

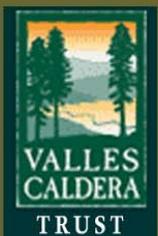
V a l l e s
C a l d e r a
T r u s t



VOLUME 2:
APPENDIX B

Final
Public Access
and Use Plan

Environmental
Impact
Statement



October 15, 2012

Errata Sheet

Revisions, Corrections, and Clarifications to the Valles Caldera Public Access and Use Plan Draft Environmental Impact Statement

In June 2012, the Valles Caldera National Preserve released the *Draft Public Access and Use Plan/Environmental Impact Statement* (EIS) for public and agency review. This errata sheet indicates changes that were made to the Final EIS as a result of comments received on the Draft EIS by the Valles Caldera Trust (VCT).

The pages that follow describe minor changes made to the Draft EIS text. In some instances, changes were made to whole sections of chapters. Those sections are being released in their entirety as separate files in order to preserve the context of those sections for the reader and are not included in this errata sheet. Those sections include:

- Summary
- New mitigation in chapter 2
- New text identifying the agency preferred and the environmentally preferred alternatives in chapter 2
- Updated information and analysis for:
 - Fish and Wildlife (elk and mule deer), chapters 3 and 4
 - Environmental Justice, chapter 4
 - Carbon Footprint and Air Quality, chapter 4
- Chapter 5 (updates to public involvement)

Revisions are shown in red in the text that follows. Additions are underlined and deleted text is crossed out.

Chapter 2: Alternatives

Page 2-1: Revise first sentence as follows: This “Alternatives” chapter describes the alternatives considered for the plan, including the recommended preferred alternative, the environmentally preferred alternative, and those eliminated from further analysis in this EIS.

Page 2-7: Under **Alternative 2: Banco Bonito Visitor Contact Station** replace the third sentence as follows:

~~Nonmotorized access from the visitor contact station would be generally open and unlimited. There is an existing network of trails leading from this location, and visitors could generally enjoy open and unlimited nonmotorized use of these trails. Ancillary infrastructure such as restrooms and picnic areas would also be developed in the area surrounding the visitor contact station. Over time, an interior route would be developed to expand access throughout the preserve.~~

Page 2-20: Revise Table 2-3, second column, sixth sentence to include the word “constructed”: Incorporate natural remediation, such as constructed wetlands.

Page 2-26: Under “Use of Wetlands,” revise first sentence by deleting “existing or” as follows: The design would use ~~existing or~~ constructed wetlands for wastewater treatment....

Page 2-30, Table 2-5: Summary of Alternative 2 Components: Second column, insert new text as follows for “Day-use recreation amenities”: Minimal development; nonmotorized recreational access from visitor contact station (e.g., hiking, biking, horseback riding) would be generally open and unlimited on the existing trail network in the vicinity (except for site-specific or seasonal restrictions for resource protection).

Also, second column, insert new text as follows for “Recreational amenities”: From the visitor contact station: Americans with Disabilities Act (ADA)-compliant day-use area, including fishing access, . . .

Page 2-35: Insert new text to the end of fifth sentence, first paragraph: This level of development is expected to accommodate approximately 50,000 visitors annually, or about 330 visitors per day during the summer recreation season on weekends and 165 per day on weekdays.

Page 2-36: Replace first sentence of third full paragraph as for page 2-7.

Page 2-39, Table 2-6: Summary of Alternative 3A Components: Add the following text to the end of the third bullet: visitors could generally have open and unlimited nonmotorized use of the existing network of trails at this location

Page 2-39, second paragraph: Insert the following text after the second sentence: Approximately 790 visitors are expected each day on weekends, and 395 on weekdays.

Page 2-41, last paragraph: Insert new text at the end of the second sentence as for page 2-38, Table 2-6.

Page 2-49, first full paragraph: Insert new text after the third sentence: Approximately 790 visitors are expected each day on weekends, and 395 on weekdays.

Page 2-63, Table 2-11: Summary of Environmental Consequences, Fish and Wildlife: Change long-term implementation level impacts for Alternative 2 from moderate to minor. Change programmatic level short-term impacts for Fish and Wildlife for Alternative 3B from moderate to minor to moderate.

Page 2-66, Table 2-11: Summary of Environmental Consequences, Water: Change Alternative 3A, Summary of Impacts, first sentence as follows: ~~Between 0.5 and 1 acre of wet meadows could~~Up to 7.8 acres of wetlands would be directly affected by the construction of new access road and facilities. Up to 1,379 feet at two stream crossings could be affected by the construction of the access road and facilities.

Also change Alternative 4A, Summary of Impacts, first sentence as follows: ~~Construction of visitor center and facilities could affect wet meadows.~~Up to 1.8 acres of wetlands would be directly affected by the construction of the access road and facilities. Up to 504 feet at one stream crossing could be affected by the construction of the access road and facilities.

Page 2-67, Table 2-11: Summary of Environmental Consequences, Cultural Resources: Change all long-term impacts from major adverse to localized, major adverse.

Page 2-70, Table 2-11: Summary of Environmental Consequences, Carbon Footprint/Air Quality: Delete “**adverse**” under Alternative 1, Programmatic, both short and long term and change cumulative from moderate to **minor**. For all remaining alternatives, change all long term impacts to **negligible** and all cumulative impacts to **minor**.

Page 2-72, Table 2-11: Summary of Environmental Consequences: Add the following note to the end of the table: **Negligible: The magnitude of change would not be measurable. Minor: Changes would be measurable but would not alter the structure, composition, or function of the resource and would be limited in context. Moderate: Changes would be measurable and may influence the structure, composition, or function of the resource but would be limited in context. Major: Changes would be measurable, would substantially alter the structure, composition, or function of the resource, and may be extensive in context.**

Chapter 3: Affected Environment

Page 3-11: Insert new text after second sentence of first paragraph: **Elk hunting and viewing are among the greatest attractions at the preserve (VCT 2005i).**

Page 3-98: Lead-in sentence to last set of bullets, change **Three** to **Four** and add **Jemez Mountains salamander (*Plethodon neomexicanus*)** to the bulleted list.

Page 311-312: Move Jemez Mountains Salamander discussion to page 3-104 following New Mexico Meadow Jumping Mouse—Federal Candidate to list the salamander as a Federal Candidate.

Page 3-105, Table 3-12: State Threatened and Endangered Animal Species Documented as Present in Sandoval and Rio Arriba Counties: Add **Jemez Mountains salamander, *Plethodon neomexicanus*, Endangered** to the list of amphibians.

Page 3-108: Last sentence above Table 3-13, insert **Jemez Mountains salamander** following spotted bat.

Page 3-191: Insert new text and table above Limited English Proficiency:

Table 3-35 shows the percentages of minority populations living below the poverty level in 2010 based on U.S. Census data.

Table 3-35: Minority Populations below Poverty Level 2010

Jurisdiction	Native American	Hispanic	Black
Sandoval County	23.0%	13.5%	6.7%
Rio Arriba County	17.7%	20.4%	ND
Los Alamos County	ND	1.5%	ND
New Mexico	31.5%	23.1%	23.6%

Source: U.S. Census Bureau n.d.

ND = no data available.

Page 3-192, Carbon Footprint and Air Quality: After the first sentence, insert new text: **Rising temperatures may, in turn, produce changes in weather, sea levels, and land use patterns, commonly referred to as “climate change.”**

Chapter 4

Page 4-3: Insert the word “substantially” into the definition of Major: Changes would be measurable, would substantially alter the structure, composition, or function of the resource, and may be extensive in context.

Page 4-6, Table 4-1: Cumulative Actions: Insert new row following NMDOT:

NMDGF / Past (late 1990s- early 2000s) / NMDGF reduced elk herd size in Jemez Mountains; this reduced the herd size in the Jemez Mountains from 7,000-9,000 to the current number of 4,000-6,000. / Regional, Preserve / Fish and Wildlife

Page 4-7, Table 4-1: Cumulative Actions, last row (N/A), move text to third column from page 3-95, fourth paragraph: The recent Los Conchas fire likely expanded favorable habitat by restoring meadow habitats on the forested domes on the eastern third of the preserve, although it is too recent to quantify this supposition.

Page 4-14: Revise first paragraph, third sentence as follows: Nonmotorized access from the visitor contact station to the existing network of trails in the area would be generally open and unlimited.

Page 4-14: Insert new paragraph after paragraph four:

As noted in chapter 3, the lack of adequate infrastructure continues to be the biggest challenge for winter recreation. The visitor contact station would provide a location for winter recreationists to assemble for guided winter activities provided by the trust. Winter recreationists would also be able to snowshoe and ski on the trails in proximity to the visitor contact station.

Page 4-15: Insert new paragraph before last one:

Hikers and winter recreationists would continue to use Valle Grande and Coyote Call trails accessible from NM-4. Details at the programmatic level would be refined in future planning, which would more fully address winter recreational activities at the preserve that have proven to be popular. At that time, the trust would consider expanding winter recreational opportunities, such as snowshoeing and cross-country skiing.

Page 4-17: Last paragraph before Programmatic Level, insert new text and revise last sentence:

The visitor center would provide a location for winter recreationists to assemble for guided winter activities provided by the trust, and would provide access to snowshoe and cross-country ski trails directly from the building. The result would be ~~,-resulting in a long-term~~ beneficial impact on visitor experience.

Page 4-17: Second paragraph under Programmatic Level, add new text to end of second sentence: Visitors would be able to bike into the preserve along a dedicated bike path, and drive personal vehicles to the Banco Bonito Staging Area for horseback riding and special events on the existing network of trails in the area.

Also add the following text to the end of the same paragraph: Winter recreationists would continue to use Valle Grande and Coyote Call trails accessible from NM-4. Details at the programmatic level would be refined in future planning, which would more fully address winter recreational activities at the preserve that have proven to be popular. At that time, the trust

would consider expanding winter recreational opportunities, such as snowshoeing and cross-country skiing.

Page 4-19: Insert new paragraph above first full paragraph:

An assessment of visitor satisfaction with public transportation services at Denali National Park and Preserve, where visitor access to the park's interior is controlled, found that the majority of visitors (71 percent) found the shuttles a "good" or "excellent" place for viewing wildlife. Eighty-seven percent said that wildlife observations from the bus was a factor that contributed to satisfaction regarding the transportation system. Seventy-two percent agreed that the bus provided freedom to view the park instead of focusing on driving, which also contributed to visitor satisfaction. Overall, 79 percent agreed or strongly agreed that the transportation service buses enhanced their visit to the park, and 88 percent rated the bus service good to excellent. Authors of the assessment concluded that "the transportation system in Denali not only allows visitors to experience the wild beauty of the park and its wildlife, but also affords a high degree of resource protection and visitor safety" (Miller and Wright 1999).

Page 4-22: First paragraph, insert new text after the second sentence: The visitor center would provide a location for winter recreationists to assemble for guided winter activities provided by the trust, and would provide access to snowshoe and cross-country ski trails directly from the building.

Page 4-26: Last paragraph, revise the last sentence as follows: Nonmotorized access from the visitor contact station to the existing network of trails in the area would be generally open and unlimited.

Page 4-42: First paragraph, delete the last part of the fourth sentence: Vehicles would be concentrated at parking areas near high-use recreation sites, but would also be visible in small quantities in the preserve's more primitive areas ~~where access would be limited primarily by a vehicle's compatibility with road levels (e.g., 4 wheel drive vehicles on Level 2 roads).~~

Page 4-46: First paragraph, first sentence, insert new text in the parenthesis: (e.g., constructed wetlands)

Page 4-88: Insert the following paragraph after the first paragraph for Jemez Mountains Salamander:

Landscape restoration treatments proposed under the 2010 Southwest Jemez Mountains Collaborative Forest Landscape Restoration "will maintain or improve habitat for Jemez Mountain salamander in selected locations within approximately 18,000 acres of occupied or potential habitat, such as by increasing the amount of downed logs and reducing the risk of stand-replacing fires" (USFS 2010d). The result would be a beneficial impact on the salamander in the future.

Page 4-89: Revise the third and fourth sentences of the first paragraph as follows:

Golden eagles ~~would be adversely impacted by deconstruction and construction activities; however, S~~urveys for bald and golden eagle nests would be conducted prior to ~~deconstruction and construction activities~~ these actions. These activities would also be scheduled ~~to occur outside of breeding and nesting, as well as migration, seasons to the extent possible~~ to avoid impacts on special-status species, including migratory birds.

Page 4-92: Revise second paragraph as follows:

Surveys for ~~bald and~~ golden eagle nests would be conducted prior to deconstruction and construction activities. ~~If any nests are found, they would be relocated. The VCT would allow a 660-foot buffer between the nest or key use areas and the use of heavy equipment or land clearing. These activities would also be scheduled occur outside of breeding and nesting, as well as migration, seasons to the extent possible~~ to avoid impacts on special-status species, including migratory birds.

Page 4-93: Second full paragraph, second sentence, replace ~~habitat~~ with wildlife.

Page 4-94: Delete text from second paragraph, first sentence as follows:

More unlimited access via personal vehicle—~~for instance, the use of 4-wheel-drive vehicles to access remote locations~~—could result in increased collection of special-status species, such as the wood lily, or illegal hunting of special-status species.

Page 4-95: Revise third paragraph as described for page 4-92.

Page 4-113: Insert new text after the first paragraph under Methodology for Analyzing Impacts:

The area of impact for the Waters of the U.S. was determined through geographic information system (GIS) analysis of the wetland or stream locations within the construction limits of the project alternatives. Digitized spatial data of potential wetland areas (wetlands, wet meadows, and montane riparian shrublands) at a 3-meter resolution were used to determine a maximum potential area of impact to wetland habitat types. Streams impacts assumed full roadways at crossings. Actual impact values are anticipated to be lower with delineations, culvert planning, and incorporation of avoidance and minimization measures during development of final design.

Page 4-118: First full paragraph change first sentence as follows: ~~Between 0.5 and 1.0 acre of wet meadows~~ Up to 7.8 acres of wetlands would be directly affected by the construction of the access road and other facilities.

Page 4-118: First full paragraph, change last sentence as follows: Assuming that the wetlands, wet meadows, and montane riparian shrublands ~~would~~ qualify as wetlands regulated under Section 404 of the Clean Water Act, these impacts would be avoided and minimized to the greatest extent practicable. ~~Remaining impacts that could not be avoided or minimized would need to be compensated~~ Unavoidable impacts will be fully mitigated on-site with restoration of in-kind resources.

Page 4-118: Second full paragraph, insert new text before first sentence: Up to 1,379 feet at two stream crossings potentially could be affected by the construction of the access road and facilities.

Page 4-122: Second full paragraph, replace first two sentences as follows:

~~Long-term water resource impacts from this alternative would be similar to those under alternative 3A, with a similar-sized visitor center, parking, picnic area, and trails. However, the access road from NM-4 would be substantially shorter, and the construction of the facility would require cutting into a slope. Several wetlands are located near the treeline that could be affected by trail or utility construction. Also, several wet meadows could be affected by parking lot and access road construction. Long-term water resource impacts from this alternative would be less than those under alternative 3A, because the access road to NM-4 would be substantially~~

shorter. Up to 1.8 acres of wetlands would be directly affected by the construction of the access road and facilities. Up to 504 feet at one stream crossing potentially could be affected.

Page 4-122: Second full paragraph, insert new text to the end of the third sentence as follows: However, in accordance with federal policies and regulations, the VCT would avoid impacts on streams and wetlands to the greatest extent practicable and would fully mitigate unavoidable impacts.

Page 4-142: Alternative 2 Summary Table: Intensity column both implementation and programmatic level rows, insert Localized before Major.

Page 4-142: First paragraph under Alternative 2, insert new text to last sentence as follows: Nonmotorized access from the visitor contact station to the existing network of trails in the area would be generally open and unlimited, but no motorized off-road access would be permitted.

Page 4-143: Second full paragraph, last two sentences: Insert localized before major and delete and mitigate impacts to a less than significant level.

Page 4-144: Revise fourth paragraph, last two sentences as for page 4-143.

Page 4-145: Revise Alternative 3A Summary Table as for page 4-142.

Page 4-146: Revise first full paragraph, last two sentences as for page 4-143.

Page 4-146: Last paragraph, revise as for page 4-143.

Page 4-147: Revise Alternative 3B Summary Table as for page 4-142.

Page 4-147: First paragraph under alternative 3B, last sentence, revise as for page 4-143.

Page 4-147: Revise last paragraph, last two sentences as for page 4-143.

Page 4-148: Revise Alternative 4A Summary Table as for page 4-142.

Page 4-148 — 4-149: Revise first two sentences top of page 4-149 as for page 4-143.

Page 4-149: Revise third full paragraph as for page 4-143.

Page 4-150: Revise Alternative 4B Summary Table as for page 4-142.

Page 4-150: Revise first paragraph, last sentence as for page 4-143.

Page 4-150: Revise second paragraph, last two sentences as for page 4-143.

Page 4-155: Revise full first sentence as for page 4-26.

Page 4-185: Revise third full paragraph, last sentence, as for page 4-26.

Page 4-194: Revise fourth bullet as follows:

- Fish and Wildlife, Special-status Species: Increased visitor use may result in habitat fragmentation, may adversely affect habitat use and migration patterns by some wildlife species, and may increase the risk of animal/vehicle collisions, resulting in direct mortality to elk and other species. Conversely, some wildlife may be attracted to human presence and new sources of food. An increase in the number of anglers could impact special-status fish through direct mortality, and could disturb special-status species that

inhabit wetlands and aquatic areas. Increased visitation may also adversely affect elk calving through disturbance or disruption.

Page 4-194: Revise second sentence of last bullet as follows: ~~Between 0.5 and 1.0 acre of wet meadows~~ Up to 7.8 acres of wetlands would be directly affected by the construction of the access road and other facilities.

Page 4-195: Insert new first sentence for third bullet as follows: Up to 1,379 feet at two stream crossings potentially could be affected by the construction of the access road and facilities. . . .

Page 4-195: Revise last sentence of second bullet under Alternative 3: Entrada del Valle Visitor Center — Primary Access via Personal Vehicle as follows for page 4-94.

Page 4-196: Revise third bullet, last sentence as follows: ~~Several slope wetlands, which are relatively rare in the southern Rocky Mountains, could be affected by trail or utility construction.~~ Up to 1.8 acres of wetlands would be directly affected by the construction of the access road and facilities.

Page 4-196: Insert new bullet after third bullet under Alternative 4A: Vista del Valle Visitor Center — Primary Access via Shuttle System:

- Water: Up to 504 feet at one stream crossing potentially could be affected by the construction of the access road and facilities.

Page 4-197: Insert new text to last sentence of second full paragraph: These impacts would be mitigated to the extent possible as described in chapter 2.

Page 4-197: Revise third and fourth bullets as follows:

- Surveys for ~~bald and~~ golden eagle nests would be conducted prior to short-term deconstruction and construction activities. ~~If any nests are found, they would be relocated. These activities would also occur outside of breeding, nesting, and migration seasons to the extent possible. The VCT would allow a 660-foot buffer between the nest or key use areas and the use of heavy equipment or land clearing.~~ Therefore, short-term uses of the environment for deconstruction and construction activities would not affect the long-term sustainability of ~~bald and~~ golden eagles.
- The construction of the visitor contact station would result in permanent impacts on approximately 3.0 acres of grassland and forest habitat, which would displace a variety of wildlife. Mitigation measures described in chapter 2 would be implemented to minimize impacts to wildlife, including elk, and special-status species to the extent possible. ~~However, considerable habitat exists throughout the preserve to provide continued long-term sustainability of wildlife and special-status species.~~

Page 4-199: Insert new first sentence to second full paragraph (under Alternative 2: Banco Bonito Visitor Contact Station): Direct mortality would occur to individuals of some wildlife and special-status species.

Page 4-199 — 4-200: Insert the following new text to the first sentence to the last four paragraphs: The potential for some irreversible and irretrievable impacts on cultural resources and wildlife/special-status species would be expected,

Appendix B - Errata

Section Change – Chapter 2, New Mitigation

(Revisions are shown in red in the text that follows. Additions are underlined and deleted text is crossed out.)

existing temporary facilities, which would be removed, would not be replaced. Visitors would still be able to hike the trails located at Rabbit Mountain without a permit or fee. However, spontaneous access to the majority of the preserve would be limited. The VCT would continue to conduct fee-based tours and activities on a scheduled basis. Additional orientation and interpretive information would not be provided other than what is available on the website or at the Jemez Springs administrative facility. Existing highway signs would remain limited to interpretive exhibits along NM-4 pullouts. No improvements would be made to roads or parking facilities. Access for the grazing program would continue, but the VCT would not enter into any new agreements or grants. The current tribal access policy would continue.

Implementation Decisions

Temporary facilities established in support of interim programs would be removed.

Programmatic Decisions

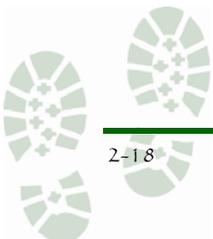
Current access through staging areas, as well as interim programs and activities, would be phased out.

Elements Common to All Action Alternatives

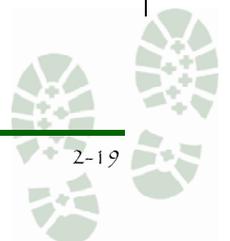
Performance Requirements

All the proposed action alternatives would include the following elements and performance requirements considered.

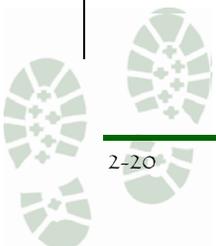
- The current interim recreation program would continue in the short term as infrastructure and facilities are developed and a transition is made to the selected alternative.
- The VCT's facilities at Jemez Springs would continue to provide ancillary support to visitors, particularly to visitors arriving from the south.
- Each action alternative would include space for maintenance activities within the footprint of the visitor contact station / visitor center. This area may be incorporated into the main structure and would have a separate entry. The area would not likely be larger than 300 square feet. Details would be determined during design.
- ~~No motorized, off-road access for hunting or for any type of visitor use is being proposed; current prohibitions against such use would continue. The VCT would provide game carts to hunters and would allow pack horses to travel in designated areas.~~
- Each action alternative would include an upgraded public road to the visitor contact station / visitor center and farther into the preserve to varying degrees. These roads would be upgraded to Level 4, which provides a moderate degree of comfort and convenience at moderate travel speeds (see the "Transportation" section of chapter 3 for a definition of USFS road levels). Currently, all roads in the preserve are Level 1 through 3; no Level 4 roads exist. All other roads would remain at their current level.



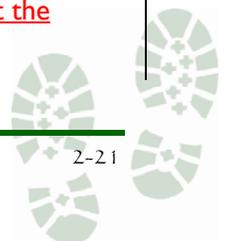
- Each action alternative would include an entry portal. Before reaching this gateway, visitors would be provided clear direction by well-placed signs along NM-4. The entry roads would include appropriate traffic controls (e.g., acceleration and deceleration lanes) so visitors can enter and exit with safety and convenience (USFS 2001).
- During winter, visitors would recreate using trails at the visitor contact station or visitor center ~~(figure 2-8 and figure 2-9)~~.
- Design of new facilities would comply with requirements of the Americans with Disabilities Act (ADA).
- The USFS has identified sustainable design concepts for lands in its jurisdiction. The design of the visitor center and/or visitor contact station structure, as well as the affected landscape as a whole, would incorporate principles of sustainable design, described in more detail below.
- The VCT will also implement the following mitigation measures:
 - Conduct construction and waste disposal activities in accordance with applicable local, state, and federal statutes and regulations.
 - Implement best management practices as defined under the NMED Air Quality Bureau San Juan Voluntary Innovative Strategies for Today's Air Standards program, a voluntary emission control program to help improve air quality.
 - Prepare a construction emissions mitigation plan, which will include use of cleaner fuels, such as low-sulfur diesel, in construction equipment.
 - Prevent wildlife from consuming artificial food sources, implement regulatory actions, provide information and education to visitors, control any problem animals, and conduct research and monitoring to help prevent wildlife from becoming conditioned to human foods.
 - Influence visitor behavior toward wildlife through education and interpretation programs.
 - Site new visitor recreational facilities to avoid or minimize wildlife critical life stage habitat, water and forage resources, wildlife travel corridors, and escape terrain.
 - Define minimum approach distances between visitors and wildlife based on wildlife flight distances; for both roadways and non-motorized trails.
 - Implement area closures, including roads and trails, when necessary to protect wildlife, particularly during critical life stages such as calving and rut. Consider limiting the number of recreationists on trails or using specific facilities if warranted to protect wildlife.



