A grayscale landscape photograph showing a wide valley with a mountain range in the background. The foreground features a hillside with sparse vegetation and some tall grasses. The overall scene is hazy and atmospheric.

CHAPTER 4

ENVIRONMENT CONSEQUENCES

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Chapter 4 analyzes the potential environmental impacts or effects of the proposed management actions explained in the four alternatives described in Chapter 2-Alternatives. These four alternatives describe different ways to manage the Federal land and resources within the Monument to achieve the goals and objectives and to meet the purpose and need for overall management of the Monument. The baseline used for the analysis is the current environment, which is described in Chapter 3-Affected Environment. Impacts are defined as changes that might occur to the existing environment as a result of implementing the actions described in the alternatives. The impacts can be beneficial or adverse and can be projected for short-term or long-term. Short-term impacts are defined as impacts that may range from 0-5 years and long-term impacts could be permanent and would remain for the life of this planning document and beyond. Direct and indirect effects will be discussed together in the following sections followed by a cumulative effects section for each resource as pertinent.

Table 4-1 Definition of Impact Terms

TABLE 4-1 DEFINITION OF IMPACT TERMS	
Direct	those effects "...which are caused by the action and occur at the same time and place" (40CFR 1508.8(a)).
Indirect	those effects "...which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on water and air and other natural systems, including ecosystems" (40 CFR 1508.8 (b)).
Cumulative	"...the impact on the environment which 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 actions" (40CFR 1508.7).
Reasonable Foreseeable Development	Consist of actions that can be projected, with a reasonable degree of confidence, within a range of time that will impact a resource.

BLM’s decisions about resource use and allocation within the Monument will be informed by the impact analysis that follows in this Chapter. A comparison of these impacts is shown at the end of **Chapter 2** and also in **Table S-1** in the **Executive Summary** at the beginning of this document.

4.2 ANALYTICAL METHODOLOGY

BLM interdisciplinary team members used their professional judgment, existing and current data, and current models and methodology for the analysis. For future actions, projected impacts and levels of use are used.

4.2.1 Analytical Assumptions

During analysis of impacts, several general assumptions were made to help guide the analysis by the resource specialists and also to inform the public. The assumptions listed below are Common to All

Alternatives. Specific assumptions to individual resources or uses are detailed in the discussion of that resource.

- Management actions proposed in the alternatives apply to public land within the Monument. However, cumulative effects analyses consider potential actions by individuals, entities other than the BLM, the BLM, and actions outside of the Monument.
- Generally speaking, proposed actions that would increase visitor use, public access, and information regarding the Monument's paleontological resources would result in an increase in the opportunity to locate, loot, and vandalize these resources. On the other hand, actions that would increase BLM presence at the Monument and inform and educate the public about the value of the Monument's unique resources would serve to deter looting and vandalism.
- The alternatives would be implemented in accordance with all laws, regulations, and best management practices (BMPs). BMPs are located in Appendix E.
- Funding and staff will be available to implement any of the alternatives proposed in this Plan.
- Acreages were calculated using GIS technology; there may be slight variations in total acres between disciplines. These variations are negligible and will not affect analysis.
- All Legislation management requirements would be adhered to, such as:
 - Continue to manage that portion of the Robledo Mountains Wilderness Study Area (WSA) within the Monument according to BLM's *Interim Management Policy for Lands under Wilderness Review* until such time that Congress designates it as a Wilderness Area or releases it from further consideration.
 - Continue to manage that portion of the Robledo Mountains Area of Critical Environmental Concern (ACEC) within the Monument as an ACEC.
 - Subject to valid existing rights, close the Monument to entry, appropriation, or disposal under the public land laws. This only refers to actions that could result in title transfer of land/property.
- The RMP decisions would remain in effect throughout the life of the Plan. Plan amendments or revisions would be required should evaluation prove decisions are no longer relevant.

4.2.2 Incomplete Information

Where possible, site-specific information/data is used, but not all resources or uses have complete data to the extent needed for land use planning. The best available data is used in developing this RMP. For these resources with incomplete information, the impacts are estimated to the best of our knowledge. It has been determined that additional data was not essential to a reasoned choice among alternatives and was not relevant to reasonably foreseeable adverse impacts. Ongoing inventory efforts by the BLM and other agencies will continue to gather more data in order to update and refine the existing data.

4.2.3 Resources or Programs Where No or Negligible Impacts Would Occur

The following resources and uses are either not present or not likely to be impacted within the Planning Area:

- American Indian Uses and Traditional Cultural Practices
- Riparian Areas
- Woodland Management
- Floodplains and Wetlands
- Geology
- Minerals
- Hazardous and Solid Wastes
- Prime or Unique Farmlands
- Wild and Scenic Rivers

Actions that are often associated with ongoing program administration are not addressed in this Chapter. These actions would comply with the resource decisions made in this Resource Management Plan (RMP), required National Environmental Policy Act (NEPA) compliance, and appropriate BMPs. Such actions and activities could include but are not limited to:

- Identification of fossil locations
- Research management actions such as:
 - Maintain and encourage valid research and volunteer partnership opportunities
 - Maintain and update an in-house reference collection
- Maintain and update baseline data (GIS and text) in hard copy and electronic format

4.3 CHAPTER ORGANIZATION

Effects from different management alternatives that could be implemented under this RMP are considered on all resources/uses that are affected by that management action. Where applicable, the analysis addresses the Planning Issues that were brought forward from internal discussions and public scoping. These issues are: Paleontological Research, Recreation, Trails and Travel Management, Habitat and Its Users, and Interpretation and Education.

The following impact discussions are organized alphabetically after the first four resources/uses, which are Paleontological Resources, Interpretation and Education, Recreation and Visitor Services, and Trails and Travel Management. Impact discussions are arranged as follows:

RESOURCE OR RESOURCE USE

Assumptions and Incomplete Information

Management Decisions with No Impacts to Resource

Effects Common to All Alternatives: Sections titled "Effects Common to All Alternatives" address impacts from actions to be carried out for that resource under all alternatives (the impact is common to Alternatives A, B, C, and D and would apply under all alternatives).

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A

Alternative A is the No Action Alternative and the impacts implementing current management decisions including those in the Omnibus Public Lands Bill and the existing Mimbres RMP are analyzed here.

ALTERNATIVE B

ALTERNATIVE C

ALTERNATIVE D

Alternatives B, C, and D are the action alternatives and the impacts of implementing the actions under these alternatives are discussed here.

This Chapter concludes with a discussion of cumulative impacts. Cumulative impacts analyze the direct and indirect effects of the proposed action and alternatives together with the effects of the other actions that have a cumulative effect. The cumulative effects analysis considers past, present, and reasonably foreseeable future actions that would affect the resource of concern within the geographic scope and the timeframe of the analysis. This analysis considers other BLM actions, other Federal actions, and non-Federal (including private) actions (40 CFR 1508.7).

4.4 RESOURCE OR RESOURCE USE

4.4.1 PALEONTOLOGICAL RESOURCES

Assumptions and Incomplete Information: Currently there are no BLM visitor use numbers to document who and how many motorized vehicles are using the Robledo Mountain Trail system outside of permitted events. The amount of non-permitted use by motorized vehicles along these routes is unknown. Since 1997, the BLM has issued Special Recreation Permits (SRPs) for commercial Off-Highway Vehicle (OHV) related events in the Robledo Mountains. On average, the OHV events have 150-300 participants that travel these routes within and outside the Monument. Beginning in 2008, the BLM established Special Stipulations to mitigate damage to exposed paleontological resources and to monitor permitted events for comprehensive resource impacts.

It is well known locally that fossils have been collected from the Robledo Mountains for decades. This includes everything from trackway slabs for decorative construction to invertebrate fossils collected by school children on field trips. What effect this has had on the integrity of the paleontological resources or the information that may have been lost can never be known. Impacts on this resource can only be determined based on what is currently known and the proposed management actions for the future.

Management Decisions with No Impacts to Paleontological Resources: Under all Alternatives, the following programs would have little or no impact to Paleontological Resources: Air Resources, Cultural Resources, Socio-Economic Conditions, Soils, Special Designations-Area of Critical Environmental Concern (ACEC), Special Status Species, Vegetation, Visual Resources, Wildland Fire Management, and Wildlife.

Effects Common to All Alternatives:

Impacts from Interpretation and Education-- Under all Alternatives there would be the opportunity to learn from the educational material on websites, educational talks, and at the local museum.

Impacts from Research Management-- Under all Alternatives, research permits for collecting paleontological resources have been and would continue to be evaluated and issued to qualified researchers on all public land.

By continuing and promoting the research program it could increase the amount of data and specimens available to researchers who are developing theories and increase the understanding of the geologic past. The impact from this knowledge could change our way of thinking about the Permian Era. Specimens found by the researchers could often end up on display for the public therefore allowing more people to see and understand these resources. High school students have been involved in one of the research activities, which educate and excite young people about paleontology.

IMPACTS OF THE ALTERNATIVES

4.4.1.1 ALTERNATIVE A

Impacts from Paleontology-- Casual collecting of common invertebrates occurs throughout the Monument. Since this is not through a permit system or within a designated area, it is unknown to what extent these activities are impacting the paleontological resources, but with casual collecting there is a loss of resources. Paleontologists familiar with the Monument have expressed the opinion that casual

collecting of common invertebrates would not be detrimental to that resource. Casual collecting of scientifically significant or vertebrate fossils may be occurring and would impact research. Permitted scientific research and collecting would continue, so additional specimens would be leaving the Monument to be curated in a repository or museum. Additional scientific information would be collected as scientists research the resources within the Monument.

Impacts from Interpretation and Education-- Under all Alternatives and specifically Alternative A, guided interpretive tours to the *Discovery Site* and other appropriate sites within the Monument would continue. This would allow for the public to experience and learn about the paleontological resources, which serves not only the objectives of education. It also serves to involve the community which tends to increase support for the Monument. Also under all Alternatives the lack of interpretation on-site in Alternative A limits what visitors can learn and view on their own at the Monument without a guided tour or interpretive talk.

Impacts from Recreation and Visitor Services-- Under Alternative A, both non-permitted OHV use and special recreation permitted OHV events would occur within the Monument. Petroleum-based fluids (i.e., transmission fluid, power steering fluid, crankcase oil, differential oil, etc.) sometimes leak during the course of a trail tour. Even though stipulations as conditions of approval for OHV SRPs require mitigation to reduce the permanent impacts from such fluid spills, there are no provisions to address similar hydrocarbon fluid releases during non-permitted use. Petroleum-based fluid stains alter the appearance of trace fossils and plant carbon impressions contained in the red beds along the routes.

Impacts from Trails and Travel Management-- Under Alternative A, non-permitted and permitted use of motorized and mechanized vehicles would continue on approximately 37.6 miles of trails and routes previously designated.

Identified paleontological resources are exposed on portions of the Tabasco Twister (Apache Canyon) and Patzcuaro's Revenge Trail (Branson Canyon) and documented in the 1994 report (Spencer L.; Hunt, A.; and Hotton II, N. 1994). These localities were confirmed again in an updated inventory during 2010. Under the No Action Alternative, the paleontological resources exposed on parts of the Tabasco Twister and Patzcuaro's Revenge Trails would continue to be destroyed by motorized vehicle use through crushing, fracturing, tire scuff marks, and petroleum product staining of the red beds. The Robledo Member (Abo Tongue) sandstones hosting fossil specimens are usually fine-bedded and friable. The impact from the weight of an OHV is often sufficient to fracture or exacerbate the natural exfoliation of these thin compositional layers. Degradation of the exposed surface destroys visible fossil specimens, but also compromises the subsequent integrity of the entire formation segment.

Although the limestone block layers are generally more resistant to natural erosion, their natural bedding planes make them susceptible to fracturing along exposed seams from excessive pressure or weight. These are exactly the kind of forces imparted by OHV activity during climbing maneuvers. The results of these impact fractures are evident at the vertical obstacles located in the arroyos.

Impacts from Livestock Grazing-- Under Alternative A, livestock grazing would continue. There is potential for livestock to trample paleontological resources, although unlikely due to the location of the paleontological resources. A majority of the paleontological resources are located on the sides of steep hills or arroyos. Those resources on level ground would have the potential to be stepped on and crushed by livestock.

Impacts from Special Designations-Research Natural Area (RNA) -- Under Alternative A, 720-acres of the Monument are designated as the Paleozoic Trackways RNA. It was designated for protection, research, and interpretation of paleontological values. The impacts from continuing the designation of the

Paleozoic Trackways RNA is duplication of most management prescriptions from the Monument Legislation. Those management prescriptions such as: retain all public land, limit vehicle use to designated roads and trails, and withdrawn from mineral entry are also stated in the designating Legislation. These duplicated management prescriptions protect paleontological resources by limiting actions that would have physical impacts on these resources.

4.4.1.2 ALTERNATIVE B

Impacts from Paleontology-- Under Alternative B, casual collecting of common invertebrate and plant paleontological resources would not be allowed. Only scientific research and collecting would be allowed. This reduces the likelihood of scientifically significant fossils being removed illegally from the Monument and scientific information from those fossils being lost to the public and to science. This allows visitors to look at the fossils, but not collect them, which would mean the supply would not be depleted unless collected illegally.

Impacts from Interpretation and Education-- Under Alternative B, education and interpretation of paleontological resources would be mostly offsite as described above except for some self-guided interpretive activities and on-site interpretive programs. The paleontological resources would remain in-situ for ongoing and future scientific research and would not be available for development of on-site public education and interpretation.

Impacts from Recreation and Visitor Services-- Under Alternative B, SRPs would not be authorized within the Monument. This would eliminate any organized group activities other than BLM-sponsored activities. This would also remove any impacts from SRPs on the paleontological resources. By removing SRPs from the Monument, this would also remove any previous SRP permittee's motivation to clean the Monument on a bi-annual basis and also would remove their stewardship towards the Monument and its resources.

Impacts from Trails and Travel Management-- Under Alternative B, the Monument would be closed to all motorized and mechanized use except administrative and emergency motorized use. Closing the PTNM to motorized and mechanized recreational activity would eliminate damage along the trails caused by this use and would conserve the paleontological resources in-situ. This would contribute to the stabilization of both the fossils and their associated geological contexts. Closure of the PTNM to motorized and mechanized recreational use would remove access to PTNM resources by these recreational user groups, reduce public access and would reduce, but not eliminate the opportunity for unauthorized collecting of paleontological resources. Closure of trails to vehicle use would eliminate a convenient, but not unique, source of recreational opportunities for the OHV and mountain bike user groups. Similar recreational venues may be found in the local Doña Ana Mountains, the Caballo Mountains, and the Las Uvas Mountains. Currently, there are no designated trail systems for either OHV or mountain bikes in these other ranges, but it is not inconceivable that challenging rock crawling opportunities for both motorized and mechanized vehicles could be authorized in these adjacent areas.

Trail use on foot or horseback would still allow the public to access paleontological resources, but the number of visitors would be reduced.

Impacts from Livestock Grazing-- Under Alternative B, livestock grazing would not be allowed; therefore the risk of paleontological resources being damaged by livestock is eliminated.

Impacts from Special Designations- Research Natural Area-- Under Alternative B, the 720 acres previously designated as the Paleozoic Trackways RNA would be undesignated. This land would then

follow the management prescriptions from the PTNM RMP. This would still allow for conservation, preservation, and educational opportunities of the paleontological resources and eliminate the duplicity of management prescriptions.

4.4.1.3 ALTERNATIVE C

Impacts from Paleontology-- Under Alternative C, paleontological sites within the Monument would be assessed to determine the best management of those sites. Assessing the importance, value, and quality of documented localities in the PTNM would allow for determining the most suitable use for these localities. Localities could be developed for interpretation while others would be preserved for research or educational purposes. Identifying future potential use of known paleontological resources in the PTNM could allow future expansion of research, interpretive and recreational opportunities. Under Alternative C, collecting of common invertebrate paleontological resources would be allowed in conjunction with BLM authorized interpretive or educational activities or programs. This would provide increased opportunities for discovery of paleontological resources in an educational and recreational setting.

Impacts from Interpretation and Education-- Under Alternative C, in addition to the off-site programs mentioned under Alternative A, pedestrian trails with kiosks and wayside exhibits and a visitor contact station would be developed for public use, which would provide an educational and recreational opportunity focusing on the paleontological resources in an outdoor setting. These developments would increase the public's understanding of the resources and probably enhance the public's appreciation of these resources. However, good interpretation provides the public with information that would raise their awareness of the sensitivity and importance of the resource and could increase stewardship and appreciation. While this enhanced appreciation should deter vandalism of the resources, increased visitor use could also increase the opportunity and occurrence of looting of paleontological resources. However, directing the public to appropriate locations for interpretation which are not as scientifically sensitive probably keeps them away from inappropriate locations because their curiosity is fulfilled by the experience of being in the actual location of the resource and having the extra benefit of interpretation.

Impacts from Recreation and Visitor Services-- Under Alternative C, on-site visitor facilities such as a visitor contact station, toilets, shade shelters, information kiosks, trail markers, and picnic sites would be developed. This would probably attract more visitors to the Monument. With increased visitation, more people would be able to experience the resources in a natural setting within the Monument. Increased visitation would increase the risk of theft and vandalism of the paleontological specimens by exposing fossil-bearing locations to the visiting public. The impacts from allowing SRPs would be the same as mentioned above under the Alternative A discussion.

Impacts from Trails and Travel Management-- Under Alternative C, within the Monument boundaries, 100 percent of the Tabasco Twister Trail (2.7 miles), and 100 percent (1.8 miles) of Patzcuaro's Revenge Trail would be closed to motorized and mechanized vehicle use. In addition, 100 percent (0.4 miles) of the Cayenne Crawler Trail would be closed to motorized and mechanized use to eliminate access from the south to Patzcuaro's Revenge Trail. Paleontological resources located within these arroyos would be protected from impacts created from motorized and mechanized vehicle use such as crushing, fracturing, and staining of the exposed fossil-bearing sandstones and limestone. This would conserve the paleontological resources for research and educational uses. One-hundred percent of an unnamed route (0.5 miles) from the intersection of Cayenne Crawler and Pasado to Sandia Gulch would be closed to motorized and mechanized use. This route was previously designated, but has not been used. Under Alternative C, a non-fee day-pass system would be established for motorized and mechanized use of designated routes not requiring a SRP. These passes would be used for public education regarding the

paleontological resources and also to inform the public on which routes are open for motorized and mechanized travel.

The BLM would also have the opportunity to assemble data related to the number of visitors requiring a permit and season of use. Public outreach could enhance awareness and increase sensitivity to these resources.

Under Alternative C, routes could be maintained or improved as long as sensitive resources are not impacted. Route improvement would allow greater numbers of visitors to enjoy the interior portions of the Monument. This enhanced access would, presumably, lead to a greater appreciation of the variety of natural resources the Monument has to offer, with a commensurate heightened sense of public ownership and responsibility for those resources. Conversely, the easier access could lead to increases in inappropriate behavior such as littering, vandalism, and theft of paleontological resources.

Impacts from Livestock Grazing-- Under Alternative C, livestock grazing would continue within the Monument, but paleontological resources could be fenced off from livestock. This would decrease impacts onto paleontological resources if it is determined that livestock are impacting the resources. Those areas not enclosed by a fence would have the same impacts on the resources as Alternative A.

Impacts from Special Designations - Research Natural Area-- Impacts are the same as described under Alternative B.

4.4.1.4 ALTERNATIVE D

Impacts from Paleontology-- Impacts to paleontological resources are the same as described under Alternative C.

Impacts from Interpretation and Education-- Under Alternative D, the impacts from all off-site activities would be the same as described above in Alternative C except that an on-site visitor center would replace the visitor contact station and a motorized interpretive tour would be created. The visitor center and the motorized interpretive tour may appeal to a larger audience, so more people would learn about the resources located within the Monument. Education programs would hopefully lead to improved stewardship of the site through an increased appreciation of the resources. A greater agency presence usually deters vandalism and theft of paleontological resources also.

Impacts from Recreation and Visitor Services-- Under Alternative D, development of recreational facilities such as a developed campground, primitive camping areas, toilets, shade shelters, information kiosks, trail markers, picnic sites, a trail system, and a visitor center would probably increase the number of visitors to the Monument. This increase in facilities and visitors could improve stewardship of the Monument and its resources but it could increase the potential for looting and destruction of paleontological resources. It is the BLM's hope that the greater BLM and visitor presence would deter vandalism and theft of paleontological resources. The impacts from allowing SRPs would be the same as mentioned above in the Alternative A discussion except the allowed locations for OHV SRPs would be limited. The routes that are known currently to have paleontological resources exposed would not be available for motorized or mechanized SRP use. This would eliminate any possible damage to the paleontological resources on those routes from motorized or mechanized SRP events.

Impacts from Trails and Travel Management-- Impacts would be the same as under Alternative C except that the Cayenne Crawler Trail would be open for motorized and mechanized use and modified to allow an additional 0.4 miles of motorized and mechanized access to the western portion of Patzcuaro's

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Revenge Trail. This would allow a total of 1.4 more miles of designated route compared to Alternative C. This additional mileage would not impact the paleontological resources located in the closed portion of Patzcuaro's Revenge Trail. Passes would not be required for non-permitted use of the designated routes. The absence of a "pass" system could result in reduced public awareness of the rules and regulations and eliminate the BLM's ability to accurately track the volume of OHV use. Thus the BLM would not have easy access to correct user information to make informed decisions on threshold related activities such as when to install more facilities.

Impacts from Livestock Grazing-- Under Alternative D, livestock grazing would continue and the impacts would be the same as under Alternative A.

Impacts from the Special Designations- Research Natural Area-- Impacts would be the same as under Alternative B.

4.4.2 INTERPRETATION AND EDUCATION

Assumptions and Incomplete Information: Off-site interpretation and educational opportunities already exist and would be expected to continue under all Alternatives. These include classroom and civic group talks given by BLM staff and partners, the exhibits and programs offered at the City of Las Cruces' Natural History Museum and future expanded exhibits under development for the Nature and Science Museum (scheduled to open in the fall of 2012). The BLM has partnered with the City of Las Cruces through an Assistance Agreement involving the future museum exhibits. Also two travelling trunk exhibits have been developed by the New Mexico Museum of Natural History and Science. They are available for use by other museums and educational facilities around the State. Travelling suitcase/school kits are being developed for outreach to the public schools.

Management Decisions with No Impacts to Interpretation and Education: Under all Alternatives, the following programs would have little or no impact to Interpretation and Education: Air Resources including Air Quality and Climate Change, Cultural Resources, Livestock Grazing, Socio-Economic Conditions, Soils, Special Designations- Area of Critical Environmental Concern, Special Status Species, Vegetation, Visual Resources, Water Resources, Wildland Fire Management, and Wildlife.

Effects Common to All Alternatives:

Impacts from Interpretation and Education-- The off-site interpretation and education management actions are the same for all Alternatives. This allows for interpretive material to be created via multiple media and for education to occur off-site. The public can learn about the Monument's resources at talks, museums, websites, videos, etc., but this type of interpretation would not have the backdrop of nature to support the resources. The number of visitors to the Monument, City of Las Cruces' Natural History Museum (future City of Las Cruces Museum of Nature and Science), and to various in-town presentations given on the Monument's resources may increase.

Guided-tours to specific sites are an action Common to All Alternatives. Guided tours offer an excellent interpretive opportunity to participants. Interaction with an interpretive tour guide usually enriches the experience because a wealth of detail can be conveyed verbally while the resources are visually available. Participants can ask questions to further their knowledge and awareness of the subject matter against a natural background that provides further subject matter for interpretation. The personal interaction provided by a live tour is probably more effective in promoting stewardship from participants. Self-guided touring and exploring is also available under all Alternatives, but under Alternatives A and B, it would be very limited in terms of interpretation and education because the experience would be unassisted by directional signs and interpretive exhibits.

Impacts from Lands and Realty-- Under all Alternatives, the pursuit and eventual acquisition of an access easement for 0.12 miles of Permian Track Road across private land outside of the Monument (near T. 22 S., R.1 E., Section 20) would be beneficial to Interpretation and Education. Acquisition of this access easement would provide the agency and the public legal access to the Monument. This acquisition would facilitate interpretive and educational activities by providing secure access for pedestrian and motor tours, as well as the security the BLM requires for the development of any infrastructure.

IMPACTS OF THE ALTERNATIVES

4.4.2.1 ALTERNATIVE A

Impacts from Paleontology and Research Management-- Under Alternative A, the Paleontology and Research Management programs would continue to permit and support the on-going research within the PTNM. Scientific research provides baseline information which is used to develop meaningful interpretive and educational products and programs. The continuation of paleontological research would enhance and benefit the interpretive materials already available and could lead to the discovery of new specimens that could be used for exhibits (either real or cast replica) and the resulting information obtained from the study of such fossils. In interpreting the fossil resources of the Monument, great care would be taken to interpret and educate without causing any loss of scientific information or undue degradation of the resource. Interpreters would work closely with the paleontologists to choose specimens for off-site museum exhibits, for exhibits possibly located adjacent to the PTNM, and for appropriate interpretive destinations within the PTNM. Other sites would be protected from visitation due to concerns over theft and vandalism.

Casual collecting of common invertebrates and plant paleontological resources in the PTNM has been occurring for years and is still occurring today. This is a legal activity, unlike collecting archaeological artifacts. Families and school groups have enjoyed finding and collecting small fossils and, at least in the case of the school groups, this activity is undoubtedly educational. Even in an unstructured context, children's imaginations are sparked by the remains of life from long ago and many of them probably pursue their interest on their own. However, one could argue that a more structured approach (signing, making information readily available) to casual collecting would be preferable and would possibly result in fewer impacts to the resource.

Impacts from Interpretation and Education-- Under Alternative A, the plans for Interpretation and Education are primarily off-site. It is assumed that off-site venues within the local community would include museums, the BLM and other agency facilities, and public schools. These off-site venues would accommodate information and interpretive talks/presentations, and classroom presentations. For people not capable of accessing the resources in an outdoor setting, interpretive and educational programs in a museum or classroom setting could increase appreciation and understanding. Museum and educational experiences could lead to an enhanced visit for those people capable of visiting the PTNM. BLM-led tours to the *Discovery Site* and other sites would continue also. Currently, there are no on-site interpretive facilities or opportunities within the PTNM such as exhibits or kiosks. There are no formal trails with signs to lead visitors to any location within the PTNM that has interpretable resources. This situation does not allow for any interpretation or education to occur out in the Monument unless one is on a guided hike. This limits the opportunities for the public to learn on their own about the resources available in the Monument.

Impacts from Recreation and Visitor Services-- Under Alternative A, there are no plans to build any visitor facilities and SRPs are allowed. On-site, self-guided interpretation and education would be limited to the *Discovery Site* which offers minimal interpretation via an informal trail with minimal signage. Guided pedestrian tours would require hiking overland (not on a trail) to bring visitors to potential interpretive destinations.

Impacts from Trails and Travel Management-- The existing designated routes (approximately 37.6 miles) are available for use, but no management actions are planned to improve the existing routes or add new trails and routes under Alternative A. Therefore, public education and interpretation would have to be accomplished off-site at museums, on areas adjacent to the PTNM or on-site through guided tours

using informal trails and designated routes for access. Opportunities for expanding the City of Las Cruces' Museum of Nature and Science experience to the Monument itself, via organized tours (motorized or pedestrian), would be limited by the lack of trails and interpretive exhibits. This would limit the on-site interpretation and education portion of the Monument.

Impacts from Lands and Realty-- Under Alternative A, in addition to the management actions and impacts Common to All Alternatives, the non-Federal minerals would not be acquired by the BLM. If those non-Federal minerals that are located within the Monument were extracted, the BLM could lose the opportunity to interpret the resources located on that Federal surface area.

Impacts from Lands with Wilderness Characteristics-- Under this Alternative, 576 acres are identified as having wilderness characteristics. This does not impact Interpretation and Education because Alternative A does not include plans for construction of new trails or interpretive exhibits within the Monument. Guided tours in this area would still be possible under this Alternative.

4.4.2.2 ALTERNATIVE B

Impacts from Paleontology and Research Management-- Under Alternative B, all paleontological resources would be conserved for scientific research and casual collecting of common invertebrates and plant paleontological resources would not be allowed. This would be a minor impact to Interpretation and Education because although collecting invertebrates may enhance interpretation, it is not essential for a meaningful experience.

Impacts from Interpretation and Education-- Under Alternative B, in addition to Alternative A's management actions and impacts, the BLM would develop interpretive materials for self-guided activities and programs for guided tours. This could increase the number of visitors to the Monument and could increase stewardship towards the Monument. Knowledge about the natural resources would increase in visitors due to the guided tours and the self-guided interpretive activities.

Impacts from Recreation and Visitor Services-- Under Alternative B, the actions described in Recreation and Visitor Services would be very similar to those described under Alternative A. There would be no on-site interpretive facilities or opportunities within the PTNM such as exhibits, kiosks or signs. Motorized and mechanized recreational use of the Monument would not be allowed in Alternative B. Without formal trails and visitor facilities, public education and interpretation would have to be accomplished off-site at museums, on areas adjacent to the PTNM or on-site through guided tours using informal non-motorized routes and self-guided activities. Self-guided interpretive activities would lead visitors to locations within the PTNM that have interpretable resources. The informal ridge trail to the Discovery Site would still lead visitors to this site, which is marked with a sign that offers little in the way of interpretation for the many slabs of sandstone with tracks that can be found scattered on the ground. Improving this interpretive destination would not be possible under Alternative B thus visitors would not be getting as much interpretation and education as possible. Under Alternative B, only allowing scientific collecting of paleontological resources without allowing casual collecting would remove an educational or recreational opportunity from the general public. This limits the opportunities for the public to gain knowledge and have hands-on opportunities with paleontological resources.

