 years (BLM 2004).
Northwest Loop Road	
New Mexico Department of Transportation	The New Mexico Department of Transportation has proposed to build a 39-mile loop road to connect U.S. Highway 550 in southern Sandoval County with Interstate 40, just east of the Rio Puerco, in Bernalillo County (New Mexico Independent 2009). The road would not cross BLM surface ownership, but would cross BLM subsurface lands.
Red Mesa Wind Farm	
Red Mesa, LLC NextEra Energy, LLC	NextEra Energy, LLC, and Red Mesa, LLC, a subsidiary of the former, have proposed a 102.4-megawatt wind energy center on the east side of Cibola County near Seboyeta, New Mexico. The project is expected to occupy approximately 5,000 acres of private land 60 miles northeast of Grants. The facility would consist of 64 wind turbine generators, an underground power collection system, an access road, and an operations and maintenance plant. The towers would stand 121 meters (398 feet) high to the top of the blade. The wind farm is expected to be operational by 2011 (Jaramillo 2010).
Uranium Mining	

Project Proponent	Brief Description
Multiple Corporation Interests	The Grants Mineral Belt between Gallup and Laguna is the main contributory for the state with the second largest known uranium reserves. While no uranium is currently being mined, multiple companies are assessing the areas around Mt. Taylor for both conventional and in-situ recovery mining of the mineral. The Cebolleta Uranium Project of Cibola Resources, LLC, located on private land 45 miles west of Albuquerque and situated on the southeastern portion of the Cebolleta Land Grant, is one instance of many in which groups are moving forward with both technical reports and feasibility studies that show promise of future uranium mining in the region (Broad Oak Associates 2007).

Table 4.4: Reasonably Foreseeable Future Projects Relevant to the RMP/EIS

Project Proponent	Brief Description
New Mexico Renewable Energy Transmission Authority (RETA)	
State of New Mexico RETA	With the enactment of the New Mexico House Bill 188: Renewable Energy Transmission Authority Act, and its subsequent creation of the New Mexico RETA, the New Mexico State Legislature has provided support to identify and establish corridors for the transmission of electricity, both intra- and interstate (2007). With the mandate to have at least 30% of the transmission project's energy coming from renewable resources, it seems likely that a transmission corridor would be required to bring the wind energy from the eastern portions of New Mexico to the energy-demanding western states. It could be suggestive that the new transmission corridor would be sited through the Planning Area.

The resource sections below address both known reasonably foreseeable future activities that are described in Table 4.3 and those activities that are not specifically identified above, but are known to take place within or near the Planning Area. Cumulative impacts are discussed within each section following the analysis of the direct and indirect impacts.

4.2 Environmental Consequences of Alternatives

This section presents the impacts to each resource from management actions proposed by other resource programs according to each alternative.

4.2.1 Air Resources

Impacts to air quality and climate in the Planning Area would primarily result from fire management, mineral resource development, and travel management decisions. Emissions include those from nonrenewable resources such as coal, oil, and gas development activities and those from renewable resources such as firewood burning. Some resource allocations like fuels treatments may result in short-term air quality impairment, but may improve air quality over the long term by creating healthy vegetation and soils that can more readily resist future wildfires

and sequester certain emissions. Travel management decisions would result in short-term impacts from blowing dust from backcountry roads.

4.2.1.1 Analysis Assumptions

Mineral development potential was assessed in the Mineral Potential Report prepared for the Planning Area (Intera 2010). The RFD scenario identified low development potential areas for oil and gas minerals and no lands with the development potential for other leasable minerals such as coal. Mineral development is a permitted process; therefore, a variety of multi-level regulatory processes exist to ensure that pollutant levels do not increase above identified thresholds and/or air quality standards. It is assumed that mineral development operations would be carried out in compliance with existing policies and regulations at both the state and federal levels. It is further assumed that roads, pipelines, excavations, and other mineral development-related disturbances in areas with soils susceptible to wind erosion would be appropriately surfaced (covering of piles where appropriate, graveling or surfactants applied to roads, etc.) to reduce fugitive dust generated by traffic and related activities. Such treatments would also be applied as appropriate on local and resource roads that represent a dust problem. Lower speed limits, enforced by the appropriate authority, would also act to limit dust in project and adjacent areas.

4.2.1.1.1 Ozone

Ozone modeling completed for the Four Corners Air Quality Task Force includes areas of Sandoval County where oil and gas development is most likely to occur in the Planning Area. The model results for the 2005 base case indicate that ozone levels in this area are much lower than in the heart of the San Juan Basin to the north and generally do not exceed 0.060 parts per million (ppm). The National Ambient Air Quality Standard (NAAQS) for ozone is currently 0.075 ppm. The standard is currently under review by the Environmental Protection Agency (EPA), which has proposed to revise the primary standard to between 0.060 and 0.070 upon completion of the review. Comparison with a 2018 base case shows little change in ozone levels and possibly a slight improvement. Modeling of mitigation scenarios to reduce NOx and VOC production from oil and gas and EGUs also shows little change to some slight improvement over the 2005 base case (Environ 2009).

4.2.1.1.2 Greenhouse Gases

The assessment of greenhouse gas emissions, their relationship to global climatic patterns, and the resulting impacts is an ongoing scientific process. It is currently not feasible to know with certainty the net impacts from the proposed alternatives on climate – that is, while BLM actions may generate, or authorize activities that generate, GHG emissions that contribute to climate change, the specific effects of those actions at the planning or project level on average global temperature are speculative given the current state of the science. Moreover, the BLM does not have the ability to associate precisely a specific action's contribution to changes in temperature or other aspects of climate with environmental impacts in any particular area. The science to be able to do so is not yet available. The inconsistent results of scientific models used to predict climate change at the global scale, coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at the planning or project levels. Determining the significance of any discrete amount of greenhouse gas emission is beyond the limits of existing science. However, the

DRMP/DEIS does identify the proposed management decisions that impact air quality, including potential emissions of greenhouse gases. The proposed resource management decisions include fire management, mineral resources, and travel management decisions. The impacts from these decisions are discussed below.

4.2.1.2 Direct and Indirect Impacts

4.2.1.2.1 Fire Management Decisions

Fire management decisions are not varied across alternatives in Chapter 2. Fuel treatments are proposed for up to 32,000 acres per year on BLM lands in the Planning Area depending on budgetary and time constraints. Fuel treatments include, but are not limited to, prescribed fire. Based on current treatments and the Fire and Fuels Plan Amendment (BLM 2004), approximately 72% of fuel treatments would include prescribed fire; therefore, of the 32,000 acres per year proposed for treatment on BLM lands in the Planning Area, approximately 23,000 acres would be treated with prescribed fire. Several criteria pollutants are of particular concern to prescribed burning, chiefly particulate matter and carbon monoxide (CO). Particulate matter produced in prescribed burns is predominantly $PM_{2.5}$ (70% of the smoke produced in burns falls into this category). The generation of increased particulates is especially noticeable during high-intensity, catastrophic wildland fires. Biomass burning contributes to the release of greenhouse gases (carbon dioxide [CO_2], methane [CH_4]) and may reduce or eliminate a carbon sink.

Direct impacts of prescribed fire fall into two general categories: short-term and long-term. Short-term air quality impacts projected from prescribed burns would be adverse and would include a general increase in particulates, CO, and ozone precursor emissions in burn areas and those locations immediately downwind. The magnitude of increase is directly dependent on the size, extent, fuel type, and management strategy of the burn. The type and amount of air pollutants released from burning wildland vegetation varies with type of fuel, moisture content, temperature of the fire, and the amount of smoldering occurring after the fire. Since prescribed burning occurs irregularly, it is generally possible to restrict burning on days with limited ventilation to avoid violating air quality standards. Long-term, direct air quality impacts projected from prescribed burns include a general increase in airborne particulates from the burn site as a result of ash dispersion and transport, which may contribute to regional haze and reducing visibility in Class I areas.

Indirect adverse impacts to air quality from prescribed burns (short-term and long-term) may include an increase in airborne particulates from the burn site as a result of wind-based erosion of devegetated areas. This effect is expected to be small as vegetation management is an active part of fire management techniques. Fuel reduction treatments, authorized by the Fire and Fuels Plan Amendment (BLM 2004), could potentially decrease the number and intensity of wildland fires with a concurrent “decrease” in the amount of particulates and other pollutants. A greater long-term beneficial effect of prescribed burning is a reduction in particulate matter, CO, and ozone precursor emissions specific to wildfire in managed areas. Ozone (a product of biomass combustion formed through the interaction of solar radiation, and the ozone precursors that include volatile organic compounds [VOCs], and nitrogen oxides) is a major constituent of photochemical smog and is also a minor greenhouse gas.

Table 4.4 provides a summary of the vegetation types proposed for fuel treatments over the next 20 years, which could include prescribed fire. The right column shows the particulate matter 10 microns in diameter or smaller (PM_{10}) emission factor for each vegetation type, expressed as tons of PM_{10} per acre burned. The purpose of this table is to show which vegetation types are likely to create a larger short-term increase in particulate matter in the atmosphere. It should be noted that not all of the acres identified for fuels treatment would be treated with prescribed fire. The numbers provided in Table 4.4 could be used to estimate the maximum PM_{10} emissions if prescribed fire was the only tool used for fuel treatments.

Table 4.4: Proposed Fire Management Treatments (acres), by Vegetation Type

Vegetation/Habitat Type	Proposed Fire Management Treatments (acres)	PM_{10} Emission Factor (ton PM_{10}/acre burned)
Forest (includes ponderosa and piñon-juniper)	165,199	0.04
Shrub, steppe, scrub	277,594	0.03
Grassland	146,922	0.01
Other (including aquatic, riparian/wetland)	23,243	Factor not available
Total	**612,958**	**–**
Percent of BLM lands in the Planning Area	82%	–

The BLM's fire management policy is consistent with the New Mexico Environment Department's Smoke Management Program and, as such, burning would be timed in conjunction with meteorological conditions to minimize smoke impacts. Specific policies, rules, and procedures are implemented by the BLM to minimize the air quality impacts and impacts to regional haze for fire events. Additional restrictions on prescribed burns and wildland fire for resource benefit treatments during certain conditions or near air quality Class I areas would also apply. All of these restrictions could impact the size and/or timing of fire management activities such as wildland fire for resource benefit, prescribed burns, or both. However, these limitations would not substantially reduce the effectiveness of long-term fire management or increase fire risk in the Planning Area.

Fire management decisions in the Planning Area would also result in beneficial impacts to air resources. Restoration of natural fire regimes would improve the long-term health of vegetation and may enhance carbon sequestration. In addition, the use of prescribed fire would lead to fewer occurrences of high-intensity wildfire within the Planning Area over the long term. The detrimental air quality impacts from wildfire would likely be greater than those from prescribed fire and exert a larger adverse effect on air quality in the Planning Area.

4.2.1.2.2 Mineral Resources Decisions

Mineral resources management decisions would likely increase emissions from equipment, fugitive dust, VOCs, NO_x, and greenhouse gas emissions resulting in adverse impacts. Short-term air quality impacts from minerals development and production would occur from several sources: 1) combustive emissions (vehicle tailpipe and exhaust stack emissions) from the operation of mobile and stationary source construction equipment would include NOx, VOCs,

and CO_2; 2) fugitive dust emissions (PM_{10}) from earthmoving and construction activities and the operation of vehicles on unpaved surfaces; 3) Fugitive emissions of methane and other VOCs from well completions, pits, pneumatic devices, and leaks. Minerals production could generate long-term combustive and fugitive dust emissions from two sources: 1) stationary sources, such as natural gas flaring, natural gas-fired compressors, and minerals storage and handling equipment; and 2) mobile sources that access and service oil and gas facilities and extract and handle subsurface minerals. Minerals reclamation activities also would produce combustive and fugitive dust. Mineral development would reduce vegetative sinks for carbon emissions by removing ground cover in portions of developed areas.

Table 4.5 shows how leasable fluid minerals would be managed under each alternative. The largest number of acres would be closed to oil and gas development under Alternative B; therefore, adverse impacts to air quality would be the smallest under this alternative. Under Alternative A, the least number of acres would be closed to oil and gas development; therefore, the adverse impacts to air quality would be the greatest under the No Action Alternative. All counties within the Planning Area are in compliance with NAAQS and are therefore attainment areas. Because the estimated growth of oil and gas wells is low (approximately 5% per year growth) and because the RFD within the Planning Area is approximately 1.1% of BLM lands, it can be assumed that mineral resources management decisions will have negligible impacts to air quality within the Planning Area. Such decisions, however, will undergo appropriate NEPA analysis that will take into account any changes in oil and gas development, air quality, and other relevant factors.

Table 4.5: Leasable Fluid Mineral Stipulations (acres), by Alternative

Designation	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Open with standard lease terms and conditions	1,327,910	1,131,076	1,136,604	1,145,147
Open with moderate constraints (CSU)	18,668	150,967	170,116	203,236
Open with major constraints (NSO)	6,660	32,211	27,350	7,629
Closed	59,470	98,454	78,638	56,696
Total	1,412,708	1,412,708	1,412,708	1,412,708

4.2.1.2.3 Travel Management Decisions

Increased travel on BLM lands in the Planning Area would adversely impact air quality through increased vehicle emissions in areas open to travel and where travel is limited to existing roads, primitive roads, and trails. Those areas closed to travel would not necessarily reduce the cumulative adverse impacts to air quality, but could result in OHV users recreating on non-BLM lands in or near the Planning Area. As a result, the impacts to air quality from travel management decisions would likely be the same across all alternatives. The types of emissions that have the potential to be omitted from OHV use include hydrocarbons, CO, NO_x, particulate matter, and hazardous air pollutants.

4.2.1.3 Cumulative Impacts

Perhaps more so than any other resource, air is impacted by emission sources both within and outside the Planning Area because of the ease of transport of air masses from one location to another. This analysis identifies those sources, existing and proposed, within and outside the Planning Area that may contribute to air quality impacts in the Planning Area.

4.2.1.3.1 Existing sources within the Planning Area

A 2005 inventory of emissions from permitted sources within the Planning Area identified 56 sources emitting over a half ton of any reportable pollutant (EPA 2008). While most of these sources are concentrated in the Albuquerque metropolitan area, there are a few sources near BLM lands, including several compressor and pump stations in central Sandoval County.

Pollutants are concentrated along major transportation corridors and in population centers from tailpipe emissions. With population trends expected to continue to increase throughout the planning period, these pollutants would likely increase. High ozone levels in Sandoval County, which may exceed the proposed new standards, are largely attributable to residential traffic in the Rio Rancho area and not related to activities on BLM lands.

4.2.1.3.2 Existing Sources outside the Planning Area

Northwestern New Mexico is home to two large coal-burning power plants, the Four Corners Power Plant operated by Arizona Public Service and the San Juan Generating Station operated by the Public Service Company of New Mexico. The Four Corners Power Plant has been identified as the largest source of NO_x in the United States, and it can be expected that under favorable wind conditions pollutants may be transported into the Planning Area. Because pollution controls have already been installed at the San Juan Generating Station under a Consent Decree with the State of New Mexico and other organizations, some improvement in emissions from this source should be observed. In addition, the requirement to install best available retrofit technology under the Regional Haze Rule should result in further improvements at both power plants in the near future.

Oil and gas development in the San Juan Basin has contributed to increases in ozone and particulate matter within the basin. Modeling completed for the Four Corners Air Quality Task Force indicates that most of this pollution stays north of the Planning Area. North to northwesterly winds could result in occasional transport into the Planning Area. There are no air quality monitors in this area; however, the modeling showed that ozone levels would remain well within current and proposed ozone standards in this area for both the 2005 base year and the 2018 projection.

4.2.1.3.3 Proposed Sources inside the Planning Area

Although oil and gas development in the Planning Area is limited because most of the area is outside the prime production areas of the San Juan Basin, it can be expected that development would continue at the current rate of around three wells per year with small incremental increases in ozone and particulate matter, as well as CO_2 and CH_4, over the life of the plan.

4.2.1.3.4 Proposed Sources outside the Planning Area

A third coal-fired power plant known as the Desert Rock Power Plant has been proposed 30 miles southwest of Farmington. A draft EIS estimates annual emissions of 5,529 tons of CO, 0.1 ton of lead, 3,325 tons of NO_x, 1,125 tons of PM_{10}, 3,319 tons of sulfur dioxide (SO_2), and 166 tons of VOCs (URS Corporation 2007). Again, impacts to the Planning Area would depend on favorable transport winds, but such a large source less than 100 miles from the Planning Area would likely have some impacts.

Continued development of oil and gas in the San Juan Basin would contribute to additional emissions in that area. The Farmington RMP (BLM 2003) estimates 9,942 new wells over the 20-year life of that plan.

4.2.1.3.5 Climate Change

The EPA's Inventory of US Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. greenhouse gas emissions were over 7 billion metric tons and that total U.S. emissions have increased by 17% from 1990 to 2007. Emissions increased from 2006 to 2007 by 1.4% (99.0 Teragrams [Tg] CO_2 equivalent [CO_2e]). The following factors were primary contributors to this increase: 1) cooler winter and warmer summer conditions in 2007 than in 2006 that increased the demand for heating fuels and contributed to the increase in the demand for electricity; 2) increased consumption of fossil fuels to generate electricity; and 3) a significant decrease (14.2%) in hydropower generation used to meet this demand (EPA 2009).

The Inventory of New Mexico Greenhouse Gas Emissions: 2000-2007 (NMED 2010) lists total statewide gross greenhouse gas emissions in 2007 as 76.2 million metric tons CO_2e, which is a slight reduction from the estimate in 2000 of 77.0 million metric tons CO_2e. The primary contributors to 2007 greenhouse gas emissions in New Mexico were electricity production (42%), the fossil fuel industry (22%), and transportation (20%) (NMED 2010). According to the New Mexico Greenhouse Gas Inventory and Reference Case Projections, 1990-2020, greenhouse gas emissions are expected to continue increasing (NMED 2006).

Ongoing scientific research has identified the potential effects of anthropogenic greenhouse gas emissions such as CO_2, CH_4, N_2O, and several trace gasses; changes in biological carbon sequestration; and other changes due to land management activities on global climate. Through complex interactions on a global scale, greenhouse gas emissions cause a net warming effect of the atmosphere, primarily by increasing the amount of heat energy retained in the atmosphere that would otherwise be radiated by the earth back into space. Although natural greenhouse gas atmospheric concentration levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization, and burning of fossil carbon sources have caused greenhouse gas concentrations to increase. The 2007 Summary for Policy Makers from the Intergovernmental Panel on Climate Change (IPCC 2007) stated, "Global atmospheric concentrations of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) have increased markedly as a result of human activities since 1750 and now far exceed preindustrial values determined from ice cores spanning many thousands of years."

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere

(IPCC 2007). Without additional meteorological monitoring and modeling systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions. What is known is that increasing concentrations of greenhouse gases may accelerate the rate of climate change (IPCC 2007).

The National Academy of Sciences (2006) has acknowledged that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes (IPCC 2007). Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures.

Currently, global climate models are unable to forecast local or regional effects on resources (IPCC 2007; CCP 2008). However, there are general projections regarding potential impacts to natural resources and plant and animal species that may be attributed to climate change from greenhouse gas emissions over time; however, these effects are likely to be varied, including those in the southwestern United States (Karl et al. 2009; U.S. Global Change Research Program 2008). For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened-endangered plants may be accelerated. Due to loss of habitat or competition from other species whose ranges may shift northward, the populations of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependent on historic water conditions (Karl et al. 2009).

The very small increase in greenhouse gas emissions that could result from approval of the Proposed Action would not produce climate change impacts that differ notably from the No Action Alternative. This is because climate change is a global process that is impacted by the sum total of greenhouse gases in the Earth's atmosphere. The incremental contribution to global greenhouse gases from the Proposed Action cannot be translated into effects on climate change globally or in the area of this site-specific action. As stated above, the assessment of greenhouse gas emissions and the resulting impacts on climate is an ongoing scientific process. It is currently not feasible to predict with certainty the net impacts from the Proposed Action on global or regional climate. That is, while BLM actions may contribute to climate change, the specific effects of those actions on global or regional climate are not quantifiable. Therefore, the BLM does not have the ability to associate an action's contribution in a localized area to impacts on global climate change. As climate models improve in their sensitivity and predictive capacity, the BLM will incorporate those tools into its NEPA analysis at that time.

4.2.2 Cave and Karst Resources

The RPFO has established a goal to identify and study karst features and caves to ensure they are available for appropriate uses by present and future generations. Resources and resource uses identified as having impacts, both adverse and beneficial, to cave and karst resources are lands and realty, mineral resources, recreation and visitor services, cultural resources, special designations, soil and water resources, paleontological resources, and special-status species.

4.2.2.1 Direct and Indirect Impacts

4.2.2.1.1 Lands and Realty Decisions

Lands and realty would have an adverse impact to cave and karst resources if those parcels identified for disposal contain cave or karst areas and are removed from federal protection. The Pronoun Cave Complex is the only identified cave system on BLM lands within the Planning Area, and is protected by the Pronoun Cave ACEC. However, karst areas and other unidentified caves may be located on parcels identified for disposal. Areas identified for disposal would undergo NEPA analysis prior to disposal and cave or karst areas would be identified at that time. If those resources were found, the RPFO would consider mitigation measures to avoid impacts to cave and karst resources. Table 4.6 shows those acres identified for disposal on BLM lands within the Planning Area.

Table 4.6: Parcels Identified for Disposal (acres) by Alternative

Status	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Disposal	55,384	57,472	58,910	62,051
Percent of BLM lands in the Planning Area	7.4%	7.7%	7.9%	8.3%

4.2.2.1.2 Mineral Resources Decisions

Management decisions to allow mineral development would have minimal impacts on cave and karst resources in those areas where proposed mineral extraction activities would take place in or near cave or karst features. Areas where mineral extraction would occur could impact the cave or karst resources directly, and could also lead to indirect impacts to water resources. To minimize any potential impacts, the RPFO proposes to implement an oil and gas stipulation that limits the amount of surface disturbance near cave and karst resources. Under Alternative B, the RPFO would implement NSO within 200 meters (656 feet) of known cave entrances, passages, or aspects of significant caves, or significant karst features. Under Alternative C, the RPFO would implement CSU within 200 meters (656 feet) of known cave entrances, passages, or aspects of significant caves, or significant karst features (see Appendix H for stipulations). Under Alternatives A and D, standard leasing terms would be applied; therefore, the RPFO would be able to move the location of oil and gas wells up to 200 meters (656 feet) for mitigation purposes.

4.2.2.1.3 Recreation and Visitor Services Decisions

Management decisions for recreation and visitor services would have both beneficial and adverse impacts to cave and karst resources. Impacts may occur as a result of SRMA and ERMA designations and subsequent recreation management. The impacts associated with increased visitation to cave or karst resources would include trampling and degradation of unique or fragile geologic features within caves. Overall disturbance to cave ecosystems could also occur as a result of increased visitation.

Activities that are not subject to the permitting process, such as dispersed recreation and cross-country OHV use, also have the potential to disturb cave and karst resources. When recreational users stray from established trails, adverse impacts may occur, especially in caves.

Beneficial impacts from recreation management decisions on cave and karst resources could also occur. Travel management decisions could have beneficial impacts to cave and karst resources in those areas where travel is restricted to existing roads and trails or closed to motorized travel. Mineral resource management decisions could be restricted within SRMA and ERMAs through site-specific NEPA analysis and could also indirectly protect cave and karst resources. The same number and size of SRMA and ERMAs are proposed under Alternatives B, C, and D. Approximately 1,181 acres of known cave and karst features would receive indirect beneficial impacts from SRMA and ERMA designations in under Alternative, B, C, and D.

4.2.2.1.4 Cultural Resources Decisions

Cultural resource management decisions would have a beneficial impact to cave and karst resources where cultural resources are located in or within proximity to cave or karst features. Management restrictions associated with cultural resources would provide an indirect benefit to caves and karst features because less surface disturbance is generally allowed to take place near cultural resource sites.

4.2.2.1.5 Special Designation Decisions

Special designations would have a beneficial impact to cave and karst resources when they require restrictions on surface-disturbing activities within the boundaries of the particular designation. Travel and mineral resource management decisions are the two major surface-disturbing activities that would be restricted within special designations and that also indirectly protect cave and karst resources. Specifically, the Pronoun Cave Complex ACEC would have beneficial impacts to cave and karst resources, because the ACEC protects the only known cave complex on BLM lands in the Planning Area. The Pronoun Cave Complex ACEC was designated under the 1986 RMP (BLM 1986). In the current DRMP/DEIS, the ACEC would be maintained at its current size under Alternatives A and C. Alternative B would expand the ACEC to include an updated inventory of cave resources. Alternative D would remove the ACEC designation. Additionally, under Alternative B, the Pronoun Cave Complex ACEC would be withdrawn from locatable mineral entry, closed to saleable mineral extraction, and managed as CSU for leasable mineral development. Under Alternative C, the ACEC would be managed as CSU for leasable mineral development and saleable mineral extraction would be avoided. Under Alternative D, the Pronoun Cave area would be open to the extraction of saleable minerals and locatable mineral entry. Under Alternatives C and D, prescribed livestock grazing would also be allowed to occur within the boundaries of the Pronoun Cave Complex. Cave resources would be adversely impacted under Alternatives C and D for the Pronoun Cave ACEC.

4.2.2.1.6 Soil and Water Resources Decisions

A defining characteristic of cave and karst features is their hydrologic properties. As a result, management decisions associated with soil and water resources, as described under Management Common to All Alternatives for soil and water resources in Chapter 2, would have a beneficial indirect impact to cave and karst resources because those policies, laws, and proposed actions to protect soil and water would also protect cave and karst resources.

4.2.2.1.7 Paleontological Resources Decisions

Paleontological resource management decisions would have a beneficial impact to cave and karst resources where paleontological resources are located within or in proximity to cave or karst features. Management restrictions associated with paleontological resources would provide an indirect benefit to caves and karst features because less surface disturbance is generally allowed to take place near paleontological resource sites.

4.2.2.1.8 Wildlife and Special-status Species Decisions

Management decisions associated with wildlife resources and special-status species would have a beneficial impact to cave and karst resources if those species were known to inhabit cave or karst features. Management restrictions intended to protect species would provide an indirect benefit to cave and karst features because less surface disturbance is generally allowed to take place near special-status species habitat.

4.2.2.2 Cumulative Impacts

The RPFO is unaware of any proposed or planned projects that would specifically impact the cave and karst resources that would be impacted by this RMP.

4.2.3 Cultural Resources

Both adverse and beneficial impacts are anticipated from the decisions made in the RMP/EIS. Adverse impacts to cultural resources in the Planning Area would primarily result from activities associated with surface and subsurface disturbance such as development projects, recreational use/OHV travel, and fire and fuels management. However, adverse impacts would also result from specific cultural resource management decisions and non-surface-disturbing activities that create visual and/or auditory effects. These latter impacts would apply primarily to sites or locations deemed sacred or traditionally important by Native American tribes and used by these groups in such a manner that visual obstructions and/or noise levels impinge upon that use. Impacts to cultural resources from program decisions are considered to be long term for the purpose of this analysis. Beneficial impacts to cultural resources would primarily result from decisions that would restrict surface disturbance, close or limit travel, or stabilize soils through restoration activities.

Because the majority of cultural resources that have been identified on BLM lands in the Planning Area consist of archaeological sites, the primary concern for impacts relates to disturbance of the artifacts, features, and architecture of sites in ways that reduce their integrity, alter their association with traditional values, and reduce the potential to recover data. Archaeological data consist of both “objects” (in the broad sense of artifacts, architecture, features, etc.) and the horizontal and vertical relationships between these objects. Our ability to interpret and understand the past is based on recovering not only the material culture of the past in the form of artifacts, buildings, and the built environment, but the spatial relationships between different aspects of material culture. Consequently, surface and subsurface disturbances have the greatest potential for adverse impacts to cultural resources. Impacts can include elimination or reduction of the setting and physical integrity of a sacred or other site, including NRHP-eligible sites, landscapes, and cultural theme areas. Other impacts include disruption or reduction of the religious values of sites and areas, reduction in the data potential of a site, and

damage to traditional collection areas or resource sites. In general, impacts to cultural resources from surface disturbance are long term and permanent; once an archaeological site has been impacted, the effect typically cannot be reversed. However, as stated previously, short-term effects from visual or auditory impacts would be avoided, minimized, or mitigated.

Potential impacts to specific cultural resources from the various proposed management alternatives are difficult to quantify precisely. The management alternatives neither stipulate precise areas for surface-disturbing activities, nor are the precise locations of all cultural resources in the area known. However, it is possible to estimate impacts based on the proposed general locations of activities and the relationships of these planning areas to zones of high, medium, or low cultural resource site density.

4.2.3.1 Analysis Assumptions

The RPFO created a site density model using site location data from the New Mexico Cultural Resource Information System (NMCRIS) database provided to the BLM in March 2010 clipped to the Planning Area boundary. To maximize the area for which quantitative analysis of impacts could be conducted, a GIS layer consisting of areas for which there has been some level of site identification was created. This layer was based on both NMCRIS survey polygons and site locations for which no survey polygon was available in NMCRIS. To create a proxy for a survey polygon in these cases, the assumption was made that where site concentrations exist, some kind of systematic inventory probably occurred, but has not made it into NMCRIS for some reason. Isolated sites could be the result of a systematic inventory of a small area, or of a larger area with low site density. Regardless, some investigation of the area around each site was most likely conducted during efforts to define site boundaries. The survey polygons that are included in NMCRIS include block surveys, linear corridor surveys, and sample surveys using widely spaced transects (usually 150–200 meters [492–656 feet]). The large number of small surveys, and particularly linear and sample surveys, creates a large edge effect. To lessen this somewhat, an approximate 200-meter (656-foot) buffer was added to survey polygons. The assumption is that the density predicted within the survey area would most likely extend to at least 200 meters (656 feet) from the area actually observed. These two buffered layers (NMCRIS survey and site location) were then merged and dissolved to create the area within which the predicted site density model could be applied. The parts of the site density model that fell outside the buffered archaeological data layer are considered areas for which no data really exist, and the model is likely to be inaccurate. Table 4.7 shows the predicted cultural resource site density (in acres) on BLM lands within the Planning Area.

Table 4.7: Cultural Resource Site Density on BLM Lands in the Planning Area (acres)

Site Density Level	Acres
Low	28,108
Medium	289,976
High	15,054
No data	411,249
Total	744,387

4.2.3.2 Direct and Indirect Impacts

4.2.3.2.1 Mineral Resources Decisions

Management decisions to allow mineral development would have minimal impacts to cultural resources though the required inventories would add to our knowledge about cultural resources. In addition, mineral development activities that are visible on or above the surface would have the potential to directly impact the visual integrity of cultural properties that derive their significance from a natural setting or from a setting relatively devoid of modern intrusion.

Mineral resources management decisions would impact 1.1% of BLM lands within the Planning Area over the next twenty years, according to the RPFO RFD for leasable, locatable, and saleable minerals. It is anticipated that mineral extraction activities would be located in areas that avoid impacts to cultural resources. Standard BLM policy and the NHPA Section 106 process would be applied to all applications for disturbance, thereby reducing opportunities for direct adverse impacts related to this disturbance. The RPFO has also developed leasing stipulations (see Appendix H) that would protect cultural resources under all alternatives. Cultural resources would be protected through either NSO (under Alternatives A and B) or CSU (all alternatives); thereby protecting cultural resources through avoidance, minimization, or mitigation of adverse impacts under all alternatives. Inadvertent impacts and impacts from vandalism that often accompany increased human activity in developed areas may occur because there would be more people in the area increasing the probability that acts of vandalism would be committed. Impacts from looting would likely decrease because increased human presence acts as a deterrent for this kind of activity.

4.2.3.2.2 Fire Management Decisions

Fire management decisions would have adverse impacts to cultural resources when fuel treatments occur where cultural resources are present. Prescribed fires can burn artifacts and features, which is of greater concern on sites with combustible cultural material. Fuels treatments that cause ground disturbance disturb the integrity of deposits or features, and damage artifacts if present. Beneficial impacts to cultural resources from fire management include the improvement of herbaceous cover on or near cultural resource sites and the potential reduction of catastrophic fires that would destroy or damage artifacts, features, or structures. Adverse impacts to cultural resources would be avoided by site-specific NEPA analysis applied prior to fuels treatments. Table 4.8 identifies the number of acres of proposed fuel treatments within each Fire Management Unit and the associated cultural site density. The proposed fuel treatments are common to all alternatives; therefore, the impacts to cultural resources from fire management decisions would be the same for all alternatives.

Table 4.8: Proposed Fuel Treatment Areas (acres) within Low to High Cultural Site Density Locations

Fire Management Treatment Areas	Low Site Density	Medium Site Density	High Site Density	No Data	Total
FRCC 2 and FRCC 3 total	23,206	238,822	12,967	336,963	612,958

*Both FRCC 2 and 3 areas are proposed for 100% treatment over the next 20 years.

4.2.3.2.3 Lands and Realty Decisions

Lands and realty decisions would have adverse impacts to cultural resources when lands proposed for disposal lead to the loss of cultural resources. Site-specific NEPA analysis would be applied prior to the disposal of lands managed by the BLM to avoid adverse impacts to cultural resources. In addition, cultural resources on public land that is otherwise suitable for disposal would be considered for exchange only with state or local agencies or non-profit private organizations with wildlife management responsibilities. Table 4.9 identifies the number of acres proposed for land disposal and the associated cultural resource site density. Alternative B would result in the greatest protection of cultural resources because the fewest number of BLM acres would be disposed (0.3% of the total surface acres) while the most acres of BLM lands would be disposed under Alternative A (8%). The Preferred alternative identifies 2.6% of BLM surface acres for disposal.

Table 4.9: Lands Identified for Disposal (acres), by Cultural Resource Site Density Level

Site Density Level	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Low	3,277	3,277	3,334	3,334
Medium	14,234	15,229	15,665	15,665
High	1,071	1,071	1,266	4,407
No data	36,802	37,895	38,645	38,645
Total	55,384	57,472	58,910	62,051

4.2.3.2.4 Special Designations Decisions

Special designations would have a beneficial impact to cultural resources because of management restrictions that are applied within the boundaries of the particular designation. Travel and mineral resource management decisions are the two major surface-disturbing activities that would be restricted within special designations and that also indirectly protect cultural resources. ACECs and National Scenic Trails are the two special designations that are proposed in the RMP/EIS. The only National Scenic Trail on BLM lands within the Planning Area is the CDT. Table 4.10 provides the proposed number and acres of special designations, by alternative. Under Alternative B, the largest number of acres would be managed as special designations while the smallest number of acres would be managed as special designations under Alternative D. Under the Preferred alternative, 8,106 fewer acres than Alternative B would be managed as special designations.

Table 4.10: Proposed Special Designations (number and acres) within the Planning Area, by Alternative

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACECs managed for cultural values	5 ACECs 25,182 acres	7 ACECs 52,718 acres	7 ACECs 39,934 acres	5 ACECs 11,373 acres
ACECs managed for other values	5 ACECs 28,583 acres	11 ACECs 97,256 acres	11 ACECs 97,095 acres	5 ACECs 31,526 acres
WSA/Wilderness Area	97,963 acres	97,963 acres	97,963 acres	97,963 acres
CDT	1 trail 11,474 acres	1 trail 38,808 acres	1 trail 23,607 acres	1 trail 11,474 acres
Total special designations acreages	137,720 acres	185,625 acres	178,000 acres	126,392 acres

Four ACECs are specifically proposed for the protection of cultural resources: Canon Jarido, Canon Tapia, Jones Canyon, and Guadalupe Ruin and Community. Three other ACECs, Cabezon Peak, Espinosa Ridge, and Ojito, are proposed for designation due to cultural values and other resource values.

4.2.3.2.5 Recreation and Visitor Services Decisions

Management decisions for recreation and visitor services would have both beneficial and adverse impacts to cultural resources. Potentially significant impacts to cultural resources would occur as a result of SRMA or ERMA designations and subsequent recreation management. Increased visitation to areas with cultural sites increases the probability that artifact collection, vandalism, and trampling of cultural resources would occur. Increased visitation also increases the likelihood of encounters between recreational users and Native American groups engaged in ceremonial use of an area, which is protected under AIRFA.

Activities that are not subject to the permitting process, such as dispersed recreation and cross-country OHV use, also have the potential to disturb cultural resources. When recreational users stray from established trails, adverse impacts occur to cultural resources if they are present. Bicycles and horses, in particular, have the potential to cause adverse impacts to cultural resources that are located on sensitive soils. Some visitors to public lands commit acts of vandalism, which can include illegal excavation of archaeological sites (i.e., pot hunting), illegal collecting of surface artifacts, damage to historic structures (shooting or dismantling), and defacement of petroglyphs.

Beneficial impacts from recreation management decisions would result from surface disturbance restrictions for travel management and mineral resources. Recreation management decisions would have beneficial impacts to cultural resources in those areas where travel is restricted to existing roads and trails or closed to motorized travel. In addition, under Alternatives B and C, one SRMA and 20 ERMAs would be managed as CSU for leasable fluid minerals, open to saleable mineral extraction, and withdrawn from locatable mineral entry. Under Alternative D, the SRMA and ERMAs would be managed as CSU for leasable fluid minerals, open to saleable mineral extraction, and open to locatable mineral entry. SRMAs are not proposed under Alternative A. Table 4.11 provides the proposed SRMA and ERMAs (in acres) and the associated cultural resource site density within each designated area.

Table 4.11: Cultural Resource Density Classes with the Proposed SRMA and ERMAs (acres) by Alternative

Site Density Level	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Low	0	12,488	12,488	12,488
Medium	0	90,781	90,781	90,781
High	0	5,956	5,956	5,956
No data	0	123,017	123,017	123,017
Total SRMA/ERMA acreages	0	232,242	232,242	232,242

4.2.3.2.6 Cultural Resource Decisions

Federal historic preservation laws that require analysis of impacts from federal actions already protect cultural resources on federal lands. Complying with management measures for authorized actions requires consulting with federally recognized tribes and other interested parties, identifying and evaluating cultural resources, and adhering to procedures for resolving any adverse effects and mitigating impacts. Completion of the Section 106 process is required for all federal undertakings implementing resource management plan decisions. There is a greater risk of impacts resulting from unauthorized activities, natural processes, dispersed activities, and incremental or inadvertent human actions, especially where inventories are incomplete.

In addition, decisions considered in the RMP/EIS that provide for management prescriptions that emphasize cultural resources would have beneficial impacts to cultural resources by four cultural resource areas with focused management. These cultural resource areas, Fort Site and Ojo Pueblo, Azabache Station, Big Bead Mesa, and the Headcut Prehistoric Community, do not meet the relevance and importance criteria for ACECs, but are still in need of protection. Under Alternatives B and C, the Fort Site and Ojo Pueblo would be managed as NSO for leasable fluid minerals on 780 acres, closed to saleable mineral extraction on sixty acres, and withdrawn from locatable mineral entry on the sixty-acre parcel where the sites occur. Under Alternatives A, B, and C, Azabache Station would be managed to protect the cultural resources from surface-disturbing activities. Under all alternatives, Big Bead Mesa would be managed to control access, limit travel, and restrict surface-disturbing activities from occurring on the Mesa. Under all alternatives, the Headcut Prehistoric Community would be managed to protect the cultural resources that occur on the site and to restrict surface-disturbing activities.

4.2.3.2.7 Livestock Grazing Decisions

Livestock grazing management decisions would potentially have adverse impacts to cultural resources in areas where livestock congregate and increase the risk of damage to cultural resources present within the area of concentration. Site-specific NEPA analysis and NHPA Section 106 compliance would be applied prior to the issuance of grazing permits and range improvements. Administrative actions, such as fencing high-value cultural sites, would be taken when needed to avoid adverse impacts to cultural resources. Grazing allotments make up approximately 95% of BLM lands in the Planning Area. Based on the prevalence of livestock grazing and site probabilities listed in Table 4.7, it is likely that livestock grazing would impact cultural resources under all alternatives. Alternative B is the most restrictive of livestock grazing because grazing would be removed from special designations and riparian areas; therefore, the

risk of impacts to cultural resources would be less under Alternative B. Alternatives C and D allow for livestock grazing within special designations and riparian areas when resource values are compatible with grazing activities. As a result, the impact to cultural resources from livestock grazing would be greater under Alternatives C and D.

4.2.3.2.8 Forests and Woodlands Decisions

Forest and woodland management decisions would have adverse and beneficial impacts to cultural resources. Areas open to the harvesting of forest products would have indirect adverse impacts to cultural resources through increased visitation to harvesting areas that have potential cultural sites. Increased numbers of people in areas with cultural sites increases the probability that unauthorized artifact collection, vandalism, and trampling of cultural resources would occur. However, not all wood product harvest would involve public firewood areas. If contractors or agencies conduct the harvest operation these adverse impacts are less likely. Adverse impacts could also arise from ground disturbance associated with forest treatment. Alternative A opens the fewest number of acres to forest product harvest. Beneficial impacts would include the improvement of herbaceous cover on or adjacent to cultural resource sites. Forest treatments could generate slash that could be placed on the ground to reduce erosion in places where cultural resources need protection from erosion. Alternative D opens the largest number of acres to forest product harvest. Table 4.12 shows the predicted cultural resource site densities within the proposed forest product harvest areas (in acres).

Table 4.12: Predicted Cultural Resource Site Densities within Forest Product Harvest Areas (acres)

Site Density Level	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Low	0	3,855	20,447	25,129
Medium	8,881	49,463	226,917	256,173
High	0	3,381	9,791	12,011
No data	3,305	62,736	303,166	350,819
Total	12,186	119,435	560,321	644,132

4.2.3.2.9 Travel Management Decisions

Travel management decisions would have both beneficial and adverse impacts to cultural resources. Areas closed to motorized travel would reduce the potential for human interaction with cultural resource sites, while those areas open to travel or limited to existing roads, primitive roads, and trails could lead to vandalism, artifact collection, and trampling of cultural resource sites. Areas designated as open to motorized travel would also be adversely impacted by surface disturbance caused by cross-country vehicle travel. Table 4.13 shows the proposed travel management decisions, by alternative. Alternative B would close the largest number of acres to motorized travel and open the least. Alternative A would close the smallest number of acres to motorized travel and open the most.

Table 4.13: Proposed Travel Management Decisions on Predicted Cultural Resource Site Densities on BLM Lands within the Planning Area (acres)

Category	Site Density	Alternative A No Action*	Alternative B	Alternative C Preferred	Alternative D
Closed	Low	390	6,201	4,625	2,979
	Medium	9,550	66,644	35,676	33,754
	High	52	3,095	3,095	3,095
	No data	10,324	101,300	80,679	60,295
Open	Low	16,935	0	983	983
	Medium	72,908	170	353	373
	High	4,291	3,504	0	0
	No data	209,446	877	16,933	18,100
Limited	Low	10,783	21,908	22,501	24,146
	Medium	207,519	223,162	253,947	255,849
	High	10,711	8,456	11,959	11,959
	No data	191,478	309,070	313,636	332,854

* These acreages are based on BLM land ownership under the 1986 RMP.

4.2.3.3 Cumulative Impacts

Surface-disturbing activities, such as the Desert Rock Power Plant, Northwest Loop Road, the Red Mesa Wind Farm, the N55 Road Improvement Project, fire and fuels management on non-BLM land in the Planning Area, the potential Renewable Energy Transmission Authority (RETA) transmission corridor, and uranium development, could contribute to cumulative impacts of cultural resources. These projects, where specific project areas are known, account for approximately 500,000 acres of surface disturbance across federal, state, tribal, and private lands. These activities, where applicable, would require adherence to federal and state cultural resource laws and regulations, resulting in the inventory and identification of cultural sites, avoidance, and in some cases data recovery.

Oil and gas development and mineral exploration and development have occurred across this region in the past and would continue into the future, both on BLM lands under the RMP/EIS and on state and private inholdings. Mineral development of inholdings and lands adjacent to the Planning Area would continue to increase the human presence in the general area, thereby increasing the risk to cultural resources from looting, vandalism, and inadvertent impacts.

Many decisions related to VRM, special designations, and restrictions on surface disturbance have the potential to provide a net positive benefit to cultural resources within the Planning Area. These decisions would reduce or control the frequency and extent of ground-disturbing activities that present the greatest threat to maintaining the use values of cultural resources.

Specific undertakings that could result in surface and subsurface disturbance and have the potential to impact cultural resources are subject to the Section 106 process of the NHPA, which calls for the identification of historic properties (i.e., NRHP-listed sites or sites determined

eligible for listing in the NRHP) within the area of potential effects and the consideration of alternatives to the planned undertaking that could avoid impacts to said properties. In the event that avoidance is not possible, mitigation of the impacts is to be considered.

4.2.4 Fire Management

Current management of the RPFO fire management program follows guidance in the Fire and Fuels RMP Amendment (BLM 2004), the Healthy Forest Restoration Act of 2003, and the most recent RPFO Fire Management Plan (BLM 2011c), which address recent issues of concern in fire management to both the public and internal resource specialists. The goal of the RPFO fire management program is to lower the FRCC within the Planning Area. Treatment acreages have been identified in Chapter 2 that would occur in FRCC 2 and 3, with the target outcome of moving towards FRCC 1 in those treated areas.

In general, the majority of fire management issues deal with the management of terrestrial vegetation. Current terrestrial vegetation management practices under wildlife, range, and forestry are conducive to the management goals for fire management.

Programs that have management decisions affecting wildland fire ecology are cultural resources, forests and woodlands, lands and realty, livestock grazing, travel management, vegetative communities, and wildlife and fish.

4.2.4.1 Direct and Indirect Impacts

4.2.4.1.1 Cultural Resources Decisions

Cultural resource management decisions, including the management of ACECs with cultural resource values, would have adverse impacts to fire and fuels management because of restrictions on potential treatment areas. These restrictions would result in a loss of treatable acres or reduction of treatment options based on recommendations to avoid, minimize, or mitigate adverse impacts to identified cultural resources. Restrictions would be applied on a case-by-case basis, and it is likely that fuels treatments would be modified, but not completely restricted, in most areas. Site-specific analysis would be applied for fuel treatments and appropriate mitigation measures would be identified at that time.

4.2.4.1.2 Forests and Woodlands Decisions

Forest and woodland management decisions would have beneficial impacts to fire management because removal of forest products, through activities such as Christmas tree harvesting and firewood thinning, would result in the long-term reduction in fuels loading and, subsequently, catastrophic fire threats. Removal of forest products would also result in increase growth of forbs and grasses due to the removal of overstory vegetation. The presence of dried understory vegetation could result in increased fire frequency in some areas. Table 4.14 identifies the acres of forest product collection areas within proposed fire management treatment areas. Alternative D opens the most acres to forest product harvest while Alternative A opens the smallest number of acres. By allowing removal of forest products in these areas, it is anticipated that the FRCC would shift towards FRCC 1.

Table 4.14: Forest Product Harvest Areas (acres) within RPFO Fire Management Units

Fire Management Unit	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
B6. Sandia	0	3,080	5,730	12,924
B8. Candy Kitchen	0	3	12,828	12,828
C1. North Malpais	0	29,078	98,333	99,045
C3. Wilderness and WSAs	0	3	257	317
C5. Mesa Chivato	1,718	214	4,348	9,640
C7. Scattered Grass/Shrub	10,468	87,057	438,825	509,378
Total	12,186	119,435	560,321	644,132

4.2.4.1.3 Fire Management Decisions

The comprehensive Fire and Fuels Plan Amendment (BLM 2004) and the most recent RPFO Fire Management Plan (currently BLM 2011c) guide fire management decisions on BLM lands in the Planning Area. Direction and guidance approved by these two plans are incorporated by reference into the RMP/EIS. T he Fire and Fuels Plan Amendment provides fire management direction that is common to all alternatives being considered in this RMP/EIS. Readers should note that the potential impacts of implementing the Fire and Fuels Plan Amendment across the entire Planning Area were analyzed as part of the Environmental Assessment prepared for that document (BLM 2004). Fuel management treatment acres are also proposed in Chapter 2 in addition to the treatment acres outlined in the Fire and Fuels Plan Amendment. These proposed fuel treatment areas are also considered management common to all alternatives.

Under all alternatives, approximately 32,000 acres of land rated FRCC 2 or 3 would be treated annually on BLM lands in the Planning Area depending on budgetary and time constraints. WUI areas, areas with fuel loading that could potentially result in the loss of ecosystem components following wildland fire, and areas that meet other management goals and objectives would be treated with prescribed fire and non-fire treatments (mechanical removal, chemical and biological treatments, manual removal, seeding, etc.). The overall impact of these treatments would be improvement in FRCC levels within the Planning Area and movement towards FRCC 1. The treatments would occur within 100% of the FRCC 2 and 3 areas on BLM lands within the Planning Area, as described in Table 4.15.

Table 4.15: Proposed Fuel Treatment Areas (acres) by FRCC

Fire Management Unit	FRCC I Acres	FRCC 2 Acres	FRCC 3 Acres	Not Inventoried	Total
B6. Sandia	1,456	7,515	2,978	975	12,924
B8. Candy Kitchen	569	5,859	6,391	9	12,828
C1. North Malpais	2,716	66,311	28,708	1,448	99,183
C3. Wilderness and WSAs	8,978	37,094	1,867	2,705	50,644
C5. Mesa Chivato	3,145	37,851	17,112	421	58,529
C7. Scattered Grass/Shrub	70,568	357,719	43,553	38,439	510,279
Total	87,432	512,349	100,609	43,997	744,387
Total Acres Needing Treatment		512,349	100,609		612,958

4.2.4.1.4 Lands and Realty Decisions

Lands and realty decisions could have adverse impacts to fire management. Proposed land disposals could result in increased development of infrastructure adjacent to public land, which could increase the exposure of private holdings to wildland fire, expanding urban interface management needs. Alternative B would dispose of the least amount of acres in FRCC 2 and 3, while Alternative D would dispose of the largest. Table 4.16 provides the number of acres proposed for disposal in FRCC 2 and 3, by alternative.

Table 4.16: Parcels Identified for Disposal (acres) in FRCC 2 and 3 by Alternative

Status	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Disposals in FRCC 2	29,505	30,529	30,947	33,025
Disposal in FRCC 3	21,141	21,937	22,512	22,635
Total Disposal in FRCC 2 and 3	50,646	52,466	53,459	55,660

Lands and realty decisions could also have a beneficial impact to fire management. Disposal and acquisition of parcels within the checkerboard areas within the Planning Area would improve the ability of the RPFO to implement effective fire management decisions.

4.2.4.1.5 Livestock Grazing Decisions

Livestock grazing would have both adverse and beneficial impacts to fire management. Adverse impacts include alterations in FRCC because key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loading would be altered within the Planning Area though livestock grazing activities. Beneficial impacts from livestock grazing activities include reducing the risk of catastrophic fire by reducing the amount of understory vegetation increasing water availability for suppression, and maintaining large undeveloped acreages, which reduces the potential for urban interface fires. Treatment areas within grazing allotments would also require rest for a minimum of two growing seasons or more, as determined by resource managers through consultation and coordination with the permittee or lessee. Furthermore, with livestock owners and managers living in proximity to BLM lands, there is a general increase of overall awareness of local conditions and fire ignitions,

primarily ignitions caused by public land users recreating on BLM lands. Table 4.17 provides the number of acres proposed for grazing within each Fire Management Unit, by alternative. Alternative A proposes the largest number of acres for livestock grazing within the RPFO Fire Management Units, while Alternative B proposes the smallest.

Table 4.17: Acres of Proposed Livestock Grazing (acres) within RPFO Fire Management Units

Fire Management Unit	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
B6. Sandia	11,769	4595	7,174	7,174
B8. Candy Kitchen	12,039	633	11,406	11,406
C1. North Malpais	52,448	831	51,617	51,617
C3. Wilderness and WSAs	39,861	12	39,849	39,849
C5. Mesa Chivato	58,351	2	58,349	58,349
C7. Scattered Grass/Shrub	449,501	225,848	223,653	223,653
Total	623,969	231,921	392,048	392,048

4.2.4.1.6 Travel Management Decisions

Travel management decisions would have a beneficial impact to fire management in those areas that are identified for closure to travel in the RMP/EIS. Approximately 80% of fire starts are estimated to occur from lightning and 20% are human-caused; therefore, closing portions of the Planning Area to travel would reduce human activity within those closed areas and possibly prevent human caused fires from occurring. Table 4.18 provides the proposed travel management decisions (in acres) under each alternative. Under Alternative B, the most acres would be closed to motorized travel and the least acres would be open to motorized travel. Under Alternatives C and D, the same number of acres would be open to motorized travel.

Table 4.18: Proposed Travel Management Decisions (acres), by Alternative

Category	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Open	303,580	4,551	18,269	19,456
Limited	420,491	562,596	602,043	624,808
Closed	20,316	177,240	124,075	100,123
Total	744,387	744,387	744,387	744,387

4.2.4.1.7 Vegetative Communities Decisions

Similar to forest and woodland management decisions, vegetation management decisions on BLM lands within the Planning Area would have a beneficial impact to fire management. Vegetation treatments such as thinning, and prescribed fire would result in the long-term reduction of hazardous fuel loadings -and the occurrence of catastrophic wildfires. Specific vegetation treatments on BLM lands within the Planning Area are not identified in the RMP/EIS. Site-specific NEPA analysis would occur prior to implementation of vegetation treatments.

