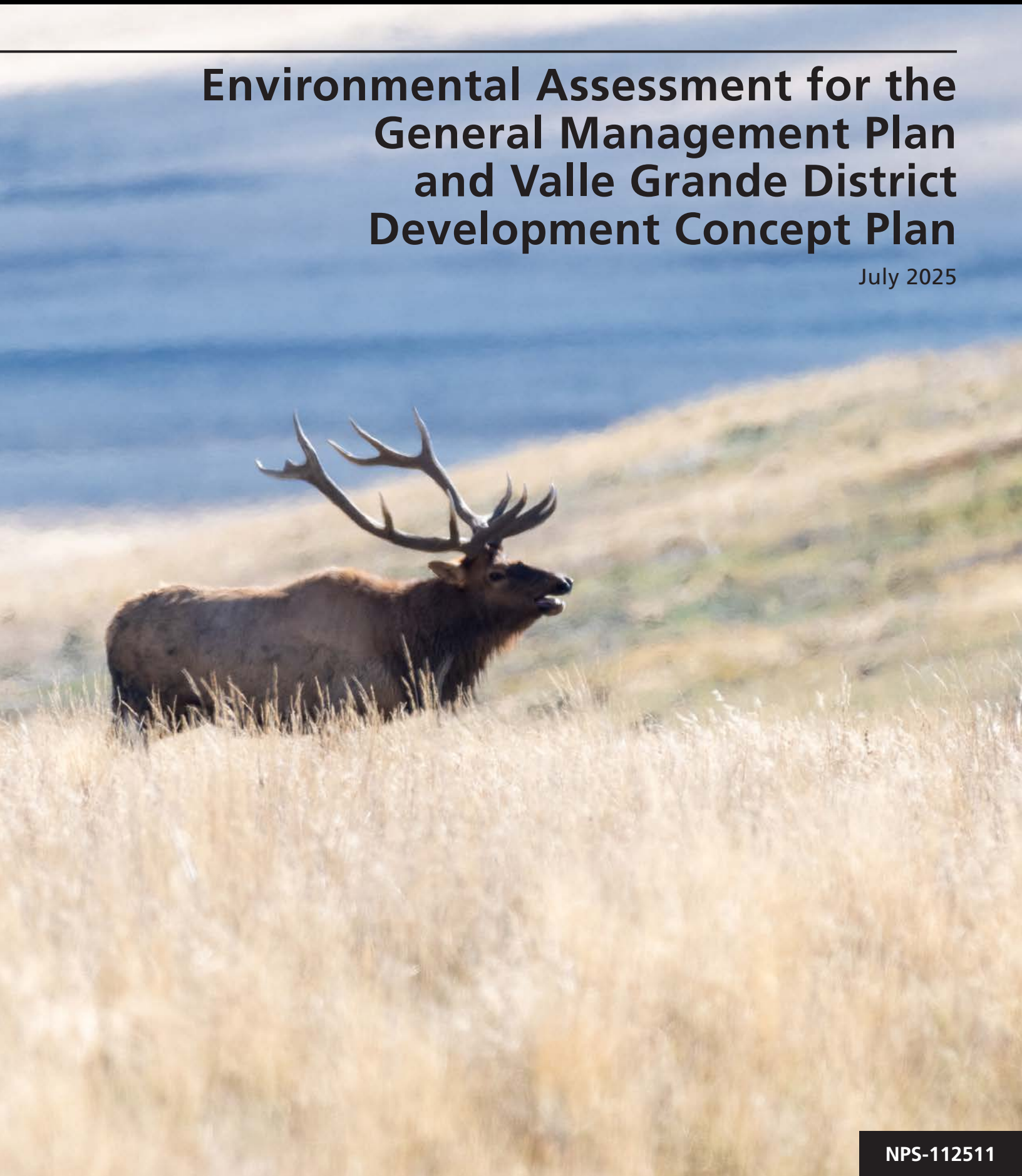
Valles Caldera National Preserve
New Mexico

National Park Service
U.S. Department of the Interior

Environmental Assessment for the General Management Plan and Valle Grande District Development Concept Plan

July 2025



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for the

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PMIS #241186C

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A GUIDE TO THIS DOCUMENT

ENVIRONMENTAL ASSESSMENT

This environmental assessment analyzes the environmental impacts associated with management actions subject to National Environmental Policy Act (NEPA) compliance. It is organized into four chapters:

- **Chapter 1: Purpose and Need** includes a purpose and need for the alternatives and describes the project area.
- **Chapter 2: Alternatives** presents the range of alternatives being considered by the National Park Service, including the preferred alternative.
- **Chapter 3: Environmental Consequences** discusses current and future conditions of the environment, including reasonably foreseeable actions and trends under the no-action alternative, which is the baseline for assessing effects to resources that are present and that could be impacted by the action alternatives.
- **Chapter 4: Consultation and Coordination** lists agencies and persons consulted during development of the plan and the NEPA process.

Appendixes: The appendixes provide supporting information, analyses, and management resources for the general management plan and Valle Grande District development concept plan environmental assessment:

- Appendix A: Impact Topics Not Carried Forward in the Environmental Assessment
- Appendix B: References

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Chapter One: Purpose and Need

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CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

This environmental assessment analyzes the environmental consequences on the human environment in Valles Caldera National Preserve ("park") that would result from the general management plan and Valle Grande District development concept plan ("plan"). The purpose and need for the plan, scope of the analysis, and relevant environmental issues and associated impact topics are outlined below.

The planning area encompasses the entire park. The major proposed developments in the Valle Grande District development concept plan would be focused on the visitor engagement zone along NM-4 and entrance road (VC01) in the Valle Grande District (see maps 4-7).

PURPOSE AND NEED FOR THE PLAN

The purpose of the plan is to

- clearly define resource conditions and visitor uses and experiences to be achieved, consistent with the park's purpose and significance statements; and
- provide a framework for managers to use when making decisions about how to best protect the park's resources, how to provide quality visitor uses and experiences, how to manage visitor use, and what kinds of facilities, if any, to develop.

The plan is needed because:

- The authorizing legislation for the park (Public Law 113-291, December 19, 2014) requires the development of a management plan in accordance with applicable laws. Likewise, the National Parks and Recreation Act of 1978 and NPS policy established general management planning requirements for each unit of the system.
- Access to the park and circulation within the park do not adequately connect visitors with park resources and experiences. Access and circulation are fragmented and have been heavily influenced by mid-20th-century logging and geothermal exploration. Existing roads and trails were not designed or built to facilitate park visitor use. The park remains largely undeveloped, and access is limited to 35 vehicles at a time (via permit) beyond the cabin district, 3.5 miles into the park. Few established trails or formal parking areas exist beyond that initial entry point, and many visitors are unable to experience the fundamental resources and values of the park.
- Visitor services remain limited due to minimal facilities and infrastructure. The few existing facilities were intended for interim use. Fundamental services, including potable water, restrooms, and parking, are either substandard, inadequate to accommodate current or any increase in visitor use, or lacking entirely. Visitor services are not accessible to people with disabilities.

This environmental assessment complies with all applicable statutory requirements and policies. These include the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code [USC] 4321 et seq),[1] the Department of the Interior (DOI) NEPA regulations (43 CFR Part 46), NPS Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision Making* (2011), and the accompanying *Director's Order 12 Handbook* (2015).

Actions directed by general management plans or subsequent implementation plans are accomplished over time. Funding availability, requirements for additional data or regulatory compliance, and competing priorities may change or delay the implementation of many actions. Major or costly actions would be implemented in phases, as identified in the management strategies and activities. Some actions could be implemented 10 or more years into the future.

The plan provides conceptual guidance to NPS managers; it does not describe how particular programs or projects should be implemented. Subsequent implementation plans, which will be consistent with the approved general management plan and Valle Grande District development concept plan, will include more extensive details and analysis. Many of these projects would require additional compliance at the point in time when moving forward on them becomes feasible.