Impacts from Trails and Travel Management – Under Alternative B, the current system of routes would be closed to motorized and mechanized vehicle use. As a consequence, those routes would be unavailable for motorized interpretive tours, which could reduce both educational and interpretive opportunities. Under Alternative B, opportunities for expanding the City of Las Cruces' Museum of Nature and Science experience to the Monument itself, via organized tours, would be limited to

pedestrian tours only and would be further limited by the lack of trails and interpretive exhibits. Hiking tours could be conducted along the existing routes; however, most of those routes do not lead to sites suitable for interpretation. The necessity of hikes across rugged terrain could reduce visitor participation in educational and interpretive activities.

Impacts from Lands and Realty-- Under Alternative B, acquiring the non-Federal mineral estate on lands within and adjacent to the Monument would be beneficial since the acquisition of the mineral rights would further protect the Monument from incompatible uses, thus protecting the values which the Interpretation and Education program would be founded upon. Currently the non-Federal mineral estate could be developed as a rock or gravel quarry. This could be a major impact to the naturalness and the scientific and educational use of the Monument.

Impacts from Lands with Wilderness Characteristics -- Under this alternative, the 576 acres identified as Lands with Wilderness Characteristics would not be available for trail or exhibit construction. Under Alternative B, there are no plans for trails or interpretive exhibits within the Monument, so this is management action would not impact Interpretation or Education. Guided tours in this area would still be possible under this alternative.

4.4.2.3 ALTERNATIVE C

Impacts from Paleontology and Research Management-- Under Alternative C, identified paleontological localities would be assessed for their educational, scientific, or recreational (interpretive) values. These actions would be beneficial to Interpretation and Education by assessing the different localities in deciding which would be appropriate for interpretive display and public viewing and which would be reserved for scientific research. This assessment process would be fundamental to choosing proper locations for interpretation. Through the assessment and data recovery process, sites which have been determined to be non-sensitive or low-sensitive by a professional paleontologist would be chosen for on-site public interpretation. These sites may contain resources which are redundant or damaged or otherwise do not offer scientifically important data, or data that has already been recovered. Sensitive locales would be protected in various ways.

Under Alternative C, limited collecting of common invertebrate paleontological resources without a permit would be allowed only in conjunction with BLM approved interpretive or educational programs or activities. This activity would be incorporated into the various interpretive and educational program for the PTNM and. This would be an effective teaching tool for school-age children that could have far-reaching impacts for their educational development. Finding a fossil is an exciting event and being able to keep it provides a physical reminder of the experience.

Impacts from Interpretation and Education-- Under Alternative C, in addition to those activities planned for Alternatives A and B, pedestrian trails with kiosks and exhibits would be developed. Increased amounts of interpretive material and opportunities could bring complicated, complex, and often obscure aspects of life on this planet to the public in a way that is easily understood. Effective interpretation enhances understanding and imparts the wonder and joy that the natural and cultural worlds contain, but is firmly based on the details of life that are often discovered only by careful scientific research and analysis. This program is usually quite beneficial in that it can help foster the public's appreciation and understanding, which leads them to want to protect and conserve these valuable resources. Children especially begin to develop deeper understandings of science, biology, geology, etc. and carry these ethics into adulthood which lead to enhanced feelings of responsibility as a citizen and member of society.

Under Alternative C, exhibits for a visitor contact station and other sites could be developed. Development of interpretive and educational programs and facilities would provide the opportunity for greater understanding of the paleontological resources through on-site venues. With on-site development of interpretive sites, visitors to the area would experience the resources in an outdoor setting, which creates context and could possibly increase the understanding of the resources. Through increased understanding, a greater appreciation for the tracks and trace fossils in the Monument might be developed by those visiting the PTNM. Increased understanding of the resources could lead to less trash, vandalism and theft of paleontological resources.

Impacts from Recreation and Visitor Services-- Under Alternative C, on-site facilities such as shade shelters, information kiosks, trail systems with trail markers, and a visitor contact station would be developed. Interpretive exhibits would inform the visitor about a variety of interpretive themes including the Paleozoic environment, the existence and behavior of extinct animals, how the trackways inform scientists about the behavior and habits of extinct animals, and the evolutionary development of reptiles and amphibians, to name only a few. Interpretive facilities would draw more visitors to the Monument, which increases the interpretive audience. A visitor contact station would serve the public by offering a sheltered location in which to hold interpretive and educational programs, possibly replica specimens, interpretive exhibits, printed materials, and possibly a sign-in kiosk. This would be very beneficial to interpretation and education because such a facility would greatly enhance the visitor's experience by offering exhibits and printed material that inform about the resources of the Monument and also provides a sheltered location for programs, furthering the BLM's educational and interpretative goals. Kiosks and signing establish a management presence and this serves both the agency and the members of the public in various ways. Visitors feel more secure about an area when trails are marked and safety information is readily available. Visitors may better appreciate the public land when they are provided information. Establishing a sense of ownership in the visiting public serves to protect the public land from vandalism and theft. The agency presence also is a deterrent to these destructive activities especially when incidences of vandalism are quickly addressed by the agency, showing that an area is not being ignored or neglected.

Impacts from Trails and Travel Management-- Under Alternative C, designated trails could be developed to guide the visitor to geological and paleontological localities that illustrate interpretive concepts. Eighty-nine percent of the existing routes in which motorized or mechanized vehicle use is allowed would remain open to this use. Educational material could be included in the no-fee day-use pass that is required for motorized and mechanized vehicle use. Formal trails and an effective interpretive/education program would assist in protecting sensitive resources by offering suitable locations that are fairly easy to access. This would satisfy the visitors' interest in viewing and experiencing exciting resources, and may also keep those visitors from seeking out locations that merit protection from the possible abuses associated with public visitation. The routes that are open under Alternative C could be used for motorized or non-motorized guided tours by the BLM, docents, or BLM's partners.

Impacts from Lands and Realty-- Under Alternative C, two additional access easements would be acquired. By acquiring these easements, these existing routes would then provide two more legal access points into the PTNM that would be ideal locations for trail heads which could be portals to interpretive trails leading to exhibits or destinations. Acquiring the non-Federal mineral estate on lands within and adjacent to the Monument would be advantageous since the acquisition of the mineral rights would further protect the Monument from incompatible uses, thus protecting the values which the Interpretation and Education Program would be founded upon.

Impacts from Lands with Wilderness Characteristics-- Under Alternative C, 253 acres would be managed as Lands with Wilderness Characteristics. These lands would be limited from development as

described under Alternative B. However, the lands outside of the lands managed for wilderness characteristics such as the *Discovery Site* would be available for the development of interpretive trails and exhibits, which would greatly increase the interpretive opportunities within the Monument. Guided tours in this area would also still be possible.

4.4.2.4 ALTERNATIVE D

Impacts from Paleontology-- Under Alternative D, the effects from the Paleontology management actions would be similar to those described under Alternative C.

Impacts from Interpretation and Education-- Under Alternative D, the effects from the Interpretation and Education management actions would be similar to those described under Alternative C. Under D, a visitor center (effects described below) and a motorized interpretive tour would be developed. These additions would probably increase the number of visitors to the Monument since a visitor center would be universally accessible and the motorized vehicle tour would not be dependent on one's physical ability or vehicle's ability.

Impacts from Recreation and Visitor Services-- The effects from Recreation and Visitor Services are the same as described under Alternative C with additional of actions that offer enhanced recreational opportunities which would be beneficial to Interpretation and Education. A visitor center would offer exhibits and activities devoted entirely to interpreting the resources of the PTNM, which would be a unique museum experience not offered anywhere else. This facility would offer the opportunity for educational programs to be conducted on-site and would assist in accommodating school and public groups visiting the PTNM. It also would serve as the launching point for many of the front-country activities such as accessing the formal trails that bring the visitor to interpretive destinations, such as in-situ fossil exhibits developed for public visitation. This would increase the number of visitors and possibly increase the stewardship of the Monument.

Impacts from Trails and Travel Management-- Under Alternative D, the closure of certain roads used for rock-crawling would still allow for pedestrian interpretive and educational activities on these routes. New routes could be developed to enhance the visitor's interpretive and educational opportunities. For instance, if a paleontological location is selected for interpretive development but is inaccessible, this alternative allows the development of a non-motorized or motorized route to facilitate access. This would allow for more visitors to access in-situ interpretive sites and experience all of the natural resources of the Monument.

Impacts from Lands and Realty-- The impacts from Lands and Realty would be the same as discussed under Alternative C.

Impacts from Lands with Wilderness Characteristics-- Under Alternative D, since no lands outside the WSA would be managed to maintain wilderness characteristics, lands with wilderness characteristics would present no restraints to developing interpretive trails and exhibits.

4.4.3 RECREATION AND VISITOR SERVICES

Assumptions and Incomplete Information: Under Alternatives C and D, a visitor contact station and a visitor center were analyzed. There is no one obvious location for these facilities. The analysis is based on the opportunity to explore several locations inside and bordering the Monument. If such facilities are decided on in the future, the locations chosen would be in consideration of legal and physical access, ecological footprints, and proximity to paleontological sites, recreational trails, and through NEPA analysis.

The following paragraphs provide an estimated cost for the construction of these facilities. The costs come from consultation with BLM civil engineers and are based on recent similar projects proposed or completed in and around the Las Cruces area. These costs are based on 2011 prices.

Under Alternative C, a visitor contact station is analyzed. The visitor contact station would be a minimal facility that is ADA (Americans with Disabilities Act) accessible. It could be a large shade structure (approximately 50 feet by 50 feet) with a set of wayside exhibits and panels. The estimated range of cost for this type of pavilion structure would be \$75,000 to \$150,000 which includes the cost of the wayside exhibits. This cost covers materials, labor, and equipment. A parking area for 15 cars would cover about 20,000 square feet of surface. To construct an improved gravel parking lot of this size would cost an estimated \$20,000 to \$25,000. To construct a paved parking lot of this size would cost an estimated \$30,000 to \$35,000. This parking area would have a solid surfaced pathway (most likely concrete) next to a handicap parking spot to provide access to the visitor contact station for those with disabilities. If pit toilets were installed, the cost would be around \$30,000 for a double handicap accessible toilet, and \$20,000 for a single toilet. The footprint for the contact station, parking lot, wayside exhibits and toilets would be about 1 to 1½ acres.

The visitor contact station may or may not be staffed by BLM employees at regular times and could be used to put on interpretive programs. It is a place where visitors can come learn about the Monument, feel like they have had contact with the resources of Monument, and learn why it was made into a National Monument.

Under Alternative D, a visitor center is analyzed. A visitor center would be an ADA accessible building that would be staffed with regular hours of operation. It would have paleontological and geological specimen exhibits and interpretive displays. The facility would have indoor bathroom facilities, electricity and plumbing. For a 2,500 to 3,000 square foot building, the cost would be \$1.5 to \$2 million. To construct a gravel 30-car parking lot, the estimate is \$30,000 to \$35,000. To construct a paved park area for 30 cars, the estimated cost is \$65,000 to \$70,000. The footprint of this building and parking lot would take up about 1½ to 2 acres of land.

A visitor center would require a greater number of staff members to maintain the facilities and manage the visitor center with regular hours of operation.

If facilities were built, a road would have to be constructed to the site. A 24-foot gravel road could cost from \$1,000 to \$3,000 per mile depending on the surface material of the land. The gravel road would cost approximately \$250 to \$500 each time it had to be maintained (that includes the cost of a road grader and labor hours). The frequency of the required maintenance visits would change in relation to visitation numbers and weather conditions. A paved road would cost around \$4,000 per mile. However, it would not have to be maintained as often as a gravel road, but the repairing of pot holes and surface disturbance would be more costly than using a road grader.

With the exception of nominal improvements such as visitor and trail signage, no capital improvement projects would be authorized until BLM secures a public right-of-way or easement to the Monument.

Under the authority of the Federal Lands Recreation Enhancement ACT (REA), the BLM uses the Special Recreation Permitting system to satisfy the demands of recreational demands within allowable use levels in an equitable, safe, and enjoyable manner while minimizing adverse resource impacts and user conflicts for all public land. With the Legislation designating Prehistoric Trackways as a National Monument, and as a unit of the National Landscape Conservation System, all SRP applications will be analyzed with an elevated consideration of protecting the resources and values of that Legislation. Environmental Assessments (EAs) have been completed for previous SRPs/Events held within the Monument. Further studies have not been completed to assess the number of OHV SRPs that could be issued annually while still protecting the Monument's resources. As a part of the SRP process, BLM monitors SRP events, completes post-event assessments, and evaluates whether the events adhere to the values of the Legislation. Based on past experience of one or two OHV SRP permitted events held during one calendar year, the BLM used professional judgment to recognize that potentially allowing more than 3 OHV SRPs during one calendar year could potentially affect the non-permitted users of the Monument.

Currently, the BLM does not have exact recreation visitation numbers and economic expenditure data associated with use of the Monument. The current estimate of visitation numbers is based on BLM staff observing visitors exploring, riding OHVs and mountain bikes, hiking, and inquiries into the resources. Other visitation data are provided through organized/permitted events, group tours and monitoring of resources, litter, trails, and areas of high use.

The current visitation is estimated to be from 5,000 to 7,000 visitors a year. Under Alternative B, with the elimination of motorized and mechanized use, the number would probably drop to less than half of the current visitation, and be somewhere from 2,000 to 2,500 a year. If under Alternative C a visitor contact station, interpretive facilities, and recreational trails were put in, it is assumed the visitation number would double to triple in number to around 15,000 a year. If under Alternative D, a visitor center is put in along with interpretive facilities and recreational trails, it is assumed the number of visitors a year would go up to 30,000 a year or more.

Management Decisions with No Impacts to Recreation and Visitor Services: The following resources or uses have no or little impact on Recreation and Visitor Services: Cultural Resources, Livestock Grazing, Special Designations- Area of Critical Environmental Concern and Research Natural Area, Special Status Species, Vegetation, Visual Resources, and Wildlife.

Effects Common to All Alternatives:

Impacts from Lands and Realty-- Under all Alternatives, the BLM would continue with the current management prescription for access acquisition which would give recreational users an easement for 0.12 miles of Permian Track Road across private land into the Monument (near T. 22 S., R. 1 E., Section 20). Acquisition of this road easement would provide the agency legal access to the Monument.

IMPACTS OF THE ALTERNATIVES

4.4.3.1 ALTERNATIVE A

Impacts from Paleontological Resources-- Under Alternative A, casual collecting of common invertebrates and plant paleontological resources would be allowed to continue. This is a current and historical recreational use of the area within and around the Monument. Paleontologists familiar with the

Monument have expressed the opinion that casual collecting of common invertebrates would not be detrimental to the resources. Under the Paleontological Resource Protection Act, this type of collecting is legal and allowed on public land. This allows visitors to enjoy another recreational opportunity in the Monument.

Impacts from Interpretation and Education-- Under Alternative A, interpretation and education allows for continued partnerships with museums, the BLM and partner-led interpretive tours to fossil sites, and development of interpretive materials for programs and events. The Monument's paleontological resources are not obvious and are often very subtle. On-site tours and interpretive programs would facilitate the visitor's experiences and increase their understanding of the resources within the Monument. The lack of on-site interpretive and educational exhibits and facilities would limit visitors' abilities to intellectually and emotionally connect with the resources of the Monument.

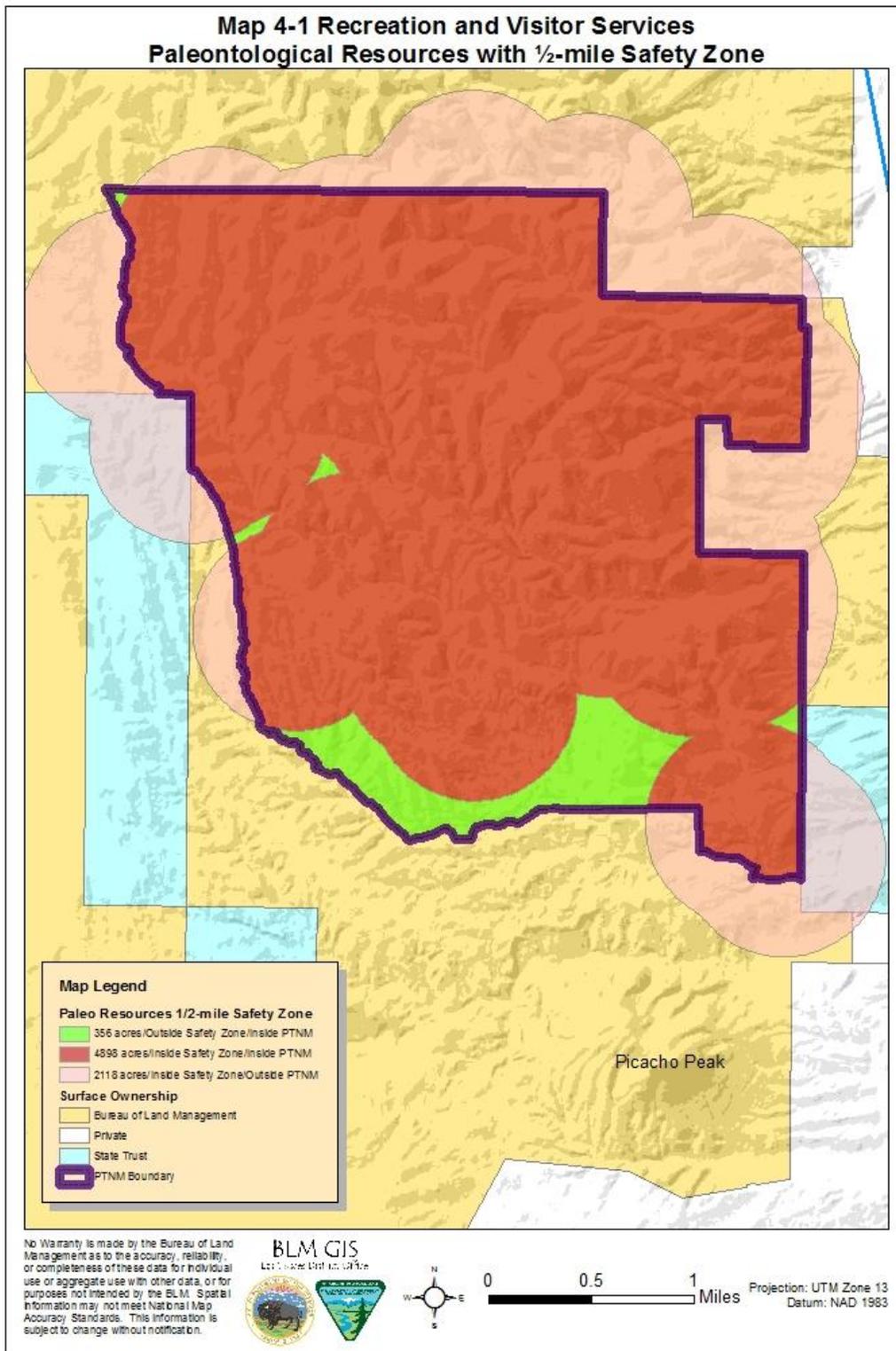
Impacts from Recreation and Visitor Services-- Under Alternative A, there are no plans to develop visitor facilities within the Monument. The Monument's desert environment is prone to extreme heat in the late spring, summer and early fall. This environment combined with the lack of comfort facilities in and around the Monument would likely deter or limit family groups, school groups and other visitors who might be in need of bathrooms, shade shelters, etc. Lack of development and facilities would increase the opportunity for visitors seeking a recreation experience in a less crowded and more natural setting. Under this Alternative, visitor use is expected to remain similar in number to that of the recent past. Lack of facilities and developed access under this Alternative may deter visitors with certain kinds of disabilities or limit their recreation opportunities. Over time, the absence of toilet facilities may create challenges associated with the need to manage human waste.

Discharge of firearms is allowed under Alternative A. Hunters would continue to use the Planning Area in accordance with New Mexico Department of Game and Fish regulations. The Monument is often used by locals for recreational target practice and unfortunately, some shooters regularly leave behind targets or trash. However, target shooting is a safety concern for recreationists, tourists, researchers, BLM staff and volunteers. Hearing repeated gunfire and seeing accumulations of trash affect those who visit the Monument seeking a quieter and more natural recreation setting.

The designating Legislation states that the Monument was established for its associated scientific, educational, scenic, and recreational values. With this designation, the BLM must provide for public access to these resources and values. For this reason, the BLM evaluated target shooting in certain areas of the PTNM in terms of public safety. The Las Cruces District Office analyzed industry standards for predictable projectile safety areas (Appendix G). From this data, the BLM concluded that a ½-mile safety zone (no target shooting) around areas where people congregate within the Monument is appropriate. Consistent with this analysis, the BLM applied the same ½-mile safety buffer zone around those locations within the Monument where people congregate such as paleontological resources (researchers, BLM staff, and tourists, etc.) and routes.

Within the Monument, often visitors and researchers congregate near the paleontological resources. The researchers are working throughout the day, often crouched in a low-visibility position at the many paleontological sites located within winding arroyos. This leaves the research scientists and other members of the public often not visible from above or within the arroyos. Unintentional bullet ricochets or misfires would present an unnecessary risk to public safety in the area.

In order to evaluate the safety risk of allowing recreational target shooting and proactively inviting researchers and tourists to the Monument, BLM applied a ½-mile buffer (consistent with Appendix G) around documented paleontological localities in the Monument. This GIS analysis determined if any areas within the Monument are outside of the safety buffer. Map 4-1 reveals that the safety buffer zones



associated with protection of public access to paleontological sites incorporates 93 percent of the Monument. Approximately 356 acres, or 7 percent, of the Monument near the southern boundary lies outside the ½-mile buffer zones associated with paleontological sites. (In conformance with the Paleontological Resources Protection Act, paleontological sites are not displayed on the associated maps.)

The second set of locations in the Monument where people congregate are designated recreational routes. The area within the Monument includes 32 miles of designated off-highway vehicle (OHV) trails having National recognition as prime and challenging trails for extreme off-roading and rock crawling enthusiasts. All of the routes within the Monument require high clearance, four-wheel drive vehicles; with approximately 50 percent of these trails rated as extreme or difficult, requiring modified vehicles with special knowledge and skills. These trails are the destination for recreation activity rather than access routes to recreation destinations beyond. The nature of travel on these difficult to extreme routes means that the OHVs move slowly over extended periods of time, with people often congregating and walking alongside the vehicles as they move through challenging obstacles. Because of the winding nature of the arroyos and associated OHV trails, and the often low or poor visibility of those moving along the trails, recreational target shooting would put these visitors at unnecessary risk. The BLM applied a ½-mile buffer around designated recreational routes in Alternative A. Map 4-2 shows 67 acres, or approximately 1 percent of the Monument lies outside of the ½-mile safety zones associated with designated recreational routes.

The ½-mile buffer zones associated with paleontological resources (Map 4-1) and designated routes (Map 4-2) were merged to determine where recreational shooting could be considered safer in the Monument. However, these two sets of safety zones cover the entire Monument (Map 4-3), indicating that there are no areas in the Monument that are more than ½-mile from areas of high public use where recreational target shooting could take place safely. In addition to areas where the public congregate, the soil surface throughout the Monument is predominantly covered with rock (80-90 percent surface coverage) which would further increase unnecessary risk to visitors from potentially increased number of ricochets.

BLM acknowledges that there is a safety risk of inviting the public and researchers to the Monument and continuing to allow recreational target shooting throughout the same area within Alternative A.

Under Alternative A, SRPs would continue to be authorized on a discretionary basis. Continuing to authorize SRP events and related activities would provide a means to manage visitor use, enhance the recreation experience, promote land stewardship, and maintain a 15-year tradition of hosting popular OHV events. Permitted activities would also result in short-term impacts such as increased noise, crowds, and associated visitor use conflicts.

Impacts from Trails and Travel Management-- Alternative A would continue to provide OHV access over approximately 32 miles of the Robledo Mountain OHV Trails - commonly known as the Chile Challenge Trails. These routes primarily benefit specialized, high-clearance OHV vehicles. This Alternative would maximize OHV access and related recreation opportunities.

The 6.2-mile (5.5 miles are within the Monument boundary) SST Mountain Bike Trail would remain and continue to provide an opportunity for both individual and group biking activities.

Alternative A does not specifically plan for additional development of separate hiking, pedestrian, and horse trails. However, portions of vehicle routes or most arroyo and canyon bottoms could be used by those who want to explore the Monument on foot or horseback. Dispersed hiking and equestrian activity would continue throughout the Monument and allow visitors the opportunity to discover and explore. Access along the trail to the original “*Discovery*” tracksite that hugs the base of the north side Community

Pit spoils pile would remain closed due to safety concerns resulting from the proximity of the trail to unstable spoils piles and debris. The absence of well designed, convenient trails impacts visitor interest and ability to reach the desired destination.

Impacts from Lands with Wilderness Characteristics-- Under this Alternative, the 576 acres identified as lands with wilderness characteristics would be available for recreational development. This is not an impact because under Alternative A there are no plans for recreational development, such as trails and visitor facilities.

Impacts from Lands and Realty-- Under Alternative A, see the *Effects Common to All Alternatives* discussion above.