4.2.4.1.8 Wildlife and Fisheries Decisions

Wildlife and fisheries management decisions would have both beneficial and adverse impacts to fire management. Under all alternatives, fuels treatments would be avoided during the nesting season for migratory birds (April 15–August 15). The DRMP/DEIS also proposes other restrictions on surface-disturbing activities, including buffers around prairie dog towns and raptor nests, avoidance of big game winter range, and big game fawning/calving habitat. These restrictions could potentially require the modification of fire management activities during specific time periods and reduce the options available for fuels reduction, surface-disturbing vegetative treatments, and prescribed fire within the proximity of the wildlife areas disclosed in Table 4.19. Under Alternative A, the least amount of surface restrictions are proposed to protect wildlife on BLM lands, while the most surface restrictions would be implemented under Alternative B.

Table 4.19: Proposed Surface Restrictions (acres) to Protect Wildlife on BLM Lands within the Planning Area, by Alternative

Surface Restrictions	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Raptor nest buffers (March 1–June 30)	0	48,415	22,136	8,300
Big game winter range (November 15–April 30)	0	189,290	189,290	0
Prairie dog towns	0	5,127	1,999	216
Wildlife habitat projects	0	725	725	0

Some wildlife management decisions common to all alternatives would benefit fire management on BLM lands in the Planning Area. Dispersed camping in riparian areas would be restricted under all alternatives, which would slightly reduce the likelihood of human-caused wildfire in these areas, as would the implementation of a limited fire suppression policy (and initiation of prescribed fires) where fuels treatments such as thinning, and prescribed fire would increase vegetation productivity and increase forage for wildlife, which is also proposed under all alternatives.

4.2.4.2 Cumulative Impacts

Under the guidance of the RPFO Fire Plan, and fire plans in adjacent BLM Field Offices and U.S. Forest Service Ranger Districts, fuel load reductions, vegetation treatments, and woodland salvaging would reduce the risks of wildland fire within the Planning Area. The Southwest Jemez Mountains Restoration Project would have beneficial cumulative impacts to fire management within the Planning Area. The Jemez Mountains are adjacent to the Planning Area; therefore, improved forest conditions in the Jemez Mountains could result in a lower chance of high-intensity wildfires starting in the Jemez Mountains and spreading to BLM lands in the Planning Area. Similarly, the Valles Caldera Landscape Restoration and Management Plan and the proposed fire and fuel treatments across lands in New Mexico could have beneficial impacts to BLM forests and woodlands in the Planning Area because the threat of high-intensity wildfires would be reduced on a landscape level. These project areas total approximately 500,000 acres across north-central New Mexico.

Adverse impacts to fire management could occur from projects that increase the amount of urban development within the Planning Area, thereby increase the number of WUI acres adjacent to BLM lands. The Northwest Loop Road may require a right-of-way permit from the RPFO, depending on the final alignment of the proposed project. The final width of the right-of-way is not known, but the length of the proposed project is approximately 39 miles. The proposed Northwest Loop Road could lead to increased WUI lands in the Planning Area, however, the amount of development that would occur from the proposed road and the relative risk are speculative at this time.

Map 005-FMU (11x17)

Map 006-FRCC (11x17)

4.2.5 Forests and Woodlands

Table 4.20 shows the number of acres potentially open to forest product removal and those areas where such activities would be prohibited under each alternative. It is important to note that the alternatives give a maximum number of acres that would be considered for the location of individual forest product harvest areas over the next twenty years on BLM lands within the Planning Area. Decisions made under this RMP/EIS related for forests and woodlands would not automatically open all acres listed in Table 4.20 to harvesting. The acreages listed below represent the BLM land base in the Planning Area available to be designated as specific forest product harvest areas. Site-specific NEPA analysis would be conducted prior to opening a specific area for forest product harvesting. The restricted areas listed below would result in adverse impacts to the harvesting of woodland products. The great majority of this harvesting is casual collection by individuals, such as for firewood, vigas, latillas, Christmas trees, and greenwood cutting.

Table 4.20: Potential Areas Open for Forest Product Harvesting (acres) with a List of Restricted Areas, by Alternative

Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
12,186 acres	119,435 • Riparian areas • ACECs • WSAs • VRM Class I • SRMAs • ERMAs • Wilderness Areas • Sensitive Soils • Lands with wilderness characteristics managed to protect wilderness characteristics	560,321 • Riparian areas • ACECs • WSAs • Wilderness Areas • Lands with wilderness characteristics managed to protect wilderness characteristics	644,132 acres • Wilderness Areas • WSAs

4.2.5.1 Analysis Assumptions

Forest product removal is a permitted multiple use; therefore, a variety of regulations, administrative processes, and best management practices exist to ensure that harvest levels remain sustainable and minimize the chance of adverse impacts to other resources. It is assumed that forest management activities would be carried out in compliance with existing policies and regulations at both the state and federal levels.

It is assumed that forest product removal in areas on BLM land within the Planning Area open to woodland harvesting could have direct and indirect beneficial impacts to the resource because: 1) opportunities would be available for the public to legally harvest wood for a variety of uses, which could reduce the incidence of trespass and timber theft which can cause damage to soils, vegetation and result in the loss of large diameter trees; and 2) managed woodland harvesting (harvesting-related fuel load reductions) could reduce fuel loading and related wildland fire risks in dense woodland stands, thereby reducing the likelihood of a stand replacement fire in ponderosa pine woodlands (USDA 2006) A stand replacement fire in ponderosa could kill old growth and large diameter ponderosa pine and could result in a loss of habitat and forest resources. Additionally harvest or removal of forest and woodland products could have a direct beneficial impact by increasing the diversity and abundance of herbaceous and woody vegetation (Moore 2006). Studies have shown that where dense stands of piñon-juniper have been thinned, understory vegetation increased dramatically on the heaviest thinned plots and the number of vegetation species present also increased significantly. (Jacobs 2002)

It is also assumed that forest product removal could cause adverse impacts to resources such as wildlife including direct habitat loss, forage loss, habitat degradation, and habitat fragmentation. Short-term indirect, adverse impacts of wood gathering on wildlife species and their habitats could include trampling and removal of native vegetation, which result in habitat degradation that can include reduced prey species, forage species, and cover. The criteria for impacts analysis were the number of acres available and unavailable for woodland harvesting on BLM lands within the Planning Area.

The RMP/EIS prohibits the harvest of riparian species such as cottonwood and willow (except for limited Native American uses). Harvest of these riparian species is therefore not analyzed further.

4.2.5.2 Direct and Indirect Impacts

4.2.5.2.1 Fire Management Decisions

One of the main goals of the forests and woodlands program is to restore forests and woodlands to the pre-fire-suppression range of historic variability for species composition, age, size, and density classes. Fire management decisions would support this goal and thereby provide a beneficial impact to forests and woodlands. In terms of harvesting of forest products, fuels treatments on BLM lands within the Planning Area could lead to improved forest conditions and harvest areas. Under all alternatives, approximately 32,000 acres of land rated FRCC 2 or 3 would be treated annually on BLM lands in the Planning Area depending on budgetary and time constraints. As a result, fire management decisions would provide beneficial impacts to forest and woodland resources equally across all alternatives. Short-term adverse impacts from fire management decisions would include removal of vegetative cover resulting from fuels treatments.

4.2.5.2.2 Forests and Woodlands Decisions

Forest and woodland management decisions could have a beneficial impact to forest health. Goals and objectives of the forests and woodlands program not only focus on harvesting of forest products, but also on managing forested areas for ecosystem health, including but not limited to wildlife habitat, watershed processes, and riparian restoration and enhancement. Under all

alternatives, the RPFO would consider the New Mexico Forest Restoration Principles (NMBETF 2006) and the New Mexico Forest and Watershed Health Plan (NMSF 2004). In addition, the RPFO would consider forest health indicators, crown condition, down woody material, and tree growth when making forest and woodland management decisions. For example, forest restoration projects would be co-located within areas for forest product harvest, where appropriate. Additionally, impacts from forest and woodland decisions vary in scale and scope, depending on the alternative. Under Alternative A, the least amount of acres would be open for forest product removal so Alternative A would have the least impact. Under Alternatives B, C, and D, progressively more lands are available for forest product removal; therefore, Alternative D would have the greatest amount of both potentially beneficial and adverse impacts. In other words, the least amount of both beneficial and adverse impacts likely to occur are under Alternative A, followed by B, C, and D. Since D has the most land open to forest products removal, the likelihood of adverse impact occurring is probably at its greatest.

4.2.5.2.3 Mineral Resources Decisions

Mineral resources management decisions would have minimal impacts to forests and woodlands in forest product harvest areas. Areas where mineral extraction would occur, mineral operators would remove forest products and make them available to authorized users..

According to the RFD, development of leasable, saleable, and locatable mineral resources would contribute to surface disturbance equating to 1.1% of BLM lands in the Planning Area over the next twenty years. It is anticipated that mineral extraction activities would be located in areas that avoid impacts to forests and woodlands. Site-specific NEPA analysis would be completed for applications for disturbance, thereby reducing opportunities for direct adverse impacts related to this disturbance. Table 4.21 shows the acres of forest and woodlands that would be managed as NSO, TL/CSU, or closed to oil and gas leasing.

Table 4.21: Forest and Woodlands (acres) Proposed as NSO, TL/CSU, or Closed to Oil and Gas Leasing, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Ponderosa pine	32	352	352	352
Piñon-juniper	17,247	45,647	45,412	43,913
Riparian/Wetland	152	446	444	403
Shrub, steppe, scrub	45,787	154,292	153,493	148,452
Total	**63,218**	**200,737**	**199,701**	**193,120**

Table 4.22 shows the acres of forest and woodlands that would be closed to saleable minerals.

Table 4.22: Forest and Woodlands (acres) Proposed as Closed to Saleable Mineral Extraction, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Ponderosa pine	2,345	3,235	3,235	2,904
Piñon-juniper	35,420	47,025	39,619	37,208

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Riparian/Wetland	904	1,335	1,187	1,123
Shrub, steppe, scrub	45,720	80,615	57,869	45,387
Total	**84,389**	**132,210**	**101,910**	**86,622**

Table 4.23 shows the acres of forest and woodlands that would be withdrawn from locatable mineral entry.

Table 4.23: Forest and Woodlands (acres) Proposed as Withdrawn from Locatable Mineral Entry, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Ponderosa pine	0	3,275	3,275	560
Piñon-juniper	722	59,684	59,758	4,034
Riparian/Wetland	103	1,291	1,256	348
Shrub, steppe, scrub	10,890	147,194	140,230	14,436
Total	**11,715**	**211,444**	**204,519**	**19,378**

The RPFO has proposed two leasing stipulations (see Appendix H) that would: 1) protect ponderosa pine; and 2) require reclamation of abandoned well pads in newly leased areas, as described under Alternatives B and C. These stipulations would minimize impacts to forest and woodlands from mineral resource decisions.

4.2.5.2.4 Travel Management Decisions

Travel management decisions would have both beneficial and adverse impacts to forests and woodlands. Areas closed to motorized travel would reduce public access to forest product harvest areas. Areas open to travel have the potential to adversely impact forest health conditions by allowing off-road cross-country travel to occur within forest and woodlands. Under Alternatives C and D, the most acres would be open to motorized travel. Areas limiting travel to existing roads and trails would provide access to forest product harvest areas while minimizing adverse impacts to understory vegetation in forests and woodlands. Table 4.24 shows the proposed travel management decisions, by alternative, within forest product harvest areas.

Table 4.24: Proposed Travel Management Decisions within Forest Product Harvest Areas (acres)

Category	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Closed	0	270	81	52
Open	0	24	18,269	19,456
Limited	12,186	119,141	541,971	624,624
Total	12,186	119,435	560,321	644,132

4.2.5.3 Cumulative Impacts

The reasonably foreseeable future actions would have long-term beneficial cumulative impacts to forest and woodland resources. Forest restoration treatments by the USFS, State Land Office, New Mexico State Forestry, and other BLM field office activities such as hazardous fuel reductions, vegetation treatments, and forest product removal, would reduce the risks of wildland fire and long-term loss of woodland resources and productivity within the Planning Area USDA 2006). The preponderance of research indicates that these activities (including stand thinning and salvage of dead, diseased, and infested trees) would also improve forest and woodland ecological conditions (Allen 2002, Davenport 1998, Miller 2001, Moore 2006).

Across the landscape, regardless of land ownership, past land management actions have resulted in increased tree densities and decreased spatial and vegetative diversity. Past, current, and future forest restoration efforts by state and federal agencies will have the cumulative effect of improved forest health across the landscape NMSF 2004). Restoring herbaceous vegetation, shrubs and browse, as well reducing tree densities and improving the health of old growth by reducing competition will have a beneficial impact on forest health (USDA 1999). These actions will reduce the adverse impact of insects and disease and severe wildfire across a broad landscape over time.

There are currently, and have been, a number of forest restoration and fuels reduction projects on USFS-managed lands adjacent to and within the vicinity of the planning area. Specifically, the Southwest Jemez Mountains Restoration Project and the Valles Caldera Landscape Restoration Project would have beneficial cumulative impacts to forests and woodlands near the Planning Area. The Jemez Mountains are adjacent to the Planning Area; therefore, improved forest health in the Jemez Mountains could result in healthier forests and woodlands managed by the BLM. Ongoing forest restoration efforts by the USFS in the Mt Taylor and Zuni Mountain areas will add to the BLM work in the planning area by enlarging the landscape area receiving forest treatments. Since 1992, the District has had program to reduce tree densities in Piñon-Juniper woodlands. Tree densities were reduced and seeding with native grasses and forbs. The planning area for these projects account for approximately 500,000 acres of forest restoration within and near the RMP Planning Area. The BLM estimates that federal and state agencies would treat up to 206,800 acres with prescribed fire, 35,900 acres with mechanical treatments, and 10,000 acres with chemical treatments over 20 years (BLM 2004).

Map-007-Forestry-1A (11x17)

Map-008-Forestry-1B (11x17)

Map-009-Forestry-1C (11x17)

Map-010-Forestry-1D (11x17)

4.2.6 Health and Safety

Under all of the alternatives, environmental conditions, as well as public health and safety, would be protected as a result of the BLM hazardous materials management practices. Authorized uses of hazardous materials would adhere to federal and state requirements to reduce or eliminate impacts. BLM procedures (including leasing stipulations), as well as state and local agencies, would address accidental events and unauthorized use. These procedures would help minimize public exposure and environmental impacts to the extent possible.

4.2.6.1 Direct and Indirect Impacts

4.2.6.1.1 Mineral Resources Decisions

Impacts to health and safety would include exposure from mineral extraction and abandoned mine lands (AML). Mineral extraction activities could pose a risk to health and safety in the following ways:

- The installation of pipelines and supporting services for pipelines (e.g., compressor stations) would be necessary for oil and gas development. Pipelines and their associated features have the potential to leak or spill oil, gas, natural gas, condensate, or other hazardous materials. The companies installing and operating pipelines in the Planning Area are responsible for understanding and abiding by the applicable laws and regulations. The RPFO would be responsible for inspecting and monitoring these operations to ensure that these companies are in compliance with all applicable laws and regulations.
- Mineral development activities would increase the instances of transportation. Transportation (e.g., trucking) companies are responsible for understanding and abiding by all applicable transportation laws and regulations.
- The potential exists for gas flow line leakage or ruptures during natural gas extraction and processing. U.S. Department of Transportation (DOT) data indicate that an average of one rupture annually should be expected for every 5,000 miles of pipeline (Office of Pipeline Safety 2005). More than 50% of pipeline ruptures occur as a result of heavy equipment striking the pipeline. Such ruptures would potentially cause a fire or explosion if a spark or open flame ignited the natural gas escaping from the pipeline.
- Pipeline design, materials, maintenance, and abandonment procedures are required to meet the standards set forth in DOT regulations (49 CFR Part 192, Transportation of Natural Gas by Pipelines).
- Well fires are rare but can occur under certain conditions, and a well fire could result from a blowout during drilling activities or from a gas leak during extraction operations. Conditions that would cause gas accumulation in a confined space and ignition by a spark would likely produce a well fire.
- The potential risks associated with oil and gas development include geologic hazards. These hazards include natural gas seepage, hydrogen sulfide releases, abnormally high gas pressure, seismic activity, fires, and explosions.

The RPFO recognizes the need to identify and address physical safety and environmental hazards at all AML sites on public lands. Under all alternatives, AML sites would be prioritized

for remediation and closure, based on physical safety, watershed protection, and funding by other agencies. Reclamation of AML sites would be completed under all alternatives, when funding is available. These reclamation activities would have beneficial impacts to soil and water resources, vegetative communities, and wildlife and fisheries. AML would be considered in future recreation management area designations, land use planning, and all applicable use authorizations. Under Alternatives B, C, and D, the RPFO would implement a leasing stipulation that places NSO restrictions on areas managed for maintenance of public health and safety. The objective of the stipulation is to protect public health and safety in areas managed for this value.

In conformance with the BLM's long-term strategies and national policies regarding AML, this RMP/EIS recognizes the need to work with partners toward identifying and addressing physical safety and environmental hazards at all AML sites on public lands.

4.2.6.1.2 Special Designations Decisions

Special designations would have a beneficial impact to health and safety because of management restrictions that are applied within the boundaries of the particular designation. Mineral resource management decisions would be restricted within special designations by leasing stipulations and restrictions on saleable and locatable mineral extraction, which also indirectly protect health and safety. ACECs and National Scenic Trails are the two special designations that are proposed in the RMP/EIS. The only National Scenic Trail on BLM lands within the Planning Area is the CDT.

Specifically, the Legacy Uranium Mines ACEC would have beneficial impacts to health and safety because the ACEC would manage fifty acres of legacy uranium mines to reduce potential public exposure to the mines. Under Alternatives B, C, and D, the ACEC would be managed as NSO, closed to the extraction of saleable minerals and motorized travel, and granting of rights-of-way would be avoided in the ACEC. The ACEC would remain open to locatable mineral entry under Alternatives B, C, and D.

Table 4.25 provides the proposed number and acres of special designations, by alternative. Under Alternative B, the most acres would be managed for special designations, while under Alternative D, the least acres would be managed for special designations.

Table 4.25: Proposed Special Designations (quantity and acres) within the Planning Area, by Alternative

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACECs managed for health and safety	0 ACEC	1 ACEC 50 acres	1 ACEC 50 acres	1 ACEC 50 acres
ACECs managed for other values	10 ACECs 53,765 acres	17 ACECs 149,924 acres	17 ACECs 136,979 acres	9 ACECs 42,849 acres
WSA/Wilderness Area	97,963 acres	97,963 acres	97,963 acres	97,963 acres
CDNST	1 trail 11,474 acres	1 trail 38,808 acres	1 trail 23,607 acres	1 trail 11,474 acres
Total special designations in Planning Area	137,720 acres	185,625acres	178,000 acres	126,392 acres

4.2.6.2 Cumulative Impacts

Mineral development, including uranium mine development, within the Planning Area would increase vehicular traffic. City and county use plans for surrounding communities could have cumulative effects, whereby mineral resources are in development adjacent to BLM lands. State lands, including the SLO, that are surrounded by BLM lands could have impacts from inholding development.

4.2.7 Lands and Realty

Impacts to the lands and realty program stem from those resource decisions that limit or hinder permitting rights-of-way or other land use authorizations, affect the BLM's ability to acquire and dispose of land, or make other land tenure adjustments. Rights-of-way are issued for the placement of pipelines, roads, sites, and transmission lines. Within this DRMP/DEIS, such decisions primarily result from and are affected by management actions from minerals, special designations, and lands with Wilderness characteristics, as well as lands and realty itself. In addition, the wildlife, vegetation, recreation, riparian, soils/watersheds, visual resources, special-status species, and cultural resources programs collectively impact the lands and realty program through a variety of restrictions on surface-disturbing activities and availability of lands for disposal. As such, potential impacts from these program decisions will be analyzed in this section.

4.2.7.1 Analysis Assumptions

The following assumptions were used to complete the impacts analysis for lands and realty:

1. The number of land use authorizations would increase over the life of the plan.
2. Existing withdrawals to other federal agencies would continue.
3. Land acquisition is a support function for resources programs (e.g., cultural resources, wildlife, recreation). The resource program benefiting from the acquisition establishes the priority or the urgency associated with any acquisition.

4.2.7.2 Direct and Indirect Impacts

4.2.7.2.1 Proposed Land Tenure Adjustments

Impacts to the lands and realty program stem from those resource decisions that limit or hinder permitting rights-of-way or other land use authorizations affect the BLM's ability to acquire and dispose of land, or make other land tenure adjustments. Rights-of-way are issued for the placement of pipelines, roads, sites, and transmission lines. Within this DRMP/DEIS, such decisions primarily result from, and are affected by, management actions from minerals, special designations, and lands with wilderness characteristics, as well as lands and realty itself. In addition, the wildlife, vegetation, recreation, riparian, soils/watersheds, visual resources, special-status species, and cultural resources programs collectively impact the lands and realty program through a variety of restrictions on surface-disturbing activities and availability of lands for disposal. As such, potential impacts from these program decisions will be analyzed in this section.

Table 4.26: Proposed Land Tenure Adjustments (acres and percent of BLM lands in the Planning Area), by Alternative

Status	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Disposal	55,384	57,472	58,910	62,051
Retention	689,003	686,915	685,477	682,336
Total	**744,387**	**744,387**	**744,387**	**744,387**

Under Alternative D, the RPFO would dispose of the largest percentage of BLM lands, while under Alternative A, the RPFO would retain the most. Additional acreage may be considered for disposal by the RPFO if the parcels under consideration meet the criteria listed in Chapter 2. The RPFO may also pursue land acquisitions within the Planning Area over the next twenty years in order to meet land management goals. Land tenure adjustments not disclosed in the RMP/EIS would be analyzed through site-specific NEPA documents. Additionally, while identified as potentially suitable for disposal, at the implementation stage site-specific analysis with public participation would be conducted. Based on the analysis and public comments received, a determination would be made on whether disposal of the parcel is in the public's best interest. If it is not in the public's best interest, the parcel will be retained in public ownership.

4.2.7.2.2 Right-of-way Exclusion and Avoidance Areas

Chapter 2 provides a detailed list of exclusion and avoidance areas for pipeline, roads, sites, and transmission rights-of-way on BLM lands within the Planning Area. The designation of avoidance areas would require potential applicants to avoid these areas if at all possible when planning for the location of rights-of-way. If the applicant's proposal is unable to avoid these areas, special stipulations and mitigating measures would be incorporated into the authorization to minimize potential adverse impacts. There are few existing rights-of-way currently authorized in exclusion areas. New proposals for rights-of-way in exclusion areas would either be rerouted or dropped from consideration. In addition, any applications for rights-of-way within VRM III areas may also require mitigation as determined during the site-specific NEPA process. Existing rights-of-way would remain in effect. Table 4.27 provides the number of acres of BLM lands within the Planning Area that would be excluded or avoided from consideration for rights-of-way for transmission lines, by alternative. Readers should note that the quantities provided in Table 4.27 should not be aggregated because many of the resource areas and special designations overlap.

Table 4.27: Exclusion or Avoidance Areas for Transmission Line Rights-of-way (acres) on BLM lands within the Planning Area, by Alternative

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
100-year floodplains	0	10,891	0	10,891	0	10,891	0
ACECs	0	0	133,493	123,167	0	38,368	0
Cave/Karst areas	0	0	189,045	189,045	0	189,045	0
Critical habitat for federal threatened and endangered species (designated and proposed)	0	None currently on BLM lands					

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
Habitat for BLM sensitive plant and animal species (includes rare plants)	0	Data not available					
Habitat for federal listed/ proposed threatened and endangered species for which critical habitat has not been designated	0	Data not available					
Habitat for federal candidate species	0	Data not available					
Habitat State-listed as crucial/sensitive	0	31,164	0	31,164	0	31,164	0
Lands with wilderness characteristics	0	0	37,514	4,075	26,110	0	2,239
National Scenic and Historic Trails	11,474	38,808	0	23,607	0	11,474	0
Soils, highly erodible (per sensitive soils definition) and all slopes >15%	0	543,280	0	543,280	0	543,280	0
TCPs*	0	37,398	0	37,398	0	37,398	0
VRM Class I	97,645	0	97,296	0	97,474	0	97,516
VRM Class II	84,449	318,931	0	68,511	0	21,549	0
Wetlands and riparian areas	0	1,359	0	1,359	0	1,359	0
Wilderness Areas	11,183		11,183		11,183		11,183
WSAs	86,780	0	86,780	0	86,780	0	86,780

* Mount Taylor is the only TCP quantified in this table due to data availability. Other TCPs are known to exist on BLM lands in the Planning Area, but data are not available for quantification at this time.

Table 4.28 provides the number of acres of BLM lands within the Planning Area that would be excluded or avoided from consideration for rights-of-way for roads and pipelines, by alternative. Readers should note that the quantities provided in Table 4.28 should not be aggregated because many of the resource areas and special designations overlap.

Table 4.28: Exclusion or Avoidance Areas for Roads and Pipeline Rights-of-way (acres) on BLM lands within the Planning Area, by Alternative

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
100-year floodplains	0	10,891	0	10,891	0	10,891	0
ACECs	0	0	133,493	123,167	0	38,368	0
Cave/Karst areas	0	0	189,045	189,045	0	189,045	0
Critical habitat for federal	0	None currently on BLM lands					

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
threatened and endangered species (designated and proposed)							
Habitat for BLM sensitive plant and animal species (includes rare plants)	0	Data not available					
Habitat for federal listed/ proposed threatened and endangered species for which critical habitat has not been designated	0	Data not available					
Habitat for federal candidate species	0	Data not available					
Habitat State-listed as crucial/sensitive	0	31,164	0	31,164	0	31,164	0
Lands with wilderness characteristics	0	0	37,514	4,075	26,110	0	2,239
National Scenic and Historic Trails	11,474	38,808	0	23,607	0	11,474	0
Soils, highly erodible (per sensitive soils definition) and all slopes >15%	0	543,280	0	543,280	0	543,280	0
TCPs*	0	37,398	0	37,398	0	37,398	0
VRM Class I	97,645	0	97,296	0	97,474	0	97,516
VRM Class II	84,449	318,931	0	68,511	0	21,549	0
Wetlands and riparian areas	0	1,359	0	1,359	0	1,359	0
Wilderness Areas	11,183		11,183		11,183		11,183
WSAs	86,780	0	86,780	0	86,780	0	86,780

* Mount Taylor is the only TCP quantified in this table due to data availability. Other TCPs are known to exist on BLM lands in the Planning Area, but data are not available for quantification at this time.

Table 4.29 provides the number of acres of BLM lands within the Planning Area that would be excluded or avoided from consideration for rights-of-way for roads and pipelines, by alternative. Readers should note that the quantities provided in Table 4.29 should not be aggregated because many of the resource areas and special designations overlap.

Table 4.29: Exclusion or Avoidance Areas for Sites Rights-of-Way (acres) on BLM lands within the Planning Area, by Alternative

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
100-year floodplains	0	10,891	0	10,891	0	10,891	0
ACECs	0	0	133,493	123,167	0	38,368	0
Cave/Karst areas	0	0	189,045	189,045	0	189,045	0
Critical habitat for federal threatened and endangered species (designated and proposed)	0	None currently on BLM lands					
Habitat for BLM sensitive plant and animal species (includes rare plants)	0	Data not available					
Habitat for federal listed/ proposed threatened and endangered species for which critical habitat has not been designated	0	Data not available					
Habitat for federal candidate species	0	Data not available					
Habitat State-listed as crucial/sensitive	0	31,164	0	31,164	0	31,164	0
Lands with wilderness characteristics	0	0	37,514	4,075	26,110	0	2,239
National Scenic and Historic Trails	11,474	0	38,808	0	23,607	0	11,474
Soils, Highly erodible (per sensitive soils definition) and all slopes >15%	0	0	543,280	543,280	0	543,280	0
TCPs*	0	37,398	0	37,398	0	37,398	0
VRM Class I	97,645	0	97,296	0	97,474	0	97,516
VRM Class II	84,449	318,931	0	68,511	0	21,549	0
Wetlands and riparian areas	0	1,359	0	1,359	0	1,359	0
Wilderness Areas	11,183		11,183		11,183		11,183
WSAs	86,780	0	86,780	0	86,780	0	86,780

* Mount Taylor is the only TCP quantified in this table due to data availability. Other TCPs are known to exist on BLM lands in the Planning Area, but data are not available for quantification at this time.

Table 4.30 provides the total acres avoided or excluded from consideration for transmission lines, roads, pipelines, and sites rights-of-way, by alternative.

Table 4.30: Total Exclusion or Avoidance Areas for Rights-of-Way (acres), by Alternative

Right-of-way Type		Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Pipeline	Open	681,354	6,346	24,088	32,105
	Avoid	0	400,345	596,025	611,844
	Exclude	75,720	337,696	124,274	100,438
Roads	Open	681,354	6,346	24,088	32,105
	Avoid	0	400,345	596,025	611,844
	Exclude	75,720	337,696	124,274	100,438
Sites	Open	681,354	6,346	24,088	32,105
	Avoid	0	77,685	468,969	486,788
	Exclude	75,720	660,356	251,330	225,494
Transmission lines	Open	681,354	6,346	24,088	32,105
	Avoid	0	400,345	596,025	611,844
	Exclude	75,720	337,696	124,274	100,438

4.2.7.3 Cumulative Impacts

City and county use plans could have cumulative impacts where land is developed adjacent to BLM lands. The RPFO is unaware of any conflicts between neighboring city or county land use plans in the Planning Area.

The number of land use authorizations, particularly rights-of-way and permits, is a function of demand for these uses. Additional future development of adjacent federal, state, and private lands would likely result in additional requests for and approval of land use authorizations for facilities such as roads, utilities, and communication sites.

The designation of right-of-way avoidance and exclusion areas on BLM lands, along with similar restrictions on right-of-way development on adjacent lands, particularly National Forest lands, would have a cumulative impact of reducing routing options for right-of-way facilities such as utilities and roads.

The N55 Road Improvement Project, referenced in Table 4.3, would require approval of a right-of-way application submitted by the Bureau of Indian Affairs. This proposed project follows along an existing route and right-of-way within the Planning Area. The proposed project size for the N55 Road Improvement Project is approximately 550 acres. The Northwest Loop Road may require a right-of-way permit from the RPFO, depending on the final alignment of the proposed project. The final width of the right-of-way is not known, but the length of the proposed project is approximately 39 miles. A new transmission corridor potentially designated by RETA may require a right-of-way permit from the RPFO. The latter two projects would be new construction within the Planning Area.

Map-011-Disposal-Areas-A (11x17)

Map-012-Disposal-Areas-B (11x17)

Map-013-Disposal-Areas-C (11x17)

Map-014-Disposal-Areas-d (11x17)

Map-015-ROW-Pipeline-Alt.B (11x17)

Map-016-ROW-Pipeline-Alt.C (11x17)

Map-017-ROW-Pipeline-Alt.D (11x17)

Map-018-ROW-Roads-Alt.B (11x17)

Map-019-ROW-Roads-Alt.C (11x17)

Map-020-ROW-Roads-Alt.D (11x17)

Map-021-ROW-Sites-Alt.B (11x17)

Map-022-ROW-Sites-Alt.C (11x17)

Map-023-ROW-Sites-Alt.D (11x17)

Map-024-ROW-Transmission-Lines-Alt.B (11x17)

Map-025-ROW-Transmission-Lines-Alt.C (11x17)

Map-026-ROW-Transmission-Lines-Alt.D (11x17_

4.2.1 Lands with Wilderness Characteristics

Lands with wilderness characteristics are areas of 5,000 acres or more with landscapes generally in a natural or undisturbed condition. These areas also provide outstanding opportunities for solitude or primitive forms of recreation (non-motorized and non-mechanized activities in undeveloped settings). Generally, actions that create surface disturbance impact the natural character of these areas and the setting for experiences of solitude and primitive recreational activities. Motorized uses in these areas detract from opportunities for both solitude and primitive forms of recreation.

In 2010, the wilderness inventory of the RPFO was updated. The update identified 37,514 acres of lands with wilderness characteristics beyond those areas already in Wilderness or WSA status. There are seven individual areas identified as: Petaca Pinta A; Ignacio Chavez A, B, and C; Chamisa E; Volcano Hill, and Cimarron Mesa. Under Alternatives A and D, lands with wilderness characteristics are not proposed for management to retain those wilderness characteristics. Under Alternative B, 37,514 acres would be managed to protect wilderness characteristics, while 26,110 acres would have wilderness characteristics protected under Alternative C. 4,075 acres would be managed to partially protect wilderness characteristics in Alternative C. Lands with wilderness characteristics would be impacted by fire management, livestock grazing, mineral resources, travel management, visual resources, and forest and woodland decisions.

4.2.1.1 Direct and Indirect Impacts

4.2.1.1.1 Fire Management Decisions

Under all alternatives, the BLM would attempt to restore natural fire regimes in fire-dependent and adapted ecosystems through the use of prescribed or managed wildland fire. Fuels treatment and management activities would be consistent with the resource goals and objectives in the DRMP/DEIS and may include mechanical treatments, manual treatments, prescribed fire, chemical, or biological treatments and seeding.

The restoration of fire-dependent and adapted ecosystems would restore a more natural vegetation community (in both species and composition) and would benefit forest health, watersheds and wildlife populations that depend on those communities. Fire operations (aircraft over-flights, fire line construction, thinning, etc.) would temporarily degrade the natural landscape and character of the lands with Wilderness characteristics. The noise and presence of the people, equipment, and operations would also temporarily diminish opportunities for solitude and primitive forms of recreation.

In the long term, surface disturbance associated with the fire treatment would be restored, with little to no net effect on naturalness. A more natural landscape would benefit the natural character of lands with Wilderness characteristics and enhance the setting and opportunities for primitive forms of recreation, including hiking, backpacking, hunting, wildlife viewing, and nature study. Fire management would enhance the natural conditions of these areas. Table 4.44 shows the acres within lands with Wilderness Characteristics that would be subject to fuels treatments.

Table 4.31: Fuel Treatment Areas (acres) within Lands with Wilderness Characteristics

Lands	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Chamisa E	X	2,238	2,238	2,238
Ignacio Chavez A	X	2,050	2,050	X
Ignacio Chavez B	X	1,273	1,273	X
Ignacio Chavez C	X	64	64	X
Petaca Pinta A	X	38	38	X
Volcano Hills	X	14,421	14,421	X
Cimarron Mesa	X	2,406	X	X
Total	X	**22,490**	**20,084**	**2,238**

Note: X indicates no management decisions to manage lands with wilderness characteristic to protect, or to partially protect, wilderness characteristics.

4.2.1.1.2 Livestock Grazing Decisions

Livestock grazing management decisions could have adverse impacts to lands with wilderness characteristics under Alternative C where new facilities may be proposed. It is not anticipated that new facilities are needed within any of these areas. Alternative B would not allow livestock grazing to occur within lands with wilderness characteristics.

Livestock operations can compromise wilderness characteristics, such as naturalness, and opportunities for primitive and unconfined recreation. However, livestock grazing has been ongoing on those lands proposed for management as wilderness and the land continues to have wilderness characteristics.

Table 4.45 shows livestock grazing areas (acres) that are proposed within lands with wilderness characteristics. Proposed livestock grazing would only impact lands managed for wilderness characteristics under Alternatives B and C because only under these two alternatives would such lands be managed for wilderness characteristics. Under Alternative B, livestock grazing would be prohibited in lands managed to protect wilderness characteristics. Livestock grazing would be allowed under Alternative C.

Table 4.32: Livestock Grazing Areas (acres) within Lands with Wilderness Characteristics

	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Chamisa E	X	0	2,202	2,202
Ignacio Chavez A	X	0	2,462	X
Ignacio Chavez B	X	0	1,541	X
Ignacio Chavez C	X	0	72	X
Petaca Pinta A	X	0	38	X
Volcano Hills	X	0	23,833	X
Cimarron Mesa	X	0	X	X
Total	X	0	30,148	X

4.2.1.1.3 Mineral Resources Decisions

The greatest number of acres (37,514 acres) would be excluded from mineral development under Alternative B due to the protection of wilderness characteristics. This would have a beneficial impact on the preservation of wilderness characteristics. Under Alternative C, 26,110 acres of lands where wilderness characteristics would be protected would benefit from exclusion of mineral development. Also under Alternative C, 4,075 acres of lands with wilderness characteristics would be closed to the extraction of leasable minerals, but open to the extraction of saleable and locatable minerals on a case-by-case basis. Considering the low level of predicted development for all minerals within the Planning Area, impacts from mineral resources on land with wilderness characteristics would be minimal.

4.2.1.1.4 Travel Management Decisions

Under Alternative B, the condition of lands with wilderness characteristics would be enhanced, as they would be closed to motorized travel on all 37,514 acres. Under Alternative C, 26,110 acres of lands with wilderness characteristics would be closed to motorized travel, and 4,075 acres would have motorized travel limited to existing primitive routes, which would protect the existing wilderness characteristics. Cimarron Mesa (7,329 acres) would be open to motorized travel under Alternative C, which does not protect wilderness characteristics.

4.2.1.1.5 Visual Resources Decisions

Under Alternative B, the RPFO would manage lands with wilderness characteristics (37,514) as VRM II. VRM Class II objectives would retain the characteristic landscape, allowing for minor changes to the landform and vegetation. This objective would protect the natural condition of the land in non-WSA areas. Under Alternative C, the RPFO would manage all lands with wilderness characteristics except Cimarron Mesa (30,185 acres) as VRM Class II and Cimarron Mesa (7,329 acres) would be managed as VRM Class III. The objective of VRM Class III is to partially retain the existing character of the landscape, allowing for moderate changes to land and vegetation. When lands with wilderness characteristics are managed to VRM Class III, wilderness values, such as naturalness, could be compromised. As a result, wilderness characteristics may be adversely impacted under Alternative C.

4.2.1.1.6 Forest and Woodland Decisions

Forest and woodland management decisions would have both beneficial and adverse impacts to lands with wilderness characteristics. Under Alternative B, all lands with wilderness characteristics (37,514 acres) would be closed to forest product removal, which would have a beneficial impact on the “naturalness” and “outstanding opportunities for solitude” wilderness characteristics by preventing vehicle travel to remove wood products in these areas. The impacts from forest and woodland decisions under Alternative B would benefit an additional 1,083 acres of land with wilderness characteristics not otherwise excluded from forest product removal. The other acres of lands with wilderness characteristics fall within SRMAs, which are excluded from forest product removal under Alternative B, but open under Alternative C.

Chamisa E (2,239 acres) would be closed to forest product removal under Alternative C, but the impact from this decision is neutral because there are not fuel wood harvest areas within Chamisa E (Table 4.46). The decision to allow forest product removal on 26,957 acres of lands with wilderness characteristics under Alternative C by limiting travel to existing routes would

have an adverse impact on the "naturalness" and "outstanding opportunities for solitude" characteristics on those lands. The degree of impact would depend upon the frequency of forest product removal on these lands. In most cases, the impact would be small because occasional forest product removal would not be substantially noticeable to the average visitor. No non-WSA areas would be managed for wilderness characteristics under Alternatives A and D. Table 4.46 shows the fuel wood harvest areas located within lands with wilderness characteristics.

Table 4.33: Fuelwood Harvest Areas (acres) within Lands with Wilderness Characteristics

Lands with Wilderness Characteristics	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Chamisa E	X	0	0	0
Ignacio Chavez A	X	0	2,454	2,462
Ignacio Chavez B	X	0	1,232	1,541
Ignacio Chavez C	X	0	72	72
Petaca Pinta A	X	0	0	38
Volcano Hill	X	0	0	23,832
Cimarron Mesa	X	0	7,329	7,329
Total	X	0	11,087	35,274

Note: X indicates no management decisions to manage lands with wilderness characteristics to protect or partially protect wilderness characteristics.

4.2.1.2 Cumulative Impacts

The analysis of cumulative impacts for areas with wilderness characteristics (designated Wilderness, WSAs, and areas identified with wilderness characteristics) includes all BLM lands in New Mexico that are currently being managed for wilderness characteristics to protect those values. The statewide total of BLM lands where law protects wilderness characteristics or administrative decision is 1,125,409 acres. Under Alternatives B, the RPFO would manage 37,514 acres of additional lands to protect wilderness characteristics. Under Alternative C, the RPFO would manage an additional 26,110 acres to protect wilderness characteristics and 4,075 acres of lands to partially protect wilderness characteristics.

4.2.2 Livestock Grazing

Historically, livestock grazing was the single use of BLM lands. Within the Planning Area, the agrarian culture is still alive with many public requests to graze on public lands. Livestock grazing continues to be one of the major uses of public lands. Over time, however, there continues to be a loss of agricultural lands to development and urban sprawl within the Planning Area. The resource impacts analyzed below reflect this continuing trend. Adverse impacts to livestock grazing are anticipated for lands and realty, mineral resources, special designations, travel management, vegetation management (including fire management, riparian resources, and forests and woodlands), recreation, wildlife, special status species and cultural resources management decisions. Beneficial long-term impacts are anticipated from vegetation management, special designations, and travel management resource decisions by increasing the amount of available forage and acres available for livestock grazing.

Grazing would be impacted when all or part of an allotment is closed to livestock grazing (during vegetation treatments, prescribed burning, reforestation, fire, drought or watershed or riparian restoration). Grazing exclusion areas designed to protect riparian habitat for wildlife and sensitive species or to protect cultural or paleontological resources would impact livestock grazing by restricting or altering livestock movement and access to forage. Mineral and energy development would impact livestock grazing in the short and long term by decreasing the amount of grazing acreage available during construction and operation of these facilities. Alternative C would best provide opportunities for grazing while meeting New Mexico Standards and Guidelines for Rangeland Health, followed by Alternative D and then Alternative A; Alternative B provides the least opportunities for grazing. Actions under most resource categories have the potential to affect livestock grazing.

4.2.2.1 Analysis Assumptions

Livestock grazing is a permitted multiple use; therefore, a variety of multi-level regulations and administrative processes exist to ensure that grazing levels do not exceed permitted thresholds and/or standards (BLM 2001). It is assumed that livestock grazing activities would be carried out in compliance with existing policies and regulations at both the state and federal levels.

Impacts on livestock grazing are generally the result of activities that affect forage levels, livestock exclusion, or reduction of allotment acreage. Impact analysis is based on interdisciplinary team knowledge of resources and the planning area, a literature review, and information provided by BLM specialists. Certain assumptions are made, including the following:

Data regarding grazing allotments are compiled from BLM sources;

- Livestock grazing will occur throughout the majority of the decision area.
- The BLM will continue to complete rangeland health assessments in accordance with the New Mexico Standards and Guidelines for Rangeland Health;
- Allotments are monitored yearly, based on allotment priority, resource values, and potential for impacts due to grazing use; and
- Season of use and number of AUMs used are difficult to control on allotments with scattered public parcels surrounded by private land.

Table 4.34 compares the number of allotments grazed, acres grazed, and AUMs available, by alternative. Because the proposed management decisions for livestock grazing under Alternatives B, C, and D are more protective of sensitive resources than the current management under Alternative A, it is expected that rangeland health within grazing allotments would improve under Alternatives B, C, and D.

Table 4.34: Comparison of Proposed Livestock Grazing Alternatives

	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
No. of allotments grazed	204	178*	178–204	178–204
Allotment acres grazed	859,659	708,475	708,475–859,659	708,475–859,659

AUMs available	116,836	97,767	97,767–116,836	97,767–116,836

Note: Acres and AUMs are BLM Land only and are calculated from the Rangeland Administration System (RAS).

* The number of allotments in Alternative B does not reflect the 60 allotments that partially fall within proposed special designations because the allotments would continue to be grazed under Alternative B. However, the portions of the allotments within special designations would be closed to livestock grazing.

Acreages and AUMs are estimates for impacts analysis. Actual numbers are to be determined and calculated at the activity level when specific actions are taken. The purpose of the information presented here is to assist in determining the impacts of programmatic actions under consideration in this planning process on various resources and resource uses.

Range improvements and rangeland projects would continue to be used to design, plan, and implement rangeland management and watershed goals. Reclamation efforts would be designed in compliance with New Mexico Standards and Guidelines (BLM 2001) to provide sufficient livestock forage that maintains or exceeds current allocations.

4.2.2.2 Direct and Indirect Impacts

4.2.2.2.1 Lands and Realty Decisions

The direct impact to livestock grazing from lands and realty decisions is the loss of forage when a parcel is disposed or devoted to a public purpose that precludes livestock grazing. Direct beneficial impacts to livestock grazing include the addition of forage through acquisition of new lands if they are made available to livestock grazing. Most land disposals would involve small isolated parcels, causing minimal impacts to livestock grazing aside from the loss of revenue generated from grazing fees. Under Alternative B, proposed land disposals would result in the loss of the smallest number of grazing allotment acres, while under Alternative D, proposed land disposal would result in the largest. Most acquisitions would be through land exchanges, which would allow for contiguous land parcels. Overall, acquisition through land exchanges would be for lands similar in stocking rate. Table 4.35 shows the number of acres and AUMs that would be lost through proposed land disposals.

Table 4.35: Acres of Grazing Allotments and AUMs Lost by Proposed Land Disposals, by Alternative

	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Acres	44,625	45,774	46,618	49,733
AUMs*	5578	5722	5827	6217

* AUMs were calculated using 8 acres per AUM, which is an RPFO average factor.

In addition to land disposal decisions, rights-of-way could also adversely impact livestock grazing. Rights-of-way for roads, transmission lines, pipelines, or sites may be within grazing allotments and would remove those acres and AUMs from BLM lands in the Planning Area. No specific rights-of-way are proposed in the RMP/EIS. Site-specific NEPA analysis would need to be completed when such projects are proposed.

4.2.2.2.2 Renewable Energy

In addition to land disposal decisions, renewable energy developments could impact livestock grazing through surface disturbance that would remove available forage for the life of project. Renewable energy projects may be within grazing allotments and would remove those acres and AUMs from BLM lands in the Planning Area. No specific renewable energy projects are proposed in the RMP/EIS. Site-specific NEPA analysis would need to be completed when such projects are proposed.

4.2.2.2.3 Vegetation Management Decisions

Vegetation management, as defined for this section, includes any management decisions that are associated with vegetation manipulation: fire management, vegetative communities, riparian resources, and forest and woodland resources. Vegetation management resource decisions would have an adverse short-term impact to livestock grazing that would last from immediately after vegetation treatments occur until revegetation is complete. Vegetation treated within grazing allotments would require rest for a minimum of two years or as determined otherwise by resource managers through consultation and coordination with the permittee or lessee. During this time, the permittee/lessee would need to find alternative forage for livestock, which could result in additional financial expenses to the permittee/lessee. In addition, 1,582 acres of riparian areas would be closed to grazing under Alternative B. Alternatives C and D would allow prescribed grazing to occur within those riparian areas identified in the Riparian and Aquatic Habitat Management EIS (BLM 2000), which is consistent with the New Mexico Standards and Guidelines (BLM 2001). Any future grazing decisions within riparian areas would remain consistent with New Mexico Standards and Guidelines. Under all alternatives, livestock grazing would not be allowed, unless otherwise agreed upon, in exclosures construction within riparian or upland areas under the Habitat Stamp Program.

Site-specific NEPA analysis would need to be completed prior to opening a specific portion of BLM lands to the Planning Area for forest product harvest and fuels treatment projects. During that time, appropriate mitigation measures would be identified to reduce the impact to livestock grazing, if possible.

Table 4.36 shows the total number of acreages proposed for fuel treatment in RPFO grazing allotments, by alternative. Under all alternatives the same amount of acres are proposed for fuel treatment in RPFO grazing allotments.

Table 4.37 shows the number of acres proposed for potential forest product harvest areas within grazing allotments on BLM lands in the Planning Area, by alternative. Under Alternative A, the least amount of acres would be open for product harvest areas, while under Alternative D the most acres would be open for forest product harvest. No specific treatments have been proposed in the RMP/EIS for riparian restoration or upland vegetation. Readers should note that the numbers shown in Table 4.36 and

Table 4.37 should not be aggregated; various vegetation treatments could occur in the same areas. For example, areas that are open to forest product harvest could also be treated with prescribed fire.

Table 4.36: Proposed Fuel Treatments with RPFO Grazing Allotments (acres), by Alternative

Fuels Treatments	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Fuels treatments	497,642	497,642	497,642	497,642
AUMs*	62,205	62,205	62,205	62,205

* AUMs were calculated using 8 acres per AUM, which is an RPFO average factor.

Table 4.37: Proposed Forest Product Harvest Areas (acre), by Alternative

Forest Product Harvest Areas	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Land available for forest products areas	12, 162	76,339	434,873	513,780
AUMs*	1,520	9,542	54,359	64,223

* AUMs were calculated using 8 acres per AUM, which is an RPFO average factor.

Beneficial impacts from vegetation management decisions on livestock grazing would be improved rangeland health. Forage conditions would be expected to improve in areas that are restored, especially when those treatments are planned following the New Mexico Standards and Guidelines (BLM 2001).

4.2.2.2.4 Mineral Resources Decisions

Management decisions to allow mineral resource development would impact livestock grazing because acres and AUMs would be lost in areas where mineral extraction would occur because vegetation would be removed resulting in reduced forage availability. According to the RFD for mineral resources, development of leasable, saleable, and locatable mineral resources would contribute to surface disturbance equating to 1.1% of BLM lands in the Planning Area over the next 20 years, which would equate to 1,075 AUMs. Therefore, it is anticipated that mineral extraction activities would be located in areas to avoid impacts to livestock grazing. Site-specific NEPA analysis would be completed for applications for disturbance, thereby reducing opportunities for direct adverse impacts related to this disturbance. Inadvertent impacts and impacts from vandalism that may accompany increased human activity in developed areas may occur.

4.2.2.2.5 Special Designations Decisions

Special designations would have both adverse and beneficial impacts to livestock grazing. Restrictions on surface-disturbing activities within special designations promote improved vegetative communities and range conditions by reducing the likelihood that forage would be removed through development activities. Many of the ACECs proposed for designation in the RMP/EIS have at least one alternative where NSO is proposed. Under these alternatives, livestock grazing would benefit.

In contrast, many of the ACECs proposed for designation also include elimination or restriction of livestock grazing under some alternatives. Restricting grazing in special designations would adversely impact livestock grazing because it would decrease acres and AUMs available for

livestock grazing. For example, there are seventy-seven permittees/lessees that that manage livestock on BLM allotments within special designations. Under Alternative B, these permittees/lessees would need to find alternative forage for livestock on a permanent basis, which could result in additional financial expenses to the permittee/lessee. Under Alternative C, some permittees/lessees may need to find alternative forage for livestock if the RPFO decides to restrict grazing within certain special designations.

Table 4.38 shows the number of grazing allotment acres impacted by proposed special designation decisions, by alternative. Under Alternative B, the largest number of acres would be closed to livestock grazing. Under Alternatives C and D, the smallest number of acres would be closed to livestock grazing. Readers should note that the numbers shown in Table 4.38 should not be aggregated; various restrictions could occur in the same areas. For example, areas that are NSO for oil and gas development may also be closed to grazing; therefore, there would be no net gain or loss to livestock grazing. This table is meant to show variations in restrictions across alternatives.

Table 4.38: Livestock Grazing Allotments (acres and AUMs) Impacted by Proposed Special Designations and Leasing Stipulations, by Alternative

Special Designation Restriction	Alternative A No Action		Alternative B		Alternative C Preferred		Alternative D	
	Acres	AUMs	Acres	AUMs	Acres	AUMs	Acres	AUMs
Acres (AUMs) closed to grazing	2,750	344	137,627	17,203	0	0	0	0
Acres (AUMs) of prescribed grazing	697,405	87,175	0	0	0–859,659	0-116,836	0-859,659	0-116,836
NSO acres	78,165	N/A	1,064,095	N/A		538,299		125,163

Note: AUMs were calculated using 8 acres per AUM, which is an RPFO average factor.

4.2.2.2.6 Travel Management Decisions

Livestock grazing would have both beneficial and adverse impacts from travel management. Areas open to motorized travel would result in direct loss of vegetation available for livestock grazing and a long-term decrease in rangeland health. In addition, disturbance from motorized travel could preclude livestock from grazing areas with heavier use. Problems with vandalism, fencing, and harassment of livestock are anticipated where urban areas interface with public lands. Under Alternatives C and D, Cimarron Mesa would be open to motorized travel Under Alternative B, the most acres would be closed to motorized travel. Those areas closed to motorized travel would have beneficial impacts to livestock grazing. Table 4.39 shows the proposed travel management decisions by alternative.

Table 4.39: Proposed Travel Management Categories (acres), by Alternative

Category	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Open	303,580	4,551	18,269	19,456

Category	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Limited	420,491	562,596	602,043	624,808
Closed	20,316	177,240	124,075	100,123
Total	744,387	744,387	744,387	744,387

4.2.2.2.7 Recreation and Visitor Services Decisions

Management decisions associated with recreation and visitor services would have adverse impacts to livestock grazing. Approximately 232,242 acres of RPFO grazing allotments are within proposed SRMA or ERMAs on BLM lands in the Planning Area under all alternatives. There are no grazing restrictions proposed within the SRMA or ERMAs except for where SRMA or ERMAs include ACECs. However, if increased recreational activities occur within the SRMA and ERMAs over time, vegetation may be trampled or eliminated in some areas. Livestock grazing would incur minor impacts from vegetation loss associated with recreation depending on the recreational activity.

