Fort Stanton-Snowy River Cave National Conservation Area
Draft Resource Management Plan/Environmental Assessment

DOI-BLM-NM-P010-2010-149-EA

Lincoln County, NM

March 2011

U.S. Department of the Interior
Bureau of Land Management
Roswell Field Office
Roswell, New Mexico

United States Department of the Interior

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TAKE PRIDE IN AMERICA

In Reply Refer To:
1610 (500)

April 14, 2011

Dear Reader:

Enclosed for review and comment is the Draft Fort Stanton-Snowy River Cave National Conservation Area Plan (NCA Plan) and Environmental Assessment (EA). This document describes and analyzes alternative plans for managing public land and resources, including cave resources, in the NCA, located in Lincoln County, New Mexico. The purpose of this review is to help the Bureau of Land Management (BLM) in its decision-making process. We welcome your comments. While you will be able to make verbal comments at the public open houses, we encourage you to also send them in writing to the following address:

Glen Garnand, NCA Plan Team Leader
BLM Roswell Field Office
2909 West Second Street
Roswell, New Mexico 88201

In addition to mailing comments, you may also send them via e-mail to NMRFO_Comments@blm.gov or fax them to BLM at 575-627-0276. E-mailed or faxed comments must indicate in the subject line that they are "Comments on the Draft Fort Stanton-Snowy River Cave NCA Plan." All written comments must be postmarked (e-mail and fax must be received) within 45-day public review period, beginning April 25, 2011 and ending June 9, 2011 in order to be considered in the Proposed NCA Plan. Where possible, include references to the pages and paragraphs in your comments.

Comments are most useful when they address one or more of the following:

- Errors in the analysis;
- New information that would have a bearing on the analysis;
- Incorrect information that may have been used which could affect the outcome of the analysis;
- Request for clarification; and
- Identification of a substantive new alternative that is different from any of the existing alternatives.

Comments, including names and street addresses of respondents, will be available for public review at the Roswell Field Office, during regular business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday, except holidays, and may be published as part of the NCA Plan. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must

state this prominently at the beginning of your written comment. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organization or businesses, will be made available for public review in their entirety. Written and oral comments that result from the 45-day review period will be considered fully and evaluated in preparing the Proposed NCA Plan.

Public meetings will be held during the 45-day review period. Dates and addresses for these meetings will be advertised in the local news media and listed on the New Mexico BLM website: http://www.blm.gov/nm/st/en.html. During the public meetings, information explaining the environmental planning process and the document will be displayed. BLM specialists will also be available to discuss the Draft NCA Plan.

Table 1 of the document is a comparison of alternatives and proposes both planning and implementation decisions. Implementation decisions are marked with a red asterisk (*). The remaining decisions are planning decisions.

When completed, this NCA Plan will amend the 1997 Roswell Resource Management Plan.

Sincerely,

Charles W. Schmidt
Field Manager

I. INTRODUCTION

The Fort Stanton Area of Critical Environmental Concern (ACEC) was established in the 1997 Roswell Approved Resource Management Plan (RMP) and Record of Decision. The management goal for the ACEC was to:

> *Protect the biological, archaeological and scenic qualities of Fort Stanton, while providing for quality recreation opportunity.*

One of the prominent features of the ACEC is Fort Stanton Cave, designated as a National Natural Landmark in 1975. The cave has been the site of numerous scientific explorations. In 2001, one such exploration resulted in the discovery of a new, undisturbed passageway. This passageway led to a dry river formation of continuous snow-white calcite – the Snowy River Passage. A truly unique formation, the Snowy River Passage was the catalyst that brought about the designation of Fort Stanton-Snowy River Cave National Conservation Area (NCA) through an Act of Congress in 2009. This designation effectively transformed the Fort Stanton ACEC, along with an additional 246 acres, into the NCA and placed it within the Bureau of Land Management's (BLM) National Landscape Conservation System (NLCS), a network of BLM-administered landscapes recognized for their outstanding cultural, ecological and scientific values.

A. Purpose and Need for the Plan

In the Omnibus Public Land Management Act of 2009 (Public Law [PL] 111-11, March 30, 2009, see Appendix 4), Congress established the NCA in order to conserve, protect, and enhance the "historic, cultural, scientific, archaeological, natural, and educational subterranean cave resources of the Fort Stanton-Snowy River cave system." The purpose of the Ft. Stanton-Snowy River Cave National Conservation Area Resource Management Plan (NCA Plan) is to provide the framework for managing the subsurface and surface resources of the NCA, incorporating previous management plans where applicable, taking into consideration any information developed in the studies of the land and resources within or adjacent to the NCA, and developing working relationships with the local community of Lincoln County, New Mexico.

The need for this plan is to comply with PL 111-11, in which Congress mandated that the BLM develop a comprehensive plan to manage the NCA and to meet the requirements of the Federal Land Policy and Management Act of 1970, as amended. Congress also provided that the surface resources of the NCA would be managed in accordance with the Fort Stanton Area of Critical Environmental Concern Final Activity Plan of 2001. To comply with the congressional directive, the BLM would prepare a Resource Management Plan Amendment (RMPA) and supporting Environmental Assessment for the NCA.

B. Planning Area

The NCA encompasses 24,876 acres of land in Lincoln County, New Mexico. The NCA is located adjacent to the Lincoln National Forest (Map 1). Most of the NCA is comprised of the former Fort Stanton ACEC plus an additional 246 acres including the Rio Bonito Acquired Lands Tract 1 (166 acres) and grazing allotment 63071 (80 acres).

C. Scoping and Issues

The BLM RMP planning process is issue-driven. The identification of issues helps to resolve resource management problems and take advantage of management opportunities. The following section discusses the issues and management concerns that determined the alternatives and the scope of analysis for the Draft RMPA and supporting Environmental Assessment (EA). Planning issues are usually considered external to the BLM and express more wide-spread opportunities, conflicts, or problems associated with the management of public lands. Planning issues may also reflect new data, new or revised policies, and changes in resource uses. Management concerns are topics that involve a resource management activity or land use and often they are internal to the agency. While some concerns may overlap issues, a management concern is generally one identified by BLM staff, an individual or group.

In April 2010, the Roswell Field Office held two public meetings in the communities most directly affected by the NCA – one in Capitan, New Mexico and one in Ruidoso, New Mexico. A total of twenty-four people attended those meetings. The BLM received 13 letters and e-mails during the scoping period. Fourteen comments were received at these public meetings and 58 comments were received from letters and e-mails. The oral and written comments about Fort Stanton Cave and the Snowy River Passage included cave management in general, visitation limits, discovery and survey criteria, bat habitat and hibernaculum, air quality and water quality. Comments about surface management within the NCA included livestock grazing, development of a campground, trails, vegetation management, and management prescriptions for areas now included in the NCA that were not part of the Fort Stanton Area of Critical Environmental Concern.

Information was also sent to and comments were solicited from Comanche Nation, the Pueblo of Isleta, the Ysleta del Sur Pueblo, the Kiowa Tribe of Oklahoma, and the Mescalero Apache Tribe. All the agencies and groups cited in Section VI of this document were invited to comment. The BLM also conducted internal scoping with an interdisciplinary team of resource specialists. Internal and external scoping efforts identified several issues and management concerns that should be considered in developing the NCA management plan. The issues and management concerns are summarized below, as well as issues that were considered but would not be addressed in the NCA plan.

Issues to be Addressed in the NCA Plan

- Cave Issues
    - How would the scientific exploration of the Snowy River Passage affect recreational access to Fort Stanton Cave?
    - Should the BLM plan for drilling a portal (entrance) into the cave and, if so, how would it mitigate the impacts to other cave resources?

- Recreation
    - How would the use of fees influence visitor use?
    - Can conflicts between the Rio Bonito Campground, riparian areas, and archaeological resource protection concerns be reconciled so that the campground can be reopened, or would the campground be more appropriate in another location?
- Livestock Grazing
    - How would conflicts between resource conservation and livestock grazing be addressed?
- Vegetation Management
    - How would conflicts between vegetation management, particularly use of prescribed fire and protecting cave resources be addressed?
- Land Acquisition
    - How would opportunities for land acquisition within the NCA be addressed?

Management Concerns to be Addressed in the NCA Plan

- Recreation
    - How would off-highway vehicle (OHV) uses on the NCA be managed to provide adequate public access while minimizing impacts to natural and cultural resources?
- Visual Resources
    - How would visual resources be managed on the NCA?
- Mineral Resources
    - How would mineral resources be managed on the NCA?
- Cultural Resources
    - How would the management plan address cultural resource management, while taking into account other uses?

Issues Not Analyzed

The following issues will not be addressed in the NCA Plan as they are outside of the scope of the plan, or they are already addressed in existing policy or administration.

- Would the BLM repair and further develop the corrals area?
    - This issue was discussed during plan development and it was determined that this action can be completed outside the scope of the NCA plan, should the BLM decide to do so.
- Would the BLM develop Fort Stanton Cave to make it more accessible?
    - Making Fort Stanton Cave more accessible would be unfeasible. The entrance to the cave is too steep and narrow to allow for the proper construction of handicap access without drastically altering the formation, which would not be consistent with the purposes of the legislation that establishes the NCA.

- Would the BLM close Camp Sierra Blanca?
    - Camp Sierra Blanca is owned and managed by the State of New Mexico. The BLM does not have authority over its management.
- The name of the NCA is confusing and inaccurate. Will the BLM change it?
    - The Fort Stanton-Snowy River Cave NCA was named by an Act of Congress, PL 11-111. The BLM does not have the authority to change the name.

D. Planning Criteria/Legislative Constraints

The BLM planning regulations (at 43 CFR 1610.4-2) require development of planning criteria to guide preparation of an RMP. ***Planning criteria*** are the standards, rules, and other guidelines developed by managers and interdisciplinary teams, with public input, for use in forming judgments about plan-level decision making, analysis, and data collection. These criteria are used to establish the parameters or "ground rules" for making planning decisions and simplifying RMP actions. The criteria may be adjusted during RMP development based on management concerns and the results of the public scoping process. Planning criteria for the Snowy River NCA Plan are as follows:

- The NCA Plan will comply with the Omnibus Public Land Management Act of 2009.
- While the multiple-use mandates of FLPMA and all other applicable laws, regulations, and policies will be followed to the extent appropriate, the provisions of the Act will prevail in managing the NCA.
- Land use decisions in the NCA Plan will apply to the surface and subsurface estate managed by the BLM.
- For program-specific guidance for decisions at the land use planning level, the process will follow the BLM's policies in the Land Use Planning Handbook, H-1601-1.
- Public participation and collaboration will be an integral part of the planning process.
- The BLM will strive to make decisions in the plan compatible with the existing plans and policies of adjacent local, state, and federal agencies and local American Indian tribes, as long as the decisions are consistent with the purposes, policies, and programs of federal law and regulations applicable to public lands.
- The NCA Plan will recognize valid existing rights.
- The NCA Plan will amend, where applicable, management decisions from existing planning documents.
- The NCA Plan will identify goals, objectives, and actions for the conservation and protection of cave resources. See Appendix 4.
- The NCA Plan will identify Best Management Practices and mitigation measures to be applied when surveying, exploring, and conducting scientific studies within Fort Stanton Cave and the Snowy River Passages.
- The BLM will work cooperatively and collaboratively with cooperating agencies and all other interested groups, agencies, and individuals.
- The BLM and cooperating agencies will jointly develop alternatives for resolution of resource management issues and management concerns.

- The BLM will consider public welfare and safety when addressing hazardous materials and fire management.
- GIS and metadata information will meet Federal Geographic Data Committee (FGDC) standards, as required by Executive Order 12906. All other applicable BLM data standards will also be followed.
- The planning process will provide for ongoing consultation with American Indian tribal governments and strategies for protecting recognized traditional uses.
- Planning and management direction will focus on the relative values of resources and not the combination of uses that will give the greatest economic return or economic output.
- The BLM will consider the quantity and quality of non-commodity resource values.
- Where practicable and timely for the planning effort, the best available scientific information, research, and new technologies will be used.
- Actions must comply with all applicable regulations and must be reasonable, achievable, and allow for flexibility while supporting adaptive management principles.
- The Economic Profile System (EPS) will be used as one source of demographic and economic data for the planning process. EPS data will provide baseline data and contribute to estimates of existing and projected social and economic conditions.

E. Planning Process

The NCA management planning process started with the development of a Preparation Plan. This plan outlines the steps to follow and the criteria to use when developing the NCA plan. The next step was the publishing of a Notice of Intent (NOI) in the *Federal Register* on March 9, 2009. This NOI notified the public that the BLM would amend the Roswell RMP to include the Fort Stanton-Snowy River Cave NCA plan.

The BLM then conducted scoping. During scoping, both external and internal comments were sought to identify issues and concerns related to the management plan. Alternatives for the NCA plan were formulated from these issues and concerns. After formulating the alternatives, the BLM analyzed the effects of the alternatives and prepared this NCA plan.

Following a comment period, the BLM will revise the plan as necessary and release the EA with a Proposed RMP. A 30-day protest period will follow concurrent with a 60-day Governor's Consistency Review. After all protests have been resolved the Decision Record will be signed and the Fort Stanton-Snowy River Cave NCA RMPA will be available.

F. Conformance with Land Use Planning

This plan will amend the Roswell Approved Resource Management Plan (RMP) and Record of Decision (BLM 1997) to conform to PL 111-11. The NCA boundary established by this law will replace the Fort Stanton ACEC boundary established in the Roswell RMP. The NCA plan will carry forward appropriate surface management decisions from previous plans, as directed by PL 111-11, and will focus on sub-surface resource management of the Fort Stanton Cave system. The NCA Plan will also revise the 1988 Cave Management Plan for Fort Stanton Cave.

G. Relationships to Statutes, Regulations, or Other Plans

All alternatives considered in the NCA Plan are consistent with:

Omnibus Public Land Management Act of 2009 (PL 111-11);
Federal Land Policy and Management Act of 1976 (43 U.S.C. 1700 et seq.);
National Environmental Policy Act of 1969 (42 U.S.C. 4321);
Taylor Grazing Act of 1934 (43 U.S.C. 315 et seq.);
Clean Water Act (33 U.S.C. 1251 et seq.), as amended;
Endangered Species Act (16 U.S.C. 1535 et seq.) as amended;
Executive Order 11988, Floodplain Management;
Executive Order 11990, Protection of Wetlands;
Federal Lands Recreation Enhancement Act (PL 108-447);
National Historic Preservation Act; and
Federal Cave Resources Protection Act of 1988.