- Route recreation facilities and activities away from key elk foraging areas and reduce human intrusions into areas where ungulates are limited or areas of high quality habitat.
- Establish designated travel routes to make human use of elk wintering areas as predictable as possible.
- Monitor elk use of areas that receive high winter use by skiers and snowshoers.
- Enforce travel restrictions on ungulate winter ranges and use signs to inform users of the importance of ungulate winter range and to keep a specific distance away from elk and deer.
- Use signs to inform users of the importance of keeping a distance from elk calving areas.
- Retain important vegetative cover for elk and mule deer.
- Incorporate blinds or visibility shields to reduce human intrusions on elk activity while facilitating visitor viewing.
- Consider creating recreation zones to allow certain recreational activities in some areas but not in others.
- Conduct surveys for golden eagle nests in suitable habitat prior to short-term deconstruction and construction activities. Allow a 660-foot buffer between the nest or key use areas and the use of heavy equipment or land clearing.
- Evaluate and monitor wildlife impacts and apply adaptive management to address recreation and wildlife concerns as needed; (e.g., spatially and temporally separate humans and wildlife from key areas at critical times by closing roads or trails, changing access points, and/or implementing a zoning strategy in which recreational uses are allowed in carefully selected areas).
- Conduct surveys for Jemez Mountain salamanders or suitable habitat characteristics prior to activities proposed in potentially suitable salamander habitat. If any salamanders are found, the VCT will consult with the USFWS on the potential impacts and the following mitigation measures:
 - Avoid the activity at those locations during the time of the salamander's highest activity when conditions are saturated during summer monsoonal rains, approximately mid-July through August.
 - Avoid ground disturbance at those locations such as excavation, churning, compaction, or any activity that reduces interspaces and subsurface channels to the extent practicable.



- Avoid vegetation modification at those locations to the extent that ground surface microclimate is made drier or otherwise altered through increased exposure to sun and wind.
- Consult with the New Mexico Endemic Salamander Team to define appropriate and feasible site-specific mitigation methods for potential impacts.
- Adopt mitigation measures to minimize the potential for downslope erosion near NM-4 that could occur from underpass and highway lane modifications.
- Implement a stormwater pollution prevention plan to address potential impacts from stormwater flowing over construction sites, resulting in no change to the long-term sustainability of the preserve's water resources from construction-related activities. The plan would also address mitigation for soil disturbance and dust generation during construction and during the removal of the existing facilities.
- Avoid impacts to streams and wetlands where practicable and minimize impacts where unavoidable; incorporate avoidance and minimization measures into final design. Where practicable, active restoration of wetlands and streams will be incorporated as construction tasks. Unavoidable impacts will be fully mitigated on-site with restoration of in-kind resources.
- Conduct wetland determinations and delineations prior to final design. Develop culvert plans for drainage crossings during final design.
- Identify an area of potential effects for the proposed visitor contact station, parking lots, picnic areas, and road improvements would be identified and the Section 106 process completed to assess the effects of the construction and use of the new visitor facilities and removal of the staging areas on cultural resources.
- Notify appropriate Pueblos or Tribes if any new cultural resources sites are discovered or artifacts removed, and provide photographs of any such items.
- Work with local Tribes and Pueblos to identify methods of sustaining on-site visits for cultural and religious practices without interference from increased public visitation, as well as identify and protect areas where Tribes and Pueblos gather important medicinal plants, herbs, and other resources.
- Investigate the possibility of employing "Cultural Guides" from the local Tribes and Pueblos to provide educational services at the visitor contact station and vicinity.



- Continue to implement mitigation measures defined in previous plans, including its Framework and Strategic Guidance for Comprehensive Management (VCT 2005i):
 - Apply restrictions on visitor use to avoid conflict with episodic wildlife needs (e.g., elk calving, foraging of certain migrating raptors), weather conditions, or preserve programs (e.g., elk hunts, livestock management, fishing).
 - Consider “quiet times” — respites from all or most visitor disturbances.
 - Monitor impacts of visitor activities and subsequently modify activities through adaptive management if needed.

Sustainable Design

Sustainable construction can lessen impacts on the environment through green building and by integrating the building into natural systems and the region’s particular environment. Green buildings typically use 30 percent less energy than conventional buildings, primarily due to reduced electricity purchases and reduced peak energy demand. The financial benefits of reduced consumption equal or exceed the average additional cost associated with sustainable building (Kats 2003b). For the USFS, sustainability “considers energy conservation at every level, from the energy required to transport materials to the energy consumed by heating, cooling, lighting, and maintaining a structure” (USFS 2001).

USFS sustainable design guidelines note that “visitors to national forests expect to see natural-appearing landscapes. To fulfill those expectations, Forest Service facilities should harmonize with their landscape settings.” In this regard, sustainability responds primarily to three contexts (USFS 2001), which include the following:

- **ecological**—the natural forces that shape landscape, including climate, geology, soils, water, elevation, and vegetation
- **cultural**—the human forces that shape and define the landscape, including history, development patterns, agriculture, and social uses
- **economic**—the budget realities and cost-saving considerations that shape the built environment

The USFS has identified eight geographic areas based on the contexts of ecology and culture. Valles Caldera National Preserve is located in the Rocky Mountain Province, which is characterized by sparse rainfall, low humidity, abundant and intense sunlight, dramatic freeze/thaw cycles, visible geology (e.g., rock outcrops), long vistas with dramatic views, wide open landscapes, high winds, thin soils, less diverse vegetation, mountainous terrain, high elevation, and clear, brilliant skies. Cultural influences include Native American, European, and Mormon cultures; ranching; a strong heritage of rustic architecture; large amounts of public land; tourism; a fast-growing population with strong demands and expectations for outdoor recreation; and strong public expectation of a “wilderness experience” (USFS 2001). The preserve embodies these characteristics, and the sustainable design concepts

Appendix B - Errata

Section Change – Chapter 2, Preferred Alternative

(Revisions are shown in red in the text that follows. Additions are underlined and deleted text is crossed out.)

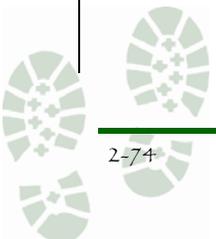
Agency Preferred Alternative

The Executive Director of Valles Caldera Trust has selected Alternative 3A; Entrada del Valle—Primary Access via Shuttle System as the recommended preferred alternative. The selection of the preferred alternative was made following careful consideration of the potential impacts of each of the alternatives, including environmental, economic, technical, and other factors presented in the Draft EIS. The Executive Director also reviewed and considered the comments submitted by the public, including agencies, organizations, and individuals, and the unanimous recommendation of the Board of Trustees put forward at a public meeting of the board on September 20, 2012. The Executive Director finds that alternative 3A would allow the trust to “expand the current level of public access and use on the preserve while protecting and preserving its natural and cultural resources and values and to provide quality outdoor recreation and interpretive opportunities that promote long-term financial self-sustainability consistent with other purposes,” which is the stated purpose of this plan. The selection of this alternative would best fulfill the statutory mission and responsibilities of the trust (the need for action).

The VCT acknowledges that alternative 3A would impact the preserve’s biological and physical environment, including its historic, cultural, and natural resources as disclosed in this document. Section 108(d) of the Valles Caldera Preservation Act directs the VCT to implement a program that “does not unreasonably diminish the long-term scenic and natural values of the area, or the multiple use and sustained yield capability of the land” (16 USC 698v). Therefore, the VCT must find a balance between providing for multiple use while protecting the preserve’s long-term values.

The Valles Caldera Board of Trustees noted that the Entrada del Valle site would welcome visitors into the preserve and that the location, being offset from the Valle Grande, would not overtly alter the view and experience for visitors or people traveling through the area. All members of the Board of Trustees supported primary access via a shuttle system, and agreed that the shuttle system would help maintain the values that people felt for the preserve, protect the environmental and cultural resources on the preserve, and ultimately provide the best experience. Additionally, alternative 3A was the most favored alternative noted by members of the public expressing support for one alternative or another, with the shuttle system being expressed as a preference by many who did not have a preferred site for the visitor center/contact station. The public and agency involvement process that supported the decision is summarized in chapter 5 of this document.

As described in the introduction of this chapter, the alternatives include both implementation-level actions and programmatic-level decisions. The decision on the implementation-level actions would allow the design and construction of a visitor center and related facilities within the Entrada del Valle site. These implementation-level decisions are site-specific actions to be implemented following the publication of the ROD for this EIS. Additional engineering and design work will be completed during this process to determine the most efficient layout of the site. The conceptual designs presented in this EIS provide a guide to the scale and range of facilities expected to be developed at the visitor center, but the exact placement of



structures, parking lots, picnic areas, and other infrastructure will be determined during final design, allowing the VCT to maintain flexibility by responding to site-specific details as design issues and criteria arise. These decisions may be implemented without further review under NEPA:

Programmatic-level decisions guide or prescribe future actions. For the preferred alternative, these actions include selection of a shuttle system as the primary means of transportation within the preserve, development of single-lane roads and bicycle paths, parking areas at fishing accesses and trailheads, recreation facilities, additional staging or visitor contact areas, development of equestrian facilities and access, and development of primitive educational or ecotourism facilities. This EIS considers only a general area of impact that could occur in any area of the preserve. These programmatic elements of the alternative will be further defined and will require additional planning and decision-making in compliance with NEPA prior to implementation.

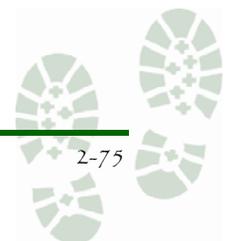
Environmentally Preferred Alternative

Section 1505.2(b) of NEPA requires that, in cases where an EIS has been prepared, the ROD must identify all alternatives that were considered, “specifying the alternative or alternatives which were considered to be environmentally preferable.” In addition, CEQ guidelines state that “the lead agency official responsible for the EIS is encouraged to identify the environmentally preferable alternative(s) in the EIS.” According to CEQ, “the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101.” Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ 1981). CEQ notes that “the concept of the ‘agency’s preferred alternative’ is different from the ‘environmentally preferred alternative’” and the council-CEQ “recognizes that the identification of the environmentally preferable alternative may involve difficult judgments....” (CEQ 1981).

The VCT has identified alternative I, the no-action alternative, as the environmentally preferred alternative based on the guidance from CEQ. The minimal level of access and careful management of such access called for under alternative I would cause the least damage to the biological and physical environment and would best protect, preserve, and enhance the preserve’s historic, cultural, and natural resources.

Alternatives Considered but Eliminated from Detailed Analysis

The following alternatives were eliminated from detailed analysis because they did not meet the purpose of and need for action or were not technically or economically feasible.



Appendix B - Errata

Section Change – Chapter 3, Fish and Wildlife

(Revisions are shown in red in the text that follows. Additions are underlined and deleted text is crossed out.)

information about the forage, and, to a lesser degree, steep slopes and a lack of nearby water sources. The highest potential herbaceous productivity is located in the broad grassy valleys. Climate, especially moisture, is the limiting factor of forage production in the majority of sites, and vegetation growth rates vary widely depending on the timing and form of annual precipitation. As a result, average biomass production can change significantly in a relatively short time. For example, overall forage production doubled between a dry year in 2002 and a wet year in 2007 (VCT 2009b).

Fish and Wildlife

The alternatives include activities that could affect fish and wildlife directly, through injury or mortality during construction, or indirectly, through modification of habitat. An increase in visitation to and recreational use of the preserve could also impact fish and wildlife.

This section describes the types of fish and wildlife that could be affected by the proposed alternatives so that potential impacts on them can be adequately analyzed. The “Special-status Species” section contains descriptions of plant and animal species that have special state or federal designations based on rarity or other need for special protection. This “Fish and Wildlife” section focuses on fish and wildlife species that do not have such protections or designations, but are vital components of the preserve’s ecosystem.

The preserve supports a great diversity of animals that live in various habitats (see the “Vegetation” section for more information). Inventories conducted from 2001 to 2006 identified 69 species of mammals, 102 birds, 6 reptiles, 3 amphibians, and 6 fish. While inventories of insects are ongoing, 134 species of aquatic insects were collected in streams and wetlands in 2003 to 2004 (Vieira and Kondratieff 2004, as cited in VCT 2009b), and 54 species of butterflies were identified in surveys in 2001 (Kleintjes 2001, as cited in VCT 2005i). Beyond elk, preserve wildlife was poorly documented until baseline studies began in 2001. These studies have included identifying the type and distribution of plants, mammals, birds, reptiles, amphibians, fish, fungi/lichens, aquatic insects, and many groups of beneficial and harmful insects (VCT 2009b). Ongoing studies in 2010 included a cooperative biodiversity study between the preserve, the USDA Systematic Entomology Laboratory, and the Smithsonian Institution for the inventory of beneficial and pest insect species on the preserve, volunteer breeding bird surveys, a survey of Gunnison’s prairie dogs, bald eagle monitoring, and a survey for short-horned lizards (VCT 2010d).

The alternatives proposed in this plan include activities, such as construction, that could affect fish and wildlife either directly through injury or mortality during construction, or indirectly through modification of habitat. An increase in visitation to and recreation use of the preserve could also impact fish and wildlife through disturbance. Outdoor recreation has the potential to disturb wildlife, resulting in energetic costs, impacts to animal behavior and fitness, and avoidance of otherwise suitable habitat (Taylor and Knight 2003). Wildlife responses to disturbance are shaped by six factors (Canfield et al. 1999):

1. Type of activity
2. Predictability of activity
3. Frequency and magnitude of the activity

4. Timing (e.g., breeding season)
5. Relative location (e.g., above or below on a slope)
6. Type of animal, including size, group size, sex, and age

Although wildlife responses to humans may vary, they can be broadly classified as attraction, habituation, and avoidance.

- Attraction is the strengthening of an animal's behavior because of positive reinforcement. Attraction is often related to food conditioning, but is equally applicable to behaviors that attract wildlife to shelter or security (Whittaker and Knight 1998).
- Habituation is a waning of response to a repeated neutral stimuli. Wildlife are capable of becoming habituated to people, human-made environments, and almost any human stimuli (Whittaker and Knight 1998). In some cases, wildlife may habituate to predictable disturbance from recreation, but in other cases they may not (Taylor and Knight 2003).
- Avoidance is the opposite of attraction; it is an aversion to negative consequences associated with a stimulus (Whittaker and Knight 1998). The presence of humans in wildlife habitat may result in animals avoiding parts of their normal range, which may be sufficient to reduce the carrying capacity of some public lands for wildlife (Taylor and Knight 2003).

Attraction, habituation, or avoidance responses are not intrinsically good or bad. Value judgements are commonly attached to these terms, and can be an obstacle to effective management (Whittaker and Knight 1998). The vulnerability of wild animals is complex. Much of the complexity results from the ability of animals to learn from experience and thereby adapt to recreational disturbance. Several studies suggest that animals subjected to predictable, non-threatening disturbances can become habituated to and tolerant of those disturbances (Cole 1993). For example, elk in Rocky Mountain National Park are "highly habituated" and have become less fearful of humans, allowing people to approach very closely (NPS 2007). Conversely, animals are likely to respond to frequent and predictable negative encounters by avoiding them. Since this behavior is largely learned, two individuals of the same species may differ greatly in their vulnerability to the same disturbance (Cole 1993).

An animal's behavior is not simply habituated or nonhabituated, but a matter of degree. Wildlife responses occur in differing magnitudes in different contexts. Wildlife also behave differently in different locations and during different activities, and the learned outcomes of these interactions affect subsequent interactions (Whittaker and Knight 1998).

The presence of humans has potential to create, enhance, ameliorate, or even reverse direct interactions between species (Muhly et al. 2011). Negative effects of disturbance on one species may have positive consequences for its competitors or prey, and disturbance may thereby alter the interactions among species in a community. Human activity can substantially alter the predation risk in important nesting habitat (Leighton, Horrocks, and Kramer 2010). A study conducted in 2011



demonstrated that areas experiencing high levels of human disturbance can displace large carnivore predators, even in non-hunted, protected animal populations, thus indirectly creating a refuge for prey species. Some prey species even appear to select space close to humans where predator densities are high as a means to avoid encounters with human-avoiding predators, such as large terrestrial carnivores, which are generally sensitive to human disturbance. Thus, predator displacement by humans can provide refuge for prey species. In addition, high-quality forage resources have been correlated with roads and trails experiencing high human use, and humans might therefore provide the best habitat patches for herbivores by both deterring predators and improving food resources (Muhly et al. 2011). A study conducted in 2007 demonstrated how moose selected birth sites near paved roads, possibly to avoid traffic-averse brown bears. The study states that “observations among diverse mammalian taxa suggest analogous use of human infrastructure to buffer against danger,” and states that the findings “offer rigorous support that mammals use humans to shield against carnivores” (Berger 2007).

Numerous studies have been conducted regarding the effects of roads on wildlife. Species that are vulnerable to traffic disturbances (e.g., noise, lights, pollution, traffic motion) and species that are vulnerable to road mortality are negatively affected by road traffic. Studies of large mammals have documented behavioral avoidance of roads for some species. However, when animals are attracted to roads for a resource (e.g., food), and have the ability and speed to avoid being killed by vehicles, roads can result in a positive effect on abundance of some species, such as those that take advantage of road-killed animals. This can result in high densities of particular species near roads. If a species is prey for other species that are negatively affected by roads, the abundance of prey species may be positively related to roads due to the protection from predation in roaded areas (Fahrig and Rytwinski 2009).

Roads are also believed to create barriers to wildlife movement across habitats, resulting in reduction in landscape connectivity and decreased animal abundance near roads. A 2009 study by Fahrig and Rytwinski states that it is fairly common to interpret such conclusions as a behavioral avoidance of roads, although reduced abundance could be based on direct mortality or avoidance. In a review of 79 studies related to animal abundance and road traffic, the authors state that many of the studies were compromised because of weakness in study design; information on behavior responses to roads needs to be clearly distinguished from information on road mortality. In addition, when a road presents a physical barrier to movement, such as fencing along the road, the effect is equivalent to an animal showing an extremely strong behavioral avoidance of the road itself. However, Fahrig and Rytwinski conclude that, although more research is needed, the evidence is strong enough to merit mitigation of effects in road construction and maintenance projects (Fahrig and Rytwinski 2009).

Scientific studies have shown that wildlife can be adversely affected by sounds that intrude on their habitats. Although the severity of the impacts varies depending on the species and other conditions, research has found that wildlife can suffer adverse physiological and behavioral changes from intrusive sounds. Some sound

characteristics have been associated with suppression of the immune system and increased levels of stress-related hormones in animals (NPS 2011).

Although numerous wildlife studies have demonstrated effects of recreationists on wildlife, a survey conducted in Utah showed that the general public believes recreation is benign and does not affect wildlife. Approximately 50 percent of visitors surveyed did not believe that recreation was having a negative impact on wildlife. In addition, visitor perceptions of wildlife flight distance differed remarkably from research data. Horseback riders tended to believe that they had the least impact on wildlife of any user group. The authors note that, "If visitors believe they can approach wildlife more closely than animals will actually allow, then recreationists will disturb wildlife in a majority of encounters" (Taylor and Knight 2003).

Study Area

The study area for evaluating impacts on fish and wildlife for implementation-level decisions is the specific proposed visitor contact station / visitor center location and vicinity for each action alternative; for programmatic-level decisions, the study area encompasses the entire preserve.

Fish

Overview

The preserve's streams contain a variety of native fish, as well as introduced rainbow and brown trout. These waters previously contained Rio Grande cutthroat trout (*Oncorhynchus clarkii virginalis*) (Anschuetz and Merlan 2007), a candidate species for federal listing under the Endangered Species Act described in more detail in the "Special-status Species" section. Approximately 27 miles of streams in the preserve offer habitat suitable for trout, out of a total of approximately 75 miles of perennial streams. Stream and fish surveys of the preserve's two major streams/rivers (East Fork of the Jemez River and San Antonio Creek) have been conducted (Simino 2002, Goodman 2003; as cited in VCT 2009b), as well as twice-yearly fish sampling at permanent monitoring stations in the lower, middle, and upper reaches of each of these two streams (2003–2009).

Four native fish species are found on the preserve (VCT 2010c):

- Rio Grande sucker (*Catostomus plebeius*)
- Rio Grande chub (*Gila pandora*)
- Fathead minnow (*Pimephales promelas* Rafinesque)
- Longnose dace (*Rhinichthys cataractae*)

Three nonnative species are found on the preserve:

- Rainbow trout (*Oncorhynchus mykiss*)
- Brown trout (*Salmo trutta*)
- White sucker (*Catostomus commersonii*)



The Rio Grande sucker and Rio Grande chub are USFS sensitive species and are described in the “Special-status Species” section.

East Fork of the Jemez River

The East Fork of the Jemez River provides 21.4 miles of fish habitat, with fish inhabiting the river from its headwaters to its mouth. There are four perennial tributaries, of which two have names—La Jara Creek and Jaramillo Creek (Simino 2002, as cited in VCT 2009b). Fisheries data are available only for Jaramillo Creek, where only trout have been found (Aquatic Consultants, Inc. 2003, as cited in VCT 2009b).

Riparian conditions along the East Fork of the Jemez River and its tributary, Jaramillo Creek, are improving in the perennial reaches from below the headwater springs to the preserve’s southern boundary, which improves instream habitat conditions for fish. In the intermittent reaches above the springs, riparian conditions have not improved and are classified as “functioning-at-risk” (TEAMS 2007, as cited in VCT 2009b).

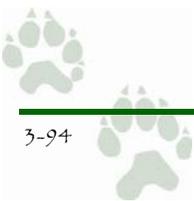
San Antonio Creek

San Antonio Creek provides 30.5 miles of fish habitat, with fish inhabiting the creek from its headwaters to its mouth (Goodman 2003, as cited in VCT 2009b). This creek has four perennial tributaries: Sulphur Creek, San Luis Creek, Rito de los Indios, and an unnamed tributary. No fisheries data is available for the tributaries, but fish are unlikely to exist in Sulphur Creek, which is a naturally acidic creek with sulfur springs and geothermal activity (Vieira and Kondratieff 2004, as cited in VCT 2009b). Fish presence is assumed in the other three tributaries.

The main stem of San Antonio Creek was likely altered considerably prior to the 1960s. Although the condition of this creek appears to be improving based on monitoring, it is not properly functioning for trout habitat along most of its length, according to USFS habitat standards. According to the 2002 stream survey, physical parameters that were not properly functioning included relative sediment content in riffles, the density of large woody debris, pool development, temperature, and width-to-depth ratio (Goodman 2003, as cited in VCT 2009b).

Reptiles and Amphibians

Amphibian surveys conducted in 2002 found abundant chorus frogs (*Pseudacris maculata*) and tiger salamanders (*Ambystoma tigrinum*) (Cummer, Christman, and Wright 2003). Northern leopard frogs (*Rana pipiens*), abundant as recently as the 1970s along Redondo Creek, appear to have been extirpated from the preserve, as is the case across much of the region, perhaps due to the spread of disease (VCT 2005i). Jemez Mountain salamanders (*Plethodon neomexicanus*) exist on the preserve and are discussed under “Special-status Species.” In addition, two lizard and three snake species have thus far been found on the preserve (VCT 2005i).