All undertakings, as defined in 36 CFR 800.16(y), tiering from this plan will comply with the implementing regulations of section 106 of the National Historic Preservation Act (NHPA) in 36 CFR 800 or the Nationwide National Park Service Programmatic Agreement, as determined by the agency official, as defined in 36 CFR 800.2(a). This regulation directs processes for preserving historic properties. Compliance requires a detailed analysis of this plan to determine potential impacts to historic properties and to identify ways to avoid, minimize, or mitigate them.

During scoping for this plan it was determined that the general actions proposed in it contain insufficient detail to fully understand potential impacts to historic properties. More specific details will emerge during the plan's design and implementation phase, at which time, the park will conduct separate analyses for all undertakings tiering from this environmental assessment in compliance with 36 CFR 800.

Similarly, a tiered compliance approach to implementing developmental activities proposed in this plan would apply to federally listed species. Section 7 of the Endangered Species Act requires federal agencies to ensure the actions they authorize, fund, or carry out do not jeopardize the continued existence of listed species or destroy or adversely modify critical

[1] Executive Order 14154, "Unleashing American Energy" (Jan. 20, 2025), and a presidential memorandum, "Ending Illegal Discrimination and Restoring Merit-Based Opportunity" (Jan. 21, 2025), require the department to strictly adhere to the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 et seq. Further, such order and memorandum repeal Executive Orders 12898 (Feb. 11, 1994) and 14096 (Apr. 21, 2023). Because Executive Orders 12898 and 14096 have been repealed, complying with such orders is a legal impossibility. The National Park Service verifies that it has complied with the requirements of NEPA, including the department's regulations and procedures implementing NEPA at 43 C.F.R. Part 46 and Part 516 of the *Departmental Manual*. It has done this consistently with the president's January 2025 order and memorandum. The National Park Service has also voluntarily considered the Council on Environmental Quality's rescinded regulations implementing NEPA, previously found at 40 C.F.R. Parts 1500–1508, as guidance to the extent appropriate and consistent with the requirements of NEPA and Executive Order 14154.

habitat. In the near term, monitoring and conducting of surveys for the presence of federally listed species would continue throughout the park.

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Chapter Two: Alternatives

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CHAPTER 2: ALTERNATIVES

INTRODUCTION

This chapter analyzes three alternatives: the no-action alternative and two action alternatives, one of which is the preferred alternative. These alternatives are summarized below.

- No-action alternative: Under this alternative, the National Park Service would continue using the management direction inherited from the Valles Caldera Trust, including visitor access and capacity levels. The park's circulation networks would remain unchanged, and visitor services would remain concentrated in the historic cabin district[2] and at Cerro La Jara. This analysis provides a benchmark to compare what would happen to the environment if current management were to continue versus what would happen to the environment if either of the action alternatives were selected for implementation.
- New appropriate facilities alternative: This is the agency's preferred alternative and proposed action. It includes several changes to the park's circulation and visitor services infrastructure. The most substantial changes would be to:
    - move the visitor services area from the cabin district and Cerro La Jara to a new location near NM-4;
    - realign the entrance road (VC01) to the west and repurpose the existing alignment as an unpaved multiuse trail;
    - improve the existing North Valle Grande Road (VC02) alignment;
    - enhance Sulphur Creek Road (VC08) from the park entrance to Sulphur Springs and allow public access; and
    - allow visitor vehicular use beyond Sulphur Springs with a backcountry vehicle pass.
- Adaptive reuse alternative: This alternative retains the visitor services area in the cabin district (no new facilities near NM-4). It proposes realigning a stretch of North Valle Grande Road (VC02) behind (northwest of) the cabin district and adding more visitor services there. Otherwise, it is the same as the new appropriate facilities alternative.

The impacts of implementing each alternative are discussed in Chapter 3: Environmental Consequences.

[2] "Cabin district" is a term of convenience used by the park to loosely refer to the cluster of historic cabins and surrounding environment in Valle Grande. There is no strict boundary associated with this term, and it is not to be confused with the formally defined Baca Ranch Cabin Area historic district.

ALTERNATIVES

Table 1 outlines the proposed management strategies and actions included in the alternatives that have the potential to affect the human environment, including park resources and visitor experiences. Current, ongoing management strategies and actions for these topics are presented in the "No-Action" column.

Regarding potential infrastructure development under the no-action alternative, this environmental assessment assumes the Front Country Infrastructure Improvements Project (FCIIP) will be complete. At the time of publication, the FCIIP was still under construction. The FCIIP is enhancing visitor services and operations in the cabin district and at the entrance station (Cerro La Jara). Some elements of the FCIIP are designed to be temporary and reversible in anticipation of definitive guidance from future plans.

At Cerro La Jara, the FCIIP will reroute a small section of the entrance road (VC01) next to the entrance station. It will also widen the road there, and redesign the parking lot. In the cabin district, the FCIIP will construct two new parking areas in the vicinity of Cowboy Cabin, two Architectural Barriers Act Accessibility Standard (ABAAS)-compliant parking spaces in front of the Ranger Station, and electric vehicle charging stations behind the Otero and Commissary Cabins. Additionally, it would create two new public trails through the cabin district and one administrative trail connecting the ranger station with the existing facilities operation center.

Waysides, kiosks, and other wayfinding and interpretive features would be added. Some utilities would be buried and some aboveground utilities altered as needed to accommodate this new infrastructure. The FCIIP will also bring the cabin district into the frontcountry. The current gate at the Cerro La Jara entrance station would be moved to a point north of the entrance road (VC01)/North Valle Grande Road (VC02) intersection. This change will enable public access to the cabin district without a backcountry pass.

Before implementation, some of the following actions would require additional compliance activities mandated by NEPA, the Endangered Species Act (ESA), and NHPA.

Table 1. Alternatives Comparison Matrix

Area/Topic	No-Action	New Appropriate Facilities	Adaptive Reuse
Brief summaries of intent for each alternative	Visitor services in the park are currently limited and are distributed between the historic cabin district, located approximately 3.5 miles from the entrance road/NM-4 intersection, and Cerro La Jara, situated halfway between the entrance road/NM-4 intersection and the cabin district. The main visitor contact facility and entrance station is at Cerro La Jara. Backcountry gates are located north of the entrance road (VC01)/North Valle Grande Road (VC02) intersection, past the cabin district. Visitors must obtain a pass for vehicular access to the backcountry. The backcountry vehicle route is one-way in and one-way out. A limited number of backcountry passes are issued each day. Frontcountry visitor use opportunities include several trailheads along NM-4 and the entrance road between NM-4 and Cerro La Jara. See maps 1, 2, and 3 below for all relevant place names and proposed actions relevant to this no-action alternative.	This alternative proposes to enhance and expand visitor services by constructing new facilities near the entrance road/NM-4 intersection. Visitor services and in-park administration would be moved out of the cabin district and concentrated in this new visitor services area. Entrance gate and fee collection functions would be moved from Cerro La Jara to the vicinity of the visitor services area. This area would serve as a hub for various visitor experiences, including hiking, ABAAS-compliant fishing access, and four-season recreation. The cabin district would shift from an administrative and visitor services hub to a destination prioritizing preservation, interpretation, and recreation. The backcountry gate north of the cabin district would be moved to Cerro Piñon. Backcountry vehicular use would still require a pass, and select backcountry roads would be improved in anticipation of higher usage if daily pass quotas are increased. The park entrance road would be realigned to the southwest to improve scenic and historic views across Valle Grande. Select trails and other visitor use infrastructure would also be improved.	This alternative proposes to enhance and expand existing visitor services in the cabin district, primarily through the adaptive use of existing historic structures, although new visitor use infrastructure may also be constructed. Entrance gate and fee collection functions would be moved from Cerro La Jara to the vicinity of the entrance road/NM-4 intersection, but there would be no visitor services at that location. The backcountry gate north of the cabin district would be moved to Cerro Piñon. Backcountry vehicular use would still require a pass, and select backcountry roads would be improved in anticipation of higher usage if daily pass quotas are increased. The park entrance road would be realigned to the southwest to improve scenic and historic views across Valle Grande. To enhance visitor safety and preserve the historic character in the cabin district, North Valle Grande Road (VC02) would be realigned to pass behind the district to its northwest. The existing historical road alignment through the district would be closed to vehicle traffic. Select trails and other visitor use infrastructure would also be improved.