This EA is tiered to and incorporates by reference the following plans:

Cave Management Plan - Fort Stanton Cave (1988);
Roswell Resource Management Plan (1997);
Fort Stanton Area of Critical Environmental Concern Final Activity Plan (2001);
Fort Stanton Watershed Improvement Project Environmental Assessment (2001);
Fort Stanton Area of Critical Environmental Concern Route Designation Plan (2003);
Discovery and Documentation Procedures in Fort Stanton Cave National Natural Landmark (2003);
Rio Bonito Acquired Lands (RBAL) Final Activity Plan (2004);
Resource Management Plan Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas (RMPA For Fire and Fuels) (2004); and
Capitan Area Grazing EA, (2010).

II. ALTERNATIVES

A. General Description of Alternatives

This plan would adopt the goals and objectives of the 1997 Roswell RMP, the 2001 Fort Stanton ACEC Final Activity Plan and the RBAL Final Activity Plan.

The No Action Alternative is the current management as prescribed in the current land use plans, including the 1997 Roswell RMP, the Fort Stanton ACEC Final Activity Plan, and the RBAL Final Activity Plan. Much of the surface management will be similar to the No Action Alternative since PL 111-11 directed the BLM to use the Fort Stanton ACEC Final Activity Plan as appropriate.

Alternative A is the Preferred Alternative. It lays out the prescriptions the BLM would like to use for the management of the NCA.

Alternative B describes management prescriptions for Fort Stanton Cave and the Snowy River Passage that are more restrictive than those in the Preferred Alternative. Alternative C describes management prescriptions for Fort Stanton Cave and the Snowy River Passage that are less restrictive than those in the Preferred Alternative.

Table 1. Comparison of Alternatives. [* denotes implementation decisions]

ISSUE/RESOURCE	NO ACTION ALTERNATIVE	ALTERNATIVE A (PREFERRED)	ALTERNATIVE B	ALTERNATIVE C
Mineral Resources	Open to the discretionary disposal of mineral materials, except for approximately 330 acres of the Feather Cave Complex.	Disposal of mineral materials open only for BLM use.	Closed to the disposal of mineral materials.	Same as the No Action Alternative.
Land Tenure	The BLM would consider acquiring private and state lands, including the Rio Bonito Waterfall, lands along the Rio Bonito adjacent to Fort Stanton, and the NMSU facilities at Fort Stanton.	BLM would consider acquisition of land to consolidate natural resource values and meet the management objectives of this plan. Properties would be acquired from willing sellers via exchange, purchase of land, easements, and donation or other comparable methods.		
Land Use Authorizations	The BLM would continue to exclude major rights-of-way (ROWs) except a utility corridor already established for the Sierra Blanca Regional Airport. The BLM would consider minor ROWs, leases and permits.	Same as No Action, plus all land use applications that include overhead structures with a height greater than 15 feet would be buried or prohibited, including small wind turbines. This would be done to reduce visual impacts on the NCA.		
Visual Resource Management Classes	The NCA manages Class II, III, and IV VRM areas.	All VRM areas managed at Class IV would be managed at Class III. Areas managed at Classes II and III will continue to be managed the same.		
Fees for use of Fort Stanton-Snowy River Cave NCA	No fees are charged for any use of the NCA.	Fees would be considered for the use of designated developed campgrounds upon completion of a business plan.	Same as Alternative A plus a fee would be charged for cave permit upon completion of a business plan.	Same as No Action Alternative.
Wild and Scenic Rivers	No rivers in the NCA are designated under the National Wild and Scenic Rivers System (NWSRS).	The BLM would not recommend any rivers to be designated as part of the NWSRS.	The BLM would recommend that Segment 1 of the Rio Bonito, as inventoried, be tentatively classified as a Scenic River Area in the NWSRS.	Same as Alternative A.

Issue/Resource	No Action Alternative	Alternative A (Preferred)	Alternative B	Alternative C
Rio Bonito Campground*	Rio Bonito Campground is closed due to its location within a riparian zone.	The Rio Bonito Campground would be re-established if a suitable location more than 100 feet from the riparian area can be provided and impacts to cultural resources can be avoided.	Same as No Action Alternative.	Same as Alternative A.
Motorized OHV Route Designation	Motorized OHV users are limited to designated roads and trails.	Motorized OHV users would be limited to designated roads.		
Fort Stanton Cave visitation limits*	Ten people allowed in the front portion of Fort Stanton Cave, six people beyond Hell Hole gate.	A range of three to ten in the front portion of Fort Stanton Cave, a range of three to six including a BLM-approved guide beyond Hell Hole Gate. See Appendix 3.		
Cave permits issued for commercial use*	Up to 20% of 400 recreational cave permits available could be issued for commercial use.	Same as the No Action Alternative.	Up to 10% of the 400 recreational cave permits could be issued for commercial use.	Up to 30% of the 400 recreational cave permits could be issued for commercial use.
Recreational access to Snowy River Passage*	No recreational access to Snowy River Passage.	Same as the No Action Alternative.	Same as the No Action Alternative.	Recreational access would be allowed under certain defined conditions. See Appendix 3.
Portals for cave access*	No portals will be drilled.	Same as the No Action Alternative.	Same as the No Action Alternative.	Portals would be considered using defined criteria; see Appendix 2.

B. Management Common to All Alternatives

Several decisions from previous management plans pertinent to the Fort Stanton-Snowy River Cave National Conservation Area would be carried forward in this plan, in accordance with PL 111-11, Sec 2203(c). These plans are the 1997 Roswell Resource Management Plan (RMP), the 2001 Fort Stanton Area of Critical Environmental Concern Activity Plan (ACEC Plan), the 2001 Fort Stanton Watershed Improvement Project (WIP), the 2003 Fort Stanton ACEC Route Designation Plan (Route Plan), the 2004 Rio Bonito Acquired Lands Final Activity Plan (RBAL), the 2004 RMP Amendment for Fire and Fuels Management on Public Land in New Mexico and Texas (Fire RMPA), and the 2010 Capitan Area Grazing Environmental Assessment (Grazing EA). The decisions brought forward from these plans are outlined below. These decisions carry through all alternatives and have undergone NEPA analyses in previous documents. In the following statements, the term NCA has replaced the term ACEC found in current planning documents.

Also in accordance with PL 111-11, Sec 2203(c), the BLM would consider entering into a cooperative agreement with Lincoln County, New Mexico concerning the interpretation and protection of the resources in the NCA.

- **Livestock Management**

  Livestock grazing would be considered to the extent it would be used as a tool to accomplish management plan objectives. Livestock grazing would be limited or excluded in riparian pastures, highly erodible areas, cave entrances, campgrounds and day-use areas, and sensitive archaeological sites. No grazing preference would be established. When livestock grazing is used as a tool, the BLM would control the number of animals and timing of grazing within the NCA. (RMP)

  When using grazing as a tool in riparian areas, grazing would occur only under favorable forage conditions and if improvements, such as fences, are functional. Cooperative agreements would be developed between BLM and authorized grazers or adjacent landowners so that the use of the land can best benefit all parties and can be developed to its full potential. Pasture fences are present within the rest of NCA in the event that livestock would be used as a vegetation management tool. (ACEC Plan)

  Grazing in allotment No. 63071, Lamay Place is authorized under Section 15 of the Taylor Grazing Act. It is currently authorized for cattle, 2 animal units and 15 animal unit months. (Grazing EA) The 1997 Roswell RMP identified this allotment as suitable for grazing. A fence currently separates the allotment from the rest of the NCA which would prevent any unauthorized movement of livestock onto the NCA.

- **Vegetation and Watershed Management**

  The goal of vegetation management is to manage resources to maintain or improve vegetation in order to attain the desired plant community (DPC) as outlined in the Roswell RMP. The goal of watershed management is to improve watershed function to enhance water quality and water availability. The BLM would manage the vegetation resources within the NCA contributing to the overall health and function

of the watershed while considering balanced resource sustainability. Best Management Practices (BMPs), such as erosion control structures, will be used to minimize sedimentation as a cause of nonpoint source pollution in surface waters. Vegetation management on the NCA will be developed under specific Ecological Range Site goals which will include agricultural crops established on existing tilled acreage using water rights obtained with the acreage. (ACEC Plan)

To meet this goal, projects would include mechanical treatment, herbicidal treatment, prescribed fire, and livestock grazing. (WIP, ACEC Plan) Prescribed burns would be conducted in selected pinyon-juniper, riparian and grassland community types in the NCA to improve wildlife habitat and reduce fuels. (Fire RMPA)

Saltcedar, Russian olive, and Siberian elm treatments of selected riparian/wetland habitat along the Rio Bonito and Salado Creek would be conducted using prescribed fire, mechanical control, or chemicals, except that chemicals would not be applied aerially. (RMP, ACEC Plan, WIP)

- **Cultural Resources Management**

  The Feather Cave Archaeological Complex, including Lower Stanton Pueblo Ruin and Feather Cave, would be managed to preserve, protect and interpret unique archaeological values, artifacts and architectural features. (RMP, ACEC Plan)

  Within the NCA, the management of Feather Cave, a site on the National Registry of Historic Places, would emphasize off-site interpretation of its religious significance while allowing for the protection of fragile cultural values. The cave is closed to recreational use. The Feather Cave display has been developed and can be viewed by the public at the Lincoln State Monument Museum of New Mexico on US Highway 380 in Lincoln, New Mexico. (ACEC Plan)

  An off-site interpretive display depicting Lower Stanton Pueblo Ruin would be developed. Development would occur after sufficient data recovery and analysis has been completed. (ACEC Plan)

  Additional research and on-site archeological surveys would be conducted on Tract 1 of the RBAL. Sites eligible for listing on the National Registry of Historic Places would be allocated into different cultural use allocations using established criteria as appropriate. The management goals would be to interpret some cultural sites for the public, research some of the sites for the information they contain and to conserve those sites that meet the criteria for conservation. (RBAL)

  A separate cultural management plan will be developed for the NCA, incorporating elements of existing plans that are in various stages of development. This plan will be all-inclusive and take into consideration the various types of archaeological sites at Fort Stanton, the need to protect those sites and the public's use of Fort Stanton. (ACEC Plan)

- **Realty – Land Use Authorizations**

  The NCA would continue to be designated as exclusion of rights-of-way for major projects such as electric transmission lines; pipelines 10 inches in diameter or larger; communication sites for interstate use; federal, state and interstate highways; major county and private roads; and commercial wind and solar energy generating sites. (RMP)

  A utility corridor for ancillary facilities associated with the Sierra Blanca Regional Airport would be retained. The corridor dimensions are 100 feet on each side of Devil's Canyon Road, and 1.5 miles in length. No additional rights-of-way corridors would be designated. The BLM would consider granting minor rights-of-way, leases and permits. The NCA would be closed to leases issued under the authority of Recreation and Public Purposes Act (R&PP). (RMP, ACEC Plan)

- **Travel Management – Trails**

  Between 1997, when the Roswell RMP went into effect, and 2009, when Congress established the NCA, the BLM completed and implemented the Fort Stanton ACEC Route Designation Plan. As a result, there are now 93 miles of multiple use trails designated within the former ACEC. In accordance with PL 111-11, the NCA Plan is not considering designating additional trails. These trails are designated for non-motorized uses (hiking, equestrian, and mountain bikes). (ACEC Plan, Route Plan)

  In order to support recreation, the BLM would consider developing a trail from the Apple Orchard to Salazar Canyon on the portion of the NCA that was Tract 1 of the RBAL. This trail would be designated for non-motorized uses (hiking, equestrian, or mountain bikes). (RBAL)

- **Recreation Management- Special Recreation Management Areas**

  The Fort Stanton ACEC and the RBAL were both designated as Special Recreation Management Areas in the 1997 Roswell RMP. These designations will carry forward with the NCA.

- **Travel Management – Off-Highway Vehicles**

  To clarify the intent of the 1997 Roswell RMP and 2001 Fort Stanton ACEC Activity Plan, within the NCA, motorized cross-country travel will be allowed for any fire, search and rescue, or law enforcement vehicle used for emergency purposes. (Route Plan)

  Access for disabled persons will be allowed per the Rehabilitation Act of 1973. Under the Act, an individual with a disability will not, solely by reason of his or her disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity conducted by BLM. Disabled access per the Rehabilitation Act is considered at the local level on a case-by-case basis. Motorized wheelchairs, as defined in the Rehabilitation Act are not considered OHVs and would not be restricted by any of the alternatives.

The New Mexico Department of Game and Fish is the licensing authority for all hunting within the NCA, including hunting by people with disabilities. Disabled hunters may be accompanied by a person who is not disabled to assist them with the retrieval of harvested game animals. Disabled hunters are not permitted to use OHVs for game retrieval.

There will be no exceptions that allow for cross-country travel for game retrieval on the NCA. This policy is consistent with all the National Forests in the State of New Mexico. Hunters should consider this cross-country restriction prior to engaging in hunting activities on the NCA.

Motorized cross-country travel for lessees and permittees will be limited to the administration of a BLM lease or permit. Persons or corporations having such a permit or lease will be able to perform administrative functions on public land within the scope of the permit or lease. Lessees and permittees will not be allowed to drive cross-country for the purposes of hunting, fishing, recreation or other purposes not directly related to the administration of their Federal permit or lease.

The constraints mentioned above, however, will not preclude modifying permits or leases to limit motorized cross-country travel during further site-specific analysis to meet resource management objectives or standards and guidelines.

Some examples of administrative functions include, but are not limited to:

- Gas or electric utilities monitoring a utility corridor for safety conditions or normal maintenance,
- Accessing a remote communications site for normal maintenance or repair,
- Livestock permittees checking vegetative conditions, building or maintaining fences, delivering salt and supplements, moving livestock, checking wells or pipelines as part of the implementation of a grazing permit or lease,
- BLM personnel involved with the administrative duties of managing public land, or
- Scientific groups under contract or permit for resource assessments or research.