Birds

Overview

Bird surveys conducted in 2001 and 2002 found at least 107 species on the preserve, of which 92 showed evidence of breeding locally. Uncommon species recorded include Wilson's snipe (*Gallinago delicata*), savannah sparrow (*Passerculus sandwichensis*), eastern meadowlark (*Sturnella magna*), and ruby-crowned and golden-crowned kinglets (*Regulus calendula* and *R. satrapa*). Representative raptor species found include northern goshawk (*Accipiter gentilis*), golden eagle (*Aquila chrysaetos*), bald eagle (*Haliaeetus leucocephalus*), and peregrine falcon (*Falco peregrinus*). The abundance of fish and the presence of elk carcasses attract significant numbers of bald eagles in the fall, which feed and roost on the preserve for weeks (Fettig, Rustay, and Henderson 2003; VCT 2005i).

Below elevations of 8,500 feet, representative bird species include blue grouse (*Dendragapus obscurus*); Merriam's turkey (*Meleagris gallopavo merriami*); several raptors (hawks and owls); American robin (*Turdus migratorius*); house wren (*Troglodytes aedon*); woodpeckers; nighthawk (*Chordeiles minor*); white-throated swift (*Aeronautes saxatalis*); western meadowlark (*Sturnella neglecta*); chickadee (*Poecile* sp.); golden and bald eagle; and several species of hummingbirds, sparrows, and warblers (Fettig, Rustay, and Henderson 2003; VCT 2005i).

Between 8,500 and 12,000 feet above sea level, representative birds include northern goshawk, Steller's jay (*Cyanocitta stelleri*), dark-eyed junco (*Junco hyemalis*), several kinglet species (*Regulus* spp.), and mountain bluebird (*Sialia currucoides*), as well as multiple species of grouse, woodpeckers, hummingbirds, sparrows, and warblers (VCT 2009b).

Migratory birds are protected under the Migratory Bird Treaty Act, discussed in the "Special-status Species" section.

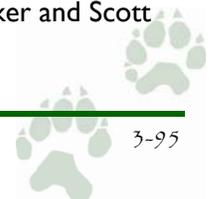
Species of Interest

The following section describes species that have a higher level of interest from a management perspective, but do not have a separate state or federal status. Generally, this includes species managed as game animals.

Merriam's Turkey

This upland game bird primarily uses ponderosa pine and pine/oak, as well as the transition habitats between ponderosa and pinyon/juniper woodland habitats and ponderosa and mixed conifer. There are three essential habitat components for Merriam's turkey: surface water, roosting trees, and openings for summer brood areas (Kamees 2002).

Merriam's turkeys prefer to roost in tall, mature or over-mature ponderosa pines with relatively open crowns and large horizontal branches starting at 20 to 30 feet (6 to 9 meters) from the ground. Trees with a diameter at breast height of over 14 inches are used as roosts. Preferred roost sites are often located just below a ridgeline. Hens (females) normally nest within 0.5 mile of water (Boeker and Scott



1969). Although no surveys have been completed on the preserve, turkeys are numerous and frequently seen by VCT personnel (Moser 2009).

Blue Grouse

The blue grouse is native to New Mexico and is found most commonly in the mountainous area of the north-central portions of the state. The Sangre de Cristo, San Juan, and Jemez Mountains are principal areas of this species (Biota Information System of New Mexico [BISON-M] 2009).

Structural diversity is a major determinant of habitat suitability for blue grouse. Structure of habitat is more important than species composition. Important forest cover types include spruce/fir, Douglas-fir, and ponderosa pine. Mixed-species forests are probably the most important habitat type in high-elevation sites (BISON-M 2009).

Blue grouse forage in conifer trees, on the forest floor, along ridgetops, and in openings. Major food items in the spring are needles, buds, and new cones of conifers. In the summer and fall, they feed mainly on grasses, forbs, and fruits of low-growing plants. During the winter, they eat mostly conifer needles (BISON-M 2009).

Blue grouse selectively feed and roost in the oldest and largest Douglas-fir trees available. Douglas-fir trees repeatedly used in winter and between winters are typically those growing under stressful conditions such as on dry, steep, talus slopes, and have endured stresses such as lightning strikes or boulder impacts (Remington and Hoffman 1996). VCT personnel have observed blue grouse on the preserve, but no formal surveys have been completed (Moser 2009).

Mammals

Overview

Below elevations of 8,500 feet, representative mammals that are found on the preserve include elk (*Cervus elaphus nelsoni*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), Gunnison's prairie dog (*Cynomys gunnisoni*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), cottontail (*Sylvilagus* sp.), woodrat (*Neotoma* sp.), weasel (*Mustela* sp.), beaver (*Castor canadensis*), badger (*Taxidea taxus*), black bear (*Ursus americanus*), mountain lion (*Puma concolor*), and several species of small mammals including squirrels, chipmunks, voles, and mice. Between elevations of 8,500 and 12,000 feet, mammals include elk, mule deer, black bear, gray fox (*Urocyon cinereoargenteus*), and several species of weasels, squirrels, chipmunks, mice, and shrews (VCT 2007).

Coyotes are common on the preserve. Black bears, mountain lions, and bobcats are rarely observed, but their populations are presumed to be viable and proportionate to available habitat, given the abundance of prey and the absence of recent hunting pressure (VCT 2005i).

Many other smaller mammals are also present, including the isolated Jemez Mountains population of Goat Peak pika (*Ochotona princeps nigrescens*), a federal

sensitive species described further in the “Special-status Species” section. The preserve also supports substantial numbers of Gunnison’s prairie dog, another federal sensitive species, which is relatively common throughout the grasslands of the caldera and is described further under “Special-status Species” (VCT 2005i).

The last beavers in the caldera were observed along Indian Creek in the 1990s. Eventually, if woody vegetation can be restored to key riparian habitats and if substantial stands of aspen can be reestablished, the reintroduction of beaver may become practical (VCT 2005i).

Species of Interest

Rocky Mountain Elk

Elk hunting and viewing are among the greatest attractions at the preserve. Elk populations are shaped by many factors, including habitat, a herd’s learned behavior, weather, disease, events on adjacent lands, and the number, kind, and behavior of predators. Elk management encompasses an array of matters that are subject to high levels of uncertainty (VCT 2005i). Elk management will likely always be a major issue on the preserve for the VCT and the NMDGF (VCT 2005i). Therefore, this species is of interest to the VCT.

Elk use a variety of habitats, including most forest types, during the course of their lives. Weather, time of day, and quantity and quality of forage influence their habitat use. Elk forage on a variety of plants, which vary based on habitat used and season. They consume largely green grass in the spring, adding more forbs and woody vegetation in summer, dried grass and woody vegetation in fall, and shrubs and conifers in winter. Elk generally rut (mate) beginning in September and calve (give birth) from mid-May to mid-June (NMDGF 2009b). Elk have been found to expand their home range from spring through midsummer and thereafter reduce areas of use through early fall (Canfield et al. 1999). Elk tend to inhabit lower elevations in winter than the rest of the year. Movements to lower elevations from high-elevation summer ranges are likely driven by snow depth and lack of abundance or quality of forage. However, elk may stay in the same area year-round when conditions are suitable (NMDGF 2009b).

Elk were extirpated from the Jemez Mountains by 1900, but following the transplants of 49 elk in 1947 and an additional 58 in 1964, they are now abundant and conspicuous, especially in the preserve (VCT 2005i). The preserve’s elk population is far greater than has previously been the case in the long-term natural history of the caldera (VCT 2005i).

NMDGF intentionally reduced the elk herd size in the Jemez Mountains during the late 1990s and early 2000s (at the same time the preserve was created), issuing nearly double the number of hunt tags for the Jemez Mountains (Units 6A, 6B, and 6C). This reduced the herd size in the Jemez Mountains from 7,000–9,000 to the current number of 4,000–6,000. In recent years, overall elk numbers have been consistent, and NMDGF estimates that the number of elk on the preserve is 2,000–2,500 animals, or about half of the herd size of the Jemez Mountains (Parmenter, pers. comm. 2012).



The population trend for the Rocky Mountain elk is stable to increasing in New Mexico. Since 1995, the NMDGF has conducted aerial elk counts over the Jemez Mountains. The most recent population estimate in the Jemez Mountains is 5,500 to 8,400 (Liley, pers. comm. 2008, as cited in VCT 2009b).

The preserve is a core breeding ground for elk in the Jemez Mountains, with an estimated 3,500 elk living on the preserve in the summer (Liley, pers. comm. 2008, as cited in VCT 2009b). Although deep winter snows drive many elk to lower elevations on nearby lands, in dry winters, large numbers remain on the preserve year-round (VCT 2005i). The entire preserve is classified as critical summer range, winter range, and calving area habitat. The Valle Jaramillo (directly west of Cerro del Medio) is a key elk calving and nursery area, and receives heavy and sustained impacts from elk (VCT 2005i). Field data collected on the preserve have found that elk calving is concentrated along the edges of the valles. Calving areas are also concentrated along VC01 (the current entrance road to the Valle Grande Staging Area), as well as along VC02 between VC01 and VC03. Some calving areas also exist farther north on VC02 near its intersection with VC09 (see figure 3-26 for a map of the preserve's roads). Historically, elk used the west side of the preserve and wintered to the south and west; however, elk now concentrate on the east and north sections of the preserve, which are in or associated with the large grassland valles, and winter to the north and east (TEAMS 2007, as cited in VCT 2009b). The primary elk grazing areas in the preserve are the central parts of the Valle Grande near the East Fork Jemez River and Jaramillo Creek, and along the VC01 and VC02 roads around the valle (Parmenter, pers. comm. 2012).

Response to Recreational Activities

Environmental factors and experience with humans and their recreational activities can have substantial impacts on the behavior of ungulates (hoofed animals such as elk and deer) (Stankowich 2008). Recreationists can impact ungulates through direct disturbance or by disrupting access to essential forage resources (Canfield et al. 1999). Factors that influence flight decisions can vary both spatially and temporally (Stankowich 2008). Ungulate populations may differ in the way they respond to human disturbance based on experience with humans, availability of alternative habitats, population size, presence of other predators, and physical terrain. Ungulates pay attention to approacher behavior, have greater perceptions of risk when disturbed in open habitats, and females or groups with young offspring show greater flight responses than adult groups. The availability of alternative sites also determines an animal's decision to flee human disturbance. When there is little cover or distance to refuge is great, risk is greater and ungulates flee at greater distances (Stankowich 2008). One study demonstrated that elk increased their travel more in the mornings than afternoons, likely by moving away from disturbance and avoiding it for the remainder of the day. Elk returned to prior behavior patterns once the disturbance ended each day (Naylor, Wisdom, and Anthony 2009). Similarly, according to Rumble, Benkobi, and Gamo (2005), effects of human activity on elk have shown to be short term, with elk returning to areas when the human activity ceased. A study on the effects of cross-country skiers on

elk found that, although animals moved away from trails with the onset of skiing, they did not move any additional distance as the number of skiers increased (Ferguson and Keith 1982, as cited in Cole 1993).

The appearance of a human on foot has been found to be more frequently associated with targeted harassment (e.g., hunting) than humans in vehicles; therefore, ungulates interpret humans on foot as more threatening (Stankowich 2008; Shultz and Bailey 1978). Brown et al. (2012) note that pedestrians are more likely to elicit responsive behaviors “consistent with prior studies implicating the human form as an important source of disturbance for ungulates.” Trails have been shown to have a stronger spatial effect on elk resource selection than roads (Rogala et al. 2011). Some studies have shown that humans on foot are the most disturbing and more evocative to ungulates than humans on horseback, on bicycles, or in cars. One study showed that people on foot moving close to elk usually caused elk to leave open areas, although elk movements were not substantially affected by people watching them from parking areas and roads. The study found that bicycles were not an important predictor of responsive behavior (Stankowich 2008). Another study “found no biological justification for managing mountain biking any differently than hiking” (Taylor and Knight 2003).

Conversely, a study conducted at Oregon’s Starkey Experimental Forest and Range found that elk are more likely to flee during mountain biking activity compared to hiking. Hikers had little effect on flight when beyond 550 yards from an elk, compared to 820 yards from horseback riders and 1,640 yards from mountain bikers. Mountain biking and hiking did not disturb elk once the elk moved away from the routes being used by recreationists, and elk were able to make up any energy lost by resuming foraging activity. The study also demonstrated that elk did not exhibit flight response when close to an off-road recreational activity 35 percent of the time. Although habituation was not observed during the study, conclusions noted that the results might change if elk eventually become habituated to some or all of the off-road activities studied (ATV use, horseback riding, mountain biking, and hiking) (Wisdom et al. 2004). Elk were not as affected by horseback riding as ATV use, mountain biking, and hiking, although elk may have habituated to horseback riding or simply avoided areas near horseback routes (Naylor, Wisdom, and Anthony, 2009).

Ungulates are more responsive to human activities when the animals are in smaller herds, dispersed rather than clustered, and closer to roads, suggesting they are not completely tolerant of human activity (Brown et al. 2012). Elk selection of locations near trails depends on hourly human activity levels and the distance to the trail. Elk have been shown to prefer areas at distances 440–875 yards from trails, avoiding areas 55 yards or less from trails in response to low levels of human activity. Elk responses in areas between 55 and 440 yards from trails were dependent on the level of human activity. Once human activity levels were greater than two people per hour, elk responded with avoidance of areas 55–440 yards from trails (Rogala et al. 2011). Seventy-five percent of flight behavior by elk occurred within 710 yards of cross-country skiers. The distance moved by elk in Yellowstone National Park after being disturbed by cross-country skiers ranged widely and was related to distance



to nearest ridges, where they may be more tolerant of human presence (Cassirer, Freddy, and Ables, as cited in Rogala et al. 2011).

Human-induced disturbance during calving season may exacerbate elk vulnerability, demonstrated in a study in Colorado that simulated “recreational hiking.” The study was able to show that repeated displacement during the calving season resulted in declines in survival of elk calves (Phillips 1998, as cited in Canfield et al. 1999; Phillips and Alldredge 2000). “Where summer recreational activities approach high levels, impacts on reproductive performance of ungulate populations may be expected” (Canfield et al. 1999). However, the study “did not specifically address the effects of trail-based recreational disturbance on elk” (Phillips and Alldredge 2000).

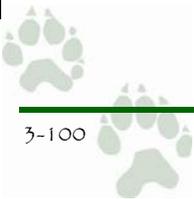
Response to Hunting

As mentioned under the “Visitor Experience” section, the preserve currently allows elk hunting, which is an important tool for managing the size of the preserve’s elk herd (VCT 2005i) and would continue under the proposed action alternatives. Studies have shown that the presence of hunting increases effects on flight behavior, and hunted ungulate populations show substantially greater flight responses than non-hunted populations (Stankowich 2008). During periods of human disturbance, such as hunting seasons, elk have been shown to seek areas that provide greater cover, whereas elk selected open grassland habitat before fall hunting seasons. Elk avoid open grasslands during the day during hunting seasons, and spend more time in areas of refuge when they are accessible to hunters (Rumble, Benkobi, and Gamo 2005; Cleveland 2010). Elk movements have been shown to increase on the opening day of firearm elk season, and the first and second weekends of the season (Rumble, Benkobi, and Gamo 2005). Cleveland (2010) found that “focused hunting has a significant impact on elk movement patterns over a more general hunting season structure that is designed to control regional elk populations.”

Thompson and Henderson (1998) note that hunted elk populations typically continue to avoid humans during non-hunting seasons. However, other studies have shown that ungulates may not show behavioral differences in response to hunting if they also experience humans in a non-threatening context. Therefore, ungulates that routinely encounter and habituate to humans in non-threatening contexts may only suffer minimal impacts on their behavior towards humans if exposed to seasonal hunting (Stankowich 2008).

Response to Roads

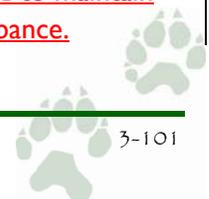
The nature of the preserve’s topography dictates the placement of roads within the low valleys or narrow corridors that separate the steep-sided volcanic domes. These corridors are often natural avenues for the movement of wildlife, especially elk (VCT 2005i). The primary effect of roads on elk may be habitat fragmentation; heavily roaded areas may contain few patches of forest cover large enough to function effectively for elk, especially where elk are hunted. Roads may also facilitate the spread of exotic vegetation, which may reduce quality and abundance of forage available to elk (Rowland et al. 2005).



Indirect habitat loss caused by avoidance of trails and roads has been documented for elk with variable responses. Where some authors reported avoidance, others reported selection for areas near human activity. The analyses assume a constant response across time and space, and may obscure the true relationship between humans and wildlife because human activity levels vary spatially and temporarily (Rogala et al. 2011). -Roads can induce a range of behavioral responses in ungulates, which in some cases seem attracted to or unaffected by road activity (Brown et al. 2012). Rowland et al. (2005) note “we know that elk response to roads generally varies depending on the level and type of motorized traffic, but we have little knowledge about the precise levels of such disturbance that elicit a response and the duration of that response.”

A number of studies have demonstrated that vehicle traffic on forest roads can establish a pattern of habitat use in which the areas nearest the road are not fully available for use by elk. “The extent of reduced habitat use can be very substantial” (Canfield et al. 1999). However, elk have been shown to adapt to human disturbance along roads that experience “normal” and “heavy” use. A study of un hunted elk at Rocky Mountain National Park produced no statistical evidence that either abundant tourist activity in autumn or planned disturbance in winter and early spring affected distribution of elk, bugling activity, behavior of rutting bulls, timing of movements, or willingness to use areas near roads. “This acceptance of human activity seems to be a learned response of un hunted elk” (Schultz and Bailey 1978). Canfield et al. (1999) note, “Relatively high levels of human disturbance are often confined within a narrow corridor through wildlife habitat, such as a road. These may have little or no measurable impact on ungulates during summer if essential foraging sites are not directly impacted or limited in availability across the summer home range” (Canfield et al. 1999). A study on the effects of noise on ungulates found that, “contrary to our predictions, ungulates were not more likely to respond, but rather less likely to respond to increased vehicle traffic” (Brown et al. 2012). Research conducted by Rogala et al. (2011) “found insufficient evidence of elk response to road activity”; however, the authors note that “in contrast to this, other research has found negative effects of road activity on elk and other ungulates.”

A 2012 report showed that high traffic levels may result in reduced flight responsiveness of ungulates to roads. Ungulates spent less response time with increased vehicle traffic, allowing more time for activities like feeding. The authors of the study suggest that the animals had become habituated to the frequent stimuli caused by road traffic, stating that ungulates are known to habituate to regular exposure to noise and other non-lethal human activities, and display individual variation within populations in their avoidance or tolerance of roads. Elk in particular exhibit behavioral patterns that suggest habituation along roads and other areas disturbed by human activities. The decreased responsiveness with increased traffic levels could indicate that passing vehicles provide a refuge from predators such that ungulates have come to perceive reduced predation risk when traffic and their associated noise levels are high, or that the animals cannot afford to maintain high levels of responsiveness to such continuous and pervasive disturbance.



Unresponsive behavior could have negative implications, such as reducing the animals' ability to visually detect predators and other environmental cues. Reduced responsiveness to road traffic could also lead to increased human conflicts, such as negative encounters with recreationists or collisions with vehicles (Brown et al. 2012).

Hunting activity may affect use of roads by elk. A study of hunted elk on a national forest near Rocky Mountain National Park indicated that elk avoid moderately and heavily used roads on winter ranges (Schultz and Bailey 1978). Rumble, Benkobi, and Gamo (2005) believe that elk dispersion patterns during hunting seasons relative to roads result from the type of equipment and methods used by hunters, for example, "road hunting." Although elk avoided roads, their response to firearm hunters was found to depend on the extent of available cover rather than a specific distance to the nearest road (Rumble, Benkobi, and Gamo 2005). Similarly, Witmer and deCalesta (1985) found that elk spent substantially more time in cover during the hunting season, during which time they also avoided roads, but not more than the yearly average.

In contrast, a study published in 2004 states that "road effects [on elk] are far more pervasive than originally believed" (Rowland et al. 2005), and that elk response to road use varies based on traffic rates, forest canopy cover adjacent to roads, topography, and road type (e.g., improved vs. primitive). Entire ranges can be abandoned if disturbance from traffic on roads and the associated habitat loss and fragmentation exceed some threshold level. The ultimate effect of displacement of elk by motorized traffic (as well as other disturbances) is a temporary or permanent reduction in effective elk habitat (Rowland et al. 2005). Shifts in elk distribution away from roads may occur across a range of temporal and spatial scales. Daily elk movements and size of home ranges may decrease when open road density decreases (Rowland et al. 2005). Ungulates are more likely to respond when herds are dispersed and are closer to the road (Brown et al. 2012). Females bearing calves may avoid roads; Witmer and deCalesta (1985) found some pregnant females avoiding roads during calving.

Habituation

Ungulates in areas with frequent contact with humans have shown reduced flight responses compared to those in areas where human contact is rare. Learning plays a substantial role in the manner and degree to which ungulates respond. Animals in general show decreased flight responses in areas with larger human populations (Stankowich 2008). According to Stankowich (2008), "the ubiquity of the [habituation] effect across studies suggests that ungulates do habituate to humans in heavily populated areas." Thompson and Henderson (1998) note that "Elk are readily domesticated and may habituate to human activity that is predictable and harmless Habituation is an adaptive behavioral strategy that elk may selectively employ to maximize reproductive fitness." However, human disturbances can be particularly detrimental during certain critical periods of an animal's life or during the year when they are in poor condition or more vulnerable to injury, such as pregnancy and calving (Stankowich 2008).

Elk display site fidelity and may not abandon traditional ranges because of disturbance if adequate cover is available. Free-ranging elk in Yellowstone National Park tolerate human presence, particularly in the area of concentrated human activity around Mammoth, Wyoming. Elk are especially prone to habituate during winter, when they are confined by deep snow to a fraction of their year-round home range (Thompson and Henderson 1998).

Ungulates have been shown to exploit predator avoidance of human activity to reduce their own predation risk. Elk may try to minimize their predation risk from cougars and black bears, since large mammalian predators are known to avoid humans (Rogala et al. 2011). Elk in Banff National Park, Canada, are more habituated to disturbance than wolves, which are their main predator. Elk therefore benefit from low predation vulnerability near human settlements (Kloppers, St. Clair, and Hurd 2005).

Human-caused noise can affect ungulates through habitat selection, foraging patterns, and overall energy budgets, with potential population-level effects. However, noise may not have lasting negative effects if animals habituate to the disturbance; that is, exhibit reduced responsiveness after repeated exposure without consequence (Brown et al. 2012).

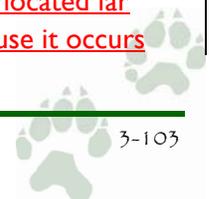
The recent Los Conchas fire likely expanded favorable habitat by restoring meadow habitats on the forested domes on the eastern third of the preserve, although it is too recent to quantify this supposition.

Mule Deer

Mule deer inhabit most forest types with good forage and cover. They use a variety of habitats during the course of their lives. Mule deer use higher elevations in the spring and summer, and migrate down to lower elevations in the fall and winter. They browse on a wide variety of woody plants, and graze on grasses and forbs. No formal surveys have been completed for deer on the preserve. However, VCT personnel rarely observe deer on the preserve, so the VCT believes the number present to be quite low (Moser 2009).

Once considered plentiful in the preserve, mule deer are now scarce. The decline of mule deer is a regionwide phenomenon and, while not fully understood, is usually attributed to a combination of factors including overhunting, territorial competition with elk, increased predation by coyotes, and a decrease in the early successional shrubby vegetation that is a mainstay of their diet. The last three of these factors may account for the low deer numbers in the preserve. It is unknown whether deer numbers are continuing to decline or have stabilized at low levels (VCT 2005i).