Area/Topic	No-Action	New Appropriate Facilities	Adaptive Reuse
		See maps 4 and 5 below for all relevant place names and proposed actions related to this alternative.	See maps 6 and 7 below for all relevant place names and proposed actions related to this alternative.
Visitor services area	Limited visitor services and activities such as contact and orientation, interpretive waysides, concessions, comfort stations, and trails would remain distributed between Cerro La Jara and the historic cabin district. Limited administrative functions, such as offices and storage, would be retained.	This alternative would construct new facilities near NM-4. It would shift most existing visitor services and programs from the cabin district to this new visitor services area. Additionally, it would add new visitor services and administrative functions there. Functions at the visitor services area would include visitor contact and orientation, concessions, and educational and interpretive programming (indoor and outdoor). Limited administrative offices and storage would also be included, along with access to recreation, including ABAAS-compliant opportunities. Future analysis and design would determine the specific facilities needed in this area to achieve these functions.	This alternative would expand and enhance existing visitor services and administrative functions in the cabin district. The primary means to achieve this would be through the adaptive use of historic structures. Limited new facilities may also be constructed to meet remaining needs. Historic structures may need to be rehabilitated to meet needs. Functions in the cabin district would be similar to those described for the proposed visitor services area under the new appropriate facilities alternative. Future analysis and design would determine the details on how existing structures would be used, the rehabilitation needs, and the requirements for new facilities.
Cabin District	See description of the current status under "Visitor Services Area." The existing Cowboy Cabin parking lots and ABAAS-compliant Ranger Station parking lot would be retained. Existing trails would be retained.	Historic structures and landscape features would be stabilized and preserved, but few or none would be adaptively used for visitor services or administrative functions. An ABAAS-compliant parking lot would be constructed near History Grove. The disposition of the Cowboy Cabin parking	See proposals under "Visitor Services Area." The historic landscape would be managed for preservation and adaptive use. Most historic structures would be rehabilitated for new visitor services or administrative functions, including four-season

Area/Topic	No-Action	New Appropriate Facilities	Adaptive Reuse
		lots, including the relocation of parking areas behind the cabins, would be determined during the detailed project design and implementation phase. Little or no other new infrastructure would be constructed.	operations. Non-historic facilities would also be used for these purposes. An ABAAS-compliant parking lot would be constructed as described under new appropriate facilities. Limited new infrastructure may be constructed to support visitor use and administrative functions.
Entrance station and backcountry gate	The fee booth at Cerro La Jara and gate in the cabin district would be retained.	A new fee booth would be constructed near the new visitor services area. The backcountry gate would be moved to Cerro Piñon.	A new fee booth would be constructed near the entrance road/NM-4 intersection, including a small parking area and a comfort station for employee use only. The backcountry gate would be moved to Cerro Piñon.
Cerro La Jara	The existing visitor contact facility, parking lot, and vault toilet at Cerro La Jara would be retained. Existing trailheads for Cerro La Jara and Valle Grande Pond would be retained.	The existing visitor contact facility and parking lot at Cerro La Jara would be removed. Existing trailheads would be retained. The disposition of the existing vault toilet would be determined during a future project design and implementation phase.	Same as new appropriate facilities alternative.
Public roads: Valle Grande District	Entrance road (VC01) and North Valle Grande Road (VC02) would not be altered. Entrance road (VC01) would remain the only frontcountry road in the district, while North Valle Grande Road (VC02) would remain in the backcountry (see maps 1 and 2).	Entrance road (VC01) would be realigned to the southwest, and the existing alignment would be repurposed as an unpaved, ABAAS-compliant, multiuse trail. The entire new entrance road alignment (new VC01) would be paved, extending from the park entrance at NM-4 to a parking lot behind the cabin district at a location to be determined. This paved road	Entrance road (VC01) would be treated as described under the new appropriate facilities alternative. North Valle Grande Road (VC02) would also be realigned under this alternative. The new alignment would be a paved road passing behind the cabin district (to its northwest). The existing historical alignment would be closed to vehicle

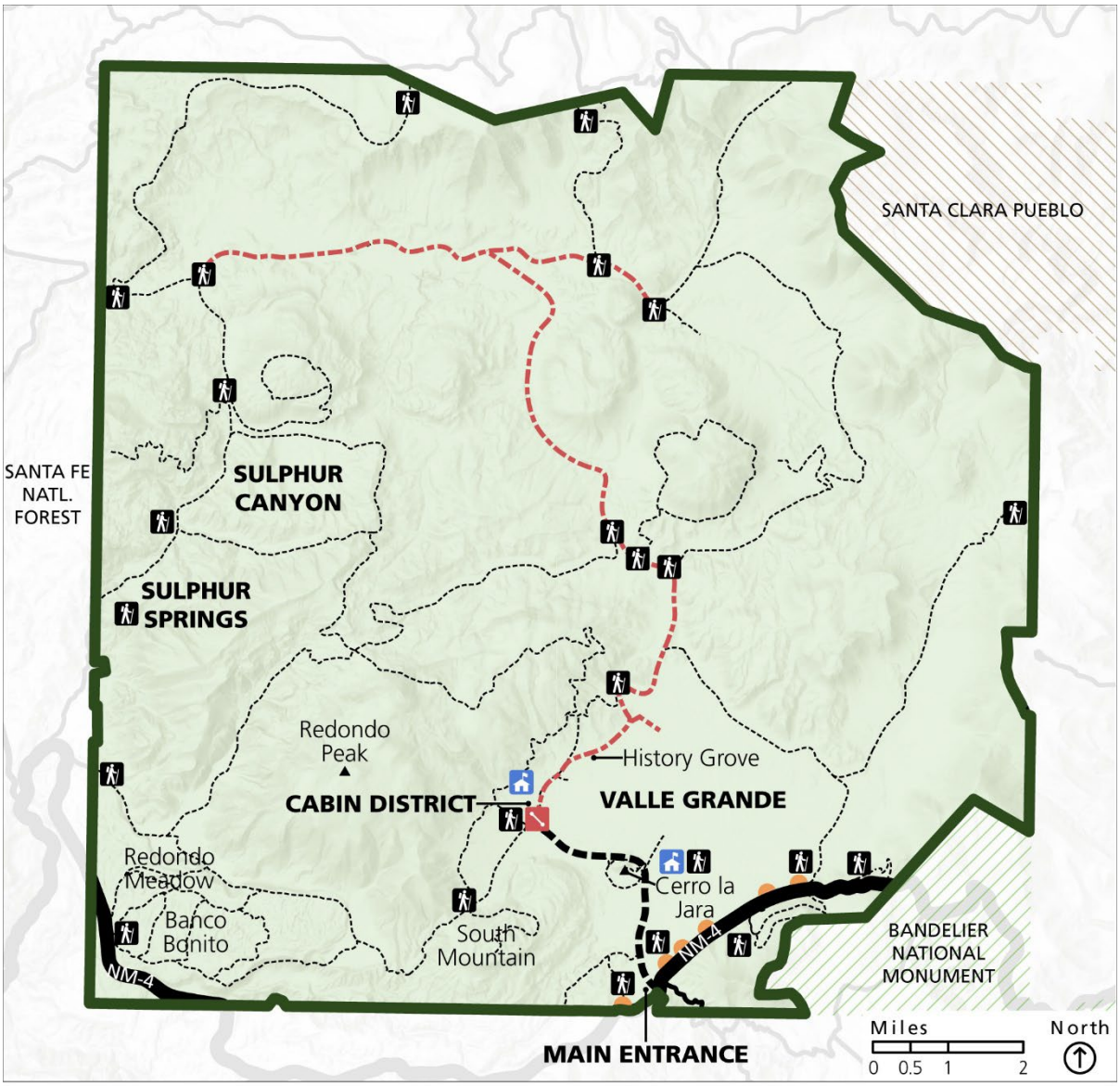
Area/Topic	No-Action	New Appropriate Facilities	Adaptive Reuse
		would cross North Valle Grande Road (VC02) and may incorporate a small section of it. The existing North Valle Grande Road (VC02) alignment would be widened but retained as a gravel road from the South Mountain trailhead to the Cerro Piñon trailhead.	traffic and maintained at its current width as an unpaved road.
Public roads: backcountry	Public vehicular access on backcountry segments of North Valle Grande and Central Caldera roads (VC02) as well as Valle San Antonio and Valle Toledo roads (VC09), would continue to be allowed only with a backcountry vehicle pass, and on the backcountry segment of Sulphur Creek Road (VC08) only with a special use permit.	Visitors would require a backcountry vehicle pass for vehicular access to backcountry stretches of North Valle Grande and Central Caldera roads (VC02), Sulphur Creek Road (VC08), and Valle San Antonio and Valle Toledo roads (VC09). The frontcountry segment of Sulphur Creek Road (VC08) from the park entrance to Sulphur Springs, would be enhanced as a single-lane improved gravel road with two-way traffic. A parking lot would be constructed at Sulphur Springs. The backcountry segment of Sulphur Creek Road (VC08) would be improved but not paved. Redondo Creek Road (the west branch of VC02) would be improved from its western park entrance to the Redondo Meadow trailhead parking area.	Same as new appropriate facilities alternative.
Pullouts on NM-4	The six existing pullouts along NM-4 would be retained as they are, each with a	Four of the existing pullouts would be paved with striped parking. One would serve as a trailhead for the Jemez River Trail. The other pullouts would connect to	Same as new appropriate facilities alternative.