4.2.2.2.8 Cultural Resources Decisions

Cultural resources management decisions would adversely impact livestock grazing when grazing is restricted to protect cultural resources sites by decreasing the acreage available for grazing. This would reduce acres and AUMs available for livestock grazing. Approximately 95% of BLM lands in the Planning Area include livestock grazing allotments. Based on the prevalence of livestock grazing and site probabilities listed in Table 4.7, it is likely that cultural resources could impact livestock grazing, as more sites are discovered and require protection. Within one cultural resources management area, two high value sites (Ojo Pueblo and the Fort Site) would be closed to grazing in the RMP/EIS. These sites together cover sixty acres and would be closed under all alternatives.

4.2.2.2.9 Special-status Species Decisions

Special-status species management decisions could adversely impact livestock grazing by reducing acres and AUMs when grazing is restricted within wildlife exclosures, breeding habitat, and occupied habitat. Permittees and lessees may be restricted from managing their livestock operation during certain breeding seasons or other time periods established to protect special-status species. Under Alternative B, the BLM would require the placement of water developments, salt supplements, and mineral supplements for livestock to be located at least 0.25 mile away from known locations of special-status plants. Under Alternative C, the BLM would require the placement of water developments, salt supplements, and mineral supplements for livestock to be located at least 152 meters (500 feet) away from known locations of special-status plants. Under Alternative D, the BLM would require the placement of water developments, salt supplements, and mineral supplements for livestock to be located at least ninety-one meters (300 feet) away from known locations of special-status plants. Under Alternatives B, C, and D, the BLM would also consider the concentration of browsing and grazing animals on known locations of special-status plants and make adjustments as needed.

4.2.2.2.10 Livestock Management Decisions

Grazing practices would be modified if a grazing allotment fails to meet any of the New Mexico Standards and Guidelines (BLM 2001), where it is determined that livestock grazing

management practices are a significant factor in this failure. Modifications could include a change in stocking rate, kind of livestock, season of use, length of season, temporary closures, or any combination of these. These modifications could mean a temporary or permanent loss of acres or AUMs available to livestock for grazing in order to repair or rehabilitate an area, and to progress towards meeting the New Mexico Standards and Guidelines. Data collected from rangeland monitoring studies would assist the Field Manager in the decision of whether or not to restrict livestock access to an area. These kinds of closures, although they cause a temporary loss of accessible forage, are implemented with the goal of restoring the area so that it can continue to support grazing and other resource uses. Under all alternatives, certain allotments could undergo season-of-use changes to facilitate grazing management while maintaining rangeland health standards. Changes in season of use do not affect forage, but they do impact the timing of its availability.

4.2.2.3 Cumulative Impacts

Cumulative impacts to livestock and grazing could result from activities on adjacent private lands, activities scheduled for State lands, and administrative actions on adjacent National Forest System and tribal lands. These effects could be both positive and negative on livestock grazing within the Planning Area. Any future land uses in the surrounding areas that degrade ecological function in the Planning Area could reduce forage quality for livestock. Increased surface disturbances from new roads, transmission lines, or energy exploration in the area could result in reduced grazing acreages and introduction of disturbance-colonizing weed species, which could decrease forage quality in the Planning Area. The N55 Road Improvement Project and potential transmission line corridors proposed by RETA referenced in Table 4.3 could reduce the acres available to livestock grazing in existing grazing allotments if the rights-of-way permits are approved. The approximate project area for the N55 Road Improvement Project is 550 acres. There is no known project area for the RETA corridors at this time.

Map-027-Range-Allotments (11x17)

Map-028-Allotments in Planning Area (11x17)

4.2.3 Mineral Resources

Mineral resources include locatable minerals that may be claimed and patented under the 1872 Mining Law, fluid and solid minerals leased for development under the Mineral Leasing Act of 1920, and common-variety mineral materials that may be purchased by private parties or used for free by public agencies and nonprofit groups under the Materials Act of 1947. The preceding laws only apply to federally owned minerals.

The RPFO historically has seen a low level of mineral resource development within the Planning Area. The RFD for leasable, locatable, and saleable minerals estimates that the same low-level trend would continue. As a result, the RPFO would continue to have the ability to adjust future mineral development activities in order to avoid conflicts and protect other resources to the greatest extent possible. The RPFO takes the approach of allowing mineral development to occur where the least amount of conflicts with other resources would be present. This section describes potential impacts to the management of mineral resources from other resource management decisions, including cave and karst resources, lands and realty, cultural resources, lands with Wilderness characteristics, paleontological resources, recreation and visitor services, riparian resources, soil and water resources, special-status species, visual resources, wildlife and fisheries, and special designations.

4.2.3.1 Analysis Assumptions

The following assumptions were used to complete the impacts analysis for mineral resources:

- Oil and gas exploration and development would continue to occur in the Planning Area.
- BLM-administered mineral estate, including split-estate lands, would be managed in cooperation and collaboration with surface owners, lessees, permittees, and operators.
- Leaseholders have the exclusive right to explore, develop, and produce mineral resources from any existing lease, even if the area containing the leases were proposed to be closed to future leasing.
- An existing mineral lease is a legally issued lease secured by a leaseholder before the effective date of the ROD for the RMP/EIS.
- Surface use restrictions, including TL, NSO, and CSU stipulations, as well as closed to leasing, cannot be retroactively applied to existing oil and gas leases or to existing use authorizations (e.g., APDs). Post-lease actions and authorizations (e.g., APDs, road and pipeline rights-of-way, etc.), however, could be encumbered by TL and CSU restrictions on a case-by-case basis, as required through project-specific NEPA analysis or other environmental review.
- Leasable mineral resources would be considered unrecoverable in areas designated closed to leasing, and in those areas open to leasing, where surface use constraints prohibit operations on areas larger than can be technically or economically developed from off-site locations (e.g., large block NSO areas). Leasable mineral resources within leased inholdings would be considered recoverable.
- The four categories of oil, gas, and carbon dioxide development potential are based on the RFD scenario with analysis presented in Section 4.1.3 include:

- High potential for hydrocarbon development indicates areas where all of the following characteristics are present: trapping mechanisms, hydrocarbon sources, and reservoir-quality rock in sufficient quantity to be economic.
- Moderate potential for hydrocarbon development indicates areas where some but not all of the following characteristics are present: trapping mechanisms, hydrocarbon source, and reservoir-quality rock.
- Low potential for hydrocarbon development indicates areas where the geologic characteristics of trapping mechanisms, hydrocarbon sources, and reservoir quality rock indicate low potential for accumulation of mineral resources.
- No potential for hydrocarbon development indicates areas where there is no geologic environment or processes to form trapping mechanisms, hydrocarbon source, and reservoir-quality rock, and the lack of mineral occurrences indicate no potential for accumulation of mineral resources.
- The primary impact to the leasable minerals program from the land use decisions in the RMP/EIS would be reduction in the availability of the hydrocarbon resources for extraction and consumer use. This would result in an increase in the cost to the producer and consumer.
- No coal leasing or development, nor development of coal bed methane, is anticipated because of the low to moderate potential for coal bed methane and the lack of interest in leasing coal on federal lands. There are no expected impacts from coal or coal bed methane to the various resources or resource use opportunities.
- There are no areas of high or moderate potential for CO_2 accumulations in areas closed to leasing or restricted by leasing stipulations. The high and moderate potential CO_2 areas are in the Northern and Southern Estancia Fields, near the town of Mesita and Acoma Pueblo.

4.2.3.2 Direct and Indirect Impacts

The impacts analysis presented for mineral resources briefly describes the impacts from other resources on BLM lands in the Planning Area to moderate and high potential mineral resources areas. At the end of this section, Table 4.46 summarizes the itemized restrictions on mineral development from each resource and provides the amount of lands (acres) on BLM lands within the Planning Area available to mineral extraction, by alternative. Site-specific NEPA analysis would be completed for proposed mineral development within the Planning Area. The RPFO would take into account the details of the proposed project and site-specific resources as part of that analysis.

4.2.3.2.1 Cave and Karst Resources Decisions

Under Alternatives B and C, a leasing stipulation is proposed for protection of cave and karst resources. Under Alternative B, surface disturbance would not be allowed within up to 200 meters (656 feet) of known cave entrances, passages, or aspects of significant caves, or significant karst features. Under Alternative C, the BLM would impose CSU restrictions beyond standard leasing terms for surface disturbance within up to 200 meters (656 feet) of known cave entrances, passages, or aspects of significant caves, or significant karst features. No leasing stipulations are proposed for cave and karst features under Alternatives A and D.

The Pronoun Cave ACEC, which protects the only known cave complex on BLM lands in the Planning Area, would impact mineral resources because the area would have limited mineral extraction opportunities. There are several active travertine mines adjacent to the proposed ACEC boundary and the entire proposed ACEC is covered by unpatented mining claims. The Pronoun Cave ACEC was designated under the 1986 RMP (BLM 1986) and was left open to mineral development. The ACEC would be closed to the extraction of saleable minerals and withdrawn from locatable mineral entry under Alternative B. Alternative C would avoid extraction of saleable minerals. Alternative D would remove the ACEC designation. Under Alternative D, the Pronoun Cave area would be open to the extraction of saleable minerals and locatable mineral entry.

4.2.3.2.2 Lands and Realty Decisions

Disposal of Federal lands would include both the surface and mineral estates. Land acquired by the BLM would be acquired with the mineral estate. Land acquired within special designation areas or with unique resource values would be managed with restrictions on mineral development and other surface-disturbing activities. Under all alternatives, lands acquired within and adjacent to special designations would be managed with the same surface restrictions of the larger special designation. Table 4.40 summarizes the proposed land disposals and their associated mineral potential, by alternative.

Table 4.40: Proposed Land Disposals (acres) with Moderate or High Mineral Potential, by Alternative

Mineral Type	Mineral Potential	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Leasable minerals	Moderate	0	0	0	0
	High	0	0	0	0
Saleable minerals	Moderate	10,838	12,096	12,096	12,347
	High	415	415	657	3,548
Locatable minerals	Moderate	3,753	4,677	5,167	5,235
	High	1,078	1,078	1,115	1,115

4.2.3.2.3 Cultural Resources Decisions

Under all alternatives, a leasing stipulation is proposed that would apply CSU to sites that are listed or are eligible for listing in the NRHP. The lessee would be given notice that all or portions of the lease area contain special values, are needed for special purposes, or require special attention to prevent damage to surface resources. Any surface use or occupancy within such areas would be strictly controlled. In addition, a leasing stipulation is proposed for protection of cultural resources in specially designated areas that are managed for cultural resource values, such as the proposed Canon Jarido ACEC.

Impacts from cultural resources management decisions on oil and gas exploration and development would include increased well development costs associated with cultural resources inventories, relocation of facilities to avoid a cultural site, implementation of directional drilling techniques, and/or site excavation if avoidance of cultural resources sites is not possible. Discovery of previously undocumented cultural features during project construction would delay

project implementation while the cultural site is evaluated. These impacts would not vary across alternatives because the restrictions would apply to all National Register-eligible cultural sites, the existence of which is independent of any management decision.

4.2.3.2.4 Lands with Wilderness Characteristics Decisions

Mineral resources have a low likelihood of being impacted by management decisions related to lands with wilderness characteristics. Lands proposed for management as lands with wilderness characteristics would be closed to extraction of leasable, saleable, and locatable minerals under Alternative B. Alternative C would apply a CSU stipulation to leasable mineral extraction and extraction of locatable and saleable minerals after evaluation on a case-by-case basis. Alternatives A and D do not include lands proposed for management for wilderness characteristics. Areas proposed for management to protect wilderness characteristics fall within either areas of low mineral potential or areas where there is currently no data to inform the mineral potential. As a result of the low potential within the protected areas, the proposed restrictions on mineral development would not result in an actual adverse impact to future mineral resource developments.

4.2.3.2.5 Paleontological Resources Decisions

Mineral resources would be impacted by paleontological resources management decisions that restrict mineral development. The RPFO is proposing to implement an oil and gas stipulation that limits the amount of surface disturbance near paleontological resources. Alternatives B, C, and D would implement CSU in areas of PFYC 4 and 5. A determination by the BLM would be made as to whether a survey by a qualified paleontologist would be necessary prior to disturbance. In some cases, appropriate mitigation measures would be required prior to surface disturbance.

Impacts from paleontological resources management decisions, especially in PFYC 4 and 5 areas, to oil and gas exploration and development would include: increased well development costs associated with potential paleontological inventories; relocation of facilities to avoid paleontological resources; implementation of directional drilling techniques; and/or site excavation if avoidance of certain paleontological sites is not possible. Discovery of previously-undocumented paleontological features during project construction would delay project implementation while the feature is evaluated.

Two ACECs are proposed in the DRMP/DEIS that would protect paleontological resources. Under Alternatives B and C, the Bony Canyon ACEC (1,147 acres) would be designated to protect and allow only professional excavation of vertebrate fossils. The ACEC would not be designated under Alternative D; however, a Research Natural Area (1,147 acres) would be designated which would continue the protection for paleontological resources under this alternative. Under Alternatives B, C, and D, the Bony Canyon ACEC would be NSO for leasable minerals within a two-acre area and CSU in the remaining area, withdrawn from locatable mineral entry, and closed to extraction of saleable minerals. The Torreon Fossil Fauna ACEC (6,488 acres) would be designated under all alternatives. The purpose of the Torreon Fossil Fauna ACEC would be to protect the Torreon Fauna Type Locality for scientific study. Under Alternative A, the Torreon Fossil Fauna ACEC would be CSU for leasable minerals. Under Alternative B, the Torreon Fossil Fauna ACEC would be closed to all mineral development. Under Alternative C, the Torreon Fossil Fauna ACEC would be NSO for leasable

minerals, closed to saleable extraction, and withdrawn from locatable mineral entry. Under Alternative D, the Torreon Fossil Fauna would be CSU for leasable minerals, open to locatable mineral entry, and saleable mineral extraction would be avoided. Table 4.41 summarizes the mineral potential within these ACECs.

Table 4.41: Proposed Torreon Fossil Fauna ACEC and Bony Canyon ACEC (acres) with Moderate or High Mineral Potential, by Alternative

Mineral Type	Mineral Potential	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Leasable minerals	Moderate	2,339	2,339	2,339	2,339
	High	0	0	0	0
Saleable minerals	Moderate	0	0	0	0
	High	0	0	0	0
Locatable minerals	Moderate	0	474	474	474
	High	0	0	0	0

4.2.3.2.6 Recreation and Visitor Resources Decisions

Mineral resources would be impacted by recreation and visitor services management decisions that restrict mineral development within developed recreation areas such as the SRMA and ERMAs. Under Alternatives B and C, a leasing stipulation is proposed for protection of recreation and visitor services. Under Alternative B, surface-disturbing activities would be prohibited (NSO) within the line of sight/sound or 0.25 mile (whichever is closer) of developed recreation areas and undeveloped recreation areas receiving concentrated public use. Under Alternative C, surface-disturbing activities would be prohibited (NSO) within the line of sight/sound or 200 meters (656 feet) (whichever is closer) of developed recreation areas. Alternatives B, C, and D, two stipulations are proposed to protect scenic resource values. All three alternatives have two stipulations, one NSO and one CSU stipulation, either of which could be applied based on site-specific circumstances. Although these stipulations are designed to protect scenic resource values in special designation areas, these stipulations could be applied elsewhere.

Under Alternatives B and C, the SRMA would be managed as NSO and the 21 ERMAs would be managed as CSU for leasable fluid minerals, open to saleable mineral extraction, and withdrawn from locatable mineral entry. Under Alternative D, the SRMA and ERMAs would be managed as CSU for leasable fluid minerals, open to saleable mineral extraction, and open to locatable mineral entry.

4.2.3.2.7 Riparian Resources Decisions

Mineral resources management decisions would be impacted by proposed leasing stipulations for riparian areas on BLM lands within the Planning Area. Under Alternatives B and C, a leasing stipulation is proposed for protection of riparian resources. Under Alternative B, surface-disturbing activities would be prohibited (NSO) within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of riparian and wetland areas. Under Alternative C, surface-disturbing activities would be subject to CSU restrictions within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of

riparian and wetland areas. There are no proposed stipulations to leasing related to riparian areas under Alternatives A and D.

One ACEC is proposed in the DRMP/DEIS that would protect a specific riparian area within the Planning Area. Under all alternatives, the Bluewater Canyon ACEC would be designated to protect the wildlife, scenic, and riparian values in the area. Under all alternatives, the Bluewater Canyon ACEC would be NSO for leasable minerals, closed to saleable mineral extraction, and withdrawn from locatable mineral entry.

Table 4.42 summarizes the mineral potential within riparian areas proposed for protection in the RMP/EIS. Under Alternatives B and C, riparian areas would be protected by leasing stipulations. Riparian areas would be protected by leasing stipulations under Alternatives A and D.

Table 4.42: Riparian Areas (acres) with Moderate or High Mineral Potential Protected by Proposed Oil and Gas Leasing Stipulations, by Alternative

Mineral Type	Mineral Potential	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Leasable minerals	Moderate	0	16,003	16,003	0
	High	0	2,183	2,183	0
	Total	0	18,186	18,186	0
Percent of moderate and high potential areas on BLM lands in Planning Area		0	18%	18%	0

4.2.3.2.8 Soil and Water Decisions

Mineral resources management decisions would be impacted by proposed stipulations for low reclamation potential soils and steep slopes within the Planning Area. Leasing stipulations for steep slopes and low reclamation potential soils are proposed under Alternatives B, C, and D. Alternatives B and C would implement CSU on steep slopes between 15% and 30%, NSO on slopes over 30%, and CSU on soils with low reclamation potential. Alternative D would implement NSO on steep slopes over 30%. The proposed leasing stipulations would protect soils from adverse impacts from leasable mineral resource development. Table 4.43 shows the number of acres of moderate and high potential for leasable minerals on low reclamation potential soils and steep slopes protected by the stipulations described above.

Table 4.43: Sensitive Soils and Steep Slopes (acres) in Moderate and High Potential Areas Proposed for Protection from Oil and Gas Mineral Development, by Alternative

	Alternative A No Action		Alternative B		Alternative C Preferred		Alternative D	
	Mod	High	Mod	High	Mod	High	Mod	High
Low **reclamation** potential (per sensitive soils definition)	0	0	39,741 (CSU)	12,063 (CSU)	39,741 (CSU)	12,063 (CSU)	0	0

	Alternative A No Action		Alternative B		Alternative C Preferred		Alternative D	
	Mod	High	Mod	High	Mod	High	Mod	High
Steep slopes 15%–30%	0	0	3,732 (NSO)	832 (NSO)	3,732 (CSU)	832 (CSU)	0	0
Steep slopes greater than 30%	0	0	1,213 (NSO)	63 (NSO)	1,213 (NSO)	63 (NSO)	1,213 (NSO)	63 (NSO)
Total*	0	0	40,211	12,128	40,211	12,128	1,213	63
Percent of oil/gas moderate and high potential areas	0	0	46%	80%	46%	80%	1%	<1%

*The sums of the acreages cannot be aggregated because the areas subject to these restrictions overlap.

4.2.3.2.9 Special Designations Decisions

Special designations would have impacts to mineral resources. Many of the ACECs proposed for designation include closures for saleable and locatable mineral development or NSO leasing stipulations under at least one alternative. Table 4.44 shows the acres of mineral development restrictions that would be applied to moderate and high mineral potential areas within ACECs, by alternative.

Table 4.44: Proposed Mineral Restrictions (acres of moderate and high potential areas) within Proposed ACECs, by Alternative

Mineral Type	Designation	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Leasable minerals	Open with moderate constraints (TL/CSU)	12,689	636	1,902	13,412
	Open with major constraints (NSO)	727	1,450	2,989	151
	Closed	437	13,167	10,034	0
Locatable minerals	Open	15,915	5,756	13,854	13,567
	Withdrawn	12,982	37,812	17,122	140
Saleable minerals	Closed	15,393	25,980	9,484	9,484
	Open with moderate constraints (Avoid)	37	0	4,433	37
	Open	2,966	0	6,397	1,478

4.2.3.2.10 Special-status Species Decisions

Under all alternatives, the RPFO would conserve and protect ESA-listed species and their critical habitats. The RPFO would also conserve and protect BLM special-status species, which are: 1) species listed or proposed for listing under the ESA; and 2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for

future listing under the ESA, which are designated as BLM sensitive by the State Director(s). All federal candidate species, proposed species, and delisted species in the five years following delisting would be conserved as BLM sensitive species.

All alternatives require some degree of spatial or temporal limitation of surface-disturbing activities to protect special-status species and their important habitats. In the case of mineral resource development, specific conditions of approval or lease terms are often required in order to mitigate the adverse impacts of development activities to special-status species.

Standard lease terms and conditions (lease notices) have been developed in consultation with the USFWS for leasable fluid mineral developments. The terms and conditions consist of specific measures to protect special-status species and comply with the ESA. These measures are required by law, are non-discretionary, and are applicable under all alternatives. The impacts of these non-discretionary measures will not be analyzed in this document, as they are outside the scope of the planning process.

Mineral resources would be impacted by additional, discretionary surface disturbance restrictions that are proposed for special-status species in the RMP/EIS. The RPFO has developed surface-disturbance restrictions for the Gunnison prairie dog in Chapter 2. Under Alternative B, surface-disturbing and disruptive activities would be strictly controlled within 0.5 mile of prairie dog towns if an activity would adversely impact prairie dogs and/or associated species. Under Alternative C, surface-disturbing and disruptive activities would be strictly controlled within 0.25 mile of prairie dog towns if an activity would adversely impact prairie dogs and/or associated species. Under Alternative D, surface-disturbing and disruptive activities would be strictly controlled within prairie dog towns if an activity would adversely impact prairie dogs and/or associated species. No Gunnison prairie dog towns have been specifically identified for protection in the DRMP/DEIS; therefore, the specific impacts to mineral resources caused by the surface disturbance restriction for Gunnison prairie dog towns are unknown. Site-specific NEPA analysis would need to be completed for proposed mineral development activities on BLM lands in the Planning Area.

4.2.3.2.11 Visual Resources Decisions

Mineral resources management decisions would be impacted by VRM decisions. Mineral development activities would be prohibited in VRM Class I areas. Under all alternatives, VRM Class I would be proposed for approximately 13% of BLM lands in the Planning Area. In addition, VRM Class II areas may also restrict mineral development within 11% (under Alternative A), 43% (under Alternative B), 9% (under Alternative C), or 3% (Alternative D) of BLM lands in the Planning Area. In addition, in specially designated areas that are managed for scenic resource values, such as Jones Canyon ACEC, a lease stipulation would be applied to protect these values.

4.2.3.2.12 Wildlife and Fisheries Decisions

All alternatives include some degree of spatial or temporal limitation on surface-disturbing activities to protect wildlife populations and their important habitats. In the case of mineral resource development, specific conditions of approval, lease terms, and/or discretionary measures are often required in order to mitigate the adverse impacts of development activities to wildlife.

The discretionary measures include spatial and temporal limitations and would have an adverse impact to mineral resource development by increasing exploration costs, time, and effort. However, the degree and magnitude of such increases depend on many factors, including the options for project siting, the locale of the lease, and the drilling schedule and window.

The RPFO coordinates with the NMDGF for the purpose of protecting wildlife species. Under all alternatives, mineral resource developers would be required to avoid surface-disturbing activities in occupied migratory bird habitat during the nesting season. This would result in impacts to mineral resources development. Adverse impacts to mineral resource development in terms of extra costs, time, and effort would result.

Under Alternatives B, C, and D, the RPFO would implement a buffer around occupied and unoccupied raptor nests, between March 1 and June 30, where surface-disturbing activities would be prohibited. Under Alternative B, the buffer would be 1 mile, under Alternative C, the buffer would be 0.5 mile, and under Alternative D, the buffer would be 0.25 mile.

Under Alternatives B and C, the RPFO would also implement restrictions on surface-disturbing activities within big game winter range between November 15 and April 30. This would be applied to winter range for mule deer, elk, and antelope. Travel on designated roads may be included in the timing limitations.

Under Alternatives B and C, the RPFO would prohibit surface-disturbing activities within fawning and calving habitat for mule deer, elk, and antelope. The restrictions would occur from May 1 to August 31 for mule deer, May 1 to June 30 for elk, and May 1 to July 15 for antelope. Surface disturbance would also be prohibited near wildlife habitat projects under Alternatives B and C. Both alternatives include a restriction to restrict surface disturbance up to 200 meters (656 feet) of existing or planned wildlife improvement projects. Large-scale vegetation manipulation, such as prescribed burns, would be excepted.

The exact impact of wildlife management decisions common to all cannot be quantified. Exact acreages of habitat to be restricted would depend on the results of field surveys associated with specific projects. However, some general conclusions can be drawn regarding the timing limitation (TL) stipulations. The fall and winter months (i.e., September–February) generally would have the fewest TL stipulations on mineral resources development, while the spring and summer months (i.e., March–August) generally would have the most. The most restrictive months of the year would be April through July, as most TL stipulations would be in effect during that period. Together, these decisions would result in adverse impacts to mineral resources. Table 4.45 provides a summary of the current number of acres of BLM lands in the Planning Area that could be impacted by surface restrictions intended to protect wildlife. Please note that Table 4.45 provides an estimate of the potential impacts based on current conditions in the RPFO's jurisdiction. These estimates may change as new habitat, raptor nests, prairie dog towns, or wildlife habitat projects are surveyed, and the number presented below should not be aggregated because habitats may overlap. Alternative B would place the most restrictions on mineral development due to the size of the buffers and timing restrictions for wildlife. Alternative A would place the least restrictions on mineral development because there are currently no surface-disturbing restrictions in place for wildlife.

Table 4.45: Proposed Surface Restrictions (acres) on High and Moderate Mineral Potential Areas to Protect Wildlife, by Alternative

Surface Restrictions	Mineral Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Raptor nest buffers (March 1–June 30)	Leasable	0	3,811	1,420	521
	Saleable	0	2,370	1,006	316
	Locatable	0	2,951	1,088	316
Big game winter range (November 15–April 30)	Leasable	0	86,872 (NSO)	86,872 (NSO)	86,872 (CSU)
	Saleable	0	36,800 (NSO)	36,800 (NSO)	36,800 (CSU)
	Locatable	0	35,191 (NSO)	35,191 (NSO)	35,191 (CSU)
Prairie dog towns	Leasable	0	474	142	4
	Saleable	0	0	0	0
	Locatable	0	0	0	0
Wildlife habitat projects	Leasable	0	153	153	0
	Saleable	0	144	144	0
	Locatable	0	158	158	0

4.2.3.2.13 Summary of Direct and Indirect Impacts to Mineral Resources

Table 4.46 summarizes the amount of BLM land (acres) within the Planning Area that would be restricted through leasing stipulations, open/closed/avoid decisions for saleable minerals, and open/withdraw decisions for locatable minerals. Under Alternative B, the largest number of acres would be closed to leasable minerals and saleable minerals, and withdrawn from locatable mineral entry. Under Alternative A, the least number of acres would be closed to leasable and saleable minerals. Under Alternative D, the least number of acres would be withdrawn from locatable mineral entry.

Table 4.46: Mineral Resource Development Restrictions (acres), by Mineral Type and Alternative

Mineral Type	Designation	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Leasable minerals	Open with standard lease terms and conditions	1,327,910	1,131,076	1,136,604	1,145,147
	Open with moderate constraints (TL/CSU)	18,668	150,967	170,116	203,236
	Open with major constraints (NSO)	6,660	32,211	27,350	7,629
	Closed	59,470	98,454	78,638	56,696
	Total	1,412,708	1,412,708	1,412,708	1,412,708
Locatable minerals	Open	1,814,168	1,538,295	1,553,004	1,803,131
	Withdrawn	16,584	292,457	277,748	27,621
	Total	1,830,752	1,830,752	1,830,752	1,830,752
Saleable minerals	Open	1,711,415	1,646,554	1,659,585	1,707,930
	Open with moderate	13,683	478	36,311	15,376

Mineral Type	Designation	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
	constraints (Avoid)				
	Closed	105,654	183,720	134,856	107,446
	Total	1,830,752	1,830,752	1,830,752	1,830,752

4.2.3.3 Cumulative Impacts

The predicted level of mineral development within the Planning Area over the next 20 years is low. The RFD for the Planning Area estimates that eight oil and gas wells would be drilled annually over the next 20 years. Similar low levels of activity are predicted for locatable and saleable minerals as well. Considering this level of activity, it is anticipated that there would be minimal cumulative impacts to mineral resources because the demand for access to minerals within the Planning Area is lower than that which could be provided by BLM lands open to potential mineral development. Specific to uranium mining, the RFD for locatable minerals includes the projected growth in uranium mining on BLM lands; however, additional uranium exploration could occur outside BLM lands within the Planning Area. The proposed Northwest Loop Road, with a proposed project length of 39 miles, could potentially cross lands where the BLM owns the subsurface mineral rights. The proposed project could include using fill material from BLM lands to construct the roadbed. The potential use of fill material from BLM lands is not anticipated to adversely impact mineral resources in the Planning Area due to the low level of predicted mineral development and the amount of material available in the project vicinity.

Map-029-Mineral Ownership (11x17)

Map-030-Fluid Mineral Potential (11x17)

Map-031-Leased Areas (11x17)

Map-032-Locatables-Potential (11x17)

Map-033-Saleable Potential (11x17)

Map-034-Locatiable and Saleable Activities (11x17)

Map-035-Surface Restrictions Leaseables A

Map-036-Surface Restrictions Leaseables B

Map-037-Surface Restrictions Leaseables C

Map-038-Surface Restrictions Leaseables D

Map-039-Surface Restrictions Locatables A

Map-040-Surface Restrictions Locatables B

Map-041-Surface Restrictions Locatables C

Map-042-Surface Restrictions Locatables D

Map-043-Surface Restrictions Saleables A

Map-044-Surface Restrictions Saleables B

Map-045-Surface Restrictions Saleables C

Map-046-Surface Restrictions Saleables D

4.2.4 Paleontological Resources

Impacts to paleontological resources can be characterized as those management decisions that result in loss, degradation, destruction, or benefits to vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Avoidance is the preferred method to prevent loss, but other mitigation can reduce and resolve adverse effects to significant localities, including records and literature searches, sampling or survey by a qualified paleontologist, or other types of paleontological research. Under all alternatives, adverse impacts to paleontological resources would be avoided or minimized to the maximum extent possible through management actions and BMPs.

The RPFO would use a PFYC map during the environmental impact evaluation process for all proposed ground-disturbing projects. The map is developed using geologic maps, known locality data, and professional judgment to evaluate geologic units' potential to produce important paleontological resources. All land use actions with a potential to impact vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils would be screened using the PFYC system. The following is a brief description of each classification:

- **PFYC 1** – Very Low. Geologic units that are not likely to contain recognizable fossil remains.
- **PFYC 2** – Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant invertebrate or plant fossils.
- **PFYC 3** – Moderate or Unknown. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence, or sedimentary units of unknown fossil potential.
- **PFYC 4** – High. Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plan fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface-disturbing activities may adversely affect paleontological resources in many cases.
- **PFYC 5** – Very High. Highly fossilferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation.

4.2.4.1 Direct and Indirect Impacts

4.2.4.1.1 Lands and Realty Decisions

Lands and realty decisions would have impacts to paleontological resource if lands proposed for disposal lead to loss of paleontological resources. Other land and realty actions such as pipeline and road ROWs could have adverse impacts if these actions occur in PFYC units with medium to high paleontological occurrences. The impact would consist of possible damage to specimens during ground disturbing activities, or unauthorized collection associated with increased traffic. Site-specific NEPA analysis would be applied prior to disposal of land managed by the BLM and ROW issuances to avoid adverse impacts to paleontological resources. Table 4.47 identifies the number of acres proposed for land disposal and associated PYFC classification. Under

Alternative D, the largest amount of acres is proposed for disposal, while Under Alternative B, the smallest number of acres is proposed for disposal.

Table 4.47: Lands Identified for Disposal (acres), by PFYC and Alternative

	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
PFYC 1	8,258	8,452	8,510	8,510
PFYC 2	15,821	16,295	17,112	18, 474
PFYC 3	26,661	28,081	28,081	28,080
PFYC 4	3,790	3,790	4,353	6,133
PFYC 5	854	854	854	854
Total	55,384	57,472	58,910	62,051

4.2.4.1.2 Special Designations Decisions

Special designations would have impacts to paleontological resources because of management restrictions that are applied within the boundaries of the particular designation. Travel and mineral resources management decisions are the two major surface-disturbing activities that would be restricted within special designations and that also indirectly protect paleontological resources. ACECs and National Scenic Trails are the two special designations that are proposed in the DRMP/DEIS. The only National Scenic Trail on BLM lands within the Planning Area is the CDT. Table 4.48: provides the proposed number and acres of special designations, by alternative. Under Alternative B, the largest amount of acres would be managed as special designations, while under Alternative D the smallest number of acres would be managed as special designations.

Table 4.48: Proposed Special Designations (number and acres) within the Planning Area, by Alternative

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACECs managed for paleontological values	1 ACEC 6,488 acres	2 ACECs 7,638acres	2 ACECs 7,638 acres	1 ACEC 6,488 acres
ACECs managed for other values	9 ACECs 47,277 acres	16 ACECs 142,336 acres	16 ACECs 129,391 acres	9 ACECs 36,411 acres
WSA/Wilderness Area	97,963 acres	97,963 acres	97,963 acres	97,963 acres
CDT	1 trail 11,474 acres	1 trail 38,808 acres	1 trail 23,607 acres	1 trail 11,474 acres
Total Special Designations in Planning Area	137,720 acres	185,625 acres	178,000 acres	126,392 acres

Two ACECs are proposed in the DRMP/DEIS that would protect paleontological resources. Under Alternatives B and C, the Bony Canyon ACEC (1,150 acres) would be designated to protect and allow only professional excavation of vertebrate fossils. The ACEC would not be designated under Alternative D; however, a Research Natural Area (1,150 acres) would be designated which would continue the protection for paleontological resources under this alternative. The Torreon Fossil Fauna ACEC (6,488 acres) would be designated under all

alternatives. The purpose of the Torreon Fossil Fauna ACEC would be to protect the Torreon Fauna Type Locality for scientific study.

4.2.4.1.3 Mineral Resources Decisions

Mineral resources management decisions would have adverse and beneficial impacts to paleontological resources by potentially disturbing areas with PFYC 3-5, though the required pre-disturbance surveys would add to our knowledge of paleontological resources. The adverse impact would be through possible destruction or unauthorized collection of specimens. The beneficial impact would be through discovery of specimens that would then be available for study. According to the RFD for mineral resources, development of leasable, saleable, and locatable mineral resources would contribute to surface disturbance equating to 1.1% of BLM lands the Planning Area over the next twenty years. It is anticipated that mineral extraction activities would be located in areas to avoid impacts to paleontological resources. BLM policy for PFYC and site-specific NEPA analysis would be applied to applications for disturbance, thereby reducing opportunities for direct adverse impacts related to this disturbance.

The RPFO proposes to implement a leasing stipulation that limits the amount of surface disturbance near paleontological resources. Alternatives B, C, and D would implement CSU in areas of PFYC 4 and 5. A determination by the BLM would be made as to whether a survey by a qualified paleontologist would be necessary prior to disturbance. When needed, appropriate mitigation measures would be required prior to surface disturbance. In addition, under Alternatives B, C, and D, the RPFO would also implement a leasing stipulation requiring NSO within areas managed for paleontological resources values where extraordinary paleontological resources exist (Appendix H for stipulations).

4.2.4.1.4 Renewable Energy Decisions

Renewable energy management decisions would have an adverse impact to paleontological resources if renewable energy projects were proposed in areas with vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Surface disturbance may create adverse impacts by degradation or unauthorized collection of specimens. Site-specific NEPA analysis would be conducted prior to the RPFO approving renewable energy projects on BLM lands within the Planning Area. At that time, the PFYC maps and data would be used to analyze the impacts to paleontological resources from a particular proposed project.

4.2.4.1.5 Travel Management Decisions

Travel management decisions would have both adverse and beneficial impacts on paleontological resources. Exposed fossil resources would be adversely impacted by open travel designations. These impacts are more likely to occur in PFYC 4 and 5 areas. There are 0 acres of PFYC 4 and 5 areas within Cimarron Mesa, the only area that will be open to vehicle travel under Alternative C. Beneficial impacts to surface fossil resources would occur from the closure of areas to vehicle travel. Vehicle closures reduce the likelihood that fossil resources would be damaged by being driven on.

4.2.4.2 Cumulative Impacts

Surface-disturbing activities, such as the Desert Rock Power Plant, Northwest Loop Road, the Red Mesa Wind Farm, the N55 Road Improvement Project, fire and fuels management on non-

BLM land in the Planning Area, the potential RETA transmission corridor, and uranium development, could contribute to cumulative impacts to paleontological resources through incremental degradation of the resource base by a variety of sources, reducing the information and interpretive potential of the paleontological resources in the region. These projects, where specific project areas are known, account for approximately 500,000 acres of surface disturbance. The activities that would require federal approval would adhere to laws, regulations, and policies established to protect significant paleontological resources.

Map-047-PFYC (11x17)

4.2.5 Recreation and Visitor Services

Impacts to recreation and visitors services would be both adverse and beneficial, depending on the resource management decision. Impacts are expected to occur from vegetation management (consisting of forests and woodlands, vegetation, and fire management decisions), special status species, wildlife, recreation, travel management, cultural resources, lands and realty, renewable energy, special designations, riparian resources, mineral resources and livestock grazing management decisions. These resources or resources uses would have both short-term adverse impacts and long-term beneficial impacts, based on the proposed management decisions.

4.2.5.1 Direct and Indirect Impacts

4.2.5.1.1 Livestock Grazing Decisions

Livestock grazing management decisions would have both beneficial and adverse impacts to recreation. Range improvements would benefit some recreational users such as hunters and wildlife observers. Artificial water sources constructed for livestock are used by a variety of both game and non-game species alike. Wildlife viewing and hunting opportunities are increased in areas with the availability of water. These management actions are anticipated to influence the distribution of wildlife throughout the planning area, thereby influencing recreational use patterns. Occasional encounters with livestock could compromise the recreational setting for some recreational users that prefer not to view livestock during recreational activities. Opportunities for motorized and mechanical recreation would be impacted if livestock were encountered on trails and roads. There are 718,035 acres of grazing allotments on BLM lands within the Planning Area, which makes up approximately 95% the Planning Area. This indicates that it is likely that recreational users could encounter livestock during their recreational activities within the Planning Area. The potential encounters would depend on the timing and location of the recreational activity. The possibility for interaction would also be less under Alternative B. The RPFO would remove grazing from 1,582 acres of riparian areas and all special designations under Alternative B. Under Alternatives C and D, prescribed grazing would be applied in riparian areas that meet the New Mexico Standards and Guidelines (BLM 2001) and ACECs where grazing would not conflict with resource protection goals of the specific ACEC. As a result, recreational users would have a lower chance of interacting with livestock when visiting riparian areas and ACECs.

4.2.5.1.2 Special Designations Decisions

Special designations would have a beneficial impact to recreation and visitor services because of management restrictions that are applied within the boundaries of the particular designation. Travel and mineral resources management decisions are the two major surface-disturbing activities that would be restricted within special designations and that also indirectly impact recreational setting. ACECs and National Scenic Trails are the two special designations that are proposed in the DRMP/DEIS. The only National Scenic Trail on BLM lands within the Planning Area is the CDT. The CDT is a venue for a popular trail running event within the Planning Area. Table 4.49: provides the proposed number and acres of special designations, by alternative. Under Alternative B, the largest amount of acres would be managed for special designations, while the smallest number of acres would be managed for special designations under Alternative D.

Table 4.49: Proposed Special Designations (quantity and acres) within the Planning Area, by Alternative

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACEC	10 ACECs 53,765 acres	18 ACECs 149,974 acres	18 ACECs 137,029 acres	11 ACECs 42,899 acres
WSA/Wilderness Area	97,963 acres	97,963 acres	97,963 acres	97,963 acres
CDNST	1 trail 11,474 acres	1 trail 38,808 acre	1 trail 23,607 acres	1 trail 11,474 acres
Total Special Designations in Planning Area	137,720 acres	185,625 acres	178,000 acres	126,392 acres

4.2.5.1.3 Recreation and Visitor Services Decisions

Recreation management decisions would have a beneficial impact to recreation within the Planning Area. One SRMA and 21 ERMAs are proposed under Alternatives B, C, and D in the DRMP/DEIS. The number and sizes of SRMA and ERMAs do not vary across the range of alternatives. Proposed management decisions, such as travel and mineral resource decisions, within the SRMA and ERMAs do vary across alternatives (see Table 2.9 in Chapter 2). Generally, Alternative B proposes more travel restrictions and fewer acres available for mineral extraction within the SRMA and ERMAs, while Alternatives C and D propose less travel restrictions and more flexibility for future mineral resource extraction, depending on the location of the SRMA or ERMA. The purpose of designating the SRMA and ERMAs is to identify areas of recreation importance or potential. This makes recreational use a primary purpose of these areas and recognizes the importance of recreation in public lands management. Table 4.50: shows the size of each proposed SRMA and ERMA. All other acres of BLM land within the Planning Area that fall outside SRMA and ERMA boundaries are managed as public lands not designated as Recreation Management Areas, which provide unconfined recreation opportunities and recreation areas that are free of unneeded regulation and control.

Table 4.50: Proposed SRMA and ERMAs (acres) on BLM Lands in the Planning Area

SRMA and ERMA Name	Alternatives B, C, and D
Continental Divide Trail SRMA	10,996
Boca del Oso ERMA	71,114
Crest of Montezuma ERMA	69,119
Herrera ERMA	50,432
Ojito ERMA	11,212
Petaca Pinta ERMA	18,456
San Juan Basin Badlands ERMA	917
Total SRMA and ERMA Acreage	232,242
Percent of BLM lands in the Planning Area	31%

In addition to the SRMA and ERMAs described above, alternatives are also proposed for how to manage the section of the CDT that falls within the Planning Area. Under Alternative A, no

specific management decision is proposed for managing the CDT. Under Alternative B, the trail would be open to hiking and equestrian use, but closed to mechanized travel. No SRPs would be granted for CDT activities. Mineral resources within the CDT SRMA would be managed as NSO for leasable fluid minerals, closed to extraction of saleable minerals, and open to locatable mineral entry. Under Alternative C, the CDT would continue to be closed to mechanized travel, special events would be reviewed by the SRP program, and mineral resources would be managed as NSO for leasable fluid minerals and open for extraction of saleable as well as locatable minerals. Management under Alternative D would be the same as described under Alternative D, except the CDT would be open to mechanized travel if the trail is reconstructed to accommodate such activities.

Under all alternatives, camping would be prohibited within 46 meters (150 feet) of riparian areas on BLM lands within the Planning Area. This would result in adverse impacts to those recreational camping groups that prefer to camp within riparian areas.

The RMP/EIS also includes alternatives for managing SRPs. Alternative A would continue to use the current guidelines for issuing SRPs, which includes commercial activity, competitive events, organized groups, special area permits, and vending permits. Alternatives B, C, and D would put specific limits on the size and nature of organized group activities that require permits. Alternatives B and C would require permits for day use activities that involve 15 or more vehicles and/or 30 or more people. Overnight activities with four or more vehicles and/or twenty or more people would require an SRP.

Alternative D would require SRPs for groups with 20 or more vehicles and/or 50 more people for day use. Overnight activities (over two or more nights) with 10 or more vehicles and/or 25 or more people would require an SRP. No fee waivers would be allowed under Alternative D.

Recreational user groups larger than twenty people may be adversely impacted because they would be required to obtain a permit from the RPFO for their event. However, beneficial impacts from SRP management decisions would include improved protection of BLM lands within the Planning Area that may be preferred locations for group events and reduced conflict between user groups in those popular locations. Under Alternatives B, C, and D, the RPFO would have a better idea of where people are recreating on BLM lands within the Planning Area and would be better informed about where recreational infrastructure or resource protection-oriented projects could be located.

4.2.5.1.4 Lands with Wilderness Characteristics Decisions

Lands with wilderness characteristics would have beneficial impacts to recreation and visitor services. These lands would provide increased recreational opportunities to user groups that prefer wilderness characteristics such as solitude and primitiveness, in addition to existing Wilderness Areas and WSAs. Under Alternative B, lands with wilderness characteristics would be closed to motorized travel; thereby restricting OHV use on BLM lands in the Planning Area. Under Alternative C, lands with wilderness characteristics decisions would close 26,110 acres to motorized vehicle traffic, limit motorized vehicles to existing primitive routes on 4,075 acres, and open 7,329 acres in the Cimarron Mesa area to motorized vehicle travel. Both Alternatives B and C provide recreational opportunities on the same amount of land, but Alternative B would have a more positive impact for low-impact recreation opportunities (such as hiking), while Alternative C would provide more opportunity for motorized vehicle recreation. Alternatives A

and D provide the most opportunity for motorized vehicle recreation because no non-WSA lands would be managed to protect wilderness characteristics.

4.2.5.1.5 Cultural Resources Decisions

Cultural resources management decisions would have both adverse and beneficial impacts to recreation and visitor services. Big Bead Mesa (320 acres) is a cultural resources area where camping would be prohibited under all alternatives in order to protect the site. The site would not be closed to hiking, but recreational users would have to find other camping locations in the areas, which could easily take place on adjacent public or other federal lands in the area.

Beneficial impacts to recreation from cultural resources management decisions would occur when cultural resource sites are allocated for public use because this would provide additional recreational opportunities. Table 4.51 shows the number of cultural resources sites that are proposed for allocation to public use on BLM lands within the Planning Area. Under Alternative D, the most sites would be allocated for public use, while under Alternatives A and B, the smallest number of sites would be allocated for public use.

Table 4.51: Cultural Resource Sites Proposed for Allocation for Public Use, by Alternative

Status	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Azabache Station	1	1	1	1
Big Bead Mesa	1	1	1	1
Guadalupe Ruin and Community ACEC	1	1	4	7
San Ysidro	0	0	1	1
Total Number of Sites Allocated for Public Use	3	3	7	10

4.2.5.1.6 Lands and Realty Decisions

Lands and realty would have an adverse impact to recreation because disposal of public lands reduces the amount of land base open to dispersed recreation. Areas identified for disposal would undergo NEPA analysis prior to disposal and recreation resource uses within the particular parcel, if any, would be identified at that time. Future acquisitions that occur with the proposed SRMA or ERMAs would beneficially impact recreation due to an increase in the SRMA land base. There are no land disposals proposed in the RMP/EIS that would fall within the proposed SRMA or ERMA boundaries.

4.2.5.1.7 Renewable Energy Decisions

Renewable energy management decisions would adversely impact recreation within the Planning Area. Renewable energy developments would remove recreation potential on the lands being developed and would degrade the recreation experience for most users on adjacent lands. Additional impacts would include fragmentation from roads, structures spread across open space, and associated traffic and noise. No renewable energy projects are currently proposed in the RMP/EIS. Site-specific NEPA analysis would be completed prior to constructing a renewable energy project on BLM lands. Impacts to recreation would be analyzed at that time.

4.2.5.1.8 Travel Management Decisions

Travel management decisions would have both adverse and beneficial impacts to recreation. BLM lands in the Planning Area would be assigned a travel management status to determine the type of public motorized vehicle use to be allowed. These designations (open, closed, limited to existing roads, primitive roads, and trails) would have various impacts to recreation based primarily on the amount of motorized access available to specific areas. The type of impact depends on the particular user. OHV users would continue to have a wide variety of routes available for use under all alternatives. OHV users enjoy cross-country travel and free play. Under Alternatives C and D, the Cimarron Mesa area (18,271 acres) would be designated as open to travel, which would allow cross-country travel and free play to OHV users. Alternative B does not propose an open travel area on BLM lands in the Planning Area; therefore, OHV users that enjoy cross-country travel and free play would be adversely impacted by having no public lands open for their use. In contrast, other recreational user groups, such as hikers, campers, and wildlife viewers, are adversely impacted by open travel areas. Often these groups prefer more secluded settings. Those areas closed to travel and limited to existing roads, primitive roads, and trails would provide beneficial impacts to these groups. All management decisions that affect motorized use would be covered by these travel management designations. Table 4.52 shows the proposed travel management categories, in acres, by alternative. Under Alternative B, the largest amount of acres would be closed to motorized travel, while under Alternatives C and D the largest amount of acres would be open to motorized travel. Under Alternative A, least amount of acres would be closed to motorized travel.

Table 4.52: Proposed Travel Management Categories (acres), by Alternative

Category	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Open	303,580	4,551	18,269	19,456
Limited	420,491	562,596	602,043	624,808
Closed	20,316	177,240	124,075	100,123
Total	744,387	744,387	744,387	744,387

Note: The No Action Alternative does not sum to the same acreage totals as Alternatives B, C, or D because of different planning direction under the 1986 RMP, as amended.

4.2.5.1.9 Special-status Species and Wildlife Decisions

Wildlife and special-status species management decisions would have both adverse and beneficial impacts to recreation. Closures of public lands are needed to protect wildlife and special-status species. Closure or other wildlife management decisions would impact the design or creation of new recreation projects, such as trails and campground facilities, as well as projects or maintenance in existing recreation developments. No specific wildlife or special-status species projects are proposed in the RMP/EIS. Site-specific NEPA analysis would need to be completed prior to implementing wildlife or special-status species projects. The impacts to site-specific recreation activities and user groups would be disclosed at that time.

Long-term beneficial impacts from wildlife and special-status species management decisions to recreation would be improved wildlife habitat and populations. Improved wildlife and special-

status species conditions would improve the recreational setting for many user groups, including hikers, campers, and wildlife viewers.

4.2.5.1.10 Vegetation Management Decisions

Vegetation management, as defined for this section, includes any management decisions that are associated with vegetation manipulation: fire management, vegetative communities, riparian resources, and forest and woodland resources. Vegetation management resource decisions would have a short-term adverse impact to recreation immediately after vegetation treatments occur. Recreation would be displaced when the vegetation treatment activity is taking place, which typically ranges from a few days to a few months. Recreation users would need to move to other areas to take part in recreational opportunities. Once the treatment project is complete, the quality of recreation could be diminished for some recreational users, for the period of time it takes for the project area to recover.

Long-term beneficial impacts from vegetation management decisions to recreation would be improved health of vegetative communities. Improved vegetative communities would improve the recreational setting for many user groups, including hikers and campers. Forage conditions would be expected to improve in areas that are restored, which would attract wildlife and benefit hunters and wildlife viewing user groups.

Table 4.53 shows the total number of acreages proposed for fuels treatments in the proposed SRMA and ERMAs, by alternative. Under Alternatives B, C, and D the same level of fuels treatments are proposed to take place within the proposed SRMA and ERMAs. There are no SRMAs or ERMAs proposed under Alternative A; therefore, no fuels treatments would take place within the designated boundaries under this alternative.

Table 4.53 Proposed Fuels Treatments (acres) within Proposed SRMA and ERMAs, by Alternative

RMA Name	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Continental Divide Trail SRMA		8,977	8,977	8,977
Boca del Oso ERMA	--	44,287	44,287	44,287
Crest of Montezuma ERMA	--	903	903	903
Herrera ERMA	--	17,330	17,330	17,330
Petaca Pinta ERMA	--	47,381	47,381	47,381
San Juan Basin Badlands ERMA	--	57,394	57,394	57,394
San Ysidro ERMA	--	6,854	6,854	6,854
RMA Total	--	183,126	183,126	183,126

Table 4.54 shows the proposed forest product harvest areas, by alternative. No specific treatments have been proposed in the RMP/EIS for riparian restoration or upland vegetation. Under Alternative B, forest product harvest areas would not be located within SRMAs or ERMAs. Under Alternatives C and D, forest product harvest areas would be open within the proposed SRMA and ERMAs. The RPFO would manage the most acres for forest product harvest areas under Alternative D.

Table 4.54: Proposed Forest Product Removal Areas (acres) within Proposed SRMA and ERMAs, by Alternative

SRMA and ERMA Name	Alternative A No Action	Alternatives B	Alternative C Preferred	Alternative D
Continental Divide Trail SRMA	0	0	5,750	6,540
Boca del Oso ERMA	0	10,386	31,169	50,431
Crest of Montezuma ERMA	0	4	917	917
Herrera ERMA	0	542	17,896	18,456
Ojito ERMA	0	4,261	7,392	11,212
Petaca Pinta ERMA	0	4,716	40,787	69,118
San Juan Basin Badlands ERMA	0	4,722	65,192	71,112
Total SRMA and ERMA Acreage	0	24,631	169,103	227,786
Percent of BLM lands in the Planning Area	0	3%	23%	31%

4.2.5.1.11 Mineral Resources Decisions

Mineral resources management decisions would have adverse and beneficial impacts to recreation within the Planning Area. Mineral development activities would remove recreation potential on the lands being developed and would degrade the recreation experience for most users on adjacent lands. Restrictions on mineral development would have beneficial impacts to recreation.

According to the RFD for mineral resources, development of leasable, saleable, and locatable mineral resources would contribute to surface disturbance equating to 1.1% of BLM lands in the Planning Area over the next twenty years. It is anticipated that mineral extraction activities would be located in areas to avoid impacts to popular recreation areas. Site-specific NEPA analysis would be completed for applications for disturbance, thereby reducing opportunities for direct adverse impacts related to this disturbance.

In addition, under Alternatives B and C, one SRMA and 21 ERMAs would be managed as CSU for leasable fluid minerals, open to saleable mineral extraction, and withdrawn from locatable mineral entry. Under Alternative D, the SRMA and ERMAs would be managed as CSU for leasable fluid minerals, open to saleable mineral extraction, and open to locatable mineral entry.

The RPFO has proposed leasing stipulations for developed recreation areas with the goal of mitigating impacts to recreational experiences in high-use areas. Alternatives B and C include a stipulation requiring NSO near developed recreation areas and undeveloped recreation areas receiving concentrated public use. A recreation-specific stipulation is not proposed under Alternatives A and D.