- **Recreation Management – Dispersed Camping**

"Vehicle campers" may drive no more than 100 feet off a BLM-designated road or trail to a campsite. Camping would not be allowed within 100 feet of the Rio Bonito and Salado Creek and no closer than 300 yards of any seeps or springs, man-made water hole, water well or watering tank used by wildlife or domestic livestock. Camping would be no closer than one-quarter mile from waysides, overlooks, interpretive trails or state highways, except at developed campgrounds and designated campsites. (RMP, ACEC Plan)

The BLM would continue to monitor the impacts of camping on the resources within the NCA. The Fort Stanton Cave Road would continue to be closed to dispersed camping from its junction with US Highway 380 to the entrance of Fort Stanton Cave. (RMP, ACEC Plan)

- **Recreation Management – Special Recreation Use**

  The BLM would consider granting special recreation use permits for events that are compatible with the continued and future uses of the NCA. In reviewing the applications for these permits, the BLM would cooperate with the applicant to identify locations where special events would minimally impact resources within the NCA. The BLM would continue to monitor the impacts of those events on the resources within the NCA. (ACEC Plan)

- **Visual Resource Management**

  The goal of visual resource management on the NCA is to maintain and enhance the current viewsheds. A visual resource inventory has been completed for the ACEC, now NCA, and the inventory remains current. The 9,533 acres of VRM Class II and the 10,367 acres of Class III VRM would not be modified in the NCA Plan. (RMP)

- **Wildfire Management**

  The NCA is designated by the RMPA for Fire and Fuels as Category B under the Fire Management Categories. Category B applies to areas where unplanned wildfire is not desired because of current conditions. These are ecosystems where an unplanned ignition could have negative effects unless/until some form of mitigation takes place. (Fire RMPA)

  The use of bulldozers to create fire lines will be prohibited on the NCA due to the presence of the endangered plant Kuenzler's hedgehog cactus, the high level of outstanding cultural resources, and the presence of cave passages close to the surface. (ACEC Plan)

- **Cave Management**

  Fort Stanton Cave would be closed annually to recreation use from November 1 to the following April 15, to protect hibernating bat populations. The BLM would protect the cave from impacts caused by grazing; road construction; changes to streams that feed caves such as Fort Stanton Cave; construction of new facilities along the Rio Bonito; and pollution such as sewage, phosphates or chemicals. The goal of such protection measures is maintaining the natural and biotic values of caves within the NCA. (RMP, ACEC Plan) Discovery and documentation procedures in the Fort Stanton Cave, including the Snowy River Passage, would be carried out as described in Appendix 1.

  For the time that Fort Stanton Cave will be open for recreational use, 200 days, there will be a maximum of two permits allowed per day. One permit for the front part of Fort Stanton Cave will allow a maximum of 10 people or 2000 total for the year. The other permit for the back part of Fort Stanton Cave will allow a maximum of 6 people or 1200 total for the year. The sum of the permits will be 400 allowing a total of 3200 people into the cave for recreational purposes per year.

- **Wilderness Characteristics**

  In preparation for this NCA plan, the BLM updated the wilderness inventory for the NCA. Upon completion of the inventory, the BLM determined that no portion of the NCA has wilderness characteristics because there are no areas within the NCA that meet the 5,000 acre minimum size requirement. The NCA is segmented by roads that meet the definition of a road under the Federal Land Policy and Management Act (FLPMA). Therefore, there are no areas within the NCA that qualify for management as Wildlands. The results of the inventory are included in the permanent Administrative Record for the NCA plan.

In addition to the above decisions, under all alternatives the NCA will be withdrawn from the general land laws, mining laws, and the mineral and geothermal leasing laws, as decreed by PL 111-11. Also, under 43 CFR 46.150(a) the BLM's Responsible Official may take actions necessary to control the immediate impacts of an emergency that are urgently needed to mitigate harm to life, property, or important natural resources. This may include closing Fort Stanton Cave, any BLM roads, or any other portion of the NCA.

C. No Action Alternative

In the No Action Alternative, the BLM would manage the NCA using the previous management decisions outlined in Section B above and the other decisions outlined in the existing land use plans mentioned. These prescriptions are summarized below and in Table 1 Comparison of Alternatives.

- Mineral Materials –

  All public lands in the NCA are open to saleable mineral disposal, except for approximately 330 acres in the Feather Cave Archaeological Complex. All public lands in the NCA would remain withdrawn from the general mining laws, and closed to the disposal of leasable minerals and to the leasing of oil and gas.

- Land Tenure –

  The BLM would consider acquiring private and state lands, including the Rio Bonito Waterfall, lands along the Rio Bonito adjacent to Fort Stanton, and the New Mexico State University facilities at Fort Stanton.

- Visual Resource Management (VRM)–

  No changes in VRM designations would be considered. Currently, the BLM manages 9,553 acres as VRM Class II; 10,367 acres as VRM Class III; and 4,972 acres as VRM Class IV.

- Recreation –

  No fees would be charged for general use of the NCA. Special Recreation Permit applications for organized groups, competitive events, and commercial activities would continue to considered on a case-by-case basis and the national permit fee schedule would apply. Motorized OHV users would be limited to designated roads and trails. Currently, no trails are designated for use by OHVs. The Rio Bonito Campground would remain closed due to its location within a riparian zone.

- Wild and Scenic Rivers-
  No rivers or river segments with the NCA are designated as part of the National Wild and Scenic Rivers System (NWSRS).

- Cave Recreation Management –
  Caves within the NCA would be managed according to current cave management plans. Recreational cave permit limitations include: up to 20 percent of the recreational cave permits would be issued for commercial use; up to 10 people per permit would be allowed in the front portion of Fort Stanton Cave and no more than six people per permit would be allowed in the back portion of Fort Stanton Cave beyond the Hell Hole gate; and there would be no recreational access to the Snowy River Passage of Fort Stanton Cave.

D. Alternative A, Preferred Alternative

In Alternative A, the Preferred Alternative, the BLM would manage the NCA using the previous management decisions outlined in Section B above as well as the No Action Alternative except where changed by the prescriptions outlined below. These prescriptions would take effect following the completion of this plan and would continue indefinitely unless amended or revised. These prescriptions are outlined in Table 1 Comparison of Alternatives.

- Mineral Materials –
  Saleable minerals would remain available for administrative use by the BLM within the NCA. The NCA would be closed to all other types of disposal of saleable minerals.

- Land Tenure –
  There would be a priority on acquisition of properties within the NCA boundary that are currently owned by the State of New Mexico. The BLM would consider acquisition of land to consolidate natural resource values and meet the management objectives of this plan. Properties would be acquired from willing sellers via exchange, purchase of land, easements, and donation or other comparable methods. Any acquired lands within or adjacent to the NCA boundary would be managed according to the prescriptions of this plan.

- Land Use Authorizations –
  The BLM would consider granting minor rights-of-way, leases and permits. Due to potential visual impacts, all land use applications that include overhead structures with a height greater than 15 feet would be buried or prohibited, including small wind turbines.

- Visual Resource Management –
  A visual resource inventory has been completed for the ACEC, now NCA, and the inventory remains adequate. Due to the designation of the NCA, the visual resource objectives have changed. Therefore all Visual Resources currently managed under VRM Class IV would be managed under VRM Class III. All Visual Resources managed under Class II and III would remain the same. This would result in 9,553 acres managed as VRM Class II and 15,339 acres managed as VRM Class III.

- Recreation –

  BLM would institute fees for designated developed campgrounds under the following conditions:

  - a campground business plan would be developed in compliance with the Federal Lands Recreation Enhancement Act of 2005 (FLREA).
  - fees would be dependent on the degree of campground improvements, including restrooms facilities, shelters, trash collection stations, water, electric, additional parking; the amount of visitor use; and maintenance costs for the campground.

  BLM would consider re-establishing a campground in the Upper Rio Bonito Canyon if a suitable location more than 100 feet from the riparian area can be provided and impacts to cultural resources can be avoided.

  OHV use would be limited to designated roads.

- Wild and Scenic Rivers –

  The BLM would not recommend any rivers or river segments within the NCA to be designated as part of the NWSRS.

- Cave Recreation Management –

  The BLM would continue to limit the number of visitors to Fort Stanton Cave through the use of cave permits. The range of visitors to the front portion of Fort Stanton Cave would be no fewer than three and no more than ten per permit. The number of visitors to the portion of the cave beyond Hell Hole gate would be no fewer than three and no more than six per permit. All visitors allowed past Hell Hole gate will include a BLM-approved guide. Occasionally science and survey expeditions under administrative permits may exceed these limits. See Appendix 3, Implementation, for a description of the process to determine the number of visitors.

  As in the No Action Alternative, up to 20 percent of the 400 available recreational cave permits could be issued for commercial use.

  There would be no recreational access to the Snowy River Passage of Fort Stanton Cave.

- Cave Portal Protocol -

  The BLM would not consider constructing a portal to access the Snowy River Passage.

E. Alternative B

In Alternative B, the BLM would manage the NCA using the previous management decisions outlined in Section B above as well as the No Action Alternative except where changed by the

prescriptions outlined below. These prescriptions would take effect following the completion of this plan and would continue indefinitely unless amended or revised. These prescriptions are outlined in Table 1 Comparison of Alternatives.

- Mineral Materials –
  The NCA would be closed to all disposal of saleable minerals, including administrative use by the BLM within the NCA.
- Land Tenure –
  Same as Alternative A.
- Land Use Authorizations –
  Same as Alternative A.
- Visual Resource Management –
  Same as Alternative A.
- Recreation –
  The BLM would institute use fees for designated developed campgrounds under certain conditions, as in Alternative A.

  OHV use would be limited to designated roads as in Alternative A.
- Wild and Scenic Rivers –
  The BLM would recommend that Segment 1 of the Rio Bonito, as inventoried, be identified as part of the National Wild and Scenic Rivers System, with a tentative classification of Scenic River Area.
- Cave Recreation Management –
  The range of visitors per permit would be the same as in Alternative A.

  Up to 10 percent of the 400 available recreational cave permits could be issued for commercial use.

  BLM would also institute fees for recreational cave permits under the following conditions:

    - A business plan would be developed in compliance with the Federal Lands Recreation Enhancement Act of 2005 (FLREA).
    - Fees would be based on an increase in visitor use of the cave as well as maintenance costs within the cave.

  There would be no recreational access to the Snowy River Passage of Fort Stanton Cave as in the No Action Alternative and Alternative A.

- Cave Portal Protocol –

  The BLM would not consider constructing a portal to access the Snowy River Passage.

F. Alternative C

In Alternative C, the BLM would manage the NCA using the previous management decisions outlined in Section B above as well as the No Action Alternative except where changed by the prescriptions outlined below. These prescriptions would take effect following the completion of this plan and would continue indefinitely unless amended or revised. These prescriptions are outlined in Table 1 Comparison of Alternatives.

- Mineral Materials –
  Same as the No Action Alternative.
- Land Tenure –
  Same as Alternative A.
- Land Use Authorization –
  Same as Alternative A.
- Visual Resource Management –
  Same as Alternative A.
- Recreation –
  As in the No Action Alternative, no fees would be charged for the use of the NCA.

  BLM would consider re-establishing a campground in the Upper Rio Bonito Canyon under the same conditions discussed in Alternative A.

  OHV use would be limited to designated roads as in Alternative A.
- Wild and Scenic Rivers –
  The BLM would not recommend any rivers or river segments within the NCA to be designated as part of the NWSRS.
- Cave Recreation Management –
  The range of visitors per permit would be the same as in Alternative A.

  Up to 30 percent of the 400 available recreational cave permits could be issued for commercial use.

  The BLM would consider recreational access to the Snowy River Passage of Fort Stanton Cave under the conditions described in Appendix 3, Implementation.
- Cave Portal Protocol -
  The BLM would consider constructing portals for access to the Snowy River Passage using the criteria in Appendix 2, Criteria for Drilling a Portal to Access Snowy River. The construction of a cave portal would allow for year-round access into Snowy River Passage. This access would prevent human interference with hibernating bat populations, allow for access into the Snowy River Passage when Fort Stanton Cave is flooded as well as address various safety and health issues of cavers within the passage. The access, depending on purpose would also allow for moving equipment easily in and out of the Snowy River Passage. See Appendix 2 for further information.

G. Alternatives and Issues Considered but Not Analyzed in Detail

- Climate change – The BLM considered including an analysis of climate change and green house gas emissions based on the alternatives within this plan. The BLM concluded that the proposed alternatives would result in negligible increase in emissions and negligible impacts to climate change. Therefore, climate change will not be addressed.
- No livestock grazing – This issue has been previously analyzed in several documents. Congress has provided that surface management of the NCA would be managed in accordance with the Fort Stanton ACEC Final Activity Plan of 2001. This plan and the Rio Bonito Acquired Lands (RBAL) Plan include a provision to use livestock grazing as a vegetation management tool. Further, no livestock grazing would be authorized under the Taylor Grazing Act, with the exception of grazing allotment #63071 Lamay Place. Since this issue has been analyzed previously under the National Environmental Policy Act (NEPA) process, further analysis is not necessary.
- Wild Horses and Burros – During the scoping period the BLM was asked to consider using the NCA as a refuge for wild horses and burros. Title 16, USC Chapter 30, § 1339, Limitations of Authority, states:

  > "Nothing in this chapter shall be construed to authorize the Secretary to relocate wild free-roaming horses or burros to areas of public land where they do not currently exist."

  Wild horses and burros have not occupied the NCA recently or in the past. Therefore this alternative will not be analyzed.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

Introduction

This chapter discusses the environment affected by plan implementation and analyzes environmental effects by alternative. This analysis will discuss both the direct and indirect effects. Direct effects are those effects which are caused by the action and occur at the same time and place. Indirect effects are those effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

Some information is unavailable at the time this plan is being written. The length of the Snowy River Passage is not known and exploration of the passage continues. Also, the source of the water that floods the Snowy River Passage is unknown.

Certain analytical assumptions were made during the writing of this NCA plan. It is assumed that the population of Lincoln County will continue to grow since it has grown throughout the last thirty years (see Section 20 Socio-Economics). It is also assumed that as population grows the demand for public recreation will continue to increase. Another assumption is that scientific exploration of the Snowy River Passage will continue.

General Setting

Historic Fort Stanton was established in 1855 and the surrounding area was reserved as a military reservation by Executive Order in 1859. Military use of the reservation ceased in 1895

and the land was transferred to the control of Secretary of the Interior the following year. It lay abandoned for over three years, until, in 1899, the military again reserved control of the area for use by the Marine Hospital Service. In 1953 the General Services Administration declared the area was surplus. Then, in 1956, about 1800 acres including the hospital buildings were conveyed to the State of New Mexico's Department of Public Welfare for use as a hospital and control of the remaining area was returned to the Department of the Interior. In 1964 a Range Study Agreement was entered between the BLM and New Mexico State University covering the Fort Stanton lands. That agreement ended in 1990. In 1987 the Sierra Blanca Regional Airport opened on an area in the southeast section of the former Fort Stanton Military Reservation.

The 1997 Roswell Approved Resource Management Plan established the Fort Stanton Area of Critical Environmental Concern (ACEC), encompassing 24,630 acres of BLM public surface and 27,622 acres of federal mineral estate. The airport and state hospital, although within the established boundary, were not included in the ACEC. The 2001 discovery of the Snowy River Passage of Fort Stanton Cave eventually propelled the area to the limelight as a special place that needed to be protected.

In the Omnibus Public Land Management Act of 2009 Congress established the Fort Stanton-Snowy River Cave National Conservation Area (NCA), effectively converting the area then known as the ACEC into the NCA. Along with the ACEC, the boundary of the NCA includes Tract 1 of the Rio Bonito Acquired Lands as well as an 80-acre grazing allotment that bordered the ACEC on the east.