As mentioned above, human recreation can affect ungulates such as deer. Studies have shown little difference between hiking and biking regarding alert distance, flight distance, or distance mule deer moved when disturbed. Results indicated little difference in wildlife response to hikers versus mountain bikers. Mule deer responses were greater to off-trail disturbance than to on-trail disturbance. Animals close to trails became alert and fled at shorter distances than animals located far from the trail. On-trail recreation may appear more predictable because it occurs



frequently and along a particular line of movement, and animals may habituate to this type of activity. However, it is still likely that animals will take flight from on-trail recreation, particularly if they are encountered in the open. Thus, even on-trail recreation could result in displacement (Taylor and Knight 2003). Cole (1993) notes that many of the immediate responses to disturbance are short term, and that deer have been shown to typically return within hours to areas they have left after being disturbed. However, even short-term effects can have a substantial impact on animals living in stressful conditions, such as deer trying to survive in deep snow and cold (Cole 1993).

Mule deer have been shown to flee only to the nearest cover before stopping. "Because increasing cover generally decreased wildlife response, mule deer in cover could be expected to show a lesser response than animals in the open" (Taylor and Knight 2003). Wisdom et al. (2004) note, "It is possible that mule deer may respond to an off-road activity by seeking cover, rather than running from the activity . . . which could result in reduced foraging opportunities."

Mule deer have demonstrated greater flight distances during mornings, indicating a greater tolerance of recreationists during the evening. In addition, the larger the group size, the greater their response distances. A recreationist above mule deer elicited a stronger response than a recreationist located level with or below mule deer (Taylor and Knight 2003).

Black Bear

Black bears are highly mobile and readily disperse long distances across many types of habitat. Bears prefer mixed deciduous/coniferous forests with a thick understory. When inactive, they occupy dens under fallen trees, in ground-level or above-ground-level tree cavities or hollow logs, in underground cave-like sites, or in dense cover. The black bear is an opportunistic omnivore and has a variable diet of plants and animals (vertebrate and invertebrate), commonly including fruits, insects, animal carcasses, and garbage (Moser 2009).

No surveys have been completed for bears on the preserve, but they are frequently observed by VCT personnel (Moser 2009). An estimated 33 to 66 individuals are believed to exist within the boundaries of the preserve (Winslow 2008).

Mountain Lion

Mountain lions inhabit rough, broken foothills and canyon country, often in association with montane forests, shrublands, and pinyon/juniper woodlands (Fitzgerald, Meaney, and Armstrong 1994, as cited in VCT 2009b). Mountain lions tend to avoid people, but can and do live close to humans. They tend to be more active when there is less human presence, and are most active during the night, with peak activity at dawn and at dusk (NMDGF n.d.a). The diet of mountain lions consists mainly of hoofed mammals, such as deer and elk. A large population of lions has been documented on Bandelier National Monument (BISON-M 2009), which is adjacent to the preserve, so that migration between the two areas is likely. VCT personnel have observed mountain lions on the preserve, but no formal surveys

have been completed. It is estimated that five to eight individuals exist within the preserve's boundaries (Winslow 2008).

Coyote



Coyotes are found in a wide range of habitats, from open prairies to heavily forested regions, and even in cities. Coyotes are highly mobile and readily disperse 50 to 99 miles (80 to 160 kilometers) or more across many types of habitats; populations tend to encompass huge areas. Dens, commonly used in subsequent years, are generally located in a burrow, at the base of a tree, in a hollow log or rock crevice, or under a building (Moser 2009).

VCT personnel have documented coyotes on the preserve, but no formal population estimates have been completed. A recent study by Gifford et al. (2008) was conducted to describe the ecology and natural history of the coyote on the preserve. Preliminary diet assessment based on fecal analysis suggests that the coyote diet on the preserve consists primarily of rodents, followed by insects and then elk. Preliminary habitat use analysis suggests a late summer avoidance of forest and preference for wet meadows (Gifford et al. 2008).

Bobcat

Bobcats are found in various habitats, including deciduous/coniferous woodlands and forest edges, brush, deserts, and other areas with thick undergrowth. When inactive, they occupy rocky clefts, caves, hollow logs, or spaces under fallen trees. The young are born in a den in a hollow log or space under a fallen tree, or in a rock shelter. Bobcats prey extensively on cottontail and jackrabbits. They also eat a variety of rodents. No surveys for bobcats have been conducted on the preserve, but occasional observations by personnel confirm their presence (Moser 2009).

Gray Fox

The gray fox is common and widespread in open terrain, woodland, and lower forest zones. Gray foxes are perhaps most common in pinyon/juniper and oak woodlands, but seem to be absent from grasslands that lack rock outcrops or at least some encroachment of juniper. The species is essentially absent from well-developed mixed coniferous and spruce/fir forest. Gray foxes use brush and brushy woods in most areas (Moser 2009).

The gray fox is an opportunistic omnivore. Diet often chiefly depends on rabbits and other small mammals in winter, and insects and fruit in summer. VCT personnel have observed gray foxes on the preserve, but no formal surveys have been completed (Moser 2009).

Special-status Species

This section describes the existing conditions of special-status species on the preserve. These plant and animal species are those that have been assigned special

Appendix B - Errata

Section Change – Chapter 4, Fish and Wildlife

(Revisions are shown in red in the text that follows. Additions are underlined and deleted text is crossed out.)

moderate adverse impacts expected under alternative 4B are combined with the overall beneficial impacts of other present and reasonably foreseeable future activities, cumulative impacts would be minor and adverse.

Fish and Wildlife

Guiding Regulations and Policies

The following laws, regulations, and policies guide or constrain the management of fish and wildlife on the preserve.

The Valles Caldera Preservation Act of 2000 includes provisions that affect the management of vegetation. These specific provisions direct the preserve to

- protect and preserve the [fish and wildlife] values of the preserve, and provide for multiple use (16 USC 698v-3[b])
- develop a management plan that will provide for multiple use and sustained yield of renewable resources within the preserve
- develop a comprehensive program for the management of lands, resources, and facilities within the preserve (16 USC 698v-6[d])

While policies that guide or constrain actions of the USFS do not apply to the VCT or the management of the preserve, such direction has been considered where applicable. USDA Departmental Regulation 9500-4 directs the USFS to recognize and enhance, where possible, the values of fish and wildlife, both terrestrial and aquatic. The regulation also “recognizes the rights of individual states to manage fish and wildlife populations under their jurisdictions” (USDA 1983). Fish and wildlife in New Mexico are regulated under chapters 30–36, title 19, of the New Mexico Administrative Code, including regulations for hunting, fishing, trapping, and management of wildlife habitat and lands.

FSM 2600—Wildlife, Fish, and Sensitive Plant Habitat Management (USFS 1991) stipulates policies and procedures for the management of wildlife and fish habitat, and reiterates policy from USDA 9500-4. The manual includes an objective to “Provide a sound base of information to support management decision making affecting wildlife and fish” (USFS 1991).

Methodology for Analyzing Impacts

Potential impacts on fish and wildlife were analyzed based primarily on two factors: documented presence of species and presence of suitable habitat. If a particular species is not documented to exist in the study area, but suitable habitat is present and potentially affected by one of the alternatives, then it was assumed that the species would be potentially affected.

The area of impact includes locations of proposed development and the extent of potential influence of project activities. The farthest extent of impacts to wildlife would be from construction noise, vehicle noise during operations, and recreational activities. The impact to wildlife was analyzed on the basis of existing conditions, documented wildlife use, and presence of suitable habitat.

Disturbance may have both immediate and long-term effects on wildlife. The immediate response of many animals to disturbance is a change in behavior, such as cessation of foraging, feeding, or altering reproductive behavior. Over time, energetic losses from flight, decreased foraging time, or increased stress levels come at the cost of energy needed for individuals' survival, growth, and reproduction. Noise, like outdoor recreation, has the potential to disturb wildlife, resulting in energetic costs, impacts to animals' behavior and fitness, and avoidance of otherwise suitable habitat (Taylor and Knight 2003).

Cole (1993) states that recreational impact occurs when there is interaction between recreational users and an environment that is vulnerable to disturbance. The spatial and temporal effects of noise and recreation, including the amount of recreational use, type of recreational activity, and behavior of recreationists, were assessed and compared to the spatial and temporal needs of wildlife to determine the level of impact.

Alternative 1: No Action

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: beneficial
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: beneficial Long term: beneficial
Cumulative	Actions listed in table 4-1	Beneficial

Direct/Indirect Impacts

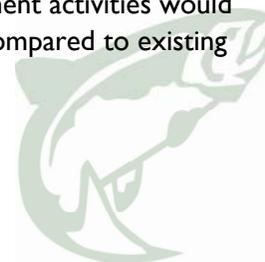
Implementation Level

Throughout the preserve, impacts to fish and wildlife would be beneficial due to reduced human activity under alternative 1.

This alternative would result in the removal of the Valle Grande and Banco Bonito Staging Areas and the elimination of the interim recreation program. The VCT would phase out current access through these staging areas, as well as interim programs and activities. Negligible adverse short-term impacts may result from deconstruction activities associated with removing existing temporary facilities. The removal of the Valle Grande Staging Area would also reduce disturbance and pollutants resulting from the concentration of people and vehicles. The long-term result would be a beneficial impact on fish and wildlife by reducing human activity levels in the preserve, which would reduce disturbance to all wildlife species.

Programmatic Level

Short- and long-term beneficial impacts on fish and wildlife would result from the elimination of the interim recreation program, because existing levels of human activity would decrease. Current grazing and other approved land management activities would continue on the preserve, with no measurable changes to wildlife compared to existing conditions.



Cumulative Impacts

Actions and activities that would affect fish and wildlife include those listed in table 4-1 for fish and wildlife. Past actions have had considerable effects on the presence of individual species of fish and wildlife in the preserve, including the extirpation of the Rio Grande cutthroat trout through the introduction of nonnative stocked trout, the extirpation of the gray wolf by overhunting, the extirpation of black-tailed prairie dogs due to poison control, and the extensive use of the preserve for livestock grazing, which created widespread ecological changes for many wildlife species. Also, logging of the high-elevation forests on the preserve have changed available habitat for species such as Mexican spotted owl, northern goshawk, southern red-backed vole, and American marten. However, since the cessation of logging, forest cover has returned to the preserve's mountains, and the implementation of the Multiple Use and Sustained Yield of Forage Resources program allocates forage to the needs of wildlife, plant regrowth and ecosystem services before providing an allocation to livestock or other use. The preserve still provides extensive protected habitat for a wide variety of fish and wildlife species.

The Las Conchas fire that burned much of the Bandelier National Monument and one-third of the preserve in 2011 had an adverse impact on individual wildlife through direct mortality. As a result of the Las Conchas fire, overland flows moved debris into stream channels throughout the preserve. Fish populations declined in the upper reaches of the East Fork of the Jemez River, and almost all fish in the headwaters of San Antonio Creek were killed (DeVault 2011). Habitat suitability for terrestrial wildlife was reduced and in some cases potentially eliminated through hardening of the soil, as was the case at Bandelier. Habitat loss at Bandelier may influence some terrestrial species to migrate to the preserve. This may be particularly true for black bears, which the national monument believes will take some time to return to Bandelier. However, at both the preserve and Bandelier, vegetation is beginning to regrow, with beneficial impacts on specific species such as coyote and deer. As burned areas recover, impacts on wildlife will become more beneficial. This benefit would be enhanced by the reduction in human presence under the no-action alternative.

The current update of the *Santa Fe National Forest Land and Resource Management Plan* (USFS 1987) to include the *Jemez National Recreation Area Management Plan* (USFS n.d.a) will improve habitat conditions for fish and wildlife, as will the implementation of the Collaborative Forest Landscape Restoration project (USFS and VCT 2010) in the southwest Jemez Mountains (including the preserve). Treatments are designed to improve terrestrial wildlife habitat for a wide variety of native species. Many of the recommendations target improvements to riparian and aquatic ecosystems. These restorative actions will beneficially affect the preserve's fish and wildlife populations. Specifically, tens of thousands of acres of habitat will be improved for the northern goshawk and peregrine falcon. Improvements to riparian habitat will also benefit beavers, as well as many birds and small mammals ~~(USFS 2010d)~~. Removing conifers and restoring historic meadows and grasslands, and increasing forest openings filled with herbaceous vegetation would greatly improve foraging habitat for deer, elk, bear, small mammals, and many bird species (USFS 2010d).



The USFS has eliminated several miles of unneeded roads on nearby lands, and plans to close and decommission more in the future. In addition, the VCT also plans to close or decommission approximately 1,000 miles of roads in the preserve over the next 10 years. These actions would support future transportation planning, reduce vehicular use, and improve habitat connectivity, beneficially impacting wildlife, especially elk. Daily movements and size of home ranges of elk may decrease when open road density decreases, which could lead to energetic benefits that translate into increased fat reserves or productivity and reduced stress levels. Road closure may also decrease illegal poaching levels (Rowland 2005).

The extirpation of some individual species from the preserve and past logging activities within the preserve have resulted in adverse impacts. One extirpated species, elk, have been re-established and the population has stabilized. In 1947 the NMDGF released 47 head of elk imported from the Yellowstone, Wyoming, area into the Río de las Vacas valley west of the Baca Location (VCT n.d.). Although the Jemez Mountains grasslands provided favorable habitat, the introduced elk herd increased at a slow rate, with the population reaching only an estimated 200 animals in 1961. The NMDGF introduced another 58 elk from Jackson Hole, Wyoming, between 1964 and 1965. The populations continued their slow increase in the Valles Caldera over the next decade (VCT n.d.). Dramatic ecological change that had both an immediate and great impact on local elk demography occurred in 1977. In June of that year, the 25,000-acre [10,000-ha] La Mesa fire burned in the ponderosa pine forests on the Pajarito Plateau at Bandelier National Monument. The fire converted the forest into grassland and opened up considerable winter habitat for the Jemez elk population. With favorable climatic conditions, the elk herd expanded to about 7,000 in 1989. In 2001 it was estimated that between 4,000 and 6,000 elk used the Baca Ranch for summer range (VCT n.d.). The preserve's elk population is now far greater than has previously been the case in the long-term natural history of the caldera (VCT 2005i) — a beneficial result.

Reasonably foreseeable future actions are beneficial overall, because and would affect a wide variety of fish and wildlife species exist at the preserve. When the long-term beneficial impacts anticipated under the no-action alternative are combined with the adverse and beneficial impacts of past, present, and reasonably foreseeable future activities, cumulative impacts would be beneficial because the current and future long-term beneficial impacts are expected to outweigh or reasonably overcome the past adverse effects through regional and local restoration activities.

Alternative 2: Banco Bonito Visitor Contact Station

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: moderate with localized major and adverse Long term: moderate -minor and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: minor and adverse Long term: minor to moderate and adverse
Cumulative	Actions listed in table 4-1	Minor to moderate and adverse

Direct/Indirect Impacts

Implementation Level

Noise generated during construction may not directly harm individual animals, but could affect feeding and breeding behaviors.

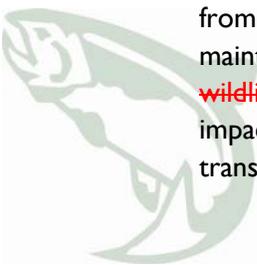
Under alternative 2, the existing Banco Bonito Staging Area would be removed and new development would occur, as described in chapter 2. As described in the “Vegetation” section, the new construction would affect mostly lower and upper montane grassland and some surrounding ponderosa pine forest. Forested areas adjacent to NM-4 would be permanently affected by the construction of an acceleration and deceleration lane on each side of the road. Approximately 3.0 acres of grassland and forest habitat would be affected by construction of the visitor contact station, parking lots, picnic area, and road improvements. The loss of this habitat would displace a variety of wildlife, including rodents, reptiles, game birds, songbirds, small and large carnivores, and foraging raptors. The type of forest impacted (mid-age closed ponderosa pine forest) is abundant in the area. Large predators such as black bears, coyotes, and mountain lions would only be expected to be present in this area on a transient basis. Elk now concentrate on the grassland valleys in the east and north sections of the preserve, so the proposed visitor contact station is not expected to substantially affect elk calving or foraging. Fish habitat would not be affected by this alternative because none exists at this location.

Some wildlife may have become habituated to human presence at the alternative 2 site, although noise from increased visitation would reduce the likelihood that wildlife would use this area.

Noise generated during deconstruction and construction from heavy equipment, such as bulldozers, dump trucks, and excavators, would affect wildlife. The equipment would not generally be operated continuously or simultaneously, resulting in variable noise levels. Noise generated during construction may not directly harm individual animals, but could affect feeding and breeding behaviors, which could have adverse indirect impacts on long-term population levels. The result would measurably alter the structure, composition, or function of wildlife species during construction, but within a localized area.

~~Alternative 2 would have moderate~~ Moderate with localized major adverse short-term impacts ~~would result,~~ which would temporarily displace wildlife most affected by construction noise. Some of these species may return, particularly those least affected by human presence.

~~Alternative 2 would have minor/moderate adverse long-term impacts due to an increase in human activity in the vicinity of the new contact station and concentrated vehicle use from the new contact station into the preserve. This site is already used as a staging area, and some wildlife may have become habituated to human presence. No new roads would be built under this alternative. However,~~ Only 15 percent of all motorized access onto the preserve comes through the [Banco Bonito Staging Area](#). Motorized access onto the preserve beyond the [Banco Bonito Staging Area](#) is currently limited to administration, and some hunting and weekend hiking shuttles. The construction of new recreational facilities would increase visitation to this area, increasing the level of noise from pedestrian and vehicle sources as well as increasing the amount of regular, routine maintenance activity in and around the visitor contact station. ~~As noted in chapter 3, wildlife can be adversely affected by sounds that intrude on their habitats.~~ These indirect impacts would reduce the likelihood that wildlife would use this immediate area on a transient basis in the future.



Conversely, humans can provide refuge from some prey species that may habituate to areas of human use to avoid predators. However, the displacement of predator species by humans can potentially have indirect effects on interacting prey species (Muhly et al. 2011). Some wildlife, such as bears, may be attracted to human presence and new sources of food. Visitors may also be tempted to feed wildlife, which can result in human/animal conflicts and alter animal behavior. In many recreational areas, animals like black bears, raccoons, squirrels, chipmunks, mice, crows, and jays actively forage for garbage and food items in areas such as picnic areas. The degree of this activity depends on location and the types of animals in the area. Bears in particular can become habituated to people and also conditioned to human foods.¹ Mitigation to offset these potential problems would include removing-preventing wildlife from consuming artificial food sources, implementing regulatory actions, providing information and education to visitors, controlling any problem animals, and conducting research and monitoring (MADGF n.d.).

Alternative 2 would have adverse long-term impacts due to an increase in human activity in the vicinity of the new visitor contact station. This site is already used as a staging area and some wildlife may have become habituated to human presence. The location is not an elk calving or grazing area. Mitigation would help address adverse impacts of habituation. Changes at the implementation level would be measurable but would not alter the structure, composition, or function of the preserve's wildlife and would be limited to the visitor contact station location. For these reasons, impacts are expected to be minor.

Programmatic Level

The presence of the visitor contact station and associated recreational facilities would increase visitation over existing conditions. Visitors would recreate beyond the immediate location of the visitor contact station, increasing human activity in habitats where such activity is currently limited and increasing human presence in areas potentially used by fish and wildlife species. Although some day-use amenities would be provided under this alternative, the visitor contact station would not likely function as a primary destination for the majority of visitors. Most visitors are expected to drive beyond the visitor contact station to access the preserve's interior. ~~Expanded and widespread human activity within the preserve has not occurred before; wildlife is not habituated to human presence.~~

At the programmatic level, most impacts would result from disturbance rather than direct impacts to ~~habitat/wildlife.~~

Off-road motorized access is currently restricted on the preserve. Routes from this visitor center location would be limited to high clearance vehicles until future transportation planning and associated improvements to roads were made. The presence of roads has been shown to have pervasive effects on elk, including reduced habitat use. However, elk have also been shown to adapt to human disturbance along roads that experience normal and heavy use. Although elk have also been shown to tolerate people watching them from parking areas and roads, unpredictable or intrusive human behavior could lead to displacement or collisions with vehicles. Elk primarily graze in the central

¹ "Habituation" implies tolerance of the close proximity of people once the animal perceives no consequence as a result. "Food conditioning" occurs when the animal then makes an association between humans and food.

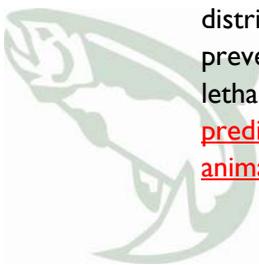
parts of the Valle Grande, where they would be a sufficient distance from roads. Elk also graze and calve along VC01 and VC02 roads around the valleys, where they could be affected by increased traffic.

Improvements to the preserve's Level 3 and Level 4 roads and development of additional small parking lots throughout the preserve would also occur. Short-term construction impacts on fish and wildlife habitat would be minor and adverse. There would be long-term increases in human activity and numbers of vehicles along these existing corridors, which can create barriers to wildlife movement across habitats, with decreased animal abundance near roads and adverse effects to landscape connectivity. Most impacts would result from noise or recreational disturbance rather than direct impacts to habitat/wildlife as improvements would be designed to minimize new impacts on wildlife habitat. Road improvements would improve access for hunters and anglers, potentially increasing harvesting pressure on fish and wildlife resources. However, these activities would continue to be managed on a permit fee basis, which allows the preserve to manage the removal pressure. Also, the paving of any roads would lead to potential roadside effects from an increased runoff rate, additional associated roadside scour, and sedimentation in adjacent aquatic habitats, which could lead to further degradation of fish habitat and habitat for amphibians such as the northern leopard frog. However, a hard road surface may allow for more precise runoff control.

Long-term increases in visitation would increase traffic volumes on preserve roads and on NM-4. Increases in traffic would increase the risk of animal/vehicle collisions, which can harm humans and wildlife. There is no current data on roadkill in the preserve, but anecdotal observations indicate that individuals from multiple species, including elk, Abert's squirrels (*Sciurus aberti*), chipmunks, raccoons, and various reptiles, occasionally die from vehicle strikes (Parmenter, pers. comm. 2011). NMDGF staff members have stated that about four elk are hit by motor vehicles annually on the stretch of NM-4 within preserve boundaries (Trujillo, pers. comm. 2011a). The expected increases in daily and seasonal vehicle trips to the new visitor contact station and along various internal preserve roads would likely lead to increased mortality rates for various wildlife species.

Increased visitation would increase noise levels along the preserve's roads and at recreational facilities throughout the preserve such as campgrounds, picnic areas, and trailheads. Wildlife can be adversely affected by sounds that intrude on their habitats and would therefore avoid these places, slightly reducing the amount of available habitat.

The development of campgrounds and picnic areas would have potential adverse impacts on wildlife, and increase the chance of negative wildlife/human interactions, which can lead to the need for lethal and nonlethal animal control actions. Deliberate and inadvertent feeding of wildlife by humans may lead to conflicts and property damage, as well as alterations in animal behavior, foraging habits, reproductive rate, physical size, distribution, and numbers (MADGF n.d.). As mentioned above, mitigation measures to prevent habituation could be employed to reduce the level of impact and the need for lethal control. By concentrating use in specific areas, animals could habituate to predictable level of human activity, reducing the adverse effects of flight response. Other animals may respond to frequent and predictable encounters by avoiding them.



Hikers, mountain bikers, and equestrians would recreate on existing trails and primitive roads within the preserve. The majority of the preserve's equestrian and mountain biking trails are located in forested areas near Banco Bonito, which does not contain the open habitats of the valleys that elk use for grazing. Therefore, minor impacts to elk recreating on the mountain bike and horseback trails near Banco Bonito are expected. Changes to elk behavior would be measurable but would not alter the structure, composition, or function of the preserve's herd and would be limited in context.

Visitors' attempts to get close to animals may have detrimental effects on elk. An increase in visitation throughout the preserve may cause indirect effects on daily and seasonal habitat use patterns by individuals of these species. Existing wildlife movement and migration patterns could be affected. Most disturbances would continue to occur along existing trails on Level I roads, albeit at an increased level.