4.2.5.2 Cumulative Impacts

The Placitas Master Plan, proposed by the City of Albuquerque Open Space Division, could have a cumulative impact to recreation and visitor services within the Planning Area. The proposed

project area for the Placitas Master Plan is 640 acres. The RPFO manages land near the community of Placitas and would likely see an increase in recreational activity within the Planning Area as a result of improved recreation infrastructure on City of Albuquerque Open Space lands.

Wildland fire suppression would temporarily affect recreation use in or adjacent to areas where prescribed fire or other vegetation treatments are being conducted. The long-term cumulative effects would reduce fire risks to recreation areas and facilities within the Planning Area and on lands under other administrative agencies. Prescribed burning would temporarily degrade air quality (and scenic quality), but with the reduced risks of wildland fire, there would be a cumulative decrease in smoke emissions.

The Northwest Loop Road could both beneficially and adversely impact recreation and visitor services within the Planning Area. The road would provide a faster connection from Interstate 40 to many of the popular recreational areas within the Planning Area, such as the San Ysidro Trials Area and the White Mesa Bike Trails. The improved access could lead to increased recreational use of these areas. Increased visitation could lead to degradation of recreational resources, such as trail impairment and vegetation trampling. Increased visitation could also lead to additional SRP requests and increased recreation-based revenue for the RPFO.

The RPFO has reviewed the travel management plans for the neighboring Santa Fe and Cibola National Forests. The cumulative impacts of travel management decisions in these plans, as well as other jurisdictions, would have beneficial cumulative effects on recreational and visitor services when travel management decisions by other agencies support the proposed travel management decisions in this RMP/EIS, especially for shared roads. For example, if the U.S. Forest Service shares management of a road with the RPFO, and the travel management decisions for how to manage the road are the same (i.e., agencies manage a road as limited to existing), this would lead to beneficial impacts to recreation. In this case, recreation user groups would have consistent access to public lands. The Santa Fe National Forest would open 186 miles of road that is currently not open, would close 2,469 miles of road to motorized use, and would add 23 miles of new routes. The Mt. Taylor Ranger District, within the Cibola National Forest, would open 98 miles of road that are currently closed or unauthorized and would close 465 miles of roads to motorized use.

The cumulative effect on recreation resources would be enhanced in the long term by managing existing and proposed SRMAs and ERMAs in the Planning Area and in adjacent BLM Field Offices. The cumulative effect of managing the Planning Area to respond to the expected increase in visitation, changes in recreational demand, and the wide range of recreational activities would have beneficial effects on recreation.

Map-048-Crest of Montezuma

Map-049-Continental Divide NST A

Map-050-Continental Divide NSt B

Map-051-Continental Divide NST C

Map-052-Continental Divide NST D

Map-053-Lands with Wilderness Characteristics

Map-054-SRMA

Map-055-ERMA

Map-056-WSAs

4.2.6 Renewable Energy

The following analysis generally discusses likely reductions in land area available for wind, solar, and geothermal renewable energy as a result of land use allocations. The future development and use of solar, wind, and geothermal resources in the Planning Area would be driven primarily by the cost-benefit ratio of development. Where development potential is economically viable, impacts to development on public lands are largely related to areas identified for avoidance and exclusion from renewable energy developments. Exclusion areas directly remove acreage available for development while avoidance areas may result in the loss of acreage if the development cannot be economically moved to an alternative location or otherwise accommodated. Additionally, the high potential areas from the Western Governors' Association were used to evaluate the avoidance and exclusion areas and the resultant management decisions.

4.2.6.1 Direct and Indirect Impacts

4.2.6.1.1 Renewable Energy Management Decisions

Chapter 2 provides a detailed list of exclusion and avoidance areas for renewable energy developments on BLM lands within the Planning Area. Direct impacts to renewable energy include management actions permitting or prohibiting renewable energy development. Market demand would drive the development of renewable energy sources on public lands in the Planning Area. Indirect beneficial impacts to renewable energy sources include management actions encouraging or facilitating renewable energy development. Indirect adverse impacts include management actions constraining renewable energy development. Resource management actions, other than those associated with the renewable energy program that could affect renewable energy include vegetative resources, visual resources, cultural resources, special status species, wildlife and fisheries, and lands and realty. In general, managing these resources could constrain renewable energy development. Specifically, renewable energy development would be restricted to avoid habitat fragmentation.

Table 4.55 provides the number of acres on BLM lands within the Planning Area that would be avoided or excluded from consideration for solar energy projects, by alternative. Solar energy developments, in particular, create a single use for a particular area; therefore, the BLM must consider the other possible uses of an area when considering a solar energy proposal. Readers should note that the quantities provided in Table 4.55 should not be aggregated because many of the resource areas and special designations overlap.

Table 4.55: Exclusion or Avoidance Areas for Solar Energy Projects on BLM lands within the Planning Area, by Alternative

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
100-year floodplains	0	0	10,891	0	10,891	0	10,891
ACECs	0	0	133,493	0	123,167	0	38,368
Cave/Karst areas	0	0	0	0	0	0	0
Critical habitat for	0	None currently on BLM lands					

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
federal threatened and endangered species (designated and proposed)							
Habitat for BLM sensitive plant and animal species (includes rare plants)	0	Data not available					
Habitat for federal listed/ proposed threatened and endangered species for which critical habitat has not been designated	0	Data not available					
Habitat for federal candidate species	0	Data not available					
Habitat State-listed as crucial/sensitive	0	0	0	0	0	0	0
Lands with Wilderness Characteristics	0	0	37,514	4,075	26,110	0	2,239
National Scenic and Historic Trails	11,474	0	38,808	0	23,607	0	11,474
Soils, highly erodible (per sensitive soils definition) and all slopes >15%	0	543,280	0	543,280	0	543,280	0
TCPs*	0	37,398	0	37,398	0	37,398	0
VRM Class I	97,645	0	97,296	0	97,474	0	97,516
VRM Class II	84,449	0	318,931	68,511	0	21,549	0
Wetlands and riparian areas	0	0	1,359	0	1,359	0	1,359
Wilderness Areas	11,183		11,183		11,183		11,183
WSAs	86,780	0	86,780	0	86,780	0	86,780

* Mount Taylor is the only TCP quantified in this table due to data availability. Other TCPs are known to exist on BLM lands in the Planning Area, but data are not available for quantification at this time.

Table 4.56 provides the number of acres on BLM lands within the Planning Area that would be avoided or excluded from consideration for wind energy projects, by alternative. Readers should note that the quantities provided in Table 4.56 should not be aggregated because many of the resource areas and special designations overlap.

Table 4.56: Exclusion or Avoidance Areas for Wind Energy Projects on BLM lands within the Planning Area, by Alternative

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
100-year floodplains	0	0	10,891	10,891	0	10,891	0
ACECs	0	133,493	0	123,167	0	38,368	0
Cave/Karst areas	0	0	189,045	189,045	0	189,045	0
Critical habitat for federal threatened and endangered species (designated and proposed)	0	None currently on BLM lands					
Habitat for BLM sensitive plant and animal species (includes rare plants)	0	Data not available					
Habitat for federal listed/ proposed threatened and endangered species for which critical habitat has not been designated	0	Data not available					
Habitat for federal candidate species	0	Data not available					
Habitat State-listed as crucial/sensitive	0	0	31,164	31,164	0	31,164	0
Lands with Wilderness Characteristics	0	0	37,514	4,075	26,110	0	2,239
National Scenic and Historic Trails	11,474	0	38,808	0	23,607	0	11,474
Soils, highly erodible (per sensitive soils definition) and all slopes >15%	0	543,280	0	543,280	0	543,280	0

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
TCPs*	0	37,398	0	37,398	0	37,398	0
VRM Class I	97,645	0	97,296	0	97,474	0	97,516
VRM Class II	84,449	0	318,931	68,511	0	21,549	0
Wetlands and riparian areas	0	0	1,359	0	1,359	0	1,359
Wilderness Areas	11,183		11,183		11,183		11,183
WSAs	86,780	0	86,780	0	86,780	0	86,780

* Mount Taylor is the only TCP quantified in this table due to data availability. Other TCPs are known to exist on BLM lands in the Planning Area, but data are not available for quantification at this time.

Table 4.57 provides the number of acres on BLM lands within the Planning Area that would be avoided or excluded from consideration for geothermal energy projects, by alternative. Readers should note that the quantities provided in Table 4.57 should not be aggregated because many of the resource areas and special designations overlap.

Table 4.57: Exclusion or Avoidance Areas for Geothermal Energy Projects on BLM lands within the Planning Area, by Alternative

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
100-year floodplains	0	10,891	0	10,891	0	10,891	0
ACECs	0	0	133,493	123,167	0	38,368	0
Cave/Karst areas	0	0	189,045	0	189,045	189,045	0
Critical habitat for federal threatened and endangered species (designated and proposed)	0	None currently on BLM lands					
Habitat for BLM sensitive plant and animal species (includes rare plants)	0	Data not available					
Habitat for federal listed/ proposed threatened and endangered species for which critical habitat has not been designated	0	Data not available					

Designation	Alternative A No Action	Alternative B		Alternative C Preferred		Alternative D	
		Avoid	Exclude	Avoid	Exclude	Avoid	Exclude
Habitat for federal candidate species	0	Data not available					
Habitat State-listed as crucial/sensitive	0	0	31,164	31,164	0	31,164	0
Lands with Wilderness Characteristics	0	0	37,514	4,075	26,110	0	2,239
National Scenic and Historic Trails	11,474	0	38,808	0	23,607	0	11,474
Soils, highly erodible (per sensitive soils definition) and all slopes >15%	0	543,280	0	543,280	0	543,280	0
TCPs*	0	37,398	0	37,398	0	37,398	0
VRM Class I	97,645	0	97,296	0	97,474	0	97,516
VRM Class II	84,449	318,931	0	68,511	0	21,549	0
Wetlands and riparian areas	0	0	1,359	0	1,359	0	1,359
Wilderness Areas	11,183		11,183		11,183		11,183
WSAs	86,780	0	86,780	0	86,780	0	86,780

* Mount Taylor is the only TCP quantified in this table due to data availability. Other TCPs are known to exist on BLM lands in the Planning Area, but data are not available for quantification at this time.

Table 4.58: Total Exclusion or Avoidance Areas for Renewable Energy Projects (acres), by Alternative

Renewable Energy Type		Alternative A	Alternative B	Alternative C	Alternative D
Geothermal		681,354	6,346	24,088	32,105
	Avoid	0	373,047	428,538	603,728
	Exclude	75,720	364,994	291,761	108,554
Solar		681,354	6,346	24,088	32,105
	Avoid	0	215,085	293,140	460,117
	Exclude	75,720	522,956	427,159	252,165
Wind		681,354	6,346	24,088	32,105
	Avoid	0	219,890	468,061	485,789
	Exclude	75,720	518,151	252,238	226,493

4.2.6.2 Cumulative Impacts

The designation of renewable energy development avoidance and exclusion areas on BLM lands, along with similar restrictions on renewable energy development on adjacent lands, particularly National Forest lands, would have a cumulative impact of reducing the potential for renewable energy development within New Mexico. The 5,000-acre Red Mesa Wind Farm project would increase the amount of renewable energy projects within the Planning Area. A renewable energy

transmission corridor, if proposed by RETA, within the Planning Area could also increase the demand for land to develop renewable energy projects due to the proximity of potential corridor(s).

Map-057-Geothermal B

Map-058-Geothermal C

Map-059-Geothermal D

Map-060-Solar B

Map-061-Solar C

Map-062-Solar D

Map-063-Wind B

Map-064-Wind C

Map-065-Wind D

4.2.7 Riparian Resources

An impact to riparian and wetland areas impacts the physical, chemical, or biological components of the ecosystem. Actions that contribute to the decline in abundance, distribution, or functionality of riparian and wetland communities are considered adverse impacts. Conversely, beneficial impacts to riparian and wetland communities are activities that protect or restore these habitat types in the planning area. Direct impacts to riparian and wetland communities result from disturbing vegetation or ground surface occurring in these communities. Indirect impacts to riparian and wetland communities result from actions within a watershed that cause a change in riparian and wetland functionality (e.g., increased rates of sediment loading or changes in hydrology), a change in water chemistry, and spread of noxious and invasive species.

Within the Planning Area, riparian areas are typically associated with perennial, intermittent, and ephemeral streams, as well as isolated springs and other water sources. Management decisions with the potential to impact riparian resource health, the functioning condition of streams, water resources necessary to riparian zone establishment and survival, or the physical environment on which riparian vegetation depends (e.g., stream stability) were the decisions evaluated in this analysis. Fire management, forests and woodlands, lands and realty, livestock grazing, mineral resources, recreation and visitor services, renewable energy, riparian resources, soil and water, lands with wilderness characteristics, travel management, special designations, special-status species, and wildlife management decisions are expected to impact riparian resources on BLM lands in the Planning Area. The adverse and beneficial impacts are described below for each resource.

4.2.7.1 Analysis Assumptions

Estimates of projected surface disturbances are used as the primary metric for determining the relative level of potential indirect impact to riparian and wetland areas. The methods and assumptions used in this impact analysis include the following:

- Surface disturbances generally increase surface runoff to streams due to an increase in impervious surface, changes in water routing, and loss of vegetation.
- Surface disturbance, transportation networks, ungulate use, and recreation increase the likelihood of noxious/invasive species introduction and spread in an area.
- The greater the amount of surface disturbance in a watershed, the greater the probability that excess surface runoff and sediment will enter the stream and contribute to the loss of riparian and wetland functionality.
- Placing salt and mineral supplements outside of riparian and wetland communities is one tool that can reduce wildlife and livestock use of riparian and wetland areas.
- Surface runoff to streams generally increases as livestock stocking rates increase. This is not a linear relationship. For example, low stocking rates typically have no measurable impact on surface runoff, moderate stocking rates typically have a negligible impact on surface runoff, high stocking rates have a measurable impact on surface runoff, and consecutive years of high stocking rates have the highest potential for increasing surface runoff to streams.

- Livestock and wildlife use is typically disproportionately higher in riparian and wetland communities than in upland communities. Improper grazing can adversely impact these communities throughout the year, but generally has greater impacts in the spring and early summer, when soils are wet and, therefore, more vulnerable to compaction and streambanks are more vulnerable to sloughing. Livestock, especially cattle, tend to congregate in these communities during the hot season (mid to late summer). While stocking rates for an allotment or pasture may be low to moderate, the utilization levels in riparian and wetland areas can be high.
- Livestock stocking rates in grazing allotments generally remain unchanged.
- Wildlife can adversely impact riparian and wetland areas, depending on how many, what type, and when the use occurs.
- Riparian and wetland areas possess the ability to recharge and rebound faster than other vegetative areas in the planning area.

4.2.7.2 Direct and Indirect Impacts

4.2.7.2.1 Fire Management Decisions

Under all alternatives, the Fire and Fuels Plan Amendment would be implemented in fire-related actions (BLM 2004). The Fire and Fuels Plan Amendment mandates the maintenance of existing healthy ecosystems and the protection of threatened, endangered, and special-status species. Adherence to the Amendment would have beneficial impacts to riparian resources because it promotes the protection and restoration of healthy ecosystems, and emphasizes hazardous fuels reduction treatments to restore ecosystems and prevent the occurrence of catastrophic wildfires that have the potential to destroy whole ecosystems.

Fuels management actions include fuels reduction treatments on 32,000 acres annually, of which 3,855 acres of treatment would occur within riparian and wetland areas (Table 4.59). These actions include mechanical and manual treatments, prescribed fire, chemical or biological vegetation control, and aerial/ground seeding. Fuels treatments may take place in riparian areas that have noxious and invasive species present and are Functioning At-Risk, in Properly Functioning Condition, constitute suitable potential or actual southwestern willow flycatcher habitat, or constitute valuable breeding bird or other wildlife community habitat. The fuels treatments within riparian areas would likely have short-term adverse impacts (defined as impacts seen within 5 years of treatment) to riparian areas because treated areas would be more susceptible to soil erosion and introduction of non-native species. However, the BLM would mitigate adverse impacts from these fuels treatments since the goal of the treatments would be to restore the native plant communities within riparian areas. Such mitigation could include timing of treatment to avoid sensitive periods, reseeding or replanting of riparian vegetation, and application of erosion control techniques such as turf reinforcement matting to encourage reestablishment of native vegetation, among other measures.

Many risks to riparian ecosystem function can be associated with mechanical, chemical, prescribed burn, and biological treatments. It is for this reason that prescriptions for these treatments in riparian areas be developed using monitoring data specific to the treatment area as well as guidance from current peer-reviewed scientific literature. Risks associated with using biological control methods should be identified and analyzed carefully at the implementation

level, and adequate conclusive scientific research should exist to support any biological control agent used for treatment of noxious/invasive weeds. Risks can include treatment of non-target species and the possibility of the control agent moving to areas where treatment is not desired. If such risks are not accounted for at the implementation level, adverse impacts to species that depend on riparian habitats could include habitat loss and fragmentation. If risks are mitigated, such projects are expected to have beneficial impacts on riparian resources.

Table 4.59: Proposed Fuels Treatments (acres) in Riparian Areas

Vegetation/Habitat Type	Proposed Fuels Treatments (acres)
Riparian/Wetland	3,554
Total Proposed Fuels Treatments	**612,958**

Fire management decisions would have long-term beneficial impacts to riparian areas through restoration of native plant communities, reduction of non-native species, and possible improvement in the local hydrology within the riparian areas. Beneficial impacts to riparian ecosystems are expected with the assumption that fire management actions such as vegetation treatments be planned and carried out in accordance with riparian resource objectives as well as other associated objectives such as Special Status Species and Wildlife management.

4.2.7.2.2 Forests and Woodlands Decisions

Under all alternatives, forest and woodland harvest activities would be prohibited in riparian areas, except where forest restoration would benefit riparian areas through activities such as removal of non-native and invasive species (e.g., saltcedar or Russian olive eradication). In these cases, forest and woodland management decisions could have a beneficial impact to riparian areas. On certain occasions, the possibility exists for allowing forestry practices to be conducted for religious ceremonial purposes by tribal people. Harvesting of willows or cottonwoods could have an adverse impact on riparian areas because they stabilize soil and play an important role in dissipating flows and retaining water in riparian systems. Such impacts could be minimized and/or avoided by applying a prescription that specifies location and timing of the action.

4.2.7.2.3 Livestock Grazing Decisions

Livestock grazing management decisions would have both beneficial and adverse impacts on riparian resources. There are 718,035 acres of grazing allotments on BLM lands within the Planning Area, which make up approximately 95% of BLM lands in the Planning Area. The RPFO would remove grazing from 1,582 acres of riparian areas and 172 AUMs under Alternative B. Under Alternatives C and D, prescribed grazing would occur within those riparian areas (approximately 1,582 acres) identified in the Riparian and Aquatic Habitat Management in the Albuquerque Field Office EIS BLM 2000, which is consistent with the New Mexico Standards and Guidelines BLM 2001).

Livestock grazing within riparian areas could have beneficial impacts on riparian areas, such as stimulation of vegetation growth, removal of standing dead vegetation, and seed distribution. These impacts could improve the condition of vegetation within riparian areas.

Livestock grazing within riparian areas could also produce adverse impacts to riparian resources. These adverse impacts could include decreased growth or loss of riparian vegetation and possible loss or degradation of riparian soils, water quality, streambed and bank structures, and habitat quality.

Livestock grazing would not be allowed in exclosures constructed within riparian areas using Habitat Stamp Program (HSP) dollars unless grazing the area would meet the management objectives of the EIS for Riparian and Aquatic Habitat Management in the Albuquerque Field Office (BLM 2000), an appropriate NEPA analysis is conducted, and the NMDGF is in agreement.

4.2.7.2.4 Mineral Resources Decisions

Under Alternatives B and C, a stipulation is proposed for protection of riparian resources. Under Alternative B, leasable fluid mineral activities would be prohibited (NSO) within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of riparian and wetland areas. Under Alternative C, leasable fluid mineral activities would be subject to CSU restrictions within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of riparian and wetland areas. No stipulations are proposed for riparian resources under Alternatives A and D; therefore, mineral resources management decisions would impact riparian resources within the Planning Area under Alternatives A and D more than Alternatives B and C. Impacts would result from selection of Alternatives A or D because there would be no stipulation in place to protect riparian areas from mineral development, which causes surface disturbance and therefore habitat loss and/or fragmentation. Beneficial impacts would result from Alternatives B and C because NSO and CSU restriction stipulations would protect riparian areas from being developed, and therefore prevent loss of riparian area vegetation.

4.2.7.2.5 Recreation and Visitor Services Decisions

Under all alternatives, dispersed camping would be prohibited within 46 meters (150 feet) of riparian areas. Designated campgrounds established in proximity to riparian areas would be designed or placed to ensure adequate spatial and visual restrictions that would allow sensitive wildlife to exist undisturbed. These decisions would have a beneficial impact on riparian resources because they would reduce the amount of vegetation disturbance and lessen the chance that campfires may harm or destroy riparian habitats. Under all alternatives, the RPFO would provide public information concerning the prevention of the spread of invasive and exotic weeds, as well as wildlife species and their habitat in riparian areas. This decision is expected to have a beneficial impact on riparian resources because it would generate greater public awareness about the sensitivity of riparian ecosystems and therefore a greater respect and sense of protection/preservation of the resource.

Under Alternatives C and D, new trails would be considered for the Oh-My-God 100 Motorcycle Race. This decision would have no impacts on riparian habitat if because newly proposed trails would avoid riparian areas. Under Alternative B, no new trails would be considered. Because of mitigation in place, Alternative B would have the same impacts as C and D.

Under Alternative C, San Ysidro SRMA, the San Ysidro Trials Area would be authorized for use of practice and events by the New Mexico Trials Association on authorized trails. This activity

involves motorcycle use in an area where tinajas (natural stone water basins) exist and harbor riparian vegetation. This activity causes surface disturbance, but trials bikes are not ridden through riparian areas, and would not cause disturbance and destruction of riparian and aquatic habitat. Monitoring results have shown that unauthorized users of this area travel on designated trails, but also create new trails causing additional surface disturbance and no protection for riparian resources. Renewable Energy Decisions

Renewable energy management decisions would beneficially impact riparian areas. Active floodplains and 100-year floodplains are identified as exclusion or avoidance areas for wind, solar, and geothermal projects under all alternatives. In addition to the exclusion and avoidance areas, Alternatives B and C also include a proposed surface disturbance restriction for riparian areas. Under Alternative B, surface-disturbing activities would be prohibited within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of riparian and wetland areas. Under Alternative C, surface-disturbing activities would be subject to restrictions within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of riparian and wetland areas. These definitions may provide additional protection from surface disturbance in addition to the active floodplain and 100-year floodplain areas, depending on the characteristics of the riparian area. No surface disturbance restrictions are proposed for general riparian resources or floodplains under Alternative A; therefore, there would be no protection from renewable energy development for riparian areas under Alternative A. Wind, geothermal, and solar energy development all result in surface disturbance and the removal/loss of vegetation. The decisions to exclude wind, solar and geothermal energy development in wetlands and riparian areas under all alternatives would have a beneficial impact to riparian resources because it would prevent adverse impacts from those types of actions and provide protection for riparian resources.

4.2.7.2.6 Riparian Resources Decisions

Riparian resources management decisions would have adverse and beneficial impacts to riparian resources on BLM lands within the Planning Area. Riparian decisions that are common to all alternatives would have beneficial impacts to riparian resources because they emphasize the following protections for riparian habitat:

- Manage for the protection and enhancement of Southwestern Willow Flycatcher habitat, according to the Southwestern Willow Flycatcher Recovery Plan and current scientific literature on the subject.
- Implement actions to restore riparian areas to PFC or maintain them at PFC or to achieve advanced ecological status.
- Address riparian habitat values for all surface and vegetation disturbing activities proposed in riparian/wetland areas, and apply mitigation to reduce impacts to floodplains and riparian areas where impacts are expected.

Under Alternatives B and C, a surface disturbance restriction is proposed for protection of riparian resources. These restrictions are similar, but not the same as the stipulations discussed under the Mineral Resources section (4.2.3.2.7). Under Alternative B, surface-disturbing activities would be prohibited within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of

riparian and wetland areas. Under Alternative C, surface-disturbing activities would be subject to restrictions within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of riparian and wetland areas. No surface disturbance restrictions are proposed for riparian resources under Alternatives A and D; therefore, there would be an adverse impact to riparian resources under these alternatives. Alternatives B and C would have beneficial impacts to riparian resources because they would protect them from surface disturbance and removal of riparian vegetation as a result of multiple-use project implementation. Alternative B would have the most beneficial impact because it would prohibit surface disturbance in riparian areas altogether.

4.2.7.2.7 Special-status Species Decisions

Under all alternatives, no management action would be permitted on public lands that would jeopardize the continued existence of plant or animal species that are listed, officially proposed, or candidates for listing as threatened and endangered. The BLM would commit to current and future conservation agreements, management plans, and recovery plans specific to threatened and endangered species and BLM sensitive species, as described in the Special-status Species section of Table 2.58 (in Chapter 2). Specifically, the BLM would prioritize maintenance and improvement of riparian/wetland areas in protection of both Special Status Species and Migratory Birds (which are discussed in the SSS section) and minimize the spread of invasive, non-native plants such as cheatgrass, saltcedar and Russian olive and would strive for a dense understory of native species in riparian areas with improvement of cottonwood and willow regeneration. Implementation of these decisions would have beneficial impacts to riparian resources. Additionally, the most prevalent threatened and endangered species in the RPFO is the Southwestern Willow Flycatcher, a riparian obligate species that is dependent on riparian ecosystems for almost its entire life cycle. A decision common to all alternatives is to implement the Southwestern Willow Flycatcher Recovery plan which includes increasing and improving occupied, suitable, and potential breeding habitat for the species. Additionally, management for other special status species (such as the yellow-billed cuckoo) and migratory birds that utilize or depend on riparian habitats would have beneficial impacts to riparian resources because they would impose added protections for the habitats that support those species.

4.2.7.2.8 Soil and Water Decisions

Under all alternatives, soils and water management decisions would comply with New Mexico Standards and Guidelines (BLM 2001). In addition, all floodplains and riparian/wetlands would be managed in accordance with Executive Orders 11988 and 11990, which would protect the quality of stream water and federally listed species habitat. Uses on BLM lands in the Planning Area would be managed to minimize and mitigate damage to soils, and activities located in areas with sensitive soils would be subject to site-specific NEPA analysis. These restrictions would decrease the number of acres in the Planning Area subject to the adverse impacts of surface-disturbing activities on riparian resources, including surface water contamination and sedimentation by runoff from disturbed soils, and would therefore constitute beneficial impacts.

Under Alternatives B and C, the RPFO would prohibit surface-disturbing activities within 200 meters (656 feet) of riparian areas and springs. Oil and gas leasing stipulations would implement CSU for 15% to 30% slopes, NSO for slopes over 30%, and CSU for low reclamation soils. These actions would help to mitigate the adverse impacts of surface-disturbing activities on riparian resources. These management decisions would also help mitigate adverse impacts to

fish and other aquatic species' habitat from increased overland flow associated with upland soil disturbance. No surface disturbance restrictions are proposed for riparian resources under Alternatives A and D; therefore, riparian resources within the Planning Area would be adversely impacted under Alternatives A and D, more than Alternatives B and C.

4.2.7.2.9 Special Designations Decisions

Riparian areas would receive indirect beneficial impacts from proposed special designations because surface restrictions would be implemented within the special designations. Two ACECs are proposed in the RMP/EIS that would protect riparian values on BLM lands within the Planning Area. Under all alternatives, the Bluewater Canyon ACEC and Espinosa Ridge ACEC would be designated to protect the riparian values in the areas. Table 4.60 shows the proposed special designations with riparian values and other values in the Planning Area. No WSA segments are nominated in the RMP/EIS.

Table 4.60: Proposed Special Designations (acres) in the Planning Area, by Alternative

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACECs managed for riparian values	2 ACECs 1,575 acres	2 ACECs 11,236 acres	2 ACECs 8,628 acres	2 ACECs 2,419 acres
ACECS managed for other values	8 ACECs 52,190 acres	16 ACECs 138,738 acres	16 ACECs 128,401 acres	9 ACECs 41,630 acres
WSA/Wilderness Area	97,963 acres	97,963 acres	97,963acres	97,963 acres
CDNST	1 trail 11,474 acres	1 trail 38,808 acres	1 trail 23,607 acres	1 trail 11,474 acres
Total Special Designations in Planning Area	137,720 acres	185,625 acres	178,000 acres	126,392 acres

4.2.7.2.10 Lands with Wilderness Characteristics Decisions

In general, managing lands to protect their wilderness characteristics limits surface-disturbing activities, which would benefit riparian resources by reducing direct disturbance of riparian habitat. In terms of direct impacts of lands with wilderness characteristics decisions on riparian resources, Alternative B would have the most beneficial impact. Under Alternative B, 243 acres of riparian areas would be subject to the surface restrictions applied to lands with wilderness characteristics, including closures to vehicles and livestock grazing. Under Alternative C, 235 acres of riparian areas would be subject to surface restrictions, including limits on new rights-of-way.

In terms of indirect impacts, Alternative B would also produce a larger beneficial impact on riparian resources than Alternative C because 11,404 more acres of land would be managed to protect wilderness characteristics. In addition, Alternative B includes more limitations on activities within lands with wilderness characteristics, such as prohibiting new rights-of-way and closing to livestock grazing. In contrast, 4,075 acres of lands with wilderness characteristics will be open to livestock grazing and new rights-of-way under Alternative C. Precluding surface-disturbing activities would prevent impacts and habitat disruption that could result from surface-disturbing activities in and adjacent to riparian areas. Limitations on travel and new rights-of-

way would beneficially reduce disturbances associated with stream crossings and off-road travel, resulting in no damage to, or removal of, riparian vegetation.

Table 4.61 shows the acres of riparian areas located within lands proposed for protection or partial protection of wilderness characteristics. Alternatives A and D would be the least protective of riparian resources, since they would not manage BLM lands within the Planning Area to protect wilderness characteristics. Alternative B would be the most protective since 243 acres of riparian areas would be managed to protect wilderness characteristics and would be the most restrictive for surface-disturbing activities. Alternative C would manage 235 acres to partially protect wilderness characteristics, but would allow for surface-disturbing activities on a case-by-case basis.

Riparian habitat is not present in Volcano Hill or Cimarron Mesa; therefore, there will be no impacts to riparian areas through designation of these areas to Lands with Wilderness with Characteristics, regardless of which alternative is chosen.

Table 4.61: Riparian Areas (acres) Located within Lands Proposed for Management for Wilderness Characteristics

LWC Management Category	Alternative B	Alternative C (Preferred)	Alternative D
Riparian Acres in LWCs Managed to Protect Wilderness Characteristics	243	235	198
Riparian acres in LWCs where wilderness characteristics would not be protected	0	8	45
Total	**243**	**243**	**243**

4.2.7.2.11 Travel Management Decisions

Travel management decisions would have a beneficial impact to riparian resources because, under all alternatives, riparian areas would be closed to motorized travel. It is possible that certain existing roads within the field office have a significant impact on watershed stability. The decision to investigate road closures and establish criteria for closing roads based on erosion concerns would have a beneficial impact on riparian resources if it resulted in the closure and rehabilitation of roads that increase runoff and/or exacerbate erosion and sedimentation. Under Alternative B, BLM Road 1103 would be seasonally closed to motorized travel between July 1 and September 15, and from November 30 to April 15. Under Alternative C, it would only be closed between November 30 and April 15. Under Alternative C, it would not be seasonally closed. Wetland areas exist in the IC Grant area (the area BLM Road 1103 goes through), and Alternative B would provide the most protection from possible off-highway vehicle use during the wet times of the year, and prevent degradation of BLM Road 1103 by vehicular travel.

4.2.7.2.12 Vegetative Communities Decisions

The vegetative communities goals and decisions common to all alternatives emphasize actions that would benefit riparian resources such as restoring and maintaining vegetative communities to desired states; managing vegetation for ecological diversity, stability, sustainability and riparian function; controlling noxious and invasive plant species; maintaining, protecting and enhancing special status species plant and animal habitats; not allowing livestock grazing in riparian areas; and following the EIAS for Riparian and Aquatic Habitat Management in the

Albuquerque Field Office (BLM 2000). These decisions would have long-term beneficial impacts to riparian resources because they promote protection, preservation, restoration, and enhancement of riparian plant communities, and improve ecological health of riparian ecosystems. Prescribed fire and other vegetation treatments would likely result in the temporary loss of habitat, but would have long-term beneficial impacts.

Under Alternative B, the BLM would not implement vegetation treatments. Under Alternative C, the BLM would implement vegetation treatments in areas not meeting the NM Standards and Guides. Under Alternative D, the BLM would implement vegetation treatments that would increase harvest of all vegetative products. The effects of implementing Alternative B would be both beneficial and adverse. Beneficial impacts would occur because vegetation treatments often are accompanied by the risk of introducing noxious and invasive species, the risk of not meeting the desired outcome and the risk of overharvesting/over-treating an important ecosystem that could result in further deterioration of an already-degraded system. On the other hand, impacts of vegetation treatments have the potential to greatly benefit ecosystem health and speed recovery processes that otherwise might take longer to occur naturally. Faster recovery times would be the beneficial impacts of implementing Alternative C. The adverse impacts of Alternative C would include the realization of the aforementioned risks associated with vegetation treatments. However, with mitigation to lessen the chance of those risks occurring, adverse impacts can be lessened or avoided altogether. Alternative D would result in the highest adverse impacts to riparian resources because it would maximize vegetative product extraction in rare and sensitive ecosystems.

4.2.7.2.13 Wildlife and Fisheries Decisions

Wildlife and fisheries management decisions are expected to have beneficial impacts to riparian resources when projects are proposed to protect wildlife that utilizes riparian habitats. There is an estimated 1,582 acres of riparian/wetland habitat on BLM lands within the Decision Area, which provide habitat for game species, mammalian predators, small mammals, birds, wetland game birds, amphibians, fish, and reptiles. Management decisions proposed to enhance habitat for these wildlife species would beneficially impact riparian resources. It is a goal of the wildlife and fisheries program to manage for the biological integrity of terrestrial, riparian, and aquatic ecosystems with emphasis on ecosystem health and species biodiversity, and to manage crucial, high-value habitats as management priorities. These areas include riparian ecosystems. Common goals of the riparian and wildlife/fisheries programs would benefit riparian resources because implementation of actions aimed at meeting those goals would be highly supported by this RMP. The decision common to all alternatives to prevent excessive use and degradation of riparian areas from livestock grazing using behavioral management, wildlife-friendly fencing, and/or upland water developments would beneficially impact riparian resources because overgrazing would be prevented (this conclusion was determined with the assumption that these and other livestock grazing management techniques are applied in the best interest of riparian ecosystem health, function and biodiversity.)

Under Alternatives B and C, a general project disturbance mitigation measure would prohibit surface disturbance within up to 200m of existing or planned wildlife habitat improvement projects with the exception of large-scale vegetation manipulation projects. This decision would have beneficial impacts to riparian resources in areas where riparian projects have been conducted. These impacts are expected under the assumption that the objectives of any large-

scale vegetation manipulation projects are consistent with the objectives of the existing or planned wildlife habitat improvement projects.

4.2.7.2.14 Lands and Realty Decisions

Lands and realty decisions would have both positive and negative impacts on riparian resources. Areas that are recommended for disposal would have a negative impact on riparian resources if the parcels contained riparian habitat and the future use of the parcel was uncertain. That is, if the parcel were developed in such a way that disturbed riparian habitat, the disposal would have an adverse impact. Conversely, areas recommended for acquisition that contain riparian habitat would create beneficial impacts through the consolidation of riparian resources on Public lands. This would result in higher manageability.

Under all alternatives, riparian areas are designated as avoidance areas for rights-of-way, which would have a beneficial impact. This management decision allows the BLM to recommend relocation of rights-of-way that could adversely impact riparian habitat. Adverse impacts to riparian habitat would only occur if no alternate location could be identified that avoids riparian areas.

4.2.7.2.15 Renewable Energy Decisions

Under all alternatives, riparian areas are designated as exclusion areas for renewable energy projects, which would have a beneficial impact on riparian resources. No riparian areas would be disturbed to install wind, solar, or geothermal energy projects. There are 579 acres of riparian habitat in high potential renewable energy areas.

4.2.7.3 Cumulative Impacts

Reasonably foreseeable future actions that would impact riparian areas include continuation of non-native species treatment projects within the Planning Area. Multiple programs within New Mexico encourage the restoration of riparian areas and the removal of non-native species, such as saltcedar and Russian olive, within riparian corridors. As both private and public land managers within the Planning Area implement non-native species removal, the riparian areas within the Planning Area would benefit from improved ecosystem health and potentially increased stream flow. This assumes that removal of invasive species is followed up with measures to encourage re-establishment or reintroduction of native riparian plant species and discourage re-establishment of noxious and invasive species.

4.2.8 Social and Economic Resources

This section presents an analysis of social and economic impacts of the management alternatives proposed in the RMP/EIS. This document discusses employment, labor income, and effects on sectors in the impact area economy that encompass the RPFO. Impacts to revenues received by states and counties, environmental justice, and communities within the Planning Area are also presented. Finally, the alternatives are discussed in light of forecasts for the area over the 20-year period of analysis.

The economic analysis focuses on changes in labor income and employment associated with BLM planning actions and estimated outputs for the alternatives (Table 4.62). The social

analysis focuses on the interests and concerns of identified communities relative to the alternatives. Higher employment, subject to some qualifications, can be seen as a benefit to the local community. Other benefits are also present, although some are not easily measured or tied to economic activity. An example of where effects are difficult to quantify are equity effects, impacts to social values, and non-market values. Regardless, these benefits are discussed despite the inability to measure them quantitatively.

Table 4.62: BLM Outputs, by Alternative

Output	Current[1]	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
General recreation (visits)[2]	47,059	54,049	54,049	54,049	54,049
Fish and wildlife recreation (visits)	3,543	4,068	4,068	4,068	4,068
Cattle (AUMs)[3]	74,339	119,064	96,413–119,064	96,413–120,971	96,413–120,971
Forest product areas (acres)	–	12,717	148,292	607,199	757,074
Natural gas (thousand cubic feet)	431,945	432,000	432,000	432,000	432,000
Oil (barrels)	38093	39,000	39,000	39,000	39,000
Sand and gravel (short tons)	205,000	205,000	205,000	205,000	205,000
Crushed stone (short tons)	76,000	76,000	76,000	76,000	76,000
Gypsum (short tons)	486	500	500	500	500

[1] Estimates include actual use levels (average annual use).

[2] Recreation visits are expected to increase by 1% per year as a result of observed rates of increase in BLM recreation data (Recreation Management Information System 2010).

[3] Data are based on the potential AUMs available for activation under maximum permitted use. The share of actual use from what is available has slightly decreased from 67% in 2000 to 54% in 2008 (see Annual AUM Authorizations in the RPFO in Chapter 3).

4.2.8.1 Analysis Methods and Assumptions

The following analysis methods and assumptions were used to complete the analysis for the social and economic impacts from the proposed management decisions:

- The Planning Area population would continue to increase and age as described in Chapter 3.
- The social groups are defined to facilitate the discussion of social impacts. These discussions simplify what are often quite complex and unique values and attitudes, and the groupings presented here are by no means mutually exclusive. For example, many

ranchers also participate in recreation activities. It is also worth noting that attitudes, interests, and values often change over time. The social analysis covers the groups and individuals that are most likely to be affected by this plan.

- Regional economic impacts are estimated based on the assumption of full implementation of each alternative. The actual changes in the economy would depend on individuals taking advantage of the resource-related opportunities that would be supported by each alternative. If market conditions or trends in resource use were not conducive to developing some opportunities, the impact to the economy would be different than estimated here.
- Resource specialists projected annual resource outputs that are based on the best available information and professional judgment. The purpose of the economic analysis is to compare the relative impacts of the alternatives and should not be viewed as absolute economic values.
- Projected recreation visits are distributed among different types of visitors based on the results of National Visitor Use Monitoring (NVUM) surveys conducted for the Cibola National Forest.
- The ratios of recreation visits to jobs and income used to assess the impacts of the alternatives are based on national ratios developed through the U.S. Forest Service's NVUM program (Stynes and White 2005).
- Baseline recreation demand is assumed to increase by 1% per year based on the observed annual rate of recreation use in the RPFO (Recreation Management Information System [RMIS] 2010).
- Non salary-related expenditures made by the RPFO are assumed to be allocated to different economic sectors based on data compiled for the Cibola National Forest.
- Range revenues received by the BLM and benefits of BLM forage were calculated using the conservative AUM price for 2009 of $1.35 per AUM and the 2007 statewide average AUM price for private land of $11, adjusted for inflation (USDA 2007).
- Potential economic impacts are assessed using the Forest Economic Analysis Spreadsheet Tool (FEAST) developed by the U.S. Forest Service Inventory and Monitoring Institute in Fort Collins, Colorado. This tool uses a Microsoft Excel workbook as an interface between user inputs and data generated using the Impact Analysis for Planning (IMPLAN) input-output modeling system (FEAST 2010).
- The FEAST analysis assesses the economic impacts of the resource outputs projected under each alternative. Resource outputs in this context are the amount of a resource (e.g., forest products, AUMs, recreation visits, etc.) that would be available for use under each alternative. Average annual resource outputs were projected by resource specialists for each alternative for a 20-year planning period based on the best available information and professional judgment.
- Employment and labor income estimates developed for this analysis include direct, indirect, and induced economic effects. Direct employment would, for example, be generated in the grazing sector. Additional employment would be generated as the affected livestock operators purchase services and materials as inputs ("indirect" effects) and ranchers spend their earnings within the local economy ("induced" effects). Direct, indirect, and induced effects are combined in the discussion of effects below.

- Theoretically, expenditures associated with changes in final demand would be available and specific enough to allocate to each of the 440 sectors contained in the IMPLAN model. In the absence of primary data, national-level production functions are used. Expenditures should be delineated between local and non-local providers, as purchases out of the economic study region would have no local economic impact. IMPLAN's data contain information, called regional purchase coefficients, which describe the proportion of a given commodity that would be provided by local producers. Previous modeling experience has shown that the data contained in the IMPLAN modeling system for the various sectors are an accurate representation of impacts.
- Biomass opportunities may exist, but are not analyzed given a lack of understanding of obstacles to implementation and impracticalities of projecting future scenarios for implementation.
- Non-market values, including natural amenities, non-use values, ecosystem services, and aspects of well-being and quality of life are assessed in qualitative terms, as appropriate.
- The social analysis assesses the potential effects of different management actions on potentially affected social groups. These groups were identified based on the results of public scoping and comments received during the planning process. This analysis addresses the potential impacts of the alternatives based on the issues and concerns raised by these groups. The analysis draws upon ongoing discussions between the BLM and potentially affected publics, as well as discussions with subject matter experts involved in other parts of the analysis. The analysis is primarily qualitative with potential impacts ranked by alternative. Quantitative measures, such as acres in protected areas, and recreation visitation, are used, as appropriate.
- The environmental justice analysis presented assesses the potential for the proposed alternatives to have disproportionately high and adverse human health or environmental effects on minority and low-income populations. The fair treatment and meaningful involvement of people of all races, cultures, and incomes in this planning process is also considered.

4.2.8.2 Economic Direct/Indirect Impacts

None of the alternatives would be expected to reduce economic diversity (the number of economic sectors) or increase economic dependency, which occurs when the local economy is dominated by a limited number of industries. Shifts in emphasis could occur, but these would not result as a consequence of planning actions in this RMP/EIS. While the alternatives have the potential to affect local businesses and individuals, the relative contribution of BLM-related activities to the local economy (see Chapter 3) and the relative differences between the alternatives would not be large enough to have any measurable effect on economic diversity or dependency. For example, the dependency of the local economy on livestock industry, forest products, mining, and recreation activities would not be affected by BLM resource management under this RMP/EIS. Under all the alternatives, all BLM-related contributions, i.e., jobs and labor income, would continue to support less than 1% of totals within the impact area economy, but could be more important for smaller communities within the Planning Area.

Estimates of the levels of employment and labor income that would be supported by the alternatives are based on projected resource outputs from BLM management actions (see Table

4.62), estimated payments to counties (see below), BLM expenditures, and other externally funded activities on BLM lands. The projected outputs and activities are discussed by resource in the following sections. Estimated average annual employment and labor income from outputs and activities are summarized in Table 4.63 and Table 4.64 below, respectively.

As a result of Alternative A, about 386 jobs and $9.4 million in labor income would be generated in the impact area economy on an average annual basis; 23% more employment and 7% more income than contributed currently due to larger permitted grazing levels evaluated under this alternative than levels evaluated under the action alternatives. This estimate is based on the level of recreation, saleable and leasable fluid minerals, and AUM permitted use and thus reflects an annual average of the maximum available contribution that would be available rather than actual use. This includes direct, indirect, and induced effects as a result of the outputs, county payments, and management actions discussed in this section. The largest employment and labor income effects would occur in the agriculture, government, and Accommodation & Food Services sectors (see Table 4.63 and Table 4.64).

Table 4.63: Average Annual Employment Contribution (number of jobs), by Sector and Alternative

Sector (area total)	Current	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Accommodation & Food Services (37,515)	22	23	23	23	23
Admin, Waste Mngt & Rem Serv (36,695)	7	7	7	7	7
Agriculture (4,104)	101	130	161	130	163
Arts, Entertainment, and Rec (10,078)	5	5	5	5	5
Construction (34,431)	2	0	0	0	0
Educational Services (9,442)	2	2	2	2	2
Finance & Insurance (20,085)	7	8	7	7	7
Government (100,073)	88	88	88	88	88
Health Care & Social Assistance (59,378)	10	11	11	11	11
Information (11,708)	2	3	3	3	3
Manufacturing (20,947)	2	3	3	3	3
Mining (1,230)	6	0	0	0	0
Mngt of Companies (3,225)	1	1	1	1	1
Other Services (22,286)	5	6	6	6	6
Prof, Scientific, & Tech Services (45,297)	9	9	9	9	9
Real Estate & Rental & Leasing (27,428)	12	15	14	14	14
Retail Trade (52,171)	16	17	17	17	17
Transportation & Warehousing (11,308)	4	5	5	5	5
Utilities (12,77)	1	0	0	0	0
Wholesale Trade (15,389)	5	7	6	6	6
Total (524,067)	314	386	368	369	369

Table 4.64: Average Annual Labor Income Contribution (thousands of 2012 dollars), by Sector and Alternative

Sector (area total)	Current	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Accommodation & Food Services ($833,447)	$519	$551	$548	$548	$548
Admin, Waste Mngt & Rem Serv ($1,187,349)	$200	$220	$216	$216	$216
Agriculture ($146,312)	$355	$553	$503	$507	$507
Arts, Entertainment, and Rec ($147,362)	$96	$102	$101	$101	$101
Construction ($1,639,435)	$113	$117	$116	$116	$116
Educational Services ($272,114)	$46	$49	$49	$49	$49
Finance & Insurance ($996,604)	$319	$377	$362	$363	$363
Government ($6,906,100)	$3,658	$3,674	$3,671	$3,671	$3,671
Health Care & Social Assistance ($2,825,886)	$513	$546	$539	$539	$539
Information ($625,124)	$133	$143	$141	$141	$141
Manufacturing ($1,448,831)	$116	$121	$120	$120	$120
Mining ($83,903)	$393	$393	$393	$393	$393
Mngt of Companies ($265,286)	$69	$73	$73	$73	$73
Other Services ($820,726)	$205	$219	$216	$216	$216
Prof, Scientific, & Tech Services ($3,105,828)	$458	$485	$479	$479	$479
Real Estate & Rental & Leasing ($327,722)	$136	$164	$157	$158	$158

Sector (area total)	Current	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Retail Trade ($1,692,934)	$493	$520	$515	$516	$516
Transportation & Warehousing ($602,919)	$231	$280	$268	$268	$268
Utilities ($124,516)	$56	$66	$64	$64	$64
Wholesale Trade ($935,120)	$329	$396	$380	$381	$381
Total ($24,987,517)	$8,811	$9,425	$9,284	$9,295	$9,295

Under Alternative B, the estimated total number of jobs and labor income associated with BLM land and resource management would be about 368 and $9.3 million, respectively, which is 17% more employment and 5% more income than contributed currently but lower than the other alternatives with lower levels of maximum permitted grazing. The largest employment and labor income effects would occur in the government, agriculture, and Accommodation & Food Services sectors (see Table 4.63 and Table 4.64).

Under Alternatives C and D, the estimated total number of jobs and labor income associated with BLM land and resource management would be about 369 and $9.3 million, which is 17.5% more employment and 6% more income than contributed currently, slightly more than experienced under Alternative B but less than Alternative A. The largest employment and labor income effects would occur in the government, agriculture, and Accommodation & Food Services sectors (see Table 4.63 and Table 4.64).

4.2.8.2.1 Recreation and Visitor Services Decisions

While change in recreation use as a result of the alternatives is not expected, the role of recreation in the local economy would continue to increase as cultural and historical interpretation, OHV use, and other forms of recreation continue to increase. Observed changes in recreation visitation within the Planning Area indicate that an annual average increase of 1% is reasonable (RMIS 2010).

Under all the alternatives, recreation management would continue to sustain opportunities important to the area economy and well-being. As noted in Chapter 3, opportunities provided to local residents are important; however, recreation expenditures do not represent new money introduced into the economy. If BLM-related opportunities were not present, it is likely that residents would participate in other locally based recreation activities and this money would still be retained in the local economy. Therefore, local recreation visits are not considered in the modeling of economic effects under the alternatives[1]. Effects from non-local use under the alternatives would account for 20 jobs and $563,000 in labor income on an average annual basis (see Table 4.66 and Table 4.67 below).

[1] If local use continues on BLM lands under the alternatives, it would continue to support approximately 12 jobs and $363,000 in labor income.

Jobs and income associated with recreation management should not overshadow the economic value of experience held by recreation users within the Planning Area. For example, cultural interpretation or motorized use in the Planning Area could change as management actions are implemented. The value of recreation experiences could thus change under the alternatives; estimates of the value of these recreation experiences are not available given the lack of data regarding visitor use levels for these activities. Regardless, changes in the perceived quality of these recreation experiences are discussed in the Recreation and Visitor Services section (4.2.12) of this DRMP/DEIS.

Under all alternatives, it can be assumed recreation use would continue to increase by 1% per year based on rates of BLM visitation observed in the past (RMIS 2010). Given this increase, average annual recreation visits are estimated at 54,049 general visits and another 4,068 wildlife-related visits (see Table 4.62). Expenditures of these visitors would support approximately twenty jobs and $563,000 in labor income in the impact area economy on an average annual basis (see Table 4.66 and Table 4.67 below).

4.2.8.2.2 Livestock Grazing Decisions

The Planning Area's relatively low level of dependency on BLM forage would continue under all of the alternatives. The permitted use[2] under all of the action alternatives (see Table 4.62 above) could accommodate at least 13% of total forage needed to feed 2007 levels of livestock in the six impact area counties. Jobs and labor income associated with BLM grazing would continue to account for less than 1% of area totals. Additionally, jobs and labor income in the agricultural sector associated with BLM management would account for less than 2% of area totals in the agricultural sector across all alternatives.

While employment and labor income associated with grazing would remain low, BLM forage would continue to provide a low cost and important complement to some livestock producers' grazing, forage, and hay production. For smaller communities within the impact area, dependency on BLM forage might also be greater. In addition to potential changes in projected employment and income as a result of changes in BLM forage offered, the value of BLM forage to area operators should also be considered. This value can be estimated as the difference between the competitive market price of an AUM and the BLM lease fee. This value is experienced above the price ranchers pay for AUM leases and can be considered a benefit. The benefit to operators from the potential permitted BLM grazing varies among the alternatives, but would not fall below $1.1 million (2009 dollars). Payments to counties under the Taylor Grazing Act would continue under all the alternatives and are discussed below.

Alternative A could authorize average annual grazing of approximately 119,064 AUMs (see Table 4.62) and would support approximately ninety jobs and $1.2 million in labor income (see Table 4.66 and Table 4.67). While these contributions are higher than current contributions from grazing, it must be noted these are impacts from the established permitted use for AUMs in the Planning Area. This is the maximum number of AUMs that could be offered under ideal forage conditions, which may not be an accurate portrayal of actual impacts. Factors such as drought,

[2] The permitted use is the maximum number of AUMs that could be offered under ideal forage conditions, which may not be an accurate portrayal of actual impacts. Factors such as drought, financial limitations on operators, market conditions, and implementation of grazing practices to improve range conditions are important to consider.

financial limitations on operators, market conditions, and implementation of grazing practices to improve range conditions are important to consider.

The benefit of BLM forage to area operators under Alternative A would be approximately $1.19 million. Thus, despite the relatively small employment and labor income impacts, the value of forage to area operators would remain.

Alternative B would have a smaller maximum potential permitted use than the other action alternatives, but could be the same as Alternative A. However, with voluntary relinquishment of permits, Alternative B could authorize less than all the other alternatives and thus support fewer average annual AUM contributions (see Table 4.62). On an average annual basis, the potential permitted use range would support seventy-three to ninety jobs and $935,000 to $1.2 million in labor income within the impact area economy. As noted above these employment and labor income impacts depict an increase from what is currently contributed from grazing and are contingent on market conditions, operator demand for BLM AUMs, and forage condition. Regardless, BLM grazing-related jobs would continue to remain below 3% of overall agricultural employment and labor income for the area. Levels of employment and income associated with Alternative B should not overshadow potential increases in other values as a result of grazing actions under this alternative. For example, voluntarily relinquished allotments would then be available for other resource benefits (see grazing portion of Table 2.58 in Chapter 2).