The topography of the NCA is highly variable, with rolling hills, wide flat-topped mesas and narrow, rocky canyons and ridges. It is situated in the foothills of the Sierra Blanca and Capitan Mountains. Elevation above sea level ranges from 6,300 feet in the east to 7,020 feet in the west. The climate is semi-arid with normal average high temperatures ranging from 50.5°F in January to 85.8°F in June and normal average low temperatures ranging from 16.3°F in January to 51.3°F in July (Western Regional Climate Center). Observed minimum and maximum temperatures were -28°F and 101°F, respectively. Average annual precipitation is 13.9 inches with average annual snowfall of 20 inches. Annual precipitation has ranged from 6.1 inches to 25.6 inches, and snowfall has been as high as 64 inches (Kunkel, 1984). The drainages in the south portion of the NCA are in a southeasterly direction. The runoff from these drainages flows into Little Eagle Creek and eventually into the Rio Ruidoso. Runoff from other drainages in the northern portion of the NCA flows into the Rio Bonito, and Salado Creek which eventually joins the Rio Bonito.

Affected Resources

The following resources or values are not present or would not be affected by the proposed plan: Areas of Critical Environmental Concern, Hazardous or Solid Waste, Wild and Scenic Rivers, Wilderness, Prime or Unique Farmlands, Minority/Low Income Populations, and Environmental Justice.

1. Air Quality

Affected Environment

The NCA is located within a Class II air quality area. A Class II area allows moderate amounts of air quality degradation. The primary sources of air pollution in the NCA are dust from blowing wind on disturbed or exposed soil and exhaust emissions from motorized equipment.

The NCA is surrounded by U. S. Forest Service lands, State Lands and private property. The Capitan Wilderness is located approximately nine miles northeast of the NCA and the White Mountain Wilderness is located approximately eight miles to the west. Under the Clean Air Act, the Capitan Wilderness has been classified as a Class II airshed and the White Mountain Wilderness has been classified as a Class I airshed.

Direct/Indirect Effects

Under all alternatives surface disturbing activities and exhaust emissions, vegetation treatments, chemical odors, and dust from motorized equipment would affect air quality. The development of mineral material sites under the No Action Alternative and Alternatives A and C would result in increased surface disturbance and increased negative effects to air quality in comparison to Alternative B, where mineral material sites would not be allowed. Air quality would temporarily be directly impacted with smoke from prescribed fire vegetation treatments and pollution from exhaust emissions, chemical odors, and dust that would be caused by the motorized equipment used to construct pipelines, power lines, roads, trails, campsites, and vegetation treatments. Dust dissemination would discontinue upon completion of the construction phases of roads, trails, campsites, and vegetation treatments. Air pollution from the motorized equipment would discontinue at the completion of the construction phase of the developments. The winds that frequent the southeastern part of New Mexico generally disperse the smoke, odors and emissions. The impacts to air quality would be greatly reduced as the construction phases and prescribed burns are completed. Other factors that currently affect air quality in the area include dust from livestock grazing activities, dust from recreational use, from use of roads for vehicular traffic, and other vegetation treatments.

2. Water Resource Management – Surface Water and Groundwater

Affected Environment

East of Highway 214 along the Rio Bonito, the Permian San Andres/Glorieta Formation outcrops at the land surface and is exposed eastward along most of the countryside of the Rio Bonito valley. Further east it is covered by younger Quaternary sediments about 10 to 15 miles from Roswell. West of the Highway 214 bridge over the Rio Bonito, the San Andres Formation generally dips westward under Sierra Blanca so that it is eventually about 2,000 feet below younger Mesozoic bedrock that outcrops at the land surface (Rawling, 2009). Fresh groundwater is available in the San Andres Groundwater Aquifer.

Perennial surface water is found on public land in Snowy River Cave at Crystal Creek Spring, on the Rio Bonito River and at Government Spring area. Ephemeral surface water within the area may be located in Salado Creek, tributaries, and stock tanks.

There are 86.19 acre-feet of surface water rights appurtenant to 26.52 acres of public land located within the NCA and 17 acre feet of ground water rights for wildlife and livestock. For a description of the water rights, see Table 2.

Table 2. Fort Stanton–Snowy River Cave NCA Water Rights Summary.

NMOSE FILE NO.	NMOSE SUB FILE	NMOSE FILING DATE	NMOSE LEGAL DESCRIPTION	NMOSE AMOUNT (ACRE-FEET)	NMOSE ACREAGE	NMOSE PRIORITY DATE (a)	NMOSE DITCH NAME (b)	NMOSE POINT OF DIVERSION
01895*	B79S	950207	S½ NW¼, SECTION 14, T.9S, R.15E	34.125	10.5	1853	Upper Providencia and/or Government Springs	NE¼NE¼SE¼ SEC. 15, T.9S, R.15E
01894-B*	B79T	950207	SW¼ NE¼, SECTION 14, T.9S, R.15E	1.69	0.52	1860	Upper Providencia and/or Govt. Springs	NE¼NE¼SE¼ SEC. 15, T.9S, R.15E
01894-B*	B79U	950207	T.9S, R.15E	50.375	15.5	1860	Upper Providencia and/or Govt.Springs	NE¼NE¼SE¼ SEC. 15, T.9S, R.15E
01873-H**				5.0		1/13/1967		NES1/4W1/4 SEC. 11, T.10S., R.14E
011959-H**				3.0		6/1/1931		NW1/4NE1/4NE1/4 SEC. 33 T.9S., R31E
01960-H**				3.0		12/31/1931		NE1/4NE1/4SE1/4 SEC. 8 T.9S., R15E
02094-H**				3.0		3/26/1987		NE1/4SW1/4SW1/4 SEC. 20 T.9S., R.15E
02321-H**				3.0		9/23/1993		SW1/4NE1/4NE1/4 SEC. 8 T.9S., R.15E

*Surface water rights.
**Groundwater water rights.

Direct/Indirect Effects

Current surface/subsurface water quantity and quality management strategies in the NCA would remain unchanged. See the 1997 Roswell RMP. This includes management actions which increase water availability by enhancing annual water yields, in-stream flows, and discharge from springs, while also reducing resource damage by floods and accelerated erosion.

Under all alternatives surface disturbance from development of trails, camping areas, roads, pipelines and power lines in the planning area can result in degradation of surface water quality and groundwater quality from non-point source pollution, increased soil losses, and increased gully erosion. Under the No Action Alternative, Alternative A Preferred Alternative, and Alternative C, the development of mineral material sites would result in an increase in surface disturbing activities and an increase in effects to surface water and groundwater than under Alternative B where mineral material sites would not be allowed.

Direct impacts would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural stabilization, and reclamation efforts. Construction activities would occur over a relatively short period; therefore, the majority of the disturbance would be intense but short-lived. Direct impacts to surface water quality would be minor short-term impacts which may occur during storm flow events. Indirect impacts to water-quality related resources, such as fisheries, would not occur.

Under Alternative C, direct impacts to surface water quality from the construction of a cave portal would be minor. Short-term impacts may occur during storm flow events. Indirect impacts to water-quality related resources, such as fisheries, would not occur. Significant impacts on ground water would not occur. Petroleum products and other chemicals, accidentally spilled, could result in surface and groundwater contamination. Authorization of the proposed projects would require full compliance with BLM directives and stipulations that relate to surface and groundwater protection.

The BLM would manage the water rights associated with the NCA according to New Mexico Office of the State Engineer (OSE) laws and regulations. Under all alternatives no impacts to water rights are expected. Current water rights management in the Roswell Field Office would continue unchanged in the NCA. See the 1997 Roswell RMP and the 2004 RBAL Final Activity Plan. This includes protecting existing public land water supplies and water resources, which include state appropriative water rights such as surface water rights and groundwater rights.

Water use proposals filed with the OSE by entities other than the BLM that could affect water rights and uses on public lands would be evaluated for their impact on BLM water resources. BLM water supplies and water resources which may be affected by water use proposals filed by applicants with the OSE are Government Springs Area, Crystal Creek Spring and other springs located in Fort Stanton Cave and Snowy River Passage, Rio Bonito River, Salado Creek, and BLM owned groundwater wells. Proposals that would impair existing water rights such as public surface water rights and ground water rights and the quality of public land resources would be protested through procedures specified by the OSE.

3. Floodplains

Affected Environment

For BLM administrative purposes, the 100-year floodplain provides the basis for floodplain management on public lands. It is based on maps prepared by the Federal Emergency Management Agency (1983). The prehistoric conditions of the Rio Bonito floodplain have been modified by construction of the Bonito Water Retention Dam, grazing, upstream development, road construction, alteration of the stream channel, and brush encroachment. The floodplain of the Salado Creek has been changed from prehistoric conditions by construction of the Salado Sediment Dam, grazing, upstream development, road construction, alteration of the stream channel, and brush encroachment.

Direct/Indirect Effects

Under all alternatives surface disturbance from development of trails, camping areas, roads, pipelines and power lines in the Planning Area can result in impairment of the floodplain from removal of vegetation, removal of wildlife habitat, impairment of water quality, decreased floodwater retention, and decreased groundwater recharge. Under the No Action Alternative, Alternative A Preferred Alternative, and Alternative C the development of mineral material sites would result in an increase in surface disturbing activities and an increase in effects to floodplains than under the Alternative B where mineral material sites would not be allowed.

4. Soils

Affected Environment

The Soil Conservation Service, now the Natural Resource Conservation Service (NRCS), has surveyed the soils in Lincoln County. Complete soil information is available in the *Soil Survey of Lincoln County, New Mexico, (USDA Soil Conservation Service 1983)*. The general soil map units represented in the project area are:

Deama-Rock outcrop - These soils are very shallow and shallow, well drained, nearly level to very steep soils, and rock outcrops located on hills, mesa sides, and breaks.

Romine-Hightower-Oro Grand - These soils are very shallow to moderately deep and very deep, well drained, nearly level to extremely steep soils located on ridges, hills and alluvial plains and in swales.

Tortugas-Rock outcrop-Asparas - These soils are very shallow, shallow, and very deep, well drained, nearly level to extremely steep soils, and rock outcrops located in valleys and on hills, piedmonts, ridges, and on mountainsides.

Direct/Indirect Effects

Activities that could cause impacts to soils include roads and trails use and construction, pipelines, power lines, and grazing use. Under all alternatives actions and activities that make soils more susceptible to erosion, or which impair soil productivity include, but are not limited to:

- soil disturbing activities that result in soil loss due to accelerated wind or water erosion;
- activities that reduce vegetative cover, thus exposing the soil to erosion processes, and reducing the amount of soil organic matter and soil productivity;
- activities that tend to concentrate surface runoff or steepened hydraulic gradients, thus increasing soil erosion by flowing water;
- activities that result in sediment loading directly to streams;
- activities that damage soil structure by compaction or other means; and
- activities that degrade the physical, chemical, or biological properties of the soil, such as high-intensity burns or other means.

Under the No Action Alternative, and Alternatives A and C, the development of mineral material sites would result in an increase in surface disturbing activities and an increase in effects to soils compared to Alternative B where mineral material sites would not be allowed.

Under Alternative C, surface disturbance from drilling a cave portal would result in a closed two track road to the drill site by the drilling rig and support vehicles, concrete trucks and other vehicles. Construction of a portal would result in surface disturbance where the area is excavated to install the concrete block, pre-stressed concrete or steel vault. Excavated dirt would have to be removed to a suitable location. Cuttings from the air-water mist drilling may spray over the catchments box and would have to be shoveled into a container and removed. No drill pad would be constructed and levelers would be used during the drilling process.

5. Riparian/Wetland Areas

Affected Environment

The riparian areas of the NCA are found along the Rio Bonito and Salado Creek. Many springs and seeps occur in the area and are located in the Rio Bonito River, Salado Creek, and unnamed ephemeral tributaries. Wetland areas occur on the Rio Bonito River and behind Salado Dam. Many wildlife species are dependent upon the unique and diverse habitat niches offered by the riparian areas. These habitats are valuable sources of forage. Riparian vegetation provides escape cover for fish, lowers summer water temperatures by shading, and reduces stream bank erosion. Riparian areas are the center of many recreational activities within the NCA, such as hiking, hunting, camping, fishing, horseback riding, bird watching, and photography.

Healthy riparian systems purify water as it moves through the vegetation by removing sediment, and retains water in stream banks and groundwater. Riparian vegetation will also dissipate the energy of flood waters, slowly releasing water over time. BLM began riparian enhancement projects on the Rio Bonito in 1982. Other projects followed and in 1990 the area was designated as BLM's first National Riparian Showcase. Protection and enhancement of riparian/wetland habitat may place constraints on recreational activities, livestock grazing management, and other potential uses of public lands within the NCA.

Direct/Indirect Effects

Under all alternatives, grazing would be limited or excluded from riparian/wetland areas, if grazing does occur it would be limited and used for a management tool. There would be a short-term reduction of standing vegetation as a result of grazing. Vegetation treatments would have a positive impact by removing invasive species and restoring riparian/wetland areas. Using grazing and prescribed fire to reduce fuel loading would have a positive impact by reducing the chance of large catastrophic fires.

6. Livestock Management

Affected Environment

There are two different livestock management strategies being applied on the NCA. The majority of the NCA is exempt from the Taylor Grazing Act. This includes the area formerly known as the Fort Stanton ACEC as well as Tract 1 of the RBAL. Livestock management on these areas is to be used as a vegetation management tool. Grazing leases will not be issued in these areas, but grazing can be authorized on a limited basis when favorable forage conditions exist and if improvements such as fences are functional. High intensity, short-duration grazing could be used to address excessive fuels, light grazing could be used to maintain the desired plant community, or moderate grazing could be allowed based on seasonal production.

An 80-acre grazing allotment that bordered the former ACEC on the east is now contained within the NCA. This allotment is subject to the Taylor Grazing Act of 1934. The BLM conducted a Rangeland Health Assessment on March 29, 2010, on the allotment, #63071 Lamay Place. The allotment was rated as "meeting" the Standards for Rangeland Health. The grazing permit would authorize fifteen animal unit months (AUMs) on the allotment. Recommendations were made to map the allotment for juniper control treatment.

Direct/Indirect Effects

Under all alternatives, livestock would continue to be used as a vegetation management tool on public lands within the former ACEC and Tract 1 of the Rio Bonito Acquired Lands. The impacts of using livestock grazing have been analyzed in the Roswell RMP, the Fort Stanton ACEC Activity Plan, and the Rio Bonito Acquired Lands Plan.

Under all alternatives, the impacts of issuing a permit to graze allotment 63071 were analyzed in the Capitan Area Grazing EA, DOI-BLM-NM-P010-082-EA.