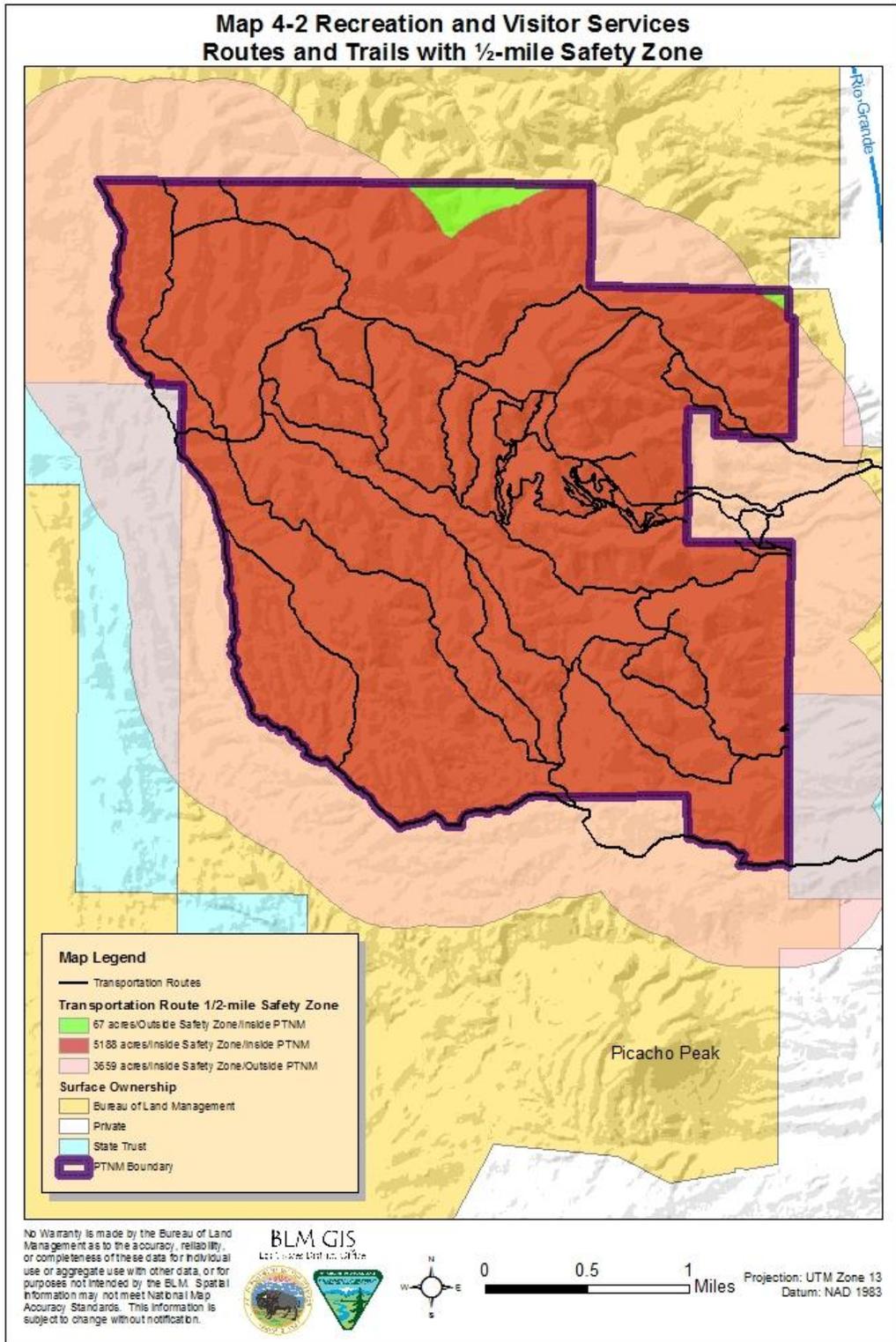
4.4.3.2 ALTERNATIVE B

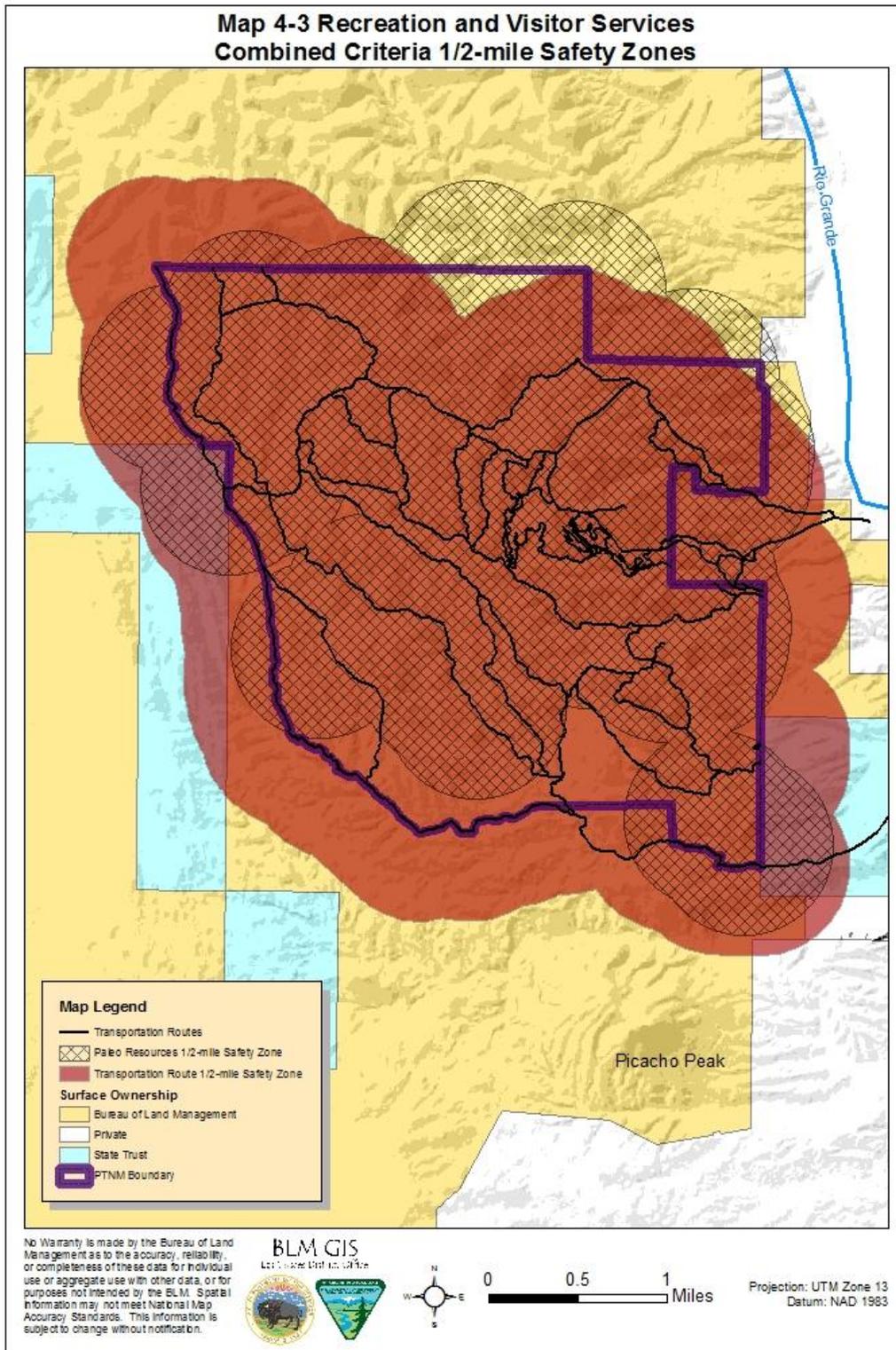
Impacts from Paleontological Resources-- Under Alternative B, casual collecting of common invertebrates and plant paleontological resources would not be allowed. This would affect visitors and school students who would enjoy visiting the Monument and collecting common invertebrate fossils. This may reduce the number of visitors and students that would want to visit the Monument.

Impacts from Interpretation and Education-- Under Alternative B, interpretation and education allows for continued partnerships with museums, the BLM and partner-led interpretive tours to fossil sites, and development of interpretive materials for programs and events. The Monument's paleontological resources are subtle and not readily evident. On-site tours and interpretive programs would help facilitate the visitors' experiences; and help them relate to and understand the resources of the Monument. Only minimal directional and informational signs would be installed. Visitors (not a part of guided tours) would have a challenging time finding paleontological sites and connecting with the resources on self-guided visits to the Monument.

Impacts from Recreation and Visitor Services-- Under Alternative B, installation of minimal directional and informational signs would facilitate exploration and discovery, and increase visitor safety by reducing the opportunity for visitors to lose their way in this often harsh, desert environment. The effects of forgoing development of additional recreation and visitor facilities are the same as under Alternative A (Section 4.4.3.1). Due to the lack of motorized and mechanical recreational use in this Alternative, visitation would probably drop to around 2,000 to 2,500 per year.

Under Alternative B, hunting would continue in accordance with New Mexico Department of Game and Fish regulations and recreational target shooting would continue within the Monument. This is the same as Alternative A. Target shooting is a safety concern for recreationists, tourists, researchers, and BLM staff and volunteers. The proposed closure to all motorized and mechanized travel may lead to concentrations of hunting or target shooting activity along the boundaries of the Monument where vehicle access is permitted. Restricted vehicle access would increase the opportunity for those who prefer to hunt on foot or horseback, away from motorized activity.





Like Alternative A, there would be no prohibition on the discharge of firearms under Alternative B. The designating Legislation states that the Monument was established for its associated scientific, educational, scenic, and recreational values. Due to the expectation of increased interest in the Monument, the BLM evaluated target shooting in certain areas of the PTNM in terms of public safety. The Las Cruces District Office analyzed industry standards for predictable projectile safety areas (Appendix G). From this data, the BLM concluded that a ½-mile safety zone around (no target shooting) areas where people congregate within the Monument is appropriate. Consistent with this rule, the BLM applied the same one-half mile safety buffer zone around those locations within the Monument where people congregate such as paleontological resources (researchers, BLM staff, and tourists, etc.).

Within the Monument, often visitors and researchers congregate near the paleontological resources. The researchers are working throughout the day, often crouched in a low-visibility position at the many paleontological sites located within winding arroyos. This leaves the research scientists and other members of the public often not visible from above or within the arroyos. Unintentional bullet ricochets or misfires would present an unnecessary risk to public safety in the area. In addition, the soil surface throughout the Monument is predominantly covered with rock (80-90 percent surface coverage) which would further increase unnecessary risk to visitors from potentially increased number of ricochets.

In order to evaluate the safety risk of allowing recreational target shooting and proactively inviting researchers and tourists to the Monument, BLM applied a ½-mile buffer (consistent with Appendix G) around documented paleontological localities in the Monument. This GIS analysis determined if any areas within the Monument are outside of the safety buffer. Map 4-1 reveals that the safety buffer zones associated with protection of public access to paleontological sites incorporates 93 percent of the Monument. Approximately 356 acres, or 7 percent, of the Monument near the southern boundary lies outside the one-half mile buffer zones associated with paleontological sites. (In conformance with the Paleontological Resources Protection Act, paleontological sites are not displayed on the associated maps.) In Alternative B, there are no plans to increase access to the Monument, which leaves these 356 acres obscured from most of the public due to the lack of access roads. There are no distinct physical boundaries for the 356 acres. From a management perspective, allowing recreational target shooting within these 356 acres would be difficult since it would be hard to sign the area and enforce the boundary.

Under Alternative B, motorized and mechanized vehicle use is prohibited. Therefore, the analysis on the safety risk for those using the designated routes is moot (4.4.3.1). Recreational target shooters could hike or horseback ride into the Monument to target practice. The safety of researchers, tourists, and BLM employees remain at risk from stray bullets.

BLM acknowledges that there is a safety risk of inviting the public and researchers to the Monument and continuing to allow recreational target shooting throughout the same area. Perhaps with no motorized or mechanized access with this alternative there would be less people within the Monument and perhaps less risk to public safety than with Alternative A.

The effects from lack of recreation and visitor facilities under this Alternative is the same as under Alternative A (Section 4.4.3.1).

Impacts from Trails and Travel Management-- Under Alternative B, the Monument would be closed to motorized and mechanized vehicle use. This would close the 32 miles of the Robledo Mountains OHV Trails (Chile Challenge Trails) and 5.5 miles of the SST Mountain Bike Trail. Eliminating the use of motorized and mechanized vehicles would essentially close the Monument to a large portion of its recreational user groups. OHV enthusiasts and mountain bikers would likely continue to pursue their recreational interest in other areas.

Closing the Monument to motorized and mechanized use would increase and enhance the recreational opportunity for those seeking a quiet and natural recreation setting (e.g., fewer signs of vehicle activity such as tire tracks, oil spills, broken rocks, etc.)

Under Alternative B, there are no plans to develop hiking or horse trails. With the exception of portions of the existing vehicle trail system, hiking and equestrian opportunities would be limited primarily to cross-country use. Access along the trail to the original “Discovery” tracksite that hugs the base of the north side Community Pit spoils pile would remain closed due to safety concerns resulting from the proximity of the trail to unstable spoils piles and debris. As in Alternative A, the absence of developed hiking trails to points of interest on the Monument interior, discourages casual investigation by the visiting public.

Impacts from Lands and Realty-- Under Alternative B, in addition to *Effects Common to All Alternatives*, BLM would acquire the non-Federal minerals within the Monument. This would eliminate the possibility of disturbance to the surface from extraction of the subsurface minerals and reduction in recreational opportunities on those lands.

Impacts from Lands with Wilderness Characteristics-- Under this alternative, the 576 acres identified as Lands with Wilderness Characteristics would not be available for recreational development. This is not an impact because under Alternative B there are no plans for recreational development, such as trails and recreational facilities, within the Monument.

4.4.3.3 ALTERNATIVE C

Impacts from Paleontological Resources-- Under Alternative C, collecting of common invertebrates resources would only be allowed in conjunction with BLM authorized interpretive or educational activities and programs. Without prior authorization, visitors would not be permitted to casually collect common invertebrates and plant paleontological resources. With BLM authorization, this would allow educational and recreational user groups to use the area as they have traditionally. Preauthorization would help to protect the resources and sustain recreational use and visitor experiences in the future.

Impacts from Interpretation and Education-- As in Alternatives A and B, interpretation and education allows for continued partnerships with museums, BLM and partner-led interpretive tours to fossil sites, and development of interpretive materials for programs and events. This would have the same beneficial effects discussed under the previous alternatives.

Under Alternative C, there would be pedestrian trails developed with orientation kiosks and wayside exhibits, along with developed exhibits for on-site interpretation and a visitor contact station. These would benefit those visitors trying to understand and relate to the resources of the Monument. On the other hand, such facilities might detract from the natural and wild settings of the Monument if these interpretive developments are too frequent or too conspicuous.

Impacts from Recreation and Visitor Services-- Alternative C, provides for the possibility to develop, install, and maintain a variety of visitor facilities (i.e., a visitor contact station, toilets, shade shelter, information kiosks, and picnic sites). Detailed planning of these facilities would be deferred until such a need was identified. This level of development would increase visitor comfort, visitor use, and overall opportunities for those seeking a more developed, safe and controlled recreation setting (e.g., school and tour groups). Due to the development of facilities and the opportunities for education and interpretation, visitation would probably double in numbers reaching 15,000 a year. This level of development would also reduce the opportunity for those seeking a less crowded and more natural recreation setting.

Under Alternative C, motorized and mechanized vehicle users would be required to obtain a no-fee day-use permit. Having to go online or drive to the BLM office to obtain a permit would result in an inconvenience and require additional planning before heading out. In the short-term, vehicle users who visit the Monument and are unaware of the permit requirement would either have to cancel their trip or return to town to obtain a permit. Requiring a vehicle day-use permit would improve the visitors' experience by providing the opportunity, when issuing a permit, to distribute information on safety and a map that directs visitors to trails and the location of interpretive and educational sites. A permit system would also provide BLM accurate visitor use data to better plan and manage vehicle use in the future.

Under Alternative C, recreational target shooting would be prohibited. BLM is mandated to provide for public access to the paleontological resources of the Monument and its associated scientific, educational, scenic, and recreational values. For this reason, the BLM evaluated the possibility of allowing target shooting in certain areas of the PTNM in terms of public safety. The Las Cruces District Office analyzed industry standards for predictable projectile safety areas (Appendix G). From this data, the BLM concluded that a ½-mile safety zone (no target shooting) around areas where people congregate in the Monument is appropriate. Consistent with this rule, the BLM applied the same one-half mile safety buffer zone around those locations within the Monument where people congregate.

One set of locations in the Monument where the public congregates are the paleontological resources. There is year-round site visitation for research activities, with individuals and groups working throughout the day, often crouched in a low-visibility position. Many of the paleontological sites are located within winding arroyos where research scientists and other members of the public would not be visible from above or within the arroyos. Unintentional bullet ricochets or misfires would present an unnecessary risk to public safety in the area. The BLM applied a one-half mile buffer (consistent with Appendix G) around documented paleontological localities in the Monument to determine if any areas could be made available for recreational shooting while protecting the safety of visitors to paleontological resource sites. Map 4-1 reveals that the safety buffer zones associated with protection of public access to paleontological sites incorporates 93 percent of the Monument. Approximately 356 acres, or 7 percent, of the Monument near the southern boundary lies outside the ½-mile buffer zones associated with paleontological sites. (In conformance with the Paleontological Resources Protection Act, paleontological sites are not displayed on the attached maps.)

The second set of locations in the Monument where people congregate are trailheads, visitor facilities, interpretive sites, kiosks, and designated recreational routes. Mechanized and motorized vehicle use would be allowed on almost 27 miles under Alternatives C. These designated off-highway vehicle (OHV) trails have national recognition as prime and challenging trails for extreme off-roading and rock crawling enthusiasts. All of the routes within the Monument require high clearance, four-wheel drive vehicles; with approximately 50 percent of these trails rated as extreme or difficult, requiring modified vehicles with special knowledge and skills. These trails are the destination for recreation activity rather than access routes to recreation destinations beyond. The nature of travel on these difficult to extreme routes means that the OHVs move slowly over extended periods of time, with people often congregating and walking alongside the vehicles as they move through challenging obstacles. Because of the winding nature of the arroyos and associated OHV trails, and the often low or poor visibility of those moving along the trails, recreational target shooting would put these visitors at unnecessary risk. The BLM applied a ½-mile buffer around designated recreational routes, trailheads, visitor facilities, interpretive sites, and kiosks that would be allowed under this Alternative. Map 4-2 shows 67 acres, or approximately 1 percent of the Monument lies outside of the ½-mile buffers associated with recreational sites and routes.

The ½-mile buffer zones associated with paleontological resources (Map 4-1) and recreational sites or routes (Map 4-2) were merged to determine where recreational shooting could be considered in the Monument. However, these two sets of buffer zones cover the entire Monument (Map 4-3), indicating

that there are no areas in the Monument that are more than ½-mile from areas of high public use where recreational target shooting could take place safely. More importantly, the soil surface throughout the Monument is predominantly covered with rock (80-90 percent surface coverage) which would further increase unnecessary risk to visitors from potentially increased number of ricochets.

Closing the Monument to recreational target shooting would slightly decrease the number of opportunities for this activity in the analysis area. However, the public land in Doña Ana County outside of the Monument is available for recreational target shooting (unless closed under Supplemental Rules at developed recreation areas). There are approximately 1,069,757 acres, or 44 percent, of Doña Ana County that are available for recreational target shooting. In addition, there is a public shooting range operated by the City of Las Cruces, the Butterfield Range, which is free to the public for target shooting. The BLM currently permits the Butterfield Range to the City of Las Cruces under a Recreation and Public Purposes Act (R&PP) lease. The Butterfield Range is an excellent shooting facility and readily accommodates a wide variety of safe shooting venues for the public.

Prohibiting target shooting would eliminate the trash and litter left by target shooters, reduce the opportunity for user conflicts, and increase visitor and BLM staff safety by reducing risks associated with stray bullets. As the Monument becomes more popular and visitation increases, the conflict of target practice and other Monument visitors would increase if the Monument is not closed to recreational target shooting. Closing the Monument to target practice shooting would create a safer environment for researchers, visitors and BLM staff and volunteers.

Impacts from Trails and Travel Management-- Under Alternative C, approximately 26.9 miles of the Robledo Mountains OHV Trail routes would remain open to motorized and mechanized vehicle use and 5.4 would be closed. Open vehicle routes would increase recreational opportunities for those who are unable to hike cross country and through rugged terrain – taking visitors/vehicles closer to various fossils and interpretive sites throughout the Monument. The closure of 5.4 miles of trail would primarily impact the more extreme OHV recreationists as these segments of trail are considered to be some of the most challenging for rock crawling. Closing this segment of trail would also increase and enhance the recreational opportunity for non-motorized users seeking a quieter and more natural recreation setting.

Under Alternative C, the 5.5 miles of SST Mountain Bike Trail would remain open for mountain biking with a no-fee day permit. This Trail would continue to provide a quality recreation experience for the mountain biking community.

Alternative C provides an opportunity to identify, construct and maintain new routes for biking, hiking, equestrian, and OHV activity. An expanded trail system would increase access and associated recreational opportunities for both motorized and non-motorized travelers. Additional trails would enhance the recreation experience by increasing access to fossil sites, scenic views, geological formations, and other unique values for which the Monument was designated. An expanded trail system and related activity may deter those seeking a recreation experience in a less crowded and more natural setting.

Impacts from Lands and Realty-- Under Alternative C, BLM would acquire access easements for public use from the New Mexico State Land Office across Section 32, T. 22 S., R. 1 E. and Section 22, T. 22 S., R. 1 W., in addition to the easement mentioned in *Effects Common to All Alternatives*. This would create more legal access points into the Monument, which would allow visitors multiple entries and open the Monument up to more people. This could lead to several impacts such as increased vandalism and trash throughout the Monument and increased recreational destinations and opportunities.

Impacts from Lands with Wilderness Characteristics-- Under Alternative C, 253 acres would be managed as Lands with Wilderness Characteristics. Management of these lands would limit man-made

intrusions as described under Alternative B. However, the remaining lands would be available for the development of recreational facilities which could greatly increase the recreational opportunities within the Monument. The *Discovery Site* is within those remaining lands (not to be managed as Lands with Wilderness Characteristics); therefore it would allow greater interpretation of that site and the ability to build trails for better access to it.

4.4.3.4 ALTERNATIVE D

Impacts from Paleontological Resources-- Under Alternative D, the same effects as discussed under Alternative C would apply.

Impacts from Interpretation and Education-- Interpretation and education allows for continued partnerships with museums, BLM and partner-led interpretive tours to fossil sites, and development of interpretive materials for programs and events. This would have the same effects as discussed under Alternatives A and B.

Under Alternative D, there would be pedestrian trails developed with orientation kiosks and wayside exhibits, along with developed exhibits for on-site interpretation. These would have the same impacts as discussed under Alternative C.

Under Alternative D, there is a plan to create an on-site visitor center. This would create an avenue for strong interpretation and BLM presence in the Monument. However, a visitor center requires regular staff hours, maintenance and a significant financial obligation. It would also detract from the experience of those seeking a wilder, more natural setting. The impact to the natural setting from any facilities proposed (kiosks, exhibits, visitor center) would be minor considering how few acres these facilities would take up compared to the number of acres that would be without facilities. Due to the topography within the Monument, most of these facilities would not be visible from most of these areas.

Impacts from Recreation and Visitor Services-- Impacts under Alternative D are the same as under Alternative C (Section 4.4.3.3) and include the following with regard to installation of a campground and visitor center. The development of a visitor center and campground and the opportunities for education and interpretation would probably increase visitation to around 30,000 visitors per year.

Installation of a campground and visitor center would increase visitor use and significantly increase BLM's financial obligation with regard to capital investments, staffing, and facility maintenance.

Installation of a visitor center would provide BLM an on-site opportunity to offer exhibits and activities devoted entirely to interpreting the unique paleontological resources of the PTNM. A visitor center would also provide a venue to conduct on-site educational programs that would better accommodate larger groups (e.g., schools, tours, family, etc.). Overall, this level of development would benefit those seeking a more comfortable, social, and controlled recreation setting. This level of development would also reduce the opportunity for those seeking a recreation experience in a less crowded and more natural setting.

Under Alternative D, recreational target shooting would not be allowed. This would have the same impacts described under Alternative C (Section 4.4.3.3).

Impacts from Trails and Travel Management-- Under Alternative D, approximately 28.3 miles of the Robledo Mountains OHV Trails would remain open to motorized and mechanized use and 4.0 miles would be closed. This closure would affect the extreme OHV recreationists as these routes are considered

to be some of the most challenging for rock crawling. Under this Alternative, 0.9 miles of Branson Canyon would remain open for rock crawling under Alternative D. The rest of the impacts would be the same as described under Alternative C (Section 4.4.3.3).

Under Alternative D, the 5.5 miles of SST Mountain Bike Trail would remain open for mountain biking. This Trail provides a quality recreation experience for the mountain biking community.

Alternative D provides an opportunity to identify, construct, and maintain new trails for biking, hiking, equestrian, and OHV activity. An expanded trail system could lead recreationists and visitors to fossil sites, scenic views, geological formations and other unique qualities and values for which the Monument was designated. This would provide greater opportunities for a quality recreation experience for hikers, horseback riders, OHV users, bicyclists, and sightseers.

Impacts from Lands and Realty-- Under Alternative D, the impacts are the same as discussed under Alternative C.

Impacts from Lands with Wilderness Characteristics-- Under Alternative D, since no lands outside the WSA would be managed to maintain wilderness characteristics, Lands with Wilderness Characteristics would present no restraints to developing recreational facilities.

4.4.4 TRAILS AND TRAVEL MANAGEMENT

Assumptions and Incomplete Information: Public interest in both recreational and scientific/educational access to the Monument is assumed to increase with advertisements of its unique and significant characteristics. Currently, there is insufficient data to predict anticipated annual visitation by either recreational or scientific interests. Therefore this limits the ability to provide quantitative analysis.

Management Decisions with No Impacts to Trails and Travel Management: The following resources or uses have little or no impact on Trails and Travel Management: Air Resources, Cultural Resources, Livestock Grazing, Research Management, Socio-Economic Conditions, Special Status Species, Vegetation, Visual Resource Management, Wildland Fire Management, and Wildlife.

Effects Common to All Alternatives:

Impacts from Paleontological Resource-- Under all Alternatives, if the PTNM Authorizing Officer determines that OHV use would cause or have the potential to cause adverse impacts to specific paleontological resource sites, then an area could be closed to travel or travel restrictions may be imposed.

Impacts from Trails and Travel Management-- Under all Alternatives, casual, dispersed pedestrian and equestrian use are allowed. This allows for hikers and equestrian users to traverse the Monument as they please. They are not bound to any route.

Impacts from Lands and Realty-- Under all Alternatives, BLM would attempt to acquire an access easement for public use from a private landowner for land located in Section 20, T. 22 S., R. 1 E. This would allow for legal access for the public and administrative use into the Monument.

Impacts from Special Designations-Area of Critical Environmental Concern (ACEC)-- Under all Alternatives, the management prescription for the Robledo Mountains ACEC limits all vehicle use to designated roads and trails. For the portion of the ACEC within the Monument, there are no roads or trails; therefore there would be no vehicle use within the ACEC portion of the Monument. All travel within the ACEC would have to be on foot or on horseback. This management prescription limits the users of the ACEC, which a portion of the public would enjoy the naturalness, while others would miss out on the ACEC portion due to these restrictions.

IMPACTS OF THE ALTERNATIVES

4.4.4.1 ALTERNATIVE A

Impacts from Paleontological Resources-- Under Alternative A, casual collecting of common invertebrates and plant paleontological resources would be allowed to continue. This may encourage the public to drive on undesignated roads to get to invertebrate fossils, thus creating illegal routes within the Monument. Most likely though due to the rough routes, the traffic to find the invertebrate fossils would be primarily pedestrian traffic.

Impacts from Interpretation and Education-- Under Alternative A, off-site interpretation and education would continue as would BLM-led tours to the *Discovery Site* and other sites. The off-site education program does not cause an impact on travel management, but there are requests for tours within the Monument. Under Alternative A, construction of new routes and maintenance of existing routes

would not be planned for. This Alternative allows for the tours on the existing routes or arroyos, but they are not the most accessible or easy to hike. As interpretive tour requests increase, the need for maintained trails would increase. Lack of scheduled route or trail maintenance or construction hinders access to the Monument for a majority of those that are interested in learning about the resources and enjoying an easy stroll.

Impacts from Recreation and Visitor Uses-- Under Alternative A, SRPs would continue to be authorized. This would allow commercial, competitive, and organized groups to continue to conduct various events within the Monument. Often the SRPs are authorized for OHV events on the designated routes within the Monument. This Alternative continues to allow for OHV SRPs, which provides a great OHV experience to those that enjoy this type of recreation. This would continue to provide a quality recreation experience to the OHV community and for other groups that apply for a SRP.

Impacts from Trails and Travel Management-- Under Alternative A, motorized and mechanized use is limited to approximately 37.6 miles of designated routes. These routes provide excellent opportunities to experience the Monument on a daily basis with minimal restrictions. Those that have high clearance vehicles capable of negotiating the challenges of these routes can experience a first class OHV or mountain bike experience. However, the lack of scheduled improvement or maintenance of routes and trails reduces the ease of access for educational and some recreational uses. There is little or no opportunity for low-clearance vehicles to access the Monument.

Impacts from Lands and Realty-- Under Alternative A, the impacts are the same as those stated in *Effects Common to All Alternatives*.

Impacts from Lands with Wilderness Characteristics-- Under Alternative A, there are no impacts from the inventoried Lands with Wilderness Characteristics on trails and travel management.

Impacts from Special Designations-Research Natural Area (RNA)-- Under Alternative A, the RNA designation would remain, which has the following management prescriptions that impact trails and travel management: limit vehicle use to designated roads and trails and manage for Recreation Opportunity Spectrum (ROS) semi-primitive non-motorized class. This designation allows motorized recreation to designated routes and non-motorized use to the remaining portion of the RNA. Currently, the most used access and one of the most extreme OHV routes in the Monument is through the RNA. These management prescriptions still allow access to the Monument for recreation, research, and administrative use.

4.4.4.2 ALTERNATIVE B

Under Alternative B, motorized and mechanized use of the routes would not be allowed within the Monument, except for administrative, permitted, and emergency use. There would be no impacts from other resources to trails and travel management.

4.4.4.3 ALTERNATIVE C

Impacts from Paleontological Resources-- Under Alternative C, casual collecting of common invertebrates and plant paleontological resources would not be allowed. Collecting of common invertebrate fossils would only be allowed in conjunction with BLM authorized interpretive or educational activities and programs. This would direct groups to specific locations, thus impacting travel management by potentially developing the need for improved access and additional wear on the routes.

Impacts from Interpretation and Education-- Under Alternative C, a hiking trail system with kiosks would be developed. A visitor contact station could be developed, thus access to the station would be necessary. These needs would add routes to the Comprehensive Trails and Travel Management (CTTM) Plan (Appendix C) and to a maintenance schedule. Physical access to the Monument would be improved. Through the interpretive hiking trails, the public could intellectually access the natural resources more easily.

Impacts from Recreation and Visitor Services-- Under Alternative C, BLM could prepare an activity plan to identify, construct and maintain new trails for biking, hiking, equestrian, and OHV activity. Relative to the degree of development, an expanded trail system would increase access and related opportunities for both motorized and non-motorized travelers. BLM would prepare an activity and site development plan to explore opportunities in locating appropriate sites to develop visitor facilities such as toilets, shade shelters, information kiosks, trail markers, picnic sites, primitive campground, visitor contact station, and a trail system. Identification, designation, and development of additional trails and facilities to accommodate motorized, mechanized, equestrian, and hiking activities would have an impact on trails and travel management. Therefore as the need for routes change, it would have to be incorporated into the CTTM Plan for the Monument. These additional facilities would be analyzed through the NEPA process prior to implementation. These changes could improve the visitor experience if the visitor is looking for a more developed site. Those visitors looking for a more primitive site could be disappointed.

Impacts from Lands and Realty-- Under Alternative C, acquisition of additional access easements for public access would necessitate expansion of the CTTM Plan for the Monument. This would allow for more access points into the Monument, which would improve the visitor experience. The CTTM Plan would have to balance the need for access and the need for resource protection. As access opportunities increase in the Monument, it also adds more administrative responsibility for the BLM to maintain and manage the use of these easements.

Impacts from Lands with Wilderness Characteristics-- Under Alternative C, approximately 253 acres within the Monument would be managed for protection of the wilderness characteristics. Since there are no trails, roads, or interpretive exhibits planned within this area, there would be no impacts to trails and travel management. The area would remain open for dispersed non-motorized, non-mechanized travel, so hiking and horseback use would continue.