Elk generally have greater perceptions of risk when disturbed in open habitats, such as the preserve's valleys. No development or recreational facilities are being proposed in the Valle Grande or Valle Jaramillo, a key calving and nursing area. The VCT would route recreation facilities and activities away from calving, foraging, and quality habitat areas. Blinds or visibility shields could be incorporated to reduce human intrusions on elk activity while facilitating visitor viewing. Signs would be used to inform users of the importance of keeping a distance from elk calving areas.

During winter, snowshoers and cross-country skiers would recreate off designated trails in the Valle Grande, where elk are more likely to concentrate during seasons with heavy snow. Because humans on foot can be perceived as most threatening to elk, such winter activities would have adverse impacts on elk. The VCT would route winter-use facilities, trails, and/or roads away from key ungulate wintering areas. The VCT would use signs to inform users of the importance of ungulate winter range and to keep a specific distance from elk and deer.

Elk would continue to experience adverse impacts during hunting, including direct mortality and increased flight response. As noted in chapter 3, hunting designed to control regional elk populations would have less of an impact than focused hunting. Studies vary on whether hunted elk populations will habituate to or avoid humans during non-hunting seasons. If the latter, increased recreational activity in the preserve may result in a sustained level of movement by elk throughout the year. However, these activities would continue to be managed on a permit fee basis, which allows the preserve to manage the removal pressure.

Rumble, Benkobi, and Gamo note that "estimating elk response to disturbance such as recreation may be difficult because timing may constrain occurrence of human activity to weekends or hunting seasons." According to Richens and Lavigne (1978, cited in Stankovich 2008), "it is not uncommon for species to show short-term effects on flight behavior but suffer no long term ill effects." However, adverse impacts would occur to some extent with increased visitor use. To avoid and minimize these impacts, the VCT would implement these additional mitigation measures:

- Evaluate and monitor wildlife impacts and apply adaptive management to address both recreation and wildlife concerns as needed (e.g., spatially and temporally

separate humans and wildlife from key areas at critical times by closing roads or trails, changing access points, and/ or implementing a zoning strategy in which recreational uses are allowed in carefully selected areas).

- Implement programs to educate visitors about the effects of their activities on wildlife, with a goal of influencing the behavior of recreationists and reducing the potential negative effects on wildlife. Integrate ecological research and monitoring into education programs, and stress that management may be necessary to protect species. Educational and interpretation programs would (1) make people aware of the link between in appropriate behavior and specific ecological problems, (2) clearly demonstrate appropriate ways for visitors to behave so that problems can be avoided, and (3) encourage a sense of commitment in people to do something about these problems (Cole 1993). Educational programs would also be designed to address behavior of visitors in proximity to habituated animals, such as feeding wildlife.
- Further refine and identify key critical life history locations for wildlife and analyze potential flight impacts to avoid and minimize flight response from noise and various recreation activities.

In the short term, minor adverse impacts on fish and wildlife would be expected at the programmatic level due to construction activities within the preserve's interior at specific locations. Long-term impacts (mostly related to disturbance) would be minor to moderate and adverse because increases in human visitation could cause measurable changes in habitat use patterns, particularly in sensitive areas such as elk calving areas and riparian zones. Disturbance would be most severe during the summer when visitation is highest and animals such as elk use the preserve as critical summer range. Impact levels would be lower during the winter and spring when visitation is lowest. The degree of disturbance would be based on results of mitigation, which would be adaptively managed to minimize impacts.

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 2 as well. When the potential long-term minor to moderate adverse impacts of alternative 2 on fish and wildlife species are combined with the adverse and beneficial impacts of past, present, and reasonably foreseeable future activities, cumulative impacts would be minor to moderate and adverse.



Alternative 3A: Entrada del Valle Visitor Center—Primary Access via Shuttle System

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: moderate with localized major and adverse Long term: minor to moderate and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: minor to moderate and adverse Long term: minor to moderate and adverse
Cumulative	Actions listed in table 4-1	Minor to moderate and adverse

A variety of wildlife species could use some portion of the alternative 3A implementation areas as breeding habitat, foraging habitat, or cover. Elk that may use the area for summer foraging and calving habitat may be disturbed.

Direct/Indirect Impacts

Implementation Level

Under alternative 3A, the existing Valle Grande Staging Area would be removed and new development would occur in a new location closer to NM-4 and the periphery of Valle Grande. This new construction would consist of a new full-service visitor center, day-use facilities, roads, recreational facilities, and parking lots, all located just west of the existing main gate on NM-4. Habitat impacts would result from the following construction elements:

- A new approach road approximately 1 mile long would be added, starting at NM-4 and connecting to the existing VC01. This road would consist of permeable fill and would incorporate culverts to address seasonal drainage issues. The new road would require a slight realignment of NM-4 in the vicinity of the access road, including the addition of acceleration and deceleration lanes.
- A full-service visitor center up to 10,000 square feet would be built, with supporting administrative facilities of up to an additional 5,000 square feet. It is anticipated that more than 120,000 guests would visit this facility each year.
- Parking would be provided for up to 100 vehicles, with RV, bus, and overflow parking to support high-use days and special events.
- From the visitor center, an ADA-compliant day-use area would be developed, including access to the East Fork of the Jemez River, overlooks, picnic areas, staging for groups and special events, and interpretive sites. From here, additional trails would provide access to the interior of the preserve.

These new facilities would be estimated to impact between 5 and 10 acres of previously undisturbed habitat composed primarily of lower and upper montane grassland, wet meadow, mixed-conifer forest, ponderosa pine forest, and blue spruce fringe forest. Some trees would likely be removed, although the number and size cannot be determined at this time. Most of the forest impacts would result from the construction of the new access road, which would skirt the edge of the Valle Grande before reaching the new visitor center. A variety of wildlife species could use some portion of the

If facilities are located in riparian or wetland habitats, impacts would be more likely to affect fish and aquatic wildlife.

implementation areas as breeding habitat, foraging habitat, or cover during daily movements. These include rodents, reptiles, game birds, songbirds, small and large carnivores, and foraging raptors. Impacts would occur on grassland habitat and wet meadow habitat, as well as potentially on rock outcrops. Rock outcrops can be used as shelter and breeding habitat for a number of wildlife species, such as gray fox and coyote. Elk that ~~may are known~~ use the southern edge of the Valle Grande for summer foraging and calving habitat may be disturbed or displaced. Approximately 80 percent of the preserve's visitation occurs from May through October, overlapping with the mid-May through June elk calving season. Under this alternative, the new access road proposed from NM-4 would divert visitor and shuttle bus traffic from VC01, along which elk graze and calve. Visitors would no longer drive along VC01 to reach the Valle Grande Staging Area, resulting in a beneficial effect. Mitigation measures identified under alternative 2 would also be applied to minimize the level of impact, particularly to calving. The construction of new trails along the East Fork of the Jemez River may have minor impacts on riparian habitat.

As described for alternative 2, some wildlife species may become attracted to the visitor center and its associated recreational facilities, such as picnic sites. Visitors may also be tempted to feed wildlife, and animals can become habituated to people and conditioned to human foods. To address this potential issue, the VCT would implement the mitigation measures described for alternative 2.

Noise impacts would occur as described for alternative 2, but to a greater extent due to the substantially increased visitation, larger parking facilities, and new access road. Wildlife would not likely use this immediate area on a transient basis in the future.

Overall, moderate with localized major adverse effects would occur in the short term, with some wildlife permanently displaced as described for alternative 2. Visitation and human presence is expected to increase substantially in the long term, affecting all habitats to some degree. The location of the entrance and visitor center in the Valle Grande is expected to attract an extensive amount of visitors compared to existing conditions. ~~As mentioned under alternative 2, wildlife in the preserve has not been exposed or become habituated to the presence of large numbers of people.~~ Minor to moderate adverse impacts are expected in the long term as wildlife habituate to the new facilities and adjust their daily and seasonal use patterns.

Programmatic Level

The presence of the visitor center and associated recreational facilities would increase visitation over existing conditions. Although hiking would continue to be primarily on Level 1 roads, hiking trails would be expanded preserve-wide to provide short day loops and multi-day backpacking opportunities. Where trail users are limited to existing roads, impacts would be similar to alternative 2, but with substantially more use. Improvements to the preserve's Level 3 and Level 4 roads and development of additional parking lots throughout the preserve would also occur, and a bicycle path would be created to parallel the loop road. Short-term construction impacts on fish and wildlife species would be minor to moderate and adverse because these actions would be related to campground and trailhead development and road upgrades, rather than new road development. Long-term impacts due to disturbance would be minor to moderate and

adverse due to the increase in number and frequency of shuttle buses using the Level 4 roads. There would also be an increase in human presence on trails and roads, and possible increased roadside scour and sedimentation impacts from an increase in impervious surface along paved roads, which could affect fish habitat. However, like alternative 2, a hard road surface may allow for more precise runoff control.

Similar to alternative 2, increased visitation would likely increase fishing and hunting pressure in the long term, as well as potentially increasing wildlife mortality from vehicle collisions, but to a greater degree.

As described for alternative 2, recreational activities in campgrounds can promote habituation and a conditioned response to human foods. Feeding of wildlife by humans may result in adverse effects on both humans and animals (MADGF n.d.). As mentioned above, mitigation measures to prevent habituation could be employed to reduce the level of impact.

Noise disturbance would occur as described for alternative 2, but with substantially more visitors using recreational facilities in the preserve. ~~However, sufficient habitat exists in the preserve that adverse physiological and/or behavioral changes to wildlife would not be anticipated.~~ The use of a shuttle system would offset disturbance in the preserve's interior that would be expected with a considerable increase in visitation.

Management actions that disperse animals from roadsides and other visitor use areas and that close roads and trails to protect animals reduce chances of visitors seeing animals. Wright (1998) notes that "innovative techniques are needed to allow visitors the opportunity to view wildlife without causing disruptions." Ongoing research has demonstrated that a public transportation system, such as shuttle bus use within some national parks, lessens impacts to wildlife along road corridors and greatly increases wildlife viewing opportunities (Wright 1998). Although visitation would increase substantially under this alternative, the use of shuttle buses would help contain and manage recreational impacts to wildlife. While some visitors would expect to use the shuttle to access specific destinations to pursue recreational activities, others would be satisfied to simply tour the Level 4 loop road and remain on the shuttle. Wildlife, especially elk and mule deer, may habituate to predictable shuttle schedule and route, along with predictable visitor behavior along roads, decreasing the likelihood of flight and lessening associated impacts. Canfield et al. (1999) note that the most detrimental disturbances to wintering ungulates are those that are unanticipated.

Impacts to elk from recreational disturbance and increased road use would occur as described under alternative 2. These impacts would be greater given the substantially higher levels of visitation expected, yet would be mitigated to a certain degree by the use of a shuttle system, which would consolidate visitors from multiple vehicles into one. The VCT would implement the same mitigation measures described for alternative 2. In addition, shuttle buses would avoid some elk calving areas along VC01, using the new access road to reach the visitor center and circumventing a section of VC01 to transport visitors farther into the preserve. Shuttle drivers would be educated about the sensitivity of the grazing and calving areas along VC01 and VC02 as they follow the proposed loop route through the preserve.

As noted under alternative 2, it is difficult to precisely predict how wildlife, particularly elk, would be affected by increased recreational activity and road use. In general, the substantial increase in human activity would create minor to moderate adverse disturbance impacts on fish and wildlife species in the long term at the programmatic level. Similarly, habitat-wildlife impacts would be minor to moderate and adverse depending on the specific locations and sizes of ancillary facilities (parking lots, additional staging area / visitor contact areas, etc.). If these facilities are located in riparian or wetland habitats, impacts would be more likely to affect fish and aquatic wildlife, as well as species such as frogs, which inhabit wet areas.

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 3A as well. When the long-term minor to moderate adverse impacts anticipated under alternative 3A are combined with the adverse and beneficial impacts of past, present, and reasonably foreseeable future activities, cumulative impacts would be minor to moderate and adverse, primarily because of impacts in previously undisturbed areas and substantial increases in human activity.

Alternative 3B: Entrada del Valle Visitor Center—Primary Access via Personal Vehicle

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: moderate to localized major and adverse Long term: minor to moderate and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: minor to moderate and adverse Long term: moderate and adverse
Cumulative	Actions listed in table 4-1	Moderate and adverse

Direct/Indirect Impacts

Implementation Level

Alternative 3B would differ from alternative 3A in that visitors would access the preserve using personal vehicles rather than shuttle buses, as described below. Implementation-level impacts would be the same as those under alternative 3A: moderate to localized major and adverse in the short term, and minor to moderate and adverse in the long term.

Programmatic Level

The transportation system would include the development of a Level 4, two-lane paved or gravel road. Although the parking area at the visitor center would be smaller than for alternative 3A, larger parking areas would be developed at recreation areas throughout the preserve to accommodate personal vehicles at those locations. The use of personal vehicles would create more frequent, persistent and widespread disturbance to

The use of personal vehicles under alternative 3B would create more frequent, persistent, and widespread disturbance to terrestrial wildlife than a shuttle system.

terrestrial wildlife than a shuttle system, and would likely result in more collisions with wildlife. Personal vehicles would be more widespread throughout the preserve, using Level 2 as well as Level 1 roads. Personal vehicles would also come in a wider variety of engine types, sizes, and noise levels compared to a presumably more similar set of shuttles. ~~Therefore, impacts from noise would be greater than similar to those under alternative 3A due to higher traffic volume, with more disturbance from different motor vehicle engines.~~

~~Impacts to elk from recreational disturbance and increased road use would occur as described under alternative 2, but to a greater degree due to substantially increased visitation. Like alternative 3A, a portion of VC01 where elk calving occurs would be closed to vehicular use, resulting in a localized beneficial effect in that area. However, calving areas farther along VC01 and VC02 would experience increased adverse effects from more motorized use. More unlimited access via personal vehicle—for instance, the use of 4-wheel drive vehicles to access remote locations—could also result in potential illegal hunting and further loss of undisturbed habitat areas for elk breeding, calving, and foraging. These differences would result in increased measurable changes to fish and wildlife compared to alternative 3A. Short term impacts would be minor to moderate adverse. Localized moderate impacts within the construction site would be expected in the long term for the reasons described for alternative 3A.~~

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 3B as well. When the long-term primarily moderate adverse impacts expected under alternative 3B are combined with the adverse and beneficial impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would be moderate and adverse.

Alternative 4A: Vista del Valle Visitor Center—Primary Access via Shuttle System

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: moderate with localized major and adverse Long term: minor and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: minor to moderate and adverse Long term: minor to moderate and adverse
Cumulative	Actions listed in table 4-1	Minor to moderate and adverse

Under alternative 4A, most of the affected habitat is relatively close to NM-4, which would reduce its value to wildlife.

Direct/Indirect Impacts

Implementation Level

This alternative is similar to alternative 3A but would locate the full-service visitor center south of NM-4 below Rabbit Mountain. Where alternative 3A focuses on day-use experience around access to the East Fork of the Jemez River and hiking at South Mountain, alternative 4A would develop a day-use area focused on views of the Valle

The alternative 4A location is not widely used by large game due to its exposure and proximity to NM-4.

Grande, interpretation of geology, and proximity to the adjacent day-use area at Bandelier National Monument, which consists of a cross-country ski trail and hiking trail leading from the preserve boundary. An underpass would be developed to provide access below NM-4 for wildlife viewing and hiking. Interpretive trails and picnic areas would be developed south of NM-4, also emphasizing views of the Valle Grande. Like under alternatives 2 and 3A/B, NM-4 would be modified to include acceleration and deceleration lanes. Also similar to alternative 3A, a shuttle system would serve as the primary mode of access into the preserve.

Habitat impacts from this alternative would be similar to those under alternative 3A, with a similar-sized visitor center, parking, picnic area, and trails. However, the access road from NM-4 would be considerably shorter, and the construction of the facility would require cutting into a slope. The type of habitat impacted by this alternative would be limited primarily to grassland habitat, with some trees removed at the proposed location of the visitor center. Several wetlands are located near the treeline that could be affected by trail or utility construction. These wetlands would be avoided to the extent possible.

The visitor center and associated infrastructure would be developed away from large streams. Most of the affected habitat is relatively close to NM-4, which would reduce its value to wildlife. Proposed facilities farther from the visitor center, such as utilities or trails, would have more likelihood of impacting undisturbed wildlife habitat.

Impacts from potential wildlife habituation and conditioning to human food at the visitor center would be mitigated as described under alternative 2. Noise impacts would also be similar to those under alternative 3A, although the proximity of this alternative to NM-4 may mean that wildlife will have adjusted to some human-caused noise or may avoid the area.

As mentioned in chapter 3, a large population of mountain lions has been documented on Bandelier National Monument, which is adjacent to the preserve, making migration between the two areas likely. Although mountain lions are most active at night, the presence of a large visitor center and a substantial increase in human presence at this location could affect mountain lion migration. However, mountain lions can coexist with human presence, and the species may currently avoid areas near NM-4.

The Vista del Valle location is not widely used by large game due to its exposure and proximity to NM-4. The underpass and wildlife viewing area associated with alternative 4A would provide an unobtrusive vantage point for visitors to observe elk and other wildlife from a distance.

Moderate with localized major adverse short term impacts on fish and wildlife would result, as described for alternative 2. Long-term impacts would be minor and adverse because of the proximity to NM-4 and the minimal impacts on forest and stream habitat. Changes proposed under this alternative would be measurable but would not alter the structure, composition, or function of the preserve's wildlife.



Programmatic Level

Programmatic-level impacts on fish and wildlife would be similar to those under alternative 3A, resulting from increases in human activity and noise in the preserve and the development of parking lots, shuttle bus stops, and other ancillary actions. Unlike alternative 3A, shuttle buses would follow VC01, along which elk calve, to access the preserve from NM-4. Shuttle buses would also increase the level of traffic along the Valle Grande on NM-4 between the proposed visitor center and VC01, potentially increasing disturbance to elk. Short-term and long-term impacts would be minor to moderate and adverse at the programmatic level, depending on the level of visitor use and the specific location of additional facilities.

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 4A as well. The wildfires that occurred in 2011 burned the area of the preserve where this alternative is proposed. Direct mortality to some individual wildlife occurred, and habitat quality was reduced in the short term. Mountain lion migration has likely ceased until sufficient habitat is restored at Bandelier and the preserve. As at Bandelier National Monument, the burned area at the preserve is recovering and wildlife will respond. Some wildlife species are attracted to burned areas, which provide new browse for herbivores such as deer and elk. When the long-term minor to moderate adverse impacts expected under alternative 4A are combined with the adverse and beneficial impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would be minor to moderate and adverse.

Alternative 4B: Vista del Valle Visitor Center—Primary Access via Personal Vehicle

Summary

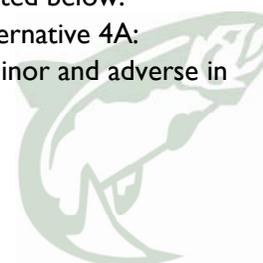
Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: moderate with localized major and adverse Long term: minor and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: Moderate and adverse Long term: Moderate and adverse
Cumulative	Actions listed in table 4-1	Moderate and adverse

Implementation-level impacts under alternative 4B would be similar to alternative 4A. Programmatic-level impacts would be similar to alternative 3B.

Direct/Indirect Impacts

Implementation Level

Alternative 4B would differ from alternative 4A in that visitors would access the preserve using personal vehicles rather than shuttle buses, as evaluated below. Implementation-level impacts would be the same as those under alternative 4A: moderate with localized major and adverse in the short term and minor and adverse in the long term.



Programmatic Level

Personal vehicle use would increase the level of traffic along the Valle Grande on NM-4 between the proposed visitor center and VC01, potentially increasing disturbance to elk. Overall, visitor access to the preserve using personal vehicles would have similar impacts to alternative 3B: moderate and adverse in the short and long term.

Cumulative Impacts

Cumulative impacts would be moderate and adverse, as described for alternative 4A.

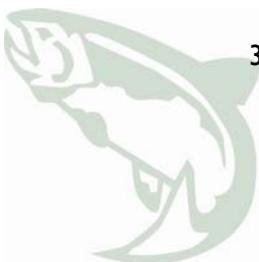
Special-status Species

Guiding Regulations and Policies

In addition to the regulations and policies that are pertinent to general fish and wildlife species, which are described in the “Fish and Wildlife” section, the following laws, regulations, and policies guide or constrain the management of special-status species in the preserve.

Section 7 of the Endangered Species Act (16 USC 1531 et seq.) requires each federal agency to ensure that its actions to authorize, permit, or fund a project do not jeopardize the continued existence of any threatened or endangered species. Section 7 requires federal agencies to determine whether their actions may affect federally listed threatened or endangered species and species of special concern, or designated and proposed critical habitat. If the VCT determines that a proposed action may affect such resources (in this case, critical habitat for the Mexican spotted owl), the VCT must request concurrence from the USFWS or request formal consultation with the USFWS. Both actions require the submittal of a written analysis to the USFWS that records the conclusions and supporting rationale regarding the effects of proposed actions on federally listed species and/or critical habitat. The USFWS has defined specific determinations to use in the analysis, described below (USFWS 2011b).

1. No effect: there would be no impacts, positive or negative, to listed or proposed species or habitat. No listed resources would be exposed to the action and its environmental consequences.
1. May affect, but not likely to adversely affect: All effects would be beneficial, insignificant, or discountable. Beneficial effects have positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur.
2. May affect, and is likely to adversely affect: listed resources are likely to be exposed to the action or its environmental consequences and would respond in a negative manner to the exposure.
3. May affect, and is likely to adversely affect: listed resources are likely to be exposed to the action or its environmental consequences and would respond in a negative manner to the exposure.



Appendix B - Errata

Section Change – Chapter 4, Environmental Justice

(Revisions are shown in red in the text that follows. Additions are underlined and deleted text is crossed out.)

Environmental Justice

Guiding Regulations and Policies

The following regulations and policies provide guidance for analyzing environmental justice impacts.

Title VI of the Civil Rights Act of 1964 prohibits discrimination based on race, color, national origin, and sex in the provision of benefits and services under any program or activity receiving federal financial assistance.

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority and Low-income Populations,” was signed by the president on February 11, 1994, and requires that federal agencies administer and implement their programs, policies, and activities that affect human health or the environment to identify and avoid “disproportionately high and adverse” effects on minority and low-income populations. The executive order ensures that agency actions do not have disproportionately high and adverse effects on environmental justice populations, or otherwise have the effect of

- excluding persons (including populations) from participation
- denying persons (including populations) from benefits
- subjecting persons (including populations) to discrimination because of their race, color, or national origin

Executive Order 12898 requires that each federal agency develop an agency-wide environmental justice strategy that

- promotes enforcement of all health and environmental statutes in areas with minority and low-income populations
- ensures greater public participation
- identifies differential patterns of consumption of natural resources among minority and low-income populations

Regarding public participation, Section 5-5 of Executive Order 12898 states that each agency, whenever practicable and appropriate, shall translate crucial public documents, notices, and hearings relating to human health or the environment for limited English-speaking populations. Section 6-606 states that Executive Order 12898 shall apply equally to Native American programs.

The CEQ has issued guidance on how to implement Executive Order 12898 and conduct an environmental justice analysis (CEQ 1997b), as has the USDA (1997).

The presidential memorandum that accompanied Executive Order 12898 specifically recognized the importance of procedures under NEPA for identifying and addressing environmental justice issues. Goals defining the purposes and policies of NEPA are consistent with the attainment of environmental justice (CEQ 1997b), as follows:

- to ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings

- to attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences
- to preserve important historic, cultural, and natural aspects of our natural heritage, and to maintain, wherever possible, an environment that supports diversity and variety of individual choice
- to achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities

Executive Order 12898 requires that, in complying with NEPA, agencies shall

- Analyze the environmental effects of proposed Federal actions, including human health, economic, and social effects on minority and low-income populations.
- Whenever feasible, identify mitigation measures that reduce significant and adverse environmental effects of proposed Federal actions on minority and low-income populations.
- Provide opportunities for community input in the NEPA process (see chapter 5 for more information about public involvement).