7. Vegetation Management

Affected Environment

Grasslands and pinyon-juniper (PJ) are major vegetation communities within the NCA. The PJ is most prevalent in the east portion of the NCA on limestone hills. It dominates the landscape of the NCA, primarily as the result of the suppression of wildfires. However, the BLM has reintroduced fire to the ecosystem through prescribed fires. Prescribed burns are used to reduce PJ, eradicate salt cedar and rehabilitate watersheds. Vegetation management, including PJ control, is a priority as it ties to watershed health and a multitude of other resource values.

General vegetation descriptions for the priority areas within the NCA are described below:

Project	**Vegetation Type**
Upper Rio Bonito	Pinyon-juniper on the uplands, grassland invaded by juniper in valley; Rio Bonito riparian area; invading saltcedar and Russian olive in riparian area; Kuenzler Hedgehog cactus on certain south-facing slopes
South Mesa	Primarily pinyon-juniper and oak brush (especially on north aspect); grassland on mesa; juniper invading lower slopes and draws; Kuenzler Hedgehog habitat on certain slopes
West Mesa Bench	Grassland on mesa; pinyon-juniper on slopes and invading lower slopes; cholla invading grasslands on mesa; Kuenzler Hedgehog habitat on certain south-facing slopes and on the edge of mesa top
West Spur	Primarily pinyon-juniper and oak brush on slopes (especially north aspect); grassland on flat mesas; West Spur Spring riparian area; draws and mesa tops invaded with juniper
Dairy Pasture	Primarily pinyon-juniper on slopes (especially north aspect); juniper invading lower slopes and draws; Kuenzler Hedgehog cactus on certain slopes
Cemetery Pasture	Mixture of pinyon-juniper and grasslands; juniper invading grasslands and draws
Rio Bonito Tract 1	Pinyon-juniper on the uplands, grassland invaded by juniper in valley; Rio Bonito riparian area; invading saltcedar and Russian olive in riparian area
Allotment #63071 Lamay Place	Primarily pinyon-juniper and oak brush on slopes (especially north aspect)

Vegetation types in other areas of the ACEC either closely approximate the above description or are combinations of these descriptions.

Direct/Indirect Effects

The impacts of vegetation treatments within the NCA were analyzed in two environmental assessments: the Fort Stanton Watershed Improvement Project, EA-NM0060-01-044, and the Lincoln Community Fuels Hazard Reduction Project, EA-NM-060-00-037. The goals of vegetation management for the NCA were also discussed in the Fort Stanton ACEC Activity Plan and the Rio Bonito Acquired Lands Plan.

Under all alternatives, when there is no livestock grazing within the NCA, impacts to vegetation will be minimal and vegetation will be utilized predominantly by wildlife.

Under all alternatives, when cattle grazing is used as a vegetation management tool, vegetation within the former ACEC and Rio Bonito Tract 1 would continue to be grazed and trampled by livestock as well as wildlife. Grazing within these areas will be controlled and monitored by the BLM.

Under all alternatives, vegetation within allotment #63071, Lamay Place, would continue to be grazed and trampled by livestock as well as wildlife. Ecological condition and trend is expected to remain stable and/or improve over the long term with the proposed authorized number of livestock and existing pasture management. Rangeland monitoring data indicates that there is an adequate amount of forage for multiple resource use objectives.

The use of mechanical and herbicidal treatments as well as prescribed fire would occur under all alternatives. With the use of mechanical treatment a change in cover and composition of juniper would occur in the project areas, moving from a juniper-dominated community to that of a grassland and grass savannah type. Understory vegetation (grasses, forbs and shrubs) in the project areas would be temporarily disturbed by actual clearing activities but is expected to recover in a short period of time. Native plant species that serve as browse and forage for wildlife would increase from the removal of invading juniper.

Removal of saltcedar and Russian olive from the riparian area would improve the health of the riparian community in the long term, allowing native riparian species to become re-established. Saltcedar and Russian olive are most susceptible to mechanical control if coupled with herbicide treatment.

The use of prescribed fire would temporarily reduce the density of standing vegetation. It is expected that understory vegetation and grass community fuels would recover in the short term. Recovery of vegetation would also be dependent on the time of the year a planned ignition occurred. Fire-tolerant species would be re-invigorated with fire, such as decadent grasses and shrub species. Forb species would initially respond to fire, increasing in abundance and diversity. Nutrient values of vegetation within the treatment area would be expected to increase due to the addition of organic matter back into the soil. A mosaic of burned and unburned vegetation would be created in the project burn area. High intensity fire may occur in certain portions of the planned project area. These sites would require a longer period to recover due to fire intensity.

8. Noxious and Invasive Weeds

Affected Environment

Under Executive Order 13112 (EO), Invasive Species, BLM is to prevent the introduction of invasive species; and control populations of these species in a cost-effective and environmentally sound manner. The Noxious Weed Management Act of 1998 for the State of New Mexico also defines three classes of these weeds.

“Class A” weeds are considered to be non-native species with limited distribution in New Mexico. Preventing new infestations and eliminating existing infestations is the highest priority. “Class B” weeds are non-native species that are presently limited to portions of the state. They

are designated for control in regions where they are not yet widespread. Preventing infestation in these areas is a high priority. In regions where a "Class B" species is already abundant, control is decided at the local level with containment as the primary goal. "Class C" weeds are other non-native weeds found in New Mexico. Many of these are widespread in the state. Long-term programs of suppression and management are a local option, depending upon local threats and the feasibility of management in local areas.

The NCA is known to have populations of saltcedar (*Tamarix spp*.), a Class C weed, and musk thistle (*Carduus nutans*) and teasel (*Dipsacus fullonum*), both Class B weeds. Poison hemlock (*Conium maculatum*), another Class B weed, is also present.

Saltcedar, also called tamarisk, is found along floodplains, riverbanks, stream courses, salt flats, marshes and irrigation ditches. Saltcedar is a fire-adapted species. The high water and salt content of saltcedar foliage make it difficult to burn. Saltcedar sprouts vigorously from the root crown and rhizomes after burning. Saltcedar exhibits increased flowering and seed production after fire. Saltcedar generally survives fire, although very hot fires may prevent sprouting. Prescribed burning alone may not be an effective control method for saltcedar. However, burning followed by herbicide application is effective. Saltcedar stands also consume large amounts of ground water and replacing the saltcedar stands with native species would save water.

Musk thistle is biennial or sometimes a winter annual, which grows up to 6 feet tall. It invades pastures, range and forest lands along roadsides, waste areas, ditch banks, stream banks and grain fields. It spreads rapidly forming extremely dense stands which crowd out desirable forages and vegetation (Whitson, 2009).

Teasel spreads rapidly in moist sites, especially along irrigation ditches, canals and disturbed sites. It is a stout taprooted biennial which also grows to a height of 6 feet. A rosette is produced the first year, followed by bolting in the second year. The spiny heads can reach lengths of 2 inches (Whitson, 2009).

Poison hemlock occurs on borders of pastures and cropland, gradually invading perennial crops such as alfalfa. It tolerates poorly-drained soils and frequents stream and ditch banks. The entire plant is poisonous, including the large white taproot, and it has been mistaken for parsley (Whitson, 2009.)

There are known populations of noxious and invasive species found within boundaries of the NCA. With these known populations, there is currently active management to control the populations within the NCA, including recent treatments on Tract 1 of the RBAL.

Direct/Indirect Effects

Noxious and invasive species will take advantage of areas opened up by disturbance, such as mineral material removal or trail building. This has generally been found where other native populations were removed by some kind of soil surface disturbance and drought followed. Thus, under the No Action Alternative and Alternatives A and C, where the NCA is open to the

disposal of mineral materials, any mineral material removal could lead to the spread of weeds. Re-establishment of good vegetative cover provides competition for noxious species, reducing their success. Livestock and wildlife will avoid grazing weeds as they may develop spines off of bracts below flowers, are toxic, or have low palatability, making these plants very unattractive.

9. Wildlife

Affected Environment

Fort Stanton provides diverse habitats for approximately 151 species of birds, 38 species of mammals and 9 species of fish.

Several bird species associated with pinyon-juniper woodlands are the Common Flicker, Ladder-Backed Woodpecker, Acorn Woodpecker, Pinyon Jay, Scrub Jay, Mountain Chickadee, Common Bushtit, Plain Titmouse, White-Breasted Nuthatch, Blue-Gray Gnatcatcher, Gray Vireo, Rock Wren, and Montezuma Quail. Bird species associated with the blue grama grassland are Scaled Quail, Roadrunner, Western Meadowlark, Northern Harrier, Brown-Headed Cowbird, Vesper Sparrow, Lark Bunting, Rufous-Crowned Sparrow, and Horned Lark. Several species of birds occur in the riparian community or near other sources of water. Representative species are Acorn Woodpecker, Killdeer, Mourning Dove, Mallard, Bufflehead, Wood Duck, Black Hawk, Belted Kingfisher, Blue Grosbeak, Lesser Goldfinch, Yellow-Rumped Warbler, Northern Waterthrush, and Yellow-Breasted Chat. In addition, the Bald Eagle winters throughout the area, and the Rio Bonito drainage is an important wintering area.

The diversity of small mammals provide for an excellent prey base for carnivores such as the coyote, gray fox, bobcat, raccoon, badger, striped skunk, long-tailed weasel, and occasionally black bear and mountain lion. Blue grama grassland mammal species include the spotted ground squirrel, pocket gopher, silky pocket mouse, Ord's kangaroo rat, bannertail kangaroo rat, northern grasshopper mouse, southern plains woodrat, and the pronghorn antelope. Other mammals use the pinyon-juniper woodland habitat to some extent. Mule deer occur throughout the Fort Stanton area. During winter, some deer migrate from the higher elevations of the Sierra Blanca Mountains to the Fort Stanton area. Since 1990, a number of Rocky Mountain elk have used the area on a year-long basis.

Beavers use the riparian habitat to the exclusion of upland habitat. Over the past years, beavers have built dams and lodges on the Rio Bonito. Annual floods that wash out the dams seem to be the most serious problem for beavers. Beavers may also leave the area when water levels drop.

Fish species found in the Rio Bonito are the Rio Grande sucker, brook trout, rainbow trout, cutthroat trout, fathead minnow, white sucker, Rio Grande chub, longnose dace, and mosquitofish. In addition, an extensive list of aquatic insects and herptiles can be found in the Fort Stanton Habitat Management Plan on file at the Roswell Field Office.

Fort Stanton Cave serves as a hibernaculum, or winter roost, for about 700 Townsend's big-eared bats (Corynorhinus townsendii) and lesser amounts of Small-footed myotis (*Myotis celiolabrum*) and Cave Myotis (*Myotis velifer*). Feather Cave is both a hibernaculum and a summer maternity roost, primarily for Townsend's Western Big-eared Bat. These and other

regional hibernacula are closed from November 1 to April 15 annually to insure colony protection. Awakening hibernating bats causes them to use up energy stored as fatty acids. This fat cannot be restored because of a lack of insects, the mainstay of bats' diet, during the winter months and the bats perish.

A recent catastrophic threat to bats in the U.S. is a newly emergent fungal pathogen, white-nose syndrome (*Geomyces destructans*). It was first documented in Howe's Caverns, New York, on a few bats in the winter of 2006 but by early 2010 it had moved approximately 120 miles per year from Howe's Caverns across 10 states and was found as far away as Virginia, West Virginia, Tennessee, Missouri and western Oklahoma (within 250 miles of northern New Mexico) in hibernation caves. This new pathogen is related to fungi that are cold-loving and normally found in permafrost. Evidence suggests that *G. destructans* prefers a temperature range of 35-57°F and high, nearly saturated, humidity. Unfortunately, these conditions are also those preferred by many bat species for hibernation. It appears that the fungal hyphae invade the hair follicles and tissue of bat wings and tail membrane (uropatagium) of hibernating bats. Because the fungus may irritate the skin of the bat, it is suspected that bats are awakening more often to deal with the fungal irritation. In addition, the immune response of bats is reduced during hibernation and bats may be waking up to fight the infection. Either way, bats are burning through their fat reserves too quickly and starving to death before spring. It is estimated that it has killed more than 1,000,000 bats by spring 2009. There is currently no evidence as to where *G. destructans* came from, why it is so lethal to hibernating bats or how to stop its progression across the U.S.

Invertebrate species in Fort Stanton and other NCA caves are 1 mm-long diplurans and millipedes which feed off dead bats and residue from visiting humans in the form of hair and skin cells that get deposited during cave trips. This is known from recent human impact DNA sequencing by the Biology Dept, University of New Mexico. A rare and unstudied tick is found in Blue Tick Cave.

Direct/Indirect Effects

Under all alternatives, short-term negative impacts to wildlife would occur during vegetation treatments, camping, hiking, horseback riding, and re-routing existing trails. Small wildlife may be temporarily displaced due to construction to re-route trails. In general, most wildlife species would temporarily leave the area during these activities and return shortly after. For other wildlife species with a low tolerance to activities, the operations or activities could displace wildlife from the area due to disturbances by the high volumes of vehicle traffic and human presence.

Long-term positive impacts will result from prescribed fire, vegetation treatments, designated camping areas, roads and closed roads. Vegetation and prescribed fire treatments will benefit wildlife by removing invasive species and restoring habitat. Designated camping areas, roads and closed roads will help isolate human presence in certain areas allowing wildlife to adjust and use more secluded areas.

If grazing is used as a tool on the NCA using the prescriptions in place (no grazing around cave entrances, no grazing in developed campgrounds), then livestock grazing should have little effect on wildlife.

Under Alternatives C, impacts to wildlife during construction of a portal would be short-term. Some small wildlife species may be displaced. Once construction is completed, the changes in habitat aboveground would be minimal and should have little impact on wildlife. Timing with respect to elk calving and deer fawning would be respected and drilling would occur in an appropriate timeframe. Most species would habituate to the small blockhouse in a short time. There are no known wildlife species other than microbes in the portion of the cave involved in this project. Bats are only known to occur near the natural cave entrance. The use of two airtight bulkheads would prevent any changes to the cave environment that could affect bats or other wildlife in other portions of the cave.

There is the threat that white-nose syndrome (WNS) would gain a foothold in a cave in New Mexico and then be transferred from cave-to-cave by human traffic or bat-to-bat in roosts. Although no specific information is available regarding cave conditions needed by western hibernating bats, the Roswell Field Office has a number of known hibernacula for Townsend's big-eared bats (*Corynorhinus townsendii*). Prior to this disease in hibernating bats, BLM had conducted bi-annual hibernation counts at a number of the caves in the BLM's Pecos District. Although bat researchers suspect that some of the spread is bat-to-bat, many caves are closed throughout the country because of concern about the fungi also spreading from site-to-site by cavers or researchers.