Impacts from Visual Resources-- Under Alternative C, VRM class objectives I and II would constrain the location and degree of any proposed trail construction. Construction of new trails would have to meet the objective to either preserve (VRM Class I) or retain (VRM Class II) the existing character of the landscape. Any newly created visual contrasts would have to be low (Class II) or very low (Class I). These constraints would require careful trail design and location and may prohibit trail construction altogether in some locations.

4.4.4.4 ALTERNATIVE D

Impacts from Paleontological Resources-- Under Alternative D, in addition to the actions and impacts stated in Alternative B.

Impacts from Interpretation and Education-- Under Alternative D, in addition to the actions and impacts stated in Alternative C, an on-site visitor center (instead of a visitor contact station) and a motorized interpretive tour route could be developed. These actions create a more developed Monument; consequently the CTTM Plan would be updated to include more or improved travel facilities. This would

allow easier access to portions of the Monument, which could benefit those that have a low-clearance vehicle. Those that enjoy the more challenging off-highway routes would not see the route improvements as an enhancement.

Impacts from Recreation and Visitor Services-- Impacts are the same as under Alternative C.

Impacts from Lands and Realty-- Impacts are the same as under Alternative C.

Impacts from Lands with Wilderness Characteristics-- Impacts are the same as under Alternative A.

Impacts from Visual Resources-- Impacts are the same as under Alternative C.

4.4.5 AIR RESOURCES

4.4.5.1 AIR QUALITY

Assumptions and Incomplete Information: Air quality data is limited within the Analysis Area and even more limited within the Planning Area. The New Mexico Environment Department has several air quality monitoring stations within Doña Ana County. Specific air quality data for specific events within the Monument is not available.

Management Decisions with No Impacts to Air Quality: The following resources or uses have no or little impact on Air Quality: Paleontological Resources, Interpretation and Education, Cultural Resources, Lands with Wilderness Characteristics, Research Management, Socio-Economic Conditions, Soils, Special Status Species, Special Designations-Area of Critical Environmental Concern and Research Natural Area, Visual Resources, Water Resources, and Wildlife.

Effects Common to All Alternatives:

Impacts from Vegetation-- Managing and restoring the vegetation within the Monument could reduce the amount of soil available for erosion and thus could lead to reduction in air quality degradation from dust. However, using only passive means of vegetation restoration, as Alternative B states, would in most cases, take a much longer time to achieve the same or similar results as would active restoration projects.

IMPACTS OF THE ALTERNATIVES

4.4.5.1.1 ALTERNATIVE A

Impacts from Trails and Travel Management and Recreation and Visitor Services-- Under Alternative A, motorized and mechanized vehicle use along approximately 37.6 miles of existing routes would result in localized dust and vehicle emissions. Most vehicle use would occur at low speeds in rough terrain along scoured canyon bottoms or across bedrock outcrops, which would not create an abundance of dust. Overall, air quality impacts from vehicle use would be minimal and short-term.

Impacts from Lands and Realty-- Under Alternative A, land use authorizations that benefit the Monument would be considered, which may create ground disturbance and temporary impacts to air quality. Actions such as surface disturbing right-of-way construction could potentially impact air quality with short-term, localized degradation. Best management practices such as controlling erosion, minimizing surface disturbance, and using dust control measures would be implemented to reduce impacts to air quality. Under Alternative A, it is not proposed to acquire the 640 acres of sub-surface acres that are not Federally-owned. This could potentially lead to development of the private minerals within the Monument, thus creating the possibility of air quality degradation from these mineral activities.

Impacts from Livestock Grazing-- Under Alternative A, movement of the livestock across the 5,280 acres and use of the two-track routes by the livestock permittees would create dust when traversed, which would temporarily adversely impact air quality.

Impacts from Soil-- The No Action Alternative management decisions for soil resources are the least restrictive of all alternatives, which allows for the greatest amount of surface disturbance. Therefore, the greatest potential to impact air quality comes from the resulting dust.

Impacts from Wildland Fire Management-- Although there are no fire management actions planned under Alternative A, in the case of an unplanned fire there would be short-term and temporary degradation to air quality during the fire. The extent of the emissions would depend on the fuel source and amount of area burning.

4.4.5.1.2 ALTERNATIVE B

Impacts from Recreation and Visitor Services-- Under Alternative B, little or no measureable impacts to air quality are anticipated resulting from recreational visitor use. Prohibiting campfires would eliminate air quality impacts from campfire smoke.

Impacts from Trails and Travel Management-- Alternative B closes the Monument to all vehicle use and eliminates the opportunity for impacts on air quality resulting from vehicle emissions and localized dust.

Impacts from Lands and Realty-- Under Alternative B, ground disturbing land use authorizations would not be permitted. Proposed in Alternative B is acquisition of the non-Federal, subsurface minerals totaling approximately 640 acres. By acquiring the subsurface minerals, it would remove the possibility of development of the private minerals within the Monument, thus eliminating the possibility of air quality degradation from these mineral activities.

Impacts from Livestock Grazing-- Livestock use under Alternative B would not be allowed. This would reduce air quality impacts as compared to Alternative A.

Impacts from Soils-- Under Alternative B, surface disturbing activities are not allowed in areas susceptible to high amounts of erosion. Reducing or eliminating surface disturbance would reduce air quality impacts from disturbance on the soil resources as compared to Alternative A.

Impacts from Wildland Fire Management-- Under Alternative B, air quality impacts from possible wildland fire are the same as under Alternative A.

4.4.5.1.3 ALTERNATIVE C

Impacts from Recreation and Visitor Services-- Under Alternative C, campfires would impact air quality with smoke emissions. Dust would occur during construction of a visitor center or visitor facilities. These impacts would be temporary, limited to the time of the campfire or construction.

Impacts from Trails and Travel Management-- Under Alternative C, permitted motorized vehicle use along approximately 26.9 miles of existing routes would result in localized dust and vehicle emissions. Most vehicle use would occur at low speeds in rough terrain and along arroyos. Overall, air quality impacts from vehicle use would be minimal and short-term.

Impacts from Lands and Realty-- Under Alternative C, limited land use authorizations that benefit the Monument would be considered, which may create ground disturbance and temporary impacts to air quality. This would be comparable to the air quality impacts discussed in Alternative A. Impacts from acquisition of the non-Federal minerals are the same as for Alternative B.

Impacts from Livestock Grazing-- Livestock use under Alternative C is similar to Alternative A except that grazing is excluded from specific locations such as proposed campsites and certain areas to protect

paleontological resources. This would likely move the minimal air quality impacts to other areas within the Monument, which would create the same impacts as Alternative A.

Impacts from Soils-- Under Alternative C, surface-disturbing activities are prohibited in areas that contain high potential for soil erosion. This reduces air quality impacts by reducing the chances of dust created at highly erosive disturbed sites.

Impacts from Wildland Fire Management-- Under Alternative C, air quality impacts from possible wildland fire are the same as Alternative A.

4.4.5.1.4 ALTERNATIVE D

Impacts from Recreation and Visitor Services-- Under Alternative D, impacts from recreation and visitor services would be similar to Alternative C. Visitors to a visitor center would create more daily motorized traffic within the Monument. Emissions and dust from visitors would increase with this Alternative as compared with the No Action Alternative.

Impacts from Trails and Travel Management-- Under Alternative D, impacts from trails and travel management would be similar to Alternative C. Motorized tour routes would create more daily motorized traffic within the Monument. Emissions and dust from visitors would increase with this Alternative as compared with the No Action Alternative.

Impacts from Lands and Realty-- Under Alternative D, land use authorizations that benefit the Monument would be considered, which may create ground disturbance and temporary impacts to air quality. This would be comparable to the air quality impacts discussed under Alternatives A and C. Impacts from acquisition of the non-Federal minerals are the same as for Alternatives B and C.

Impacts from Livestock Grazing-- Under Alternative D, impacts from livestock grazing on air quality would be similar to Alternative A.

Impacts from Soil-- Under Alternative D, soil management would allow for disturbance in highly erosive sites, which could add to localized dust that impairs the air quality.

Impacts from Wildland Fire Management-- Under Alternative D, prescribed fire can be used as a management tool. Prescribed fire would impact air quality during the prescribed fire with smoke and dust until re-vegetation occurs. The extent of the emissions would depend on the type and amount of fuel and size of fire. Air quality impacts would be minimized by using appropriate smoke management provisions.

4.4.5.2 CLIMATE

Assumptions and Incomplete Information: The assessment of greenhouse gas (GHG) emissions, their relationship to global climatic patterns, and the resulting impacts is an ongoing scientific process. The inconsistency in results of scientific models used to predict climate change at the global scale and the lack of scientific models capable of predicting climate change on regional or local scales, limit the ability to quantify potential future impacts of decisions made at this level. Determining the significance of any discrete amount of GHG emissions is beyond the limits of existing science. However, scientists are increasingly able to isolate likely scenarios for climate change and its impacts on a regional scale. The U.S. Global Change Research Program Report on Impacts of Climate Change in the United States (2009) focuses on broad areas of the country and greatest points of vulnerability as well as looking at Climate

Change Impacts in different sectors of the economy. In the Southwest, a particular concern is the uncertainty around precipitation and the potential for extended periods of drought stressing already uncertain water supplies.

When further information on the impacts to climate change is known, such information would be incorporated into the BLM's planning and NEPA documents as appropriate.

Management Decisions with No Impacts to Climate: The following resources or uses have no or little impact on Climate: Paleontological Resources, Interpretation and Education, Cultural Resources, Lands and Realty, Lands with Wilderness Characteristics, Research Management, Soils, Special Status Species, Special Designations-Area of Critical Environmental Concern, Wilderness Study Area, Research Natural Area, Visual Resources, Water Resources, and Wildlife.

Effects Common to All Alternatives:

Impacts from Trails and Travel Management and Livestock Grazing-- Livestock, humans, and vehicle emissions may contribute to climate change through the increase or decrease of greenhouse gas emissions, but it is uncertain as to what degree these activities can make a discernible impact on climate change within the 5,280 acres.

Impacts from Wildland Fire Management-- If a wildfire or prescribed fire occurred, it would result in greenhouse gas emissions, but the subsequent new vegetation may make up for this in carbon sequestration over time.

4.4.6 CULTURAL RESOURCES

Assumptions and Incomplete Information: The BLM cultural resource management program has been developed to comply with Federal law, implementing regulations, and other policy documents which address cultural resources and historic preservation. Impact analysis assumes that the program would be implemented in accordance with BLM policy. The program consists of four elements which include (1) inventory and evaluation, (2) protection and preservation, (3) cultural resource use allocation, and (4) planning.

The analysis assumes that BLM will continue the compliance (support) aspect of the program by reviewing specific projects as they are proposed within the Monument in accordance with Section 106 of the National Historic Preservation Act (NHPA). This entails taking into account the potential effects on cultural resources that are eligible for the National Register of Historic Places (NRHP) and modify proposed activities to avoid adverse effects to significant cultural resources or reduce or mitigate adverse effects should avoidance not be possible.

Information about cultural resources within the PTNM is incomplete. No systematic, block inventory has been undertaken to identify and evaluate cultural resources. Class III inventory will be conducted in compliance with Section 106 of the NHPA as projects with the potential to adversely affect significant cultural resources are proposed.

Management Decisions with No Impacts to Cultural Resources: The following resources or uses have no or little impact on Cultural Resources: Interpretation and Education, Air Resources-Air Quality and Climate, Geology/Minerals, Lands with Wilderness Characteristics, Socio-Economic Conditions, Soils, Special Designations-Area of Critical Environmental Concern, Wilderness Study Area, Research Natural Area, Special Status Species, Visual Resources, and Wildlife.

Effects Common to All Alternatives: The common denominator for *Effects Common to All Alternatives* is those programs that have the potential to propose projects that include ground disturbing activities. The programs with this potential across all Alternatives are impacts from ground disturbance from (1) Paleontological Research and (2) Research Management. This potential exists where new ground disturbance would be proposed. In all such cases where new ground disturbance is proposed, BLM will comply with Section 106 of the NHPA to inventory and evaluate cultural resources, and either modify the project to avoid adverse effects to significant cultural resources eligible for the NRHP or reduce or mitigate adverse effects where avoidance is not possible.

IMPACTS OF THE ALTERNATIVES

4.4.6.1 ALTERNATIVE A

Under Alternative A (existing management), impacts would be anticipated from the programs listed above under *Effects Common to All Alternatives* but could also include the following:

Impacts from Paleontological Resources-- Under Alternative A, casual collecting of paleontological resources is allowed. While collecting paleontological resources, there is potential for cultural resources to be inadvertently or intentionally vandalized or stolen from the Monument.

Impacts from Recreation and Visitor Services-- Under Alternative A, dispersed camping is allowed. The location of any dispersed camping site with the Monument could impact cultural resources.

Dispersed camping sites could be subject to compliance with Section 106 of the NHPA if these sites become popular and heavily used. Casual collecting of rock and mineral resources is allowed also. While collecting these resources, there is potential for cultural resources to be inadvertently or intentionally vandalized or stolen from the Monument.

Impacts from Trails and Travel Management-- Under Alternative A, the location of any existing or new routes that could be maintained, improved, or developed would be subject to compliance under Section 106 of the NHPA in order to avoid adverse effects to cultural resources.

Impacts from Lands and Realty-- Under Alternative A, any proposed land use authorizations that allow surface disturbing activities would be subject to compliance with Section 106 of the NHPA due to the proposed action potentially impacting cultural resources. However, projects proposed where cultural properties are found would be adjusted by means of mitigating the effects such as redesigning the project or changing the location. Therefore, no impacts to cultural resources are anticipated under this action.

Impacts from Livestock Grazing-- Under Alternative A, the location for any proposed range improvements with the potential for ground disturbance would be subject to compliance with Section 106 of the NHPA. The action to build, maintain, modify, or remove fences, water systems, or other range improvements would potentially impact cultural resources. However, projects proposed where cultural properties are found to be located would be adjusted by means of mitigating the effects such as redesigning the project or changing the location. Therefore, no impacts to cultural resources are anticipated under this action.

4.4.6.2 ALTERNATIVE B

Under Alternative B, potential impacts would be anticipated from the programs listed above under *Effects Common to All Alternatives*.

4.4.6.3 ALTERNATIVE C

Under Alternative C, impacts would be anticipated from the programs listed above under *Effects Common to All Alternatives* but could also include the following:

Impacts from Paleontological Resources-- Under Alternative C, collecting of common invertebrates in conjunction with a BLM authorized activity or program would be allowed. While collecting common invertebrates, there is potential for cultural resources to be inadvertently or intentionally vandalized or stolen from the Monument. This risk is less than Alternative A due to the activity being authorized and the collecting directed in a specific location supervised by individuals trained to discern fossils and minerals from artifacts.

Impacts from Recreation and Visitor Services-- Under Alternative C, designated camping areas, visitor contact station, and visitor facilities are proposed. In conjunction with BLM authorized interpretive or educational activities and programs, limited collecting of rock and mineral resources would be allowed, which would limit the potential for vandalism or looting of cultural resources. These activities would be conducted under the supervision of staff or trained docents and volunteers who can discern rocks and minerals from artifacts. The location of any proposed primitive campground, designated camping area, visitor contact station, or visitor facilities would be subject to compliance with Section 106 of the NHPA. The surface disturbance created by these proposed actions could potentially impact cultural resources. However, proposed projects where cultural properties are found would be adjusted by means of

mitigating the effects such as redesigning the project or the changing the location. Therefore, no impacts to cultural resources are anticipated under this Alternative.

Impacts from Trails and Travel Management-- Under Alternative C, potentially new routes and trails would be constructed and existing routes could be maintained or improved. The location of any existing or new routes that could be maintained, improved, or developed would be subject to compliance under Section 106 of the NHPA in order to avoid adverse effects to cultural resources.

The proposed projects where cultural properties are found would be adjusted by means of mitigating the effects such as redesigning the project or changing the location. Therefore, no impacts to cultural resources are anticipated under this action.

Impacts from Lands and Realty-- Impacts to cultural resources would be similar to those described under Alternative A.

Impacts from Livestock Grazing-- Impacts to cultural resources would be similar to those described under Alternative A.

Impacts from Vegetation-- Under Alternative C, manual removal of noxious weeds would be allowed, if necessary. The location for any proposed manual removal of noxious weeds and invasive species would be subject to compliance with Section 106 of the NHPA. The action that would allow the manual removal of noxious weeds and invasive species would be adjusted by means of mitigating the effects such as redesigning the project, so as to not create surface disturbance if cultural resources are found at the project site. Therefore, no impacts to cultural resources are anticipated under this action.

4.4.6.4 ALTERNATIVE D

Under Alternative D, potential impacts would be anticipated from the programs listed above under *Effects Common to All Alternatives* but could also include the following:

Impacts from Paleontological Resources-- Under Alternative D, the impacts would be the same as Alternative C.

Impacts from Recreation and Visitor Services-- Under Alternative D, pedestrian trails, kiosks and wayside exhibits, campgrounds, and a full service visitor center are proposed. Casual collecting of rock and mineral resources is allowed also. While collecting these resources, there is potential for cultural resources to be inadvertently or intentionally vandalized or stolen from the Monument. The location of any proposed visitor facility would be subject to compliance under Section 106 of the NHPA. The actions that would allow new pedestrian trails, kiosks, wayside exhibits, campgrounds, and a full visitor center could potentially impact cultural resources. However, the project proposed where cultural properties are found to be located would be adjusted by means of mitigating the effects such as redesigning the project or changing the location. Therefore, no impacts to cultural resources are anticipated from proposed facilities under this Alternative.

Impacts from Trails and Travel Management-- Impacts to cultural resources would be the same as those described in Alternative C.

Impacts from Land and Realty-- Impacts to cultural resources would be the same to those described in Alternative A and Alternative C.

Impacts from Livestock Grazing-- Impacts to cultural resources would be the same to those described in Alternative A and Alternative C.

Impacts from Vegetation-- Impacts to cultural resources would be the same to those described in Alternative C.

Impacts from Wildland Fire Management-- The location of any proposed prescribed fire and mechanical thinning would be subject to compliance under Section 106 of the NHPA. The action that would allow prescribed fire and mechanical thinning could potentially impact cultural resources. However, the proposed projects where cultural properties are found would be adjusted by means of mitigating the effects such as redesigning the project or changing the location. Therefore, no impacts to cultural resources are anticipated under this action.

4.4.7 LANDS AND REALTY

Assumptions and Incomplete Information: Any and all land use authorizations would include stipulations to avoid introducing noxious weeds into the Monument.

Management Decisions with No Impacts to Lands and Realty: The following resources or uses have no or little impact on Lands and Realty: Interpretation and Education, Trails and Travel Management, Air Resources, Cultural Resources, Livestock Grazing, Research Management, Special Designations-Research Natural Area, Special Status Species, Vegetation, Wildland Fire Management, Wildlife.

Effects Common to All Alternatives:

Impacts from Lands and Realty-- Under all Alternatives, BLM would continue to acquire an access easement for legal access across Section 20, T. 22 S., R. 1 E. This would allow BLM and the public to have legal access into the Monument.

Impacts from Special Designations-Area of Critical Environmental Concern-- Under all Alternatives, rights-of-way are not authorized in the ACEC. These limitations on rights-of-way would reduce the number of acres available for rights-of-way in the Monument by about 789 acres.

IMPACTS OF THE ALTERNATIVES

4.4.7.1 ALTERNATIVE A

Impacts from Lands and Realty-- Under Alternative A, due to the Legislation guiding the decisions made in the Monument, there are no resources impacting lands and realty. The Legislation has stated that only those uses that benefit the Monument would be allowed and Alternative A is considered the No Action Alternative. The private mineral estate located in the southern portion of the Monument would not be acquired, which could result in split-estate issues. This would be incompatible with management of the public land within the PTNM. Under Alternative A, land use authorizations (both surface disturbing and non-surface disturbing) could be authorized on a case-by-case basis following NEPA analysis and if it is consistent with the Monument's goals and objectives.

4.4.7.2 ALTERNATIVE B

Impacts from Recreation and Visitor Services-- Under Alternative B, there would be no management actions that would impact lands and realty.

Impacts from Lands and Realty-- Under Alternative B, surface-disturbing authorizations would not be authorized. Non-surface disturbing activities could be authorized. This would allow authorizations such as film permits in the Monument, which could be a benefit to the promotion of the resources and scientific research. In Alternative B, there are no structures or facilities planned, so this limitation from lands and realty does not impact other management actions.

The BLM would attempt to acquire non-Federal minerals located in Section 36, T. 23 S., R. 1 W., to reduce possible surface disturbance associated with mineral development which would be incompatible with management of the PTNM. This would allow enhanced management consistent with the

Monument's goals and objectives. As a result of acquiring the non-Federal minerals, the BLM would have jurisdiction over both the surface and subsurface.

Impacts from Lands with Wilderness Characteristics-- Under Alternative B, approximately 576 acres of land within the Monument would be managed for wilderness characteristics. One of the management prescriptions is to manage this area as an exclusion area for rights-of-ways. This would eliminate those 576 acres from being available for rights-of-ways, but does not eliminate them from all land use authorizations. For example, film permits proposing no surface disturbance could be permitted under Alternative B. Although this limits the type of land use authorizations permitted within these 576 acres, it allows management of the area to be consistent with the goals and objectives of lands with wilderness characteristics.

Impacts from Visual Resources-- Under Alternative B, the area designated as the Robledo Mountains WSA and ACEC and Lands with Wilderness Characteristics would be managed as VRM Class I (1,365 acres). The rest of the Monument would be managed as VRM Class II. In Alternative B, surface disturbing land use authorizations are not allowed, so there would be no impacts from visual resources on the Lands and Realty program.

4.4.7.3 ALTERNATIVE C

Impacts from Recreation and Visitor Services-- Under Alternative C, impacts from the Recreation and Visitor Services program could include the need for authorizing rights-of-way (electricity, water, roads) to service the proposed visitor facilities.

Impacts from Lands and Realty-- Under Alternative C, land use authorizations (both surface disturbing and non-surface disturbing) would be considered if it is consistent with the Monument's goals and objectives and NEPA analysis. Acquisition of access easements for public use from the New Mexico State Land Office across Section 32, T. 22 S., R. 1 E. and Section 22, T. 22 S., R. 1 W. would facilitate public and administrative access. This allows for improving and managing the Monument, thus improving visitors and scientists' visit to the Monument with potential improvements and access.

Impacts from acquiring the 640 acres of non-Federal mineral estate within and adjacent to the Monument in Section 36, T. 23 S., R. 1 W. are the same as Alternative B.

Impacts from Lands with Wilderness Characteristics-- Under Alternative C, approximately 253 acres of land within the Monument would be managed for wilderness characteristics. One of the management prescriptions is to manage the 253 acres as an exclusion area for rights-of-ways. This would eliminate those 253 acres from being available for rights-of-ways, but does not eliminate them from all land use authorizations. For example, film permits proposing no surface disturbance would be considered for authorization. Although this limits the types of land use authorizations permitted within these 253 acres it allows management of the area to be consistent with the goals and objectives of Lands with Wilderness Characteristics.

Impacts from Visual Resources-- Under Alternative C, the area designated as the Robledo Mountains WSA and ACEC and Lands with Wilderness Characteristics would be managed as VRM Class I (1,042 acres). The rest of the Monument would be managed as VRM Class II. Any authorizations in VRM Class I areas would not impair the wilderness characteristics or the visual qualities. Prior to construction of any visitor facilities, an activity and site development would be completed, which would explore opportunities of appropriate locations for facilities. Therefore, authorizations would be designed as to not impair these visual qualities.

4.4.7.4 ALTERNATIVE D

Impacts from Recreation and Visitor Services-- The impacts are the same as under Alternative C.

Impacts from Lands and Realty-- The impacts are the same as under Alternative C.

Impacts from Lands with Wilderness Characteristics-- Under Alternative D, there would be no management actions for lands with wilderness characteristics that would impact lands and realty.

Impacts from Visual Resources-- Under Alternative D, the area designated as the Robledo Mountains WSA and ACEC would be managed as VRM Class I (789 acres). The rest of the Monument would be managed as VRM Class II. These impacts are the same as for Alternative C.

4.4.8 LANDS WITH WILDERNESS CHARACTERISTICS

Assumptions and Incomplete Information: Wilderness characteristics attributes include the area's size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation. They may also include supplemental values. Lands with Wilderness Characteristics are those lands that have been inventoried and determined by the BLM to contain wilderness characteristics as defined in section 2(c) of the Wilderness Act (Public Law 88-577). In 2011, the wilderness inventory was updated for the Monument. This inventory identified 576 acres of land contiguous to the Robledo Mountains WSA within the Monument as having wilderness characteristics.

Management Decisions with No Impacts to Lands with Wilderness Characteristics: The following resources or monument uses have little or no impact on those Lands with Wilderness Characteristics: Air Resources, Cultural Resources, Livestock Grazing, Soils, Special Management Areas-ACEC and RNA, Special Status Species, Visual Resources, Vegetation, Water Resources, Wildland Fire Management, and Wildlife.

IMPACTS OF THE ALTERNATIVES

4.4.8.1 ALTERNATIVE A

Under Alternative A, 576 acres are identified as having wilderness characteristics, but are not protected from actions that would diminish those characteristics. Having stated that, there are not any activities planned under Alternative A for those 576 acres that would impact the wilderness characteristics of these lands.

4.4.8.2 ALTERNATIVE B

Under Alternative B, approximately 576 acres are identified as Lands with Wilderness Characteristics. There are no resource management actions that would cause impacts that would detract from the naturalness of these 576 acres. All resource management actions stated under Alternative B would be complementary to protecting wilderness characteristics.

4.4.8.3 ALTERNATIVE C

Under Alternative C, approximately 253 acres would be identified and protected as lands with wilderness characteristics. Approximately 323 acres of land identified during the 2011 inventory would not be protected for its wilderness characteristics. There are no planned resource management actions that would cause impacts that would detract from the naturalness of the 253 acres.

Impacts from Paleontological Resources-- Under Alternative C, collecting of common invertebrate fossils would be allowed in conjunction with BLM authorized interpretive or educational programs or activities. This would direct fossil collectors to specific locations. Although these locations have not been determined as of yet, those lands inside of the area protected as lands with wilderness characteristics would not be chosen. The 253 acres protected for its wilderness characteristics would not be used for public fossil collecting. Those 323 acres not protected for wilderness characteristics could then be chosen for purposes such as paleontological research, collecting areas, interpretation, etc. The human impacts on the 323 acres would be noticeable, which is the reasoning behind only protecting 253 acres (in addition to the Robledo Mountains WSA) for its wilderness characteristics.

Impacts from Interpretation and Education-- Under Alternative C, development of a hiking trail system with kiosks would occur. In order to interpret the *Discovery Site* properly, a trail and signage would be necessary on the land not protected for its wilderness characteristics. The human impacts on the 323 acres would be noticeable, which is the reasoning behind only protecting 253 acres for its wilderness characteristics in Alternative C.

Impacts from Recreation and Visitor Services-- Under Alternative C, designated camping areas, hiking trails, visitor contact station, and visitor facilities are proposed. These recreational trails and facilities could be placed on the 323 acres outside of the protected lands with wilderness characteristics. These lands would then lose their naturalness, but those 253 acres adjacent to the Robledo Mountains WSA would still be managed for wilderness features.

Impacts from Trails and Travel Management-- Under Alternative C, new routes and trails could be constructed and existing routes could be maintained or improved. This alternative would allow for a trail to be constructed or maintained to the *Discovery Site*, which is the boundary for those acres managed as lands with wilderness characteristics. Alternative C allows for man-made intrusions on the area outside of the protected 253 acres. Those that want a wilderness experience would be able to access these lands and the Robledo Mountains WSA via the trail leading to the *Discovery Site*.

Impacts from Lands and Realty-- Under Alternative C, surface-disturbing land use authorizations would be authorized on those lands not protected for wilderness characteristics following NEPA analysis. Wilderness characteristics would be lost for those acres (323) that are not protected. Surface-disturbing land use authorizations could take away the naturalness from area, which is why those actions would not be permitted within the lands protected for wilderness characteristics.

4.4.8.4 ALTERNATIVE D

Under Alternative D, non-WSA lands would not be managed to maintain wilderness characteristics, so there would be no lands with wilderness characteristics to incur impacts.

Impacts from Paleontological Resources-- Under Alternative D, the impacts are the same as Alternative B except proposed actions may impact those 576 acres that are not protected for wilderness characteristics. The loss is 576 acres of lands with wilderness characteristics.

Impacts from Interpretation and Education-- Under Alternative D, the impacts are the same as Alternative C except the impacts could be on 576 acres. The loss is 576 acres of lands with wilderness characteristics.

Impacts from Recreation and Visitor Services-- Under Alternative D, the impacts are the same as Alternative C except the impacts could be on 576 acres. The loss is 576 acres of lands with wilderness characteristics.

Impacts from Trails and Travel Management-- Under Alternative D, the impacts are the same as Alternative C except the impacts could be on 576 acres. The loss is 576 acres of lands with wilderness characteristics.

Impacts from Lands and Realty-- Under Alternative D, the impacts are the same as Alternative C except the surface disturbing impacts could be on 576 acres. The loss is 576 acres of lands with wilderness characteristics.