The potential benefit to permittees of low cost BLM forage, below the cost of competitively priced AUMs, would be $1.08 million, which is less than the maximum potential benefit under the other alternatives. However, as noted above, this is greater than the current value ($721,000).

Alternative C would have a higher maximum potential permitted use than Alternatives A and B (see Table 4.62). On an average annual basis, the range of potential permitted AUMs would support seventy-three to ninety-one jobs and $935,000 to $1.2 million in labor income. These employment and labor income impacts depict an increase from what is currently contributed from grazing and are contingent on market conditions, operator demand for BLM AUMs, and forage condition. BLM grazing-related jobs would continue to remain below 3% of overall agricultural employment and labor income for the area.

The jobs and income associated with Alternative C should not overshadow potential increases in efficiency for individual operators under this alternative. The potential benefit of low cost BLM forage permittees would realize below the cost of competitively priced AUMs and would be approximately $1.09 million. Thus, despite the relatively small employment and labor income impacts, the value of forage to area ranchers would remain. Also, additional efficiency gains would result from reduced conflict from adjustment to 12,489 acres of allotments in Unit 5 and another 1,024 acres of Section 15 allotments (see grazing portion of Table 2.58 in Chapter 2).

Employment and labor income impacts associated with Alternative D would be the same as described above under Alternative C (see Table 4.66 and Table 4.67). The potential benefit of low cost BLM forage permittees would realize below the cost of competitively priced AUMs and would be the same as described above under Alternative C. However, the additional efficiency gains resulting from reduced conflict from adjustment to several allotments in eastern Sandoval County would not be experienced under this alternative. In other cases, efficiency gains would

be experienced on an individual basis or by the BLM as conflicts are reduced and grazing arrangements are made for the 1,024 acres of Section 15 allotments (see grazing portion of Table 2.58 in Chapter 2).

4.2.8.2.3 Forests and Woodlands Decisions

Under Alternative A, forest products would continue to be made available to communities in the Planning Area (see Table 4.62). Compared to the action alternatives, this alternative would continue to maintain the current accessibility of permit issuing stations and forest product collection areas that communities are accustomed to, and the potential for increased cost with increased travel time and increased use of substitute heat sources would be avoided. Consequently, the potential for disparate effects to minority and low-income populations would be avoided.

Alternative B would continue to provide forest product harvest areas to communities in the Planning Area (see Table 4.62); however, less acreage would be available for forest product harvest areas than under Alternatives C and D. While the potential acreage of forest product harvest areas under this alternative appears higher than under Alternative A, the distribution of those areas relative to communities could change as a result of designations that do not allow forest product removal. As a result, the potential for increased cost with increased travel time to permitting stations and collection areas could occur.

While some forest product users could experience increased costs associated with greater distance required to travel for forest products, others would choose not to travel or travel to collect forest products less often. As a result, these communities could experience increased heating costs associated with consumption of substitute sources of heat such as propane and natural gas. The removal of forest product collection areas adjacent to communities in the Planning Area under this alternative could have the greatest potential for disparate effects to minority and low-income populations. The communities that could be most affected by less available acreage could include Cuba and the surrounding area, including eastern Navajo chapters such as Ojo Encino and Torreon. Jemez Pueblo may also be affected by increased distances required to access forest products and increased fuelwood costs. In the western portion of the Planning Area, the Ramah Navajo reservation would have less opportunity to harvest forest products under Alternative B, as would communities in the Grants/Milan area and some Navajo Chapters south of Gallup.

Alternative C would continue to provide forest products to communities in the Planning Area (see Table 4.62). While the potential acreage of forest product harvest areas under this alternative appears higher than under Alternatives A and B, the distribution of those areas relative to communities could change as a result of designations that do not allow forest product removal. As a result, the potential for increased cost with increased travel time and increased use of substitute heat sources could occur. Thus, the removal of forest product collection areas adjacent to communities in the Planning Area could disparately impact minority and low-income populations under this alternative.

Alternative D would continue to provide forest products to communities in the Planning Area (see Table 4.62). While the potential acreage of forest product harvest areas under this alternative appears higher than under the other alternatives, the distribution of those areas relative to communities could change as a result of designations that do not allow forest product

removal. As a result, the potential for increased cost with increased travel time and increased use of substitute heat sources could occur. Thus, the removal of forest product collection areas adjacent to communities in the Planning Area could disparately impact minority and low-income populations under this alternative.

4.2.8.2.4 Fire Management Decisions

Potential wildland fire-related costs (such as property loss, lost revenues, and suppression costs) cannot be projected. It is commonly accepted that fire suppression costs and risk to life and property should be less when wildland fires occur where hazardous fuels have been treated compared to areas where fuels have not been treated. For example, fires generally burn hotter and flame lengths are higher in non-treated areas (USDI 2007). Currently, approximately 7,000 acres are treated annually with prescribed fire and mechanical and chemical methods. Under management common to all alternatives, approximately 32,000 acres would be targeted for fuels treatment dependent on budgetary and time constraints. If treatment targets were met, risk and associated costs would be reduced under all the alternatives relative to current treatment levels.

4.2.8.2.5 Mineral Resources Decisions

Current levels of leasable, locatable, and saleable mineral production would continue to be provided by the BLM in the Planning Area under all the alternatives (see Table 4.62). While current mining activities are not a direct result of new planning actions in this RMP/EIS, management under this plan will allow and determine the nature of these activities in the future. For example, withdrawal from mineral entry and closure of leasable acres would be implemented for several ACECs under the various alternatives. Regardless of these changes, current levels of production and associated employment and labor income (approximately 28 jobs and $1.4 million in labor income) would be supported under all the alternatives (see Table 4.66 and Table 4.67).

County and state governments operate under free use permits to remove crushed stone, sand, and gravel, such that no revenues or lease fees are received by the BLM and consequently no payments to counties are made. However, royalties from oil and gas are distributed back to local governments under the 1902 Reclamation Act and the 1920 Mineral Leasing Act, as amended. These payments are discussed below.

Under all alternatives, the RPFO would implement two leasing stipulations that would apply NSO to cultural resources and aviation facilities located in Township 11 North, Range 1 East, as well as churches and cemeteries. Under Alternatives B, C, and D, the RPFO would implement a leasing stipulation requiring NSO within areas managed for the maintenance of public health and safety. Alternatives B and C would implement one additional CSU for leasable mineral development near private residences. Alternative B would provide the greatest protection for social and economic resources in this RMP/EIS.

4.2.8.2.6 Externally Funded Ecosystem Restoration

A portion of the management actions performed on BLM lands is carried out with funds not provided by the BLM. Thus, these expenditures are not accounted for under the category of general BLM expenditures discussed below. As presented in Chapter 3, recent examples of such projects include stewardship agreements with area pueblos providing “wood for work.” In addition, vegetation treatments, road maintenance, and road closure work are also performed

periodically with external funds. These treatments are labor intensive and utilize agricultural and associated businesses contained within the impact area economy. As a result of these treatments, three jobs, and $98,000 in labor income are supported annually (see Table 4.66 and Table 4.67). In addition to direct job and income impacts in the agricultural industry, these estimates include impacts to industries that provide factors of production to the agricultural industry and other industries impacted by wage-related spending.

4.2.8.2.7 Impacts to Counties

Costs to local governments would remain unchanged as a result of planning actions, i.e., demand for services and infrastructure would not change as a result of BLM planning actions. Any changes under the alternatives in grazing revenues would not be large enough to significantly affect the overall amount of payment made to counties, since these payments make up small portions of county payments by alternative (see Table 4.65). Payments in lieu of taxes (PILT) and mineral royalty distributions, respectively, provide 73% and 26% of BLM-associated payments to counties under all the alternatives. Assuming current levels of county payments from BLM-managed land would continue, payments would support at least forty-seven jobs and $1.7 million in labor income in the impact area economy (see Table 4.66 and Table 4.67). Alternative A would provide the largest payments to the counties, slightly more than Alternatives B, C, and D.

Table 4.65: Payments to Counties (2010 dollars), by Alternative

Output	Current	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
PILT	$1,555,806	$1,555,806	$1,555,806	$1,555,806	$1,555,806
Range revenue	$18,463	$27,817	$25,171	$25,393	$25,393
Mineral royalty distributions	$558,572	$558,572	$558,572	$558,572	$558,572
Total	**$2,132,841**	**$2,142,195**	**$2,139,549**	**$2,139,771**	**$2,139,771**

Under Alternative A, annual payments to counties in the Planning Area would be approximately $2.143 million, which includes PILT, payments received from grazing revenues, and mineral royalty distributions (see Table 4.65). These payments would support about forty-seven jobs and $1.7 million in labor income (see Table 4.66 and Table 4.67). Alternative A would provide the largest percent increase in average annual employment and average annual labor income, slightly more than Alternatives B, C, and D. Payments to counties and their impacts under this alternative are slightly higher than the other alternatives since the level of grazing is based on the established permitted use for AUMs, which is slightly higher under this alternative. As discussed above this represents the maximum number of AUMs that could be offered under ideal forage conditions, which may not be an accurate portrayal of actual impacts. Regardless, contributions from these payments are only slightly higher than the other alternatives given the large dependence of PILT and mineral royalty distributions.

Under Alternative A, more BLM acres would be zoned for disposal than under the action alternatives. Further site-specific NEPA processes not covered under this plan would evaluate the availability of this land for disposal if proposed. If this land is disposed, it would no longer count towards the entitlement acreage used in PILT, thus possible decreases under this

alternative suggest the action alternatives would maintain PILT contributions to a greater degree than Alternative A. However, predicting county payments based on entitlement acreage alone is impractical due to changes in the population ceiling, congressionally approved annual appropriation acts, and other factors discussed in Chapter 3. Nevertheless, if BLM land is disposed of, it would be subject to property taxes whereas before disposal it was not. PILT are designed to help offset losses in property taxes due to the nontaxable status of federal lands within state or county boundaries. Therefore, county property taxes could offset losses from the qualifying entitlement acreage for PILT.

Table 4.66: Average Annual Employment[1] by Program (full and part-time jobs), by Alternative

Resource	Current	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Recreation[2]	19	20	20	20	20
Livestock grazing	56	90	81	82	82
Mineral resources	28	28	28	28	28
Externally funded projects	3	3	3	3	3
County payments	47	47	47	47	47
BLM expenditures	115	115	115	115	115
Total	**267**	**300**	**293**	**294**	**294**
Percent change from current	–	13.0%	9.8%	10.1%	10.1%

[1] Average annual values are based on projected impacts over the 20-year analysis period. Source: Potential employment and labor income impacts are based on the estimated resource outputs summarized by alternative in Table 4.62. Potential impacts were estimated using the IMPLAN model and FEAST.

[2] As discussed in Chapter 3, these recreation estimates do not include visits from local use since their expenditures do not represent new money into the economy.

Table 4.67: Average Annual Labor Income (thousands of 2010 dollars), by Program and Alternative

Resource	Current	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Recreation	$533	$563	$563	$563	$563
Livestock grazing	$721	$1,155	$1,045	$1,055	$1,055
Mineral resources	$1,389	$1,389	$1,389	$1,389	$1,389
Externally funded projects	$98	$98	$98	$98	$98
County payments	$1,743	$1,743	$1,743	$1,743	$1,743
BLM expenditures	$4,488	$4,488	$4,488	$4,488	$4,488
Total	**$8,971**	**$9,438**	**$9,328**	**$9,336**	**$9,336**
Percent change from current	–	5.2%	3.9%	4.0%	4.0%

Under Alternative B, annual payments to counties would be approximately $2.140 million, which includes PILT, payments received from grazing revenues, and mineral royalty distributions (see Table 4.65). These payments would support about forty-seven jobs and $1.7 million in labor income (see Table 4.66 and Table 4.67). Payments to counties and their impacts under this alternative are slightly lower than the other alternatives since the level of grazing is based on the established permitted use for AUMs, which is slightly lower under this alternative. As discussed above, this represents the maximum number of AUMs that could be offered under ideal forage conditions, which may not be an accurate portrayal of actual impacts. Contributions from these payments are only slightly lower than the other alternatives given the large dependence of PILT and mineral royalty distributions. Regardless, contributions from these payments would be the same as experienced currently or perhaps larger with favorable market conditions.

Under Alternative C, annual payments to counties in the Planning Area would be approximately $2.140 million, which includes PILT, payments received from grazing revenues, and mineral royalty distributions (see Table 4.65). These payments would support about forty-seven jobs and $1.7 million in labor income (see Table 4.66 and Table 4.67). Payments to counties and their impacts under this alternative are slightly more than Alternative B and less than Alternative A since the permitted use for AUMs is slightly higher and lower under Alternatives B and A, respectively. As discussed above this represents the maximum number of AUMs that could be offered under ideal forage conditions, which may not be an accurate portrayal of actual impacts. Contributions from these payments are only slightly different than the other alternatives given the large dependence of PILT and mineral royalty distributions. Regardless, contributions from these payments would be the same as experienced currently or perhaps larger with favorable market conditions.

Under Alternative D, annual payments to counties would be the same as Alternative C (see Table 4.65).

4.2.8.2.8 BLM Expenditures and Employment

Levels of expenditures and employment at the RPFO are not expected to vary as result of the alternatives. While different alternatives may cost more or less to implement, speculating whether the budget would be available is impractical. However, this does not mean implementation is impractical, since management priorities are likely to determine how funds are allocated to actions outlined in the plan. Thus, a constant budget over the life of the plan is a reasonable and practical assumption, based on the average annual salary and non-salary expenditures presented in Chapter 3. Under all the alternatives, it is estimated that average annual BLM expenditures would continue to support around 115 jobs and $4.5 million in labor income (see Table 4.66 and Table 4.67) in the impact area economy.

4.2.8.2.9 Renewable Energy Decisions

While all land in the Planning Area without surface occupancy or leasing restrictions would potentially be available for wind and solar development (given further site-specific review), not all land can be considered suitable for development. Developable land depends on the resource and transmission line availability and capacity. Decisions to invest in wind and solar energy are also dependent on the cost of alternative sources of energy, as well as the regulatory environment and other costs to society. Natural gas, oil, and coal prices therefore also determine the level of

energy investment. The viability of commercial wind power projects also depends on the pricing agreements between power producers and purchasers. All of these components are difficult to predict, which makes speculation on possible development impractical. In addition, costs associated with development on public land (i.e., site-specific planning) could limit project development. In the future, with changes in energy markets, technology, and/or development saturation on available private land, development on BLM-administered lands in the Planning Area may become more likely. If wind energy development were to occur on BLM lands in the impact area, employment and labor contributions would result. Per 1.5-megawatt turbine, eleven full time-equivalent jobs and $400,000 in labor income would result during construction, and one full-time equivalent job and $64,500 labor income would be provided during normal operation on an average annual basis (U.S. Department of Energy 2009).

4.2.8.2.10 Role of Amenities, Migration, and Non-market Values

The economic analysis assesses the economic effects of the direct use of resources in terms of jobs and income. This type of analysis does not include other types of economic value often referred to as non-market values, which are discussed in Chapter 3. Non-market values are important to the well-being of visitors, area residents, and others outside the Planning Area. These values include natural amenities, quality of life factors, recreational opportunities, ecosystem services, and non-use values such as existence, option, and bequest values. Non-market values are difficult to quantify and insufficient data exist to assess the effects of management actions. However, the fact that no monetary value is assigned to these values does not lessen their importance in the decision-making process.

In addition, helpful inferences can be made. While there is a general consensus that non-use values exist, the methodologies for measuring these values are controversial and difficult to apply. Wilderness has been the subject of numerous non-use studies, usually conducted for specific natural areas; however, no attempt has been made to directly elicit potential non-use values associated with the alternatives under this RMP/EIS. The alternatives establish areas to be managed for Wilderness characteristics and changes to ACECs and other special designations such as VRM classes. These designations would further maintain and perhaps enhance non-market values associated with natural amenities protected on these lands.

Additionally, these ACECs, lands to be managed for Wilderness characteristics, and VRM acres may attract new residents and tourists to the area, which would then contribute to area economic activity. Natural amenities and quality of life have been increasingly recognized as important factors in the economic prospects of many rural communities in the West (Rudzitis and Johnson 2000). In addition, non-labor income is intimately tied to natural amenities as discussed in Chapter 3. Rural county population change, the development of rural recreation, and retirement-destination areas are all related to natural amenities (McGranahan 1999). Thus, designations that maintain and protect natural amenities may similarly contribute to area economic well-being.

These designations would further maintain and perhaps enhance non-market values associated with natural amenities protected on these lands. Under Alternative A, less land would be managed under these special designations than under Alternative B; however, more would be managed than under Alternatives C and D. Thus, Alternative A would ensure less protection of non-market values and natural amenities than Alternative B but would ensure more than Alternatives C and D (Table 4.68). Consequently well-being associated with non-market values

and potential contributions from new residents and tourists attracted by natural amenities could be less than Alternative B but more than Alternatives C and D.

Table 4.68: ACECs, Lands Managed to protect Wilderness Characteristics, and VRM Class I and Class II Areas (acres), by Alternative

Designation	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACECs	53,765	149,974	137,029	44,049
Lands managed to protect Wilderness Characteristics	0	37,514	26,110	2,239
VRM Class I	97,645	97,296	97,474	97,516
VRM Class II	84,449	318,931	68,511	21,549

Under Alternative B, more acreage would be designated as ACECs, lands to be managed to protect wilderness characteristics, and VRM Class I and II acres than the other alternatives (see Table 4.68). Therefore, this alternative would ensure more protection of non-market values and natural amenities than the other alternatives. Consequently, well-being associated with non-market values and potential contributions from new residents and tourists attracted by natural amenities could be more than the other alternatives.

Under Alternative C, less acreage would be designated as ACECs, lands to be managed to protect wilderness characteristics, and VRM Class I and II acres than Alternatives A and B but more than Alternative D (see Table 4.68). Therefore, this alternative would provide less protection of non-market values and natural amenities than Alternatives A and B but more than Alternative D. Consequently, well-being associated with non-market values and potential contributions from new residents and tourists attracted by natural amenities could be less than these alternatives but more than Alternative D.

Under Alternative D, less acreage would be designated as ACECs, lands to be managed for wilderness characteristics, and VRM Class I and II acres than the other alternatives (see Table 4.68). Therefore, this alternative would provide the least protection of non-market values and natural amenities among the alternatives. Consequently, well-being associated with non-market values and potential contributions from new residents and tourists attracted by natural amenities could be less than the other alternatives.

4.2.8.3 Social Direct/Indirect Impacts

The social analysis focuses on changes to social and economic well-being as it relates to the quality of life of those individuals and communities identified in Chapter 3. While many of the potential changes in quality of life can only be discussed qualitatively, several indicators provide an approach to discuss the magnitude of effects to these communities. Table 4.69 lists these indicators and provides a comparison among the alternatives for communities.[3] As social indicators, Alternative D has the largest acres for forest products, Alternatives B, C, and D have

[3] Changes in indicators do not imply the same change in quality of life for all communities since marginal changes in quality of life relative to the indicators cannot be considered equal among communities. For example, the change in quality of life associated with more access for communities interested in traditional uses is different than the change in access for those interested in ranching.

the most acreage for fuel treatment, and Alternative A has the largest acres of protected areas. Cattle forage would increase with all alternatives. Comments from the RMP planning process and the community economic workshops provided specific information pertaining to the concerns of individuals and groups interested in this plan. All comments were examined and general categories were formed from common themes pertaining to community connections and interests in BLM management. The eight communities of interest identified include individuals and groups interested in adjacent uses, public health and safety, recreation, resource protection, resource use, and traditional uses. In addition, communities identified within specific areas that were identified as connected to the BLM in the Planning Area include pueblos and land grants. These communities are described in Chapter 3, while effects to these communities are discussed below.

Table 4.69: Social Indicators, by Alternative

Social Indicator	Current	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Cattle forage (AUMs)	74,339	119,064	96,413–119,064	96,413–120,971	96,413–120,971
Forest products (acres)	–	12,186	119,435	560,321	644,132
Fuel treatments (acres)	7,000	32,000	32,000	32,000	32,000
Protected areas* (acres)	296,796	228,346	587,236	315,262	159,024

* These areas include ACECs, VRM Class I, VRM Class II, and lands with wilderness characteristics managed to protect wilderness character. Based on the proposed management decisions in this RMP/EIS, these areas would typically have fewer surface-disturbing activities occur within their boundaries compared to other locations in the Planning Area.

The following social analysis assesses the potential effects of management actions common to all the alternatives on communities identified in Chapter 3. Higher employment, subject to some qualifications, can be seen as a benefit to the local community. Other benefits are also present, although some are not easily measured or tied to economic activity. An example of where effects are difficult to quantify are equity effects or impacts to well-being. Regardless, these benefits are discussed despite the inability to quantify them.

4.2.8.3.1 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The Executive Order further stipulates that agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin.

All alternatives could result in increases in employment and labor income relative to current conditions over the next decade, from which minority and low-income populations may benefit.

Access to subsistence uses, traditional materials, and cultural sites would be accommodated to varying degrees under the alternatives. Access to these materials and sites would continue to provide valuable resources to communities in the area, sustaining lifestyles, traditions, ceremonies, and the heritage that remain an important part of area community's lifestyle and well-being. As discussed above, the removal of forest product collection areas adjacent to communities in the Planning Area could disparately impact minority and low-income populations that depend on these sources of forest products.

Additionally, public involvement efforts for this project have been inclusive, and the BLM has considered input from persons or groups regardless of race, color, national origin, income, or other social and economic characteristics.

4.2.8.3.2 Recreation and Visitor Services Decisions

Under all the alternatives, recreation management would continue to sustain opportunities important to the area economy and the well-being of recreationists. While perceptions regarding the quality of experience could change under the alternatives, opportunities currently experienced would be maintained and recreation use is anticipated to increase at current rates. Regardless, changes in the perceived quality of these recreation experiences are discussed in the Recreation and Visitor Services section (4.2.12) of this EIS/RMP.

4.2.8.3.3 Livestock Grazing Decisions

Under all the alternatives, current levels of grazing could be accommodated under the range of potential permitted uses (see Table 4.69). Additional AUMs could be authorized; however, AUMs authorized depends on other factors than just market conditions such as drought, financial limitations on operators, and implementation of BLM grazing practices to improve range and conditions of other resource values. Ranching has played a historic role in the community and many would like to see this traditional use continue.

Under all the alternatives, management actions that would remove grazing from active allotments would be relinquished voluntarily as stated in the livestock grazing portion of Table 2.58 in Chapter 2. In this manner, individual operators would have the opportunity to continue grazing or relinquish voluntarily if in their best interest. Consequently, disparate effects to minority or low-income populations dependent on these grazing allotments would be avoided.

4.2.8.3.4 Fire Management Decisions

Potential wildland fire-related costs (such as property loss, lost revenues, and suppression costs) cannot be projected. It is commonly accepted that fire suppression costs and risk to life and property should be less when wildland fires occur where hazardous fuels have been treated compared to areas where fuels have not been treated. Under management common to all alternatives, approximately 32,000 acres would be targeted for fuels treatment dependent on budgetary and time constraints. Currently, approximately 7,000 acres are treated annually with prescribed fire and mechanical and chemical methods. If treatment targets were met, risk and associated costs would be reduced under the alternatives relative to current treatment levels (see Table 4.69). Consequently, individuals and groups interested in adjacent uses would experience an increase in well-being as a result of increased fuel treatments they associated with wildland fire-related costs.

4.2.8.3.5 Forest and Woodlands Decisions

Under Alternative A, forest products would continue to be made available to communities in the Planning Area (see Table 4.69). Compared to the action alternatives, this alternative would continue to maintain the current accessibility of permit issuing stations and forest products collection areas that area communities are accustomed to and depend upon.

Consequently, individuals and groups who give a high priority to resource use, traditional uses, and other communities would not experience the potential decreases in well-being with reduced access to permits and forest product harvest areas under the action alternatives. Consequently, the potential for disparate effects to minority and low-income populations would be avoided.

Alternative B would continue to provide forest products to communities in the Planning Area (see Table 4.69); however, less acreage would be available for forest product harvest areas than under Alternatives C and D. Less accessibility of permitting stations and designated fuelwood areas could result from designations that do not allow forest product removal. Consequently, individuals and groups who give a high priority to resource use, traditional uses, and other communities could experience decreases in well-being with less access to this important resource that sustains their quality of life. The communities that could be most affected would include Cuba and the surrounding area including eastern Navajo chapters such as Ojo Encino and Torreon. Jemez Pueblo may also be affected by increased distances required to access forest products and increased heating costs. In the western portion of the Planning Area, the Ramah Navajo reservation would have less opportunity to harvest forest products, as would communities in the Grants/Milan area and some Navajo Chapters south of Gallup.

Alternative C would continue to provide forest products to communities in the Planning Area (see Table 4.69). While the potential acreage of forest product harvest areas under this alternative appears higher than under Alternatives A and B, the distribution of those areas relative to communities could change as a result of designations that do not allow forest product removal. Consequently, individuals and groups who give a high priority to resource use, traditional uses, and other communities could experience decreases in well-being with less access to this important resource that sustains their quality of life.

Alternative D would continue to provide forest products to communities in the Planning Area (see Table 4.69). While the potential acreage of forest product harvest areas under this alternative appears higher than under the other alternatives, the distribution of those areas relative to communities could change as a result of designations that do not allow fuelwood removal. Consequently, individuals and groups who give a high priority to resource use, traditional uses, and other communities could experience decreases in well-being with less access to this important resource that sustains their quality of life.

4.2.8.3.6 Mineral Resources Decisions

Under all alternatives, current levels of locatable, leasable and saleable mineral material development would be accommodated (see Table 4.62). Employment and income generated from these activities would continue to support area well-being. The availability of sand, gravel, and crushed stone would remain under all the alternatives, as these materials are used to improve and maintain area infrastructure, such as aggregate for road resurfacing. As a result the quality

of life of individuals and groups interested in resource uses would be maintained with these anticipated levels of mineral material availability.

Under all alternatives, the RPFO would implement two leasing stipulations that would apply NSO to cultural resources and aviation facilities located in Township 11 North, Range 1 East, as well as churches and cemeteries. Under Alternatives B, C, and D, the RPFO would implement a leasing stipulation requiring NSO within areas managed for the maintenance of public health and safety. Alternatives B and C would implement one additional CSU for leasable mineral development near private residences. Alternative B would provide the greatest protection for social and economic resources in this RMP/EIS.

4.2.8.3.7 Impacts to Counties

Under all the alternatives, the large dependence of county PILT and mineral royalty distributions means county payments do not vary. Since it is anticipated that current mineral development would continue and entitlement acreage determining the BLM portion of PILT would not change, employment and income impacts do not vary (approximately forty-seven jobs and from $1.7 million in labor income). Thus, county programs and infrastructure supported by these payments would not be affected by the alternatives. Consequently, economic well-being and quality of life of those dependent on these contributions would likely remain the same under the alternatives.

4.2.8.3.8 BLM Expenditures and Employment

Under all the alternatives, it is assumed the level of expenditures and employment at the RPFO would not vary by alternative, so employment and income supported does not vary among the alternatives. Thus, economic well-being and quality of life of those dependent on these contributions would likely remain the same under the alternatives.

4.2.8.3.9 Role of Amenities, Migration, and Non-market Values

As noted in Chapter 3, individuals and groups interested in resource protection are aware of how the unique, natural environment contributes to their current and future social and economic well-being. Concerns such as the negative impacts from damaged visual quality, invasive species, and maintenance of special area designations are held by communities interested in resource protection and traditional uses.

The alternatives establish ACECs, lands to be managed for Wilderness characteristics, and VRM Class I and II acres (see Table 4.69). These designations would further maintain and perhaps enhance non-market values associated with natural amenities protected on these lands. Natural amenities and quality of life have been increasingly recognized as important factors in many rural communities in the West (Rudzitis and Johnson 2000). Thus, the established ACECs, lands to be managed for Wilderness characteristics, and VRM Class I and II acres similarly contribute to the quality of life of communities interested in resource protection.

Under Alternative A, less land would be managed under these special designations than under Alternative B; however, more would be managed than under Alternatives C and D (see Table 4.69). Therefore, under Alternative A greater contributions to the quality of life of communities interested in resource protection would be anticipated relative to Alternative B alongside less contribution relative to Alternatives C and D.

Under Alternative B, more acreage would be designated as ACECs, lands to be managed for wilderness characteristics, and VRM Class I and II acres than the other alternatives (see Table 4.69). Therefore, under this alternative a greater contribution to the quality of life of communities interested in resource protection would be anticipated relative to the other alternatives.

Under Alternative C, less acreage would be designated as ACECs, lands to be managed for wilderness characteristics, and VRM Class I and II acres than Alternatives A and B but more than Alternative D (see Table 4.69). Therefore, under this alternative less of a contribution to the quality of life of communities interested in resource protection would be anticipated relative to Alternatives A and B alongside a greater contribution relative to Alternative D.

Under Alternative D, less acreage would be designated as ACECs, lands to be managed for wilderness characteristics, and VRM Class I and II acres than the other alternatives (see Table 4.69). Therefore, under this alternative the smallest contribution to the quality of life of communities interested in resource protection would be anticipated relative to the other alternatives.

4.2.8.3.10 Travel management Decisions

Under all alternatives, individuals with disabilities could request a permit to travel on closed roads consistent with the Rehabilitation Act of 1973. Such access would be considered on a case-by-case basis by the RPFO.

4.2.8.4 Cumulative Impacts

The regional economy can be affected by a variety of factors, including population growth, changes in interest rates, locations of new industries, recession, growth of new sectors, tax policy, state economic policy, etc. When compared to these variables, the management actions under this RMP/EIS have a relatively small effect on the regional economy. Because the changes in economic activity presented above would be largely unnoticeable regionally, there should be no cumulative economic effects regionally.

4.2.8.4.1 Recreation and Visitor Services

Area National Forests are required to complete comprehensive travel management plans for motorized recreation. The extent and nature of actions in these plans would determine the social and economic consequences for the area. Once this RMP/EIS is approved, the BLM would develop transportation plans that would identify a network of routes that would support some current uses now taking place in the Planning Area or expected to take place in the future, which would include uses on adjacent National Forests.

4.2.8.4.2 Livestock Grazing

Children in traditional ranching families often do not maintain the family tradition given new challenges presented by changing market conditions such as increased cost of operation (Nathan Combs, BLM, personal communication with Henry Eichman, U.S. Forest Service, July 28, 2008). While the level and approach to grazing differs among the alternatives, 54% of AUMs were used in 2008 out of the permitted maximum number of AUMs that could be offered under ideal forage conditions. This was down from 67% in 2000 (see Annual AUM Authorizations in

the RPFO in Chapter 3). While these decreasing trends in AUM utilization are largely outside the spectrum of BLM management, current levels of grazing would be supported under Alternative A and Alternatives C and D with cooperation of favorable market conditions and willing permittees.

4.2.8.4.3 Forests And Woodlands

As discussed in Chapter 3, the contribution of BLM forest products is small relative to forest products gathered from U.S. Forest Service lands; however, BLM contributions are still locally important. In winter months, forest product gathering occurs on BLM lands since U.S. Forest Service collection areas are closed and inaccessible from snow and mud. Thus, the changes in access to forest product harvest areas discussed above under the alternatives still have the potential to disparately affect minority and low-income populations. Noting that the U.S. Forest Service forest product areas are less available in winter months than BLM sources accentuates the potential for disparate effects to minority and low-income populations who depend on BLM sources of forest products for home heating and cooking.

4.2.8.4.4 Mineral Resources

Current levels of leasable, locatable, and saleable mineral production would continue to be provided by the BLM in the Planning Area (see Table 4.62). Consequently, any cumulative effects to local social and economic conditions from mineral resource uses on BLM lands would be the same among the alternatives.

Decisions to invest in energy development and infrastructure on BLM lands are dependent on factors determined by regional and world markets. Speculation beyond current rates of development is unrealistic since decisions to invest are dependent on these factors outside the scope of BLM management. In addition, costs associated with development on public land (i.e., site-specific planning) could hamper development. In the future, with changes in energy markets, technology, and/or development saturation on available private land, development on BLM-administered lands in the Planning Area may become more likely and the exclusion of areas on BLM lands may limit development if substitute locations are not available. However, it can be reasonably assumed that the availability of rights-of-way and land for energy development on BLM lands would accommodate development interests in the future.

4.2.8.4.5 Externally Funded Ecosystem Restoration

Current levels of management performed on BLM lands carried out with funds not provided by the BLM would continue under all the alternatives. Consequently, any associated cumulative effects would be the same among the alternatives.

4.2.8.4.6 Impacts to Counties

Under all the alternatives, the large dependence of county PILT and mineral royalty distributions means county payments do not vary (approximately 47 jobs and from $1.7 million in labor income). In addition, as discussed in Chapter 3, county payments in Planning Area counties make up less than 5% of local government revenues (see Revenue Sharing section of Chapter 3). Thus, county programs and infrastructure supported by these payments would not differ among the alternatives. Consequently, cumulative economic effects on counties would likely remain the same under the alternatives.

4.2.8.4.7 BLM Expenditures and Employment

Under all the alternatives, it is assumed the level of expenditures and employment at the RPFO would not vary by alternative, thus employment and income supported does not vary among the alternatives. Consequently, any cumulative economic effects on those dependent on these contributions would remain the same under the alternatives.

4.2.8.4.8 Role of Amenities, Migration, and Non-market Values

Establishing areas to be managed for Wilderness characteristics, changes to ACECs, and other special designations such as VRM (see Table 4.68) would further maintain and perhaps enhance non-market values associated with natural amenities protected on these lands. Natural amenities and quality of life have been increasingly recognized as important factors in many rural communities in the West (Rudzitis and Johnson 2000). Thus, the established ACECs, WSAs, and lands to be managed for wilderness characteristics similarly contribute to area quality of life of communities interested in resource protection. The effects on quality of life from special area designations and management of these attributes on private, state, and other federal lands cannot be projected, but could be the greatest under Alternative B and the least under Alternative D with the respective most and least acres designated among the alternatives, respectively (see Table 4.68).

4.2.8.4.9 Lands and Realty and Renewable Energy

Exclusion areas and limitations on leasing on BLM lands in the Planning Area could increase development and rights-of-way on private, state, or other federal lands. However, decisions to invest in energy development and infrastructure on BLM lands are dependent on factors determined by regional and world markets. Speculation beyond planned development is unrealistic since decisions to invest are dependent on these factors outside the scope of BLM management. In addition, costs associated with development on public land (i.e., site-specific planning) could hamper development. In the future, with changes in energy markets, technology, and/or development saturation on available private land, development on BLM-administered lands in the Planning Area may become more likely and the exclusion of areas on BLM lands may limit development if substitute locations are not available. However, it can be reasonably assumed that the availability of rights-of-way and land for energy development on BLM lands would accommodate development interests in the future. Consequently, exclusion areas would not limit development in the area or increase development on other private, state, or federal lands.

4.2.8.4.10 Cumulative Effects to Population

Population increases are also anticipated over this period within the Planning Area. According to projections from the University of New Mexico, the population in all six Planning Area counties would increase by 24% between 2010 and 2020. Sandoval County would increase the most over this period (30%), while Rio Arriba County would increase the least (5%) (University of New Mexico 2008). These population increases suggest use of BLM lands would continue to increase, challenges with the urban interface could increase, and competing uses of BLM lands would remain a challenge.

In conclusion, projected employment changes in the area suggest economic contributions from BLM management would be small. However, the role the BLM plays may increase along with

the population since the lands managed by the BLM sustain area well-being and would continue to do so under all alternatives. This occurs largely through the provision of natural amenities and recreational opportunities that attract tourists, businesses, and maintain quality of life. None of the alternatives would alter the trends outlined above but would sustain aspects of quality of life such as employment, recreation, education, and cultural development. While the provision of these resources varies by alternative, these opportunities would be available for a variety of demographic groups, area residents, tourists, and others who value the area.

4.2.9 Soil and Water Resources

Most allowable uses have the potential to affect soil resources to some degree. Surface-disturbing actions would result in removal of vegetative cover, soil compaction, reduced infiltration, changes in physical and biological properties, and reduction in organic matter content. These direct impacts to soils tend to increase the potential for accelerated erosion by exposing soil particles to wind and water. There also would be a loss of soil productivity through disruption of natural soil horizons and removal of vegetated acreage for use by roads, well pads, and other facilities. Surface uses that may not result in direct surface disturbance, but may affect soil stability through changes in vegetative cover or soil infiltration rates, include grazing by livestock and wildlife (if improper grazing damages vegetative cover), vegetative treatments, and fire and fuels management. A combination of bare soil surface caused by vegetation removal or changes in community structure, erodible soils, and slope leads to the greatest potential for soil erosion from water.

Actions that disturb or compact soil, remove or reduce vegetative cover, or reduce soil productivity are considered adverse impacts. Conversely, beneficial impacts to soil include actions that stabilize soil or increase soil productivity. In addition, those actions that avoid or minimize soil compaction or erosion are beneficial.

Short-term impacts to soils are those that result during initial surface disturbance prior to completion of revegetation or installing other practices that minimize wind and water erosion. The amount of bare ground predicted under each alternative after successful reclamation of disturbed areas is important to consider when evaluating long-term impacts to soils. Areas not reclaimed leaving bare soil include roads and areas around facilities that sustain concentrated surface uses by equipment or animals, which preclude the reestablishment of vegetation. Long-term impacts due to accelerated erosion would occur in locations where bare soils are allowed to remain exposed to wind and water for more than 5 years or where the loss of productivity results from significantly altering the soil profile.

Surface disturbance can affect surface water quality mainly by increasing sediment delivery to drainages, which is ultimately transported to streams during runoff events. Surface disturbance of highly erodible soils is the most likely disturbance to increase sedimentation in streams. Impacts to water resources also would occur when activities or projects take place within riparian areas and floodplains, or when an upstream increase in runoff or erosion results in damaging levels of stream energy or sedimentation within stream/riparian/floodplain areas. Differences between alternatives are based on acreage allocations that would increase activities associated with soil loss, soil exposure, and riparian/floodplain areas. Impacts to soil and water are expected to occur

from vegetation management, livestock grazing, mineral resources, renewable energy management, travel management, and soil and water management.

4.2.9.1 Analysis Assumptions

A variety of multi-level regulatory (e.g., water quality protection permitting) and non-regulatory (e.g., employing standard BMP's) processes exist to ensure that erosion and pollutant levels do not increase above identified thresholds and/or water quality standards. It is assumed that land uses would be carried out in compliance with existing policies and regulations at both the state and federal levels. It is further assumed that all surface-disturbing and runoff-increasing activities would be designed and implemented to minimize runoff, erosion, and sedimentation. Installing and maintaining erosion controls and other mitigation measures, such as BMPs, results in a substantial reduction in soil erosion, ranging between 40 and 97 percent depending on site conditions (USFS 2003b). However, these measures may not reduce adverse impacts on soil compaction and productivity. Proposed surface disturbance under each alternative potentially modify soils by disrupting soil stability, changing vegetative cover, decreasing productivity, and increasing compaction. If these modifications occur on highly erodible soils, the potential for accelerated erosion is approximately 40-percent greater (USFS 2004) than predicted for less erodible soils.

The following specific factors were considered for the impacts analysis related to soil and water resources:

- The "sensitive soils" designation refers to highly erodible soils and soils with a poor chance of successful reclamation after drastic disturbance to the soil profile.
- There are soils in the Planning Area that are likely to have limited reclamation success when these areas are reclaimed after drastic disturbance such as oil and gas field development, temporary roads, or similar activities. Soils identified with a USDA-NRCS rating of "poor" means that revegetation and stabilization are expected to be difficult and costly. Soils identified as "not rated" were included in the low reclamation potential soils because this category represents the badland soils in the Planning Area.

Infrastructure development and soil disturbance on steeper slopes (greater than 15% slope) generally increases the downslope water erosion potential because of higher runoff volumes and rates. This typically would be expected with permanent surface installations such as wind farms, solar arrays, pipelines, roads, communication sites, transmission lines, and oil and gas facilities. The appurtenant access roads required foremost of these would be a part of the increased runoff and erosion potential. Therefore, slope steepness may be an important consideration for protecting soil stability when authorizing land uses on these slopes would increase runoff and erosion potential. Active floodplains, defined as the low-lying land surface adjacent to a stream that is flooded at least once or twice (on average) every three years (Pritchard 1999, 1998), are associated with nearly all identifiable streams such as those depicted in the National Hydrologic Dataset (USGS 2010). Both 100-year floodplains and active floodplains are important considerations for protecting property and natural riparian/floodplain functions when authorizing land uses in these areas including rights-of-way and potential sites for renewable energy facilities.

4.2.9.1.1 Vegetation Management Decisions

Vegetation management, as defined for this section, includes any management decisions that are associated with vegetation manipulation: fire management, vegetative communities, riparian resources, and forest and woodland resources. Vegetation management resource decisions would have short-term adverse and beneficial impacts to soil and water resources immediately after vegetation treatments occur. Exposed and disturbed soils from mechanical treatments would be more susceptible to erosion immediately after the vegetation treatment occurs. Beneficial short-term impacts would occur when forest thinning projects include lop and scatter treatments which leave behind slash to protect soils from erosion.

The vegetation management decisions would work to restore the native vegetative communities on BLM lands within the Planning Area that best protect both soil and water resources. Long-term beneficial impacts from vegetation management decisions on soil and water resources would be improved land health, as defined by the New Mexico Standards and Guidelines (BLM 2001). Fuel treatments are prioritized for 629,737 acres rated as FRCC 2 and 3. Of these areas, 416,090 acres contain highly erodible soils. Table 4.70 shows the total number of acreages available for forest product harvest areas within highly erodible soils. Under Alternative D, the largest amount of acreage for forest harvest products would be open within highly erodible soils, while under Alternative B the least amount of acreage within highly erodible soils would open to forest product harvest. No specific treatments have been proposed in the RMP/EIS for riparian restoration or upland vegetation.

Table 4.70: Proposed Forest Product Removal Areas (acres) within Highly Erodible Soils, by Alternative

Soil Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Sensitive soils	12,015	0	426,239	488,149

4.2.9.1.2 Livestock Grazing Decisions

Livestock grazing management decisions would have both adverse and beneficial impacts to soil and water resources on BLM lands within the Planning Area. In general, making areas unavailable for grazing could provide long-term protection to soil and water resources because it would limit the loss of vegetative cover and the disturbance of sensitive soils by livestock. Areas available for livestock grazing would potentially be adversely impacted from decreased growth or loss of riparian and other vegetation by the removal of the above ground portion of palatable plant species.

Under all alternatives, livestock grazing would be managed in order to achieve and maintain the New Mexico Standards and Guidelines (BLM 2001). Under these guidelines, the PFC of wetlands and riparian areas would be achieved, the use and perpetuation of native species would be emphasized, noxious and invasive plant establishment and spread would be minimized, and adjustments would be made to grazing practices when the New Mexico Standards and Guidelines are not being met. Under Alternative B, a total of 771,308 acres of BLM livestock grazing allotments across BLM, public, and private lands would not be grazed due to proposed special designations. As a result, under Alternative B, fewer adverse impacts would be expected to occur to soil and water resources. Under Alternatives C and D, the RPFO would apply prescribed livestock grazing to BLM lands within the Planning Area. Up to 500,000 acres of highly erodible soils on BLM lands in the Planning Area would be available to livestock grazing

under Alternatives C and D. The New Mexico Standards and Guidelines and allotment-specific management would mitigate the impacts of livestock grazing to soil and water resources.

4.2.9.1.3 Mineral Resources Decisions

Management decisions to allow mineral development would have short- and long-term impacts to soil and water resources. In the short term, loss of vegetation associated with surface disturbances for well pads, access roads, and minerals infrastructure would increase runoff, erosion, and sedimentation though mitigative measures would be taken to minimize these impacts. Site-specific NEPA analysis for these activities would be applied to fully analyze the impacts to surface and ground water resources in these cases.

The typically slow regrowth of vegetation within the Planning Area would cause surface disturbance to have long-term, indirect, adverse impacts of increased runoff, erosion, and sedimentation, especially when mineral development takes place on low reclamation potential soils. Leasing stipulations for steep slopes and low reclamation potential soils are proposed under Alternatives B, C, and D. Alternatives B and C would implement CSU on steep slopes between 15% and 30%, NSO on slopes over 30%, and CSU on soils with low reclamation potential. Alternative D would implement NSO on steep slopes over 30%. The proposed leasing stipulations would protect soils from adverse impacts from leasable mineral resource developments.

Leasing stipulations for riparian areas are proposed under Alternatives B and C. No surface occupancy within 200 meters (656 feet) of channels ephemeral, intermittent, and perennial streams of within the outer margins of riparian/wetland areas would be implemented under Alternative B. This stipulation would change to CSU within the same areas under Alternative C. These stipulations would provide some protection to floodplains when leasable mineral resource developments are proposed. No leasing stipulations for riparian areas are proposed under Alternatives A and D.

A leasing stipulation for biological soil crusts is proposed under Alternatives B, C, and D. This stipulation would implement NSO for surface-disturbing activities in areas managed for biological soil crust resources, such as in the San Miguel Dome area.

4.2.9.1.4 Renewable Energy Decisions

Renewable energy management decisions would have short-term impacts and long-term adverse impacts to soil and water resources. Loss of vegetation associated with surface disturbances for renewable energy infrastructure would increase runoff, erosion, and sedimentation both during construction and over the life of the renewable energy project.

Renewable energy projects would be located outside sensitive soil and floodplain areas to the greatest extent possible. Exclusion and avoidance areas were identified in Chapter 2 for areas where renewable energy developments are not suitable. Sensitive soils are identified as avoidance areas for wind, solar, and geothermal projects under Alternatives B, C, and D. Wetland and riparian areas are identified as exclusion areas for wind, solar, and geothermal projects under Alternatives B, C, and D. Active floodplains are identified as exclusion areas for wind and solar projects and avoidance areas for geothermal projects under Alternatives B, C, and D. One-hundred-year floodplains are identified as avoidance areas for wind and geothermal projects and exclusion areas for solar projects under Alternatives B, C, and D.

4.2.9.1.5 Soil and Water Decisions

Implementation of the soil and water decisions (Chapter 2, Goals, Objectives, and Management Common to All Alternatives) would result in short- and long-term beneficial impacts for the RPFO land by limiting certain uses, employing standard Best Management Practices, and implementing projects with the specific objective of watershed stabilization, improvement, and restoration. Site-specific NEPA analysis would be applied prior to land use activities to avoid adverse impacts to soil and water resources.

Alternative B would afford the most protection and improvement potential for biological soil crusts at San Miguel dome. Less protection is offered under Alternatives C and D as grazing and mineral entry would be allowed. Alternative D would likely result in long term adverse impacts to stability with the fewest restrictions on livestock, foot traffic, and potential mineral entry.

4.2.9.1.6 Travel Management Decisions

Travel management decisions would have both adverse and beneficial impacts to soil and water resources. In those areas where roads are closed, vegetation communities could become re-established on roadbeds and improve soil conditions. Management decisions that propose open travel could result in vegetation loss, rutting, increased soil erosion, and impacts to water quality. These impacts would be similar, but of small magnitude for the limited to existing roads, primitive roads, and trails travel designation. Table 4.71 shows the proposed travel management decisions, by alternative. Under Alternatives C and D, the RPFO proposes to open 18,271 acres within Cimarron Mesa to OHV use. Within Cimarron Mesa, 15,188 acres are classified as having sensitive soils; therefore, erosion is expected to occur from OHV use under Alternatives C and D.

Table 4.71: Proposed Travel Management Designations (acres), by Alternative

Category	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Open	303,580	4,551	18,269	19,456
Limited	420,419	562,596	602,043	624,808
Closed	20,316	177,240	124,075	100,123
Total	744,387	744,387	744,387	744,387

4.2.9.2 Cumulative Impacts

Reasonably foreseeable future actions in the Planning Area and on federal, state, private, and other lands within and adjacent to the Planning Area that would affect soils and water resources include mineral development, renewable energy projects, and other surface-disturbing projects. Soil disturbance within or adjacent to the Planning Area would likely contribute additional sediment to ephemeral and intermittent streams. Beneficial impacts to soil and water resources would result from other federal, state, tribal, and local planning and watershed restoration/improvement efforts, which would reduce negative impacts to soil and water resources on adjacent public and private lands. Table 4.4 provides a summary of proposed surface-disturbing projects that are expected to take place within or near the planning area in the future. These projects, where specific project areas are known, account for approximately

500,000 acres of surface disturbance, which are likely to cumulatively impact soil and water resources within the Planning Area.

Map-066-Sensitive Soils

Map-067-Wind and Water Erodable Soils

4.2.10 Special Designations

There are four types of special designations relevant to impacts analysis in this chapter: WSAs, ACECs, Wild and Scenic Rivers and the Ojito Wilderness Area. Eight WSAs are carried forward from the 1986 RMP to the proposed alternatives. The RPFO must bring forward the WSAs because Congress has not released the WSAs from Wilderness consideration. The RPFO would manage WSAs for: 1) maintaining the management of these areas as provided in the IMP for Lands Under Wilderness Review (BLM 1995); and 2) managing in accordance with the "non-impairment criteria." The Ojito Wilderness Area would be managed consistent with the Wilderness Act.

Table 4.72: Proposed Special Designations (number and acres) within the Planning Area, by Alternative

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACEC	10 ACECs 53,765 acres	18 ACECs 149,974 acres	18 ACECs 137,029 acres	11 ACECs 44,049 acres
Wild and Scenic Rivers	97 acres	941 acres	941 acres	941 acres
WSA/Wilderness Areas	97,963 acres	97,963 acres	97,963 acres	97,963 acres
CDT	1 trail 11,474 acres	1 trail 38,808 acres	1 trail 23,607 acres	1 trail 11,474 acres
Total	137,720 acres	185,625 acres	178,000 acres	126,392 acres

The BLM has proposed four ACECs that correspond with five WSAs and the Ojito Wilderness Area (Table 4.74). These ACECs are proposed for lands that meet the relevance and importance criteria required for qualification as an ACEC. If Congress were to release the five WSAs from Wilderness consideration, these areas would be managed under the prescriptions of the ACECs. Three WSAs do not correspond with an associated ACEC; therefore, if the three WSAs were to be released from consideration there would be no additional protection for those areas.

In order to appropriately quantify the impacts from special designations, the impacts analysis in this chapter considers only the ACEC special designation for those WSAs and the Ojito Wilderness Area that have a corresponding ACEC. For the three WSAs that do not have corresponding ACECs, the WSA special designation is analyzed. This approach is intended to reduce potential duplication of impacts analysis from two special designations (WSAs and ACECs) located within the same acreage.

Table 4.73: Proposed Special Designations (acres) in the Planning Area, by Alternative

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACECs managed for riparian values	2 ACECs 1,575 acres	2 ACECs 11,236 acres	2 ACECs 8,628 acres	2 ACECs 2,419 acres
ACECS managed for other values	8 ACECs 52,190 acres	16 ACECs 138,738 acres	16 ACECs 128,401 acres	9 ACECs 41,630 acres

4.2.10.1 Wilderness and Wilderness Study Areas

Wilderness Areas

Three Wilderness Areas and eight WSAs fall within the RPFO management boundaries. The Tent Rocks and El Malpais Wilderness Areas have been excluded from the BLM lands under analysis in the Planning Area because they are associated with other planning documents. The Ojito Wilderness Area is included within the acres of BLM lands under analysis in the Planning Area. This section describes the impacts to Wilderness Areas and WSAs from the management decisions proposed in the RMP/EIS.

The only difference among alternatives for WSAs involves livestock grazing within the areas. Under Alternative B, the BLM would prohibit grazing in all WSAs. Alternative C would allow prescribed grazing to occur in WSAs, and Alternative D would reinstate any suspended AUMs within WSAs.

Table 4.74: WSAs and Associated ACECs, by Alternative

Existing WSA and Wilderness Areas (acres)	Proposed ACECs (acres)			
	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Cabezon WSA (8,162)	5,765	17,150	17,150	6,984
Chamisa WSA (14,510)	0	43,026	43,026	0
Ignacio Chavez WSA (32,431)				
Petaca Pinta WSA (11,664)	0	13,723	13,723	13,723
Ojito WSA (111) and the Ojito Wilderness Area (11,183)	16,310	16,310	6,454	0
Empedrado WSA (9,035)	0	0	0	0
Le Lena WSA (10,252)	0	0	0	0
Manzano WSA (896)	0	0	0	0

Table 4.75: Livestock Grazing Areas (acres) within Wilderness Areas and WSAs, by Alternative

Wilderness Areas and WSAs	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Cabezon Peak WSA (8,162 acres)	8,162	0	0–8,162	0–8,162
Chamisa WSA (14,510 acres)	14,510	0	0–14,510	0–14,510
Empedrado WSA (9,035 acres)	9,035	0	0–9,035	0–9,035
Ignacio Chavez WSA (32,431 acres)	32,431	0	0–32,431	0–32,431
La Lena WSA (10,252 acres)	10,252	0	0–10,252	0–10,252
Manzano WSA (896 acres)	896	0	0–896	0–896
Ojito WSA (111 acres)	128	0	0–128	0–128
Ojito Wilderness (11,183 acres)	11,183	11,183	11,183	11,183
Petaca Pinta WSA (11,664 acres)	11,664	0	0–11,664	0–11,664
Total (98,244 acres)	98,261	11,183	11,183–98,261	11,183–98,261

4.2.10.2 Congressionally Designated Trails

The Continental Divide National Scenic Trail traverses the Planning area for approximately 135 miles; approximately fifty miles are located on BLM lands or BLM-owned easements. The majority of the trail is absent tread; instead it is marked across the landscape by posts and rock cairns. The nature of the trail means that travelers walk on live vegetation in many portions of the trail. The setting is a primitive, natural appearing route. Use on the trail is light, but is increasing closest to access points near towns. Portions of the trail are not rideable by horses or mountain bikes where it climbs up steep slopes. Water is very limited along its route. The trail is permanently located, except for two areas where its location is not in close correlation with the purposes of the Trail. Those areas are the vicinity of the town of Cuba and the area south of Grants where the trail is located on the shoulder of paved highways. The purposes of the Continental Divide National Scenic Trail are to connect people and communities to the Continental Divide by providing scenic, high-quality, primitive hiking and horseback riding experiences, while preserving the significant natural, historic, and cultural resources along the Trail.