Area/Topic	No-Action	New Appropriate Facilities	Adaptive Reuse
	paved surface and three with an interpretive sign.	the proposed boardwalk or natural surface trail (see "trailheads and trails" row) with its viewing platforms.	
Picnic areas and ramadas	There would continue to be no picnic areas or ramadas in the Valle Grande District.	Picnic areas may be constructed at appropriate locations in the Valle Grande District.	Same as new appropriate facilities alternative.
Trailheads and trails	Existing trailheads would be retained, including the Cerro La Jara Trailhead, Coyote Call Trailhead, Pond Trailhead, Valle Grande Trailhead, and South Mountain Trailhead. Existing trails established during the Valles Caldera Trust management period would be retained, including the following: o Cerro La Jara Trail (1.5 mi) o Valle Pond Trail (1 mi) o Coyote Call Trail (2.9 mi) and Rabbit Ridge Extension (2.4 mi) o Missing Cabin Trail (0.5 mi) o Hidden Valley Trail (3.4 mi)	Existing trailheads and trails would be retained as per the no-action alternative. A Jemez River Trailhead (formerly the "Missing Cabin/Hidden Valley Trailhead") would be formalized. Three trailheads at Cerros del Abrigo would be consolidated into a single trailhead. A boardwalk or natural-surface trail would be constructed following the route of NM-4 where it passes along the southern extent of Valle Grande. Future planning efforts (e.g., a trails management plan) would identify appropriate trailhead hubs servicing multiple trails. They would also define appropriate infrastructure at different trailheads and consider consolidating certain trails.	Same as new appropriate facilities alternative.
Visitor capacity	The park would remain without formally established visitor capacities.	The visitor capacity for the South Valle Grande District would be no more than 2500 people per day.	Same as new appropriate facilities alternative.

Area/Topic	No-Action	New Appropriate Facilities	Adaptive Reuse
		The visitor capacity for the North Valle Grande District would be no more than 400 people at one time.	
Management zones	The park would remain without formally established management zones.	Three management zones would be established as described in the general management plan and summarized in the following paragraphs. **Visitor Engagement Management Zone** This zone is where most short-term visitors to the park would go. These easy-to-reach areas would have higher visitor use and density. Visitors would be provided with opportunities to experience, appreciate, and connect with park resources in a more developed setting. Most of the development, visitor services, and facilities in the park would be in this zone. These could include a visitor service area, amphitheater, paved roads, parking areas, full-service restrooms, picnic areas, developed campgrounds, and administrative facilities and utilities. Most public roads in this zone would be open year-round. Visitors would be offered a variety of opportunities for all ability levels, including on-site interpretation and education to learn about park resources. **Self-Guided Management Zone** In this zone, visitors would have the opportunity to venture into the park away	Same as new appropriate facilities alternative.

Area/Topic	No-Action	New Appropriate Facilities	Adaptive Reuse
		from the main hub of activity to directly experience the sights and sounds of the natural landscape. The zone would include development and facilities that are dispersed and designed for low to moderate densities of visitors. These might include trailheads, parking, well-engineered multiple-use trails, occasional waysides/signs, vault toilets, picnic areas, and primitive campsites. This zone would include transportation corridors to explore the park, and most facilities would occur within these corridors. Public roads in this zone would be open seasonally. Although a degree of self-reliance and outdoor skill would be necessary, areas in this zone would not be so remote that they require a high level of skill or preparation. **Backcountry/Self-Reliance Management Zone** This zone encompasses large contiguous areas of the park where natural processes, ecosystem function, and natural wildlife behavior are prioritized. Visitors would be able to experience solitude in diverse natural landscapes with few encounters with other visitors. Areas in this zone would be remote and undeveloped, requiring a higher degree of outdoor skill and self-reliance. Beyond primitive trails and minimal signs, no visitor facilities would be maintained.	