4.4.9 LIVESTOCK GRAZING

Assumptions and Incomplete Information: It is assumed that the number of visitors to the Monument would increase over time.

Management Decisions with No Impacts to Livestock Grazing: The following resources or uses have no or little impact on Livestock Grazing: Paleontological Resources, Interpretation and Education, Air Resources, Cultural Resources, Lands and Realty, Research Management, Soils, Special Designations-Research Natural Area, Special Status Species, Visual Resources, Water Resources, and Wildlife.

Effects Common to All Alternatives:

Impacts from Special Designations-Area of Critical Environmental Concern-- Under all Alternatives, the continued management of the ACEC designation would limit the construction of surface disturbing range improvements such as fences, watering facilities, pipelines, and erosion control structures. This could limit the ability to change the management of the area due to not being able to create pastures or create new livestock waters in order to rotate the use of the rangeland.

Impacts from Travel and Trail Management-- Under Alternatives A, C, and D, livestock operators would have permission to use motorized vehicles on designated routes. This would allow for the operators to maintain range improvements and care for livestock with motorized vehicles, on foot, or horseback.

Impacts from Wildland Fire Management-- Under all Alternatives, improvements within the Monument would be protected from all fire by preplanned defendable space and fire suppression tactics as needed. Even though, these precautions would be taken, wildfires could damage or destroy range improvement infrastructure such as watering facilities and fences, and could result in injury or death of livestock. In the event of a wildland fire, grazing deferment would potentially occur, which would impact livestock operations. Livestock would have to be removed from the burned area therefore the grazing permittees would then have to find another location for the livestock or reduce their number of livestock until the grazing deferment is complete.

IMPACTS OF THE ALTERNATIVES

4.4.9.1 ALTERNATIVE A

Impacts from Recreation and Visitor Services-- Under Alternative A, visitor facilities would be minimal. With the designation of the Monument, it is assumed that the number of visitors would increase. Increased recreational use by visitors to the Monument could result in conflicts with livestock and allotment management goals. Visitors congregating around livestock waters would directly conflict with livestock watering needs. Vandalism, carelessness or abuse by visitors could result in damage to range improvements including watering facilities, pipelines, and fences, which would in turn interfere with the proper management of livestock.

Impacts from Trails and Travel Management-- Under Alternative A, the designated routes would continue to exist for motorized, mechanized, and pedestrian travel. Designation of the Monument is expected to result in increased use of roads and trails within the Monument, leading to the potential for an increase in collisions with vehicles resulting in injury to visitors or livestock.

Impacts from Livestock Grazing-- Under Alternative A, grazing would continue on both the Picacho Peak and Altamira allotments. Range improvements would continue to exist on the Picacho Peak Allotment, which are authorized under Section 4 range improvement permits and cooperative agreements. Range improvement permits grant title and maintenance responsibility to the grazing permittee, while cooperative agreements provide shared title between the permittee and BLM. The goal of improvements to the range infrastructure would be to improve distribution of cattle, promote rangeland health, and maintain or enhance forage production. The authorization of future range improvements would be prioritized based on a cost-benefit analysis. The continued maintenance and functionality of these improvements is important to maintain an even distribution of the grazing pressure associated with cattle grazing and provide water sources for wildlife.

Impacts from Lands with Wilderness Characteristics-- Under Alternative A, there are no designated lands with wilderness characteristics, so there are no impacts to livestock grazing.

Impacts from Vegetation-- Under Alternative A, chemical herbicides could be used to control noxious weeds. Introduced exotic and native weeds would compete with desired native plant species for water and nutrients if not controlled. It is probable that continued shrub encroachment would result in further competition with perennial forage species. Increased competition for resources could ultimately lead to reductions in grass cover and forage available for livestock use.

4.4.9.2 ALTERNATIVE B

Impacts from Livestock Grazing-- Under Alternative B, livestock grazing would be excluded from the PTNM. As a result, livestock grazing would not be impacted by any other resources. Minor fence reroutes of the pasture fence dividing the north and south pastures of the Picacho Peak Allotment would be necessary to fully exclude approximately 150 acres in the southern part of the National Monument from the remainder of the Allotment. Additional fence might also be needed to define the Monument boundary. The perimeter of the PTNM is approximately 14.5 miles in length. Of this length, approximately 0.75 miles of existing fence parallels the Monument boundary. Approximately 1.3 miles of pasture fence would need removal or need to be rerouted. In total, approximately 13.75 miles of fence would need to be constructed to define the entire Monument boundary, and ensure grazing from the surrounding allotments would be excluded. Assuming an estimate of \$3.20 per foot based on construction of a wire fence in rough terrain from the 2011 practice cost data from the Natural Resources Conservation Service (NRCS 2011), this would result in approximately \$232,320 of cost that would likely be incurred by the BLM to exclude livestock grazing from the Monument.

Overall, exclusion of grazing on the Monument would eliminate approximately 4,360 acres from the north pasture on the Picacho Peak Allotment; this would make the north pasture virtually unusable, since the remaining parcels would be very small and would be separated by the Monument. Ultimately, this would result in decreased flexibility for the grazing permittee since only one pasture would remain on the Allotment removing the ability to defer areas from grazing. Also, reductions to the number of cattle that could responsibly graze on the Allotment would need to be made from the reduced acreage on the allotment, having a direct economic impact on the livestock operations for the grazing permittee. There would be a decrease in carrying capacity of 396 animal unit months (AUMs) or 39 cattle yearlong for the Picacho Peak Allotment based on the new percentage of public land forage use of 85 percent. In addition, all livestock watering points and pipelines in the north pasture of the Picacho Peak Allotment are within the Monument boundary. The majority of range improvement projects in the Monument are currently authorized under range improvement permits that grant title and maintenance responsibility to the grazing permittee. The Robledo Interior Fence and the Robledo Pipeline are authorized under cooperative agreements, where title is shared between the contributing grazing permittee and the BLM, and

maintenance responsibility belongs to the grazing permittee. If grazing were discontinued within the Monument, the United States would be required to compensate the permittee for their share of the value of the range improvements in accordance with the grazing regulations (43 CFR 4120.3-6). The permittee may be allowed to remove the range improvements authorized under a range improvement permit, which would include salvaging materials and performing site rehabilitation where needed as a result of ground disturbance from removing these improvements.

Exclusion of livestock from the Monument would have a minor impact on current management trends for the Altamira Allotment. There would be a loss of approximately 800 acres available to grazing, which would result in reductions to the allotment carrying capacity. The loss of these acres would result in a decrease in carrying capacity of approximately 58 AUMs or 5 cattle yearlong on the Altamira Allotment. Currently, no range improvement projects are authorized on the Altamira Allotment within the Monument boundary.

4.4.9.3 ALTERNATIVE C

Impacts from Recreation and Visitor Services-- Under Alternative C, visitor facilities would expand. Therefore, there is a potential for some grazing exclusion areas that would result in minor decreases in acreage available for grazing. Projects that involve reducing the acreage available to grazing would be individually analyzed for site-specific impacts to livestock grazing and if applicable, changes to carrying capacity.

Impacts from Trails and Travel Management-- Under Alternative C, improvement of designated routes or construction of new routes could increase motorized use of the Monument, which would result in the increase for potential conflicts between livestock and motorized vehicle users. More interaction between livestock and humans or vehicles increases the chances of livestock and visitors getting hurt or livestock improvements getting damaged.

Impacts from Livestock Grazing-- Under Alternative C, adjustments could be made to the allotment management plan in consultation with the grazing permittee to aid in management of the Monument. Adjustments to allotment management would be necessary if exclusion areas were created in order to minimize contact between livestock and recreational areas that would see heavy use by Monument visitors. Adjustments to the allotment management plan would also be needed if changes were warranted in season of use, prescribed grazing systems, or livestock numbers. Range improvements would be authorized in a manner consistent with Alternative A in order to promote rangeland health and maintain or enhance forage production. Improvements would be designed to enhance Monument management objectives and minimize potential conflicts with other resources and uses.

Impacts from Lands with Wilderness Characteristics-- Under Alternative C, approximately 253 acres would be managed for wilderness characteristics. Within these 253 acres, surface disturbing range improvements would not be constructed and motorized and mechanized vehicle use would not be allowed. This would exclude an additional 253 acres within the Monument for construction of livestock improvements.

Impacts from Vegetation-- Under Alternative C, integrated management techniques including passive, manual, biological, chemical, and mechanical treatment methods to manage noxious weeds and non-native invasive species would be used. This would limit the competition between noxious weeds or non-native invasive species with desired forage thus increasing desired forage for livestock. Particular sites within the Monument would be managed for multiple-use values while maintaining or enhancing habitat for special status species.

Impacts from Wildland Fire Management-- Impacts to livestock grazing from wildland fire management under this Alternative would be the same as those described under Alternative A.

4.4.9.4 ALTERNATIVE D

Impacts from Recreation and Visitor Services-- Impacts to livestock grazing from recreation and visitor services under this Alternative would be similar to those described under Alternative C.

Impacts from Trails and Travel Management-- Impacts to livestock grazing from trails and travel management under this Alternative would be similar to those described under Alternative C.

Impacts from Livestock Grazing-- Under Alternative D, management of livestock grazing would occur in a manner similar to the current management outlined in Alternative A.

Impacts from Lands with Wilderness Characteristics-- Under Alternative D, impacts to livestock grazing from lands with wilderness characteristics are the same as described under Alternative A.

Impacts from Vegetation-- Under Alternative D, integrated management techniques including passive, manual, fire, biological, chemical, and mechanical treatment methods to manage noxious weeds and non-native invasive species would be used. This would limit the competition between noxious weeds or non-native invasive species with desired forage thus increasing desired forage for livestock. Particular sites within the Monument would be managed for emphasizing commodity uses while maintaining or enhancing habitat for special status species.

Impacts from Wildland Fire Management-- Under Alternative D, fire could be used as a vegetation management tool. Grazing deferments would be necessary to accumulate fine fuels in preparation of a prescribed fire, and also following a fire to help protect vegetation and soil stability afterward. Grazing deferments would impact typical livestock operations on the Picacho Peak Allotment by reducing flexibility in pasture rotation since there are only two active pastures on the Allotment. Any deferments in the north pasture for fire treatments to manage the Monument would either result in rotating livestock into the south pasture or moving them to privately-owned or leased lands elsewhere for the duration of the required deferment period. Any additional livestock use in the south pasture would result in increases to grazing pressure on vegetation, particularly around water sources.

4.4.10 SOCIO-ECONOMIC CONDITIONS

Data Sources:

Economic effects were modeled using IMPLAN Professional Version 3.0 and the Forest Economic Analysis Spreadsheet Tool (FEAST), with 2009 data. Data on use levels under each alternative were collected from the PTNM's resource specialists. In most instances, the precise change is unknown. Therefore, the changes are based on the professional expertise of the resource specialists.

Social effects use the baseline social conditions presented in the Affected Environment Section, visitor information from the Recreation Section of this analysis, and information from the Community Socioeconomic Workshops (Preister 2003) to discern the primary values that the Monument provides to area residents and visitors. Social effects are based on the interaction of the identified values with estimated changes to resource availability and uses.

Assumptions and Incomplete Information:

1. Animal Unit Months (AUMs) were converted to Head Months (HMs) for consistency with the economic modeling software. This conversion comes from the Forest Service Grazing Statistical Summary (USFS 2011). In New Mexico, one cattle AUM is equivalent to 0.8 HMs.
2. The economic impact of grazing was estimated using authorized levels. However, actual use is permitted annually based on a number of factors, such as current forage and market conditions. The impact of current utilization is reported.
3. Changes in use levels were estimated using professional judgment. However, precise changes in use are not possible to predict.
4. Some of the value of public land management is not captured in market transactions. Non-market goods and services, such as clean air and scenic vistas, have economic values. However, the monetary values of such goods and services are generally unknown. As a result, it is difficult to analyze potential tradeoffs between market and non-market values. In general, management actions that promote public land health will increase non-market values. For the purpose of this analysis, lands managed for wilderness characteristics will be used as a proxy for non-market values.
5. Visitor use is expected to continue at current levels, with steady annual increases. Monument visitation estimates are unavailable. Although periodic vehicle counts occur, no statistically rigorous surveys have been deployed to estimate Monument visitation. While the paleontological resources of the PTNM do attract visitors, this is a form of dispersed recreation for which BLM does not have visitation estimates. As a result, economic analysis of recreation on the Monument will provide response coefficients (economic impact per \$1 million of visitor expenditures).
6. It is assumed that visitors to the Monument for the purpose of recreation and scientific research would steadily increase over the life of the Plan, regardless of the chosen alternative.
7. The Community Socioeconomic Workshop report (Preister 2003) identifies a number of values related to public land in Doña Ana County, including: (a) public land access, (b) diverse and plentiful recreation opportunities, (c) ecological health, (d) preservation of traditional and cultural uses of public land, (e) community and economic development. These are assumed to be the key social values related to public land management in the Analysis Area.

Management Decisions with No Impacts to Social and Economic Conditions: Under all Alternatives, the following programs would have little or no impact to Socio-Economic Conditions: Paleontological Resources, Interpretation and Education, Air Resources, Cultural Resources, Lands and Realty, Soils, Special Status Species, Vegetation, Water Resources, and Wildlife.

Effects Common to All Alternatives:

Impacts from Recreation and Visitor Services-- Under all Alternatives, visitation to the Monument is expected to increase steadily over the life of the Plan. Table 4-2 lists the estimated employment and labor income supported in the local economy per \$1 million of visitor spending.

Table 4-2 Local Employment and Income Impacts per \$1,000,000 of Visitor Spending, by Segment Share

TABLE 4-2 LOCAL EMPLOYMENT AND INCOME IMPACTS PER \$1,000,000 OF VISITOR SPENDING BY SEGMENT SHARE		
	EMPLOYMENT	LABOR INCOME
Local Day	12.3	\$347,954
Local Overnight – on BLM	10.6	\$368,637
Local Overnight – off BLM	13.9	\$394,212
Non-local Day	13.8	\$375,536
Non-local Overnight – on BLM	13.1	\$405,798
Non-local Overnight – off BLM	16.2	\$428,085
SOURCE: MIG 2009		

Table 4-3 provides the average spending by party for hiking/biking and OHV use. These figures are based on the average spending of visitors to National Forests, as data specific to the Monument or the BLM are not available.

Table 4-3 Average Party Spending By Activity

TABLE 4-3 AVERAGE PARTY SPENDING BY ACTIVITY		
	AVERAGE VISITOR SPENDING (HIKING/BIKING)	AVERAGE VISITOR SPENDING (OHV USERS)
Local Day	\$21	\$58
Local Overnight	\$150	\$134
Non-local Day	\$50	\$109
Non-local Overnight	\$473	\$277
SOURCE: Stynes and White 2010		

Taken together, these tables enable the translation of party visits to local economic impacts. For instance, $3,871(\$1,000,000/12.3 = \$81,301$ in visitor spending per job. $\$81,301/\$21 = 3,871$ local day party visits) local day visitor parties hiking or biking on the Monument would support one job in the local economy.

During Fiscal Year 2010, the Park Rangers recorded approximately 200 visitors per month, on average. However, vehicle counts occur inconsistently and are not representative of total visitation to the Monument. Traditionally, there has been one SRP issued each year for commercial OHV activity within the boundaries of the PTNM. Reported utilization (by vehicle registration) typically runs between 200 and 300 vehicles per day for the 4-day event. There are no reliable estimates of guests and spectators, although anecdotal information suggests that each vehicle averages one passenger (guest) and that the number of spectators may vary from fewer than 10 to more than 100, depending on the venue.

Impacts to Environmental Justice-- The majority (65.7 percent) of residents in Doña Ana County identify as Hispanic or Latino (U.S. Census Bureau 2010). The County also has a high incidence of poverty, with approximately one-quarter of residents living in poverty. However, an analysis of the decisions to be made under the Alternatives did not identify environmental justice consequences. Since all Alternatives continue to support similar levels of employment and income, none of the decisions are expected to disproportionately or adversely affect environmental justice communities.

Consequences to social values are analyzed within the Alternatives. Although quality of life associated with Monument uses may vary between Alternatives, none of these changes are expected to disproportionately affect Hispanic and Latino residents.

American Indian uses and traditional cultural practices will not be affected by any planning decisions.

IMPACTS OF THE ALTERNATIVES

4.4.10.1 ALTERNATIVE A

Impacts from Trails and Travel Management-- Under Alternative A, non-permitted and permitted use by motorized and mechanized vehicles would continue on approximately 37.6 miles of trails and routes previously designated. Alternative A offers the most miles of trails and routes among the considered Alternatives. Residents and visitors who hold social values related to public land access and OHV recreation would benefit from Alternative A. However, a number of comments in the Preister (2003) report expressed concern that motorized and mechanized recreation on public land disturbs ecological health and reduces the quality of the recreation experience for non-motorized users.

The link between miles of designated trails and routes and site visitation is unknown. More opportunities for motorized and mechanized recreation may make the Monument more attractive to some individuals and less attractive to others. Therefore, the economic impact of trail and route designation cannot be calculated.

Impacts from Livestock Grazing-- Alternative A would continue current livestock grazing management, with 454 permitted AUMs within the Monument boundary. However, the current stocking rate is considerably less. With over 1.5 million cattle and calves in New Mexico, the AUMs on the PTNM account for a very small portion of the livestock farming and ranching sector in the State (NASS 2011). As a result, less than one job and between \$3,000 and \$5,000 (depending on stocking rate) in labor income would be supported by grazing on the Monument, annually.

Impacts from Lands with Wilderness Characteristics-- Under Alternative A, there would be no lands managed with wilderness characteristics; therefore, there is no social or economic impact.

Impacts from BLM Expenditures-- Salary and non-salary (e.g., equipment) expenditures related to Monument management support approximately 5 jobs and \$287,000 in labor income in the local economy, annually.

Payments from the Monument to states and counties (e.g., PILT) total approximately \$13,000. These payments contribute to State and local budgets. Due to the relatively small size of these payments, less than one job and approximately \$8,000 in labor income would be supported in the local economy, annually.

4.4.10.2 ALTERNATIVE B

Impacts from Trails and Travel Management-- Under Alternative B, the Monument would be closed to all motorized and mechanized use except administrative and emergency motorized use. Alternative B offers the fewest miles of roads and trails open to motorized and mechanized use. The closure of the Monument to all recreational motorized and mechanized uses would reduce quality of life for individuals who primarily value public land access and OHV recreation opportunities. The selection of Alternative B would make the Monument a less attractive recreation destination for motorized and mechanized recreationists. As a result, some individuals would likely choose to recreate elsewhere or stay home. This would reduce the economic impact of recreation on the public land in the local economy. However, since a number of individuals stated that motorized recreation reduced the quality of their experiences of public land (Preister 2003), the elimination of motorized and mechanized recreation on the Monument may make it a more attractive destination for non-motorized uses. As explained under Alternative A, the net economic effect of trail and route designation cannot be calculated with available information.

Impacts from Livestock Grazing-- Alternative B would eliminate livestock grazing on the Monument. No grazing-related employment or labor income would be supported by activities on the Monument. Although the economic effect of this change would be imperceptible in the local economy, there would be social consequences. The ranchers who use the Picacho Peak and Altamira Ranch allotments would need to replace the lost forage. Since private forage is more costly than public land forage, the ranchers' operating costs would increase (NASS 2011). In addition, some individuals associated public land grazing with cultural and heritage values. The loss of grazing opportunities on public land, therefore, would reduce the quality of life for individuals who hold such values.

Impacts from Lands with Wilderness Characteristics-- Alternative B would manage 576 acres (11 percent) of the Monument for wilderness characteristics outside of the WSA. Alternative B would manage the highest proportion of the Monument for wilderness characteristics among the considered Alternatives. Therefore, Alternative B would be most likely to increase non-market economic values. Alternative B would appeal to individuals who are primarily concerned with the ecological health of the public land.

Impacts from BLM Expenditures-- Salary and non-salary (e.g., equipment) expenditures related to Monument management support approximately 5 jobs and \$287,000 in labor income in the local economy, annually.

Payments from the Monument to states and counties (e.g., PILT) total approximately \$13,000. These payments contribute to State and local budgets. Due to the relatively small size of these payments, less than one job and approximately \$8,000 in labor income would be supported in the local economy, annually.

4.4.10.3 ALTERNATIVE C

Impacts from Recreation and Visitor Services-- A visitor contact station would be developed under Alternative C. The expected cost for the station is outlined in the Recreation and Visitor Services Section (Section 4.4.3). During site construction, approximately 2.4 jobs and \$91,750 in labor income would be contributed to the local economy. The visitor contact station would not require additional staffing, therefore, no additional jobs would be supported during the operations and maintenance phase. Periodic road and site maintenance would contribute to the local economy; however, expected expenditures are minimal.

Impacts from Trails and Travel Management-- Under Alternative C, 100 percent of Tabasco Twister Trail (2.7 miles) and 100 percent (1.8 miles) of Patzcuaro's Revenge Trail would be closed to motorized and mechanized vehicle use. One-hundred percent (0.5 miles) of an un-named route from the intersection of Cayenne Crawler and Pasado to Sandia Gulch would be closed. One-hundred percent (0.4 miles) of the Cayenne Crawler Trail would be closed to motorized and mechanized use to eliminate access from the south to Patzcuaro's Revenge Trail. Alternative C has the second-fewest miles of roads and trails open to motorized and mechanized users among the considered alternatives. Alternative C would leave the majority of the designated routes and trails available under Alternative A open to motorized and mechanized uses. Therefore, while social values related to access and OHV recreation would decrease relative to Alternative A, the change would be small. It is unlikely that many individuals would choose not to recreate on the Monument as a result of this change. Therefore, no measurable economic impact is expected. In social terms, Alternative C would balance some of the conflicting interests related to public land management. Specifically, Alternative C would continue to support public land access and diverse recreation opportunities while also reducing damage to natural and cultural resources.

Impacts from Livestock Grazing-- Alternative C would continue to permit cattle grazing. Although, as with Alternative A, actual use may be expected to be lower depending on forage and market conditions. With over 1.5 million cattle and calves in New Mexico, the AUMs on the PTNM make up a very small portion of the livestock farming and ranching sector in the State (NASS 2011). As a result, less than one job and between \$3,000 and \$5,000 (depending on stocking rate) in labor income would be supported, annually.

Impacts from Lands with Wilderness Characteristics-- Alternative C would manage 253 acres (5 percent) of the Monument for wilderness characteristics. Alternative C would manage the second-highest proportion of the Monument for wilderness characteristics among the considered Alternatives. This Alternative would balance the interests of individuals who value the ecological preservation of the public land with the interests of individuals who primarily value access and motorized recreation opportunities. Alternative C would increase non-market economic values relative to Alternatives A and D.

Impacts from BLM Expenditures-- Salary and non-salary (e.g., equipment) expenditures related to Monument management support approximately 5 jobs and \$287,000 in labor income in the local economy, annually. The construction and maintenance of the visitor contact station is excluded from these estimates.

Payments from the Monument to states and counties (e.g., PILT) total approximately \$13,000. These payments contribute to State and local budgets. Due to the relatively small size of these payments, less than one job and approximately \$8,000 in labor income would be supported in the local economy, annually.

4.4.10.4 ALTERNATIVE D

Impacts from Recreation and Visitor Services-- A visitor center would be developed under Alternative D. The expected cost for the center is outlined in the Recreation and Visitor Services Section (Section 4.4.3). During the construction phase, approximately 22 jobs and \$830,300 in labor income would be contributed to the local economy. Throughout operations and maintenance of the facility, additional staff would be required to manage the visitor center. Staffing of the visitor center would support slightly more than one job and \$33,000 in labor income in the local economy, annually.

Impacts from Trails and Travel Management-- Impacts would be the same as under Alternative C except that the Cayenne Crawler Trail (0.4 miles) would be left open for motorized and mechanized use and modified to allow motorized and mechanized use on 0.9 miles of Patzcuaro's Revenge Trail.

Alternative D would offer the second-highest miles of roads and trails open to motorized and mechanized use among the considered alternatives. However, the difference between Alternative C and Alternative D is so small in terms of the total available routes that the social and economic impacts are not expected to differ between these alternatives.

Impacts from Livestock Grazing-- Alternative D would be the same as Alternative A.

Impacts from Lands with Wilderness Characteristics-- Alternative D would manage 0 acres (0 percent) of the Monument for wilderness characteristics outside of the WSA. Alternative D would manage the same number of acres for wilderness characteristics as Alternative A; therefore, the social and economic impacts discussed under Alternative A also apply to Alternative D.

Impacts from BLM Expenditures-- Salary and non-salary (e.g., equipment) expenditures related to Monument management support approximately 5 jobs and \$287,000 in labor income in the local economy, annually. The construction and maintenance of the visitor center is excluded from these estimates.

Payments from the Monument to states and counties (e.g., PILT) total approximately \$13,000. These payments contribute to State and local budgets. Due to the relatively small size of these payments, less than one job and approximately \$8,000 in labor income would be supported in the local economy, annually.

The use of prescribed fire and mechanical thinning and management tools based on future needs and vegetation analysis may be used under Alternative D. The precise use and extent of treatment is unknown, therefore, how this would affect BLM expenditures and related local economic conditions cannot be calculated.

4.4.11 SOILS

Assumptions and Incomplete Information: The analysis of impacts on soil resources was based on the following assumptions:

Soil resources would be managed to meet *New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management (New Mexico Standards and Guidelines)*.

Soils would be managed to minimize erosion and maintain soil productivity.

Surface disturbance of soil, including compaction of soil or loss of vegetation cover, might increase water runoff and downstream sediment loads and lower soil productivity, which may degrade water quality, alter channel structure, and affect overall watershed health.

The degree of impact attributed to any one disturbance or series of disturbances would be influenced by several factors, including location within the watershed, soil characteristics, time and type and degree of disturbance, existing vegetation type and quantities, and climatic conditions.

The greatest anticipated impacts on soil resources would occur from surface disturbance associated with paleontological resources, trails and travel management, livestock grazing, and recreation and visitor services. Management actions would be designed to minimize impacts by implementing BMPs and other site-specific protection measures. These measures often cause localized, short-term, site-specific impacts on soil resources, but are designed to maintain soil productivity and stability in the long-term. Management actions that restrict or prohibit surface disturbance would often help maintain or improve soil conditions.

Management Decisions with No Impacts to Soils: The following resources or uses have little or no impact on Soil Resources for all Alternatives: Air Resources--Air Quality and Climate Change, Cultural Resources, Geology/Minerals, Lands with Wilderness Characteristics, Research Management, Special Designations--Area of Critical Environmental Concern, Wilderness Study Area, Research Natural Area, Special Status Species, Visual Resources, Water Resources, and Wildlife.

Effects Common to All Alternatives:

Impacts from Vegetation-- Under all Alternatives, the impacts from Vegetation would have very similar effects on soil resources. All of the Alternatives would have positive impacts to the soils by reducing and managing noxious weeds and non-native invasive plant species and promoting healthy native plant communities. This would enhance infiltration, increase soil moisture and organic content, and promote soil productivity and stabilization.

IMPACTS OF THE ALTERNATIVES

4.4.11.1 ALTERNATIVE A

Impacts from Paleontological Resources-- Under Alternative A, the Paleontology Program would continue to permit and support the on-going research within the PTNM, which would involve excavation of paleontological resources. These excavations would cause localized highly disturbed areas. A fairly high number of past excavations that have occurred within the PTNM have been on relatively steep slopes where erosion potentials are the highest. Mitigation measures are generally adequate for stabilizing these

soils after excavation, but some soil loss on steep slopes, void of vegetation, is inevitable. However, these activities are typically small in scale and have had little impact to the watershed as a whole. Casual collecting of common invertebrates and plant paleontological resources would result in minor surface disturbance at infrequent intervals from foot traffic and hand tools.

Impacts from Interpretation and Education-- Under Alternative A, minor soil disturbance would occur along designated trails at infrequent intervals associated with BLM or partner-led interpretive tours. Disturbances would primarily be in the form of foot traffic from small groups of people.

Impacts from Recreation and Visitor Services-- Under Alternative A, dispersed camping could cause localized removal of vegetation and compaction of the soil leading to increased runoff and erosion. Although impacts from camp sites are generally isolated and small, no restrictions on camping locations could result in multiple camp sites cumulatively adversely impacting a greater area. Commercial, competitive and organized group activities would be administered through the SRP program. Each event permitted through the SRP would require mitigation on a case-by-case basis due to varying impacts associated with event type, size, and location.

Impacts from Trails and Travel Management-- Under Alternative A, designated routes would be available for motorized or mechanized use. Many of these routes are in the bottom of arroyos. Colluvial deposits along the slopes of the canyons are easily eroded and could be damaged by impacts from both vehicles and spectators. This degradation is caused by both non-permitted use and permitted events. BLM monitoring of the 2008 and 2009 Chile Challenge Trails Tour Events confirmed that visitor and spectator use of canyon slopes for event viewing resulted in creation of new trails, dislocation and displacement of soils and large cobbles and damage to vegetation. OHV trails are primarily located along canyon bottoms and ridge tops that are relatively resistant to erosion. These areas have essentially been compacted, devoid of vegetation and soil, and have very low potential for natural recovery. Petroleum product spill would contaminate soils in various locations along OHV routes reducing soil productivity and potentially lower vegetation densities in the long-term. However, the volume of fluid spilled at any given location is typically small (less than 1 gallon). Where “braided” routes (i.e., routes that are used to get around an inoperative vehicle or obstacle) are created, vegetation is crushed and soils are disturbed or compressed. These impacts contribute to increased susceptibility to erosion and sediment load during water runoff.