Table 4.76: Summary of Impact to the CDNST Trail

	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Acres	11,474	38,808	23,607	11,474
Saleable Minerals	Open	Closed	Avoid	Open
Forest Product Removal	Open	Closed	Avoid	Open
Motorized Vehicle Use	Open	Closed	Avoid	Open
Leasable Fluid Minerals	NSO	NSO	NSO	NSO
VRM	Prevailing	VRM II	Prevailing	Prevailing

	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
	VRM		VRM	VRM

Table 4.77: VRM Classes (miles) along the CDNST

VRM	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
I	20.2	20.1	20.1	20.1
II	1	32.8	3.5	0.4
III	0	0	10.4	0
IV	31.7	0	18.9	32.4

4.2.10.3 Direct and Indirect Impacts

4.2.10.3.1 Visual Resources Decisions

VRM decisions may have adverse impacts on Special Designation Areas. The only lands identified under all alternatives to be designated VRM Class I are lands within WSAs and Wilderness Areas. Lands surrounding WSAs and Wilderness Areas may be managed to a standard less than VRM Class I. When this occurs and the VRM Class II, III, or IV lands are visible from within a WSA or Wilderness Area, Wilderness values, such as naturalness, would be compromised. Individuals would be more likely to see development activities from within a Wilderness Area or WSA when the VRM class surrounding the area is Class III or IV.

4.2.10.3.2 Lands and Realty Decisions

Similar to VRM, lands and realty management decisions related to lands adjacent to Special Designation Areas may adversely impact wilderness characteristics when adjacent lands are disposed from the BLM's management. When land disposal takes place adjacent to Special Designation Areas, those disposed lands may be managed in a way that compromises wilderness, recreational or conservation opportunities. Development may occur on the disposed parcel that is visible and/or audible from within the Special Designation Area. Site-specific NEPA analysis would be applied prior to disposals of BLM land and during this time impacts to the Special Designated Area would be disclosed.

4.2.10.3.3 Surface Disturbance Decisions

Impacts from renewable energy, mineral development, and travel have been grouped in this section under the heading "surface disturbance." Resource management decisions associated with these resource uses would result in similar surface-disturbing impacts to Special Designated Areas. Motorized travel, renewable energy developments, and mineral extraction would be prohibited within WSAs and Wilderness Areas and limited in other Special Designated Areas; however, these activities may be allowed to occur adjacent to WSAs and Wilderness Areas. When these activities take place adjacent to WSAs and Wilderness Areas, Wilderness values would likely be compromised though through the use of BMPs, these impacts would be minimized. Surface-disturbing activities may be visible and/or audible from within the Special Designated Area.

4.2.10.3.4 Livestock Grazing Decisions

Livestock grazing is a permitted use as defined by the Wilderness Act of 1964 it would be restricted in Wild and Scenic Rivers Area. Interaction with livestock could compromise Wilderness values, such as opportunities for solitude and naturalness, for some recreational users and not for others. As a result, livestock grazing management decisions could have perceived adverse impacts to WSAs and Wilderness Areas under Alternatives C and D for some recreational users because livestock grazing would be allowed to take place within areas designated to protect Wilderness values. The permitted livestock grazing activities would be required to meet the New Mexico Standards and Guidelines; thereby avoiding impacts to Wilderness Areas. Alternative B would not allow livestock grazing to occur within most WSAs or Wilderness Areas.

4.2.10.4 Cumulative Impacts

The analysis of cumulative impacts for Special Designation Areas includes all BLM lands in New Mexico that are currently being managed for Wilderness characteristics to protect those values. The statewide total of BLM lands where Wilderness characteristics are protected by law or administrative decision is 1,125,409 acres. Under all alternatives, the RPFO would continue to manage Special Designation Areas in conformance with the Wilderness Act, Wild and Scenic Rivers Act, ACEC prescribed management decisions and applicable restrictions of this RMP.

Special Designation Areas would be cumulatively impacted by projects that compromise the characteristics that define each specific area. For example, projects that impact visual resources and solitude may adversely impact Wilderness Areas. The proposed Desert Rock Power Plant could potential have long-term adverse impacts to Wilderness Areas within the Planning Area, especially those located in the northwest or north-central portion of the Planning Area. Air pollution and haze from the plant could potentially be seen from within the Planning Area under certain weather conditions. Short-term adverse impacts to Wilderness Areas may occur from fire and fuels treatments near the Wilderness Areas conducted by other agencies. The BLM estimates that federal and state agencies would treat up to 206,800 acres with prescribed fire over the next 20 years. If these treatments occur adjacent to Special Designation Areas, then fire operations (aircraft over-flights, fire line construction, etc.) would temporarily degrade the natural landscape and character of the Special Designation Area. The noise and presence of the people, equipment, and operations would also temporarily diminish opportunities for solitude and primitive forms of recreation or the specific activity associated with the Special Designation.

Map-068-ACECs (11x17)

Map-069-Bluewater Canyon (8.5x11)

Map-070-Bony Canyon (8.5x11)

Map-071-Cabezon peak (8.5x11)

Map-072-Canon Jarido (8.5x11)

Map-073-Canon Tapia (8.5x11)

Map074-Cerro Verde (8.5x11)

Map-075-Elk Springs (8.5x11)

Map-076-Espinosa Ridge (8.5x11)

Map-077-Guadalupe Ruin and Community (8.5x11)

Map-078-Jones Canyon (8.5x11)

Map-079-Legacy Uranium Mines 1(8.5x11)

Map-080-Legacy Uranium Mines 2(8.5x11)

Map-081-Legacy Uranium Mines 3(8.5x11)

Map-082-Ojito (8.5x11)

Map-083-Petaca Pinta (8.5x11)

Map-084-Pronoun Cave (8.5x11)

Map-085-San Luis Mesa Raptor Area (8.5x11)

Map-086-San Miguel Dome (8.5x11)

Map-087-Toerreon Fossil Fauna (8.5x11)

Map-088-Ingacio Chavez Grant (8.5x11)

4.2.11 Special-Status Species

Actions that could occur through implementing each alternative could impact special status wildlife species. Cave and karst resources, cultural resources, fire management, forests and woodlands, lands and realty, livestock grazing, mineral resources, recreation and visitor services, renewable energy, riparian resources, soil and water, lands with Wilderness characteristics, travel management, special designations, special-status species, visual resource management, and wildlife management decisions have the potential to impact special-status species on BLM lands in the Planning Area. The adverse and beneficial impacts are described below for each resource.

Because of the large number of special-status species – including threatened, endangered, and BLM sensitive species – it was determined that the most effective way to disclose impacts at the programmatic level would be to analyze the impacts to the habitat cover types used by these species (see Chapter 3 for species and habitat descriptions). Accordingly, for the purposes of analysis, the special-status species described in Chapter 3 are grouped here by habitat type, as shown in Table 4.77 below. In some areas, based on the limited impact varying by species type, impacts are discussed by alternative to give a more overall description of the impacts resulting from the management action.

Direct impacts to special status wildlife result from the direct loss of critical habitat or a key habitat feature, such as a nest site or lek area, or from the immediate loss of life. Special status wildlife can also be directly disturbed by human activities, potentially causing them to abandon a nest, lek, or home range. It has been widely documented that disturbance during sensitive periods (e.g., winter, nesting) leads to lower recruitment rates and higher mortalities, which adversely impact special status species wildlife.

Habitat loss and fragmentation are assumed to adversely impact special status wildlife. Habitat loss generally is a direct impact; i.e., the individual or population is immediately impacted. The impacts of habitat fragmentation, however, operate indirectly through mechanisms, such as population isolation (Saunders et al. 1991); edge impacts, such as increased nest predation and parasitism (Paton 1994; Faaborg et al. 1995); encroachment of noxious/invasive weeds; and disruption of migration patterns.

Indirect impacts to special status wildlife occur by changing habitat characteristics or quality, which can ultimately result in changes in migration patterns, habitat use, carrying capacity, and long-term population viability. Indirect impacts to habitats for special status wildlife also could occur when specific actions change the habitat in a way that makes it unsuitable for future habitation.

Disturbance impacts could range from short-term displacement and shifts in activities to long-term abandonment of home range (Miller 1998; Yarmaloy et al. 1988; Connelly et al. 2000). For the purpose of this analysis, short-term impacts (up to 5 years) to special status wildlife are those activities that an individual or species respond to immediately, but do not impact the population viability of the species. Long-term impacts (more than 5 years) are those that cause an individual or species to permanently abandon an area or that impact the population viability and survival of the species.

Allowable uses and management actions that contribute to the decline in abundance or distribution of special status plants are considered adverse. Conversely, beneficial impacts to special status plants consist of activities that protect habitat or reduce the risk of harm to these species in the planning area. An increase in special status plant numbers over time in response to an enhanced habitat or the increased viability of a species is considered a beneficial impact.

Direct impacts to special status plant species are defined, for this analysis, as actions resulting in damage to or loss of individual special status plants, fragmentation of habitat, loss of habitat quality, loss of pollinators, and loss of soil seed banks. Surface-disturbing activities, herbivory, trampling, fire, and herbicide application are considered the primary means by which direct impacts to special status plants could occur. Activities that create or increase competition between special status plants are also considered direct impacts. Plant collection and OHV use also could directly impact special status plant populations. Indirect impacts to special status plant species are defined as actions that aid or compromise the protection of special status plants. The loss or degradation of suitable habitat for special status plant species is considered a direct impact. Indirect impacts to potential habitats for special status plants also could occur when actions change the habitats in a way that makes them unsuitable for future colonization.

Table 4.78: Habitat Types and Associated Special-status Species

Vegetation/Habitat Type	BLM Sensitive Species	Federally Listed Species
Aquatic (451 acres)	Wildlife Flathead Chub (*Platygobio gracilis*), Zuni bluehead sucker (*Catostomus discobolus yarrow*), Southwest Toad (*Anaxyrus microscaphus*)	Wildlife Rio Grande silvery minnow (*Hybognathus amarus*)
Ponderosa pine (3,909 acres)	Wildlife Northern goshawk (*Accipiter gentilis*), ferruginous hawk (*Buteo regalis*), pale Townsend's big-ear bat (*Corynorhinus townsendii pallescens*), occult little brown myotis bat (*Myotis lucifugus occultus*), big free-tailed bat (*Nyctinomops macrotis*), fringed myotis bat (*Myotis thysanodes thysanodes*), Yuma myotis bat (*Myotis yumanensis yumanensis*), spotted bat (*Eurderma maculatum*), long-eared myotis bat (*Myotis evotis evotis*), long-legged myotis bat (*Myotis volans interior*), small-footed myotis bat (*Myotis ciliolabrum melanorhinus*), meadow jumping mouse (*Zapus hudsonius luteus*), Cebolleta pocket gopher (*Thomomys bottae paguatae*), Goat Peak pika (*Ochotona princeps nigrescens*), Cassins's Finch (*Carpodacus cassinii*). Plants Plank's campion (*Silene plankii*), Acoma fleabane (*Erigeron acomanus*)	Wildlife Mexican spotted owl (*Strix occidentalis lucida*), black-footed ferret (*Mustela nigripes*), Plants Zuni fleabane (*Erigeron rhizomatus*)
Piñon-juniper (188,975 acres)	Wildlife Northern goshawk (*Accipiter gentilis*), ferruginous hawk (*Buteo regalis*), pale Townsend's big-ear bat (*Corynorhinus townsendii pallescens*), occult little brown myotis bat (*Myotis lucifugus occultus*), big free-tailed bat (*Nyctinomops macrotis*), fringed myotis bat (*Myotis thysanodes thysanodes*), Yuma myotis bat (*Myotis yumanensis yumanensis*), spotted bat (*Eurderma maculatum*), long-eared myotis bat (*Myotis evotis evotis*), long-legged myotis bat (*Myotis volans interior*), small-footed myotis bat (*Myotis ciliolabrum melanorhinus*), meadow jumping mouse (*Zapus hudsonius luteus*), Cebolleta pocket gopher (*Thomomys bottae paguatae*) Plants Plank's campion (*Silene plankii*), Knight's milkvetch (*Astragalus knightii*), Acoma fleabane (*Erigeron acomanus*), Grama grass cactus (*Sclerocactus papyracanthus*), Tufted sand verbena (*Abronia bigelovii*), Gypsum Townsend's aster (*Townsendia gypsophila*)	Wildlife Mexican spotted owl (*Strix occidentalis lucida*), black-footed ferret (*Mustela nigripes*), Plants Zuni fleabane (*Erigeron rhizomatus*)

Vegetation/Habitat Type	BLM Sensitive Species	Federally Listed Species
Riparian/Wetland (3,965 acres)	Wildlife Jemez mountain salamander (*Plethodon neomexicanus*), Texas horned lizard (*Phrynosoma cornutum*), northern goshawk (*Accipiter gentilis*), white-faced Ibis (*Plegadis chihi*), black tern (*Chlidonias niger surinamensis*), pale Townsend's big-ear bat (*Corynorhinus townsendii pallescens*), occult little brown myotis bat (*Myotis lucifugus occultus*), big free-tailed bat (*Nyctinomops macrotis*), fringed myotis bat (*Myotis thysanodes thysanodes*), Yuma myotis bat (*Myotis yumanensis yumanensis*), spotted bat (*Eurderma maculatum*), long-eared myotis bat (*Myotis evotis evotis*), long-legged myotis bat (*Myotis volans interior*), small-footed myotis bat (*Myotis ciliolabrum melanorhinus*), meadow jumping mouse (*Zapus hudsonius luteus*), Cebolleta pocket gopher (*Thomomys bottae paguatae*), Pecos River muskrat (*Ondatra zibethicus ripensis*), Cassin's Finch (*Carpodacus cassinii*), Black-chinned Sparrow (*Spizella astrogularis).* Plants Parish's alkali grass (*Puccinellia parishii*)	Wildlife Southwestern willow flycatcher (*Empidonax traillii extimus*), Mexican spotted owl (*Strix occidentalis lucida*), least tern (*Sterna antillarum athalassos*), black-footed ferret (*Mustela nigripes*), Plants Pecos sunflower (*Helianthus paradoxus*)
Shrub, steppe, scrub (341,037 acres)	Wildlife Texas horned lizard (*Phrynosoma cornutum*), northern goshawk (*Accipiter gentilis*), ferruginous hawk (*Buteo regalis*), burrowing owl (*Athene cunicularia hypugaea*), Baird's sparrow (*Ammodramus bairdii*), loggerhead shrike (*Lanius ludovicianus excubitorides*), pale Townsend's big-ear bat (*Corynorhinus townsendii pallescens*), occult little brown myotis bat (*Myotis lucifugus occultus*), big free-tailed bat (*Nyctinomops macrotis*), fringed myotis bat (*Myotis thysanodes thysanodes*), Yuma myotis bat (*Myotis yumanensis yumanensis*), spotted bat (*Eurderma maculatum*), long-eared myotis bat (*Myotis evotis evotis*), long-legged myotis bat (*Myotis volans interior*), small-footed myotis bat (*Myotis ciliolabrum melanorhinus*), Cebolleta pocket gopher (*Thomomys bottae paguatae*), slate millipede (*Comanchelus chihuanus*) Plants Plank's campion (*Silene plankii*), Knight's milkvetch (*Astragalus knightii*), gypsum Townsend's aster (*Townsendia gypsophila*), Acoma fleabane (*Erigeron acomanus*), Grama grass cactus (*Sclerocactus papyracanthus*), Tufted sand verbena (*Abronia bigelovii*)	Wildlife Aplomado falcon (*Falco femoralis septentrionalis*), black-footed ferret (*Mustela nigripes*), Plants Zuni fleabane (*Erigeron rhizomatus*)

Vegetation/Habitat Type	BLM Sensitive Species	Federally Listed Species
Grassland (157,642 acres)	Wildlife Texas horned lizard (*Phrynosoma cornutum*), northern goshawk (*Accipiter gentilis*), ferruginous hawk (*Buteo regalis*), burrowing owl (*Athene cunicularia hypugaea*), Baird's sparrow (*Ammodramus bairdii*), pale Townsend's big-ear bat (*Corynorhinus townsendii pallescens*), occult little brown myotis bat (*Myotis lucifugus occultus*), big free-tailed bat (*Nyctinomops macrotis*), fringed myotis bat (*Myotis thysanodes thysanodes*), Yuma myotis bat (*Myotis yumanensis yumanensis*), spotted bat (*Eurderma maculatum*), long-eared myotis bat (*Myotis evotis evotis*), long-legged myotis bat (*Myotis volans interior*), small-footed myotis bat (*Myotis ciliolabrum melanorhinus*), meadow jumping mouse (*Zapus hudsonius luteus*), Cebolleta pocket gopher (*Thomomys bottae paguatae*), Goat peak pika (*Ochotona princeps nigrescens*), slate millipede (*Comanchelus chihuanus*), McCown's Longspur (*Calcarius mccownii*), Gunnison's prairie dog (*Cynomys gunnisoni*), Black-tailed prairie dog (*Cynomys ludocicianus*). Plants Gypsum Townsend's aster (*Townsendia gypsophila*), Grama grass cactus (*Sclerocactus papyracanthus*)	Wildlife Aplomado falcon (*Falco femoralis septentrionalis*), black-footed ferret (*Mustela nigripes*), Plants None
Other (61,095 acres)		
Total **(757,074 acres)**		

4.2.11.1 Analysis Assumptions

The following assumptions were used to analyze impacts to special-status species from other proposed resource management decisions:

- Implementation of all of the alternatives would be in accordance with existing laws, regulations, and standard management guidelines.
- Impacts to special status wildlife species are based primarily on potential impacts to habitats managed by the BLM.
- Precise quantitative estimates of impacts generally are not possible because the exact locations of future actions are unknown, population data for species status wildlife species are often lacking, or habitat types impacted by surface-disturbing activities cannot be predicted.
- Actions impacting one species have similar impacts on other species using the same habitats or areas. Measures to protect one species generally will result in long-term benefits to other species occurring within that habitat. Where resources overlap, management actions associated with protecting wildlife habitats and cultural resources directly benefit special status plant species.
- The more acreage of habitat protected, the greater the benefit to the targeted species.
- Prescribed fire is used to manage vegetative communities and can result in short-term adverse impacts with long-term beneficial impacts to wildlife and wildlife habitats.
- Because of the migratory nature and relative mobility of some special status wildlife species (e.g., waterfowl, neotropical migrants, and raptors), these species are impacted by actions on non-BLM-administered land more so than other species. In the case of migratory species, impacts to winter and migration habitats could adversely impact the viability of some species. Winter and migration habitats are assumed to be at least as important to long-term viability of these species as breeding and nesting habitats.
- New oil and gas leases have special leasing stipulations for protection of special status plant species.
- The total amount of new surface disturbance allowed by an alternative is a good index of potential impacts to special status plants. Success of reclamation measures prescribed as a condition of development is unknown, and could underestimate the potential impact of surface disturbance on special status plant populations.
- The existing provisions in place (e.g., presence/absence surveys conducted prior to proposed actions) to protect special status species are carried out and conditional monitoring is conducted (e.g., grazing and surface disturbance reclamation) to ensure special status species are not jeopardized.

4.2.11.2 Direct and Indirect Impacts

4.2.11.2.1 Cave and karst Resources Decisions

Cave and karst resources decisions would provide beneficial impacts to special-status species, especially the nine special-status bat species that are known to occur on BLM lands within the

Planning Area. The Pronoun Cave Complex is the only known cave system on BLM lands within the Planning Area. A bat survey conducted in 1998 found thirteen species of bats in the Planning Area, five of which were documented in or near the cave complex (Gannon et al. 1998). The Pronoun Cave Complex would be protected through an ACEC designation under Alternatives A, B, and C; therefore, the bat species and other special-status species that use the caves would have the greatest protection under these alternatives. Site-specific NEPA analysis would be completed for proposed actions that occur within or near the Pronoun Cave Complex. As a result, future impacts to the special-status species would be considered regardless of the proposed Pronoun Cave Complex ACEC status.

4.2.11.2.2 Cultural Resources Decisions

Cultural resources management decisions may have beneficial impacts to special-status species because of restrictions on surface-disturbing activities that directly protect cultural resources and could indirectly protect special status species habitat and critical habitat. There are four cultural resource areas, Big Bead Mesa, Headcut Prehistoric Community, Azabache Station, Fort Site and Ojo Pueblo, which have proposed surface restrictions under various alternatives. The surface restrictions, which vary by alternative and are described in Chapter 2, could include NSO or CSU for leasable fluid minerals, avoid or close to saleable mineral extraction, and/or withdrawn from locatable mineral entry. Motorized travel is also generally limited to existing primitive roads and trails for these areas. The restrictions would result in additional beneficial impacts to special-status species because surface disturbance would be limited, thereby protecting special-status species habitat. Table 4.79 shows the number of acres for each cultural resource site that would have surface restrictions applied, by alternative.

Table 4.79: Proposed Cultural Resource Areas with Surface Restrictions (acres), by Alternative

Cultural Resource Area	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Azabache Station	81	81	81	0
Big Bead Mesa	340	340	340	340
Fort Site and Ojo Pueblo	0	1,130	1,130	0
Headcut Prehistoric Community	960	1,280	1,280	960
Total	**1,381**	**2,831**	**2,831**	**1,300**

4.2.11.2.3 Fire Management Decisions

Under all alternatives, the Fire and Fuels Plan Amendment would be implemented in fire-related actions (BLM 2004). The Fire and Fuels Plan Amendment mandates the maintenance of existing healthy ecosystems and the protection of threatened, endangered, and special-status species in the Planning Area.

Fuels management actions include fuels reduction treatments on 32,000 acres annually. These actions include mechanical and manual treatments, prescribed fire, chemical or biological vegetation control, and aerial/ground seeding. These fuels management decisions would likely have a beneficial long-term impact to special-status species populations by helping to restore the natural fire regime, which would improve habitat health (Lewis and Harshbarger 1976), forage, nesting opportunities, and cover. Restoring the natural fire regime would also reduce the chance

of catastrophic fire and the subsequent loss of major ecosystem components. Long-term adverse impacts could include the transition in vegetation to early seral stages, which could cause special-status species to seek new, more suitable habitat and could cause mortality for special-status plant species. In the short term, vegetation treatments could result in trampling or removal of special-status species forage and/or habitat, human-caused wildfire disturbance, and direct mortality of special-status plant species. Table 4.80 displays the number of acres proposed for fire management treatments within each habitat type.

Table 4.80: Proposed Fire Management Treatments (acres), by Habitat Type

Vegetation/Habitat Type	Proposed Fire Management Treatments (acres)
Aquatic	95
Grassland	146,922
Other	19,594
Piñon-juniper	161,374
Ponderosa pine	3,825
Riparian/Wetland	3,554
Shrub, steppe, scrub	277,594
Total	**612,958**
Percent of BLM lands in the Planning Area	82%

4.2.11.2.4 Forests and Woodlands Decisions

Forests and woodlands management decisions could impact special-status species because habitat would be open to forest product removal under each alternative. Adverse impacts to special-status species from forest product removal would include direct habitat loss, habitat degradation, and habitat fragmentation. Indirect, adverse impacts of wood gathering to special-status species and their habitats include trampling and removal of native vegetation, which would result in habitat degradation that can include reduced prey species, forage species, and cover. Indirect, adverse impacts of wood gathering to special-status bird species would also include reduced reproductive opportunity due to removal of trees causing a decrease in nesting substrate.

Forest and woodland decisions could also have beneficial impact on special-status species. The goals and objectives of the forests and woodlands program not only focus on harvesting of forest products, but also on managing forested areas for ecosystem health (which includes but is not limited to: habitat, watershed processes, and riparian restoration and enhancement). Vegetative treatment would result in improvements to habitat that may benefit many wildlife species. Studies have shown that where dense stands of piñon-juniper have been thinned, understory vegetation increased dramatically on the heaviest thinned plots and the number of vegetation species present also increased significantly. Forest restoration projects could be designed to improve habitat by favoring certain vegetation types over others, reducing tree densities, altering spatial distribution of trees, or reducing erosion and increase herbaceous ground cover through lop and scatter of slash. Under all alternatives, the RPFO would consider the New Mexico Forest Restoration Principles (2006) and the New Mexico Forest and Watershed Health Plan (New Mexico Forest and Watershed Health Planning Committee 2004). In addition, site-specific

NEPA analysis would be completed before the RPFO opened particular areas to forest products harvest and this analysis would include impacts to special-status species known to occur in the particular area. Table 4.81 shows the proposed forest product harvest areas that would be available on BLM lands in the Planning Area, by habitat type and alternative. Under Alternative D, the largest percent of habitat types within BLM land in the Planning Area would be open to forest product harvest and under Alternative A, the smallest percentage of habitat types would be open to forest product harvest.

Table 4.81: Proposed Forest Product Harvest Areas (acres) within Habitat Types on BLM lands in the Planning Area, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	2	324	412	428
Grassland	865	29,095	123,840	140,964
Other	200	6,018	36,309	54,778
Piñon-juniper	5,543	22,395	133,074	145,273
Ponderosa pine	417	69	894	975
Riparian/Wetland	183	378	2,325	2,589
Shrub, steppe, scrub	4,976	61,156	263,467	299,125
Total	**12,186**	**119,435**	**560,321**	**644,132**
Percent of BLM lands in the Planning Area	2%	16%	75%	87%

4.2.11.2.5 Lands and Realty Decisions

Lands and realty management decisions that have the potential to have adverse impacts to special-status species and their habitat would result from authorizations of right-of-way grants and the expansion or development of utility corridors. These actions would create surface disturbances of various magnitudes depending on the size and location of the project. Surface impacts from construction of communication facilities and other developments requiring a right-of-way would be disclosed in site-specific NEPA documentation. There would also be potential for the introduction of noxious or invasive plant species via construction equipment, vehicles, and personnel; however, the adverse impacts would be mitigated through BMPs, noxious weed controls, and restoration and rehabilitation measures outlined in management common to all alternatives for lands and realty and vegetation communities in Chapter 2.

Rights of way are authorized for uses such as pipelines, roads, sites and transmission. Implementation of all these actions results in large amounts of surface disturbance. These impacts are adverse, and are difficult to mitigate because facilities often require the creation and maintenance of new roads for long-term periods of time. If such disturbance occurs in special status species habitat, it would adversely affect special status species because it would cause loss and/or fragmentation of contiguous habitat. The facilities themselves can also have adverse effects on special status species (SSS). For example, power lines can have severe adverse impacts on special status birds and migratory bird species because they cause electrocution and they are flight impediments that cause mortality by collision. To mitigate these effects, power line construction should follow the Suggested Practices for Avian Protection on Power Lines

(Avian Power Line Interaction Committee, 2006). Mitigation includes such actions as covering conductors and spacing transmission lines apart certain distances to prevent large birds from getting tangled between lines. If these and other mitigation measures are applied at the time of implementation, adverse impacts can be reduced. Lands and realty decisions would also adversely impact special-status species by those decisions to dispose of BLM lands. Disposal of lands could result in fragmentation of otherwise contiguous habitat, depending on land use and ownership patterns. By transferring lands to private ownership, development, and human activities, including introducing domestic pets or livestock, could disturb special-status species or degrade adjacent habitat quality. Indirect impacts from land disposals could include disturbance to special-status species and degradation of habitat on those lands that remain in public ownership adjacent to the associated disposed lands. Land disposals surrounding urban areas could result in the potential elimination of a buffer zone protecting special-status species and their habitat. Table 4.82 displays the number of acres proposed for land disposal, by alternative.

Table 4.82: Proposed Land Disposals (acres), by Alternative and Vegetation Type

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	269	269	269	269
Grassland	14,377	14,429	14,723	15,897
Other/Not classified	4,071	4,398	4,417	4,461
Piñon-juniper	24,937	26,155	26,867	26,867
Ponderosa pine	221	482	749	749
Riparian/Wetland	663	730	801	801
Shrub, steppe, scrub	10,846	11,009	11,084	13,007
Total	**55,384**	**57,472**	**58,910**	**62,051**

Beneficial impacts could result from land acquisitions and the identification of exclusion and avoidance areas for rights-of-way. Land acquisitions could result in the protection of special-status species habitat that may not otherwise occur if the land in question was managed by a private entity. Rights-of-way exclusion areas would offer greater protection for special-status species habitat than avoidance areas because they would completely preclude surface-disturbing activities.

The following types of habitats are proposed as exclusion or avoidance areas for rights-of-way:

- Designated and proposed critical habitat for federal threatened and endangered species – pipelines, roads, transmission lines, and sites would excluded from these areas under Alternative B and avoided under Alternatives C and D.
- Habitat for federally listed/proposed threatened and endangered species for which critical habitat has not been designated – pipelines, roads, transmission lines, and sites would be avoided in these areas under Alternative B, C, and D.
- BLM sensitive plant and animal species habitat (including rare plants) – pipelines, roads, transmission lines, and sites would be avoided in these areas under Alternative B, C, and D.

- Federal candidate species habitat – pipelines, roads, transmission lines, and sites would be avoided in these areas under Alternative B, C, and D.
- State-listed crucial and sensitive habitats – pipelines, roads, transmission lines, and sites would be avoided in these areas under Alternative B, C, and D.

4.2.11.2.6 Livestock Grazing Decisions

Livestock grazing can have both adverse and beneficial impacts to special-status species. Livestock grazing allotments occupy 718,035 acres (95%) of BLM lands in the Planning Area. Adverse impacts could occur as a result of livestock grazing where special status plant species occur but have not yet been identified. These adverse impacts could occur through trampling of special status plants and consumption of species that are palatable to livestock. In areas where the location of special status plant species is known, adverse impacts would be prevented through mitigation. Mitigation could include excluding grazing from special status plant population areas by fencing or placing water developments and mineral supplements away from sensitive plant habitats. Livestock grazing management decisions, including the continuing implementation of the New Mexico Standards and Guidelines (BLM 2001), can potentially benefit some special-status species habitat by promoting regrowth of forage species, reducing the prevalence of some invasive plants, and creating openings and disturbed areas used by some species. Other beneficial impacts from livestock grazing for special-status species and their habitat would occur when range improvements are implemented in the Planning Area. Special-status species may use range improvements, such as watering tanks, when placed within or near their habitat

4.2.11.2.7 Mineral Resources Decisions

Impacts from minerals decisions on special-status species and their habitats could include habitat loss and degradation resulting from the removal of vegetation (surface disturbance), and subsequent occupation of areas for oil and gas well pads, open pit mines, and associated roads and infrastructure. Species avoidance of disturbed and occupied areas would reduce their value as habitat. Many species avoid areas with high or inconsistent levels of noise, roads with frequent vehicle traffic, areas that are heavily lit at night, and areas surrounding structures.

Adverse impacts of minerals decisions on special-status species would be reduced by the implementation of leasing stipulations and BMPs. Under all alternatives, the RPFO would complete, as required, ESA Section 7 consultation with the USFWS for leasing activities. Alternatives B and C also include a proposed CSU stipulation that could delay a surface-disturbing or disruptive activity for ninety days and could control or exclude the activity within 0.25 mile of identified habitat or nests.

The amount of land that is open to oil and gas leasing or other mineral development is not necessarily indicative of the number of acres that would be directly disturbed. Areas managed under standard or TL and/or CSU stipulations allow mineral development, but not all of those acres would be subjected to surface disturbance. Habitat quality may be preserved by the implementation of seasonal restrictions and spatial buffers that protect crucial habitats. For example, habitat areas for special-status plant species that are located in low reclamation opportunity soils would be closed to oil and gas leasing under Alternative B. Areas categorized as NSO or closed preclude all surface-disturbing mineral development and therefore improve the

quality and condition of wildlife habitats. Table 4.83 shows the number of acres that would be managed as NSO, TL/CSU, or closed to oil and gas leasing, by alternative and habitat type.

Table 4.84 shows the number of acres closed to saleable mineral extraction, and Table 4.85 shows the number of acres that would be withdrawn from locatable mineral entry, by alternative and habitat type.

Table 4.83: Habitat Type (acres) Proposed as NSO, TL/CSU, or Closed to Oil and Gas Leasing, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	12	80	80	78
Grassland	17,512	59,177	57,081	54,075
Other	4,030	21,739	19,242	20,288
Piñon-juniper	17,274	45,647	45,412	43,913
Ponderosa pine	32	352	352	352
Riparian/Wetland	152	446	444	403
Shrub, steppe, scrub	45,787	154,192	153,493	148,452
Total	**84,799**	**281,633**	**276,104**	**267,561**
Percent of BLM lands in the Planning Area	6%	20%	20%	19%

Table 4.84: Habitat Type (acres) Proposed as Closed to Saleable Mineral Extraction, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	8	20	8	8
Grassland	17,063	34,549	22,457	16,775
Other	4,194	16,941	10,481	4,041
Piñon-juniper	35,420	47,025	39,619	37,208
Ponderosa pine	2,345	3,235	3,235	2,904
Riparian/Wetland	904	1,335	1,187	1,123
Shrub, steppe, scrub	45,720	80,615	57,869	45,387
Total	**105,654**	**183,720**	**134,856**	**107,446**
Percent of BLM lands in the Planning Area	6%	10%	7%	6%

Table 4.85: Habitat Type (acres) Proposed as Withdrawn from Locatable Mineral Entry, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	7	71	70	7
Grassland	4,084	59,513	53,115	6,039
Other	777	21,428	20,044	2,198
Piñon-juniper	722	59,684	59,758	4,033
Ponderosa pine	0	3,275	3,275	560
Riparian/Wetland	103	1,291	1,256	347
Shrub, steppe, scrub	10,890	147,194	140,230	14,436
Total	**16,583**	**292,456**	**277,748**	**27,620**
Percent of BLM lands in the Planning Area	1%	16%	15%	2%

4.2.11.2.8 Recreation and Visitor Services Decisions

In general, special-status species can be adversely impacted by recreation caused by human interactions, including higher noise levels, litter, and wildlife harassment and/or degradation of habitat (Knight and Gutzwiller 1995). While camping tends to be more concentrated along riparian areas, such as Bluewater Creek, locally there can be major impacts to vegetation and stream bank stability.

Collection of firewood for campfires has the potential to adversely impact special-status species with removal of live, dead, and downed material. This material provides shelter for various species, including birds, small mammals, bats, reptiles, and amphibians. OHV use and other disturbances to soils from unauthorized travel increase soil loss from wind and water erosion, which can further degrade habitat quality. Where this occurs repeatedly, impacts to species, vegetation, and soils could be an issue at the site, but minor at the landscape level.

Increased development of trails, climbing routes, and other recreation pursuits throughout the Planning Area could increase habitat fragmentation and adversely impact special-status species (Rost and Bailey 1979; Wisdom et al. 2005). Under Alternatives B, C, and D, 231,325 acres of SRMAs and ERMAs are proposed on BLM lands within the Planning Area. These areas could facilitate an increase of visitors because they are managed to provide specific recreation opportunities. Increased visitation by recreational user groups could result in an increase in human disturbance to wildlife. Table 4.86 shows the proposed SRMA and ERMAs and the habitat types the designated areas would encompass.

Table 4.86: Vegetation/Habitat Types (acres) within the Proposed SRMA and ERMAs

SRMA and ERMA Name	Vegetation Type							
	Aquatic	Grassland	Piñon-Juniper	Ponderosa Pine	Riparian/ Wetland	Shrub, Steppe, Scrub	Other	Total
Continental Divide Trail SRMA	6	1,365	4,111	470	69	4,450	525	**10,996**

SRMA and ERMA Name	Vegetation Type							
	Aquatic	Grassland	Piñon-Juniper	Ponderosa Pine	Riparian/ Wetland	Shrub, Steppe, Scrub	Other	Total
Ancestral Way ERMA	0	1,112	261	0	0	3,832	693	**5,898**
Azabache ERMA	6	4,530	154	0	4	8,081	124	**12,899**
Bony Canyon ACEC ERMA	0	632	29	0	0	585	68	**1,314**
Ceja Pelon ERMA	9	1,107	858	0	2	3,720	17	**5,713**
Cerro ERMA	4	3,705	45	0	0	7,783	899	**12,436**
Cerro Verde ERMA	0	503	56	0	0	932	3,127	**4,618**
Chijuilla ERMA	16	3,248	10,297	12	10	27,696	791	**42,070**
Cimarron Mesa ERMA	3	1,895	4,101	0	96	3,069	9,105	**18,269**
Crest of Montezuma	0	44	532	261	45	26	9	**917**
La Mesita Blanca ERMA	0	3,218	25	0	0	2,416	40	**5,699**
Las Milpas ERMA	0	789	8	0	0	1,668	58	**2,523**
Oh-My-God 100 ERMA	0	1,874	3,642	25	0	11,527	340	**17,408**
Pronoun Cave ERMA	0	440	267	0	0	393	0	**1,100**
Prospect ERMA	0	4,892	747	0	2	5,594	208	**11,443**
Sandy Wash ERMA	3	5,687	3	0	7	11,403	1,371	**18,474**
San Luis Mesa ERMA	14	3,748	370	0	7	7,789	309	**12,237**
San Miguel Dome ERMA	0	1,927	9	0	0	4,890	135	**6,961**
San Ysidro Trials Area ERMA	3	1,202	96	22	29	3,323	468	**5,143**
Torreon Fossil East and West ERMA	0	1,510	235	0	0	3,852	324	**5,921**
Volcano Hill ERMA	7	5,276	793	0	40	8,499	12,042	**26,657**
White Mesa Bike Trails ERMA	2	791	4	0	12	1,957	780	**3,546**
Total SRMA and ERMA Acreage	73	49,495	26,643	790	323	123,485	31,433	**232,246**
Percent of BLM lands in the Planning Area	-	7%	3%	-	-	17%	4%	**31%**

4.2.11.2.9 Renewable Energy Decisions

Renewable energy management decisions that have the potential to have adverse impacts to special-status species and their habitat could result from authorizations for development of renewable energy projects. Renewable energy projects would create surface disturbances of

various magnitudes depending on the size and location of the project. Solar, wind and geothermal energy development projects would directly remove vegetation and would result in habitat fragmentation. Additionally, wind farms are known to cause high rates of mortality in bats and birds, and would have severe adverse impacts on those species. These and other impacts from wind, solar, and geothermal energy development would be disclosed in site-specific NEPA analysis. There would also be high potential for the introduction of noxious or invasive plant species via construction equipment, vehicles, and personnel. Although the adverse impacts would be mitigated through BMPs, noxious weed controls, and restoration and rehabilitation measures, special status species habitats impacted by all renewable energy development projects would be adversely impacted directly, short term and long term due to the longevity of such projects.

Beneficial impacts would result from the identification of exclusion and avoidance areas for renewable energy projects. Exclusion areas would offer greater protection for special-status species habitat than avoidance areas because they would completely preclude surface-disturbing activities.

The following types of habitats are proposed as exclusion or avoidance areas for rights-of-way:

- Designated and proposed critical habitat for federal threatened and endangered species – wind and geothermal projects would be excluded from these areas under Alternative B and avoided under Alternatives C and D. Solar projects would be excluded from these areas under Alternatives B, C, and D.
- Habitat for federally listed/proposed threatened and endangered species for which critical habitat has not been designated – wind and geothermal projects would be excluded from these areas under Alternative B and avoided under Alternatives C and D. Solar projects would be excluded from these areas under Alternatives B and C. Solar projects would be avoided in these areas under Alternative D.
- BLM sensitive plant and animal species habitat (including rare plants) – wind and geothermal projects would be excluded from these areas under Alternative B and avoided under Alternatives C and D. Solar projects would be excluded from these areas under Alternatives B and C. Solar projects would be avoided in these areas under Alternative D.
- Federal candidate species habitat – wind and geothermal projects would be excluded from these areas under Alternative B and avoided under Alternatives C and D. Solar projects would be excluded from these areas under Alternatives B and C. Solar projects would be avoided in these areas under Alternative D.
- State-listed crucial and sensitive habitats – wind and geothermal projects would be excluded from these areas under Alternative B and avoided under Alternatives C and D. Solar projects would be excluded from these areas under Alternatives B and C. Solar projects would be avoided in these areas under Alternative D.

4.2.11.2.10 Riparian Resources Decisions

There are many goals shared by the riparian and special status species programs, the main one being the protection, restoration, and enhancement of riparian ecosystems and biodiversity. Many special status species are riparian obligate or facultative species that heavily rely on riparian habitat for parts or all of their life cycle. Due to this close association, riparian resources

management decisions would have beneficial impacts to special-status species in the Planning Area. The riparian/wetland areas within the Planning Area support twenty-three special-status species including the Endangered Southwestern Willow Flycatcher. Under Alternatives B and C, a leasing stipulation is proposed for protection of riparian resources. Under Alternative B, surface-disturbing activities would be prohibited within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of riparian and wetland areas. Under Alternative C, surface-disturbing activities would be subject to restrictions within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of riparian and wetland areas. No leasing stipulations are proposed for riparian resources under Alternatives A and D. Alternatives B and C would have beneficial impacts on riparian resources because they would protect riparian habitat from surface-disturbing activities.

4.2.11.2.11 Special-status Species Decisions

Under all alternatives, no management action would be permitted on public lands that would jeopardize the continued existence of plant or animal species that are listed, officially proposed, or candidates for listing as threatened and endangered. The BLM would commit to current and future conservation agreements, management plans, and recovery plans specific to threatened and endangered species and BLM sensitive species, as described in the Special-status Species section of Table 2.58 (in Chapter 2).

To support future black-footed ferret reintroductions, the Gunnison prairie dog would be protected under Alternatives B, C, and D. Under Alternative B, the RPFO would protect prairie dogs on BLM land by restricting shooting in identified augmented prairie dog sites year-round. Under Alternative C, the RPFO would protect prairie dogs on BLM land during the breeding season (Mar 15–June 15) by restricting shooting in identified augmented prairie dog areas. In addition, surface-disturbing and disruptive activities would be strictly controlled within 0.5 mile (Alternative B), 0.25 mile (Alternative C), and within (Alternative D) prairie dog towns if an activity would adversely impact prairie dogs and/or associated species. Selection of any of these alternatives would have beneficial impacts on prairie dogs, and indirectly may benefit black-footed ferrets in the long term. However, Alternative B would have the most beneficial impacts.

Under management common to all alternatives for the Southwestern Willow Flycatcher, the BLM would implement the Southwestern Willow Flycatcher Recovery Plan (USFWS 2002), and engage in active riparian restoration and enhancement projects aimed at increasing and improving occupied, suitable, and potential breeding habitat. The BLM would also prioritize the treatment of noxious and invasive species within potential SWFL habitat. Treatment of saltcedar in known or potential nesting flycatcher habitat would have adverse impacts on nesting flycatchers because the species is now known to nest in saltcedar successfully. Contrary to previous notions, saltcedar actually does provide adequate and optimal nesting substrate for the species, and nesting flycatchers have been observed in sites occupied by both saltcedar and willows. To protect special-status plants, the BLM would design placement of water developments and salt and mineral supplements for livestock at 0.25 mile (Alternative B), 500 feet (Alternative C), or 300 feet (Alternative D) away from known locations of special-status plants. The beneficial impacts of these actions include deterring livestock congregation from occurring on special status plant populations and/or habitat. The further away water developments and mineral supplements are located away from these sensitive populations, the

less likely these populations are to be trampled by livestock. The BLM would consider the impacts of a concentration of browsing/grazing animals on known locations of special-status plants.

4.2.11.2.12 Soil and Water Decisions

Under all alternatives, soils and water management decisions would comply with New Mexico Standards and Guidelines (BLM 2001). In addition, all floodplains and riparian/wetlands would be managed in accordance with Executive Orders 11988 and 11990, which would protect the quality of stream water and federally listed species habitat. Uses on BLM lands in the Planning Area would be managed to minimize and mitigate damage to soils, and activities located in areas with sensitive soils would be subject to site-specific NEPA analysis. These restrictions would decrease the number of acres on BLM lands in the Planning Area subject to the adverse impacts of surface-disturbing activities on wildlife habitats, including surface water contamination and sedimentation by runoff from disturbed soils.

Under Alternatives B and C, the RPFO would prohibit surface-disturbing activities within 200 meters (656 feet) of riparian areas and springs. Oil and gas leasing stipulations would implement CSU for 15% to 30% slopes, NSO for slopes over 30%, and CSU for low reclamation soils. These actions would help mitigate the adverse impacts of surface-disturbing activities to special-status species and their habitats.

4.2.11.2.13 Special Designations Decisions

Special designation areas, such as ACECs, would generally have long-term positive impacts to special-status species that occur within their boundaries by limiting or preventing surface disturbance, human activities, and associated habitat degradation and fragmentation. Impacts to special-status species vary among alternatives primarily according to the proposed acreage of these specifically designated areas.

Four ACECs are proposed for designation in order to protect rare plants. The Cabezon Peak, Espinosa Ridge, and Torreon Fossil Fauna ACECs would be designated under all alternatives. The Ojito ACEC would be designated under Alternatives A, B, and C. Table 4.87 provides the size of proposed ACECs for special-status species, specifically rare plants, by alternative. Alternative B would provide the greatest number of acres of special designations for special-status species and Alternative D would provide the smallest number of acres.

Table 4.87: Proposed ACECs (acres) for the Protection of Special-Status Species, by Alternative

Proposed ACEC	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Cabezon Peak	5,765	17,150	17,150	6,984
Espinosa Ridge (formerly Ball Ranch)	1,478	10,295	7,687	1,478
Ojito	16,310	16,310	6,454	0
Torreon Fossil Fauna	6,488	6,488	6,488	6,488
Total	30,041	50,243	37,779	14,950

ACEC designations would indirectly benefit special-status species by limiting human and surface disturbance, preserving habitat, or preventing noise. Where established, ACECs would

be avoidance areas for rights-of-way and renewable energy developments, including wind, solar energy, and geothermal sites. Prohibiting these uses within ACECs would prevent adverse impacts to special-status species and migratory birds related to these developments and their implications for surface disturbance and habitat loss/fragmentation. The designation of ACECs could potentially increase recreational use in those areas, resulting in increased impacts to special-status species and their habitat. Increased interpretation, monitoring, maintenance, and enforcement along proposed ACECs by the BLM and interested partners would strive to minimize existing or additional impacts to special-status species from recreational use. However, these impacts would be carefully considered in greater detail at the implementation level based on the type of recreation that is expected to occur and the sensitivity level of the special status species or habitat in question to that specific recreation type. ACECs are not designated for recreational purposes, but because of their unique nature, have a higher probability of becoming points of interest to recreational users. Disclosing information about sensitive areas to the public can be a risk due to the possible heightened interest and consequential increase of recreational interest and visitation to those areas.

Table 4.88: Proposed ACECs (acres) on BLM Lands in the Planning Area, by Habitat Type and Alternativeshows the proposed ACECs designations by habitat type on BLM lands in the Planning Area.

Table 4.88: Proposed ACECs (acres) on BLM Lands in the Planning Area, by Habitat Type and Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	1	6	6	5
Grassland	11,335	22,102	19,650	6,321
Other	2,133	11,757	11,603	4,759
Piñon-juniper	7,081	42,105	41,953	11,659
Ponderosa pine	12	2,954	2,954	12
Riparian/Wetland	55	1,185	1,183	175
Shrub, steppe, scrub	25,635	53,385	45,818	14,789
Total ACEC acres	46,252	133,494	123,167	37,720
Percent of BLM lands in the Planning Area	6%	18%	17%	5%

4.2.11.2.14 Lands with Wilderness Characteristics Decisions

Alternatives B proposes to manage 37,514 acres of land to protect wilderness characteristics, while Alternative C would manage 26,110 acres to protect wilderness characteristics and 4,075 acres of lands to partially protect wilderness characteristics. These alternatives would generally benefit special-status species by reducing habitat degradation and fragmentation, with Alternative B having a more beneficial impact because more acres would be protected from surface-disturbing activities. Protection of lands with wilderness characteristics under Alternatives B and C includes limiting vehicle access and excluding or avoiding new rights-of-way and renewable energy developments.

Table 4.89 displays the proposed lands that would be managed to protect or partially protect wilderness characteristics, by habitat type.

Volcano Hill and Cimarron Mesa are mostly comprised of short to medium shrubby, grasslands. There are small sections within Cimarron Mesa that are piñon-juniper woodlands, lightly to moderately dense. Neither of these habitat types is suitable for either area's two known T & E species with critical habitat requirements, the Pecos Sunflower and the Mexican Spotted Owl. Due to the lack of suitable habitat in either Volcano Hill or Cimarron Mesa, it is not expected that there will be any impacts to T & E species. Some Bureau Sensitive plant species are known to occur in these habitat types and would be adversely impacted under Alternative A due to the open travel area at Cimarron Mesa. This use would have adverse impacts on rare plants due to direct disturbance of vegetation by vehicular travel.

Table 4.89: Lands with Wilderness Characteristics (acres), by Habitat Type

Vegetation/Habitat Type	Petaca Pinta A	Ignacio Chavez A	Ignacio Chavez B	Ignacio Chavez C	Chamisa E	Volcano Hill	Cimarron Mesa
Aquatic	0	0	0	0	0	5	0
Grassland	0	811	440	17	0	3,972	538
Other	0	102	32	0	4	11,539	5,540
Piñon-juniper	0	6	54	0	1,233	1,017	671
Ponderosa pine	0	0	0	0	559	0	0
Riparian/Wetland	0	0	0	0	200	26	3
Shrub, steppe, scrub	38	1,543	1,014	55	243	7,274	575
Total	**38**	**2,462**	**1,541**	**72**	**2,239**	**23,833**	**7,329**

4.2.11.2.15 Travel Management Decisions

The impacts of travel decisions on special-status species would primarily depend on the number of acres open and closed to motorized travel use under each alternative. Motorized travel use can cause damage to vegetation used as wildlife forage and cover, as well as cause noise disturbance. OHV use therefore generally has adverse impacts to special-status species, especially birds, in the Planning Area (Reijnen and Foppen 1994; Gelbard and Belnap 2003). Areas closed to OHV use would include some WSAs. OHV use also contributes to habitat fragmentation and habitat degradation, including the spread of noxious weeds. Habitat fragmentation may be less obvious than direct impacts such as vehicle collisions with species or vegetation removal, but often carries considerable consequences for long-term population and reproductive success. In general, the fewer routes available for motorized travel, the less habitat loss and/or fragmentation that would occur. Table. 4.90 shows the proposed acreages closed to travel on BLM lands in the Planning Area.

Table 4.90: Closed Areas of BLM lands within the Planning Area by Alternative (acres)

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	2	34	13	7
Grassland	5,672	28,775	19,820	15,751
Other	824	24,434	16,966	5,487

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Piñon-juniper	1,142	45,084	33,219	32,185
Ponderosa pine	0	3,233	2,891	2,891
Riparian/Wetland	85	1,246	1,081	1,043
Shrub, steppe, scrub	12,591	74,434	50,085	42,759
Total	**20,316**	**177,240**	**124,075**	**100,123**
Percent of BLM lands in the Planning Area	3%	24%	17%	13%

4.2.11.2.16 Vegetative Communities Decisions

Vegetative treatment could result in improvements to habitat that may benefit special-status species, with the assumption such treatments are carefully prescribed and carried out with specific special status species objectives in mind. Sagebrush thinning treatments that provide minimal disturbance to soils, including the use of prescribed fire, chemical treatments, or mechanical blading (shaving), could increase vegetative diversity, providing greater habitat choices to a variety of species. However, special status species dependent on or utilizing sagebrush ecosystems would suffer from eradication of sagebrush in areas treated by the aerial application of chemical herbicides. Piñon-juniper thinning, either through prescribed fire or mechanical means, would allow more sunlight and water to reach the understory for grass and forb growth and increased vegetative diversity and structure, which provide additional habitat for more species of animals. Type conversion Over-thinning of piñon-juniper woodlands to grasslands would have an adverse impact to piñon-juniper obligate species.

Vegetative treatments, to reduce noxious or invasive species, such as saltcedar, cheatgrass, thistles, or knapweeds, would be beneficial to special-status species habitat because treatments restore native plant communities and improve ecological health of the area. This determination relies on the assumption that treatments to control or eradicate noxious or invasive species are followed by actions that encourage re-establishment or reintroduction of native desired plant species, and re-establishment of noxious/invasive species is discouraged or prevented. Vegetative treatments of saltcedar could result in short-term adverse impacts to nesting special-status bird species. For example, southwestern willow flycatchers are known to nest in saltcedar. Under all alternatives, projects involving treatment of saltcedar in known southwestern willow flycatcher habitat would require consultation with the USFWS. Prescribed fire would likely result in the temporary loss of habitat, but would have beneficial impacts in the long term.