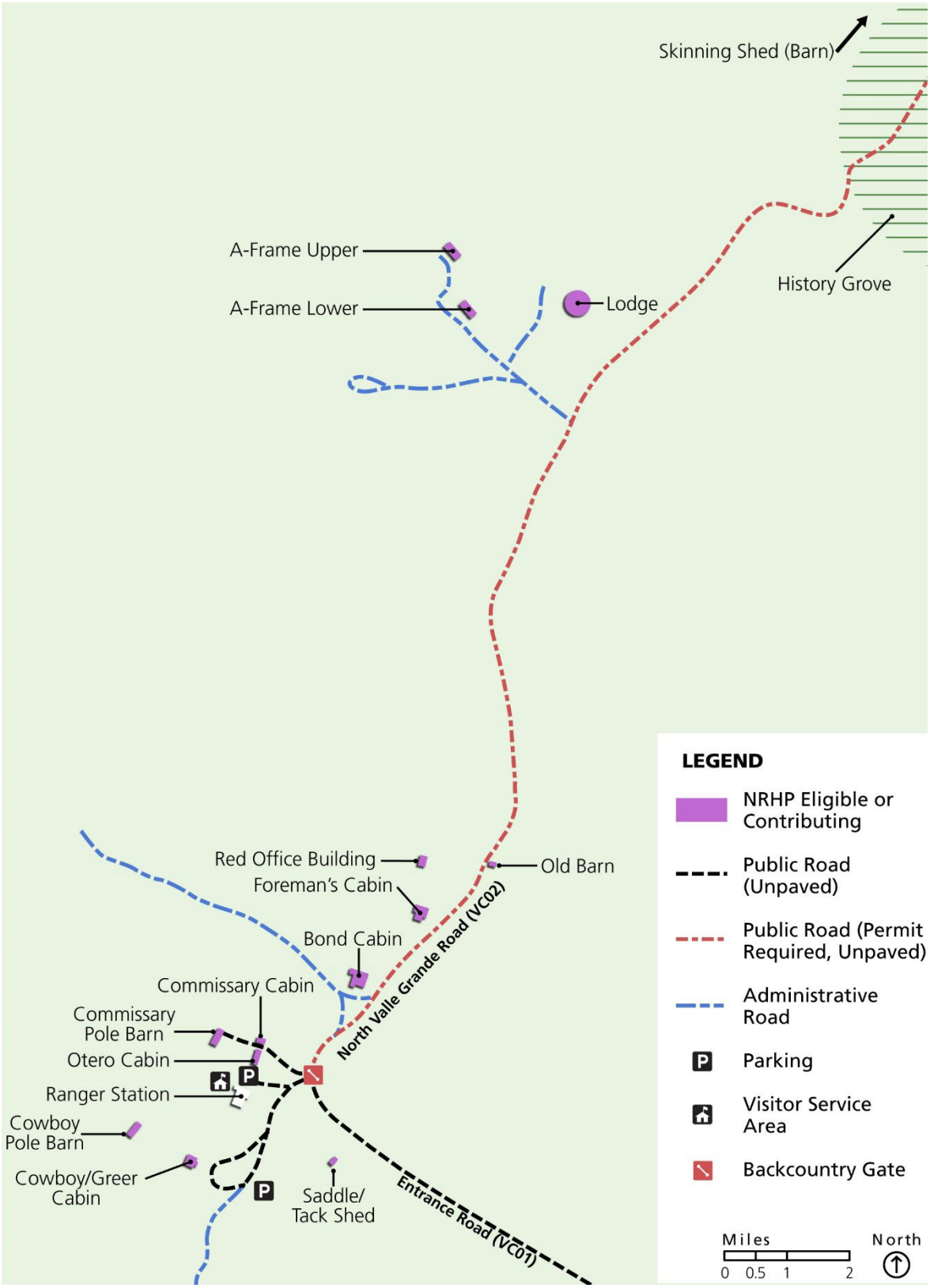
Map 1. No-Action Alternative



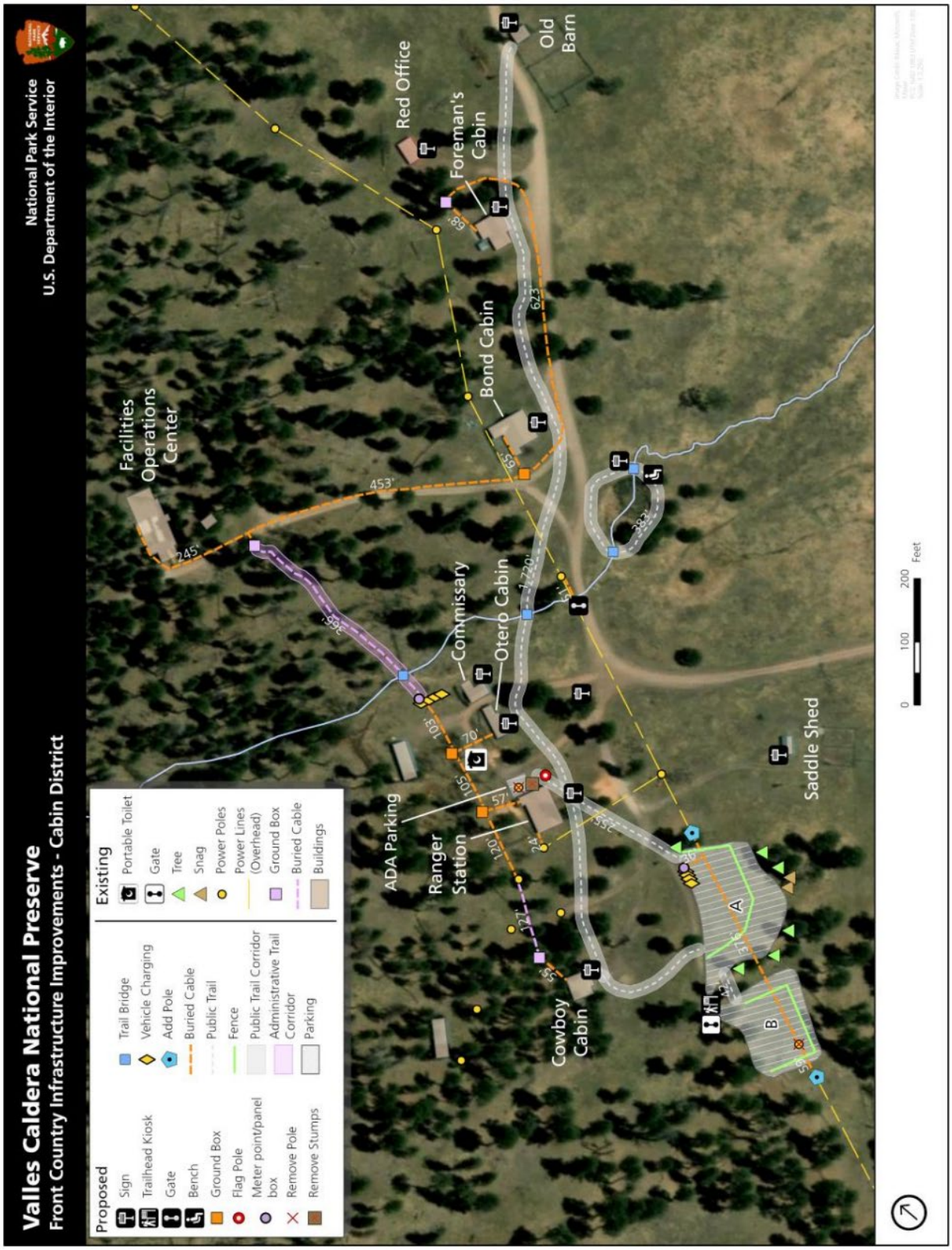
LEGEND

- Park Boundary
- Existing Public Road (Unpaved)
- Existing Public Road (Permit Required, Unpaved)
- Existing Trail
- Existing Visitor Service Area
- Existing Trailhead
- Existing Backcountry Gate
- Existing Road Pulloffs

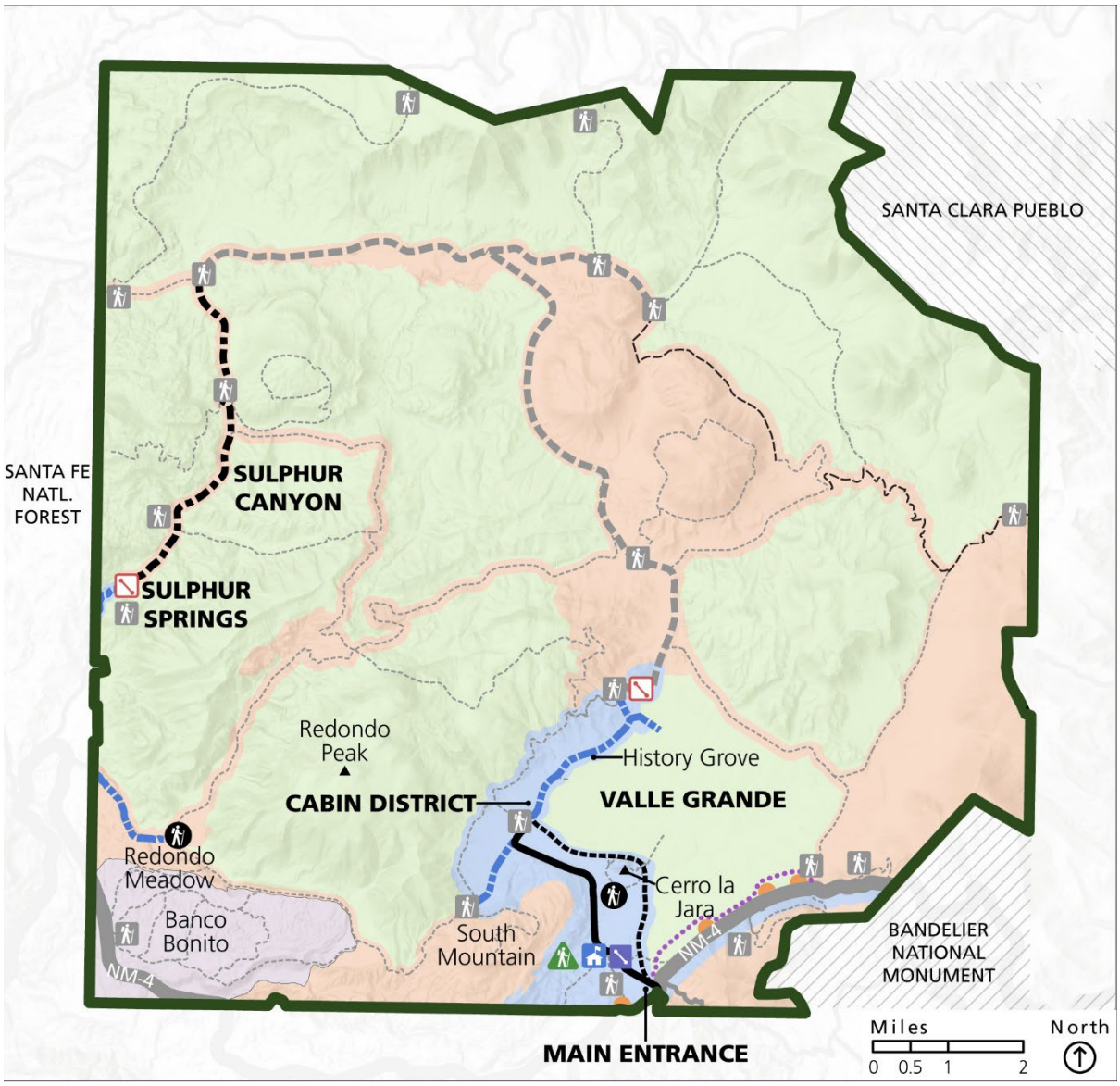
Map 2. No-Action Alternative—Cabin District