The U.S. Fish and Wildlife Service has provided strict guidelines for decontamination of all equipment taken into bat caves (Appendices 1 & 3). The Roswell Field Office has implemented decontamination procedures and would consider closing BLM caves under its jurisdiction in order to slow the spread of WNS.

10. Special Status Species

Affected Environment

Kuenzler's hedgehog cactus is listed as an endangered species by the federal government and the State of New Mexico. The NCA supports a large known population of the cactus. Prime habitat is on open southeast-facing aspects on the upper third of 20 percent slopes in the pinyon-juniper zone at 6,600 to 6,900 feet elevation. Healthy populations also occur on level ridge tops, on northeast, east, south and west aspects and on mid and lower slopes of 5 to 25 percent slope, and even on the lower slopes below a band of pinyon-juniper or oak.

The highest priority sites for protection are the ten largest cactus populations identified in an extensive survey conducted in 1991. The BLM conducted another cactus survey in 2009. Population studies include an intensive survey for the cactus, monitoring of recruitment of young individuals of the species, and potential livestock grazing impacts.

Direct/Indirect Effects

The BLM conducted Section 7 consultation with the US Fish and Wildlife Service when it developed the 1997 Roswell RMP. The consultation included the Kuenzler's hedgehog cactus and the Service agreed with the BLM's conclusion that activities may affect, not likely to adversely affect the species (Cons. #2-2296 F-102).

Endangered plant species, such as Kuenzler's hedgehog cactus, are managed through a policy of avoidance. All surface disturbance activities are located on sites where the species does not occur. As surface disturbing activities were authorized prior to the designation of the NCA, a survey for the presence of Kuenzler's hedgehog cactus was conducted. Prospective projects that conflicted with cactus locations were moved, rerouted or not approved.

The policy of avoidance would continue in this NCA plan. Under all alternatives, new surface disturbance activities would be surveyed for the cactus prior to any authorization. Sites containing the cactus would be avoided. This includes potential location for portal access under Alternative C.

11. Visual Resources

Affected Environment

The landscape is described in the General Setting section of this document. A VRM inventory was completed for the 1997 RMP. The Visual Resources within NCA area are currently managed as Class II, III and IV. There are 9,553 acres of Class II VRM. This includes the area along the Upper Rio Bonito as well as the northeast section of the NCA. The Class II rating means that any changes in any basic elements (form, line, color, texture) caused by a management activity should not be evident in the landscape. A contrast may be seen but should not attract attention.

There are 10,367 acres of Class III VRM on the NCA. This is mostly in the western section of the NCA (Upper Mesa), the northern section (Salado Pasture and Rio Bonito Tract 1), and a small portion along State Route 220 on the eastern section of the NCA. The Class III rating means the contrasts to the basic elements caused by the management activity may be evident and begin to attract attention in the landscape. The changes, however, would remain subordinate to the existing landscape.

There are 4, 972 acres of Class IV VRM on the NCA, completely on areas surrounding the Sierra Blanca Regional Airport and Fort Stanton Proper. The Class IV rating means that changes to the basic elements caused by management activity can be highly visible. Any management actions may dominate the visual landscape; however care should be taken to minimize visual impacts as much as possible

Direct/Indirect Effects

The Preferred Alternative would manage all Class IV management areas as Class III. A total of 4,972 acres would be affected by this change. This would mean management actions would be less visible in these areas because less attention could be drawn to these actions under this designation.

Under Alternatives B and C the impacts would be the same as under the Preferred Alternative. Under the No Action Alternative, the NCA would continue to be managed under the three separate VRM Classes resulting in no additional impacts.

Under Alternative C, impacts to the viewshed from surface disturbances such as mineral materials sites or drilling a cave portal would be short-term, lasting only as long as the activity occurs and subsequent reclamation of disturbed sites takes place. Surface disturbance would present impacts until the area was reclaimed and the vegetation restored, probably less than four growing seasons in length. There would be no changes in visual class presented by the blockhouse at the top of the shaft since it would extend only two feet above the surface.

12. Recreation

Affected Environment

The NCA has about 93 miles of sustainable horseback, mountain biking, and hiking trails that wind through open meadows and canyons, including the Rio Bonito National Petroglyph Trail. Cross-country horse and foot travel is allowed. Mountain bikers are encouraged to stay on established trails to protect riders and the landscape. The trails are all closed to motorized OHV use, except where they overlap with the 20 miles of designated roads. All roads and trails are marked with signs stating open or closed and delineate permissible access, whether by foot, horseback, mountain bike or vehicle. See the Fort Stanton ACEC Route Designation Plan for further information.

The NCA is open to overnight camping with a 14-day maximum length of stay. There are two established camping areas: an equestrian trailhead on NM 220 and a campground at the Fort Stanton Cave entrance. There are facilities for equine stock and water located at the equestrian trailhead on NM 220. Several tables, fire rings and a toilet are located at the Cave Campground. The Cave Campground does not have equestrian facilities or water.

Approximately 20,910 visitors recreated on the NCA in fiscal year 2009. Fiscal year 2010 visitation was 13,494. Visitors come to the NCA for many reasons. The extensive sustainable trail system and stock facilities provide quality riding opportunities for equestrians. The prime big game habitat offers excellent hunting opportunities, including a designated youth deer hunting area. The NCA also attracts cavers to Fort Stanton Cave, the third longest cave system in New Mexico. Other recreational opportunities include hiking, mountain biking, wildlife viewing, photography, and camping.

No camping is allowed within 100 feet of the Rio Bonito and Salado Creek, within 300 yards of water sources (e.g. seeps, springs, water well or tank), and within one quarter mile from waysides, overlooks, interpretive trails or state highways, except at developed campgrounds or designated campsites. “Vehicle campers” are permitted to drive no more than 100 feet off BLM-designated roads to a campsite.

The NCA also lends itself to special recreation events such as equestrian, living history, mountain bike, orienteering, and group camping events. The area has hosted many of these events in the

past. Events that are not compatible with the NCA management objectives include, but are not limited to, motor vehicle events such as off-road racing or motorcycle trials.

Direct/Indirect Effects

Sites currently used for dispersed camping by recreationists would continue to experience surface disturbances caused by vehicles pulling off a road up to the allowed 100 feet for camping purposes. However, these sites tend to recover rapidly during normal rain events and annual growing season. Seed mixtures appropriate for this area would be applied if necessary for reclamation purposes.

The 93 miles of trails on the NCA for equestrian, hiking, and mountain biking are constructed to sustainability standards. Only the designated trail tread would experience impacts from use by equestrian riders, hikers, and mountain bikers. These impacts are mitigated through annual maintenance of the trails. Areas outside the designated trails would not experience adverse impacts.

The equestrian trailhead would continue to see heavy equestrian, hiking, and mountain bike use. However, at this facility, impacts are lessened due to established parking areas, controlled vehicle and equestrian traffic, and rapid recovery of vegetation during a normal rain events and growing season. Seed mixtures appropriate for this area would be applied if necessary for reclamation purposes.

New dispersed camping sites would be expected to develop on the NCA if “vehicle camper” visitor use increases. Surface disturbances would occur as recreationists drive off designated roads to establish a camp site. Disturbed areas would be expected to recover due to rain events and annual growing season.

The trails are all closed to motorized OHV use, except where they overlap with the 20 miles of designated roads. Under Alternatives A, B and C, limiting OHVs to designated open roads instead of roads and trails would have no impact since no trails are currently designated as open to OHV use. Thus there would be no net change in available routes for OHVs. Restricting OHVs to roads would produce a long-term benefit to visitors in the NCA by channeling OHV users away from visitors seeking quiet and solitude.

The impacts from special recreation use permits have been analyzed in individual National Environmental Policy Act documents and will continue to be analyzed on a case-by-case basis.

Under Alternatives A and B, instituting fees for campground use could have positive and negative effects. Money collected from fees would benefit the resource and would provide tangible products such as signs, maps, brochures, and site improvements. This would increase visitor satisfaction, possibly leading to increased visitation. Some user groups may oppose fees resulting in strained relations between the BLM and these users. Self-service fee tubes would be employed if a campground host is not available to collect fees. These tubes could be vandalized and theft of fees could occur.

Under Alternatives A and C, once the criteria for creating a Rio Bonito Campground are met, a campground could be established. Opening a campground in this area would increase visitation to the Upper Rio Bonito Valley. This would increase surface disturbance and traffic. It could also increase conflicts with nearby cultural resources.

13. Wild and Scenic Rivers

Affected Environment

In preparation for this NCA Plan, the BLM updated the Wild and Scenic Rivers inventory for the Rio Bonito and Salado Creek segments in the NCA. The Salado Creek Segment included the entire length of Salado Creek that was within the NCA boundary. The Rio Bonito was divided into three segments. Rio Bonito Segment 1 is the portion of the Rio Bonito that runs from the western boundary of the NCA to the western boundary of the land controlled by New Mexico State. Segment 2 of the Rio Bonito extends from the eastern boundary of the State land to the Government Springs area. Rio Bonito Segment 3 starts at the Government Springs area, where several springs and seeps vastly change the morphology of the river, to the eastern boundary of the NCA.

The river segments were evaluated using the guidance in BLM Handbook 8351, Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, and Management. Each segment was evaluated for free-flowing characteristics and Outstandingly Remarkable Values (ORVs). A Wild and Scenic River must be both free-flowing and have at least one ORV. The results of this inventory are included in the permanent Administrative Record for the NCA Plan.

Direct/Indirect Effects

The No Action Alternative is based on the Wild and Scenic Rivers inventory completed in 1994 for the Roswell Field Office Draft Resource Management Plan for the Fort Stanton ACEC. It did not include the section of the Rio Bonito that falls on what was formerly known as the Rio Bonito Acquired Land Tract 1. The 1994 inventory concluded that neither the Rio Bonito nor the Salado had any eligible segments under the NWSRS.

The recent inventory determined that Segment 1 of the Rio Bonito is, in fact, eligible under the NWSRS. Segment 1 is free-flowing and has Scenic, Recreational, and Cultural ORVs. Rio Bonito Segment 2 was determined to have free-flowing characteristics but did not have any ORVs. Rio Bonito Segment 3 and Salado Creek were ineligible based on lack of both free-flowing characteristics and ORVs.

In Alternative B, Rio Bonito Segment 1 would be given a tentative classification of a Scenic River Area. This classification is based on several factors. The shoreline and watershed of this segment is largely primitive and undeveloped. There is only one vehicular bridge crossing this segment and it is low profile and currently not being used. There is a road that parallels the river, but it is unpaved and well concealed from the river by topography and vegetation. Designating Rio Bonito Segment 1 as a Scenic River would require that the BLM manage the segment to protect its free-flowing characteristic and its ORVs.

Under Alternative A, the Preferred Alternative, as well as Alternative C, the BLM will not recommend that Rio Bonito Segment 1 be added to the NWSRS. Since this river falls within a National Conservation Area it is already afforded a high degree of protection. The NCA designation and other existing management prescriptions appropriately protect the free-flowing characteristic and the ORVs. Inclusion of the segment in the NWSRS would not be expected to enhance this protection. Also, the flow of this segment of the Rio Bonito is severely restricted by the Bonito Dam, which is located upstream of the segment on private land. The BLM is limited in its ability to protect the river flows due to this upstream allocation.

14. Mineral Resources

Affected Environment

The Roswell RMP designated the area now known as the NCA as withdrawn from mineral entry and closed to mineral leasing. It also designated the area as open to the discretionary disposal of mineral materials. PL 111-11 clarified that the area is withdrawn from location, entry, and patent under the mining laws and operation under the mineral leasing and geothermal leasing laws.

Saleable minerals are commodities disposed of via sales or free use (government agencies and municipalities) by the Federal government and generally comprise common varieties of construction materials and aggregates.

Direct/Indirect Effects

Under all alternatives, the withdrawal from mineral entry and the mineral leasing closure will continue to remain in effect and these minerals would continue to be unavailable for exploration or development. Impacts would continue to be negligible as these lands have not been available since PL 111-11 took effect.

Under Alternatives A, mineral materials are available only for the BLM's use within the NCA. Under Alternative C and the No Action Alternative, mineral materials would continue to be made available on a case-by-case discretionary basis. An irreversible and irretrievable commitment of resources occurs when mining is conducted and minerals are sold. However, economic benefits are realized from the sale and the future use of the materials. Cave passages would be avoided when mineral materials are made available.

Under Alternative B the NCA would be closed to the disposal of mineral materials. This would increase the costs of doing business by delaying projects, forcing alternative sources for mineral materials, increasing haul distances, increasing haul costs, limiting flexibility in timing of activities, increasing reclamation costs and precluding some activities.

15. Cultural Resources

Affected Environment

Human occupation of the Fort Stanton area extends back in time to the Archaic Period (approximately 5500 BC – 400 AD). Archaic sites are rare on Fort Stanton but several of these archaeological sites have been located and dated to 6000 BC (Shelley and Wenzel; 2002). Although isolated projectile points have been found within the NCA that date to the Paleo-Indian (11,000-5000 BC) period, as of yet Paleo-Indian archaeological sites have not been located, thus a Paleo-Indian occupation is not warranted. The Archaic time period is represented by a number of sites as is the Formative (900-1400 AD), also called the Ceramic time period. The variety of prehistoric sites ranges from open sites to rock shelters, caves, architectural (pit houses) and petroglyphs. Site density is high along major drainages such as the Rio Bonito. The Fort Stanton area seems to have been abandoned from 1300 to 1450 by the agriculturalists of the Formative period (Shelley and Wenzel; 2002). This corresponds to large population shifts as seen in other areas of the Southwest and is probably due to climate changes.

There are several large pueblos located within a few miles of the NCA which have evidence of intensive agricultural societies, Robinson Pueblo, Double Crossing Ruin, and LA 51344. These sites also indicate a large hunting season, as seen by the amount of pronghorn antelope and other mammal remains. All of these sites are within the Formative Period.

Little information is known of the early proto-historic occupation of the NCA. Investigations of early Mescalero Apache sites that are associated with the NCA are currently ongoing. Results of those investigations should reveal important information of land usage in the early 1500s. In the first half of the nineteenth century Hispanic peoples began settling in the area. By 1855, Fort Stanton was built to provide protection for the local Anglo and Hispanic population from the Mescalero Apaches. Besides Fort Stanton Proper, there are known historic sites dating to the same time frame and associated with Fort Stanton.

There have been several large cultural inventory surveys on the NCA. One of these was undertaken prior to the construction of the Sierra Blanca Regional Airport. The cultural resources inventory for the Sierra Blanca Regional Airport covered 1,700 acres. Other large surveys have focused on the Rio Bonito drainage. Smaller surveys have occurred prior to small-scale surface disturbing projects such as water line and fence construction. A total of 33 small cultural resource inventories have been conducted for a total of 770 acres out of the 24,876 acres within the NCA, or .03 percent.