Impacts from Lands and Realty-- Under Alternative A, realty actions such as right-of-way or land use authorization would be allowed. Authorizations of rights-of-way could cause adverse impacts to soils from surface disturbances. Each lands and realty action would require mitigation on a case-by-case basis due to varying impacts associated with action type, size, and location.

Impacts from Livestock Grazing-- Under Alternative A, grazing would continue within the Monument. High impact areas around livestock watering facilities would continue to be void of vegetation. Research in the Chihuahuan desert indicates that biomass of perennial grasses on sandy soils can be reduced up to 1000 meters from water (Fusco et al. 1995). Soils would be compacted and water infiltration rates would be reduced decreasing soil moisture contents. This would cause localized soil erosion from alluvial and eolian processes. Maintenance of existing structural improvements (i.e., pipeline and troughs) and potential new improvements could result in surface disturbance. These disturbances would likely cause localized short-term soil loss and degradation. Monitoring rangeland health would help ensure vegetation, soils, and hydrologic processes were in equilibrium with the ecosystem and provide guidelines for improvement should rangeland health fall below the standard.

Impacts from Wildland Fire Management-- Under Alternative A, management tools such as prescribed fire and mechanical thinning would not be considered for use in the Monument. Fire suppression tactics that cause surface disturbance could cause localized short-term impacts to soil in wildland urban interface areas.

4.4.11.2 ALTERNATIVE B

Impacts from Paleontological Resources-- Under Alternative B, the impacts are similar as described under Alternative A. However, under this Alternative, soil disturbance would be slightly less with the closure of PTNM to casual collecting of common invertebrates and plant paleontological resources. These actions would cause less surface disturbance relative to Alternative A.

Impacts from Interpretation and Education-- Under Alternative B, impacts to soils from Interpretation and Education are the same as described under Alternative A.

Impacts from Recreation and Visitor Services-- Under Alternative B, camping would not be allowed within the Monument. Current camp sites would be rehabilitated and allowed to recover to the natural surroundings over time, which would reduce impacts to soil such as compaction and erosion. SRPs would not be permitted, so there would be no impacts from such events as previously permitted.

Impacts from Trails and Travel Management-- Under Alternative B, closing PTNM to motorized and mechanized vehicles would have fewer impacts on soil resources than Alternative A. Recreational OHVs would not be traveling any trails and no new trails would be created. This would decrease soil disturbances and provide some chance for soil recovery along the routes. However, these routes, which mostly are in arroyos, have little potential for recovery due to natural flash floods and the overall slow nature of soil formation processes in semi-arid climates. Natural rehabilitation of the trails would be a very long process.

Impacts from Lands and Realty-- Under Alternative B, surface disturbing activities would not be authorized. Soil resources would not be altered or impaired.

Impacts from Livestock Grazing-- Under Alternative B, removal of grazing from these allotments would provide less impact to soils, better vegetation communities and densities, and a healthier ecosystem. Areas around livestock watering facilities would begin rehabilitating, and vegetation would likely begin to grow within the degraded areas. This would increase soil moisture and infiltration and lower erosion potentials. Fewer rangeland improvements would cause reduced surface disturbance except during periods of maintenance for wildlife purposes.

Impacts from Wildland Fire Management-- Under Alternative B, impacts to soils from Wildland Fire Management are the same as described under Alternative A.

4.4.11.3 ALTERNATIVE C

Impacts from Paleontological Resources-- Under Alternative C, impacts to soils from paleontological resources are the same as described under Alternative A.

Impacts from Interpretation and Education-- Under Alternative C, impacts to soils from interpretation and education are the same as described under Alternative A.

Impacts from Recreation and Visitor Services-- Under Alternative C, designated primitive campsites would be established. Impacts from camping would be the same as Alternative A. However, designated primitive campsites would reduce the size and number of campsites; thus, reducing the impacts to soil resources from camping activities. Additionally, designating specific campsites would provide controlled locations resulting in better managed and maintained camping facilities. Visitor facilities such as toilets, shade shelters, information kiosks, picnic sites, and parking lots would result in ground clearing and compaction activities. This would remove vegetation, compact soil, alter the natural topography, decrease infiltration and increase surface water runoff and erosion rates. The magnitude of these effects from a specific action would greatly depend upon the size, location, current climatic conditions and soil type for any given surface disturbing activities. Impacts from activities through the SRP program would be the same as Alternative A.

Impacts from Trails and Travel Management-- Under Alternative C, impacts to soil resources would be similar to, but slightly less than Alternative A. The nature of impacts to soils would be the same, but the length of designated trails would be less. In total, 5.4 miles of routes would be closed to motorized and mechanized vehicles. Along these closed routes, the same long-term impacts would occur to soils, as those identified in Alternative B. Increased visitation and foot traffic could lead to accelerated erosion and slope destabilization in the areas that are heavily visited. With well-placed, and properly engineered and marked trails, these impacts would be monitored and stabilizing mitigation measures would be enacted before irreparable damage occurs.

Impacts from Lands and Realty-- Under Alternative C, impacts to soils from lands and realty are the same as described under Alternative A.

Impacts from Livestock Grazing-- Under Alternative C, impacts to soils from livestock grazing are the same as described under Alternative A.

Impacts from Wildland Fire Management-- Under Alternative C, impacts to soils from Wildland Fire Management are the same as described under Alternative A.

4.4.11.4 ALTERNATIVE D

Impacts from Paleontological Resources-- Under Alternative D, impacts to soils from paleontological resources are the same as described under Alternative B.

Impacts from Interpretation and Education-- Under Alternative D, impacts to soils from interpretation and education are the same as described under Alternative A.

Impacts from Recreation and Visitor Services-- Under Alternative D, developed campgrounds along with designated primitive camping sites would have greater impacts than Alternatives A, B, and C due to larger areas of surface disturbance and compaction.

All other impacts from actions initiated by recreation and visitor services would be the same as Alternative C.

Impacts from Trails and Travel Management-- Under Alternative D, the nature of the impacts to soils from Trails and Travel Management are the same as described under Alternative A. However, 4.0 miles of existing designated routes would be closed to motorized and mechanized vehicles. Along these closed routes, the same long-term impacts would occur to soils, as those identified in Alternative B.

Impacts from Lands and Realty-- Under Alternative D, impacts to soils from lands and realty are the same as described under Alternative A.

Impacts from Livestock Grazing-- Under Alternative D, impacts to soils from livestock grazing are the same as described under Alternative A.

Impacts from Wildland Fire Management-- Under Alternative D, prescribed fire and mechanical thinning are allowed as management tools if deemed necessary in the future. Fire suppression tactics and mechanical thinning that cause surface disturbance would cause localized short-term impacts to soil.

4.4.12 SPECIAL DESIGNATIONS

4.4.12.1 AREA OF CRITICAL ENVIRONMENTAL CONCERN

Assumptions and Incomplete Information: The Legislation states in Section 2104 ADMINISTRATION (e) SPECIAL MANAGEMENT AREAS – “*The establishment of the Monument shall not change the management status of any area within the boundary of the Monument that is –(B) managed as an area of critical environment concern.*”

Management Decisions with No Impacts to Special Designations – ACEC: The proposed BLM management decisions in the Alternatives would not result in impacts that would alter the characteristics for which the ACEC was designated (significant paleontological, cultural, and scenic values, and high diversity of cacti species).

4.4.12.2 RESEARCH NATURAL AREA

Management Decisions with No Impacts to Special Designations-RNA: See discussion below in “*Effects Common to All Alternatives*”.

Effects Common to All Alternatives: Management actions for all resources and uses would be similar on the land within the Monument whether it has the Paleozoic Trackways RNA designation (Alternative A) or the RNA designation removed (Alternatives B, C, and D). The Monument designation duplicates the management goals of the RNA; such as protect, research, and interpret paleontological values to the entire Monument. Therefore, the RNA designation and management actions are redundant and not necessary.

4.4.12.3 WILDERNESS STUDY AREA

Assumptions and Incomplete Information: The Legislation states in Section 2104 ADMINISTRATION (e) SPECIAL MANAGEMENT AREAS – “*The establishment of the Monument shall not change the management status of any area within the boundary of the Monument that is – (A) designated as a wilderness study area and managed in accordance with section 603(c) of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1782(c).*”

That being stated, the Robledo Mountains WSA would be managed to preserve its wilderness characteristics so as not to impair the area’s suitability for wilderness designation. All proposed actions within the WSA must follow the *Interim Management Policy for Lands under Wilderness Review (IMP)*.

Management Decisions with No Impacts to Special Designations-WSA: The following resources or Monument uses have little or no impact on the Robledo Mountains WSA: Paleontological Resources, Interpretation and Education, Recreation and Visitor Services, Trails and Travel Management, Air Resources, Cultural Resources, Lands and Realty, Livestock Grazing, Soils, Special Management Areas-Area of Critical Environmental Concern and Research Natural Area, Special Status Species, Vegetation, Visual Resources, Water Resources, Wildland Fire Management, and Wildlife.

Effects Common to All Alternatives: No alternatives considered would result in impairment to the WSA.

4.4.13 SPECIAL STATUS SPECIES

Assumptions and Incomplete Information: There is only one recorded occurrence of a special status plant (night-blooming cereus) near the Monument and a substantial amount of habitat for this plant occurs throughout the Monument. If there were losses, they would be at an individual level rather than the entire population.

Prior to any construction, a field survey would be completed and any special status species found within the construction site would be avoided or mitigated.

If additional special status species are designated or discovered, the management actions in this Plan will encompass that species as well if that species or its habitat is found within the Monument.

Management Decisions with No Impacts to Special Status Species: The following resources or Monument uses have little or no impact on Special Status Species: Paleontology, Air Resources--Air Quality and Climate Change, Cultural Resources, Lands and Realty, Research Management, Socio-Economic Conditions, Soils, Special Designations- Area of Critical Environmental Concern and Research Natural Area, Visual Resources, and Water Resources.

Effects Common to All Alternatives: Impacts *Common to All Alternatives* were not identified.

IMPACTS OF THE ALTERNATIVES

4.4.13.1 ALTERNATIVE A

Impacts from Interpretation and Education-- Under Alternative A, there would be no management actions for interpretation and education that would impact special status species.

Impacts from Trails and Travel Management-- Under Alternative A, there are approximately 37.6 miles of motorized and mechanized routes and 5.3 miles of trail for mechanized vehicle use only open year-round. The use of those routes could potentially cause injury or mortality of slow moving special status animals such as Texas horned lizards that may inhabit areas near these routes.

Impacts from Livestock Grazing-- Under Alternative A, livestock grazing would continue within the Monument and livestock grazing improvements would continue to function. Grazing improvements such as water facilities would benefit special status animals due to continued availability of water in an area in which water would not naturally occur.

Impacts from Vegetation-- Under Alternative A, chemical herbicides would be used to control noxious weeds within the Monument. Any vegetation treatments that may occur would benefit special status animals by increasing forage and improving grassland habitat.

Impacts from Wildland Fire Management-- Under Alternative A, there would be no management actions for Wildland Fire Management that would impact special status species.

4.4.13.2 ALTERNATIVE B

Impacts from Interpretation and Education-- Under Alternative B, there would be no management actions for interpretation and education that would impact special status species.

Impacts from Recreation and Visitor Services-- Under Alternative B, recreational use of the Monument under Alternative B would be limited to hunting, hiking, and sightseeing. Aside from the animals being hunted, this use would be minimally invasive to special status species in general. No camping would be allowed therefore displacement would be limited to day-use associated with dispersed recreation. This temporarily displaces special status species in areas where the recreation is occurring. There is only one recorded occurrence of a special status plant (night-blooming cereus) near the Monument and a substantial amount of habitat for this plant occurs throughout the Monument that if there were losses, they would be at an individual level rather than the entire population. SRP events would not be allowed, thus the impacts from those events would be nonexistent.

Impacts from Trails and Travel Management-- Under Alternative B, motorized and mechanized use of the Monument would be prohibited thus minimizing the chance of slow moving special status species to be injured on and near travel routes.

Impacts from Livestock Grazing-- Under Alternative B, livestock grazing would not continue within the Monument. Prohibiting grazing and its associated activities would both benefit and harm special status species. Availability of forage and cover would increase as grasses and forbs would be expected to increase in certain areas. This would be beneficial to special status species. However, the lack of maintained water troughs in the arid desert would cause special status species to leave the Monument seeking habitat where natural or artificial water sources are available.

Impacts from Vegetation-- Impacts to special status species from Vegetation Management under this Alternative would be similar to those outlined under Alternative A.

Impacts from Wildland Fire Management-- Under Alternative B, there would be no management actions for Wildland Fire Management that would impact special status species.

4.4.13.3 ALTERNATIVE C

Impacts from Interpretation and Education-- Under Alternative C, pedestrian trails and interpretation kiosks would be developed. This would potentially bring an increase in human traffic causing special status animal species to temporarily vacate the area near the trails and kiosks to avoid confrontation.

Impacts from Recreation and Visitor Services-- Under Alternative C, visitor facilities such as toilets, shade shelters, information kiosks, trail markers, and picnic sites would be developed and maintained. This could displace special status species that inhabit the area where these facilities would be built and used. Dispersed recreation would continue and also continue to temporarily displace special status species in areas where the recreation is occurring. The establishment of a primitive campground would displace any special status species that inhabits the area where the campground would be built. An increase in human activity would temporarily cause special status species to vacate areas frequented by humans.

Impacts from Trails and Travel Management-- Under Alternative C, there are approximately 26.9 miles of motorized and mechanized routes and 5.3 miles of trails for mechanized vehicles only (such as bikes) open for use. Due to the motorized and mechanized vehicular use allowed on certain routes, there

would be potential for slow moving special status species to be injured on and near travel routes. This risk would increase during SRP events where a greater number of vehicles or people could be utilizing the routes.

Impacts from Livestock Grazing-- Under Alternative C, grazing would continue except where excluded to protect paleontological resources, campsites, or other specified locations. Grazing improvements such as water facilities would benefit special status species due to continued availability of water in an area in which water would not naturally occur.

Impacts from Vegetation-- Impacts to special status species from vegetation management under this Alternative would be similar to those outlined under Alternative A.

Impacts from Wildland Fire Management-- Under Alternative C, there would be no management actions for Wildland Fire Management that would impact special status species.

4.4.13.4 ALTERNATIVE D

Impacts from Interpretation and Education-- Under Alternative D, development of interpretation kiosks would potentially bring an increase in human traffic causing special status species to temporarily vacate the area near the trails and kiosks to avoid confrontation.

Impacts from Recreation and Visitor Services-- Under Alternative D, development of pedestrian trails would potentially bring an increase in human traffic causing special status species to temporarily vacate the area near the trails to avoid confrontation. The establishment of an on-site visitor center would displace special status species from the site chosen for the visitor center. Activities associated with the construction of the visitor center could potentially lead to mortality of slow moving special status species such as Texas horned lizards which are unable to quickly vacate the area. Recreational use of the Monument under Alternative D would lead to a possibility of the establishment of a developed campground which would displace any special status species that inhabits the area where the campground would be built.

Impacts from Trails and Travel Management-- Under Alternative D, new routes or trails could be constructed and maintained. There are approximately 28.3 miles of motorized and mechanized routes and 5.3 miles of trails for mechanized use only proposed for use. The establishment of new routes or trails would create a potential for slow moving special status species to be injured or killed on and near travel routes. Vehicular use of the Monument would not be prohibited therefore there would be potential for slow moving special status species to be injured on and near travel routes. This risk would increase during special events where a greater number of vehicles would be utilizing the routes.

Impacts from Livestock Grazing-- Under Alternative D, impacts to special status species from livestock grazing are the same as described under Alternative A.

Impacts from Vegetation-- Under Alternative D, impacts to special status species from Vegetation Management would be the same as those outlined under Alternative A.

Impacts from Wildland Fire Management-- Under Alternative D, prescribed fire is allowed as a management tool. Prescribed fire could displace, kill, and render habitat unsuitable for special status species for longer durations of time than a one-time event, road construction, or some other short duration disturbing activity. The long-term positive benefits of prescribed fire to the overall ecosystem would be substantial.

4.4.14 VEGETATION

Assumptions and Incomplete Information: It is assumed that visitors to the Monument for the purpose of recreation would steadily increase over the life of the Plan.

Management Decisions with No Impacts to Vegetation: The following resources or Monument uses have little or no impact on Vegetation: Paleontological Resources, Interpretation and Education, Air Resources, Cultural Resources, Lands and Realty, Research Management, Special Designations- Research Natural Area, Visual Resources, and Water Resources.

Effects Common to All Alternatives

Impacts from Vegetation-- Under all Alternatives, non-permitted plant collecting is not allowed within the Monument. By not allowing plant collecting, this would help to protect native vegetation diversity and abundance directly benefiting wildlife, and helping protect the soil from erosion.

Impacts from Special Designations-Area of Critical Environmental Concern-- Under all Alternatives, the ACEC designation limits surface disturbance within the special designated area. This designation would continue to protect vegetation from surface disturbing activities.

Impacts from Wildland Fire Management-- Under all Alternatives, fires would be suppressed and hazardous fuels would be treated in wildland urban interface areas. Under the current fire management direction for the Robledo Mountains, vegetation would be disturbed by wildfires and fire suppression activities.

4.4.14.1 ALTERNATIVE A

Impacts from Recreation and Visitor Services-- Under Alternative A, increased visitor use would likely result in some disturbance to vegetation through hiking cross-country, and could result in the introduction and spread of noxious and invasive weeds through vehicles or clothes contaminated by weed seeds.

Impacts from Trails and Travel Management-- Under Alternative A, the existing routes would continue to be used for motorized, mechanized, and pedestrian travel. The Robledo Mountains OHV Trails and a bike trail cross much of the Monument. Designated routes within the Monument are also used by the grazing permittee for managing cattle and maintaining range improvements. Activities associated with the use of these trails and roads would have the potential to remove or damage vegetation within and adjacent to these routes.

Impacts from Lands and Realty-- Under Alternative A, vegetation disturbance including damage or removal would occur within or adjacent to new rights-of-way. Development of non-Federal minerals would result in further vegetation disturbance.

Impacts from Livestock Grazing-- Under Alternative A, livestock would continue to graze public land forage. The majority of the Monument is in the north pasture of the Picacho Peak Allotment, with smaller portions in the south pasture and on the neighboring Altamira Allotment to the north. Currently, livestock that graze in the majority of the National Monument are managed under a deferred-rotation grazing system in accordance with the allotment management plan for the Picacho Peak Allotment. The grazing permit for Picacho Peak specifies that 89 cattle are permitted to graze yearlong. At this carrying capacity,

a maximum of 822 AUMs of public land forage would be removed from the land administered by the BLM in this allotment each year. Utilization of forage is expected to be between 30 and 50 percent of the key forage species. Due to the rugged terrain, and the location of water and supplements, cattle distribution and forage utilization would not be uniform across the entire Monument. Since the revision of the management plan in 1997, the allotment has been stocked to a maximum of 58 percent of the permitted carrying capacity, thus actual forage removed has been substantially lower than the maximum allowed.

The southern part of the Altamira Allotment is lightly stocked due to terrain and the lack of developed water; as a result very little forage is removed from the Monument as a result of livestock grazing on this allotment. Any new water developments in the southern part of the Altamira Allotment would alter grazing use in this area, and would result in additional forage harvested from the Monument. In addition to grazing, vegetation would also be disturbed in order to construct future range improvements, such as watering facilities, fences, erosion control structures and pipelines.

Livestock grazing does have the potential to introduce Class A, B, or C noxious weeds into an area. One mechanism under which this can occur is through consumption of feed contaminated with weed seed; however, this is unlikely since maintenance feeding of livestock is not authorized on public land found in the Monument. It is more likely that cattle could introduce weed species through the introduction of seeds that are stuck to animal hair, and are subsequently transported and dropped. This would most likely occur when replacement animals are brought in from other ranches or auctions and added to the herd on the allotment. Livestock grazing is not anticipated to influence the spread or vigor of salt cedar populations within or adjacent to the Monument. Continued monitoring of the Monument by the BLM would allow for the discovery and rapid treatment of noxious weeds.

Impacts from Soils-- Under Alternative A, critical soils on slopes over 10 percent would be a priority for altering grazing management to reduce erosion and improve water quality. Loss of soil due to erosion would impact soil fertility, and could result in shifts in the type of vegetation and species that can grow in a particular area. Research indicates that black grama dominated ecosystems in southern New Mexico are at risk from nutrient imbalances as a result of wind erosion, which can also shift the competitive advantage to shrubs (Li et. al. 2009). Additionally, soil disturbance and erosion could result in areas favoring colonization by weeds, which would compete with native perennial vegetation.

Soil disturbing activities would be authorized with proper mitigation to protect air and water quality. Soil disturbances would likely lead to loss of vegetative cover, which would typically be temporary and limited to the construction phase of a project. Rehabilitation of vegetation on sites following surface disturbing activities would depend on the specific project, and would be analyzed on a site-specific basis.

Impacts from Vegetation-- Under Alternative A, the management action to control noxious weeds is to use chemical herbicides. Currently, no known populations of Class A or B noxious weeds have been identified within the Monument. Populations of the Class C noxious weed salt cedar (*Tamarix ramosissima*) have been discovered in an earthen reservoir within the Monument and in drainage areas adjacent to the Monument. Vegetation management treatments under this Alternative would primarily be carried out using herbicides, and would certainly result in a shift of the species dominating treated areas. In many areas of the Monument, creosotebush dominates the landscape. Recent mapping of vegetation states indicates that there is some potential for restoration in shrub-dominated areas in the Limestone Hills ecological site, which makes up approximately 53 percent of the Monument. However, given the rugged terrain and the limitation for using herbicides on areas with slopes less than 10 percent, much of the Monument would not be treatable using chemical control methods under this Alternative. There might be some opportunity to treat creosotebush on level or gently sloping areas, while leaving the steeper slopes and draws untreated, resulting in a mosaic of vegetation types within the Monument.

Impacts from Wildlife-- Under all Alternatives, the Robledo Mountains Habitat Management Plan (HMP) (for deer, antelope, upland game species) would be developed and implemented. Mule deer would continue to graze herbaceous plants and browse palatable woody plant species. Areas dominated by shrub cover tend to be at a higher risk of plant seedling predation by rodents in the Chihuahuan desert (Bestlemeyer et. al. 2007); as a result, continued shrub invasion by creosotebush and mesquite could potentially result in decreased establishment of perennial forage plants through this mechanism.

4.4.14.2 ALTERNATIVE B

Impacts from Recreation and Visitor Services-- Vegetation disturbances would diminish, since new recreation sites and trails would not be developed.

Impacts from Trails and Travel Management-- Under Alternative B, the Monument is closed to motorized or mechanized recreation and SRPs. Closure of the Monument to all motorized and mechanized vehicles and permitted recreational events would reduce the potential for damage to vegetation adjacent to existing roads and trails.

Impacts from Lands with Wilderness Characteristics-- Under Alternative B, approximately 576 acres would be managed as Lands with Wilderness Characteristics. Additional protections to vegetation from limiting surface disturbance would be provided to lands with wilderness characteristics. Therefore, the vegetation would have less physical impacts on it as would non-lands with wilderness characteristics.

Impacts from Livestock Grazing-- Under Alternative B, the Monument would be closed to livestock grazing. Closure of the Monument to livestock grazing would reduce the amount of plant biomass removed from the Monument. Over time, it is expected that cover, plant density, species diversity and plant production would increase. In addition, there would be an increase in fine fuels, which would allow fires to burn more readily in the Monument.

Impacts from Soil-- Under Alternative B, surface disturbing activities within the Rio Grande watershed and areas with high potential for soil erosion would be prohibited. These limitations on surface disturbing activities would result in maintenance of ground cover and could lead to increased production of vegetation.

Impacts from Vegetation-- Under Alternative B, vegetation would be managed according to an integrated approach primarily using passive methods, but also employing manual and biological strategies in order to move toward the potential natural community of ecological sites. Treatment options would be limited for noxious weed control, and strategies would be dependent on the species present and the size of the infestation.

Impacts from Wildland Fire Management-- Impacts to vegetation under Alternative B would be the same as those discussed under Alternative A.

Impacts from Wildlife-- Under all Alternatives, the Robledo Mountains HMP (for deer, antelope, upland game species) would be developed and implemented. It is anticipated that wildlife populations would increase due to increased forage availability and cover from lack of livestock grazing in Alternative B. As a result, vegetation removal by wildlife species would increase. This could result in a shift in use patterns, with increased utilization of plant species favored by wildlife.

4.4.14.3 ALTERNATIVE C

Impacts from Recreation and Visitor Services-- Under Alternative C, disturbance to vegetation would occur in order to construct visitor facilities. Disturbance to vegetation would mainly occur during construction activities; however, increased use in high traffic areas may result in continual disturbances that would reduce vegetative cover in some areas. Vegetation would be lost in areas where permanent visitor facilities would be constructed.

Impacts from Trails and Travel Management-- Under Alternative C, disturbance to vegetation would occur in order to construct or develop new trails. Increased use on these new trails or routes would result in reduced vegetative cover.

Impacts from Lands and Realty-- Impacts to vegetation from lands and realty under Alternative C would result from vegetation disturbance including damage or removal that would occur within or adjacent to new rights-of-way or land use authorizations.

Impacts from Lands with Wilderness Characteristics-- Under Alternative C, approximately 253 acres would be managed as lands with wilderness characteristics. Additional protections to vegetation from limiting surface disturbance would be provided to lands with wilderness characteristics. Therefore, the vegetation would have less physical impacts focused upon it as would non-lands with wilderness characteristics.

Impacts from Livestock Grazing-- Impacts to vegetation from livestock grazing under Alternative C would be the same as those identified under Alternative A.

Impacts from Soils-- Under Alternative C, mitigation of soil-disturbing activities would help to protect vegetation from excessive disturbance.

Impacts from Vegetation-- Under Alternative C, vegetation management would focus on maintaining vegetative cover and production with regard to the current ecological potential of land within the Monument using passive and active treatments. Particular emphasis would be placed on maintaining and enhancing native plant populations and habitat for special status species.

Impacts from Wildland Fire Management-- Impacts to vegetation from wildland fire management under Alternative C would be similar to those discussed under Alternative A.

Impacts from Wildlife-- Impacts to vegetation from wildlife under Alternative C would be the same as those described under Alternative A.

4.4.14.4 ALTERNATIVE D

Impacts from Recreation and Visitor Services-- Impacts to vegetation would be the same as those described under Alternative C.

Impacts from Trails and Travel Management-- Impacts to vegetation would be the same as those described under Alternative C.

Impacts from Lands and Realty-- Impacts to vegetation from lands and realty under Alternative D would be similar to those discussed under Alternative C.

Impacts from Lands with Wilderness Characteristics-- Impacts to vegetation would be the same as those described under Alternative A.

Impacts from Livestock Grazing-- Impacts to vegetation from livestock grazing under Alternative D would be to the same as those described under Alternative A.

Impacts from Soil-- Impacts to vegetation from soil resources under Alternative D would be similar to those described under Alternative A.

Impacts from Vegetation-- Under Alternative D, vegetation management objectives would focus on maintaining cover and production with regard to the current potential of ecological sites found within the Monument using active and passive restorative methods. Emphasis would be placed on maintaining or enhancing habitat for special status species in conjunction with boosting plant production for use by livestock.

Impacts from Wildland Fire Management-- Under Alternative D, fire would have a more prominent role in maintaining the health of the ecosystem by allowing prescribed fire and mechanical thinning. Fire would help to reduce shrub cover, and would favor re-establishment of fire-adapted perennial plant species. Fire has been found to have negative impacts to black grama (Allred and Snyder 2008); however the impact fire has to the survival and health of black grama is dependent on precipitation, fire temperature and grass patch size (Drewa et. al 2006).

Impacts from Wildlife-- Impacts to vegetation from wildlife under Alternative D would be the same as those described under Alternative A.

4.4.15 VISUAL RESOURCES

Assumptions and Incomplete Information: The number of visitors to the Monument would probably increase over time.

Per BLM policy, all land within WSAs is managed under a Visual Resource Management (VRM) Class I management objective until such time as the Congress decides to designate the area as wilderness or release it for other uses. Accordingly, this impact analysis assumes under all Alternatives that those lands that fall within the Robledo WSA (789 acres) would be managed as to preserve the existing visual character of the landscape--where management activities would be limited, very low, and not attract attention.

Contrast ratings would be required for proposed projects in highly sensitive areas and for projects with the potential for high impact. Visual design considerations such as siting, color selection, and reclamation would be incorporated into all surface disturbing projects regardless of the anticipated size of the impact.

The location(s) of the proposed visitor contact station (Alternative C) and visitor center (Alternative D) are unknown at this time. For this reason, the impact analysis would assume that neither of these facilities would be located within the Monument boundary. Should future activity level planning propose locating such facilities within the Monument boundary, a visual contrast rating and impact analysis would be required to determine compliance or the need to amend the VRM class objective.