All alternatives could benefit special-status species habitat by using prescribed burning, planting native seed when possible and where beneficial to the habitat, and establishing natural disturbance regimes across the landscape to increase biodiversity and structure diversity, adding long-term benefits to habitat for as many species as possible.

4.2.11.2.17 Wildlife and Fisheries Decisions

Wildlife and fisheries improvement projects would have beneficial impacts to special-status species if planned and conducted consistently with special status species habitat improvement objectives. Accessible watering sites and wildlife-adapted fences would improve the mobility of special-status species. Conversely,, it is possible that wildlife improvements, such as vegetation

treatments, for one particular species would adversely impact another species. Site-specific NEPA documentation would be completed before habitat improvement projects are approved by the RPFO, and impacts to special-status species from other wildlife improvement projects would be analyzed at that time. Many decisions common to all alternatives that are aimed at protection of wildlife and fisheries would have beneficial impacts on special status species. They include, but are not limited to the following:

- The BLM would design all range and watershed improvements to achieve range, watershed, and wildlife objectives for maintaining, improving or enhancing habitats.
- The BLM would install wildlife escape ramps in all new and existing water tanks or troughs.
- The BLM would require all new power lines to be built to "electrocution-proof" specifications for protection of migratory birds, using the Suggested Practices for Avian Protection on Power Lines (Avian Power Line Interaction Committee, 2006).

4.1.1.1.1 Visual Resource Management Decisions

The BLM would implement prairie dog augmentation in support of the black-footed ferret Recovery Plan, but that would support other special status species that depend on or utilize prairie dog ecosystems or populations for all or a part of their life cycle. Visual Resources Decisions

The impacts to special-status species from visual resources decisions are primarily associated with limitations on surface disturbance intended to reduce impacts to areas with high visual resource values. VRM Class I and II designations are the most restrictive of oil and gas development and other surface-disturbing activities and would therefore be the most beneficial to special-status species and their habitats. In areas designated as VRM Class I or II, surface-disturbing activities are generally prohibited or limited. Table 4.91 shows the proposed VRM classes in acres. Under Alternatives B, C, and D, the most acres for VRM Class I would be proposed while Alternative A would propose the least. Alternative B would propose the most acres for VRM Class II, while Alternatives C and D would propose the least.

Table 4.91: Proposed VRM Classes (acres) for BLM Lands in the Planning Area

VRM Class	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
VRM I	97,646	97,296	97,474	97,516
VRM II	84,449	318,931	68,510	21,549
VRM III	61,789	27,529	80,931	83,050
VRM IV	153,250	300,631	497,471	542,272
Total	**397,133**	**744,387**	**744,387**	**744,387**

4.2.11.3 Cumulative Impacts

Reasonably foreseeable projects that could adversely impact special-status species include developments that would result in habitat loss or fragmentation. Mineral developments, new road projects, transmission lines, growth of urban areas, renewable energy projects, and other surface-disturbing activities that occur on public, private, or tribal lands near the Planning Area could

remove species habitat. These projects, where specific project areas are known, account for approximately 6,000 acres of habitat disturbance.

Beneficial cumulative impacts to special-status species would occur from such restoration projects as the Southwest Jemez Mountains Restoration Project, the Valles Caldera Landscape Restoration and Management Plan, statewide fuel treatments, and riparian restoration projects. These projects would lead to restored native ecosystems that could support special-status species and provide improved habitat areas for seasonal migrations. The planning area for these projects account for approximately 500,000 acres of forest restoration within and near the RMP Planning Area. The BLM estimates that federal and state agencies would treat up to 206,800 acres with prescribed fire, 35,900 acres with mechanical treatments, and 10,000 acres with chemical treatments over 20 years (BLM 2004). The Southwest Jemez Mountains Restoration Project and Valles Caldera Landscape Restoration Plan are currently in the planning phases; the specific treatment areas are unknown at this time. The planning area for the projects is approximately 210,000 acres in the southwest Jemez Mountains.

4.1.2Travel Management

Travel management affects a variety of travel modes and opportunities for access to public lands. The alternatives vary in providing motorized and non-motorized access. Motorized access would be managed under four possible categories based on BLM land use planning decisions considering natural resource protection, route utility, and public safety: 1) *open*, which allows for unlimited travel, including cross country; 2) *limited to designated* routes, and 3) *closed* to motorized use. The fourth category, *limited to existing* routes, serves as an interim category applied to areas where inventories and subsequent designations have not been completed.

The indicators for analyzing impacts to travel are:

- Efficacy of road and trail densities to support goals related to conservation of scenic quality or sensitive habitat management or to accommodate certain uses.
- Whether the road provides access to an important destination; provides access to private, state, or other federal lands; or is critical for recreation and resource use activities.
- The number of acres designated as open, closed, or limited to existing routes for recreation opportunities and access.

4.2.11.4 Direct and Indirect Impacts

4.2.11.4.1 Travel Designations Decisions

Travel areas classified as open or limited to existing roads, primitive roads, and trails would allow all forms of travel (i.e., motorized, mountain biking, and non-mechanized hiking and equestrian), which would have beneficial impacts to travel by providing opportunities for a wide range of travel modes. Areas closed to motorized travel would adversely affect travel because of the reduced opportunities for motorized access to areas on BLM lands within the Planning Area. The number of acres designated as open, limited, or closed to travel are shown in Table 4.92. Under Alternative B, the most acres would be closed to motorized travel and the least acres, along with Alternative A, would be open to motorized travel. Under Alternative A, the least number of acres would be closed to motorized travel.

Table 4.92: Proposed Travel Management Categories (acres), by Alternative

Category	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Open	303,580	4,551	18,269	19,456
Limited	420,491	562,596	602,043	624,808
Closed	20,316	177,240	124,075	100,123
Total	744,387	744,387	744,387	744,387

4.2.11.5 Cumulative Impacts

Reasonably foreseeable future actions impacting travel management include the addition of routes for fire and fuels management to reduce the risks of wildland fire, new minerals exploration and development routes, increased recreational demand and visitation by adding new routes, and other changes in travel management. The proposed N55 Road Improvement Project and Northwest Loop Road would impact travel management within the Planning Area. The N55 Road would improve an existing route in the Planning Area by paving and improving the engineered aspects of the road. This would beneficially impact travel in the vicinity of the road because the public and local landowners would have improved access to their land, grazing allotments, and other resources in the area. The length of the proposed N55 Road Improvement Project is approximately 31 miles. The Northwest Loop Road, approximately 39 miles, would also beneficially impact travel within the Planning Area. The public would have decreased travel times within the project vicinity. It is anticipated that at least 45 to 60 minutes of travel time between Interstate 40 and U.S. Highway 550 could be saved by the proposed Northwest Loop Road.

Transportation and road networks adjacent to BLM lands include routes shared with other federal agencies, the SLO, tribes, and private landowners. Cumulative impacts to transportation and access would occur primarily from actions that facilitate, restrict, or preclude motorized access. Management actions that restrict OHV use would limit the degree of travel opportunities and the ability to access certain portions of the Planning Area. The continued maintenance of federal and state highways would provide arterial connections to BLM roads. County-maintained routes that connect federal and state highways to BLM-system routes would maintain and improve access to resources in the Planning Area.

The RPFO has reviewed the travel management plans for the neighboring Santa Fe and Cibola National Forests. The cumulative impacts of travel management decisions in the these plans, as well as other jurisdictions, would have beneficial cumulative effects on recreational and visitor services when travel management decisions by other agencies support the proposed travel management decisions in this RMP/EIS, especially for shared roads. For example, if the U.S. Forest Service shares management of a road with the RPFO, and the travel management decisions for how to manage the road are the same (i.e., agencies manage a road as limited to existing), this would lead to beneficial impacts to recreation. In this case, recreation user groups would have consistent access to public lands. The Santa Fe National Forest would open 186 miles of road that is currently not open, would close 2,469 miles of road to motorized use, and would add 23 miles of new routes. The Mt. Taylor Ranger District, within the Cibola National

Forest, would open 98 miles of road that are currently closed or unauthorized and would close 465 miles of roads to motorized use.

Map-089-Travel Designations A

Map-090-Travel Designations B

Map-091-Travel Designations C

Map-092-Travel Designations D

4.2.12 Vegetative Communities

For the purposes of this DRMP/DEIS, the primary indicator of impacts to vegetation is the acres of surface disturbance caused by management decisions regarding other resources. Such surface disturbance would impact vegetation resources to varying degrees, depending on the amount, location, and type of surface disturbance and the disturbed vegetation's characteristics or ability to withstand surface disturbance. Surface-disturbing activities that currently occur and that are expected to continue include livestock grazing, lands and realty (granting of rights-of-way), fire and fuels management, special designations, minerals development, travel management, and recreation and visitor services. These activities would be required to follow the BMPs outlined in Appendix G.

4.2.12.1 Direct and Indirect Impacts

4.2.12.1.1 Livestock Grazing Decisions

Livestock grazing management decisions would have both adverse and beneficial impacts to vegetative communities within the Planning Area. In general, making areas unavailable for grazing would provide long-term protection and enhancement of vegetation because it would limit the loss of vegetative cover and the trampling of species. Areas available for livestock grazing generally suffer some short-term adverse impacts from decreased growth or loss of riparian and other vegetation. Livestock grazing could provide beneficial impacts to vegetative communities by controlling the spread of noxious and invasive weeds when the appropriate timing and intensity of grazing in applied in the spring.

Under all alternatives, livestock grazing would be managed in order to achieve and maintain the New Mexico Standards and Guidelines (BLM 2001). Under these guidelines, the PFC of wetlands and riparian areas would be promoted, the use and perpetuation of native species would be emphasized, noxious weed establishment and spread would be minimized, and adjustments would be made to grazing practices when vegetation PFC is not being met. The New Mexico Standards and Guidelines would mitigate the impacts of livestock grazing to vegetation resources; however, the potential for impacts still exists and would be greater under alternatives with a higher percentage of lands available for grazing.

4.2.12.1.2 Lands and Realty Decisions

Lands and realty management decisions that have the potential to have adverse impacts to vegetation would result from authorizations of right-of-way grants and the expansion or development of utility corridors. These actions would create surface disturbances of various magnitudes depending on the size and location of the project. Surface impacts from construction of communication facilities, transmission lines, pipelines, and roads would be disclosed in site-specific NEPA documentation. There would also be potential for the introduction of noxious or invasive plant species via construction equipment, vehicles, and personnel. However, the adverse impacts would be mitigated through BMPs, noxious weed controls, and restoration and rehabilitation measures. Lands and realty decisions that would also adversely impact vegetative communities would be those decisions to dispose of BLM lands thus removing the vegetative communities from BLM administration and protective measures.

Beneficial impacts would result from identification of exclusion and avoidance areas for rights-of-way and mineral withdrawals. Exclusion areas would offer greater protections for vegetation than avoidance areas because they would completely preclude surface-disturbing activities.

4.2.12.1.3 Fire Management Decisions

Under all alternatives, the Fire and Fuels Plan Amendment would be implemented in fire-related actions (BLM 2004). As discussed in Section 4.2.4 Fire Management, the RPFO would treat approximately 32,000 acres annually (approximately 4% of the Planning Area), depending on budgetary and time constraints. Wildland fire use would not be authorized in areas that are known to be highly susceptible to post-fire weed invasion, areas with important terrestrial and aquatic habitats, and non-fire-adapted vegetation communities unless reasonable resource protection measures are in place. These actions would have long-term beneficial impacts to vegetation by reducing the opportunities for the spread of weeds and exotic, invasive species into native vegetation communities.

Vegetation treatments such as mechanical and manual treatments, prescribed fire, chemical or biological vegetation control, and aerial/ground seeding would have both beneficial and adverse impacts to vegetation communities in fire-treated areas. Long-term beneficial impacts to vegetation would occur in treated areas once invasive species competition is eliminated or reduced, assuming that a diverse native community has the potential to establish in the area. The short-term adverse impacts of fuels management actions on vegetation would include the unavoidable potential trampling and disturbance of native species and the thinning and removal of ecologically desirable species. These actions could result in a short-term adverse reduction of native species diversity. However, these treatments would improve vegetation communities in the long term once natives are re-established. These beneficial impacts would include more diverse species and habitat structure, multiple age classes, and openings for forbs and woody species recruitment.

4.2.12.1.4 Special Designations Decisions

Special designations would have a beneficial impact to vegetative communities because of management restrictions that are applied within the boundaries of the particular designation. Travel and mineral resource management decisions are the two major surface-disturbing activities that would be restricted within special designations and that also indirectly protect vegetative communities. ACECs and National Scenic Trails are the two special designations that are proposed in the DRMP/DEIS. The only National Scenic Trail on BLM lands within the Planning Area is the CDT. Table 4.93 provides the proposed number and acres of special designations, by alternative. Under Alternative B, the most acres would be proposed for special designations. Under Alternative D, the least number of acres would be proposed for special designations.

Table 4.93: Proposed Special Designations (number and acres) with the Planning Area, by Alternative

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACEC	10 ACECs 53,765 acres	18 ACECs 149,974 acres	18 ACECs 137,029 acres	11 ACECs 42,899 acres
WSA/Wilderness Area	97,963 acres	97,963 acres	97,963 acres	97,963 acres

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
CDNST	1 trail 11,474 acres	1 trail 38,808 acre	1 trail 23,607 acres	1 trail 11,474 acres
Total special designations in Planning Area	137,720 acres	185,625 acres	178,000 acres	126,392 acres

4.2.12.1.5 Mineral Resources Decisions

Management decisions to allow mineral development would have short- and long-term adverse impacts to vegetative communities. In the short term, loss of vegetation associated with surface disturbances for well pads, access roads, and minerals infrastructure would increase the potential for invasion of undesirable plant species, and cause a potentially irretrievable loss of vegetation productivity during the period of disturbance though all disturbed areas will be fully reclaimed prior to release of bonds.

According to the RFD for mineral resources, development of leasable, saleable, and locatable mineral resources would contribute to surface disturbance equating to 1.1% of BLM lands in the Planning Area over the next twenty years. The typically slow regrowth of vegetation within the Planning Area would cause surface disturbance to have long-term, indirect, adverse impacts to vegetation resources. Initial establishment of native species following seeding is estimated to take three to four years, depending on the successful deferment or exclusion of livestock grazing and the prevention of the establishment of weedy annuals from the site during this time (Monsen et al. 2004). Revegetation is especially difficult in desert shrub habitat, because soils are shallow and highly saline, and moisture availability is relatively low (Monsen et al. 2004). Three leasing stipulations are proposed under Alternatives B and C that would protect vegetative communities. The lease reclamation stipulation would require leases containing well pads, roads, and/or facilities that are not plugged and/or reclaimed to current standards must be either put to beneficial uses or reclaimed within two years of lease issuance. The RPFO would also implement a NSO leasing stipulation that would prohibit the removal of ponderosa pine trees for authorized surface-disturbing activities. Under Alternatives B and C, oil and gas leasing stipulations would implement CSU for low reclamation soils. This stipulation would have a beneficial impact to vegetative communities because it would help preserve communities that are difficult to re-create by restriction oil and gas development in low reclamation potential areas. In addition, under Alternative B, habitat areas for special-status plant species that are located in low reclamation potential soils would be closed to oil and gas leasing.

4.2.12.1.6 Travel Management Decisions

Travel management decisions would have both beneficial and adverse impacts to vegetative communities. Areas closed to motorized travel would reduce trampling activities on the closed BLM roads and trails, thereby encouraging revegetation of the roadways. Areas open to travel have the potential to adversely impact vegetative communities by allowing off-road travel to occur, which could introduce invasive and noxious weeds to these areas. Areas limiting travel to existing roads and trails would provide access to BLM lands within the Planning Area while minimizing adverse impacts to vegetative communities. Table 4.94 shows the proposed travel management decisions, by alternative, within the Planning Area. Under Alternative B, the largest number of acres would be closed to motorized travel and no areas would be open to

motorized travel. Under Alternatives C and D, the most acres would be open to motorized travel.

Table 4.94: Proposed Travel Management Decisions (acres) on BLM Lands within the Planning Area, by Alternative

Category	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Open	303,580	4,551	18,269	19,456
Limited	420,491	562,596	602,043	624,808
Closed	20,316	177,240	124,075	100,123
Total	744,387	744,387	744,387	744,387

4.1.2.1.1 Recreation and Visitor Services Decisions

In general impacts from recreation activities on vegetative communities would be limited to isolated surface disturbances where activities such as dispersed camping and cross-country hiking occur. Where recreation is managed using a SRMA or ERMA, BLM rules and guidelines would limit or control activities through specialized management tools such as designated campsites, permits, area closures, and limitations on number of users and duration of use. Adverse impacts from recreation activities on vegetative communities could occur if visitors engage in unauthorized plant harvesting, such as the removal of rare plants, cacti, or penstemon plants. In addition, efforts would be made to educate public land visitors and users about the ethics of responsible use.

4.2.12.1.7 Renewable Energy

Lands and realty management decisions that have the potential to have adverse impacts to vegetation would result from authorizations of renewable energy projects. These actions would create surface disturbances of various magnitudes depending on the size and location of the project. Surface impacts from construction for renewable energy development would be disclosed in site-specific NEPA documentation. There would also be potential for the introduction of noxious or invasive plant species via construction equipment, vehicles, and personnel. However, the adverse impacts would be mitigated through BMPs, noxious weed controls, and restoration and rehabilitation measures.

Beneficial impacts would result from identification of exclusion and avoidance areas for renewable energy projects. Exclusion areas would offer greater protections for vegetation than avoidance areas because they would completely preclude surface-disturbing activities.

4.2.12.2 Cumulative Impacts

Any reasonably foreseeable future activity that involves surface disturbance would have a short-term cumulative impact to vegetative communities within the Planning Area. Mineral developments, new road projects, urban growth, renewable energy projects, and other surface-disturbing activities that occur on public, private, or tribal lands within the Planning Area could introduce or spread noxious weeds within the Planning Area. Changes in land use could result in habitat loss for some vegetative species. The Desert Rock Power Plant, new transmission

corridors, the proposed N55 Road Improvement Project, new uranium mines, and the Northwest Loop Road could result in habitat fragmentation and habitat loss for vegetative species, including rare plants. The planning area for these projects account for approximately 500,000 acres of forest restoration within and near the RMP Planning Area. The BLM estimates that federal and state agencies would treat up to 206,800 acres with prescribed fire, 35,900 acres with mechanical treatments, and 10,000 acres with chemical treatments over 20 years (BLM 2004). The Southwest Jemez Mountains Restoration Project and Valles Caldera Landscape Restoration Plan are currently in the planning phases; the specific treatment areas are unknown at this time. The planning area for the projects is approximately 210,000 acres in the southwest Jemez Mountains.

The proposed fire and fuels management projects, described in Table 4.3, would have short-term adverse and long-term beneficial impacts to vegetative communities. Short-term impacts include the risk of prescribed fires getting out of control and moving across the landscape into RPFO-managed areas. In the long term the fire and fuel treatment projects would restore the native vegetative communities across the state, which would reduce the threat of high-intensity wildfires from moving into the Planning Area. Similarly, the Southwest Jemez Mountains Restoration Project and the Valles Caldera Landscape Restoration and Management Plan would also reduce the threat of high-intensity wildfires and reduce the potential spread of non-native species across jurisdictional boundaries.

Map-093-Level 3 Ecoregions

Map-094-MLRA

4.2.13 Visual Resources

The RPFO completed a BLM Visual Resource Inventory (VRI) in 2010 to determine the relative value of visual resources throughout the Planning Area and rate all lands with an assigned VRI class number. There are four VRI classes: Classes I and II represents the most or more valued visual resources, Class III represents moderate value, and Class IV represents the least valued (see Table 4.95). These VRI class ratings are informational in nature and provide a basis for considering visual values in the RMP process. VRI class ratings, however, do not establish management direction and should not be used as the basis for constraining or limiting surface-disturbing activities.

Table 4.95: VRI for BLM lands in the Planning Area (acres)

VRI Class	Acres Inventoried
VRI I	96,460
VRI II	1,222
VRI III	24,748
VRI IV	621,957
Total	**744,387**

In addition to completing a VRI, BLM is also required to designate all public lands with a VRM class objective to provide a management threshold or level of acceptable impacts to visual resources. The proposed VRM class objectives (see Table 4.96) reflect not only the VRI but also take into account other proposed resource allocations and needs that may/would result in future visual intrusions e.g., rights-of-way, recreation facilities, mineral leases, etc.

The following BLM VRM class objectives and descriptions are summarized from BLM Manual Handbook H-8431-1 (1986).

- VRM Class I – The objective of VRM Class I is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activities. The level of change to the characteristic landscape should be very low and should not attract attention.
- VRM Class II – The objective of this class is to retain the existing character of the landscape. The level of change to the landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes to the landscape must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- VRM Class III – The VRM Class III objective is to partially retain the existing character of the landscape. The level of change to the landscape should be moderate. Management activities may attract the attention of the casual observer, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- VRM Class IV – The objective of VRM Class IV is to provide for management activities that require major modifications to the existing character of the landscape. The level of change to the landscape can be high. The management activities may dominate the view

and may be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic visual elements of form, line, color, and texture.

4.2.13.1 Analysis Assumptions

The visual resource impact(s) analysis throughout this chapter is broad scale and uses the number of acres proposed for each VRM class objective and the respective level of visual intrusions or surface disturbances permitted under each objective.

The assumptions for analyzing the impacts to visual resources in the Planning Area are: 1) the greater the size and/or severity of surface disturbance and/or degree of air quality degradation, the greater the impact there would be to scenic quality; 2) all Planning Area resources with management actions that permit surface disturbances or degrade air quality would have adverse impacts to visual resources to some degree; 3) surface disturbances would introduce new visual elements onto the landscape or intensify existing visual elements, altering the line, form, color, and/or texture that characterize the existing landscape; and 4) changes in air quality, either from smoke, dust, haze, or other pollutants could potentially reduce or degrade scenic quality by obscuring distant views in the short and long term.

4.2.13.2 Direct and Indirect Impacts

4.2.13.2.1 Visual Resource Decisions

VRM decisions would either have an adverse or beneficial impact to visual resources within the Planning Area depending on the variation between the visual resource inventory class and VRM management class for a particular area. Table 4.96 shows the proposed VRM management classes (in acres), by alternative. Please note that the VRM inventory and assigned management classes under the 1986 RMP and No Action Alternative did not include all BLM lands in the Planning Area. Under Alternatives B, C, and D, the most acres for VRM Class I would be proposed while Alternative A would propose the least. Alternative B would propose the most acres for VRM Class II, while Alternatives C and D would propose the least.

Table 4.96: VRM Classes (acres), by Alternative

VRM Class	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
VRM I	97,646	97,296	97,474	97,516
VRM II	84,449	318,931	68,510	21,549
VRM III	61,789	27,529	80,931	83,050
VRM IV	153,250	300,631	497,471	542,272
Total	**397,133**	744,387	744,387	744,387

4.2.13.2.1.1 Impacts from Management Specific to Alternative A

Under Alternative A, nearly all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Less than 1% of VRI I acres would be in VRM Class II or VRM Class III, potentially resulting in only partially retaining the

character of those lands. Table 4-97 shows how much of each VRI class would be managed under each VRM class under Alternative A, both as acres and percentage of the VRI class.

Table 4.97: Alternative A VRM Decisions by VIR (acres and percent)

Alternative A VRM	Acres	VRI Class I		VRI Class II		VRI Class III		VRI Class IV		Total
		Acres	%	Acres	%	Acres	%	Acres	%	Acres
VRM I	97,645	95,909	99	0	0	52	0	601	0	**96,562**
VRM II	84,449	379	0	50	4	2,890	12%	59,716	10	**63,035**
VRM III	61,789	78	0	0	0	0	0	61,711	10	**61,789**
VRM IV	153,250	0	0	0	0	2,545	10	150,705	24	**153,250**
Sum	**397,133**	**86,590**	**100**	**50**	**4**	**5,487**	**22**	**272,733**	**44**	**374,636**

*For Alternative A, the VRM class acreages do not match the acreages of the updated VRI because of changes in the Planning Area. As a result, the sum of the values within a column does not match the total VRI acres for each VRI class.

4.2.13.2.1.2 Impacts from Management Specific to Alternative B

Under Alternative B, nearly all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 13% of VRI Class I acres would be in VRM Class II. With regard to VRI Class II lands, 100% would be in VRM Class II, allowing a low level of change. Table 4-98 shows how much of each VRI class would be managed under each VRM class under Alternative B, both as acres and percentage of the VRI class.

Table 4.98: Alternative B VRM Decisions by VRI (acres and percent)

Alternative B VRM	Acres	VRI Class I		VRI Class II		VRI Class III		VRI Class IV		TOTAL
		Acres	%	Acres	%	Acres	%	Acres	%	Acres
VRM I	97,296	96,329	100	0	0	0	0	967	0	**97,296**
VRM II	318,931	131	0	1,222	100	21,832	88	295,747	48	**318,932**
VRM III	27,529	0	0	0	0	642	3	26,887	4	**27,529**
VRM IV	300,631	0	0	0	0	2274	9	298,356	48	**300,630**
Sum	**744,387**	**96,460**	**100**	**1,222**	**100**	**24,748**	**100**	**621,957**	**100**	**744,387**

4.2.13.2.1.3 Impacts from Management Specific to Alternative C

Under Alternative C, all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. With regard to VRI Class II lands, 100% would be in VRM Class II, allowing a low level of change. Table 4-99 shows how much of each VRI class would be managed under each VRM class under Alternative C, both as acres and percentage of the VRI class.

Table 4.99: Alternative C VRM Decisions by VRI (acres and percent)

Alternative C VRM	Acres	VRI Class I		VRI Class II		VRI Class III		VRI Class IV		TOTAL
		Acres	%	Acres	%	Acres	%	Acres	%	Acres
VRM I	97,474	96,446	100	0	0	0	0	1,028	0	**97,474**
VRM II	685,11	6	0	49	4	7,891	32	60,565	10	**68,511**
VRM III	80,931	8	0	0	0	0	0	80,923	13	**80,931**
VRM IV	497,471	0	0	1,173	96	16,857	68	479,441	77	**497,471**
Sum	**744,387**	**96,460**	**100**	**1,222**	**100**	**24,748**	**100**	**621,957**	**100**	**744,387**

4.2.13.2.1.4 Impacts from Management Specific to Alternative D

Under Alternative D, all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. With regard to VRI Class II lands nearly all would be in VRM Class II, allowing a low level of change; and less than 1% would be in VRM Class IV, potentially resulting in a high level of change to those acres. Table 4-100 shows how much of each VRI class would be managed under each VRM class under Alternative D, both as acres and percentage of the VRI class.

Table 4.100: Alternative D VRM Decisions by VRI (acres and percent)

Alternative D VRM	Acres	VRI Class I		VRI Class II		VRI Class III		VRI Class IV		TOTAL
		Acres	%	Acres	%	Acres	%	Acres	%	Acres
VRM I	97,516	96,446	100	0	0	0	0	1,070	0	97,516
VRM II	21,549	6	0	49	4	2,053	8	19,441	3	21,549
VRM III	83,050	0	0	0	0	12,314	50	70,736	11	83,050
VRM IV	542,272	8	0	1173	96	10,381	42	530,710	85	542,272
Sum	**757,074**	86,590	100	13,363	100	330,650	100	32,6471	100	757,074

4.1.2.1.2 Fire Management Decisions

Short-term, direct impacts of prescribed burning would result in the obvious visual contrasts created in treated or burned over areas. Generally, the use of prescribed fire would have a long-term benefit on visual resources by decreasing the frequency, size, and opportunity for unmanaged and catastrophic wildland fire, thereby increasing the opportunity to maintain various mosaics of live vegetation that would, overall, tend to increase more desirable and naturally occurring visual contrasts.

4.1.2.1.3 Land Use Authorization Decisions

Impacts from land use authorizations and realty management decisions would include both short and long term visual impacts. These effects would include, but are not limited to, the short term effects of construction activities such as fugitive dust and temporary placement of construction

equipment and vehicles; and the undesirable, long term visual contrasts created by clearings, removal of vegetation, and installation of facilities such as new roads, water tanks, power transmission lines, etc. Areas identified for ROW avoidance and exclusion would reduce or prohibit related activities/disturbances resulting in the long-term protection of visual and scenic resources.

Minerals and hydrocarbon leasing would have direct and indirect adverse impacts on visual quality, both short and long term. The effects on visual quality would include, but not limited to, visual contrasts created with the construction of well pads, access roads, drilling rigs, pipelines, and processing and support facilities. Indirect impacts to visual quality would result from soil erosion on disturbed areas, fugitive dust created during construction, and/or haze from compressor and generator emissions that can obscure or degrade scenic vistas. Areas withdrawn or excluded from oil and gas leasing would eliminate associated impacts of mineral development, resulting in long term protection of visual and scenic resources.

4.1.2.1.4 Travel Management Decisions

Continued recreational OHV use would tend to cause both long and short-term adverse impacts to visual quality under all alternatives. Direct, long term impacts from motorized use would result from visual contrasts caused by pioneering of new routes, soil erosion and widening of trails, and the short term or temporary impacts resulting from vehicles generating localized dust.

4.2.13.3 Cumulative Impacts

Mineral development, including oil and natural gas well drilling, is expected to increase at a low level over the next 20 years. VRM classes and associated mitigation would likely limit the impacts to viewsheds with high scenic quality in the Planning Area and in the adjacent National Forests. The proposed Desert Rock Power Plant could potential have long-term adverse impacts to visual resources within the Planning Area. Air pollution and haze from the plant could potentially be seen from within the Planning Area under certain weather conditions. The Red Mesa Wind Farm would also have long-term impacts to visual resources within the central portion of the Planning Area near Mount Taylor.

Map-095-VRM A

Map-096-VRMB

Map-097-VRM C

Map-098-VRM D

4.2.14 Wildlife and Fisheries

Actions that remove, degrade, or fragment wildlife habitats are considered adverse. Beneficial impacts include actions that conserve or improve habitats, such as big game crucial winter range, nest sites, or leks.

Direct impacts to wildlife could result from the loss of habitats or key habitat features, such as a nest site or lek area, or from the immediate loss of life. Wildlife also can be directly disturbed by human activities, potentially causing wildlife to abandon a nest, lek, or home range. Disturbance during sensitive periods (e.g., winter, nesting) is known to adversely impact wildlife. Human activities, such as OHV use, recreation, and noise from equipment associated with development and surface-disturbing activities, impact some wildlife species. These activities are considered to be particularly detrimental to nesting and lekking grouse, nesting raptors, and wintering big game. Disturbance impacts range from short-term displacement and shifts in activities to long-term abandonment of home range (Yarmaloy et al. 1988; Miller et al. 1998; Connelly et al. 2000).

Habitats can be lost and fragmented by activities such as vegetation treatments, fire management and ecology, mineral exploration and extraction, construction and maintenance of roads and trails, and development of wind-energy facilities.

Indirect impacts to wildlife can occur by changing habitat characteristics or quality. Habitat quality can be impacted by various surface-disturbing activities and other actions that remove vegetation and disturb soil. Indirect impacts to potential habitats for wildlife also could occur.

- Activities on public lands that could result in adverse impacts to wildlife and fisheries include, but are not limited to: Direct or indirect harm, harassment, or loss of an individual animal regardless of how long the impact may occur;
- Toxic contamination of wildlife or the loss of habitat for populations to re-establish caused by toxic material either on the surface or below ground;
- Short- or long-term loss or degradation of wildlife abundance, diversity, or habitat from impacts to key wildlife habitat areas;
- Impacts from inadvertent violations of federal, state, or local plans, regulations, laws, and statutes for the protection of wildlife, regardless of how long the infraction may occur; and
- Loss or degradation of wildlife habitat from introduction of invasive, non-native, or exotic flora or fauna.

Avoidance is the preferred method to prevent loss or degradation to wildlife or habitat. If a measure to prevent the loss of habitat is not available, then an action (mitigation) would be designed to minimize impacts to all affected areas, including consideration of off-site mitigation and studies to determine the magnitude of impacts for adaptive resource management techniques, which would adjust management accordingly. Potential impacts from cave and karst resources, cultural resources, fire management, forests and woodlands, lands and realty, livestock grazing, mineral resources, recreation and visitor services, renewable energy, riparian resources, soil and water, lands with Wilderness characteristics, travel management, special designations, special-

status species, visual resource management, and wildlife management decisions are expected to impact wildlife and fisheries in the Planning Area. The adverse and beneficial impacts are described below for each resource.

4.2.14.1 Analysis Assumptions

Table 4.101 below summarizes the habitat types utilized by the representative wildlife species found on BLM lands in the Planning Area. These representative species were chosen for their high public interest, such as deer or elk, or because they represent an important ecological group, such as neotropical birds. Most of the quantitative analyses in this section report impacts by habitat type, since there are too many wildlife species to address each one individually.

Assumptions used in this impact analysis include the following:

- The BLM is responsible for managing habitats, whereas state and federal wildlife management agencies (e.g., NMDGF, USFWS) oversee management of wildlife species. Therefore, this analysis primarily relies on changes to vegetation types to estimate impacts to wildlife habitats.
- For each alternative, changes to vegetation types, either in quantity, quality, or increased fragmentation, are compared to baseline conditions. Adverse and beneficial impacts to vegetation types (i.e., wildlife habitats) are assumed to have a corresponding adverse or beneficial impact on wildlife species.
- Disturbance impacts to wildlife are evaluated by comparison to current management practices in the planning area; increased protection in time or space are beneficial, where as reduced protection result in adverse impacts.
- Disturbance during sensitive periods adversely impacts wildlife.
- Habitat fragmentation adversely impacts wildlife.
- Prescribed fire is a tool used to manage vegetative communities and can result in short-term adverse impacts with long-term beneficial impacts to wildlife and wildlife habitats.
- Management actions aimed at benefiting specific wildlife species can have adverse or beneficial impacts on other wildlife species.
- Alternatives with a larger number of acres of surface water developed will exhibit a greater benefit to migratory game birds and other riparian/wetland wildlife species when compared to alternatives with smaller acreage of surface water developed.
- The potential for adverse and beneficial impacts to wildlife is anticipated to be commensurate with the intensity of allotment monitoring and the amount of forage utilization from livestock grazing in the planning area.
- The more acreage of habitats protected from fragmentation, the greater the benefit to big game and other wildlife species. Alternatives proposing to protect the most habitats from fragmentation are anticipated to have the most beneficial impact on wildlife.
- Prohibiting surface disturbance or occupancy is more restrictive and provides more protection for wildlife than avoiding surface disturbance or occupancy.
- The more surface disturbance that occurs on steep slopes or on highly erosive soils, the greater the potential for adverse impacts to wildlife habitats.

- The more area used by OHVs and the higher the density of OHV use, the more adverse impacts are anticipated to wildlife habitats.
- The BLM will utilize best available information, management and conservation plans, and other research and related directives, as appropriate, to guide wildlife habitat management on BLM administered lands.
- All active grazing allotments will be managed in accordance with the conditions of the grazing permits.

Table 4.101: Grouping of Wildlife Species by Habitat Type and Habitat Availability on BLM lands within the Planning Area

Vegetation/Habitat Type	Acres	Wildlife Associations
Aquatic	435	Amphibians, fish
Grassland	156,708	Pronghorn, bobcat, coyote, small mammals, raptors, upland game birds, neotropical bird, reptiles, amphibians
Other	60,306	
Piñon-juniper	177,521	Mule deer, elk, pronghorn, coyote, small mammals, neotropical birds, raptors, upland game birds, reptiles
Ponderosa pine	3,867	Elk, mule deer, bobcat, black bear, mountain lion, small mammals, raptors, neotropical birds, upland game birds, reptiles
Riparian/Wetland	3,664	Bobcat, small mammals, neotropical birds, wetland game birds, amphibian, fish, reptiles
Shrub, steppe, scrub	341,886	Mule deer, elk, pronghorn, raptors, small mammals, neotropical birds, upland game birds, reptiles
Total	**744,387**	

4.2.14.2 Direct and Indirect Impacts

4.2.14.2.1 Cave and Karst Resources Decisions

Cave and karst resources management decisions would beneficially impact wildlife because caves can provide unique habitat to wildlife, specifically roosting, maternity and hibernation habitat for bats. The Pronoun Cave Complex is the only known cave system on BLM lands within the Planning Area. A bat survey conducted in 1998 found eleven species of bats in the Planning Area, five of which were documented in or near the cave complex (Gannon et al. 1998). The Pronoun Cave Complex would be protected through an ACEC designation under Alternatives A, B, and C; therefore, bat species and other wildlife that utilize the caves would be protected under these alternatives from such activities as oil & gas and renewable energy development. Site-specific NEPA analysis would be completed for proposed actions that occur within or near the Pronoun Cave Complex.

4.2.14.2.2 Cultural Resources Decisions

Cultural resources management decisions would have beneficial impacts to wildlife because of restrictions on surface-disturbing activities that directly protect cultural resources, and that would indirectly protect wildlife habitat. There are four cultural resource areas, Big Bead Mesa,

Headcut Prehistoric Community, Azabache Station, Fort Site and Ojo Pueblo, which have proposed surface restrictions under various alternatives. The surface restrictions, which vary by alternative and are described in Chapter 2, could include NSO or CSU for leasable fluid minerals, avoid or close to saleable mineral extraction, and/or withdrawn from locatable mineral entry. Motorized travel is also generally limited to existing primitive roads and trails for these areas. Table 4.102 shows the number of acres for each cultural resource site that would have surface restrictions applied, by alternative.

Table 4.102: Proposed Cultural Resource Areas with Surface Restrictions (acres), by Alternative

Cultural Resource Area	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Big Bead Mesa	340	340	340	340
Headcut Prehistoric Community	960	1,280	1,280	960
Azabache Station	81	81	81	0
Fort Site and Ojo Pueblo	0	1,130	1,130	0
Total	**1,381**	**2,831**	**2,831**	**1,300**

4.2.14.2.3 Fire Management Decisions

Under all alternatives, the Fire and Fuels Plan Amendment would be implemented in fire-related actions (BLM 2004). Adherence with the Fire and Fuels Plan Amendment (which mandates the maintenance of existing healthy ecosystems and the protection of threatened, endangered, and special-status species) would have beneficial impacts to wildlife habitat on BLM lands in the Planning Area wherever wildlife habitat overlaps with that of protected special-status species and would ensure that healthy ecosystems are not adversely impacted by fire management and fuels reduction.

Fuels management actions include fuels reduction treatments on 32,000 acres annually. These actions include mechanical and manual treatments, prescribed fire, chemical or biological vegetation control, and aerial/ground seeding. These fuels management decisions would likely have a beneficial long-term impact to wildlife and fish populations by helping to restore the natural fire regime, which would improve habitat health (Lewis and Harshbarger 1976), forage, nesting opportunities, and cover. Restoring the natural fire regime would also reduce the chance of catastrophic wildfire and the subsequent loss of major ecosystem components. In the short term, vegetation treatments could result in adverse impacts such as trampling or removal of wildlife forage and/or habitat and human-caused wildlife disturbance. Table 4.103 displays the number of acres proposed for fire management treatments within each habitat type.

Table 4.103: Proposed Fire Management Treatments (acres), by Habitat Type

Vegetation/Habitat Type	Proposed Fire Management Treatments (acres)
Aquatic	95
Grassland	146,922
Other	19,594

Vegetation/Habitat Type	Proposed Fire Management Treatments (acres)
Piñon-juniper	161,374
Ponderosa pine	3,825
Riparian/Wetland	3,554
Shrub, steppe, scrub	277,594
Total	**612,958**
Percent of BLM lands in the Planning Area	82%

4.2.14.2.4 Forests and Woodlands Decisions

Forest and woodland management decisions would impact wildlife because wildlife habitat would be open to forest products removal under each alternative. Adverse impacts to wildlife from the removal of forest products could include direct habitat loss, forage loss, habitat degradation, and habitat fragmentation. Short-term indirect, adverse impacts of wood gathering on wildlife species and their habitats include trampling and removal of native vegetation, which result in habitat degradation that can include reduced prey species, forage species, and cover. Indirect, adverse impacts of wood gathering to bird species would also include reduced reproductive opportunity due to removal of trees causing a decrease in nesting substrate. Collection of dead and down fuelwood would also have adverse impacts to those wildlife species that utilize such habitats for all or a part of their life cycle. Fuelwood collection would also cause additional direct impacts such as increased illegal off-highway vehicle use. Monitoring data has shown a common occurrence of unauthorized off-highway vehicle use in areas open to fuelwood collection. This type of activity causes habitat loss and fragmentation and can cause nest abandonment during critical nesting periods.

Forest and woodland management decisions would have a beneficial impact to wildlife. The goals and objectives of the forests and woodlands program not only focus on harvesting of forest products, but also on managing forested areas for ecosystem health (including, but not limited to: wildlife habitat, watershed process, and riparian restoration and enhancement). Forest restoration projects including those with forest product removal can be designed to improve habitat by favoring certain vegetation types over others, reducing tree densities, altering spatial distribution of trees or by reducing erosion and increasing herbaceous ground cover through lop and scatter of slash. Vegetative treatment would result in improvements to habitat that may benefit many wildlife species. Studies have shown that where dense stands of piñon-juniper have been thinned, understory vegetation increased dramatically on the heaviest thinned plots and the number of vegetation species present also increased significantly. Under all alternatives, the RPFO would consider the New Mexico Forest Restoration Principles (2006) and the New Mexico Forest and Watershed Health Plan (New Mexico Forest and Watershed Health Planning Committee 2004). Table 4.104 shows the proposed forest product harvest areas that would be available on BLM lands in the Planning Area, by habitat type and alternative.

Table 4.104: Proposed Forest Product removal Areas (acres) within Habitat Types on BLM lands in the Planning Area, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	2	324	412	428
Grassland	865	29,095	123,840	140,964
Other	200	6,018	36,309	54,778
Piñon-juniper	5,543	22,395	133,074	145,273
Ponderosa pine	417	69	894	975
Riparian/Wetland	183	378	2,325	2,589
Shrub, steppe, scrub	4,976	61,156	263,467	299,125
Total	**12,186**	**119,435**	**560,321**	**644,132**
Percent of BLM lands in the Planning Area	2%	16%	75%	87%

4.2.14.2.5 Lands and Realty Decisions

Lands and realty management decisions that have the potential to have adverse impacts to wildlife and wildlife habitat would result from authorizations of right-of-way grants and the expansion or development of utility corridors. These actions would create surface disturbances of various magnitudes depending on the size and location of the project. Surface impacts from construction of communication facilities and other developments requiring a right-of-way would be disclosed in site-specific NEPA documentation, but generally result in habitat loss and fragmentation due to the clearing of vegetation for development of facilities such as communication towers, power lines, and placement of pipelines. New road construction is also typically associated with rights-of-way, due to the maintenance requirements of facilities. New road construction is a direct adverse impact of issuing rights of way, and causes long-term habitat loss, unless the roads can be rehabilitated post construction. There would also be potential for the introduction of noxious or invasive plant species via construction equipment, vehicles, and personnel. Although the adverse impacts would be mitigated through BMPs, noxious weed controls, and restoration and rehabilitation measures, mitigation does not guarantee the site will return to its pre-construction condition, and the risk of adversely impacting wildlife habitat is present.

Lands and realty decisions would also adversely impact wildlife by those decisions to dispose of BLM lands. Disposal of lands could result in fragmentation of otherwise contiguous habitat, depending on land use and ownership patterns. By transferring lands to private ownership, development, and human activities, including introduction of domestic pets or livestock, could disturb wildlife or degrade adjacent habitat quality. Indirect impacts from land disposals could include disturbance to wildlife and degradation of habitat on those lands that remain in public ownership adjacent to the associated disposed lands. Land disposals surrounding urban areas could result in the potential elimination of a buffer zone protecting wildlife and wildlife habitats. Conversely, disposals have the possibility to coincide with acquisitions as part of a land swap, in which case can result in beneficial impacts in the form of acquiring more valuable/high quality habitat, and consolidating BLM land ownership for more effective wildlife habitat management.

Table 4.105 displays the number of acres proposed for land disposal, by alternative. Under Alternative A, the most acres are proposed for disposal while under Alternative B, the least number of acres are proposed for disposal.

Table 4.105: Proposed Land Disposals (acres), by Alternative and Vegetation Type

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	269	269	269	269
Grassland	14,377	14,429	14,723	15,897
Other/Not Classified	4,071	4,398	4,417	4,461
Piñon-juniper	24,937	26,155	26,867	26,867
Ponderosa pine	221	482	749	749
Riparian/Wetland	663	730	801	801
Shrub, steppe, scrub	10,846	11,009	11,084	13,007
Total	**55,384**	**57,472**	**58,910**	**62,051**

Beneficial impacts would result from land acquisitions and the identification of exclusion and avoidance areas for rights-of-way. Land acquisitions could result in the protection of special-status species habitat that may not otherwise occur if the land in question was managed by a private entity. Exclusion areas would offer greater protection for wildlife habitat than avoidance areas because they would completely preclude surface-disturbing activities.

4.2.14.2.6 Livestock Grazing Decisions

Livestock grazing can have both adverse and beneficial impacts to wildlife. Livestock grazing could have adverse impacts on elk and mule deer due to foraging niche overlap with cattle (Torstenson et al., 2006). Livestock grazing could have adverse impacts on ground-nesting birds through trampling of nesting habitat (Fondel and Ball 2003and indirectly through increased parasitism by brown-headed cowbirds (Walsberg, 2005).

Livestock grazing management decisions, including the continuing implementation of the New Mexico Standards and Guidelines (BLM, 2001) could benefit some wildlife habitat by promoting regrowth of forage species, reducing the prevalence of some invasive plants, and creating openings and disturbed areas used by some species. Other beneficial impacts from livestock grazing for wildlife and wildlife habitat would occur when range improvements are implemented in the Planning Area. Wildlife use range improvements, such as watering tanks, when placed within or near their habitat.

Under Alternative A, 22 allotments (16,833 acres, 1,907 AUMs) are in non-use status. Under Alternative B, these areas would be closed to authorized livestock grazing use. Under Alternative C, these areas would remain in non-use status until such time that conditions warrant authorization of livestock grazing (i.e., until the BLM receives an application for permit). Alternative B would have the most beneficial impacts to wildlife habitat because there would be no foraging niche overlap between wildlife species and livestock. Alternative C could have adverse impacts to wildlife because, in the event grazing permits are issued for those areas,

resource conflict could occur and wildlife would be in competition with livestock for forage and water resources

Under Alternative A, there are eight permitted grazing allotments (12,553 acres, 1,581 AUMs) in the southeast portion of Sandoval County that would be closed to grazing under Alternative B. Under Alternative C, six of the eight allotments would remain permitted, and two (totaling 64 acres, 22 AUMs) would be leased until they are disposed of. Alternative B would have beneficial impacts to wildlife because there would be no foraging niche overlap between wildlife species and livestock. Alternative C could have adverse impacts to wildlife habitat because resource conflict could occur and wildlife would be in competition with livestock for forage and water resources.

Under Alternative A, 1,180 AUMs are in suspension until monitoring data determines the forage can be available on a long-term sustainable basis. Under Alternative B, the BLM would close these AUMs, which would avoid foraging niche overlap with wildlife. Under Alternatives C and D, the BLM would reauthorize the suspended AUMs for livestock grazing under prescribed grazing management on allotments meeting the NM Standards and Guides (BLM 2001as shown by supporting monitoring data. Alternative B is the most beneficial decision for wildlife. Alternatives C and D could have adverse impacts on wildlife because resource conflict could occur.

Under Alternative A, there are 149 allotments permitted for yearlong livestock grazing. Under Alternative B, BLM would convert those allotments to seasonal grazing systems. Under Alternative C, BLM would convert those allotments to seasonal grazing systems, as necessary, to make significant progress towards meeting the goals and objectives for livestock grazing. Under Alternative D, the BLM would convert allotments to yearlong or seasonal grazing systems in an attempt to provide flexibility in livestock management. Under all alternatives, the acres grazed and AUMs would remain the same, and only season of use would differ. In general, Alternative B would have the most beneficial impacts to wildlife because wildlife would be in competition with livestock only part of the year, rather than all year with yearlong grazing. Additionally, if the season of use is prescribed to maximize vegetative output, it would have positive implications for wildlife habitat. Alternatives C and D would have equivalent impacts to wildlife and wildlife habitat, with yearlong or seasonal grazing systems being implemented where they are necessary. If yearlong grazing is implemented on allotments, there could be an adverse impact on perennial plants because reproduction could be limited by year-round foraging, possibly resulting in a loss of favored native plant species. The loss of these species could allow an increase in noxious, invasive, or non-native plant species.

Under Alternatives A, C and D, the BLM would manage riparian areas in accordance with the EIS for Riparian and Aquatic Habitat Management in the Albuquerque Field Office (BLM 2000). Under Alternative B, the BLM would prohibit livestock grazing in riparian areas by removing 1,582 acres from livestock grazing. Adaptive management is the emphasis of the Riparian EIS, and this approach would have beneficial impacts to riparian areas because it would rely on management changes based on quantitative monitoring data indicating the trend of individual riparian systems. Livestock grazing would only be allowed in riparian areas that are in Properly Functioning Condition and that have monitoring data to suggest they are sustainable with prescribed grazing. Removal of grazing from riparian areas would have beneficial impacts to wildlife that utilize riparian habitats.

Currently, grazing occurs in special designation areas. Under Alternative B, the BLM would exclude livestock grazing from all areas with special designations. Under Alternative C, the BLM would allow prescribed grazing in specially designated areas where grazing would not conflict with resources protected by the special designation. Excluding grazing in all special designation areas would benefit wildlife because it would eliminate competition for forage and water resources. Alternative C would only have beneficial impacts to wildlife in areas that are specially designated for the protection of wildlife or Special Status Species habitat. Areas that are specially designated for the protection of other resources such as cultural or paleontological resources are generally accompanied by restrictions for actions that cause surface disturbance, and therefore would also limit disturbance to wildlife habitat. For this reason, Alternative B would have the most beneficial impacts to wildlife and wildlife habitat.

4.2.14.2.7 Mineral Resources Decisions

Impacts from minerals decisions on wildlife and their habitats would include short and long term habitat loss and/or degradation resulting from the removal of vegetation (surface disturbance), and subsequent occupation of areas for oil and gas well pads, open pit mines, and associated roads and infrastructure. Wildlife avoidance of disturbed and occupied areas would reduce their value as habitat. Many species of wildlife avoid areas with high or inconsistent levels of noise, roads with frequent automobile/truck traffic, areas that are heavily lit at night, and areas surrounding structures. Impacts of minerals decisions on wildlife resources would be reduced by the implementation of leasing stipulations and BMPs. Restrictions include no surface-disturbing activities within riparian habitat, required revegetation of oil and gas well sites upon project completion, and land management that meets or moves toward meeting New Mexico Standards and Guidelines (BLM 2001).

Under Alternative B, C, and D, the RPFO would implement a buffer around occupied and unoccupied raptor nests, between March 1 and June 30, where leasable fluid mineral activities would be prohibited. Under Alternative B, the buffer would be 1 mile, under Alternative C, the buffer would be 0.5 mile, and under Alternative D, the buffer would be 0.25 mile.

Under Alternatives B and C, the RPFO would also implement restrictions on leasable fluid mineral activities within big game winter range between November 15 and April 30. This would be applied to winter range for mule deer, elk, and antelope. Travel on designated roads may be included in the timing limitations.

Under Alternatives B and C, the RPFO would prohibit leasable fluid mineral activities within fawning and calving habitat for mule deer, elk, and antelope. The restrictions would occur from May 1 to August 31 for mule deer, May 1 to June 30 for elk, and May 1 to July 15 for antelope. Surface disturbance would also be prohibited near wildlife habitat projects under Alternatives B and C. Both alternatives include a restriction to restrict leasable fluid mineral activities up to 200 meters (656 feet) of existing or planned wildlife improvement projects.

In addition, the implementation of BMPs for the benefit of wildlife and their habitats (e.g., centralization of drill rigs and storage tanks, reduction of the number of access roads, and interim and final reclamation practices) would also reduce some of the short- and long-term impacts listed above. Interim reclamation occurs during the operational phase of a project and consists of revegetating all areas surrounding wells and roads that are not actively used during oil or gas production. Final reclamation occurs when a well has been plugged and abandoned and includes

the practices of recontouring soil surfaces to match surrounding landforms, replacing topsoil, and reseeding with native plant species. The number of years required for successful final reclamation would depend on the habitat type; grasslands recover more quickly than sagebrush or desert shrublands, which recover more quickly than forested areas such as piñon-juniper or ponderosa pine habitat. A commonly used average value and goal for reclamation across the project area is ten years. Following the successful reclamation of a well site or road, the long-term adverse impacts to wildlife species would be largely eliminated.

The amount of land that is open to oil and gas leasing or other mineral use is not necessarily indicative of the number of acres that would be directly disturbed. Areas managed under standard or TL and/or CSU stipulations allow mineral development, but not all of those acres would be subjected to surface disturbance. Habitat quality may be preserved by the implementation of seasonal restrictions and spatial buffers that protect crucial habitats. For example, under Alternative B, big game winter range and wildlife habitat projects areas that are also designated by the USDA-NRCS as having low reclamation opportunity would be closed to oil and gas leasing. Areas categorized as NSO or closed preclude all surface-disturbing mineral development and therefore improve the quality and condition of wildlife habitats. Table 4.106 shows the number of acres that would be managed as NSO, TL/CSU, or closed to oil and gas leasing, by alternative and habitat type.