Map 3. No-Action Alternative—Cabin District Detail



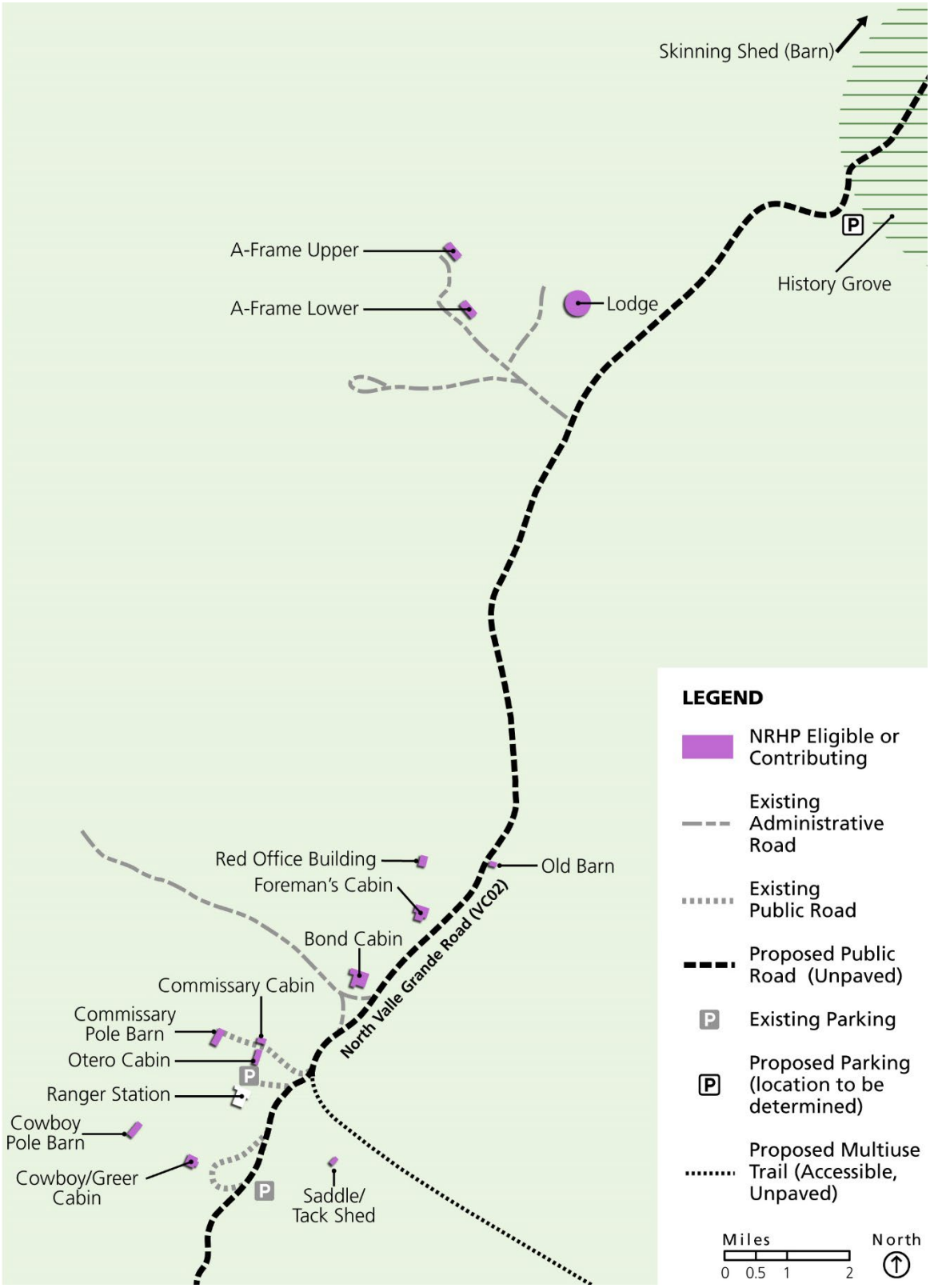
Map 4. New Appropriate Facilities Alternative