In addition to cultural surveys, excavations have been permitted as part of archaeological field schools, for research and ahead of construction projects for Highway 380 improvements.

Direct/Indirect Effects

Cultural surveys will continue to be required before any ground disturbing activities are authorized. Recreational sites and events have been located to avoid cultural resources.

In consultation with the Mescalero Apache, information was relayed as to specific Traditional Cultural Properties (TCP) locations as told in the Mescalero Apache oral history. An ethnographic study capturing the Mescalero Apache oral history as it pertains to the NCA would be considered.

Under Alternative C, the surface drill sites and access roads for drilling a cave portal would avoid cultural sites. If paleontological resources are discovered during project work they would be reported to BLM specialists who would determine appropriate course of action. An intensive cultural resource inventory would be completed prior to surface and subsurface construction of the proposed portal. Cultural resources found would be avoided during portal construction.

Under Alternatives A and B as well as the No Action Alternative effects to cultural resources and TCPs would remain the same.

16. Land Tenure

Affected Environment

The NCA is comprised of 24,876 acres of federal land managed by the Bureau of Land Management. Within the boundary of the NCA there are in-holdings by the State of New Mexico and the Village of Ruidoso, as well as a small private holding which is not part of the NCA. There is a total of 1,325 acres of state land; including Fort Stanton Proper (227 acres), Post Cemetery (1.2 acres) and the Merchant Marine Cemetery (12 acres). Camp Sierra Blanca and other facilities are included in the overall number. In addition, the Sierra Blanca Regional Airport, owned by the Village of Ruidoso, contains 1,677 acres. Surrounding the NCA there are holdings managed or owned by the US Forest Service, State of New Mexico and private individuals.

Public Law 111-11 states that the NCA is withdrawn from all forms of entry, appropriation, or disposal under the general land laws.

Direct/Indirect Effects

Land acquisition would be the same as under all alternatives. Land acquisition would help accommodate resource management needs and could result in improved protection for all resources within the NCA.

17. Land Use Authorizations

Affected Environment

A right-of-way (ROW) is an authorization to place facilities over, on, under, or through public lands for construction, operation, maintenance, or termination of a project. Public lands are made available throughout the planning area for ROWs and corridors. The NCA is in an exclusion area for major ROWS. Applications for minor ROWs would continue to be considered on a case-by-case basis after completing the appropriate level of NEPA analysis.

There is currently a utility corridor ROW for the Sierra Blanca Regional Airport that will be retained.

Direct/Indirect Effects

Minor ROWs would continue to be granted in certain areas and certain conditions under all of the management alternatives. Minor ROWs would be considered in cases to resolve trespass issues as well as improve access to the NCA for the BLM and the public. Trespass will be dealt with immediately after discovery, especially if resources are threatened.

Since the NCA is a ROW exclusion area, companies would have to find alternate routes for major projects. Under all alternatives, minor ROWs within the NCA that are proposed to be of a height greater than 15 feet will be buried or prohibited. The effect would be that proponents of such projects might look for alternate routes instead of bearing the expense of burying the utility line.

18. Cave Recreation Management

Affected Environment

Fort Stanton Cave (FSC) is the largest known cave within the NCA, and is the third longest cave in New Mexico. The total known length of passages extends approximately 14.75 miles. The surface definition of the cave covers approximately 985 acres. Other smaller caves and blow holes exist within the area. Seven miles of FSC other than Snowy River Passage are open annually for recreational caving by permit from April 15 to November 1, after which it is closed to protect hibernating bat populations. The cave is widely known for its rare velvet formations, and there are also interesting helictites, aragonite, selenite needles, and various forms of gypsum.

Feather Cave is closed to all visitor use, except for administrative or research purposes, to protect the significant bat hibernacula and to protect visitors from extreme safety hazards associated with breakdown, vertical entrances and histoplasmosis. All federally-managed caves within the NCA are protected by the Cave Resource Protection Act of 1989 and other BLM policies and guidelines.

The possibility exists that Native Americans explored Fort Stanton Cave and could have used the cave as a shelter during inclement weather. Accounts of early exploration by soldiers stationed at Fort Stanton indicate finding petrified hearths and fire brands in 1856. These accounts indicate Native Americans ventured at least one-half mile inside the main corridor. In 1855 a patrol of Company K, 1st Regiment, U.S. Dragoons (later 1st Regt, U.S. Cavalry) from the newly established Fort Stanton made the first recorded visit to the cave.

The first known formal exploration of FSC was in 1877 when the Wheeler Expedition, part of the Surveys of the Territories (Wheeler, Hayden, Powell), discovered Hell Hole and the Lower Breakdown Passage. The group completed one of the first instrument surveys of a cave in the United States and left their names inscribed in Wheeler Hall, over 1 mile into the cave. Visits were probably fairly regular by soldiers and townspeople but very few letters or diaries have surfaced indicating amounts of visitation. The Great Divide Expedition of 1891, sponsored by a

Denver-based periodical of the same name, chronicled the adventures of three members of the 10th Infantry Band from Fort Stanton in a vivid, if somewhat inaccurate, account for its readers. In 1908 the Chief of Engineers Office made another instrument survey of the cave. Except for minor discoveries, the known cave remained that which the Wheeler Expedition had discovered.

The contemporary period of cave exploration began in 1956 as cavers breached Three-way Hill, discovered the Keyhole and the large, well-decorated passages beyond, bringing total passage length to just under eight miles. In 1969 the next major discovery was made, the one-half mile long Lincoln Cavern. The Snowy River Passage of FSC was discovered in September 2001 and within five years that one significant discovery extended the known cave length to almost 15 miles.

Geophysical surface studies indicate other passages in FSC, with an estimated conservative length of 30 miles total. The cave has a strongly joint-controlled, rectilinear pattern of phreatic origin, which means the cave formed below the water table in a series of cracks, or faults, and its passages intersect at angles. These passages were later enlarged by running water, a process called vadose alteration. Passages run east to west and north-northeast to south-southwest.

FSC is widely known for displays of rare velvet formations. The cave also contains displays of helictites, aragonite, selenite needles and various forms of gypsum. The velvet is located in the Upper Breakdown Room and Lake Room and the rear portions of the cave. Venturing through Hell Hole and into the passages beyond is not recommended for inexperienced cavers, as this area involves a very strenuous trip in which fatigue is a serious problem. Many formations have been destroyed deliberately by vandals and collectors, and accidently, by careless visitors.

Fort Stanton recreational cave trips can range from two hours to more than 20 hours. Safe caving practices demand at least three sources of light for each person and a minimum of three persons for the trip. Visitors are not allowed to cave alone. A hard hat or caving/climbing helmet must be worn to protect the head. Sturdy hiking shoes or boots provide the best traction. Visitors must dress appropriately as temperatures in the cave average about 56 degrees.

Commercial operation is authorized and is used as an opportunity to interpret resources through the principles of Leave No Trace (LNT).

The Snowy River passage was discovered by cavers investigating strong air flows coming through breakdown in the cave. Snowy River receives its name from a bright white crystal calcite formation covering the floor of the passage. Approximately eight miles of passage have been mapped. This includes several other passages branching off Snowy River that do not have the white calcite deposit but resemble the main portion of Fort Stanton Cave.

This area of the cave is a segment of a much larger complex cave system. How it formed and how it relates to the local geology and hydrology is currently being studied. Geomicrobiologists, mineralogists, geologists, and geohydrologists from New Mexico Tech, University of New Mexico, New Mexico Bureau of Geology and Mineral Resources and the National Cave and Karst Research Institute are studying all scientific aspects of the Passage. To date several species of microorganisms that were previously unknown have been discovered.

Direct/Indirect Effects

Under all alternatives the total number of recreational permits issued per year is not to exceed 400 and the total recreational visitation per year is not to exceed 3,200 people. Since the recreational permit process and visitor limits to Fort Stanton Cave were implemented the number of recreation permits has not exceeded 200 and the number of recreation visitors has not exceeded 1,500.

Up to 20 percent of recreation permits could be issued for commercial use under the No Action Alternative and Alternative A. Alternative B would limit the commercial use of recreation permits to 10 percent. There may be no impacts to commercial cave usage from this reduction since commercial use is currently less than two percent of recreational permits. However, if future commercial usage increases this could limit opportunities for recreational access to the cave. Under Alternative C, up to 30 percent of annual recreation permits could be issued for commercial use. This could result in additional commercial operators in the future and could increase the opportunity for recreational access to the cave.

Under Alternative B, fees for cave permits could have both positive and negative effects. As in collecting fees for campgrounds, these fees would benefit the resource and provide tangible products such as brochures and site improvements within the cave. This could increase visitor satisfaction or could lead to increased strains between the BLM and the cavers. At the same time, the cave permit fees would increase the costs for commercial cave guides who will most likely pass those costs on to their clients. This may reduce income for commercial guides if clientele perceive the price of guided cave tours to be excessive or simply unaffordable. Ten people per permit are allowed in the front portion of Fort Stanton Cave and six people per permit are allowed in the back portion under the No Action Alternative. This is a manageable amount and recreational trips have decreased in recent years. There have been recent discoveries of unauthorized formation mining and other significant impacts in the back section of the cave beyond the Hell Hole gate. These impacts would likely continue under this alternative.

Under Alternatives A, B and C, a range of three to ten people per permit would be allowed in the front portion of the cave and three to six people per permit would be allowed in the portion beyond Hell Hole gate. This would keep limits the same or below current management. This should not create greater impacts than current management and could reduce impacts. The use of BLM-authorized guides beyond the Hell Hole gate would reduce the risk of formation mining and other adverse impacts. These BLM-approved guides would be required to have special training in LNT backcountry ethics and visitor management. As in the No Action Alternative, periodic science and survey trips under administrative permits may exceed this limitation.

Science and survey trips under administrative permits exceed the limitations due to specialized parties and persons acting to take equipment in and/or bring same out. In the case of Snowy River, all persons leading expeditions have previously been to Snowy River and understand the need for great care in negotiating routes to minimize impacts. The administrative permits document the number of people visiting Snowy River Passage on expeditions. The expeditions, in turn, document the impacts to the mineral deposits by those expeditions.

The BLM expects impacts to the calcite deposits of Snowy River by expeditions as discovery and survey continue. Examples of these impacts are mud accidentally tracked onto the calcite, cracks where the calcite deposits are thin, and rubs or scrapes of the calcite resulting from crawling in narrow passages. Periodic flooding of Snowy River, such as the 2010 flood, may contribute to natural restoration by washing away mud and depositing new calcite over disturbed areas.

Under the No Action Alternative and Alternatives A and B, there is no recreational access to the Snowy River Passage, Lincoln Cavern, Priority 7, and Bat Cave areas in Fort Stanton Cave as these are either for research or hazardous sites. Within the cave interior, trails focus visitor travel to passage centers, thus preventing adverse impacts to cave resources in various locations.

Alternative C would allow limited recreational access to the Snowy River Passage of Fort Stanton Cave under certain defined conditions. See Appendix 3, Implementation. Adverse impacts could occur by too much human influence on biotic communities, especially if trip/permit stipulations and research guidelines were not effectively followed over time.

19. Cave Portal Protocol

Affected Environment

Currently there are no artificial or constructed entrances into Fort Stanton Cave and the Snowy River Passages. Fort Stanton Cave is closed from November 1 to April 15 to protect hibernating bat populations. The threat of white-nose syndrome may close Fort Stanton Cave to recreational visits in order to prevent the spread of the disease to other bat populations. Other cave passages may be administratively closed due to flooding or other additional safety concerns. A cave portal would allow administrative access, bypassing these areas and providing year-round access to Snowy River.

A cave portal would address human occupant health and safety issues. As cave passages increase in length without any additional exits to the surface, the risk to occupant safety increases. In the event of a medical emergency a cave portal would help to safely remove the injured person in a timely manner. It would also help evacuate a person in the tragic event of death within the passage.

Average time of exploration trip via Fort Stanton Cave entrance is approximately 24 to 36 hours. In the event of a rescue in the far reaches of Snowy River South rescue of an injured caver would take approximately 72 hours if not longer and depending on injury type.

Constructing a portal or portals to access Snowy River could impact the air flowing through the cave system. Currently, the cave system exchanges air with the surface through the main entrance due to two mechanisms:

1. Barometric interchange. Air flows into the cave when the surface barometric pressure is higher than in the cave and air flows out of the cave when the surface barometric pressure is lower than the cave. Velocity of airflow tends to vary inversely with the diameter of the passages so that in large passage cross-sections the airflow is low and in smaller passages it

may be significantly higher. Spot measurements at the Main Gate just inside the entrance have varied from 0.15 mph to 3 mph. Velocities as high as 20.5 mph have been reported at the constriction named the "Hair Dryer" in the Priority 7 passage. During times when surface barometric pressure is relatively stable for extended periods of time (days), there are often twice-daily airflow reversals due to the diurnal fluctuations in surface pressure due to atmospheric heating and cooling, particularly in the warmer seasons.

2. Density current interchange. During parts of the year when the surface air temperature is significantly lower than that in the cave, cold air flows into the cave along the floor and a corresponding warmer air current flows out along the roof particularly when the barometric pressure is not a factor. This results in cold air pooling in lower areas of the cave such as the Main Corridor. No measurements are available to quantify this type of airflow.

Table 3. Airflow Measurements

Velocity (ft/sec)	Cross section (ft^2)	Vol. (ft^3/sec)	Description
8.8	0.7	6.2	Priority 7, first pinch, (Before digging), Corcoran 1970
2.0	1.5	3.0	Snowflake #3, 5' before end, Corcoran 1970
17.6	2.0	35.2	P7 Hair Dryer (Swartz, 2003)
15.8	2.0	31.6	P7 Hair Dryer (Swartz, 2001)
20.5	2.0	41.0	P7 Hair Dryer (Zannes trip, 2005)
7.3	40.0	292.0	SRS108 (Davis, 2003)
8.0	6.4	51.2	DSMH Dig, Env. Seal (open) McLean, 2007
2.9	7.5	21.8	DSMH Entry Pit (Corcoran, 2005)
2.2	9.5	20.9	Snowflake #3 (Corcoran, 2000)
1.8	26.0	46.8	Priority 7, near gate (Corcoran, 2000)
2.3	255.0	586.5	Main Gate (Corcoran, 2007)

There have been numerous reports of noticeable airflow throughout the Snowy River complex. It appears that the airflow is typical of a barometric interchange between the Main cave system entrance and all other passages, including Snowy River. Airflow patterns suggest that there are no other significant entrances to the cave system to provide air interchange or, if such entrances exist, they are located at remote locations that have little effect on the observations made so far.