Departmental Regulation 5600-2 (USDA 1997) states that the USFS will analyze the environmental effects, including human health, economic, and social effects, of federal actions on minority and low-income communities when such analysis is required by NEPA.

Per 5600-2, in determining whether

- an effect on a minority and/or a low-income population is disproportionately high and adverse, agencies should consider whether the adverse effect is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.
- there are disproportionately high and adverse environmental or human health effects, including social and economic effects, on an identifiable low-income or minority population, agencies should consider, as appropriate, such effects as ...destruction or disruption of man-made or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality (USDA 1997).

Executive Order 13166, "Improving Access to Services for Persons with Limited English Proficiency," is intended to improve access to federal programs and activities for persons who, as a result of national origin, are limited in their English proficiency (LEP). Executive Order 13166 requires Federal agencies to examine the services they provide, identify any need for services to those with LEP, and develop and implement a system to provide those services so LEP persons can have meaningful access to them. The Department of Justice (DOJ) *Federal Agency LEP Guidance and Language Access Plan* is currently pending (DOJ n.d.). However, the "Language Access Assessment and Planning Tool for Federally Conducted and Federally Assisted



Programs,” published by the Department of Justice in May 2011, offers guidance on identifying limited English proficiency communities (DOJ 2011).

Valles Caldera Preservation Act restricts access to Redondo Peak within the preserve, as follows:

Section 105(g) REDONDO PEAK.— (1) IN GENERAL.—For the purposes of preserving the natural, cultural, religious, and historic resources on Redondo Peak upon acquisition of the Baca ranch under section 104(a), except as provided in paragraph (2), within the area of Redondo Peak above 10,000 feet in elevation— (A) no roads, structures, or facilities shall be constructed; and (B) no motorized access shall be allowed. (2) EXCEPTIONS.—Nothing in this subsection shall preclude— (A) the use and maintenance of roads and trails existing as of the date of enactment of this Act; (B) the construction, use and maintenance of new trails, and the relocation of existing roads, if located to avoid Native American religious and cultural sites; and (C) motorized access necessary to administer the area by the Trust (including measures required in emergencies involving the health or safety of persons within the area).

Valles Caldera Preserve Authorization assigned to Santa Clara Pueblo the right to purchase 5,046 acres at the headwaters of Santa Clara Creek in the northeast corner of the preserve. Santa Clara completed this transaction on July 25. Santa Clara and the United States also subsequently carried out a reciprocal exchange of conservation easements along their common boundary at the northeast corner of the preserve. These easements guarantee that no inappropriate development will occur along the part of the caldera rim that defines the boundary (VCT 2005i).

Valles Caldera National Preserve, Framework and Strategic Guidance for Comprehensive Management (2005) presents the framework for decision-making that the Valles Caldera Trust proposes to use as it develops programs and policies for the management and use of the preserve. Page 107, “Visitor Programs and Guidelines,” states, “activities must not conflict with religious and cultural priorities and uses” (VCT 2005i).

Methodology for Analyzing Impacts

The methodology for determining impacts on environmental justice is based on the guidance above. The geographic area of concern and the affected populations are identified in chapter 3, “Affected Environment.”

CEQ guidance on environmental justice acknowledges that “there is no standard formula for how environmental justice issues should be identified or addressed.” However, the CEQ provides principles as general guidance, and Departmental Regulation 5600-2 (USDA 1997) provides methodology for analyzing impacts on environmental justice. These documents were used to develop the following methodology for analyzing impacts:

- I. Identify the minority and low-income populations and Indian Tribes in the affected area that might be disproportionately affected (described in chapter 3).
- I. Identify cultural, social, occupational, historical, or economic factors that may amplify the natural and physical environmental effects of the alternatives, such as

None of the alternatives are expected to have a disproportionately high impact on environmental justice populations.

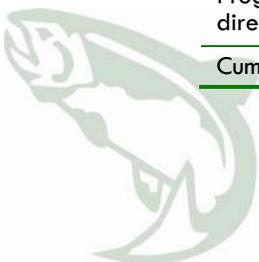
sensitivity of the community or population to particular impacts, the effects of disruption on community structure, and the nature and degree of the impact on the physical and social structure of the community.

2. Analyze potential impacts on the economic and social factors identified in step 2 above, as well as to subsistence consumption and human health related to such consumption, for each alternative. Determine differences in rates and patterns of subsistence consumption as compared to rates and patterns of the general population.
3. Determine whether the proposed alternatives would have a disproportionately high and adverse effect on human health or the environment, including socioeconomic effects, of minority, low-income, or tribal populations. Consider destruction or disruption of human-made or natural resources, destruction or diminution of aesthetic values, and destruction or disruption of community cohesion or a community’s economic vitality. As recommended by the CEQ, to determine disproportionately high and adverse environmental effects, this methodology considers the following (CEQ 1997):
 - whether the impacts meet the definition of significant under NEPA. Relevant NEPA significance criteria include:
 - effects on public health and safety
 - unique characteristics of the geographic area
 - precedent-setting effects for future actions
 - cumulative effects
 - loss or destruction of significant scientific, cultural, or historic resources
 - whether the impacts are significant (as defined by NEPA, above) and appreciably exceed or are likely to appreciably exceed those on the general population
4. Determine impacts on populations and/or individuals with limited English proficiency based on the number or proportion of persons with limited English proficiency likely to be affected by the alternatives.

Alternative 1: No Action

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: none Long term: negligible and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: negligible and adverse
Cumulative	Actions listed in table 4-1	Beneficial



Direct/Indirect Impacts

Implementation Level

Alternative 1 would result in negligible impacts due to the reduction in services and access to low-income, minority, and Native American visitors.

This alternative would result in the removal of the Valle Grande and Banco Bonito Staging Areas and the elimination of the interim recreation programs and activities. No additional structures or facilities would be built to accommodate visitors. There would be no measurable short-term impacts at the implementation level. Low-income, minority, and Native American visitors to the preserve would be adversely affected in the long term by a reduction in visitor services, as described in the “Visitor Experience” section. However, these impacts would be negligible and adverse and would not be disproportionately high compared to the general population.

The removal of the staging areas would not measurably affect persons with limited English proficiency. The preserve would notify the public of the effects of this alternative in English as well as in the most frequently encountered languages in the area.

Programmatic Level

The VCT would phase out current access through the staging areas, as well as interim programs and activities. Visitation would decrease considerably under this alternative compared to existing conditions. The result would be an adverse impact on local economies, as described in the “Socioeconomics” section, which would also affect low-income, minority, and Native American populations that rely on tourism income. These impacts would not be expected to disproportionately affect environmental justice populations, and there would be no impact on an environmental justice community’s economic vitality. Overall short- and long-term impacts related to tourism spending would be negligible and adverse.

Phasing out current access and interim programs and activities, with associated decreased visitation, would not affect community cohesion for any environmental justice populations in the study area.

Under alternative 1 would not change the landscape features that are important to the local Pueblos. Native American groups would continue to be allowed access for game hunting, plant gathering, mineral collecting, and ceremonial pilgrimage as under existing conditions.

As noted in chapter 3, the preserve is an important agricultural resource for many minority residents. Access for grazing or other land management activities would continue, consistent with the decisions and environmental documents guiding those specific actions. No impact on the affected populations would be expected compared to existing conditions because access for grazing would continue to be provided.

Also as noted in chapter 3, the preserve is a sacred place to Native Americans. Under this alternative, there would be no changes to landscape features that serve as focal points for physical and metaphysical interaction for local Pueblos. The removal of the staging areas may improve certain landscape features, such as the Valle Grande. Although general visitation would be curtailed under this alternative, Native American groups would still be permitted periodic on-site visits for game hunting, plant gathering, mineral collecting, and ceremonial pilgrimage as under existing conditions. Such access would continue to maintain and affirm cultural identities while also providing for subsistence consumption, with no related adverse health effects. Therefore, there would be no adverse impact or disproportionately high adverse impact on Native Americans seeking access to and traditional use of the preserve.

There would be no measurable change to persons with limited English proficiency from the reduction in visitor services. The preserve would notify the public of the effects of this alternative in English as well as in the most frequently encountered languages in the area.

Overall, there would be no disproportionately high adverse impacts on environmental justice populations under alternative 1. There would be little change from existing conditions. Any adverse impacts would be related to decreased tourism revenue and would be negligible.

Cumulative Impacts

Actions and activities that would affect this resource include those listed in table 4-1 under “environmental justice.” The 1993 Jemez National Recreation Area Act resulted in a beneficial impact on Native Americans by allowing the temporary closure of portions of the Jemez National Recreation Area to protect traditional and customary uses by local Tribes. This law currently benefits and will continue to benefit Tribes in the future. Actions described in the “Socioeconomics” section would also affect all environmental justice populations through employment opportunities. When these beneficial impacts are combined with the overall negligible adverse impacts from the no-action alternative, cumulative impacts would be beneficial because the effects of alternative 1 would not be substantial.

Alternative 2: Banco Bonito Visitor Contact Station

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Programmatic level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Cumulative	Actions listed in table 4-1	Beneficial

Direct/Indirect Impacts

Increased visitation under alternative 2 would increase tourism spending, and generate jobs for construction and visitor services, potentially benefiting environmental justice populations. Bilingual staff may be needed to serve visitors.

Implementation Level

Under alternative 2, the existing Banco Bonito Staging Area would be removed and a small-scale visitor contact station would be developed (up to 5,000 square feet), with associated day-use facilities, a small parking area, and roads to provide access to the preserve for personal vehicles and/or shuttles. Nonmotorized access from the visitor contact station [to the existing network of trails in the area](#) would be generally open and unlimited. As described under the “Socioeconomics” section, short-term deconstruction and construction impacts may result in the purchase of local goods and employment of local workers, including environmental justice populations. This beneficial impact would be slight.

The new visitor contact station and associated day-use facilities would draw considerably more visitors to the preserve, and thus to the general area, with increased spending locally on food, lodging, and other services (more detail is provided under

“Programmatic Level” for this alternative). The VCT may need to hire additional employees to operate and maintain the visitor contact station. As noted in chapter 3, a substantial proportion of the local population is Hispanic or Latino, with 24% speaking Spanish. Department of Justice guidance notes that “the greater the number or proportion of limited English proficiency persons in an area, the more likely language services are needed,” and recommends hiring bilingual staff for public contact positions (DOJ 2002). In addition, the VCT would also investigate the possibility of employing “Cultural Guides” from the local Tribes and Pueblos to provide educational services at the visitor contact station and vicinity. This would result in a slight beneficial impact on local environmental justice populations.

The Pueblo of Jemez has identified a sacred pilgrimage trail from the village of Walatowa to Redondo Peak, the Pueblo’s most important landmark in the preserve, which passes through the area of the proposed visitor contact station. The VCT would work with the Pueblo during final design to help identify a site for the visitor contact station and associated facilities that would avoid this trail and minimize impacts to it and its use by the Pueblo. The VCT would also work with the Pueblo to avoid and protect important plant procurement areas the Pueblo has identified in the vicinity.

Programmatic Level

Programmatic-level actions proposed under alternative 2 would increase visitation substantially over existing conditions by providing increased access and recreational opportunities throughout the preserve. Approximately 50,000 visitors would be expected annually, which would beneficially affect local economies through spending on food, lodging, and other services. These benefits would affect environmental justice populations employed in these sectors in both the short term and the long term.

As noted in chapter 3, a fairly high percentage of minority populations in the area live below the poverty level. Increased tourism to the area is expected to result in the need for additional services, potentially providing the opportunity for new business development and the need to hire employees. Increased tourism may also generate a desire for locally made crafts and interest in indigenous customs, also potentially creating job opportunities that support existing skills, knowledge, and expertise. As noted on the preserve’s web site, “The Valles Caldera National Preserve has long attracted people who wish to study and learn about a wide range of topics, such as ... cultural history In the years to come, the VCT will be exploring options to create meaningful programs on the preserve that offer lasting, long-term benefits to the area’s local communities, the state of New Mexico and the world beyond.” This commitment to education is reflected in the *Strategic Management Plan for the Valles Caldera National Preserve, Fiscal Years 2012-2018*, which calls for the establishment of “permanent and formal education programs for all ages” (VCT 2012). The VCT recognizes the educational value that minority populations in the area can provide to visitors, and will work with these populations to integrate them into high-quality educational programs. For example, the VCT would investigate the possibility of employing “Cultural Guides” from the local Tribes and Pueblos to provide educational programs within the preserve. These new opportunities would be designed to help address local populations living at and below poverty levels.

The development of the visitor contact station and associated increased visitation would not affect community cohesion for any environmental justice populations in the study area.

Access for grazing or other land management activities would continue. The preserve would continue to be an important agricultural resource for many minority residents. No impact on the affected populations would be expected compared to existing conditions because these programs would continue to be provided.

Under this alternative, improvement and increased use of preserve roads, increased recreational amenities (such as campgrounds), and the presence of substantially more visitors could change landscape aesthetics and features that are important to local Pueblos. However, the removal of the staging areas may improve certain landscape features, such as the Valle Grande.

Under alternative 2, shuttles and private vehicles would have access only to Level 3 and Level 4 roads, as shown in chapter 2. None of the preserve's Level 1 or Level 2 roads from the Valle Toledo to the Santa Clara Indian Reservation would be open to shuttle or private vehicle use. Therefore, no access to the Santa Clara Reservation or the easement would be permitted.

VCT staff would work with local Tribes and Pueblos to identify methods of sustaining on-site visits for cultural and religious practices without interference from increased public visitation, as well as identify and protect areas where Tribes and Pueblos gather important medicinal plants, herbs, and other resources. Native American groups would still be permitted periodic on-site visits for cultural and religious practices and to hunt and gather natural resources, as under existing conditions. Therefore, there would be no adverse impact or disproportionately high adverse impact on Native Americans seeking access to and traditional use of the preserve.

Increased visitation may result in a need to hire additional employees and an opportunity to comply with limited English proficiency guidance by hiring bilingual individuals. This would result in a slight beneficial impact on local environmental justice populations.

Overall, there would be no disproportionately high adverse impacts on environmental justice populations under alternative 2. Slight beneficial impacts would be expected primarily from increased local spending by visitors, which would affect environmental justice populations as well as general populations.

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 2 as well. When the beneficial impacts expected under alternative 2 are combined with the overall beneficial impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would be beneficial.



Alternative 3A: Entrada del Valle Visitor Center—Primary Access via Shuttle System

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Programmatic level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Cumulative	Actions listed in table 4-1	Beneficial

Direct/Indirect Impacts

Implementation Level

The same benefits expected under alternative 2 to environmental justice populations would occur, but to a greater degree due to higher visitation levels. Bilingual staff may be needed to serve visitors.

As mentioned in the “Socioeconomics” section, the central feature of alternative 3A is the development of a full-service visitor center that would offer a wide variety of visitor services and amenities, as well as associated day-use facilities. Short-term deconstruction and construction impacts may result in the purchase of local goods and employment of local workers, which could include environmental justice populations. This beneficial impact would be slight.

The visitor center and associated day-use facilities could become a destination in itself due to the extent of its offerings. The VCT would need to hire additional employees or concessionaires for the visitor center, providing an opportunity to comply with limited English proficiency guidance by hiring bilingual individuals. The VCT would also investigate the possibility of employing “Cultural Guides” from the local Tribes and Pueblos to provide educational services at the visitor center and vicinity. This would result in a slight beneficial impact on local environmental justice populations in the short and long term.

The VCT would work with local Tribes and Pueblos during final design to help identify a site for the visitor contact center and associated facilities to protect important plant procurement areas and archeology.

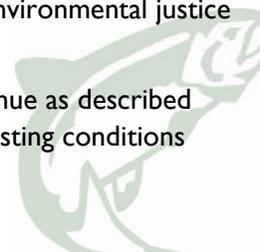
Programmatic Level

The VCT would work with local Pueblos to identify methods of protecting culturally important features of the preserve.

Alternative 3A would result in an increase to 120,000 visitors to the area, which would beneficially affect local economies, including environmental justice populations, through local spending on food, lodging, and other services. New employment opportunities as described under alternative 2 (such as hiring “Cultural Guides”) would also apply to this alternative, and would be designed to help address local populations living at and below poverty levels.

Increased visitation would not affect community cohesion for any environmental justice populations in the study area.

Access for grazing or other land management activities would continue as described under alternative 2. No impact would be expected compared to existing conditions because these programs would continue to be provided.



Alternative 3A could result in a change to landscape aesthetics and features that are important to local Pueblos, as described for alternative 2. Similarly, the preserve would work with local Tribes to identify methods of protecting these features, as well as areas where Tribes and Pueblos gather important medicinal plants, herbs, and other resources. VCT staff would also work with local Tribes to identify methods of sustaining on-site visits for cultural and religious practices without interference from increased public visitation. Therefore, there would be no adverse or disproportionately high impact on Native Americans who value and use the preserve.

Under alternative 3A, shuttle access would be restricted to only Level 4 roads as shown in chapter 2. None of the preserve’s Level 1 or Level 2 roads from the Valle Toledo to the Santa Clara Indian Reservation would be open to shuttle or private vehicle use. Therefore, no access to the Santa Clara Reservation or the easement would be permitted.

Like under alternative 2, increased visitation may result in a need to hire additional bilingual employees, such as shuttle bus drivers or resource interpreters, resulting in a slight beneficial impact on local environmental justice populations.

Overall, there would be no disproportionately high adverse impacts on environmental justice populations under alternative 3A. Beneficial impacts would be expected primarily from increased local spending by visitors, which would affect environmental justice populations as well as general populations.

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 3A as well. When the beneficial impacts expected under alternative 3A are combined with the primarily beneficial impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would be beneficial.

Alternative 3B: Entrada del Valle Visitor Center—Primary Access via Personal Vehicle

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Programmatic level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Cumulative	Actions listed in table 4-1	Beneficial

Direct/Indirect Impacts

Implementation Level

Alternative 3B would differ from alternative 3A in that visitors would access the preserve using personal vehicles rather than shuttle buses, discussed under “Programmatic Level” for this alternative. Implementation-level impacts would be the same as those under alternative 3A: beneficial.

Increased access under alternative 3B could affect landscapes that are important to local Tribes, and the use of the preserve for cultural and religious practices. VCT staff would work with Tribes to mitigate this possibility.

Programmatic Level

Impacts would be similar to those under alternative 3A. However, visitors would have more direct access to areas of the preserve, which could affect landscape aesthetics and features that are important to local Tribes, as well as affecting the use of the preserve for cultural and religious practices. Under alternative 3B, private vehicle access would be restricted to only Level 4 roads as shown in chapter 2. None of the preserve’s Level 1 or Level 2 roads from the Valle Toledo to the Santa Clara Indian Reservation would be open to private vehicle use. Therefore, no access to the Santa Clara Reservation or the easement would be permitted.

Like under alternative 3A, the preserve would work with local Tribes to identify methods of protecting these important cultural features, as well as areas where Tribes and Pueblos gather important medicinal plants, herbs, and other resources. VCT staff would also work with local Tribes to identify methods of sustaining on-site visits for cultural and religious practices without interference from increased public visitation. Programmatic-level impacts would therefore be beneficial, as described for alternative 3A.

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 3B as well. When the beneficial impacts expected under alternative 3B are combined with the primarily beneficial impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would be beneficial.

Alternative 4A: Vista del Valle Visitor Center—Primary Access via Shuttle System

Summary

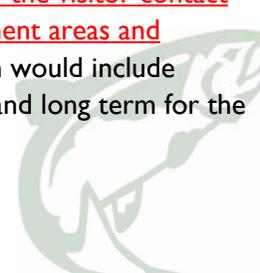
Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Programmatic level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Cumulative	Actions listed in table 4-1	Beneficial

Direct/Indirect Impacts

Implementation Level

Implementation and programmatic level impacts under alternative 4A would be similar to alternative 3A.

Like alternative 3A, the central feature of alternative 4A is the development of a full-service visitor center, with similar amenities and facilities. The VCT would work with local Tribes and Pueblos during final design to help identify a site for the visitor contact center and associated facilities to protect important plant procurement areas and archeology. Implementation-level impacts to local economies, which would include environmental justice populations, would be beneficial in the short and long term for the same reasons described for alternative 3A.



Programmatic Level

Alternative 4A would result in an increase to 120,000 visitors to the area, with the same beneficial economic impacts on environmental justice populations as described for alternative 3A. Other impacts on environmental justice populations at the programmatic level would be the same as those under alternative 3A, because the difference in the location of the visitor center and the amenities provided under alternative 4A would not create measurably different effects compared to alternative 3A.

Overall, there would be no disproportionately high adverse impacts on environmental justice populations under alternative 4A. Beneficial impacts would be expected primarily from increased local spending by visitors, which would affect environmental justice populations as well as general populations.

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 4A as well. When the beneficial impacts expected under alternative 4A are combined with the primarily beneficial impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would be beneficial.

Alternative 4B: Vista del Valle Visitor Center—Primary Access via Personal Vehicle

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Programmatic level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Cumulative	Actions listed in table 4-1	Beneficial

Direct/Indirect Impacts

Implementation-level impacts under alternative 4B would be similar to alternative 4A. Programmatic-level impacts would be similar to alternative 3B.

Implementation Level

Alternative 4B would differ from alternative 4A in that visitors would access the preserve using personal vehicles rather than shuttle buses, discussed under “Programmatic Level” for this alternative. Implementation-level impacts would be the same as those under alternative 4A: beneficial.

Programmatic Level

Impacts would be similar to those under alternative 3B regarding more direct visitor access to the preserve. Programmatic-level impacts would therefore be beneficial, as described for alternative 3B.

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 4B as well. When the beneficial impacts expected under alternative 4B are combined with the primarily beneficial impacts of

other past, present, and reasonably foreseeable future activities, cumulative impacts would be beneficial.



Appendix B - Errata

Section Change – Chapter 4, Carbon Footprint and Air Quality

(Revisions are shown in red in the text that follows. Additions are underlined and deleted text is crossed out.)

Carbon Footprint and Air Quality

Guiding Regulations and Policies

Executive Order 13514, “Federal Leadership in Environmental, Energy, and Economic Performance,” requires all federal agencies to submit a comprehensive GHG inventory and establish a percentage reduction target. Executive Order 13423, “Strengthening Federal Environmental, Energy, and Transportation Management,” identifies six areas for reducing the environmental footprint. GHG reporting will help agencies understand their emission profile and improve environmental performance in the following six environmental footprint areas (the scopes described in chapter 3 are added to each):

- Energy (Scopes 1 and 2)
 - Improve energy efficiency and reduce greenhouse gas emissions through the reduction of energy.
 - Shift toward renewable energy such as solar power and biomass.
- Water (Scopes 1 and 2)
 - Reduce water consumption in buildings, grounds, and related facilities.¹
- Green purchasing (Scope 3)
 - Increase the sustainability performance of purchased goods and services and the performance of suppliers, contractors, and partners.
 - Increase the number of buildings that are Leadership in Energy and Environmental Design (LEED) certified.
- Fleet and transportation (Scope 1)
 - Improve transportation and travel practices, which in turn will reduce harmful emissions, increase operational and fuel efficiency, and reduce the use of nonrenewable fuel.
- Waste prevention and recycling (Scope 3)
 - Minimize waste generation and reduce landfill use. Reduce, reuse, and recycle materials.
- Sustainability leadership
 - Make strong efforts to meet or exceed the requirements of executive orders and policies related to sustainable operations.
 - Leadership and management have a commitment to communicate the agency’s vision for sustainable operations (USFS 2010c).

As mentioned in chapter 3, the Clean Air Act has defined national air quality standards that set allowable concentration and exposure limits for six pollutants considered harmful to human health. These standards are applied and administered at the state

¹ Water typically requires treatment prior to use and prior to return to the environment, and it is pumped and pressurized to reach consumers. These activities require energy, resulting in greenhouse gas emissions.

level. Areas that do not comply with NAAQS are known as “nonattainment” and must comply with a number of special requirements.