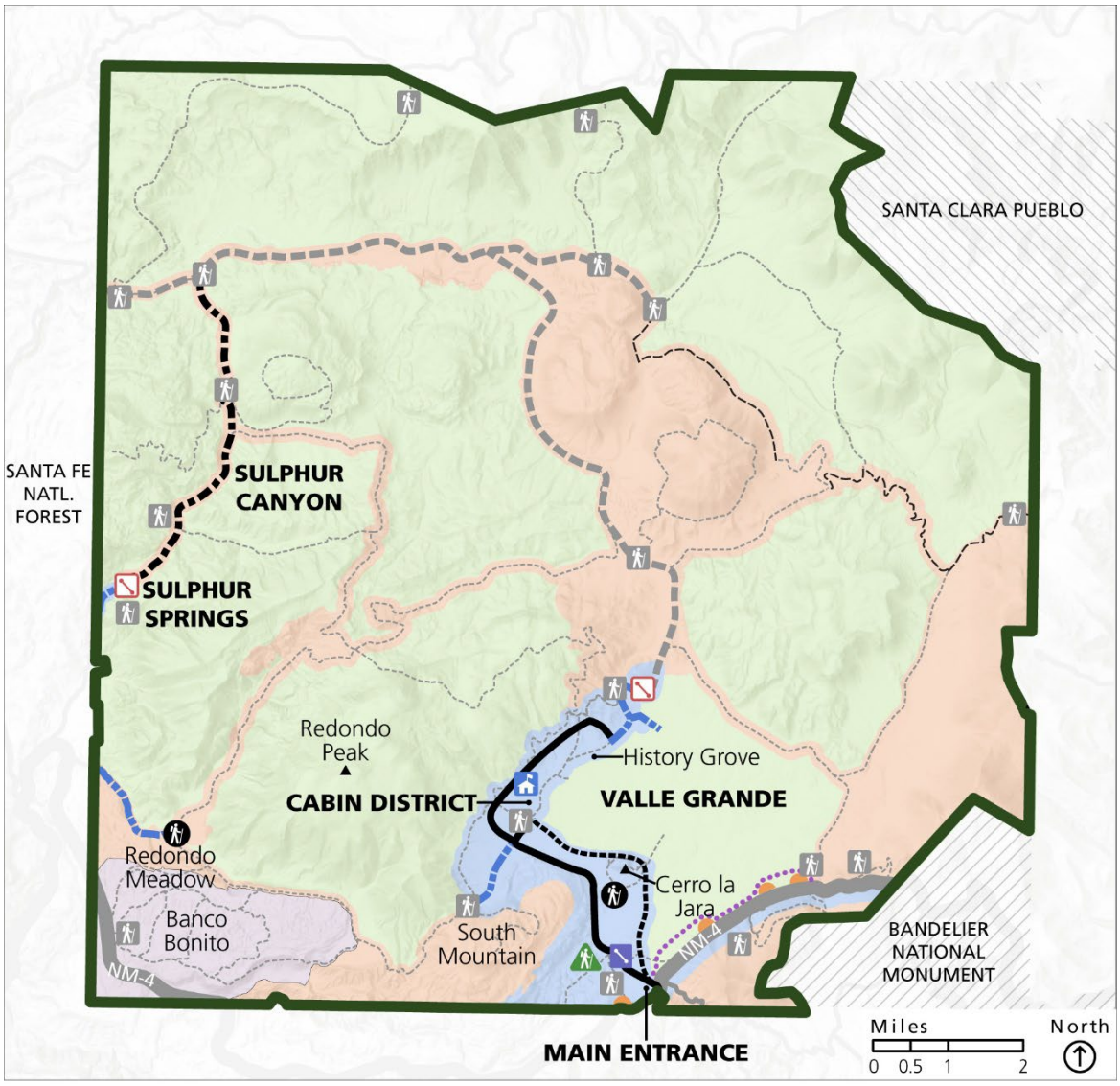
LEGEND

- Park Boundary
- Proposed Public Road (Paved)
- Existing Public Road (Permit Required, Unpaved)
- Proposed Public Road (Permit Required, Unpaved)
- Proposed Public Road (Unpaved)
- Existing Trail
- Minor Trail Relocation
- Proposed Boardwalk
- Proposed Multiuse Trail (Accessible, Unpaved)
- Proposed Visitor Service Area
- Existing Trailhead
- Formalize Existing Trailhead
- Proposed Trailhead
- Proposed Entrance Gate
- Proposed Backcountry Gate
- Improve Existing Road Pulloffs
- Visitor Engagement Zone
- Self-Guided Zone
- Backcountry Zone
- Banco Bonito

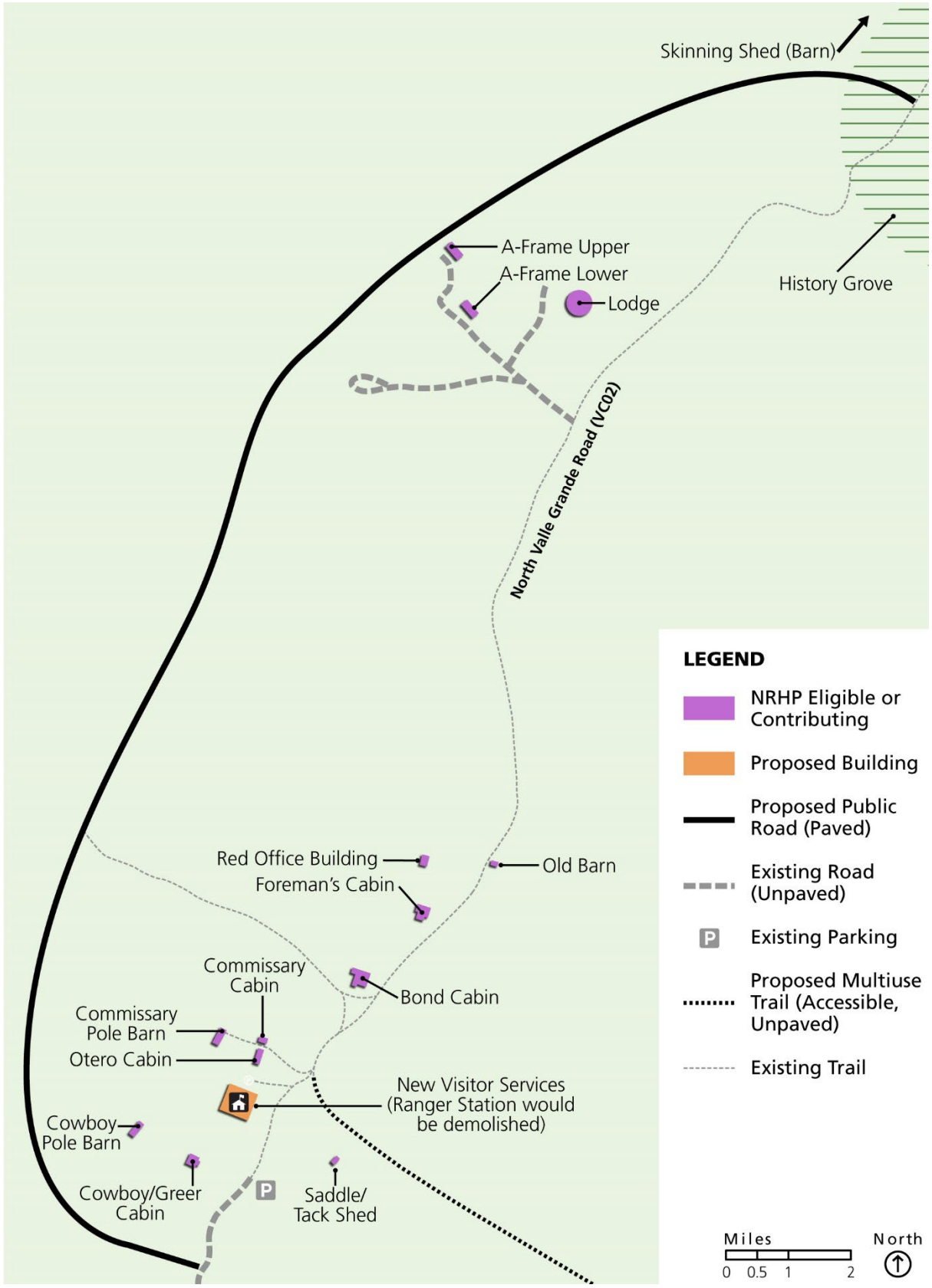
Map 5. New Appropriate Facilities Alternative—Cabin District



Map 6. Adaptive Reuse Alternative



Map 7. Adaptive Reuse Alternative—Cabin District



MITIGATION MEASURES

As this is an overarching plan, potential mitigation measures were considered but none were identified that exceed best management practices, standard operating procedures, or NPS policies. Specific mitigation measures will be identified during the design phase for individual project implementation.

ALTERNATIVES CONSIDERED BUT DISMISSED

During the planning process, the park considered a third action alternative, the Redondo Slope alternative. Its primary distinguishing feature would have been construction of a new visitor services area directly west of the cabin district. It would have been below a legacy logging road—Redondo Foothills Trail (VC0201), which runs along the lower slopes of Redondo Peak that was burned during the 2013 Thompson Ridge Fire. Its advantages would have been its location, which could highlight the resurgent dome and climate change impacts and consolidate the built environment (it would have been close to the cabin district and facilities operations center). Compared to the adaptive reuse alternative, visitor services directly within the cabin district would have been reduced, since they would have been moved to the Redondo Slope location, but they still would have been more robust than under the new appropriate facilities or no-action alternatives since the eventual design of the proposed Redondo Slope visitor services area would likely have leveraged the close proximity of the cabin district to coordinate visitor services between the two locations and support higher visitor use in both. This alternative would also have proposed building stabilizations and adaptive use in the cabin district. Proposed actions elsewhere, such as road realignments and facility removal at Cerro La Jara, would have been the same as the two action alternatives considered in this plan.

During discussions of a potential new visitor services area in the Redondo Slope area, it became apparent that certain key advantages of this alternative were duplicative of the proposed new visitor services area near NM-4 , found in the preferred alternative. However, it had certain drawbacks related to cost, efficiency, and climate adaptation. The location of a new visitor services area deep in the park would be more difficult, time-consuming, and expensive to make accessible after heavy snows compared to one near NM-4. Access would also be less safe even after snow removal due to blowing snow or heavy rains, as the long road to the cabin district is prone to flooding. Additionally, the location was deemed less defensible against wildfires. Conventional wisdom has been that burn scars do not reburn, yet the park has recently observed the opposite phenomenon. Climate change projections suggest that this trend will worsen.

Therefore, the Redondo Slope alternative was not carried forward because it duplicated another, less environmentally damaging or less expensive alternative and because of its relative technical or economic infeasibility.