Management Decisions with No Impacts to Visual Resource Management: The following resources and their corresponding uses would have little or no impact on Visual Resource Management within the Planning Area: Paleontological Resources, Air Resources, Cultural Resources, Special Status Species, Socio-Economic Conditions, Soils, Research Management, Vegetation, Water Resources, Wildland Fire Management, and Wildlife.

IMPACTS OF THE ALTERNATIVES

4.4.15.1 ALTERNATIVE A

Under Alternative A, the potential level of visual resource impacts are as follows: (1) 15 percent of the Planning Area (789 acres) would be managed under a VRM Class I objective where impacts from management activities should be very low, (2) 17 percent of the Planning Area (932 acres) would be managed under a Class II objective where impacts from management activities should be low, (3) 50 percent of the Planning Area would be subject to a moderate degree of visual impacts where 2,627 acres would be managed under a VRM Class III objective, and (4) 18 percent of the Planning Area would be subject to a high degree of visual impacts where 932 acres would be managed under a VRM Class IV objective.

Table 4-4 provides an overall indication of the level of potential visual impacts with a comparison of the VRM objective to the corresponding visual inventory class rating.

Table 4-4 VRM Objectives Compared to Visual Resource Inventory Class Ratings Alternative A

**TABLE 4-4
VRM OBJECTIVES COMPARED TO VISUAL RESOURCE INVENTORY CLASS RATINGS
ALTERNATIVE A**

PROPOSED VRM CLASSES (ACRES)	VRI CLASS I (ACRES)		VRI CLASS II (ACRES)		VRI CLASS III (ACRES)		VRI CLASS IV (ACRES)		TOTAL	
	789**	%	4,466	%	0	%	0	%		
VRM I	789*	789	100%	0	0%	0	0%	0	0%	789
VRM II	907	0	0%	907	20%	0	0%	0	0%	907
VRM III	2,627	0	0%	2,627	59%	0	0%	0	0%	2,627
VRM IV	932	0	0%	932	21%	0	0%	0	0%	932
Totals	5,255	789*	100%	4,466	100%	0	0%	0	0%	5,255

NOTES: * Robledo Mountains WSA
** Default VRI Class I for WSA

Impacts from Interpretation and Education-- Under Alternative A, most interpretation and education activities would occur off-site and outside of the Planning Area. Overall, the anticipated or potential visual impacts resulting from interpretive activities would be low and meet or exceed all VRM Class objectives.

Impacts from Recreation and Visitor Services-- Under Alternative A, visual impacts resulting from dispersed recreational use (e.g., establishment of primitive campsites, fire rings, and pioneered foot trails) would continue and likely increase proportionally with the levels of visitor use. Overall, the anticipated or potential visual impacts resulting from recreational activities would be low and meet or exceed all VRM Class objectives.

Impacts from Trails and Travel Management-- Under Alternative A, continued use off the existing road and trail network (37.6 miles) within the Monument would result in low level, site-specific visual impacts such as trail widening and vehicle pullouts. These anticipated impacts would not affect BLM’s ability to manage visual resources to meet the proposed VRM objectives.

Impacts from Lands and Realty-- Under Alternative A, the non-Federal minerals are not subject to acquisition. Without acquisition, there is the potential for development and those impacts commonly associated with mineral development (e.g., excavation, road construction, installation of facilities, etc.) would impact visual resources.

Impacts from Livestock Grazing-- Under Alternative A, visual impacts related to livestock grazing activities and the range improvements would continue. The use of the area for livestock grazing is light; therefore the visual impacts are minor.

4.4.15.2 ALTERNATIVE B

Under Alternative B, 73 percent of the Planning Area (3,915 acres) would be managed as VRM II as to retain the existing character of the landscape where impacts from management activities should be low; and the remaining 27 percent (1,365 acres) would be managed to preserve the existing character of the visual landscape where impacts from management activities should be very low as VRM I.

Table 4-5 provides an overall indication of the level of potential visual impacts with a comparison of the VRM objective to the corresponding visual inventory class rating.

Table 4-5 VRM Objectives Compared to Visual Resource Inventory Class Ratings Alternative B

TABLE 4-5 VRM OBJECTIVES COMPARED TO VISUAL RESOURCE INVENTORY CLASS RATINGS ALTERNATIVE B											
PROPOSED VRM CLASSES (ACRES)	VRI CLASS I (ACRES)			VRI CLASS II (ACRES)			VRI CLASS III (ACRES)		VRI CLASS IV (ACRES)		TOTAL
	789**	%	4,491	%	0	%	0	%	5,280		
VRM I	1,365*	789	100%	576	13%	0	0%	0	0%	1,365	
VRM II	3,915	0	0%	3,915	87%	0	0%	0	0%	3,915	
VRM III	0	0	0%	0	0%	0	0%	0	0%	0	
VRM IV	0	0	0%	0	0%	0	0%	0	0%	0	
Totals	5,280	789	100%	4,491	100%	0	0%	0	0%	5,280	

NOTES: * Includes Robledo Mountains WSA and Lands with Wilderness Characteristics
 ** Default VRI Class I for WSA

Impacts from Interpretation and Education-- Under Alternative B, most interpretation and education activities would occur off-site and outside of the Planning Area. The overall potential for visual impacts resulting from interpretive and educational activities would be low to very low and compliant with all proposed VRM Class objectives.

Impacts from Recreation and Visitor Services-- Under Alternative B, the Monument would be closed to mechanized and motorized vehicle use and dispersed camping, which would reduce visual impacts resulting from tire tread and the establishment of primitive campsites, fire rings, etc. The overall potential for visual impacts resulting from recreational activities would be low to very low and compliant with all proposed VRM Class objectives.

Impacts from Trails and Travel Management-- Under Alternative B, recreational motorized and mechanized vehicle use would not be allowed and no new routes would be developed. Therefore, there would be no measureable impacts on visual resources.

Impacts from Lands and Realty-- Under Alternative B, the non-Federal minerals would be acquired and eliminate the opportunity for mineral development(s) and the associated impacts.

Impacts from Livestock Grazing-- Under Alternative B, livestock grazing would be eliminated. This would result in the need to build a new fence around the boundary of the Monument in order to keep livestock from trespassing onto the Monument. Construction of a fence would introduce short-term visual impacts resulting from soil disturbance and removal of vegetation; impacts that would diminish over time as disturbed soils darken, stabilize, and flatten, and natural regeneration of vegetation begins to occur. Long-term impacts would result from standing posts and wire. An environmental assessment would be required to determine site-specific impacts, appropriate mitigation, and compliance with VRM objectives.

4.4.15.3 ALTERNATIVE C

Under Alternative C, 80 percent of the Planning Area (4,213 acres) would be managed to retain the existing character of the landscape where impacts from management activities should be low and not attract attention. The remaining 20 percent of the Planning Area (1,042 acres) would be managed to

VISUAL RESOURCES

preserve the existing character of the visual landscape where impacts from management activities should be very low and must not attract attention.

Table 4-6 provides an overall indication of the level of potential visual impacts with a comparison of the VRM objective to the corresponding visual inventory class rating.

Table 4-6 VRM Objectives Compared to Visual Resource Inventory Class Alternative C

TABLE 4-6 VRM OBJECTIVES COMPARED TO VISUAL RESOURCE INVENTORY CLASS RATINGS ALTERNATIVE C										
PROPOSED VRM CLASSES (ACRES)	VRI CLASS I (ACRES)		VRI CLASS II (ACRES)		VRI CLASS III (ACRES)		VRI CLASS IV (ACRES)		TOTAL	
	789* *	%	4,466	%	0	%	0	%	5,255	
VRM I	1,042*	789	100%	253	6%	0	0%	0	0%	1,042
VRM II	4,213	0	0%	4213	94%	0	0%	0	0%	4,213
VRM III	0	0	0%	0	0%	0	0%	0	0%	0
VRM IV	0	0	0%	0	0%	0	0%	0	0%	0
Totals	5,255	789*	100%	4,466	100%	0	0%	0	0%	5,255
NOTES: * Includes Robledo Mountains WSA and Lands with Wilderness Characteristics ** Default VRI Class I for WSA										

Impacts from Interpretation and Education-- Under Alternative C, visitor facilities such as a wayside exhibits and information kiosks would be developed. These facilities would introduce varying degrees of visual contrasts to the landscape. Site-specific impacts, mitigation, and a determination of compliance with VRM objectives would be disclosed through activity level planning, associated NEPA documentation, and visual contrast ratings.

Impacts from Recreation and Visitor Services-- Under Alternative C, visitor facilities such as a primitive campsites, toilets, shade shelters, trail markers, and picnic sites would potentially be developed. All of these facilities would introduce varying degrees of visual contrasts to the landscape. Site-specific impacts, mitigation, and a determination of compliance with VRM objectives would be disclosed through activity level planning, associated NEPA documentation, and visual contrast ratings.

Impacts from Trails and Travel Management-- Under Alternative C, continued use of approximately 32.2 miles of the existing route and trail network would result in low level, site-specific visual impacts such as trail widening and vehicle pullouts. These anticipated impacts would not affect BLM's ability to manage visual resources to meet the proposed VRM objectives.

Construction of new routes or foot trails to improve access and meet visitor use demands would introduce varying degrees of visual contrasts (line, color, form, and texture) across the landscape. The location of any new routes or trails would be restricted to those areas outside of VRM Class I. Site-specific impacts, mitigation, and a determination of compliance with VRM objectives would be disclosed through activity level planning, associated NEPA documentation, and visual contrast ratings.

Impacts from Lands and Realty-- Impacts to visual resources would be the same as those described under Alternative B.

Impacts from Livestock Grazing-- Impacts to visual resources would be the same as those described under Alternative A.

4.4.15.4 ALTERNATIVE D

Under Alternative D, 85 percent of the Planning Area (4,466 acres) would be managed to retain the existing character of the landscape where impacts from management activities should be low and not attract attention. The remaining 15 percent of the Planning Area (789 acres) would be managed to preserve the existing character of the visual landscape where impacts from management activities would be very low.

Table 4-7 provides an overall indication of the level of potential visual impacts with a comparison of the visual resource management objective to the corresponding visual inventory class rating.

Table 4-7 VRM Objectives Compared to Visual Resource Inventory Class Alternative D

TABLE 4-7 VRM OBJECTIVES COMPARED TO VISUAL RESOURCE INVENTORY CLASS RATINGS ALTERNATIVE D										
PROPOSED VRM CLASSES (ACRES)	VRI CLASS I (ACRES)		VRI CLASS II (ACRES)		VRI CLASS III (ACRES)		VRI CLASS IV (ACRES)		TOTAL	
	789**	%	4,466	%	0	%	0	%	5,255	
VRM I	789*	789	100%	0	0%	0	0%	0	0%	789
VRM II	4,466	0	0%	4466	100%	0	0%	0	0%	4,466
VRM III	0	0	0%	0	0%	0	0%	0	0%	0
VRM IV	0	0	0%	0	0%	0	0%	0	0%	0
Totals	5,255	789*	100%	4,466	100%	0	0%	0	0%	5,255

NOTES: * Robledo Mountains WSA
** Default VRI Class I for WSA

Impacts from Interpretation and Education-- Impacts to visual resources would be the same as those described under Alternative C.

Impacts from Recreation and Visitor Services-- Impacts to visual resources would be the same as those described under Alternative C.

Impacts from Trails and Travel Management-- Impacts to visual resources would be the same as those described under Alternative C.

Impacts from Lands and Realty-- Impacts to visual resources would be the same as those described under Alternative B.

Impacts from Livestock Grazing-- Impacts to visual resources would be the same as those described under Alternative A.

4.4.16 WATER RESOURCES

Assumptions and Incomplete Information: The analysis of impacts on water resources was based on the following assumptions:

Hydrologic processes would be managed to meet *New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management (New Mexico Standards and Guidelines)*.

Surface disturbance of soil, including compaction of soil or loss of vegetation cover, might increase water runoff and downstream sediment loads and lower soil productivity, which may degrade water quality, alter channel structure, and affect overall watershed health.

The degree of impact attributed to any one disturbance or series of disturbances would be influenced by several factors, including location within the watershed, soil characteristics, time and type and degree of disturbance, existing vegetation type and quantities, and climatic conditions.

Currently, there is incomplete information regarding groundwater associated within the Monument. Given the history of the Robledo Mountains, the inferred lack of aquifer potential, and the absence of groundwater data within the Monument, there is still a high degree of uncertainty regarding groundwater resources. Therefore, impacts to groundwater from management actions cannot be analyzed in detail. Additionally, the absence of perennial and intermittent surface waters in the Monument also limits the ability to analyze impacts to surface water resources from management actions. The analysis below focuses on impacts to the Rio Grande from management actions produced within the Rio Grande watershed.

Management Decisions with No Impacts to Water Resources: The following resources or uses have little or no impact on water resources for all alternatives: Air Resources, Research Management, Special Status Species, Visual Resources, and Wildlife.

Effects Common to All Alternatives: Impacts to the Rio Grande could occur if nonpoint source pollutants (NPS) are produced from surface disturbing activities and transported to the River. Surface disturbing activities often result in decreased infiltration, increased runoff and erosion, degradation of vegetation, alteration of soil characteristics, changes in water flow patterns, and decreased watershed health. This could cause elevated concentrations of NPS to be transported to the Rio Grande. The degree of impact attributed to any one disturbance or series of disturbances under Alternatives A, C, and D could be highly variable and would be influenced by several factors, including location within the watershed, soil characteristics, time and type and degree of disturbance, existing vegetation type and quantities, and climatic conditions. Each one of these variables would be accounted for when developing mitigation measures for all surface disturbing activities occurring in the Rio Grande watershed. The greatest anticipated impacts on water resources would occur from surface disturbance associated with paleontological resources, trails and travel management, livestock grazing, and recreation and visitor services.

All resource management actions that propose limitations or restrictions on surface disturbing activities would help soil stability and productivity and aid vegetation communities necessary to slow water velocities and hinder erosion. Therefore, the proposed actions under Alternative B would have the greatest capabilities for reducing surface disturbance, resource degradation, and NPS pollutants.

4.4.17 WILDLAND FIRE MANAGEMENT

Assumptions and Incomplete Information: Based on known history, there is no known wildland fire event within the area of the Robledo Mountains. With this in mind, the occurrence of a wildland fire in the Monument would be uncommon. Predicting future wildland fire occurrence is highly speculative. Many factors influence wildland fires such as fuel source availability, ignition sources (human and natural caused), and weather conditions.

Protecting cultural resources from prescribed fire would require small site-specific fuels modifications where necessary to reduce the imminent threat of fire. This could include removing vegetation down to mineral soil around known cultural sites for planned fire events.

Management Decisions with No Impacts to Wildland Fire Management: The following resources or uses have no or little impact on Wildland Fire Management: Paleontological Resources, Interpretation and Education, Air Resources, Lands and Realty, Lands with Wilderness Characteristics, Research Management, Socio-Economic Conditions, Soils, Special Designations-Research Natural Area, Special Status Species, Visual Resources, Water Resources, and Wildlife.

Effects Common to All Alternatives:

Impacts from Special Designations-Area of Critical Environmental Concern-- In the ACEC, natural ignited fires would only be allowed to continue to burn in areas designated as Fire Management Unit Categories C and D. The portion of the ACEC within the Monument is designated as Fire Management Unit Category C

Impacts from Vegetation-- Vegetation restoration, through herbicide application could result in recovery of, and increase in herbaceous vegetation and grasses within the Monument. This increase in fine fuels could also increase potential for naturally ignited and man-caused fires.

IMPACTS OF THE ALTERNATIVES

4.4.17.1 ALTERNATIVE A

Impacts from Recreation and Visitor Services-- Under Alternative A, visitor facilities would be practically non-existent. Dispersed camping along with campfires would be allowed. Recreation activities could increase the potential for man-caused wildfire events through shooting and hunting. Dispersed camping in areas where designated campfires rings have not been created would be allowed, however; lack of fuel reduction strategy to these areas represents some of the highest risk of human-caused fire ignitions.

Impacts from Trails and Travel Management-- Under Alternative A, the existing routes would continue to be used for motorized, mechanized, and pedestrian travel. Recreation activities could increase the potential for man-caused wildfire events through OHV use. Motorized vehicle use on existing trails could increase potential for man caused fires, due to mechanical instances such as overheating, and discarded cigarettes.

Impacts from Livestock Grazing-- Under Alternative A, livestock would continue to graze public land forage. The understory that could carry fire is typically eaten by livestock; therefore the possibility of a wildfire carrying within this area is minimal.

4.4.17.2 ALTERNATIVE B

Impacts from Recreation and Visitor Services-- Under Alternative B, the Monument is closed to SRPs, camping and campfires. Closure of the Monument to all permitted recreational events and campfires would reduce the potential for human caused fire. Recreation activities such as hunting and recreational target shooting would continue and could increase the potential for man-caused wildfire events.

Impacts from Trails and Travel Management-- Under Alternative B, the Monument is closed to motorized or mechanized recreation. Closure of the Monument to all motorized and mechanized vehicles would reduce the potential for human caused fire.

Impacts from Livestock Grazing-- Under Alternative B, livestock grazing is not allowed within the Monument. Elimination of livestock grazing activities would likely increase the amount of herbaceous plant materials. Fuel continuities would likely increase as herbaceous plant material increases. Potential for wildfire, both naturally ignited and human caused would be greater and potentially larger in size.

4.4.17.3 ALTERNATIVE C

Impacts from Recreation and Visitor Services-- Under Alternative C, visitor facilities such as toilets, shade shelters, information kiosks, trail markers, and picnic sites would be developed and maintained. Campfires would be limited to designated campfire rings. Visitor use would likely increase as facilities, are developed, which could result in increased fire ignitions. Designated camp fire rings would reduce the chance of human-caused fire ignitions as compared to Alternative A. Recreational target shooting would not be allowed, therefore decreasing the chance of a human-caused wildfire from this recreational activity.

Impacts from Trails and Travel Management-- Under Alternative C, visitor facilities such as new routes and trails would have the potential to be developed and maintained. Visitor use would likely increase as routes and trails are developed, which could result in increased fire ignitions.

Impacts from Livestock Grazing-- Under Alternative C, grazing would continue except where excluded to protect paleontological resources, campsites, or other specified locations. Impacts to wildland fire management from livestock grazing under Alternative C would be similar to those described under Alternative A; except for the fact that grazing could be eliminated from camping areas with fire rings. This could increase the fire behavior of human-caused fires in that immediate area. Increase fuel loadings around camp fires could increase the potential for human caused fires.

4.4.17.4 ALTERNATIVE D

Impacts from Recreation and Visitor Services-- Impacts to wildland fire management from recreation and visitor services under Alternative D would be similar to those described under Alternative C.

Impacts from Trails and Travel Management-- Impacts to wildland fire management from Trails and Travel Management under Alternative D would be similar to those described under Alternative C.

Impacts from Livestock Grazing-- Impacts to wildland fire management from livestock grazing under Alternative D would be similar to those described under Alternative A except prescribed fire is a management alternative under Alternative D.

If fire is used as a management tool, existing uses such as livestock grazing would have to be considered. Designated burn areas may need to be rested from grazing pressure to allow for grass densities to become favorable to carry fire and meet resource objectives. Proper grazing practices through the removal of herbaceous material usually favor less intense wildfire and wildfire potential.

4.4.18 WILDLIFE

Management Decisions with No Impacts to Wildlife: Under the all Alternatives, the following resources and uses would not affect Wildlife and Wildlife Habitat: Air Resources-Air Quality and Climate Change, Cultural Resources, Lands with Wilderness Characteristics, Socio-Economic Conditions, Soils, Special Designations- Area of Critical Environmental Concern and Research Natural Area, Research Management, Visual Resources, and Water Resources.

Effects Common to All Alternatives:

Impacts from Vegetation-- Any vegetation treatment would benefit wildlife by increasing forage and improving grassland habitat.

IMPACTS OF THE ALTERNATIVES

4.4.18.1 ALTERNATIVE A

Impacts from Paleontology-- Under Alternative A, casual collecting of common invertebrates and plant paleontological resources and scientific research would continue, which would continue to affect wildlife. Continuation of these activities would temporarily displace wildlife in areas that are being used; however, this would be of short duration and would not cause wildlife species to permanently vacate the area.

Impacts from Recreation and Visitor Services-- Under Alternative A, visitor facilities would be practically non-existent and dispersed camping along with campfires would be allowed. Wildlife would continue to be affected by casual recreational use of the Monument. Continuation of these activities would temporarily displace wildlife in areas that are being used; however, this would be of short duration and would not cause wildlife species to permanently vacate the area.

Impacts from Trails and Travel Management-- Under Alternative A, approximately 32.2 miles of motorized and mechanized vehicle use routes and 5.3 miles of trails for mechanized vehicles only are designated for use. Use of motorized and mechanized vehicles could potentially cause injury or mortality of slow moving wildlife such as reptiles that may inhabit areas near roads.

Impacts from Livestock Grazing-- Under Alternative A, livestock grazing and range improvements would continue. Grazing activities such as water facilities would benefit wildlife due to continued availability of water in an area in which water would not naturally occur.

Impacts from Wildland Fire Management-- Under Alternative A, there would be no management actions for Wildland Fire Management that would impact the Wildlife Program.

4.4.18.2 ALTERNATIVE B

Impacts from Paleontology-- Under Alternative B, casual collecting of common invertebrates and plant paleontological resources would not be allowed, but scientific research would be allowed. Scientific research could be minimally invasive to wildlife. The research could temporarily displace wildlife.

Impacts from Recreation and Visitor Services-- Under Alternative B, recreational use would be limited to hunting, hiking, equestrian use, and sightseeing. Aside from the animals being hunted, this use would

be minimally invasive to wildlife in general. No camping would be allowed; therefore, displacement would be limited to day-use associated with dispersed recreation. This temporarily displaces wildlife in areas where the recreation is occurring.

Impacts from Trails and Travel Management-- Under Alternative B, motorized and mechanized vehicular use of the Monument would be prohibited thus minimizing the chance of slow moving wildlife to be injured on and near travel routes.

Impacts from Livestock Grazing-- Under Alternative B, livestock grazing is not allowed within the Monument. Prohibiting grazing and its associated activities would both benefit and harm wildlife. Availability of forage and cover would increase as grasses and forbs would be expected to increase in certain areas. This would be beneficial to wildlife. However, the lack of water in the arid desert would cause wildlife to leave the Monument seeking habitat where natural or artificial water sources are available.

Impacts from Wildland Fire Management-- Under Alternative B, there would be no management actions for Wildland Fire Management that would impact the Wildlife Program.

4.4.18.3 ALTERNATIVE C

Impacts from Paleontology-- Under Alternative C, casual collecting of common invertebrates and plant paleontological resources would be allowed in conjunction with prior BLM authorized interpretive or educational programs or activities. This would direct fossil collectors to specific locations, which would potentially increase wildlife and human interaction. This would cause wildlife to vacate the collection areas.

Impacts from Interpretation and Education-- Under Alternative C, pedestrian trails and interpretation kiosks that are developed would potentially bring an increase in human traffic causing wildlife to temporarily vacate the area near the trails and kiosks to avoid confrontation. There would also be an increased possibility of human encounters with hazardous wildlife such as rattlesnakes.

Impacts from Recreation and Visitor Services-- Under Alternative C, visitor facilities such as toilets, shade shelters, information kiosks, trail markers, and picnic sites would be developed and maintained. This could displace wildlife where these facilities would be built and used. Dispersed recreation would continue to temporarily displace wildlife in areas where the recreation is occurring. The establishment of a primitive campground would displace any wildlife that inhabits the area where the campground would be built. An increase in human activity would cause wildlife to vacate areas frequented by humans.

Impacts from Trails and Travel Management-- Under Alternative C, vehicular use of the Monument would continue on a portion of the existing routes and new routes could be developed; therefore, there would be potential for slow moving wildlife to be injured on and near travel routes. This risk would increase during special events where a greater number of vehicles would be utilizing the routes.

Impacts from Livestock Grazing-- Impacts to the Wildlife Program from livestock grazing under Alternative C would be the same as those described under Alternative A.

Impacts from Wildland Fire Management-- Under Alternative C, there would be no management actions for Wildland Fire Management that would impact the Wildlife Program.

4.4.18.4 ALTERNATIVE D

Impacts from Paleontology-- Impacts to the Wildlife Program from paleontology under Alternative D would be the same as those described under Alternative B.

Impacts from Interpretation and Education-- Under Alternative D, pedestrian trails, interpretation kiosks, and a motorized tour route that could be developed would potentially bring an increase in human traffic causing wildlife to temporarily vacate the area near the routes, trails, and kiosks to avoid confrontation. The establishment of an on-site visitor center would displace wildlife from the site chosen for the visitor center. Activities associated with the construction of the visitor center could potentially lead to mortality of slow moving wildlife unable to quickly vacate the area.

Impacts from Recreation and Visitor Services-- Under Alternative D, impacts to the Wildlife Program from recreation and visitor services under Alternative D would be similar to those described under Alternative C.

Impacts from Trails and Travel Management-- Impacts to the Wildlife Program from Trails and Travel Management under Alternative D would be the same as those described under Alternative C.

Impacts from Livestock Grazing-- Impacts to the Wildlife Program from livestock grazing under Alternative D would be the same as those described under Alternative A.

Impacts from Wildland Fire Management-- Under Alternative D, prescribed fire is allowed as a management tool. Prescribed fire could displace, kill, and render habitat unsuitable for wildlife for longer durations of time than a one-time event, road construction, or some other short duration disturbing activity. The long-term positive benefits of prescribed fire to the overall ecosystem would be substantial.

4.5 CUMULATIVE IMPACTS

Council on Environmental Quality regulations state that the cumulative impact analysis should include the anticipated impacts on the environment resulting from “*the incremental impacts 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 time*” (40 CFR 1508.7).

Impacts of the Alternatives presented in this RMP/EIS are assessed for cumulative impacts along with other actions conducted in the Analysis Area.

4.5.1 Methodology

The cumulative impacts discussion that follows considers the Alternatives in the context of the broader human environment and, specifically, actions that occur outside the scope and geographic area covered by the Planning Area. Because of the programmatic, comprehensive nature of the RMP, this assessment is broad and generalized to address potential effects that could occur from the Alternative management actions when combined with other activities or projects. This assessment is primarily qualitative for many resources because of the lack of detailed information that would result from project-level decisions and other activities or projects.

Cumulative impact analysis is limited to important issues of National, regional, or local significance. Therefore, not all issues identified for direct or indirect impact assessment in this EIS are analyzed for cumulative effects. Because of the wide geographic scope of a cumulative impact assessment and the variety of activities assessed, cumulative impacts are commonly examined at a more qualitative and less detailed level than are the direct and indirect impacts presented previously in this Chapter.

The spatial boundaries of each resource’s cumulative analysis, known as the cumulative impact analysis area, vary by resource and are larger for resources that are mobile or migrate (i.e., air quality or wildlife species) compared to resources that are stationary (i.e., paleontological resources). The spatial boundaries of resources and resource uses may be contained within the Planning Area or may extend beyond the Planning Area. Evaluation of potential impacts considers incremental impacts that may result from the proposed project, while also considering impacts from past, present, and reasonably foreseeable future actions. Reasonably foreseeable future actions are those future actions that have been committed to or that are known proposals that could take place within the planning period. These are not actual planning decisions or resource commitments.

The BLM land surrounding the PTNM is undergoing a RMP revision. This RMP is not approved nor funded, so it will not be included in cumulative impacts. Reasonable Foreseeable Future Actions must be approved or funded to be considered.