Methodology for Analyzing Impacts

Changes to GHG emissions (which ultimately affects climate change) and air quality can result in regional and/or global effects. This analysis considers the impacts of those changes at the regional level. The methodology for determining impacts on the preserve’s carbon footprint uses a qualitative approach based on how the alternatives address the six areas for reducing the environmental footprint described in the guidance above. The context for assessing direct impacts is the preserve itself, and areas under its direct influence. The context for indirect impacts extends outside the preserve to varying degrees to account for visitor miles traveled, transportation of purchased goods and generated waste, etc.

Air quality is evaluated in a dynamic setting of space and time, and relates to the production of particulate matter and its dispersion. The methodology for determining impacts to air quality uses a qualitative approach based on how the alternatives could affect criteria pollutant emissions and nearby Class I areas through increased visitation to the preserve (implementation level) and within the preserve (programmatic level).

Alternative 1: No Action

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial to negligible and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short/long term: beneficial
Cumulative	Actions listed in table 4-1	Moderate -Minor and adverse

Direct/Indirect Impacts

Implementation Level

Energy consumption would decrease under alternative 1, but there would be no opportunity to communicate the VCT’s vision for sustainable operations.

This alternative would result in the removal of the Valle Grande and Banco Bonito Staging Areas and the elimination of the interim recreation programs and activities. Energy consumption would be reduced and waste generation slightly reduced through the removal of the staging areas, although the change to the amount of CO₂ emitted from stationary combustion sources or electricity usage would be slight. No change related to fugitive emissions would occur. There would be no change to water consumption because the staging areas do not use surface water or groundwater. There would be no measurable change regarding how the VCT purchases goods and services. No LEED-certified buildings would exist at the preserve. There would be limited opportunity to communicate the VCT’s vision for sustainable operations. For these reasons, carbon footprint impacts at the implementation level would range from beneficial to negligible and adverse in the short and long term compared to existing conditions.

Approximately 25,000 people participated in public programs at the preserve in 2010. Assuming no change in visitation under the no-action alternative, 25,000 fewer people would drive to the preserve to recreate. Some people may still drive to the preserve to hike the two free trails near Rabbit Mountain. It is expected that many of these visitors would be local or passing through on the way to other destinations, representing a small number of visitors and a negligible adverse indirect impact on carbon footprint and air quality.

Programmatic Level

The visitor services currently provided by the existing temporary facilities would not be replaced. Reducing the amount of tours available would slightly reduce harmful emissions from vans, increase operational and fuel efficiency, and reduce the use of nonrenewable fuel. The amount of emissions from mobile combustion sources would decrease due to fewer tours and fewer visitors driving to and in the preserve. Under the no-action alternative, the number of miles driven within the preserve is expected to be reduced from approximately 75,000-100,000 to approximately 30,000-50,000 annually (Rodriguez, pers. comm. 2012c). As a result, short- and long-term impacts would be beneficial at the programmatic level.

Cumulative Impacts

Actions and activities that would affect visitors include those listed in table 4-1 for carbon footprint and air quality. GHG and criteria pollutant emissions increased in the past from roadway development on nearby USFS lands, which allowed for more vehicle emissions, including emissions from logging trucks. Logging and clearing trees for roads also reduced the area's capacity to offset GHGs locally. The 1987 *Santa Fe National Forest Land and Resource Management Plan* (USFS 1987) increased old-growth management areas, eliminated unneeded roads, and decreased sawtimber sales, which would have helped offset past GHG impacts. In the preserve, forest cover has returned to previously disturbed areas, and all unplanned fires are suppressed. The presence of more trees will help sequester CO₂ and offset GHG emissions. Similarly, the Collaborative Forest Landscape Restoration project (USFS and VCT 2010) will restore sustainable ecological forest conditions on 210,000 acres in the Jemez Mountains.

Increased tourism and transportation improvements have drawn visitors to the area, whose vehicles contribute to GHG and criteria pollutant emissions. Plans to increase tourism (e.g., by adding scenic byways) and improve the local economy would continue that impact. Planned public transportation services and bike routes would help offset some emissions from personal vehicles.

Oil and gas production on USFS land and in Rio Arriba County has contributed, and will continue to contribute, to GHG and criteria pollutant emissions through the provision of fossil fuels for consumption. Recent wildfires contributed greatly to GHG and particulate matter emissions through the burning of wood. As the forests recover, trees will return to the area to sequester GHG emissions. The implementation of the *Santa Fe National Forest Land and Resource Management Plan* (USFS 1987) will allow for natural recovery from wildfire. The plan also permits timber harvesting for commercial purposes.

The actions described above have had and will continue to have both adverse and beneficial effects on GHG and criteria pollutant emissions. In general, these actions increased emissions in the area, with oil and gas production having a broader impact. The result would be a ~~moderate-minor~~ adverse effect at the regional level. The slight beneficial effects expected under the no-action alternative would not affect the overall impacts from these other actions. Therefore, cumulative impacts would remain the same: ~~moderate-minor~~ and adverse.

Alternative 2: Banco Bonito Visitor Contact Station

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: minor to moderate <u>negligible</u> and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: moderate <u>negligible</u> and adverse
Cumulative	Actions listed in table 4-1	A moderate <u>Minor</u> and adverse

Direct/Indirect Impacts

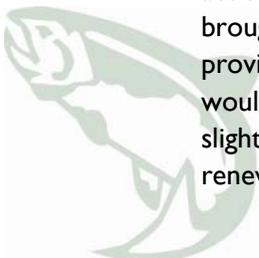
Implementation Level

Carbon and criteria pollutant emissions would increase due to the development of the visitor contact station, activities associated with the increased number of guests, and increased services (shuttles, programs) under alternative 2 compared to existing conditions.

Under alternative 2, the existing Banco Bonito Staging Area would be removed and a small-scale visitor contact station would be developed (up to 5,000 square feet), with associated day-use facilities, a small parking area, and roads to provide access to the preserve for personal vehicles and/or shuttles, which would be used on high-use days to accommodate increased visitation.

The visitor contact station would be LEED certified and would incorporate recycled materials. The building would be located in a previously disturbed area. Therefore, no trees, which sequester CO₂, would be removed. As described in chapter 2, the building would use renewable energy sources and incorporate several energy efficiency concepts, such as passive and active solar power, Trombe walls, and a geothermal heat pump to reduce heating requirements. Passive and active solar power would produce electricity, with the potential to return electricity to the grid. The use of daylighting and low-energy appliances would reduce electrical demand. Therefore, the use of stationary combustion sources would be minimal.

Securing a water source at this location would be difficult. Rainwater harvesting would be used if appropriate, and potable water would be used only for hand washing and drinking. The preserve would use graywater in toilets or composting toilets. These actions would reduce or eliminate the amount of potable water that would need to be brought to the site. If water did need to be pumped to the site, solar energy would provide the pumping power and the energy needed to do so. Purchased electricity would be used if solar was not sufficient, in which case GHG emissions would increase slightly where electricity is generated, depending on the source (e.g., coal vs. renewable).



Waste generated at the visitor contact station would be minimized and recycled to the extent practicable. The VCT would purchase local goods and use local services when feasible to help control the amount of GHGs emitted regionally. The visitor contact station would provide an opportunity for the VCT to communicate sustainable design concepts in operation and to demonstrate nature and technology working together. The LEED design and other sustainable practices would provide educational opportunities for the public.

Annual visitation, which was approximately 25,000 in 2010, would increase to an estimated 50,000, representing an approximate doubling of visitors. This would result in an increase of mobile combustion sources from visitors driving to and from the visitor contact station. It is assumed that the percentage of New Mexico visitors to the preserve would remain high, at approximately 84%, with the majority coming from the preserve's region. It is also assumed that the majority of visitors from other states would include the preserve as part of a larger northern New Mexico itinerary, resulting in a small proportion of GHGs ~~and criteria pollutants~~ emitted to visit the preserve. ~~Although this increased level of visitation would represent a considerable increase in vehicles traveling to the preserve, the magnitude of change would not be measurable in the regional context, measurable regional indirect impact, but would not alter the amount of emissions in the area, resulting in a long-term minor adverse impact. Long-term impacts would be negligible.~~

Negligible, localized adverse short-term impacts at the implementation level would occur due to emissions from construction vehicles. Some long-term beneficial impacts would occur if the VCT returns electricity to the grid. Beneficial impacts would also result from educational opportunities provided by the LEED building and other practices. This alternative would represent the VCT's commitment to meet or exceed the requirements of the sustainability executive orders.

Although implementing sustainable building concepts at the visitor contact station would limit stationary combustion sources as much as possible, GHG emissions would still increase over existing conditions because no visitor contact station or visitor center currently exists. Visitors driving to the preserve would nearly double, increasing indirect GHG ~~and criteria pollutant~~ emissions. No shuttle or personal vehicle access would be permitted beyond the visitor contact station into the preserve during winter when inversions and associated poor ventilation typically occur. Because the visitor contact station is not expected to function as a primary standalone destination, few visitors are expected there during winter.

As noted in the "Transportation" section, the level of service for this alternative would remain at B or better, where traffic would operate at a reasonable free-flow rate (i.e., idling and stop-and-go traffic that contributes to carbon monoxide would be infrequent).

Criteria pollutant emissions at the state level have decreased in the past five years, with particulate matter emissions below the NAAQS for Sandoval County. As mentioned in chapter 3, the EPA states that substantial progress made by motor vehicle emission control is expected to continue into the future. Increased visitation to the preserve, coupled with increasing improvements, is not expected to exceed the NAAQS. Similarly, increased emissions resulting from more visitors driving to the preserve are

not expected to measurably affect the Class I areas at Bandelier or San Pedro Parks. Overall, long-term implementation-level impacts would not be measurable ~~and would affect the region as more people drive to the visitor contact station, but the contribution would be slight~~. Therefore, long-term impacts would be ~~minor to moderate and adverse~~ negligible at a regional level.

Programmatic Level

As noted in chapter 3, the total carbon footprint from transporting visitors within the preserve is estimated at approximately 33 tons of CO₂ emissions per year, which would be 66 when doubled (i.e., from visitation increasing from approximately 25,000 in 2010 to approximately 50,000). Under this alternative, visitors would have more vehicular access farther into the preserve than under existing conditions, ~~substantially~~ increasing the amount of mobile combustion sources and associated GHG and criteria pollutant emissions in the preserve. Shuttles would be used on high-use days as warranted and for special events and tours. It is not known precisely how often shuttles would operate, so it is not possible to predict the amount of GHGs and criteria pollutants they would emit. Because vans are currently used to provide tours, which would continue under this alternative, it is assumed that shuttle use to handle peak demand would represent additional mobile combustion sources compared to existing conditions. Therefore, emissions from shuttle use would likely be higher compared to existing conditions. Over the years, the VCT would phase in more fuel-efficient shuttle vehicles, helping to reduce the amount of GHGs and criteria pollutants they emit. In addition, the preserve's peak visitation occurs during summer when the highest number of good to excellent ventilation days occur, which would help offset air quality impacts. During winter when weather inversions occur and ventilation can be poor, visitation is low, with corresponding fewer impacts on air quality. Overall, increased driving by visitors throughout the preserve when roads are open to personal vehicles in spring, summer, and fall, coupled with increasing motor vehicle emission control improvements, is not expected to exceed NAAQS or measurably affect the Class I areas at Bandelier or San Pedro Parks.

No new roads would be built; the VCT would upgrade existing roads for vehicular use. Driving on unpaved roads can reduce fuel economy (USDOE 2012). Upgraded roads may improve fuel efficiency, but likely not enough to offset increased vehicular use.

Negligible, localized adverse short-term impacts would occur from construction crews improving the preserve's roads and creating related facilities, such as parking lots. Although the number of vehicles driving within the preserve would increase substantially, changes to GHG and criteria pollutant emissions would not be measurable at the regional level. Long-term impacts would be negligible. In the long term, programmatic-level impacts would be adverse compared to existing conditions, primarily due to increased vehicular use in the preserve. Long-term programmatic-level impacts would be measurable and would influence the VCT's carbon footprint and, to a lesser extent, air quality, resulting in moderate adverse impacts.

Under alternative 2, increased visitation to the preserve, coupled with increasing improvements, is not expected to exceed the NAAQS. Vehicles used



Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 2 as well. When the long-term ~~minor to moderate~~negligible adverse impacts expected under alternative 2 are combined with the ~~moderate~~minor adverse impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would remain ~~moderate~~minor and adverse.

Alternative 3A: Entrada del Valle Visitor Center—Primary Access via Shuttle System

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: minor to moderate <u>negligible</u> and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: moderate <u>negligible</u> and adverse
Cumulative	Actions listed in table 4-1	moderate <u>Minor</u> and adverse

Emissions would increase under alternative 3A due to the development of the visitor center, activities associated with the increased number of guests, and increased services (shuttles, programs).

Direct/Indirect Impacts

Implementation Level

The central feature of alternative 3A is development of a full-service visitor center, with associated day-use and parking facilities. The visitor center would be up to 10,000 square feet, accommodating substantially more visitors than the existing Valle Grande Staging Area, which would be removed. Like under alternative 2, the visitor center would be LEED certified and would incorporate recycled materials. The building would use renewable energy sources and employ several energy efficiency concepts, as described in chapter 2. Passive and active solar power would produce electricity, with the potential to return electricity to the grid. The use of daylighting and low-energy appliances would reduce electrical demand. Therefore, the use of stationary combustion sources would be minimal.

The building would be located in a previously undisturbed area. Some trees, which sequester CO₂, would be removed to accommodate the new facilities (see the “Vegetation” section). This amount would be negligible in the context of the preserve’s forested landscape.

The highly developed visitor center and associated day-use facilities could become a destination in itself due to the extent of its offerings, drawing people to the site who may not explore the preserve further. Recreational uses concentrated at the visitor center would reduce the amount of vehicle trips farther into the preserve for those people who are satisfied with the visitor center’s offerings.

This alternative would greatly increase visitation. It is expected that approximately 120,000 guests would visit the visitor center each year, compared to approximately 25,000 visitors who participated in public programs in 2010. Such a change would

increase regional mobile combustion sources from people traveling to the preserve. ~~Impacts would be similar to those described for alternative 2 (e.g., regional vs. out-of-state visitation), but to a much larger degree. This increased visitation would represent a measurable regional indirect impact that may influence the amount of GHG and criteria pollutant emissions in the area, particularly if the visitor center becomes a primary destination for out-of-state visitors rather than an addition to an existing itinerary. The result would be a moderate adverse impact.~~

The site for alternative 3A has good water sources, which would require minimal transportation. Conservation actions would reduce or eliminate the amount of potable water that would need to be brought to the site, as described for alternative 2. If water did need to be pumped to the site, solar energy would provide the pumping power. Purchased electricity would be used if solar was not sufficient, in which case GHG emissions would increase slightly where electricity is generated, depending on the source (e.g., coal vs. renewable).

Like under alternative 2, waste generated at the visitor center would be minimized and recycled, and the VCT would purchase local goods and use local services when feasible. The visitor center would provide an opportunity to communicate sustainable design concepts, and the LEED design would provide educational opportunities for the public. This alternative would represent the VCT's commitment to meet or exceed the requirements of the sustainability executive orders.

Negligible, localized adverse short-term impacts would occur due to emissions from construction vehicles. Some long-term beneficial impacts would occur if the VCT returns electricity to the grid. Beneficial impacts would also result from educational opportunities provided by the LEED building and other practices.

Although implementing sustainable building concepts at the visitor center would limit stationary combustion sources as much as possible, GHG emissions would still increase over existing conditions because no visitor center currently exists. As noted in the "Transportation" section, the level of service for this alternative would remain at B or better, where traffic would operate at a reasonable free-flow rate. Highway performance could change to LOS C, which is a stable transportation flow, during peak hours. Due to improvements in transportation emissions technology, the increased number of vehicles traveling to the preserve is not expected to measurably affect mobile source GHG emissions at a regional level. Continued improvements to motor vehicle emission controls would help keep emissions below NAAQS, despite a substantial increase in motor vehicles being driven to the preserve. Increased emissions from more visitors driving to the preserve are not expected to measurably affect nearby Class I areas.

Overall, long-term implementation-level impacts would substantially increase GHG emissions from existing conditions at the preserve, but would not measurably affect GHG emissions or air quality at the regional level. Therefore, impacts would be negligible. ~~be measurable and would influence the VCT's carbon footprint and, to a lesser extent, air quality, primarily from increased visitation and associated indirect vehicle emissions. Impacts would therefore be minor to moderate and adverse.~~

Programmatic Level

Alternative 3A seeks to reduce emissions through the use of shuttles in lieu of personal vehicles.

Like alternative 2, programmatic level actions proposed under alternative 3A would provide increased access and recreational opportunities throughout the preserve. Alternative 3A seeks to reduce emissions through the use of shuttles in lieu of personal vehicles. These alternatives could create a demand for connecting existing bus routes in Los Alamos and Jemez Springs to the preserve². Primary visitor access would be via shuttle bus during peak season, with limited personal vehicle access through a permit system. Use of a shuttle system would limit the number of mobile combustion sources within the preserve; however, GHG and criteria pollutant emissions would be higher compared to existing conditions due to substantially increased visitation. As the VCT phases in fuel-efficient electric vehicles, emissions may be reduced somewhat, but would still occur where the purchased electricity is generated, depending on the source (e.g., coal or renewable resources).

Use of shuttles within the preserve would minimize impacts to air quality by limiting the number of vehicles emitting pollutants. No shuttle or personal vehicle access would be permitted beyond the visitor center into the preserve during winter when inversions and associated poor ventilation typically occur. People may still visit the visitor center and recreate using the facilities there, although visitation would be low. No measurable change to air quality is expected during winter months. No NAAQS exceedances and no measurable impacts to nearby Class I areas are expected from increased motor vehicle use within the preserve.

Visitors would be able to bike into the preserve along a dedicated bike path, which would also help limit the number of motor vehicles entering the preserve. Personal vehicles would be allowed to access the Banco Bonito Staging Area for horseback riding and special events, and hunters would continue to drive to their destinations, with associated emissions. It is not known how many visitors would drive their vehicles to Banco Bonito Staging Area or hunting destinations, so an increase or decrease in emissions from mobile combustion sources compared to existing conditions cannot be determined.

Slight beneficial impacts would result from carpooling programs for administrative staff and from providing non-motorized access to the preserve from its perimeter. Indirect beneficial impacts would result from proposed environmental and ecotourism activities that could focus on how visitors can reduce GHG and criteria pollutant emissions.

No new roads would be built; the VCT would upgrade existing roads for vehicular use. Upgraded roads would improve fuel efficiency, but not likely enough to offset increased vehicular use.

Negligible, localized short-term impacts would occur from improving the preserve's roads and constructing related facilities, such as parking lots. In the long term, programmatic level impacts would substantially increase GHG emissions from existing conditions at the preserve, but would not measurably affect GHG emissions or air

² While this hypothesis is reasonable, no market research has been undertaken to support it.

~~quality at the regional level. Therefore, impacts would be negligible, occur primarily due to increased vehicular use within the preserve. Long-term programmatic-level impacts would be measurable and would influence the VCT's carbon footprint and, to a lesser extent, air quality, resulting in moderate impacts.~~

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 3A as well. In addition, as noted under “Transportation” in table 4-1, MRCOG may provide public transportation services to areas along NM-4 as well as new biking facilities, providing alternatives to driving to the preserve. These facilities would combine with the preserve’s shuttle system to help reduce the reliance on personal vehicles to experience the preserve, which would constitute a beneficial impact. However, these actions would not be sufficient to change the overall cumulative impacts on the area’s emissions. When the ~~minor to moderate~~negligible adverse impacts expected under alternative 3A are combined with the ~~moderate-minor~~ adverse impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would remain ~~moderate-minor~~ and adverse.

Alternative 3B: Entrada del Valle Visitor Center—Primary Access via Personal Vehicle

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: minor to moderate negligible and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: major-negligible and adverse
Cumulative	Actions listed in table 4-1	Major-Minor and adverse

Direct/Indirect Impacts

Implementation Level

Alternative 3B would differ from alternative 3A in that visitors would access the preserve using personal vehicles rather than shuttle buses, discussed under “Programmatic Level” for this alternative. At the implementation level, there would be little measurable difference between the alternatives. Therefore, impacts would be the same as those under alternative 3A: negligible and adverse in the short and long term, ~~and minor to moderate and adverse in the long term.~~

Programmatic Level

GHG emissions would increase from personal vehicle use in the preserve. It is anticipated that 120,000 people would visit the preserve annually, almost five times the number of visitors in 2010. It is estimated that GHG emissions from transportation of visitors within the preserve is currently 33 tons of CO₂ per year. This would potentially increase to approximately 165 tons of CO₂ annually based on current travel patterns

within the preserve, representing a substantial increase over the preserve's existing carbon footprint and resulting in a major adverse long-term impact.

Air quality would be affected by a large increase in motor vehicles driving within the preserve. These impacts would be more prevalent during summer, when ventilation is typically good to excellent, which would reduce impacts. During winter, no shuttle or personal vehicle access would be permitted beyond the visitor center into the preserve when poor ventilation typically occurs. People may still visit the visitor center and recreate using the facilities there, although winter visitation would be low. No measurable change to air quality is expected during winter months. Short-term impacts would be the same as those described for alternative 3A, negligible and adverse. Overall, no NAAQS exceedances and no measurable impacts to nearby Class I areas are expected from increased motor vehicle use within the preserve when roads are open to personal vehicles in spring, summer, and fall.

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 1 would apply to alternative 3B as well. When the long-term ~~moderate to major~~negligible adverse impacts expected under alternative 3B are combined with the ~~moderate~~minor adverse impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would be ~~major~~minor and adverse.

Alternative 4A: Vista del Valle Visitor Center—Primary Access via Shuttle System

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: minor to moderate <u>negligible</u> and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: moderate <u>negligible</u> and adverse
Cumulative	Actions listed in table 4-1	Moderate <u>Minor</u> and adverse

Direct/Indirect Impacts

Implementation Level

Alternative 4A would have obstacles to providing water to the visitor center, and existing electrical power is almost two miles away. VCT would likely have to expand utilities to serve the visitor center.

Like alternative 3A, the central feature of alternative 4A is the development of a full-service visitor center, with similar amenities and facilities. The primary difference is that the alternative 4A site presents many obstacles to securing a viable water source, and electrical power is almost 2 miles away. Although renewable energy sources would be used as much as practical, they may not be sufficient to provide necessary utilities. Obtaining utilities at this location could require additional energy sources. However, this difference between alternatives 3A and 4A would not be substantial, and impacts would be the same for the reasons described for alternative 3A: negligible adverse short-term impacts would occur due to emissions from construction vehicles, and overall negligible long-term ~~implementation-level~~ impacts would result at the regional level would be

~~minor to moderate and adverse due to substantially more visitors driving to the preserve.~~

Programmatic Level

There would be no measurable difference between alternatives 3A and 4A at the programmatic level; therefore, negligible adverse short- and long-term impacts ~~and moderate adverse long-term impacts would occur.~~

Cumulative Impacts

The other past, present, and reasonably foreseeable future actions described for alternative 3A would apply to alternative 4A as well. When the long-term ~~minor to moderate~~negligible adverse impacts expected under alternative 4A are combined with the ~~moderate~~-minor adverse impacts of other past, present, and reasonably foreseeable future activities, cumulative impacts would be ~~moderate~~-minor and adverse.

Alternative 4B: Vista del Valle Visitor Center—Primary Access via Personal Vehicle

Summary

Effect	Context	Intensity
Implementation level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: moderate - <u>negligible</u> and adverse
Programmatic level: direct/indirect	Within the bounds of the study area	Short term: negligible and adverse Long term: major - <u>negligible</u> and adverse
Cumulative	Actions listed in table 4-1	Major - <u>Minor</u> and adverse

Implementation-level impacts under alternative 4B would be similar to alternative 4A. Programmatic-level impacts would be similar to alternative 3B.