Airflow measurements are non-simultaneous spot measurements and only give approximate relative volumes or capacities for the passages observed. Airflow observations indicate bi-directional flow at all passage connections. This implies that the primary mechanism responsible for air movement is barometric pressure changes outside the cave resulting in a corresponding response by the cave system. The highest volume airflow observed is in the Snowy River South passage, indicating potential for significant passage beyond the known extent. The airflow volume in this passage, as measured near survey station SRS108, is

apparently greater than the sum of airflow from the known passage connections to the other parts of the cave system. This may be partially accounted for by leakage at other unknown passage connections or breakdown interfaces.

Airflow has been noticed in Snowy River North and in The Metro passages, but no measurements have been made and the reports do not mention strong airflow in these passages. Airflow volumes related to Snowy River have been estimated from spot measurements at a few locations in the Snowy River section. The preceding table gives a summary of those estimates. Also included is a single measurement at the Main Gate near the entrance of the cave system for comparison.

Direct/Indirect Effects

The No Action Alternative and Alternatives A and B do not authorize portals to be drilled into Fort Stanton Cave. The impacts of constructing one or more portals would be avoided.

Should Fort Stanton Cave be closed due to white-nose syndrome (WNS), administrative access to Snowy River would be allowed under the No Action Alternative and Alternatives A and B. The decontamination protocols for WNS would be followed to allow such administrative trips into the cave. See Appendix 3 for a description of the WNS decontamination protocol.

Conversely, should Fort Stanton Cave be closed to recreational cavers due to WNS, the construction of one or more large-diameter portals under Alternative C could allow access to Snowy River without the WNS decontamination process. More information about the spread of WNS is needed to make a final determination of whether or not to institute WNS decontamination protocol when accessing Snowy River via a large-diameter portal.

Some Snowy River trips are now taking 24 hours round-trip. A cave rescue without a portal could take two or three days with hazards to the patient's health.

Under Alternative C, constructing one or more portals would be allowed if certain criteria are met but the size, number, and location would be determined after further information is available. See Appendix 2, Criteria for Drilling Portal Access to Snowy River Fort Stanton – Snowy River Cave National Conservation Area. Portals would allow expedition relief and resupply, and emergency access and patient extrication in the event of an accident. Portals would also support critical scientific research, allowing equipment to be more easily delivered to the far reaches of Snowy River and also giving scientists better access. Telemetry can also be installed and cave data transmitted in real time to nearby BLM facilities.

As was done with the current Snowy River Access Route, using geophysical means to identify a target, the preferred bottom portal location would be offset to prevent drilling spoils from damaging cave resources (see Figure 1 in Appendix 2) and allow for an environmental seal to be constructed leading into the cave.

The air-water mist drilling of any diameter-sized hole would bring the drill cutting fines to the surface and deposit the cutting fines on the surface in a steel box to be later removed from the area. There may be a scattering of cuttings that escape the cuttings box.

Possible impacts to the cave system during and after construction include:

- Cave ceiling collapse during construction due to vibration from drilling operations or breaking through the ceiling (missing the offset target). Depending on the size of the collapse, cave passages may be blocked and any mineral formations present at the collapse site would be damaged beyond the point of reclamation. Using the offset technique described above reduces the risks of ceiling collapse, however, unknown faults and other geologic factors might cause the drilling operation to miss its intended target.
- Dust resulting from drilling operations could contaminate the water and air in the cave. A successful completion using the offset technique would avoid this impact.
- Construction of one or more portals could alter the natural air flow in the cave system. Successful completion using the offset technique would avoid this impact. After the shaft has been drilled to the desired depth, an airlock system would be constructed at the surface to prevent altering the airflow in the cave. Only after the completion of the airlock would excavation commence to access the bottom of the shaft. See Appendix 2 and the description below in Mitigation Measures.
- The vertical shaft of a portal could inadvertently alter the natural flow of water within the cave system. Resistivity and other geophysical studies could reduce the possibility of altering the water flow within the cave.

Mitigation Measures

To avoid contaminating the cave the drilling target would be offset from the passage. See Figure 1 in Appendix 2. Once at the required depth, a tunnel from the passage to the bore hole would be excavated by hand. This method would reduce the amount of dust in the cave and reduce the possibility of ceiling collapse. Additionally, natural airflow within the cave could be maintained during construction with this method.

Excavation of mineral materials will be avoided where geophysical studies indicate passages may occur. Geophysical studies may be necessary prior to excavation of mineral material by heavy equipment if it is outside of any known subsurface voids or passageways. No excavation will be allowed around natural cave entrances. Mineral materials may be utilized during the excavation and construction of additional passageways or entryways.

Every feasible preventive measure to eliminate surface and subsurface materials from entering into the passage during portal drilling would be used.

BLM would have an on-site inspector from the Roswell Field Office during construction and drilling operations for cave portals to insure compliance with the conditions of approval contained in the temporary right-of-way.

BLM would inspect portal breakthrough sites to determine stabilization and restoration needs and environmental closure design.

Upon completion of the portal shaft, an airlock system would be constructed that seals the portal. This would maintain the natural air flow within the cave system. See Appendix 2 for a description of this system.

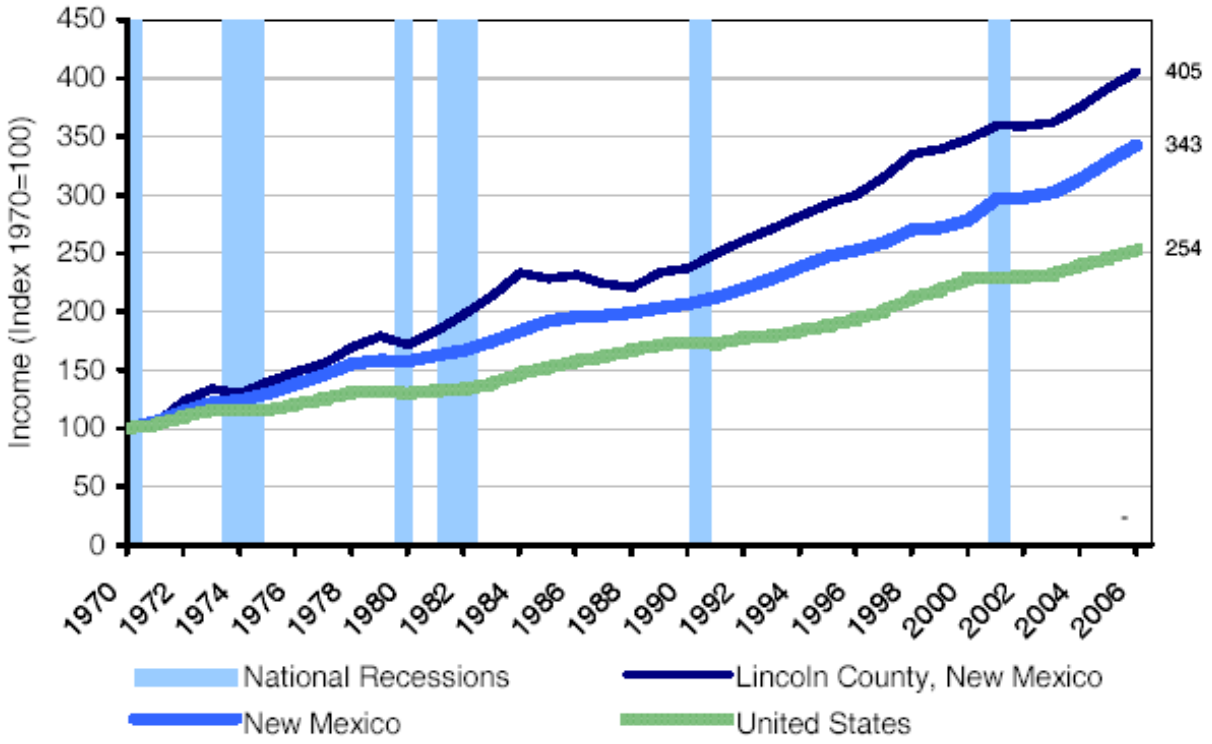
20. Socio-Economics

Affected Environment

The NCA is located in southern Lincoln County, New Mexico. The county is mostly rural in nature but includes the incorporated communities of Capitan, Carrizozo, Corona, Ruidoso and Ruidoso Downs. Over the period from 1970 to 2006, the population of the county grew 174 percent from 7,611 to 20,858, greatly outpacing the population growth of the state of New Mexico and the entire United States (BEA REIS 2006 Table CA30). The median population of the area has gotten older in the ten years between 1990 and 2000. The median age in 1990 was 37.2 and in 2000 it was 43.8.

Income growth in Lincoln County has outpaced the state and the country as well (Figure 1). The Standard Industrial Classification (SIC) System illustrates growth by category. Table 4 shows this classification of Lincoln County from 1970 to 2000. The fastest growing industry, by far, is the Services and Professional Industry, particularly Retail Trade and services such as health, legal and business services.

Figure 1. Income Growth of Lincoln County Compared to the State and the Nation



Source: BEA REIS 2006 Table CA30

Table 4. County Employment (Jobs) by Industry.

Industry	1970	2000	% of New Employment
Total Employment	3166.0	10536.0	
Wage and Salary Employment	2066.0	6684.0	62.7
Proprietors' Employment	1100.0	3852.0	37.3
Farm and Ag Services	591.0	648.0	**0.8**
Farm	549.0	476.0	
Ag Services	42.0	172.0	1.8
Mining	10.0	112.5*	**1.4**
Manufacturing (incl. forest products)	49.0	336.0	**3.9**
Services and Professional	1726.0	7255.5	**75.0**
Transportation & Public Utilities	106.0	332.0	3.1
Wholesale Trade	34.0	123.5*	1.2
Retail Trade	619.0	2390	24.0
Finance, Insurance & Real Estate	306.0	1175.0	11.8
Services (Health, Legal, Business, Others)	661.0	3235.0	34.9
Construction	172.0	843.0	**9.1**
Government	618.0	1341.0	**9.8**
Source: EPS 2009			

*Estimate.

Interestingly, a similar system used from 2001-2006, the North American Industrial Classification System (NAICS), showed that Construction was the fastest growing industry in Lincoln County during that timeframe (BEA REIS 2006 CD Table CA25N).

The employment described above generates personal income. Two ways to measure the quality of the jobs are per capita income and average earnings. Per capita income is calculated by dividing the total income by the total population. Average earnings are calculated by dividing total income by the number of workers. Although income growth in Lincoln County has outpaced the state and the country, the per capita income and average earnings of the county have remained below both the state and the nation (EPS, 2009). Table 5 shows a comparison of the per capita income and average earnings for Lincoln County between 1970 and 2006, adjusted for inflation.

Table 5. Changes in Income.

	Lincoln County		New Mexico	United States
	1970	2006	2006	2006
Per Capita Income	$16,419	$24,281	$29,929	$36,714
Average Earnings Per Job	$26,899	$22,527	$38,239	$47,286

Direct/Indirect Effects

The NCA presents additional opportunities for public recreation within Lincoln County. The NCA surrounds the Fort Stanton State Monument and is approximately 10 miles west of the Lincoln State Monument. The NCA is approximately 5 miles east of Smokey Bear State Park in Capitan, New Mexico. Within Lincoln County there are two other BLM campgrounds and seven Forest Service campgrounds.

For 12 years the area was managed as an area of critical environmental concern and the prescriptions of this NCA plan are generally in line with past management. The NCA designation and this plan neither closes areas to uses by the public nor would there be an opening of an area previously closed to public use. The NCA would be an added attraction in Lincoln County but it would be difficult to measure the effect on the local economy. Therefore, the designation and management of the NCA would be expected have no net effect on the communities and economy of Lincoln County.

IV. CUMULATIVE IMPACTS

A cumulative impact is defined as "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 nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

The direct and indirect impacts of this proposed plan have been documented in each use or issue. By adopting much of the current land use planning decisions into this NCA plan, few if any additional impacts would be expected.

The population of Lincoln County has been increasing steadily over the last forty years, as noted in Section 21 Socio-Economics. This increase in population has led to increased housing developments. Much of the private land to the west of the NCA is subdivided for current or future residential housing. In some cases these houses are adjacent to the NCA boundary.

Housing developments on private land and the associated need for domestic water might impact the ground water in the NCA. Fort Stanton Cave and the Snowy River Passage have experienced periods of water flow through the cave system. The formation of the calcite which gives Snowy River its name is the result of water flow. An increase in the number of domestic and municipal water wells or increased pumping from these wells may reduce the water flow through the cave system.

Currently the Village of Capitan has three municipal wells permitted on the NCA and these wells could affect the amount of ground water in the aquifer. Water rights are granted by the OSE. BLM works with OSE to monitor the number of wells and the amount of water pumped from the aquifer adjacent to the NCA.

Fort Stanton Proper is designated a monument by the New Mexico State Monuments. The Fort Stanton-Snowy River Cave NCA also joins other national designations within Lincoln County and southern New Mexico. The nearby Capitan Mountain and White Mountain Wilderness Areas are

managed by the Lincoln National Forest. Within a two-hour drive is White Sands National Monument and within a three-hour drive is Carlsbad Caverns National Park, both managed by the National Park Service. The BLM does not anticipate a sharp influx of visitors because of the NCA designation.

V. BLM TEAM MEMBERS

Team Member	*Title*
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Jerry Dutchover	Geologist
Rebecca Hill	Archaeologist
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Michael McGee	Hydrologist
Bill Murry	Recreation Planner
Adam Ortega	Range Management Specialist
Howard Parman	Planning and Environmental Coordinator
Knutt Peterson	GIS Specialist
Glen Pugh	Civil Engineer
Randy Vinson	Range Management Specialist
Philip Watts	GIS Specialist
Allen Wyngaert	Fire Management Specialist

VI. PERSONS, GROUPS, AND AGENCIES CONSULTED

U.S. Forest Service, Lincoln National Forest, Smokey Bear District
U.S. Park Service, Carlsbad Caverns National Park
New Mexico Department of Game and Fish
Lincoln County Commission
New Mexico Institute of Mining Technology (New Mexico Tech), Dr. Penny Boston
National Cave and Karst Research Institute, Dr. George Veni
University of New Mexico, Biology Department, Dr. Diana Northup; Earth and Planetary Sciences Department, Drs. Victor Polyak and Yemani Asmerome
New Mexico Bureau of Geology and Mineral Resources, Drs. Lewis Land and Talon Newton
National Speleological Society
Socorro Backcountry Horsemen
Conservation Lands Fund
Ecoservants, Stephen Carter
American Endurance Ride Conference
Fort Stanton Cave Study Project
Comanche Nation
Isleta Pueblo
Ysleta del Sur Pueblo

Mescalero Apache
Kiowa Tribe of Oklahoma
Debbie Buecher, Bat Biologist
Jan Biella, Acting State Historic Preservation Officer

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