Chapter 3 “*Affected Environment*” considers the impacts of past and present actions on the current conditions within the Monument. Past events/actions and reasonably foreseeable actions that have or are occurring in the Analysis Area are documented in the following table:

PAST AND PRESENT EVENTS/ACTIONS

<p>COMMUNITY SETTLEMENT</p>	<p>The Mesilla Valley has a long and significant history in New Mexico. Following its initial population by Native Americans, the Mesilla Valley was inhabited by the Spanish party of Friar Agustin Rodríguez in 1581. After the 1848 Treaty of Guadalupe Hidalgo, which signaled the end of the Mexican War, a colony of individuals not desiring American citizenship moved across the Rio Grande and established the town of Mesilla.</p> <p>The Mesilla area was seen as an ideal location for a railroad route to the Pacific, which would connect the rest of the United States to California.</p> <p>The Gadsden Treaty was signed on December 30, 1853, after the region was purchased for \$10 million, resulting in the addition of Mesilla to Doña Ana County. The railroad was routed through Las Cruces instead, and that city eventually replaced Mesilla as the County seat.</p> <p>This has brought settlement and human influence and use to Doña Ana County, which includes the Robledo Mountains.</p>
<p>CURRENT RANCHING ACTIVITIES</p>	<p>Ranching and livestock grazing has been a predominant use of the land since the 1880s, when railroads arrived in the territory. Historically, grazing on public land has been authorized and numerous rangeland improvements such as fencing and watering sources have been developed. Ranching continues to take place on public land within the Analysis Area. Management of the rangeland in the last 50 years has also imposed regulations—classified as perennial, perennial/ephemeral, and ephemeral—to protect resources on grazing allotments. The Federal Rangeland Improvement Act of 1978 improved grazing allotment management for the BLM. Most of the land administered by BLM in the Analysis Area is grazed by livestock. Currently, the Monument is grazed by two different livestock operators.</p>
<p>TAYLOR GRAZING ACT OF 1934</p>	<p>The Taylor Grazing Act of 1934 (Title 43 United States Code Section 315), signed by President Roosevelt, was intended to “<i>stop injury to the public grazing lands by preventing overgrazing and soil deterioration; to provide for their orderly use, improvement, and development; to stabilize the livestock industry dependent upon the public range.</i>” BLM was now required to allot grazing permits to ranchers and monitor and enforce grazing allowances. Additionally, a portion of the fees collected for grazing livestock on public land was returned to the appropriate grazing district to be used for range improvements. The two grazing allotments within the Monument are managed as intended by the Taylor Grazing Act, which allows proper vegetation use.</p>
<p>CLIMATIC EVENTS</p>	<p>Severe droughts occurred in 1916-18, 1921-26, 1934, and 1951-57. The 1951-57 drought is believed to have been the most severe in the past 350 years. Floods occurred on the Rio Grande in 1904, 1905, 1929, 1935, and 1941 (U.S. Geological Survey 2007).</p>
<p>WILDERNESS ACT OF 1964</p>	<p>Congress passed the Wilderness Act of 1964, which directed the Secretary of the Interior shall review every roadless area of 5,000 contiguous acres or more in the National parks, monuments, and other units of the National park system and every such area of, and every roadless island within, the National wildlife refuges and game ranges, under his jurisdiction on the effective date of this Act and shall report to the President his recommendation as to the suitability or non-suitability of each such area or island for preservation as wilderness.</p> <p>BLM designated the Robledo Mountain WSA, which 789 acres are within the Monument. The management actions of those 789 acres within the Monument will not impair Congress’ decision to designate or not designate that land as Wilderness if and when they decide to take action.</p>

PAST AND PRESENT EVENTS/ACTIONS

<p>BLM COMMUNITY PIT NO. 1</p>	<p>The BLM has closed a rock quarry just west of Las Cruces and adjacent to the Monument, known as Community Pit No. 1. The Community Pit #1 has operated since 1969 and has been a source for many of the rock walls in the Las Cruces area. Mining at the quarry focused on sandstone and siltstone.</p> <p>Past mining practices at the quarry have left it with unsafe vertical high walls, which pose a safety concern to the operators. In addition, some significant fossil trackways have been found in the siltstone and sandstone at and near the quarry. Although excavation at the quarry has led to additional findings, there are concerns in the academic community that continued mining could harm undiscovered specimens. The BLM has long-term plans to reclaim the quarry; in the meantime the area will remain closed.</p> <p>The quarry is surrounded on three sides by the Monument, which has led to many discussions on how the Community Pit No. 1 can benefit the Monument. Until the quarry is deemed safe, these discussions will stay as discussions.</p>
<p>APACHE CANYON BLM QUARRY</p>	<p>The BLM authorized the extraction of building stone material at the quarry known as Apache Canyon prior to 2000. This quarry was active until the BLM did not renew the permit in February of 2011. The proximity to the Prehistoric Trackways National Monument and continual finding of fossils at the quarry's edge was the logic for closure of the quarry. The excavations and use of this area has exposed fossils and created parking areas that in the future may potentially be a prime interpretation and educational resource; although this area is outside of the Monument boundary.</p>
<p>NEW MEXICO FOREST AND WATERSHED HEALTH PLAN</p>	<p>The <i>New Mexico Forest and Watershed Health Plan</i> represents a broad agreement as to how ecological restoration efforts should take place in New Mexico and addresses important ecological principles, sociocultural concepts, and economic issues. The plan will use an adaptive management and landscape approach and will consider the ecological capacity of the region. The integration of these three approaches toward the renewal and long-term stewardship of the natural landscape is the main focus of the New Mexico Forest and Watershed Health Plan. The planning effort will include entire watersheds, from high-elevation forested areas to lower-elevation rangeland and riparian areas.</p>
<p>NEW MEXICO ENVIRONMENTAL DEPARTMENT WATERSHED RESTORATION ACTION STRATEGY FOR THE LOWER RIO GRANDE WATERSHED</p>	<p>The Watershed Restoration Action Strategy grant for the Lower Rio Grande watershed, enabled under the Clean Water Act, Section 319(h), provides an opportunity for the New Mexico Department of Agriculture to list specific water quality problems in the Lower Rio Grande, and it identifies the contaminants that are causing these problems and their sources. Strategies have been developed to improve watershed conditions through best management practices. The Watershed Restoration Action Strategy will be updated every few years to reflect changing conditions. The Robledo Mountains are bound to east by the Rio Grande. Best management practices will be incorporated into any surface disturbing actions within the Monument.</p>
<p>NEW MEXICO GAME AND FISH DEPARTMENT; COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY</p>	<p>The New Mexico Comprehensive Wildlife Conservation Strategy identifies species and habitats of greatest conservation concern in the State. Its focus is on Species of Greatest Conservation Need (SGCN), key wildlife habitats, and the conservation of both. The desire is that New Mexico's key habitats persist in the condition, connectivity, and quantity to sustain viable populations of SGCN. BLM works with the New Mexico Department of Game and Fish in order to reach both agencies goals. This Strategy will help identify habitat of concerned species and how the BLM can contribute to the Strategy's success.</p>

PAST AND PRESENT EVENTS/ACTIONS

<p>COUNTY COMPREHENSIVE PLAN</p>	<p>The <i>Doña Ana County Comprehensive Plan</i> was adopted in 1994. The goals of the comprehensive plan are to provide basic infrastructure, maintain and protect the County's resources, provide community systems or facilities and services, promote economic development and employment opportunities, adopt and implement a land use plan, encourage affordable housing and a variety of housing types, and improve intergovernmental relations. As a part of the community and county, the BLM strives to work with Doña Ana County to facilitate the County's needs. The Monument may provide an additional tourist attraction or educational and recreational resource to the County.</p>
<p>LAS CRUCES DEVELOPMENT</p>	<p>While government is the largest employment sector in Doña Ana County, the economy continues to diversify. As a regional trade, education, and health care center, the County's employment continues to grow in most sectors, with education and health services growing at an average annual growth rate of 7.3 percent over the past 10 years; professional and business services growing at an average annual rate of 5.8 percent; and construction growing at an average annual rate of 4.9 percent. Of the County's largest employers, two are government testing facilities, and three are education systems, with one each in local government, health services, and retail trade. Other major employers are in the manufacturing, leisure, hospitality, and information sectors. Although the housing construction "mini-boom" of 2005 has slowed, commercial construction has accelerated, with 2006 total reported gross receipts in the construction sector growing by 32.6 percent compared to 2005. Total reported gross receipts for all industries grew at an annual average rate of 9.3 percent over the past 3 years. Retail trade gross receipts grew at an annual average rate of 6.5 percent during that period according to the Mesilla Valley Economic Development Alliance. As Las Cruces grows, so does the impact on the adjacent natural resources. Due to the proximity of the Monument to Las Cruces, it has the potential to be a very popular destination.</p>

REASONABLY FORESEEABLE FUTURE ACTIONS (2010 TO 2030)

<p>PROJECTED POPULATION GROWTH</p>	<p>The population of Doña Ana County is anticipated to increase through the life of the Plan.</p> <p>Below are population projections for the <i>Prehistoric Trackways National Monument Resource Management Plan/Environmental Impact Statement (EIS) Analysis Area</i>.</p> <table border="1" data-bbox="565 1234 1380 1381"> <thead> <tr> <th colspan="6">POPULATION PROJECTIONS BY YEAR</th> </tr> <tr> <th>COUNTY</th> <th>2010</th> <th>2015</th> <th>2020</th> <th>2035</th> <th>2030</th> </tr> </thead> <tbody> <tr> <td>Doña Ana</td> <td>227,009</td> <td>253,548</td> <td>282,152</td> <td>313,073</td> <td>345,458</td> </tr> <tr> <td colspan="6">SOURCE: Bureau of Business and Economic Research, University of New Mexico (2002 [revised 2004])</td> </tr> </tbody> </table>	POPULATION PROJECTIONS BY YEAR						COUNTY	2010	2015	2020	2035	2030	Doña Ana	227,009	253,548	282,152	313,073	345,458	SOURCE: Bureau of Business and Economic Research, University of New Mexico (2002 [revised 2004])					
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<p>VISION 2040 REGIONAL PLANNING PROJECT</p>	<p>The <i>Vision 2040</i> Comprehensive Regional Plan is the first long-range regional plan to include Doña Ana County and its four municipalities: the City of Las Cruces, Village of Hatch, Town of Mesilla, and City of Sunland Park. The study will address a wide range of growth-related issues, such as transportation, utilities and water, economic development, affordable housing, environmental protection, hazard mitigation, and intergovernmental cooperation. It will include extensive analysis of the current situation and a range of possible growth scenarios, which will result in specific policy recommendations. The recommendations from the regional study will be used for the second phase of the project: updates to the City of Las Cruces' and Doña Ana County's comprehensive plans. The project began in October 2007 and is expected to be complete in Fall of 2011.</p>
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NEW MEXICO RIO GRANDE TRAIL	New Mexico State Parks is in the process of establishing a trail, which would roughly parallel the Rio Grande. The basic infrastructure of the trail already exists in many locations via the levee systems and informal trail networks of the irrigation districts and on some publicly-owned land. The river and its bosque attract and sustain a wide variety of recreation—from hunting and fishing to river rafting to hiking, biking, and horseback riding. In many ways, human recreation in the river corridor also provides a vital connection to experiencing and appreciating the river, and educating the public about its past, present, and future. Trails can be a great component of community tourism, economic development, conservation, and health/fitness strategies. State Parks owns land at seven different places along the southern section of the Rio Grande (from Elephant Butte to Las Cruces). The trail will ultimately link all these sites and tie into the new Mesilla Valley Bosque State Park near Las Cruces. Communities in southern New Mexico, such as in Doña Ana County, have been actively pushing trail planning and development locally.
STATE GRAVEL PIT	Approximately 240 acres of New Mexico State trust land are leased to a sand and gravel operator that is directly adjacent to the southeast of the Monument. It is located in T. 22 S., R. 1 E., Section 32. The current operation has been permitted with the State of New Mexico since 2000.
BLM COMMUNITY PIT NO. 1	In 2008, an Environmental Assessment , NM-030-2009-0042, was completed by the BLM- Las Cruces District Office for the purpose to improve public safety; reduce visual impacts; return the Community Pit to multiple-use; and reduce erosion and other resource impacts. The proposed action is for the BLM to bid out a design and construct contract for reclamation of the Community Pit No.1. A reclamation plan would be developed. The exposed fossil bearing strata around the quarry body would be mapped and recorded as a component of the reclamation design.
DOÑA ANA COUNTY BLM RECREATION AREAS	Within Doña Ana County, the BLM has several recreation areas such as: Picacho Peak, Doña Ana Mountains, A-Mountain., Organ Mountains, Dripping Springs, Aguirre Spring, and Aden Hills OHV area. These areas allow for a variety of recreation opportunities. Some are dispersed while others have maintained trails. Hiking, picnicking, and sightseeing are offered at all of the sites. Doña Ana Mountains are best known for their mountain bike trails. Aden Hill OHV Area is used continuously by motorcycles, and Aguirre Spring offers a campground. Picacho Peak and Dripping Springs offer picnic areas, trails, and beautiful views.
NM STATE PARKS AND MONUMENTS	New Mexico State Parks manages three areas within Doña Ana County. They are Mesilla Valley Bosque State Park, Fort Selden State Monument, and Leasburg Dam State Park. Mesilla Valley Bosque State Park is south of PTNM, encompassing 300 acres of bosque (riverside forest) along the Rio Grande and 600 acres of adjacent Chihuahuan Desert. The park is a refuge for wildlife and a haven for people seeing the quiet enjoyment of nature. Leasburg Dam, constructed in 1908, channels water from the Rio Grande for irrigation in the Mesilla Valley. A quiet desert oasis, this State park provides peace and relaxation, beautiful cactus gardens, several trails and opportunities for fishing and canoeing in the Rio Grande. Fort Selden State Monument has a museum and ruins at the site of a 19th century army outpost. Built on the banks of the Rio Grande, this adobe fort housed units of the U.S. Infantry and Cavalry. Their intent was to protect settlers and travelers in the Mesilla Valley from desperados and Apache Indians. The government decommissioned the fort and it was abandoned in 1891.

4.5.2 Cumulative Impacts (Narrative Discussion)

The previously described impacts, in combination with past, present, and proposed and reasonably foreseeable future projects in the Analysis Area (Doña Ana County) could result in cumulative impacts. These potential effects are discussed below per resource if it is deemed to have a cumulative impact.

4.5.2.1 Cumulative Impacts to Paleontological Resources

The assessment area for the Paleontological Resources program is the southern third of the Robledo Mountains. Cumulative impacts on paleontological resources may occur through natural processes as well as motorized and mechanized recreational use, mineral exploration, rockhounding, and recreational collecting of common invertebrate fossils. Those paleontological resources outside of the Monument that are impacted by actions either natural or man-caused would be in addition to those impacts from research, interpretation, and nature within the Monument. Past research culminating in scientific reports and scientific publications has expanded the understanding of the paleontological resources. Under all Alternatives, preservation (no mining of Federal minerals within the Monument) of certain rock outcrops containing paleontological resources provides data for research, which would improve the world's knowledge of the Permian Era. For all Action Alternatives, non-permitted removal of petrified wood and plant fossils would not be allowed in the Monument, which would allow for these specimens to remain in the Monument for further study by visitors or by scientists. This would also lead collectors to search for these specimens elsewhere.

4.5.2.2 Cumulative Impacts to Interpretation and Education

The assessment area for the Interpretation and Education program is Doña Ana County. The following paragraph contains information for all Alternatives. With the opening of the Las Cruces Museum of Nature and Science in 2012, it is expected that interest in visiting the PTNM would grow due to the Trackways being a centerpiece for the museum. Continued paleontological research would benefit Interpretation and Education since new discoveries would enhance the interpretive experience for years to come. It can be expected that many generations would be able to enjoy and learn about the resources of the PTNM in addition to, and outside of the museum or classroom setting. The opportunity to enhance science education for children and adult visitors would be greatly increased and would grow over time. As more people experience the PTNM, the word would spread and with other types of outreach and advertisement, the cumulative effect of this would be extremely beneficial to not only the people themselves by providing an enriched experience of the public land, but it furthers the larger objectives of interpretation and education. The interpretive and recreational facilities and activities throughout the County would help promote the BLM as a land-managing agency that promotes education and enjoyment of the resources that it manages.

4.5.2.3 Cumulative Impacts to Recreation and Visitor Services

The assessment area for the Recreation and Visitor Services Program is Doña Ana County. The TriCounty RMP, which is currently being written, would direct the management of recreation on BLM land outside of the Monument, but within Doña Ana, Sierra, and Otero Counties. The TriCounty RMP would take into consideration the increase in interest of the Monument and would correlate its management decisions to complement those of the Monument RMP. Other agencies, such as State and local governments, contribute to cumulative impacts with recreation facilities such as the New Mexico Rio Grande Trail. It may disperse the visitor use or it may bring in more visitors to the area.

4.5.2.4 Cumulative Impacts to Trails and Travel Management

The assessment area includes Doña Ana County. Cumulative impacts to travel management would occur primarily from actions that facilitate, restrict or preclude motorized access. While in the concept stage, a mountain bike and motorized vehicle BLM recreation area is being developed within Doña Ana County. This might alleviate some of the motorized and mechanized vehicle pressure on the Monument in those Alternatives that allow mechanized and motorized vehicle use. In Alternative B, where the Monument is closed to all mechanized and motorized vehicle use, this would increase the use of the new BLM recreation area outside of the Monument. The New Mexico Rio Grande Trail could encourage more visitors to explore the Robledo Mountains and PTNM.

4.5.2.5 Cumulative Impacts to Air Quality

The assessment area for the Air Quality Program is Doña Ana County. The population of Doña Ana County is projected to increase. Population growth, which often equates to disruption of the soil and expansion of gravel pits, is likely to continue to impact the quality of air resources. In the long-term, fugitive dust, particulates, noise, and engine exhaust contaminants would increase with population. This would have the potential to affect visibility and result in increased ambient concentrations and deposition of air pollutants within the analysis area. Those alternatives that allow increased travel would cumulatively contribute to the air quality impacts.

4.5.2.6 Cumulative Impacts to Climate

Emission of GHGs is a cumulative issue with potential long-term effects. Although emission of GHGs from activities in the Analysis Area would contribute to the total greenhouse gases in the global pool, the models used by climate scientists are not precise enough to: 1) predict impacts on climate or the natural environment from increased or decreased emissions occurring from a specific region, or 2) determine the effects in a localized area. It is probable that these impacts would not be from BLM activities proposed within the Monument.

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. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability of climatic conditions, but increasing concentrations of greenhouse gases (GHGs) are likely to accelerate the rate of climate change.

In 2007, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the end of the 21st Century, global average surface temperatures would increase 1.1 to 6.4°C (2.0 to 11.5°F) above 1980-1999 levels under a range of potential emissions scenarios (IPCC 2007b). The US Global Change Research Program, in its 2009 Report on *Global Change Impacts in the United States* explains that actual warming levels within this range depend on the future level of emissions and the sensitivity of climate systems to those emissions. The National Academy of Sciences (2006) points out 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 and in the middle of continents. The US Global Change Research Program Report indicates the most of the US will experience greater warming in summer than winter although Alaska will experience more warming in winter. It is not, however, possible to predict with any certainty regional or site-specific effects on climate relative to the proposed action.

Potential impacts to natural resources and plant and animal species due to climate change are likely to be varied, including those in the southwestern United States. 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 and decreased vegetative cover. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened or endangered plants may be accelerated. Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at higher elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependent on historic water conditions. When compared to baseline information for 1961-1990, periods between 1991 and 2005 show temperature increases in over 95 percent of the geographical area of New Mexico. Warming is greatest in the northwestern, central, and southwestern parts of the state (Enquist and Gori 2008).

The assessment of GHG emissions, their relationship to global climatic patterns, and the resulting impacts is an ongoing scientific process. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models capable of predicting climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level. Determining the significance of any discrete amount of GHG emissions is beyond the limits of existing science. However, scientists are increasingly able to isolate likely scenarios for climate change and its impacts on a regional scale. The U.S. Global Change Research Program Report on *Impacts of Climate Change in the United States* (2009) focuses on broad areas of the country and greatest points of vulnerability as well as looking at Climate Change Impacts in different sectors of the economy. In the Southwest, a particular concern is the uncertainty around precipitation and the potential for extended periods of drought stressing already uncertain water supplies.

4.5.2.7 Cumulative Impacts to Cultural Resources

The assessment area for the Cultural Resources program is Doña Ana County.

Future residential development and construction of infrastructure could disturb cultural resources within the Analysis Area. When public land is disposed to accommodate future development or BLM permitted activities are approved BLM would be required to mitigate any adverse effects that might occur to cultural resources eligible for the National Register of Historic Places. This could result in the identification of more cultural resource sites, and an increase in information concerning cultural resources within the Analysis Area. Doña Ana County's *Vision 2040* comprehensive regional plan would address growth-related issues. Recreation could increase on BLM-administered land as a result of population growth, which could result in disturbance of cultural resources, but increased recreation use could increase opportunities for public education and interpretation.

4.5.2.8 Cumulative Impacts to Lands and Realty

The assessment area for the Lands and Realty program is Doña Ana County.

For all Alternatives, the Legislative restrictions on land use authorizations in the Monument would have a minor cumulative effect by reducing routing options through the Monument and possibly increasing construction costs for utilities if they need to change their preferred route around the Monument.

It is anticipated that approximately 640 acres of mineral estate could be acquired and transferred into public ownership over the life of this Plan in all Action Alternatives. Cumulative impacts from this acquisition, the withdrawal of the Federal minerals within the Monument and any other acquisitions or

withdrawals within Doña Ana County would minimally decrease the mineral land development opportunities.

In all Alternatives, Legislation directs the exclusion of land use authorizations that do not benefit the Monument. These other actions would be required to seek alternate routes or sites outside the Monument. This would be a minor cumulative effect by reducing routing options through the Monument and possibly increasing construction costs for utilities. This would not impact the number of land use authorizations, it would only affect the permitted location.

4.5.2.9 Cumulative Impacts to Lands with Wilderness Characteristics

The assessment area for the Lands with Wilderness Characteristics is Doña Ana County.

Mineral activities and motorized recreation use adjacent to the Monument could impact the opportunities to experience solitude and primitive unconfined recreation in land with wilderness characteristics. As population growth in the Analysis Area continues, all these activities are likely to increasingly degrade areas with wilderness characteristics not being protected. In Alternatives A, C, and D, those lands with wilderness characteristics that are not being managed for those characteristics would potentially lose those qualities with the cumulative impacts from other activities such as recreational use, development of visitor facilities, interpretation and education development, and scientific research.

4.5.2.10 Cumulative Impacts to Livestock Grazing

The assessment area for the Livestock Grazing program is Doña Ana County.

There are 62 grazing allotments within Doña Ana County. Continued expansion of the City of Las Cruces and adjacent towns, and development of private land in Doña Ana County has resulted in an urban interface that has impacted livestock grazing allotments. Increased recreational use on public land has resulted in past damage to pipelines that supply water to troughs used by livestock and wildlife and to fences used in managing cattle. Future population growth and the resulting need for expansion of populated areas could potentially result in further conflicts and constraints to livestock grazing allotments. These constraints would be further compounded in the livestock grazing allotments in which the Monument has been designated if they were closed to grazing under Alternative B; these constrictions of the allotments would likely impact the economic viability of the ranching operations for these grazing permittees, particularly on the Picacho Peak Allotment, due to the amount of acreage that would be lost to grazing. Additional gravel pits and recreational facilities would reduce the forage available for the livestock if the land was within a grazing allotment.

4.5.2.11 Cumulative Impacts to Social and Economic Conditions

The assessment area for social and economic conditions is Doña Ana County.

Since 1990, the population in the Analysis Area has increased substantially. Continued population growth is expected. This growth would increase the demand for recreational opportunities in the area. As a result, recreational use of the Monument would increase. Conflicting values related to public land uses (e.g., motorized recreation and preservation of wilderness characteristics) require managers to make tradeoffs, which may reduce some individuals' quality of life. Population growth would make these pressures more acute.

Increased urbanization would affect the viability of public land grazing. As addressed in Section 4.5.2.10 (Cumulative Impacts to Livestock Grazing), constraints on grazing would affect the economic well-being of permittees.

In Alternative B, motorized vehicle use and SRPs are not allowed within the Monument, which would either push the use outside of the Monument or outside of Doña Ana County. If the use leaves Doña Ana County, the economic stimulus from this use would be lost.

4.5.2.12 Cumulative Impacts to Soils

The assessment area for the Soils Program is Doña Ana County.

Surface disturbance and loss of vegetation are the main contributors to decreased soil productivity and increased soil erosion. A growing portion of soil resources would likely be compacted or paved by various activities throughout the area, regardless of public or private ownership. The increasing population growth and development around Las Cruces and the subsequent increase in recreational activities, such as OHV users, could have direct impacts on soil resources from surface disturbance. With the increase in residential, commercial, and industrial development, OHV users may create new trails in areas that had not previously been disturbed, which could lead to further soil disturbance. Alternative B potentially has the most impact due to the prohibition of motorized and mechanized vehicle use and livestock grazing within the Monument. This reduces the number of designated miles of motorized and mechanized use by 37.6 miles. Limiting these two uses could result in decrease of soil erosion within the Monument, but the impacts would be transferred to land outside of the Monument.

4.5.2.13 Cumulative Impacts to Vegetation

The assessment area for the Vegetation Program is the Robledo Mountains.

Increased use within the Monument coupled with use of recreational trails on public land in the surrounding mountains could result in the potential for increased disturbance of vegetation and the introduction of noxious weeds throughout the southern Robledo Mountains. This could result in further deterioration of rangeland health and productivity. Surface-disturbing activities and construction of roads and infrastructure could be a primary cause of site-specific loss of forage and the spread of noxious weeds, specifically in Alternatives C and D for visitor facilities. Vegetation treatments and monitoring efforts would help maintain or improve the quantity and quality of forage. Under Alternative B, with the removal of livestock grazing, the vegetation density would increase, which would lead to several impacts such as potential wildlife increase or wildland fire potential.

4.5.2.14 Cumulative Impacts to Visual Resources

The assessment area for the Visual Resources Program is Doña Ana County.

Population growth and its associated development, increases in OHV recreation use, and mineral exploration and developments could have direct impacts on visual resources through increased surface disturbance.

4.5.2.15 Cumulative Impacts to Water Resources

The assessment area for the Water Resources Program is Doña Ana County.

Surface disturbance and loss of vegetation are key contributors to decreased water infiltration, increased soil erosion, and degradation to watershed health. Population growth around Las Cruces could have direct and indirect negative impacts on water resources and watershed health resulting from increases of paved roads, parking lots, buildings, and other impermeable surfaces due to the expansion of residential, commercial, and industrial development. It is inferred that recreational activities, such as camping and OHV use, outside city limits would increase proportionally to population growth. Negative impacts would primarily be derived from surface disturbances such as new roads and trails, in which the magnitude of the impacts would be dependent on the type, intensity and duration of the disturbance. Alternative B has the most potential for positive impacts to water resources and watershed health within the Monument, due to the prohibition of motorized and mechanized vehicle use and livestock grazing. Limiting these two uses could result in decreased surface disturbance and soil erosion within the Monument. However, these impacts would likely be transferred to land outside of the Monument.

4.5.2.16 Cumulative Impacts to Wildland Fire Management

The assessment area for the Wildland Fire Management Program is the Robledo Mountains.

Potentially, the risk of a wildfire carrying within the Monument may increase in Alternative B due to the removal of livestock grazing resulting in vegetation density increase. Overall, all Alternatives, when considered with other past, present, and reasonably foreseeable future actions, are not anticipated to have a significant effect in terms of wildland fire management.

4.5.2.17 Cumulative Impacts to Wildlife and Special Status Species

The assessment area for the Wildlife and Special Status Species Programs is the Doña Ana County.

Current management of livestock, vegetation and wildlife is intended to facilitate achievement of the standards for public land health. Wildlife and special status species on public land may be affected by offsite use and development regardless of the RMP alternative selected. The conversion of land use from agricultural to residential and commercial uses would decrease the habitat values of undeveloped land. The change in land use could result in the loss of habitat for some special status species. Management of adjacent land would affect habitat conditions and special status species populations.

Planning efforts to direct urban growth and preserve natural resources, like the New Mexico Department of Game and Fish's *Comprehensive Wildlife Conservation Strategy* (2006), the *Vision 2040* Regional Planning Project in Doña Ana County, and comprehensive plans for local government are directing growth that can help to preserve habitats and populations for special status species, particularly those in sensitive areas.

4.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

A discussion of irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented is required by Section 102 (2) (C) of NEPA. Irreversible commitment of a resource is a resource commitment that cannot be reversed such as an extinction of a species or

destruction of a paleontological resource. An irretrievable commitment of a resource is one that is lost for an amount of time such as a mineral withdrawal.

By allowing collecting of invertebrate paleontological resources this could result in an irreversible commitment of resources. Although this collecting has to result in only negligible disturbance to the Earth's surface or other resources, it could result in loss of vertebrate paleontological resources also. By allowing scientific collecting of significant paleontological resources, this will mitigate the possibility of an irretrievable loss to these resources. Those fossils will be curated in a Federal repository, studied, and possibly displayed for the public to view. Development of interpretation, educational, and recreational resources and approving land use authorizations and research permits that result in surface disturbance would create irreversible or irretrievable results for soil and vegetation. In order to reduce these impacts, best management practices would be used. During all surface disturbing activities, the laws protecting cultural and paleontological resources would be adhered to in order to reduce or eliminate impacts on these resources. The withdrawal of the Monument from mineral development would preclude the extraction and use of these resources. It is possible, but unlikely the withdrawal would be removed by Congress and therefore this action is considered an irretrievable commitment of resources.

4.7 UNAVOIDABLE ADVERSE IMPACTS

Section 102 (2) (C) of NEPA also requires that any adverse environmental effects which cannot be avoided should this proposal be implemented are disclosed. Unavoidable adverse impacts are those that remain following the implementation of mitigation measures.

Casual collecting of common invertebrates would cause unavoidable loss, but the educational gain from this activity would outweigh the loss. Unavoidable loss for other paleontological resources could occur due to looting, vandalism, erosion, and inadvertent destruction. This impact is expected to be reduced as surveys of the Monument are completed and necessary precautions are put in place. Unavoidable adverse impacts from increased visitation are increased soil compaction and erosion, disturbance to vegetation, wildlife, and livestock, wildfire ignition, and conflicts between users. Vehicle use within the Monument could inadvertently destroy cultural or paleontological resources if the resource was not detected and protected. Travel management restrictions such as route closures have an adverse impact on recreational motorized or mechanized use within the Monument. Should livestock grazing be eliminated within the Monument as proposed in Alternative B, it would have an adverse impact on the livestock grazing permittee.