Direct/Indirect Impacts

Implementation Level

Alternative 4B would differ from alternative 4A in that visitors would access the preserve using personal vehicles rather than shuttle buses. Implementation-level impacts would be the same as those under alternative 3A: negligible and adverse in the short and long term ~~and moderate and adverse in the long term.~~

Programmatic Level

Short- and long-term impacts would be negligible and adverse ~~and long-term impacts would be major and adverse~~, as described for alternative 3B, because only slight differences would exist between alternatives 3B and 4B.

Cumulative Impacts

Cumulative impacts would be major and adverse, as described for alternative 3B.



Chapter 5 Consultation and Coordination



The intent of NEPA is to encourage the participation of federal and state-involved agencies and affected citizens in the assessment procedure, as appropriate. This section describes the consultation that occurred during development of this EIS. This chapter also includes a description of the public involvement process, [a summary of the comments received during the public and agency comment period for the Draft EIS, and the selection of a preferred alternative based on review and analysis of public and agency input. Finally, this chapter includes](#) a list of the recipients of the draft document [and a list of preparers of the analysis.](#)



This page intentionally left blank.



5. Consultation and Coordination

The VCT undertook the following activities to involve the public and agencies in preparation of this EIS.

Public Involvement Activities

Public Scoping

Soon after the preserve transferred to federal ownership, the VCT held listening sessions with the public in 2001. Most people had never been to the preserve and had no frame of reference, so the VCT undertook an effort to introduce people to the landscape. The information from these sessions helped identify public concerns and desires and helped the VCT move forward with planning efforts.

In 2006, the VCT formally initiated access and use planning, which led to public workshops hosted by the VCT in 2007 to identify goals and assess sites for development. These workshops were held in Jemez Springs, Pojoaque, Los Alamos, and Rio Rancho, New Mexico, and consisted of open houses with staffed stations and facilitated workshops. Preserve staff members tried to solicit as much public feedback as possible about the landscape and potential changes to it within the framework of the act that established the preserve. Following these meetings, the VCT facilitated another workshop to identify values and activities, balancing various recreational activities and management actions. Information gathered at these workshops helped define the scope of analysis for this EIS.

Public Notification

The VCT published a notice of intent to prepare an environmental impact statement for a public use and access plan in the Federal Register Friday, August 28, 2009. The VCT posted information to its website, released a letter dated August 13, 2009, and released flyers inviting the public to give input on the EIS by attending public workshops or submitting comments online through the VCT website. The VCT held public workshops September 14 and 15, 2009, described in more detail below.

Public Workshops

The intent of the public workshops for this EIS was to solicit feedback on the preliminary conceptual alternatives the VCT had identified. The first meeting was held September 14, 2009, at the Hilton Garden Inn in Albuquerque, New Mexico. The second was held September 15 at the Santa Fe Community College in Santa Fe, New Mexico. Both meetings began at 5:30 p.m. and concluded at approximately 8:00 p.m. The general format of the meetings included an open house, where attendees could visit several stations with background information and descriptions of the various planning elements the preserve had identified to incorporate into alternatives development. The elements consisted of access, capacity, activities, level of development, financing, and values. VCT staff members and consultants were available to describe the process and answer questions. After each open house, the VCT presented a brief overview of the planning process, followed by group discussions.



Public Alternatives Meeting

The VCT hosted public meetings in Santa Fe and Jemez Springs, New Mexico, to solicit public input on the alternatives developed for analysis in the EIS. The meetings were held March 1, 3, and 5, 2011. The first was held in Santa Fe; the latter two were held in Jemez Springs at the VCT administrative offices. The meetings combined short presentations and open house areas where people could talk to VCT staff members. Brief overviews and presentations were supplemented by more detailed information available in both hardcopy and electronic formats. This information was available at the meetings, on the VCT web site, or by mail (upon request).

Other Public Outreach Activities

In preparation of the public workshops that followed the publication of the notice of intent, the VCT created an area of its website devoted to presenting information about elements the VCT had identified to help guide the development of alternatives. This web page was designed to allow users to provide comments and feedback about each planning element (access, capacity, activities, development, financing, and values) in order to help build the alternatives. Each element was fully described with a narrative and summary table. The public was able to register and enter comments that were visible to all site users. The website also included an overview, videos, maps, and a glossary of terms. As with the comments received during public meetings, the VCT considered the comments received on this interactive web page in the development of the alternatives. This web page was updated prior to the March 2011 alternatives meetings to provide detailed information about the purpose and need, proposed action, alternatives eliminated, and the alternatives being considered in detailed analysis. The public was provided



an opportunity to comment on these sections of the analysis through an interactive forum hosted on the web page. Following the comment period the web pages remained active throughout the analysis.

The Spring/Summer 2009 edition of the preserve's newsletter, *La Ventana en los Valles*, included an article on the back cover announcing the start of the public access and use planning process (VCT 2009i). This article described the study conducted by the Economics Group of Entrix, which identified possible alternatives the VCT could pursue to meet its goals of environmental and financial self-sufficiency. The article announced that these alternatives, along with others, would be available for public input through open houses planned for that summer. The article noted that the intent of the open houses was to "invite public participation and interaction with VCT specialists who will provide exhibits and interpret the access and use combinations. The public testing of these combinations will stimulate new ideas and concepts that will potentially add to self-sufficiency and long-term management of the preserve."

In August 2009 the VCT published a document titled Public Scoping Information on its website for the public access and use plan, which consolidated key documents from the website into a single pdf file. This included a letter to the public soliciting feedback, a flyer announcing public meetings held in 2009, a glossary of terms, guidelines for submitting comments online, a description of the initial alternatives, maps, and financing information.

The Fall 2009 *La Ventana en los Valles* newsletter included an article on the back cover about public participation in planning and decision-making as an essential component of NEPA, with specific details about how to become involved in the progression of this EIS (VCT 2009h). The article listed several methods the public could use to become involved and offer comments, encouraging participation in the public access and use planning process.

The Spring 2011 *La Ventana en los Valles* newsletter included an article about the public meetings held in March 2011 to present the alternatives to be analyzed in the EIS (VCT 2011a). The newsletter updated readers on the status of the EIS and assured them that public comments had been instrumental in developing the alternatives. The article also notified readers that the online interactive commenting feature developed on the VCT website, which had allowed people to share their comments about the EIS, had ended. The article noted that all information and reports about the EIS could still be downloaded from the website, and that readers could request that information be sent to them via surface mail by contacting the VCT via telephone or email or at its physical location in Jemez Springs.

Public Outreach Associated with Publication of Draft EIS

The VCT released the Draft EIS on June 11, 2012. The release was announced through a Notice of Availability published in the Federal Register, a legal notice published in the Albuquerque Journal, and press releases to the Albuquerque Journal and other local print, radio, and television media outlets. A newsletter was sent to 2,249 agencies, individuals, and organizations. The newsletter included detailed



information and electronic links to view the Draft EIS, find background information, attend public meetings, visit the locations being considered for development, and submit comments.

Paper copies of the complete Draft EIS, a CD, and separate summary were distributed to the USFS (Region, Forest, and District offices), Bandelier National Monument, and Jemez, Zia, and Santa Clara Pueblos (whose lands border the preserve). To ensure the public had access to paper copies of the Draft EIS, the complete package was also distributed to Caldera Action and the following local libraries: Los Alamos County Library, Albuquerque-Bernalillo County Library System, Cuba Public Library, Jemez Pueblo Community Library, Espanola Public Library, Santa Fe Public Library, Loma Colorado Library, and the New Mexico State Library in Santa Fe. On request, a paper copy was also sent to White Rock Public Library and Northwestern University. Packages containing a paper copy of the Draft EIS Executive Summary as well as a CD with all documents were distributed to other state and federal agencies and interested Pueblos and Tribes (see below for the distribution list).

Copies of the Draft EIS were supplemented with cover letters including information regarding the length of the comment period and how and where to deliver written comments, and a public hearing notice with the dates, times and locations of the public meetings, at which written comments could be received.

Electronic copies of the complete Draft EIS, individual chapters, and the executive summary were available on the VCT website. The VCT maintains a section of its web site dedicated to planning and public involvement. In addition to the Draft EIS, the public could access background information about the project, the VCT, or NEPA, and submit online comments and view the comments of others.

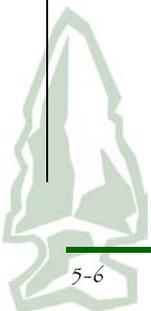
The VCT held two public meetings to discuss the Draft EIS in June 2012, during which the VCT presented an overview of the Draft EIS. VCT staff facilitated a group discussion about the Draft EIS and proposed alternatives, and resource specialists were present to interact with the public and answer questions. Attendees were able to provide comments in writing or by using a computer connected to the project web site.

The meetings were held on the following dates and locations:

- June 25, 2012: The Valles Caldera Trust Science and Education Center in Jemez Springs, NM
- June 26, 2012: The University of New Mexico – Los Alamos in Los Alamos, NM

Additionally, the VCT opened the three potential visitor center sites for members of the public and provided signage in the areas proposed for development. These areas were open to the public throughout the public comment period.

Public and agency comment periods began with publication of the Draft EIS and ended on August 14, 2012; comments could be submitted online or via surface or electronic mail. Comments submitted on the project web site were reviewed for



inappropriate or unrelated content and then posted¹. Comments received via direct mailing were entered into the online database by the VCT so all comments received were available for public viewing.

The VCT received 125 separate written communications in the form of letters, email, and project comment forms. Seven of these comments were from agencies or Pueblos and Tribes, and 118 were from members of the public, including citizen groups or organizations. Copies of the written communications and responses to comments are included in Appendix A. The comments are summarized below.

Agency Consultation and Coordination

Public Agencies and Organizations

Public agencies and organizations were included in all mailings and notices distributed to the public. In addition, they received planning status updates and schedules, and were provided with contact information for further inquiry.

Cultural Resource Consultation

Tribal governments and State Historic Preservation Office (SHPO) were included in communications throughout the development of the Public Access and Use Plan EIS. To avoid duplication of efforts, the VCT used the NEPA process to achieve public notification for NHPA Section 106. Concurrent notification and comment periods for were used for NEPA and NHPA.

The New Mexico SHPO was included in all mailings and notices distributed to the public. In addition, the SHPO and the Advisory Council of Historic Preservation received planning status updates and schedules, and were provided with contact information for further inquiry. It is anticipated that implementation-level and programmatic-level decisions will have unavoidable adverse effects to significant historic properties. To address this concern and to develop appropriate processes to resolve these effects, the VCT has met with SHPO to construct a programmatic agreement that addresses implementation-level and programmatic-level undertakings in multiple phases. The Advisory Council of Historic Preservation has been invited to participate in the programmatic agreement and may be included as a signatory pending their decision. Following a 30-day no-action period, which is initiated upon release of the Final EIS, ROD will be signed. The programmatic agreement will be finalized prior to the ROD.

Formal and informal tribal consultation has taken place throughout the planning process. Communications specific to the project included scoping, alternatives development, project updates, and distribution of the Draft EIS. The phased programmatic agreement between the VCT and SHPO specifies that tribal consultation will be included in development of all mitigation plans for resolution of adverse effect and in developing subsequent agreements for resolution of adverse effects. The VCT would work with local Tribes to identify methods of protecting

¹ One comment was rejected because it was unrelated to the Draft EIS. The comment was redirected to the Executive Director, and the commenter was notified of this action.

important cultural features by including tribal consultation in future planning and decision-making about the programmatic elements in the plan. Tribal governments and SHPO were included in all mailings and notices distributed to the public. In addition, received planning status updates and schedules, and were provided with contact information for further inquiry.

Threatened and Endangered Species Consultation

Formal consultation under Section 7 of the Endangered Species Act was not warranted for this project. The U.S. Fish and Wildlife Service was informed of the planning process in concert with the public and other agencies and organizations.

Summary of Comments on Draft EIS

During the public comment period, the VCT received 118 written comments from individuals or organizations, and 7 written comments from Tribes or government agencies. Project staff reviewed, categorized, and responded to each written communication received. In many cases one letter or email included several comments. Project staff responded to a total of 166 comments. The remainder of this section summarizes the public and agency comments.

Comments from the Public

Comments from the public fell into seven general categories. The categories are as follows:

- Stated preference
- Alternatives (applied when the commenter suggested modification of existing alternative or a new alternative)
- EIS Content
- Biology
- Cultural Resources
- Administration
- Transportation

A summary of the comments received follows, and a matrix containing the comments with responses is included in appendix A.

Stated Preferences

Many commenters expressed a preference for one alternative over another, or against a specific alternative. These preferences are tallied below. In addition to expressions of support for specific alternatives, eight people wrote to say they would like to see a shuttle system instead of personal vehicles used for access to the preserve.



Table 5-1: Stated Preferences for a Specific Alternative

<u>Alternative</u>	<u>Number of Comments Expressing Preference</u>
<u>Alternative 1</u>	<u>7</u>
<u>Alternative 2</u>	<u>19</u>
<u>Alternative 3</u>	<u>29</u>
<u>No preference between 3A and 3B: 6</u>	
<u>Alternative 3A: 14</u>	
<u>Alternative 3B: 9</u>	
<u>Alternative 4</u>	<u>19</u>
<u>No preference between 4A and 4B: 2</u>	
<u>Alternative 4A*: 14</u>	
<u>Alternative 4B: 3</u>	
<u>Shuttle (no preference for visitor center location provided)</u>	<u>9</u>

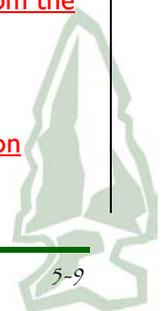
* Two commenters expressing supporting for this alternative later rescinded that support in writing. This total reflects the adjustment.

Alternatives

Several comments included ideas or suggestions for variations on the existing alternatives, or new alternatives, or features to include if an action alternative were to be selected. These ideas are summarized below:

- Only allow government vehicles off-road
- Hire Native American guides for cultural interpretation
- Encourage backcountry access (camps, scouting events, hunting/fishing clinics, etc.)
- Limit camping sites in developed areas and in the backcountry
- Enhance low-impact use (and limit use of vehicles within preserve)
- Develop a multi-use trail network within, around, and circling the preserve
- Eliminate grazing
- Build all parking and building facilities off site to protect the visual landscape
- Build campgrounds at Banco Bonito, away from the visitor center but near a water source
- Develop horse stables
- Develop a hotel for visitors
- Locate operations and maintenance facilities outside of public view
- Ban all-terrain vehicles, dirt bikes, and similar recreational vehicles from the preserve
- Allow off-road access to anglers and hunters

Additionally, several people suggested elements that would be part of an action alternative, including the following:



- Access for disabled persons
- Geologic education on formation of caldera
- Bicycle access

Chapter 2 of the EIS was revised to elaborate on these features of the alternatives. Regarding the access for disabled visitors, the EIS was revised to further stress that the VCT would comply with the ADA to provide access to disabled visitors to the fullest extent possible under all action alternatives.

Environmental Impact Statement Content

Several commenters asked for clarification of elements of the EIS, or noted gaps in the data or analysis presented. Appendix A describes how the VCT responded to all comments received on the Draft EIS. Specific topics or questions asked include the following:

- What are plans for spontaneous access of the preserve?
- How many people currently visit the preserve?
- Where is a link to agency procedures for NEPA?
- Provide more mitigation measures in Chapter 2.
- How was the severity of impacts defined in the Draft EIS?

Biology

Commenters requested more mitigation for wildlife and additional information in the EIS on potential impacts to elk and golden eagles, and requested that the VCT make decisions with natural resources in mind, rather than just needs and wants of people.

Cultural Resources

Commenters expressed concerns about access to sites of cultural importance to Pueblos and Tribes (e.g., concerns about protecting those resources, and concerns about excluding non-Tribal people from those same areas).

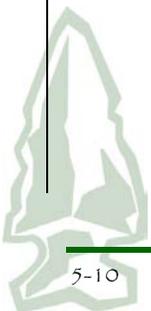
Administration

Multiple people suggested extending the VCT's management deadline of 2015 to 2020; several comments received were related to management of the preserve by the NPS. These issues were not within the scope of the decision to be made through this EIS. Others suggested strategies for phasing development in light of funding constraints.

Some commenters expressed concerns related to public safety, such as the need to augment additional law enforcement presence with increased visitation and safety related to co-mingling hunting activities with increased visitor access.

Transportation

In addition to the many comments expressing a preference for shuttle or private vehicle access within the preserve (with the majority suggesting shuttles); other



comments related to transportation included a suggestion to analyze the environmental impacts of the existing road system rather than use it as a baseline, and to disallow ATV use on the preserve.

Agency Comments

As noted above, seven government agencies or Tribes submitted written comments on the Draft EIS. The comments are summarized by sender, below.

Environmental Protection Agency

The USEPA reviewed the EIS and rated it “EC-2,” meaning the agency “has environmental concerns and request additional information in the FEIS.” Specifically, the USEPA requested inclusion of additional mitigation measures for anticipated environmental impacts, including development of a construction emissions mitigation plan, use of constructed wetlands for waste and stormwater treatment, and augmentation of the discussion of how the project could affect minority and low-income populations, particularly through job creation. Finally, the USEPA asked for more information regarding tribal involvement throughout the planning process.

New Mexico Department of Game and Fish (NMDGF)

NMDGF requested additional analysis on the potential effects of the project, specifically increased visitor use and vehicle access on elk behavior, particularly during calving periods. NMDGF also recommended closing selected roads during elk calving periods to mitigate impacts to those populations. NMDGF also offered corrections regarding the listing status of the Jemez Mountain Salamander.

New Mexico State Historic Preservation Office (SHPO)

The SHPO suggested two methods of approaching mitigation plans for impacts to cultural resources, allowing the VCT a choice in structuring agreements with them regarding those resources.

Council of the Incorporated County of Los Alamos

The Council of the Incorporated County of Los Alamos solicited input from residents and submitted that to the VCT (the individual letters are summarized above in public comment section). The council then recommended adoption of Alternative 3A or 3B for the preserve.

Pueblo of Laguna

The Pueblo of Laguna determined that none of the alternatives would have a significant impact at this time, but requested to be notified for review of any artifacts that may be discovered during implementation.

Jemez Pueblo

The Jemez Pueblo expressed a preference for alternative 1, the no-action alternative due to concerns about impacts to culturally significant areas. For the other alternatives, the Jemez Pueblo identified sites that hold cultural (medicinal, religious) significance.



The Hopi Tribe

The Hopi Tribe recommended alternative 1, the no action alternative. The Tribe requested copies of the cultural resources surveys of potentially affected areas and proposed treatment plans for their review and comment. They also inquired about funding plans and the potential for visitor entry fees.

Board of Trustees Recommendation of Preferred Alternative

The VCT Board of Trustees discussed the preferred alternative for this plan during a public meeting held Thursday, September 20, 2012. After consideration of the potential impacts as disclosed in the Draft EIS and review of public and agency input, the trustees unanimously stated their preference for Alternative 3A: Entrada del Valle Visitor Center—Primary Access via Shuttle System. The trustees noted that the site welcomed visitors into the preserve, but the location on the edge of the Valle Grande would not overtly alter the view or experience for visitors or people traveling through the area. Additionally, the trustees noted the practical aspects of the site, such as proximity of utilities (particularly water availability) and ease of entrance into and exit from the preserve for shuttles (e.g., no backtracking onto NM-4). All members of the Board of Trustees supported primary access via a shuttle system. The Supervisor of the Santa Fe National Forest stated that she believed the shuttle system would be important to maintain stakeholder's values and that the shuttle system would be best for the preserve's resources and would ultimately provide the best experience. The Superintendent at Bandelier National Monument noted that it is best to start with a shuttle system rather than change at a later time. There may be future potential of connecting the transportation systems between Bandelier National Monument and the preserve.

List of Recipients

The following agencies, organizations, and other interested parties will received a complete hardcopy or CD of the public access and use plan Draft EIS and/or will received letters with invitations to download more detailed information.

Recipient	Hardcopy or CD of EIS	Invitation to Download Info
Federal Agencies		
U.S. Forest Service		
Region 3	✓	
Santa Fe National Forest	✓	
Santa Fe National Forest Ranger Districts		
Jemez	✓	
Cuba	✓	
Espanola	✓	
Coyote	✓	
National Park Service (Bandelier National Monument)	✓	
U.S. Fish and Wildlife Service	✓	

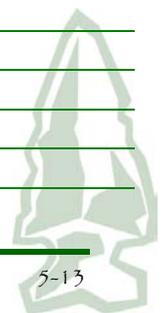


Recipient	Hardcopy or CD of EIS	Invitation to Download Info
Tribes		
Jemez Pueblo	✓	
Santa Clara Pueblo	✓	
Pueblo of Zia	✓	
All Tribal Governor's Offices ¹	✓	✓
New Mexico State Agencies		
New Mexico Department of Game and Fish	✓	
New Mexico Environment Department	✓	
New Mexico Mid-region Council of Governments		✓
New Mexico State Historic Preservation Office	✓	✓
Organizations		
Caldera Action	✓	
WildEarth Guardians	✓	✓
The Nature Conservancy	✓	✓
Regional and Local Agencies		
Mayors of Cities and Towns		
Jemez Springs		✓
Los Alamos		✓
San Ysidro		✓
White Rock		✓
Rio Rancho		✓
Santa Fe		✓
Cuba		✓
Sandoval County		✓

¹ Paper copies of the summary and full electronic copies of the Draft EIS were sent to the following: Pueblo of Acoma, Pueblo of Cochiti, Pueblo of Isleta, Pueblo of Laguna, Pueblo of Nambe, Ohkay Owingeh, Pueblo of Picuris, Pueblo of Pojoaque, Pueblo of San Felipe, Pueblo of San Ildefonso, Pueblo of Sandia, Pueblo of Santa Ana, Kewa Pueblo, Pueblo of Taos, Pueblo of Tesuque, Pueblo of Zuni, Jicarilla Apache Nation, Mescalero Apache Tribe, Navajo Nation, Navajo Nation Council, San Carlos Tribal Council, The Hopi Tribe, White Mountain Apache, Southern Ute Tribe, Ute Mountain Ute Tribe, Ysleta del Sur Pueblo, Apache Indian Tribe of Oklahoma, Cheyenne-Arapaho Tribes of Oklahoma, Comanche Nation, Fort Sill Apache Tribe, Kiowa Tribe of Oklahoma, Pawnee Tribal Business Council, and Wichita & Affiliated Tribes.

List of Preparers and Contributors

Name	Title / Contribution
Valles Caldera National Preserve	
Jamie Civitello	Archeologist
Kimberly DeVall	Interpretation and Education Coordinator
Rob Dixon	Director, Enterprise Division
Rourke McDermott	Landscape Architect
Bob Parmenter	Director, Scientific Services Division
Marie Rodriguez	Director, Natural Resources Division/Project Leader
Anastasia Steffen	Cultural Resources Coordinator



Name	Title / Contribution
John Swigart	GIS Specialist
Dennis Trujillo	Executive Director
David Evans and Associates, Inc. (DEA)	
Orion Ahrensfeld	Visual Simulations
Riley Atkins	Alternatives Review
Maggie Buckley	Socioeconomics, Environmental Justice—Chapter 3
Bill Byrne	Cost Estimates
Suzanne Carey	Wastewater
Ian Chase	Transportation
Mara Krinke	Quality Control
Kacey Meis	GIS Support
Craig Miller	Biological Resources—Chapter 3
Debra Perkins-Smith	Quality Control
Zachary Pope	Wastewater
Gray Rand	Biological Resources
Ed Schumm	Transportation
Rebecca Smith	Cost Estimates
Patricia Steinholtz	Project Manager, Primary Author, Document Designer
Stacy Tschuor	Transportation
Environmental Management and Planning Solutions, Inc. (EMPSI)	
David Batts	Public Involvement
Tetra Tech	
Kevin Doyle	Cultural Resources
The Final Word	
Juanita Barboa	Technical Editor / Quality Control
Sherrie Bell	Technical Editor
Laurel Porter	Technical Editor