Table 4.107 shows the number of acres closed to saleable mineral extraction, and

Table 4.108 shows the number of acres that would be withdrawn from locatable mineral entry, by alternative and habitat type.

Table 4.106: Habitat Type (acres) Proposed as NSO, CSU, or Closed to Oil and Gas Leasing, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	12	80	80	78
Grassland	17,512	59,177	57,081	54,075
Other	4,030	21,739	19,242	20,288
Piñon-juniper	17,274	45,647	45,412	43,913
Ponderosa pine	32	352	352	352
Riparian/Wetland	152	446	444	403
Shrub, steppe, scrub	45,787	154,192	153,493	148,452
Total	**84,799**	**281,633**	**276,104**	**267,561**

Table 4.107: Habitat Type (acres) Proposed as Closed to Saleable Mineral Extraction, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	8	20	8	8
Grassland	17,063	34,549	22,457	16,775
Other	4,194	16,941	10,481	4,041

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Piñon-juniper	35,420	47,025	39,619	37,208
Ponderosa pine	2,345	3,235	3,235	2,904
Riparian/Wetland	904	1,335	1,187	1,123
Shrub, steppe, scrub	45,720	80,615	57,869	45,387
Total	**105,654**	**183,720**	**134,856**	**107,446**

Table 4.108: Habitat Type (acres) Proposed as Withdrawn from Locatable Mineral Entry, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	7	71	70	7
Grassland	4,084	59,513	53,115	6,039
Other	777	21,428	20,044	2,198
Piñon-juniper	722	59,684	59,758	4,033
Ponderosa pine	0	3,275	3,275	560
Riparian/Wetland	103	1,291	1,256	347
Shrub, steppe, scrub	10,890	147,194	140,230	14,436
Total	**16,583**	**292,456**	**277,748**	**27,620**

4.2.14.2.8 Recreation and Visitor Services Decisions

In general, wildlife can be adversely impacted by recreation caused by human interactions, including higher noise levels, litter, and wildlife harassment and/or degradation of habitat (Knight and Gutzwiller 1995). While camping tends to be more concentrated along riparian areas, such as Bluewater Creek, locally there can be major impacts to vegetation and stream bank stability.

During hunting seasons, mostly in Sandoval County, nominal impacts occur in upland pine forests. In these undeveloped settings, wildlife could be collected or harvested, displaced, harassed, and disturbed, and degradation of habitat can occur from trampling or vegetative collection (authorized and unauthorized firewood collection, plant/seed collection, etc.).

Collection of firewood for campfires has the potential to adversely impact wildlife with removal of live, dead, and downed material. This material provides shelter for various species, including birds, small mammals, bats, reptiles, and amphibians. OHV use and other disturbances to soils from unauthorized travel increase soil loss from wind and water erosion, which can further degrade habitat quality. Where this occurs repeatedly, impacts to wildlife, vegetation, and soils could be an issue at the site, but minor at the landscape level.

Increased development of trails, climbing routes, and other recreation pursuits throughout the Planning Area could increase habitat fragmentation and adversely impact wildlife (Rost and Bailey 1979; Wisdom et al. 2005). Under Alternatives B, C, and D, 231,325 acres of SRMAs and ERMAs are proposed on BLM lands within the Planning Area. These areas could attract an

increase of visitors because they are managed to provide specific recreation opportunities. Increased visitation by recreational user groups could result in an increase in human disturbance to wildlife. Table 4.109 shows the proposed SRMA and ERMAs and the habitat types the designated areas would encompass.

Table 4.109: Vegetation/Habitat Types (acres) within the Proposed SRMA and ERMAs

SRMA and ERMA Name	Vegetation Type							
	Aquatic	Grassland	Piñon-Juniper	Ponderosa Pine	Riparian/ Wetland	Shrub, Steppe, Scrub	Other	Total
Continental Divide Trail SRMA	6	1,365	4,111	470	69	4,450	525	10,996
Ancestral Way ERMA	0	1,112	261	0	0	3,832	693	5,898
Azabache ERMA	6	4,530	154	0	4	8,081	124	12,899
Bony Canyon ACEC ERMA	0	632	29	0	0	585	68	1,314
Ceja Pelon ERMA	9	1,107	858	0	2	3,720	17	5,713
Cerro ERMA	4	3,705	45	0	0	7,783	899	12,436
Cerro Verde ERMA	0	503	56	0	0	932	3,127	4,618
Chijuilla ERMA	16	3,248	10,297	12	10	27,696	791	42,070
Cimarron Mesa ERMA	3	1,895	4,101	0	96	3,069	9,105	18,269
Crest of Montezuma	0	44	532	261	45	26	9	917
La Mesita Blanca ERMA	0	3,218	25	0	0	2,416	40	5,699
Las Milpas ERMA	0	789	8	0	0	1,668	58	2,523
Oh-My-God 100 ERMA	0	1,874	3,642	25	0	11,527	340	17,408
Pronoun Cave ERMA	0	440	267	0	0	393	0	1,100
Prospect ERMA	0	4,892	747	0	2	5,594	208	11,443
Sandy Wash ERMA	3	5,687	3	0	7	11,403	1,371	18,474
San Luis Mesa ERMA	14	3,748	370	0	7	7,789	309	12,237
San Miguel Dome ERMA	0	1,927	9	0	0	4,890	135	6,961
San Ysidro Trials Area ERMA	3	1,202	96	22	29	3,323	468	5,143
Torreon Fossil East and West ERMA	0	1,510	235	0	0	3,852	324	5,921

SRMA and ERMA Name	Vegetation Type							
	Aquatic	Grassland	Piñon-Juniper	Ponderosa Pine	Riparian/ Wetland	Shrub, Steppe, Scrub	Other	Total
Volcano Hill ERMA	7	5,276	793	0	40	8,499	12,042	26,657
White Mesa Bike Trails ERMA	2	791	4	0	12	1,957	780	3,546
Total SRMA and ERMA Acreage	73	49,495	26,643	790	323	123,485	31,433	232,246
Percent of BLM lands in the Planning Area	-	7%	3%	-	-	17%	4%	31%

4.2.14.2.9 Renewable Energy Decisions

Renewable energy management decisions that have the potential to have adverse impacts to wildlife and wildlife habitat would result from authorizations for development of renewable energy projects. Renewable energy projects would create surface disturbances of various magnitudes depending on the size and location of the project. Impacts from wind, solar, and geothermal energy developments would include vegetation removal and habitat fragmentation. Additionally, wind farms are known to cause high rates of mortality for birds and bats. . There would also be potential for the introduction of noxious or invasive plant species via construction equipment, vehicles, and personnel. Although the adverse impacts would be mitigated through BMPs, noxious weed controls, and restoration and rehabilitation measures, the success levels of rehabilitating such large acreages of cleared vegetation (from projects with similar surface disturbance such as oil & gas and mineral development) are variable, and the long lifespan of renewable energy projects generally means an increase in cost associated with noxious weed control.

Beneficial impacts would result from the identification of exclusion and avoidance areas for renewable energy projects. Exclusion areas would offer greater protections for wildlife and wildlife habitat than avoidance areas because they would completely preclude surface-disturbing activities.

4.2.14.2.10 Riparian Resources Decisions

There are many goals shared by the riparian and wildlife programs, the main one being the protection, restoration, and enhancement of riparian ecosystems and biodiversity. Many wildlife species are riparian obligate or facultative species that heavily rely on riparian habitat for all or part of their life cycle. Due to this close association, riparian resources management decisions would have beneficial impacts to wildlife habitat in the Planning Area.

Under Alternatives B and C, restrictions on surface-disturbing activities are proposed for protection of riparian resources. Under Alternative B, surface-disturbing activities would be prohibited within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200 meters (656 feet) of the outer margins of riparian and wetland areas. Under Alternative C, surface-disturbing activities would be subject to restrictions within 200 meters (656 feet) of the channels of ephemeral, intermittent, and perennial streams, or within 200

meters (656 feet) of the outer margins of riparian and wetland areas. Under Alternatives A and D, no restrictions are proposed to protect riparian areas from surface-disturbing activities. Alternatives B and C would protect riparian habitat from surface-disturbing activities.

4.2.14.2.11 Special-status Species Decisions

Under all alternatives, no management action would be permitted on public lands that would jeopardize the continued existence of plant or animal species that are listed, officially proposed, or candidates for listing as threatened and endangered. The BLM would commit to current and future conservation agreements, management plans, and recovery plans specific to threatened and endangered species and BLM sensitive species, as described in the Special-status Species section of Table 2.58 (in Chapter 2). Although meant to protect and conserve special-status species, the actions would also benefit other wildlife species that share habitat with the targeted special-status species.

Special Status Species management in the RPFO heavily emphasizes protection, restoration and enhancement of riparian habitats because many special status species depend on riparian areas for all or a portion of their life cycle including the Southwestern Willow Flycatcher and the Yellow-billed Cuckoo. Similarly, a plethora of wildlife species rely on these habitats as well because they are rare oases in the desert southwest. The SSS decision common to all alternatives to implement the Southwestern Willow Flycatcher Recovery Plan would beneficially impact wildlife because so many other wildlife species utilize riparian habitats as well.

The SSS decision to designate suitable habitat for prairie dog population augmentation would benefit wildlife because prairie dogs are a keystone species that perform a multitude of ecosystem functions such providing a prey base for predators such as raptors, creating and maintaining burrow systems that are used by other wildlife and special status species for reproduction, and increase water infiltration into local soil benefitting the plant community and reducing the chance of erosion. Studies have shown that when keystone species are removed from an ecosystem, species richness decreases. Decisions to protect prairie dog populations from shooting would benefit wildlife because shooting produces noise disturbance that can disrupt foraging, reproductive patterns and other processes that are essential to survival. Additionally, prohibiting shooting in these areas would lessen the chance that other (including sensitive) wildlife species would become the target. Controlling surface disturbing activities around and within prairie dog populations would benefit wildlife species that co-occur with prairie dogs or that utilize the ecosystems for all or a part of their life cycle. Surface disturbance directly adversely impacts this habitat and results in habitat loss and fragmentation.

4.2.14.2.12 Soil and Water Decisions

Under all alternatives, soils and water management decisions would comply with New Mexico Standards and Guidelines (BLM 2001). In addition, all floodplains and riparian/wetlands would be managed in accordance with Executive Orders 11988 and 11990, which would protect the quality of stream water and federally listed species habitat. Uses on BLM lands in the Planning Area would be managed to minimize and mitigate damage to soils, and activities located in areas with sensitive soils would be subject to site-specific NEPA analysis. These restrictions would decrease the number of acres on BLM lands in the Planning Area subject to the adverse impacts of surface-disturbing activities on wildlife habitats, including surface water contamination and sedimentation by runoff from disturbed soils.

Under Alternative B, and C, the RPFO would prohibit surface-disturbing activities within 200 meters (656 feet) of riparian areas and springs. Oil and gas leasing stipulations would implement CSU for 15% to 30% slopes, NSO for slopes over 30%, and CSU for low reclamation soils. These actions would help to mitigate the adverse impacts of surface-disturbing activities to wildlife and wildlife habitat. These management decisions would also help to mitigate adverse impacts to fish and other aquatic species' habitat from increased overland flow associated with upland soil disturbance.

4.2.14.2.13 Special Designations Decisions

Special designation areas, such as ACECs, would generally have long-term positive impacts to wildlife and fisheries that occur within their boundaries by limiting or preventing surface disturbance, human activities, and associated habitat degradation and fragmentation. Impacts to wildlife and fisheries vary between alternatives primarily according to the proposed acreage of these specifically designated areas.

ACECs designated specifically to protect wildlife and vegetation would directly benefit wildlife species and their habitats. ACECs designated to preserve historic, cultural, and scenic values (as opposed to wildlife or vegetation) would indirectly benefit wildlife by limiting human and surface disturbance, preserving habitat, or preventing noise. Under Alternatives B, C, and D, ACECs would be evaluated as potential avoidance areas for rights-of-way and renewable energy developments, including wind, solar energy, and geothermal sites. Prohibiting these uses within ACECs would prevent adverse impacts to wildlife related to these developments. The designation of ACECs could potentially increase recreational use in those areas, resulting in a greater amount of impacts to wildlife and wildlife habitat. Increased interpretation, monitoring, maintenance, and enforcement along proposed ACECs by the BLM and interested partners would strive to minimize existing or additional impacts to wildlife from recreational use. Table 4.110 shows the number of size of proposed ACECs designated for protection of wildlife values and other values in the Planning Area. Under Alternative B, the most acres would be proposed for special designations. Under Alternative D, the least number of acres would be proposed for special designations.

Table 4.110: Proposed Special Designations (acres) in the Planning Area, by Alternative

Special Designations	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
ACECs managed for wildlife and rare plant values	8 ACECs 52,136 acres	11 ACECs 136,618 acres	11 ACECs 123,993 acres	7 ACECs 41,732 acres
ACECS managed for other values	2 ACECs 1,629 acres	7 ACECs 13,356 acres	7 ACECs 13,036 acres	3 ACECs 1,167 acres
WSA/Wilderness Area	97,963 acres	97,963 acres	97,963 acres	97,963 acres
CDNST	1 trail 11,474 acres	1 trail 38,808 acres	1 trail 23,607 acres	1 trail 11,474 acres
Total special designations in Planning Area	137,720 acres	185,625 acres	178,000 acres	126,392 acres

4.2.14.2.14 Lands with Wilderness Characteristics Decisions

Volcano Hill (23,833 acres) and Cimarron Mesa (7,329 acres) are mainly composed of short to medium shrubby, grasslands. These grasslands are prime habitat for pronghorn antelope, the species likely to be most affected by any of the alternative prescriptions. Cimarron Mesa has little piñon-juniper woodland, low to moderate in tree density, which is potential habitat for elk and deer.

If BLM managed Volcano Hill and Cimarron Mesa as Land with Wilderness Characteristics per Alternative A, no change of management would occur in these areas. This "no-action" alternative could lead to negative impacts on wildlife in response to allowance of extraction of leasable minerals, mineral sales, and surface disturbance activities. These allowances entail a considerable amount of surface disturbance, which leads to vegetation destruction and ultimately the destruction of habitat for species in the area. Forest product removal would be permitted and could negatively impact wildlife with destruction of elk and deer woodland habitat. Unrestricted travel would make vehicle collisions with wildlife and vegetation destruction more likely. Construction of new rights-of-way (addition of roads, pipelines, transmission lines, or communication sites to the area) could lead to habitat degradation by vegetation and landscape disturbance and destruction. Livestock grazing would be permitted in the Volcano Hill and Cimarron Mesa area. Grazing would create competition between wildlife and cattle for forage and will lead to vegetation destruction by direct forage or footpath damage, which ultimately leads to soil degradation. Creation of new recreational developments would bring more travelers to the area, which increases likelihood of disturbance. A positive impact on wildlife per Alternative A lies in the potential installation of new wildlife developments such as, wildlife drinkers and exclosures which are meant to augment and preserve habitat in an area.

Alternative B could positively impact wildlife through the restrictions on the development of mineral materials, travel, rights-of-way, livestock grazing, recreational developments, and surface disturbance activities. All of these actions have potential for disturbance or removal of wildlife habitat (as discussed above, for Alternative A). Exclusion of fire product removal would positively impact wildlife due to the elimination of associated adverse impacts such as illegal off-highway vehicle use. However, an accumulation of fire fuel in the area may lead to a higher temperature fire potential. Alternative B would also restrict the development of new wildlife habitat improvement projects in these areas that are developed for the benefit of wildlife.

Alternative C would have positive impacts on wildlife by the complete exclusion of extraction of leasable minerals. Extraction leads to habitat loss and fragmentation, and often results in the introduction and/or spread of noxious/invasive weeds. Management under this alternative would include evaluation of surface disturbance activities on a case-by-case basis, which, with interdisciplinary planning, would lead to mitigation proceedings for the benefit of wildlife and wildlife habitat. Under Alternative C, forest products removal and management would be allowed. Allowing forest product removal has the potential to positively and negatively impact wildlife. Forest products include vegetative material found on public lands that can be harvested for recreation, personal use, or as a source of income. Some examples are grasses, seeds, roots, bark, berries, mosses, greenery, edible mushrooms, tree seedlings, transplants, poles, posts, and firewood. Due to the biological nature of these products, there are ecological costs associated with removing them from an ecosystem. Many wildlife species rely on these products for various reasons (e.g., forage, nesting substrate, etc.). More specifically, removing whole trees

for fuelwood would cause nesting habitat loss for some species including but not limited to the Piñon Jay and Gray Vireo. Vehicle use would be limited to the use of designated routes, which would cause less impact than unrestricted travel, but more impact than a no-travel alternative. Livestock grazing would be permitted under Alternative C. Grazing would cause direct disturbance of vegetation due to cattle foraging, footpaths, waste and associated soil degradation. To reduce adverse impacts, all construction of new range improvements would be consistent with maintenance of wilderness characteristics. Under Alternative C, the lands would be managed as VRM II, for which the emphasis is on retention of the existing character of the landscape (per the management type, the level of change to the characteristic landscape should be low).

Alternative D reflects Alternative A. Both alternatives entail a "no-action" approach, resulting in the same management prescriptions, and related impacts.

Table 4.111: Proposed Lands Managed for Wilderness Characteristics (acres), by Alternative

Lands with Wilderness Characteristics	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Chamisa E	X	2,239	2,239	2,239
Ignacio Chavez A	X	2,462	2,462	X
Ignacio Chavez B	X	1,541	1,541	X
Ignacio Chavez C	X	72	72	X
Volcano Hill	X	23,833	23,833	X
Cimarron Mesa	X	7,329	X	X
Petaca Pinta A	X	38	38	X
Total	X	37,514	30,185	2,239

Note: X indicates no management decisions to manage lands with wilderness characteristics to protect or partially protect wilderness characteristics.

4.2.14.2.15 Travel Management Decisions

The impacts of travel decisions to wildlife would primarily depend on the number of acres open and closed to motorized travel use under each alternative. Motorized travel use can cause damage to vegetation used as wildlife forage and cover, cause noise disturbance, and result in mortality of wildlife through vehicular collisions or unauthorized removal of both plant and animal species. OHV use therefore generally has adverse impacts to wildlife species, especially birds, in the Planning Area (Reijnen and Foppen 1994; Gelbard and Belnap 2003). Areas closed to OHV use would include some WSAs. OHV use also contributes to habitat fragmentation and habitat degradation, including the spread of noxious weeds. Habitat fragmentation may be less obvious than direct impacts such as vehicle collisions with wildlife or vegetation removal, but often carries considerable consequences for long-term population and reproductive success. Large expanses of habitat may be required to meet the minimum habitat requirements of the largest, most widely roaming species, including top carnivores and large migrating herd animals. Table 4.112 shows the proposed acreages closed to travel on BLM lands in the Planning Area.

Table 4.112: Wildlife Habitat Closed to Motorized Travel, by Alternative

Vegetation/Habitat Type	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
Aquatic	1	35	13	7
Ponderosa pine	0	3,233	2,891	2,891
Piñon-juniper	1,142	45,084	33,219	32,185
Riparian/Wetland	85	1,246	1,081	1,043
Shrub, steppe, scrub	12,591	74,434	50,085	42,759
Grassland	5,672	28,775	19,819	15,751
Other	824	24,434	16,966	5,487
Total	**20,316**	**177,240**	**124,075**	**100,124**
Percent of BLM lands in the Planning Area	%	%	%	

Note: The No Action Alternative does not sum to the same acreage totals as Alternatives B, C, or D because of different planning direction under the 1986 RMP, as amended.

4.2.14.2.16 Vegetative Communities Decisions

Vegetative treatment would result in improvements to habitat that may benefit many wildlife species. Studies have shown that where dense stands of piñon-juniper have been thinned, understory vegetation increased dramatically on the heaviest thinned plots and the number of vegetation species present also increased significantly. While vegetation composition changed, deer use increased in correlation with the amount of trees removed, and overall small mammal abundance increased on all treated plots (Abert et al. 1994).

Sagebrush treatments that provide minimal disturbance to soils, including the use of prescribed fire or mechanical blading (shaving), would increase vegetative diversity, providing greater habitat choices to a variety of species. Piñon-juniper thinning, either through prescribed fire or mechanical means, would allow more sunlight and water to reach the understory for grass and forb growth or increased vegetative diversity and structure, which provide additional habitat for more species of animals. Some areas would be treated for priority species habitat, such as mule deer, which would benefit other species, such as hawks, rodents, game birds, reptiles, and amphibians. Over-thinning of piñon-juniper ecosystems could also have an adverse impact to piñon-juniper obligate species.

Vegetative treatments to reduce invasive species, such as saltcedar, cheatgrass, thistles, or knapweeds, would be beneficial to wildlife habitat because treatments restore native plant communities and improve the ecological health of the area. Prescribed fire would likely result in the temporary loss of habitat, but would have beneficial impacts in the long term.

All alternatives would benefit wildlife habitat by using prescribed burning, planting native seed when possible, and establishing natural disturbance regimes across the landscape to increase biodiversity and structure diversity, adding long-term benefits to wildlife habitat for as many species as possible.

4.2.14.2.17 Wildlife and Fisheries Decisions

Wildlife and fisheries management decisions would have beneficial impacts to wildlife and wildlife habitat. The RPFO has proposed a series of restrictions on surface disturbing activities to protect wildlife and wildlife habitat. Under Alternative B, C, and D, the RPFO would implement a buffer around occupied and unoccupied raptor nests, between March 1 and June 30, where surface-disturbing activities would be prohibited. Under Alternative B, the buffer would be one mile, under Alternative C, the buffer would be 0.5 mile, and under Alternative D, the buffer would be 0.25 mile.

Under Alternatives B and C, the RPFO would also implement restrictions on surface-disturbing activities within big game winter range between November 15 and April 30. This would be applied to winter range for mule deer, elk, and antelope. Travel on designated roads may be included in the timing limitations.

Under Alternatives B and C, the RPFO would prohibit surface disturbing activities within fawning and calving habitat for mule deer, elk, and antelope. The restrictions would occur from May 1 to August 31 for mule deer, May 1 to June 30 for elk, and May 1 to July 15 for antelope. Surface disturbance would also be prohibited near wildlife habitat projects under Alternatives B and C. Both alternatives include a restriction to restrict surface disturbing activities up to 200 meters (656 feet) of existing or planned wildlife improvement projects. Large-scale vegetation manipulation, such as prescribed burns would be excepted.

Under Alternatives B, C, and D, the RPFO would prohibit surface disturbing activities near prairie dog towns. Under Alternative B, surface disturbing and disruptive activities would be strictly controlled within 0.5 mile of prairie dog towns if an activity would adversely impact prairie dogs and/or associated species. Under Alternative C, surface disturbing and disruptive activities would be strictly controlled within 0.25 mile of prairie dog towns. Under Alternative D, surface disturbing and disruptive activities would be strictly controlled within prairie dog towns.

Wildlife and fish improvement projects would have beneficial impacts to wildlife. Wildlife-accessible watering sites and wildlife-adapted fences would improve mobility of wildlife species. Conservation, enhancement, and restoration projects for special-status species would have beneficial impacts to wildlife habitat within the Planning Area. It is also possible that wildlife improvements, such as vegetation treatments, for one particular species could adversely impact another species. Site-specific NEPA documentation would be completed before habitat improvement projects are approved by the RPFO. Impacts to wildlife from other wildlife improvement projects would be analyzed at that time.

4.2.14.2.18 Visual Resources Decisions

The impacts to wildlife from visual resources decisions are primarily associated with limitations on surface disturbance intended to reduce impacts to areas with high visual resource values. VRM Class I and II designations are the most restrictive of oil and gas development and other surface-disturbing activities and would therefore be the most beneficial to wildlife and their habitats. In areas designated as VRM Class I or II, surface-disturbing activities are generally prohibited or limited. Table 4.113 shows the proposed VRM classes in acres. The most acres for VRM Class I are proposed under Alternatives B, C, and D while under Alternative A the least

acres would be managed as VRM I. Under Alternative B, the most acres for VRM Class II are proposed, while under Alternatives C and D the least acres are proposed for VRM II.

Table 4.113: Proposed VRM Classes (acres) on BLM Lands in the Planning Area

Class	Alternative A No Action	Alternative B	Alternative C Preferred	Alternative D
VRM I	97,646	97,296	97,474	97,516
VRM II	84,449	318,931	68,510	21,549
VRM III	61,789	27,529	80,931	83,050
VRM IV	153,250	300,631	497,471	542,272
Total	397,133	744,387	744,387	744,387

4.2.14.3 Cumulative Impacts

Reasonably foreseeable projects that would adversely impact wildlife include developments that would result in habitat loss or fragmentation. Mineral developments, new road projects, urban growth, renewable energy projects, and other surface-disturbing activities that occur on public, private, or tribal lands near the Planning Area could displace wildlife for the length of the project. Change in land use could result in habitat loss for some wildlife species. The Desert Rock Power Plant, new transmission corridors, the proposed N55 Road Improvement Project, new uranium mines, and the Northwest Loop Road could result in habitat fragmentation and habitat loss. Linear projects, such as roads and transmission lines could have adverse impacts for migrating wildlife species if not properly mitigated with appropriate wildlife crossing areas. These projects, where specific project areas are known, account for approximately 6,000 acres of habitat disturbance.

Beneficial cumulative impacts to wildlife would occur from such restoration projects as the Southwest Jemez Mountains Restoration Project and the Valles Caldera Landscape Restoration and Management Plan. The proposed fire and fuel management projects on public lands in New Mexico would also have long-term beneficial impacts to wildlife. These projects would lead to restored, native ecosystems that support healthy populations of wildlife and provide improved habitat areas for seasonal migrations. The planning area for these projects account for approximately 500,000 acres of habitat restoration within and near the RMP Planning Area. The BLM estimates that federal and state agencies would treat up to 206,800 acres with prescribed fire, 35,900 acres with mechanical treatments, and 10,000 acres with chemical treatments over 20 years (BLM 2004). The Southwest Jemez Mountains Restoration Project and Valles Caldera Landscape Restoration Plan are currently in the planning phases, the specific treatment areas are unknown at this time. The planning area for the projects is approximately 210,000 acres in the southwest Jemez Mountains.

Map-099-Vegetation Cover Types

4.2.15 Unavoidable Adverse Impacts

Unavoidable adverse impacts are those that remain following the implementation of mitigation measures or impacts for which there are no mitigation measures. Mitigation measures include stipulations and the BMPs specified for the RMP alternatives. These measures also include compliance with the applicable laws, regulations, policies, and guidelines. Furthermore, implementation decisions require project-specific planning and NEPA analysis where additional mitigation measures are imposed as conditions of approval.

Some unavoidable adverse impacts would occur as a result of implementing the decisions in the RMP. Implementation decisions require appropriate project-specific planning and NEPA analysis and constitute the BLM's final approval for authorizing on-the-ground activities to proceed.

Surface-disturbing activities (e.g., construction of well pads and roads, renewable energy projects, pipelines and transmission lines, mining, and vegetation treatments), OHV use, fire management, some recreational activities, and operation and maintenance of existing facilities and infrastructure on BLM lands in the Planning Area would cause fugitive dust, exhaust emissions, and smoke, thereby adversely impacting air quality.

Surface-disturbing activities, OHV use, fire management, some recreational activities, uncontrolled animal concentrations, and operation and maintenance of existing facilities and infrastructure on BLM lands in the Planning Area may cause soil erosion. These same activities, in combination with precipitation events, also may result in runoff and sedimentation to existing surface waters. Additional unavoidable adverse impacts from these activities include the transport and spread of noxious weeds on BLM lands in the Planning Area. Noxious weeds would continue to spread via the wind, in water courses, and by attaching to livestock, wildlife, humans, and vehicles. The presence of noxious weeds in the Planning Area is considered an unavoidable impact.

Surface-disturbing activities and the development of mineral, energy, and other facilities on BLM lands in the Planning Area are expected to cause the unavoidable degradation, loss, and fragmentation of habitats. OHV use, fire management, some recreational activities, concentrated livestock grazing, and operation and maintenance of existing facilities and infrastructure on BLM lands in the Planning Area may contribute to the unavoidable degradation, loss, and fragmentation of wildlife habitats. Section 4.2.22 provides the detailed analysis of these impacts on wildlife and fisheries within the Planning Area.

Protection of some resource values (e.g., wildlife, special-status species, cultural, and paleontological resources) would adversely impact the use of other resources, such as minerals and renewable energy. Conversely, use of minerals and renewable energy are expected to adversely impact the distribution of some wildlife, special-status species, and vegetative communities.

Minerals exploration and development, rights-of-way development, road and trail construction, fence and water developments, and mechanical vegetation manipulation would cause unavoidable beneficial impacts to the economic well-being of the Planning Area, while having

minimal impacts on the natural character and opportunities for solitude and primitive recreation through project location, design, and BMPs.

Surface-disturbing activities and development from BLM actions would cause minimal change to the landscape, scenic quality, and setting in the Planning Area. Non-BLM actions on lands adjacent to BLM-administered lands also would cause change to the landscape and setting. Fire, insect and disease damage, and development also are expected to temporarily impact the scenic quality of the Planning Area. Surface-disturbing activities, OHV use, vandalism, and natural processes (e.g., fire and erosion) would impact cultural and paleontological resources in the Planning Area.

There would continue to be impacts to cultural and paleontological resources associated with dispersed recreation activities, OHV use, vandalism, and other types of activities not authorized by the BLM. Unavoidable damage to cultural resources from permitted activities could occur if resources undetected during surveys were identified during ground-disturbing activities. In these instances, further impacts would be ceased upon discovery and measures would be taken to mitigate the adverse impact to the resource. Irreversible and Irretrievable Commitment of Resources

Section 1502.16 of CEQ regulations requires that the discussion of environmental consequences include a description of "any irreversible or irretrievable commitment of resources which would be involved in the proposal should it be implemented." An irreversible commitment of resources refers to decisions impacting the use of nonrenewable resources and results in the resource being permanently lost. For example, the production of oil and gas is an irreversible commitment of these resources. An irretrievable commitment of a resource refers to decisions resulting in the loss of production or use of a resource over a given period of time. For example, in the construction of a road, the forage is lost for as long as the road remains.

Given the definitive nature of irreversible commitments of resources, their consideration is imperative in land use planning. Soil erosion, loss of productivity, and soil structure might be considered irreversible commitments to resources. These effects are caused by surface-disturbing activities, such as construction of corridors and mineral resources development. Although they might be mitigated, the loss of soil and soil productivity is still anticipated.

Irretrievable commitments are perhaps the predominant type of commitment that the BLM makes for the resources it manages, given that over time, whether during the life of the plan or beyond, most current resources and opportunities can be restored. Diminished water quality from sedimentation, salinity, and non-point source pollution caused largely by anticipated surface-disturbing activities associated with mineral resource development and recreation use could be restored. Resource management decisions under Alternatives B, C, and D to limit disturbance to soil and water would decrease the potential for impact.

4.2.15.1 Cultural Resources

Disturbance to cultural resources of any kind, whether associated with cultural- and heritage-oriented recreation, mineral resource development, renewable energy, or other uses of public lands, typically are irreversible. Any activity managed by the BLM that disturbs the surface and subsurface or causes wear could destroy cultural materials. This would also apply to

paleontological resources, for which any damage, including loss of opportunity to collect scientific data, would be irreversible.

Because the location and nature of all cultural resources in the area under consideration are unknown, it is not possible to determine the amount or level of irreversible and/or irretrievable impacts to cultural resources in the Planning Area. However, it is likely that, in spite of Section 106 of the NHPA and BLM policy and guidelines, some non-mitigatable impacts would occur and would likely be irreversible since restoration of an archaeological site is typically very difficult, if not impossible.

4.2.15.2 Fire Management

The prohibition of fuels reduction and vegetation treatments could result in irretrievable increases in fire suppression costs, as well as irretrievable losses in habitat value as vegetation types move away from the desired future condition. However, non-surface-disturbing vegetation treatments and/or effective suppression followed by effective rehabilitation/restoration could prevent these impacts from being irreversible. It should be noted that reactive fire management (fire suppression and rehabilitation) is typically more expensive, time consuming, and damaging than proactive fire, fuels, and vegetation management (prescribed burns, mechanical thinning, chemical treatment, and subsequent restoration).

4.2.15.3 Lands and Realty

All alternatives permit land tenure adjustments (sales, exchanges) that may result in the permanent loss of lands from public ownership if they enter state or private ownership.

4.2.15.4 Livestock Grazing

Areas not available for livestock grazing would result in an irretrievable loss of forage for livestock under the life of the plan. Also, vegetation treatments, prescribed burns, and wildland fire would result in an irretrievable loss of vegetation and forage for livestock grazing until the vegetation is restored.

4.2.15.5 Minerals

The extraction and development of mineral resources from BLM lands in the Planning Area would result in both an irreversible and irretrievable loss of those mineral resources because of the finite nature of the resource. The impacts would be irretrievable and irreversible because once extracted, the mineral resource cannot be used again, nor can it be replaced in the foreseeable future. BLM Handbook H-1624-1, Planning for Fluid Minerals, acknowledges leasing of oil and gas resources as an irreversible commitment.

4.2.15.6 Lands with Wilderness Characteristics

Any loss of size, naturalness, and/or opportunities for solitude or primitive and unconfined recreation within lands with wilderness characteristics caused by surface-disturbing activities such as mineral development, forest product harvest, and cross-county travel would most likely be irretrievable until and if the impact area is fully reclaimed. The scenic quality of areas with

scenic values that are proposed to be managed as VRM III, as in Cimarron Mesa, could be degraded over the life of the plan.

4.2.15.7 Recreation and Visitor Services

There would be no irreversible losses of recreation resources for any of the alternatives. Irretrievable impacts to recreation resources would be caused by: 1) short-term loss or diminishing of recreation-related scenic quality from vegetation treatments, fuel reductions, or invasive weed control until vegetation regrowth; and 2) short-term irretrievable loss of scenic recreational opportunities caused by mineral development until disturbances are reclaimed.

4.2.15.8 Riparian Resources

Irretrievable loss of riparian habitat could occur because of grazing, visitor trampling, and construction-related removal of riparian habitat. However, this habitat could eventually be restored, so those impacts would not be irreversible. It is possible that noxious weed infestation of disturbed riparian areas could become an irreversible impact based on past difficulties in controlling invasive species, such as saltcedar and Russian olive. An irretrievable loss of riparian habitat could also occur if riparian habitat is converted to upland habitat (by filling, draining, or other landscape alterations) in association with the placement of utility corridor infrastructure.

4.2.15.9 Soil and Water

Where surface-disturbing activities occur and are not mitigated, an irreversible loss of soil and soil productivity would result. Where surface disturbance affects sensitive soils, the impacts would be irretrievable in the long term because of these soils' limitations. Either of these types of impacts may result from livestock grazing, mineral development, or recreation or travel (including the use of OHVs).

4.2.15.10 Special-status Species

Irretrievable impacts associated with surface-disturbing activities proposed throughout the Planning Area include the loss of special-status species habitat value from mineral development, fire treatments, renewable energy development, and motorized travel. These resource values would be lost until successful restoration/rehabilitation takes place. Implementation of reclamation/rehabilitation would prevent these impacts from being irreversible.

4.2.15.11 Travel Management

All routes not designated would be irretrievable in that the use of that travel resource would be irretrievably lost until the routes were designated for use. However, none of these non-designations would be irreversible, in that it is possible to make these routes available for use again subject to additional analysis and/or adaptive management response.

4.2.15.12 Vegetative Communities

There could be irretrievable impacts associated with surface-disturbing activities and livestock grazing proposed on BLM lands in the Planning Area. The protective measures required by the RPFO include the reclamation of disturbed areas following completion of the management action (e.g., well pad deconstruction, road rehabilitation, reseeding, and weed eradication). Vegetation resources would be restored or rehabilitated after proposed disturbance and/or development; therefore, minimal irreversible impacts to native vegetation resources would be associated with the management decisions proposed for BLM lands in the Planning Area. If vegetative communities found on sensitive soils are disturbed, restoration and rehabilitation efforts may not be as effective and could result in irreversible impacts to native vegetative communities. Livestock grazing could also result in irretrievable impacts to vegetative communities if livestock grazing is not appropriately managed, especially during drought conditions.

4.2.15.13 Visual Resources

Irretrievable impacts to visual resources would also be produced by surface disturbances such as mineral development, access road construction, renewable energy development, fire management, and vegetation treatments. This irretrievable loss would be most apparent under those alternatives that propose lower visual protections for those areas. The visual resources impacted by such developments would be irretrievably lost until those areas are rehabilitated or restored. However, because they can be restored, these impacts would not be irreversible.

4.2.15.14 Wildlife and Fisheries

Irretrievable impacts associated with surface-disturbing activities proposed throughout the Planning Area include the loss of wildlife habitat value from mineral development, fire treatments, or motorized travel. These resource values would be lost until successful restoration/rehabilitation takes place. Implementation of reclamation/rehabilitation would prevent these impacts from being irreversible.

5 CONSULTATION AND COORDINATION

5.1 Introduction

This chapter documents the consultation and coordination efforts undertaken by the BLM throughout the process of preparing the RMP and developing the Draft EIS. Title II, Section 202 of the Federal Land Policy and Management Act of 1976 (FLPMA) directs the BLM to coordinate planning efforts with American Indian tribes, other federal departments, and agencies of the state and local governments as part of its land use planning process. Also to be involved are interest groups and individuals.

Consultation and coordination are important to ensure that: (1) the most appropriate data have been gathered and employed for the analyses; (2) agency and public concerns are considered and incorporated into the planning process; and (3) paperwork and delays are reduced (40 CFR 1500.4-5). BLM managers and the Interdisciplinary Team of agency specialists have accomplished coordination with other agencies and consistency with other plans through ongoing communications, meetings, and collaborative efforts.

The BLM is also directed to integrate National Environmental Policy Act (NEPA) requirements with other environmental review and consultation requirements to reduce paperwork and delays (40 CFR 1500.4-5).

5.2 Public Scoping Meetings, Input, and Other Initial Meetings

A Notice of Intent (NOI) published in the *Federal Register* (FR) on January 29, 2008, formally announced the intent of the BLM to revise the existing plan and prepare the associated EIS. Publication of the NOI initiated the scoping process and invited participation by affected and interested agencies, organizations, and the general public to determine the scope and issues to be addressed in the alternatives and analyses of the EIS.

5.2.1 Scoping Meetings

The scoping period for this planning effort began on March 1, 2008, with the period's end date extended from June 1, 2008, to September 30, 2008, at public request. The BLM sent a scoping notice to governmental agencies, interested organizations, and individuals for this planning process, in addition to placing paid notices in local newspapers. Table 5.1 lists the eight public scoping meetings held. The Scoping Report is available at the Rio Puerco RMP Revision website cited below (Section 5.2.4).

Table 5.1: Public Scoping Meetings

Date	Location	Attendance
Wednesday, April 2, 2008	Albuquerque Marriott Pyramid Hotel	42
Thursday, April 3, 2008	Los Lunas Museum of Heritage & Arts	5
Monday, April 7, 2008	Cuba Senior Center	17
Tuesday, April 8, 2008	Bernalillo High School Gymnasium	41

Date	Location	Attendance
Wednesday, April 9, 2008	Moriarty Civic Center	2
Thursday, April 10, 2008	Loma Colorado Library, Rio Rancho	9
Wednesday, April 16, 2008	Grants Convention Center	7
Thursday, April 17, 2008	University of NM, Gallup Campus	1

5.2.2 Planning Themes Raised in Scoping Comments

Over 95 percent of the comment submissions were from individuals. The majority of comments were nearly evenly divided between four major land or resource uses, referred to as "Planning Themes": minerals and energy development, off-highway vehicle use, recreation and visitor services, and special area designations. These four themes were addressed in the comments of approximately 90 percent of responding individuals.

Those individuals and entities involved in the scoping process identified public and agency concerns, defined relevant issues, and suggested possible alternatives that are being considered in the Draft RMP Revision/Draft EIS. In reviewing the scoping comments, the BLM ID Team assigned each comment received to one or more of the following five categories.

1. Addressed through RMP Revision planning decisions. (These comments are being addressed in this document, either through new decisions or decisions carried forward from the 1986 RMP.)
2. Resolved outside the RMP Revision process by following policy or taking administrative action (in compliance with national laws, regulations, and BLM policies).
3. Addressed outside the RMP Revision process as part of existing BLM staff work (e.g., Wilderness Study Areas, "stand-alone" amendments to the 1986 RMP completed since its adoption).
4. Addressed independent of the RMP Revision through national planning and environmental analysis efforts (e.g., for the West-Wide Energy Corridor, renewable energy development).
5. Determined to be outside the scope of the BLM's RMP Revision—considered but not addressed (e.g., the proposed Northeast Loop Road, Sandoval County Plan, proposed Wild Horse State Park—refer to Chapters 1 and 2 for further explanation).

5.2.3 Economic Profile System Workshops

In addition to scoping meetings, the BLM held two Economic Profile System (EPS) workshops, inviting local citizens and community leaders to develop a common economic understanding. The first EPS workshop was held in Albuquerque on July 29, 2008, with the second held in Grants on July 31, 2008. Both workshops covered topics including the changing economy in the Western U.S., trends in local economies, adapting to change, an EPS demonstration, the EPS profile of local counties, and the role of public land management in local economies.

5.2.4 Training Sessions

The agency also conducted two training sessions for agency staff and members of the public, "BLM Planning Concepts," and "Nuts and Bolts of the Planning Process." Both sessions were held in Albuquerque, with the first on November 27-29, 2007, and the second on February 25-28, 2008.

5.2.5 Website

A website for the Rio Puerco RMP Revision continues to help facilitate public notification and involvement at:
http://www.blm.gov/nm/st/en/fo/Rio_Puerco_Field_Office/rpfo_rmp_revision.html.

5.3 Description of Consultation and Collaborative Efforts

This section describes consultation and collaborative efforts with local American Indian entities, federal, state, and local agencies, and interest groups.

5.3.1 Cooperating Agencies

Potential cooperating agencies were identified and invited to enter formal agreements early in the planning process. The criteria used to identify potential cooperators were that they be governmental entities that have jurisdiction by law, or special expertise with respect to potential impacts (40 CFR 1506.1). Federal agencies that manage lands adjacent to BLM lands within the Planning Area were also invited to cooperate.

The RPFO extended invitations for cooperating agency status to 45 federal, state and local agencies and jurisdictions, in addition to the leaders of 35 American Indian tribes, nations and pueblos. Those entities that have agreed to formal cooperation status under a Memorandum of Understanding are listed in Table 5.2 below.

Table 5.2: Agencies Cooperating in the BLM Planning Process for this RMP Revision

Federal Agency	**State Agencies**
U.S. Dept. of the Interior, Fish & Wildlife Service	New Mexico Department of Agriculture
Local Agency	New Mexico Department of Game & Fish
City of Albuquerque, Open Space Division	

The BLM invited the cooperating agencies to participate in developing RMP alternatives, supplying existing data and other information relative to their agency responsibilities, goals, mandates, and expertise. Agency representatives provided input during the initial scoping process on issues of special expertise or legal jurisdiction. In addition, they participated in a series of alternative formulation workshops, reviewed draft information and documents, and periodically met with BLM managers and resource specialists to discuss planning issues and give input.

5.3.2 American Indian Entities

Thirty-five tribes, tribal organizations, pueblos, and Navajo chapter houses have lands located within the Planning Area or contiguous to it. These are listed in Table 5.3 below.

Tribal consultation began with a letter announcing the start of the RMP Revision and inviting local tribes, nations and pueblos to participate in the process. Subsequently, 25 meetings were held with various American Indian leaders, soliciting input and hearing their concerns. The concerns included but were not limited to land tenure, energy corridors and access to various parcels. Additionally, the tribes were invited to several planning training sessions, alternative development and analysis workshops, with several tribal members participating.

Rio Puerco Field Office managers and staff are continuing consultation with American Indian entities on a government-to-government basis throughout the planning process. American Indian governments have been encouraged to identify issues, express concerns, and provide information they would like the BLM to consider in its decision-making process. The agency has provided the entities with information about the plan for developing the cultural resource component of the RMPR/EIS, and requested that they identify any traditional cultural places and resources that should be considered. Agency staff and managers continue to seek opportunities to develop cooperative management partnerships with these groups where appropriate.

Table 5.3: American Indian Entities Contacted for Plan Participation

Tribes & Nations	**Tribes & Nations**
Comanche Tribe	Navajo Nation & Navajo Nation Historic Preservation Department
Fort Sill Apache Tribe	
Jicarilla Apache Nation	
Mescalero Apache Tribe	
White Mountain Apache Tribe	**Navajo Chapters**
Hopi Tribe	Alamo
Southern Ute Tribe	Baca/Haystack
Ute Mountain Ute Tribe	Break Springs
Pueblos	Cañoncito Bank
Acoma	Casamero Lake
Cochiti	Counselor
Isleta	Little Water
Jemez	Ojo Encino
Laguna	Pueblo Pintado
San Felipe	Ramah
Sandia	Red Rock
Santa Ana	To’hajiilee
Santo Domingo	Torreon
Zia	Tsayatoh
Zuni	Whitehorse Lake

5.3.3 Federal Agencies and Members of Congress

The Fish and Wildlife Coordination Act of 1934 [Title 16, United States Code, Sec. 661 *et seq*. (16 U.S.C. 661 *et. seq*.)], as amended, and the Endangered Species Act of 1973 (16 U.S.C. Sec. 1531 *et seq*.) require consultation with the U.S. Fish and Wildlife Service (USFWS) before initiation of any BLM project that has potential to affect any federally listed, special-status species or its habitat. Because the Rio Puerco RMP Revision is considered a major federal action, the Rio Puerco Field Office has initiated consultation with the USFWS. While informal consultation has been occurring since May 2010, formal consultation will not begin until the BLM submits a Biological Assessment (BA) to USFWS for their review and concurrence.

Other federal agencies contacted and invited to participate in this planning process include those listed in Table 5.4 below.

In addition to the agencies listed in the table, the BLM also informed the Honorable Senators and Representatives Jeff Bingaman, Pete V. Domenici, Tom Udall, Heather Wilson, Martin Heinrich, and Ben Lujan of the Rio Puerco RMP Revision process. These individuals currently serve or have served the citizens of New Mexico in the U.S. Congress.

Table 5.4: Federal Agencies Conctacted for Plan Participation

U.S. Department of the Interior	**U.S. Department of Agriculture**
Bureau of Indian Affairs	Forest Service
Bureau of Reclamation	Cibola National Forest
National Park Service	Natural Resources Conservation Service
Bandelier National Monument	**U.S. Environmental Protection Agency**
El Malpais National Monument	**U.S. Army Corps of Engineers**
El Morro National Monument	
Fish & Wildlife Service	
Geological Survey	

5.3.4 State and County Agencies and Other Local Entities

Staff and managers at the BLM Rio Puerco Field Office have contacted other interested agencies or governments by telephone, e-mail and formal correspondence to share information regarding the BLM‘s RMP Revision process. Agencies contacted are listed in Table 5.5 below.

Consistent with legislation protecting state-listed species, the BLM has contacted the New Mexico Department of Game and Fish and the New Mexico Energy, Mineral, and Natural Resources Department regarding the potential presence of state-listed threatened and endangered plant and animal species in the Planning Area.

Under the New Mexico Protocol Agreement and the BLM National Programmatic Agreement, the BLM notified the New Mexico State Historic Preservation Office (SHPO) in March 2008 that an EIS was being prepared for management of public lands in Bernalillo, Cibola, McKinley, Sandoval, Torrance, and Valencia counties. In 2008, the BLM conferred with the SHPO

regarding the extent of the area of potential effect, data sources, and appropriate tribal consultation. In accordance with the BLM National Programmatic Agreement and New Mexico Protocol, BLM staff will continue to consult on undertakings pursued in accordance with an Approved RMP once the planning process is complete.

Table 5.5: State, County, Local, and Private Entities Contacted for Plan Participation

State Government Agencies	Cities, Towns & Villages
Governor of New Mexico	Albuquerque
Attorney General	Bernalillo
Bureau of Geology & Mineral Resources	Corrales
Bureau of Mines	Cuba
Dept. of Agriculture	Estancia
Dept. of Cultural Affairs	Gallup
Dept. of Energy, Minerals & Natural Resources	Grants
Forestry Division	Ojo Encino
Parks & Recreation Division	Placitas
Dept. of Finance & Administration	Rio Rancho
Dept. of Game & Fish	San Luis
Dept. of Health & Human Services	San Ysidro
Dept. of Indian Affairs	Torreon
Dept. of Tourism	**Soil & Water Conservation Districts**
Dept. of Transportation	Claunch
Environment Department	Cuba
Farm & Livestock Bureau	East Torrance
Oil Conservation Division	Edgewood
Soil & Water Conservation Division	Lava
State Engineer	Pinto
State Historic Preservation Office	Valencia
State Land Office	
State Monuments	
Counties	**Local Entities**
Bernalillo	Las Huertas Watershed Group (Placitas)
Catron	Las Placitas Association
Cibola	Livestock Water Associations
McKinley	Placitas Board of Realtors
Sandoval	San Luis Domestic Water Association
Santa Fe	**Private Companies**
Socorro	Jemez Electric Cooperative
Torrance	La Farge
Valencia	Public Service Co. of NM

5.3.5 Interest Groups

An effective means of sharing information and collecting input for the RMP Revision has been one-on-one or small-group discussions with interested parties, at their request. BLM staff and

managers have engaged in discussions with a variety of special interest groups during the planning process. Coordination has occurred with the East Mountain Regional Trails Council, New Mexico Off-Road Vehicle Association, New Mexico Wilderness Alliance, San Antonio de Las Huertas Land Grant, San Juan Badlands Group, Western Watersheds Project, Wild Earth Guardians, Wilderness Society, and Wild Horse Observers Association.

5.4 Lists of Preparers and Reviewers

Reviewers and preparers of the Draft RMP/EIS (including members of the Interdisciplinary Team) are listed in Tables 5.6 through 5.10 below.

Table 5.6: Rio Puerco Field Office/NMSO Interdisciplinary Team

Name	Title and/or Responsibility
Angel Martinez	RMP Team Lead, Planning & NEPA Coordinator
Melanie Barnes	RMP Team Lead (Former), Surface Protection
Joe Blackmon	RMP Team Lead (Former)
Sabrina Flores	RMP Team Technical Coordinator (Former)
Kent Hamilton	Planning & NEPA Coordinator (Retired)
Matt Atencio	Rangeland Management, Vegetation
Mike Bilbo	Cave & Karst Resources
Andrea Chavez	Fish & Wildlife, Special-Status Species, Threatened & Endangered Species Consultation
Donna Dudley	Recreation, Wilderness & Wilderness Study Areas (Retired)
J.J. Gallegos	Facilities
Jamie Garcia	Recreation, Wilderness & Wilderness Study Areas
Brittany Gaudette	Geology (Former)
John Gilmore	Geology (Retired)
Cynthia Herhahn	American Indian Tribal Interests, Cultural Resources
Pat Hester	Paleontological Resources (Retired)
Jeanne Hoadley (NMSO)	Air Quality (Retired)
Jeremy Kruger	Woodland & Forest Management
David Mattern	Air Quality, Soil Resources, Water Resources
Joe Mirabal	Geology, Public Safety
Danny Randall	National Recreation Areas
Todd Richards	Fire Management
Arlene Salazar	Land Tenure Adjustments, Land Use Authorizations, Utility Corridors/Communication Sites, Withdrawals, Renewable Energy

Table 5.7: Technical and Administrative Support Team

Name	Title and/or Responsibility
M'Lee Beazley	Printing
Dawn Chavez	Geographical Information Systems, Visual Resources
Yari Estrada	Support Services
Melissa Goldin	Desktop Publishing
Theresa Nallick	Geographical Information Systems (Former)

Name	Title and/or Responsibility
Sarah W. Spurrier	Records Administrator
Britni Vickers	Support Services
Martin Visarraga	Geographical Information Systems

Table 5.8: Managers and Reviewers – State Office Management Team

Name	Title and/or Responsibility
Jesse Juen	BLM State Director
Linda S.C. Rundell	BLM State Director (Retired)
Bill Merhege	Deputy State Director, Resources
Ron Dunton	Deputy State Director, Resources (Retired)
Melanie Barnes	State Planning & Environmental Coordinator
Meagan Stouffer	State Planning & Environmental Coordinator
Mark Spencer	State Planning & Environmental Coordinator (Former)

Table 5.9: Albuquerque District/Rio Puerco Field Office Management Team

Name	Title and/or Responsibility
Edwin J. Singleton	Albuquerque District Manager
Thomas E. Gow	Rio Puerco Field Manager
Lindsey Eoff	Assistant Field Manager, Renewable Resources (Former)
David Sitzler	Assistant Field Manager, Multi-Resources (Retired)

Table 5.10: State Office Review Team

Roger Cumpian	Powell King	Sarah Schlanger
Brad Higdon	Signa Larralde	James Sippel
Rebecca Hunt	Debbie Lucero	John Sherman
Roger Jaggers	Marikay Ramsey	Jay Spielman

5.5 Plan Evaluation

The plan should be periodically evaluated (at a minimum of every 5 years) as documented in an evaluation schedule. Plan evaluations should also be completed before initiation of any plan revisions and for major amendments. Special or unscheduled evaluations may also be required to review unexpected management actions or significant changes in the related plans of American Indian entities, other federal agencies, and state and local governments, or to evaluate legislation or litigation that has the potential to trigger an RMP Amendment or Revision. More information concerning plan evaluations and other planning issues can be found in the BLM *Land Use Planning Handbook* (H-1601-1; USDI, BLM 2005)

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