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Chapter Three: Environmental Consequences

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CHAPTER 3: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The National Park Service identified important issues for detailed analysis in the environmental assessment through civic engagement, tribal consultations, and interdisciplinary team discussions. They also identified issues that could be eliminated from further study. These actions were consistent with Council on Environmental Quality (CEQ) guidance, section 4.2.E of the 2015 NPS NEPA Handbook, and NPS Director's Order 75a: *Civic Engagement and Public Involvement*. As a result, the National Park Service carried forward the following impact topics for detailed analysis:

- Visitor use and experience
- Federally listed species
- Floodplains
- Wetlands
- Archeological resources
- Ethnographic landscape
- Historic ranching structures and landscapes

The analysis is based on expected changes that each alternative would have on the current conditions of the resources and resource trends. This analysis includes both beneficial and adverse impacts, including the impacts of the alternatives in combination with other ongoing and reasonably foreseeable actions that would likely result from implementing any of the alternatives considered in this plan. The analysis also assumes that laws and policies have been followed to protect resources and visitor experiences. Finally, it assumes that prior to the construction of facilities, site-specific environmental analyses, permitting, and consultation will occur (as appropriate) as further feasibility and site design studies are completed.

The planning team considered other issues and topics during the development of this plan. See appendix A for brief descriptions of the impact topics discussed during the development process but ultimately dismissed from detailed analysis and the accompanying rationale.

VISITOR USE AND EXPERIENCE

Visitor use and experience are distinct but intertwined elements and address different components of a visit from where, when, and how visitors engage with the resources (use) and what they feel and perceive throughout their visit (experience). Both visitor use and experience contribute to the overall value of a visitor's time in the park. Visitor use and experience are evaluated together in the analysis of the alternatives. This analysis focuses on the visitor use and experience for the entire park.

Current and Expected Future Condition of Visitor Use and Experience if No Action Is Taken

Visitor use and experience under the no action alternative would remain the same or similar to existing and expected future conditions, with slight improvements as actions from the Front Country Infrastructure Improvement Project are implemented in the cabin district.

Visitors would continue to primarily access the park by private vehicle. The main entrance to the park off NM-4 and visitor services, such as orientation, interpretive materials, and programs, would be located approximately 2 miles down a dirt entrance road (VC01) south of the entrance station at Cerro La Jara. During the park's wettest periods, the current alignment of the entrance road (VC01) causes visitor and administrative access problems. The road is routinely flooded by the East Fork Jemez River and adjacent floodplain during years with high snowmelt.

Visitors would also continue to have access to the park by foot or bicycle where small informal parking areas exist just outside or just inside the park boundary. Some of these pedestrian and bicycle entrances include the park entrance pedestrian access (when the entrance gate is closed), Valle Grande Trailhead, the two-track across from Rabbit Mountain Trailhead, Redondo Meadows Trailhead, and Sulphur Canyon Trailhead (see map 1 for trailheads near the park boundary). These entrances take visitors to various destinations, including frontcountry and backcountry areas. Vehicles would continue to be permitted in both the frontcountry and backcountry; however, visitors must obtain a vehicle pass to enter the backcountry by motor vehicle.

National Park Service staff has collected and reported monthly and annual recreation visitation data since 2020. However, these data must be used with caution, as they only account for visitors entering through the main entrance. Data from 2020 were affected by limited visitor access due to the COVID-19 pandemic and may not fully represent visitor demand at that time. The park saw 30,434 visitors in 2020, 76,578 visitors in 2021, a decrease to 63,738 visitors in 2022, a rise to 76,090 in 2023, and a further increase to 82,111 in 2024. Based on these limited data, it is difficult to determine how visitation is trending.

The population of the state of New Mexico is forecasted to stagnate over the next decade (University of New Mexico 2024). However, substantial competition for outdoor recreation and leisure activities exists in Northern New Mexico, including sites closer to the population centers of Santa Fe and Albuquerque. Both factors could impact the number of visitors coming to the park, albeit in different directions. Additional factors include the increasing awareness of Valles Caldera as being a unit of the National Park System and the potential attractiveness of high-elevation landscapes that will serve as refuges in a warming climate. Valles Caldera is typically 20°F cooler than the Albuquerque Metro Area during the summer.

Under current management, the park entrance station would remain at Cerro La Jara, and limited visitor services would be available in the historic cabin district. Existing services in the cabin district would continue to include a ranger station, restrooms, waste disposal, interpretive materials, and public trails. Near the entrance station at Cerro La Jara, a small gravel parking area, vault toilets, the La Jara Trailhead, and Pond Trail Trailhead would be maintained. A small gravel parking area would remain near the visitor contact station.

Access beyond the backcountry gate near the intersection of the entrance road (VC01) and North Valle Grande Road (VC02) would continue to require a backcountry vehicle pass. The park would continue to allow 35 vehicles per day to enter the backcountry. These passes may be obtained online prior to arrival, and visitors could be issued passes in person if they remain available for the same day. Vehicle access via Sulphur Creek Road (VC08) would continue to require a special use permit for activities such as hunting, research activities, and road-based tours. There would be no limit to visitors walking or biking into backcountry areas.

Because of the vehicle pass requirements and daily quota of 35 vehicles, visitors would expect to have a much quieter and more contemplative experience in the backcountry compared to frontcountry areas near Cerro La Jara and the cabin district.

Visitors would continue to experience the natural resources and scenic beauty of the park through designated trails, informal or social trails, and NM-4 pullouts. Trailheads shown on map 1 would remain available for public use. An ABAAS-compliant trail in the cabin district would also remain. There would be no change to the pullouts located along NM-4.

Past, ongoing, and reasonably foreseeable park actions that influence visitor use and experience include habitat restoration, resource monitoring, protection of endangered species, historic preservation projects to restore the cultural and historic landscape, and implementation of the actions identified in chapter 2 of the Front Country Infrastructure Improvement Project environmental assessment and associated finding of no significant impact. While these actions can temporarily degrade visitor experiences during construction phases due to area closures, noise, and visual impacts.

However, these types of efforts would have beneficial impacts on the visitor experience once complete. They would maintain or improve natural and historic resource conditions for the enjoyment of present and future generations. They would also create more accessible opportunities and allow visitors to experience the cabin district without a vehicle pass.

Visitor use patterns are anticipated to be impacted by climate change throughout the national park system, affecting when, where, and how visitors recreate (Fisichelli et al. 2015). Data suggest warming winters, decreased snowpack, increased frequency, duration, and intensity of drought, and increased wildfire risk among other potential climate change impacts to the park and its resources (Climate Change Response Program 2024).

Recovery from these ecological disturbances varies but may reduce visitor access and alter the experiences of ecosystems and aesthetics. An increase in average temperature may lead to increased visitor use during peak and shoulder seasons (the months before and after peak season) as well as extended shoulder seasons. Increased use during shoulder seasons may result in additional impacts to resources and visitor crowding.

Rising temperatures and drought may limit or change recreation opportunities in both summer and winter. Decreased snowpack could limit over-snow recreational opportunities such as skiing and snowshoeing. Warmer, more limited water supplies may also affect fishing and backpacking opportunities. Higher temperatures at lower elevations may lead more visitors to seek cooler high-elevation landscapes, like Valles Caldera.

Additionally, increased temperatures and decreased precipitation may lead to more intense wildfires, posing risks to visitor safety and access to the park.

Effects of the Action Alternatives

New Appropriate Facilities Alternative

Under this alternative, visitor services, facilities, and orientation would be modified and expanded. Visitor services, including visitor contact, restrooms, and exhibits, as well as limited administrative space, would be moved to a new facility closer to NM-4.

This new facility would incorporate elements such as an outdoor plaza with interpretive signs, a gathering area for park programs, a parking lot and drop-off area, a trailhead, and ABAAS-compliant fishing access. This hub would allow for better visitor orientation, as it could occur earlier in the visitor experience cycle, before visitors experience other areas of the park. Additionally, picnic areas would be provided in the Valle Grande District.

These changes would improve the visitor experience by creating a more welcoming, purpose-built environment and providing additional amenities that better engage visitors and help them enjoy the park and its resources. Locating the visitor services area closer to NM-4 would also allow visitors, including short-duration visitors, to make initial contact with rangers, obtain interpretive materials, and participate in programs without having to drive two miles down a dirt road, which anecdotally has been identified as a deterrent to visiting the park. An additional benefit is that vehicle traffic would be removed from Valle Grande (with road realignment), thus improving the views of the valley.

Under this alternative, trails and pullouts would also be modified. The legacy entrance road (VC01) would be converted into an unpaved, ABAAS-compliant, multiuse trail. Existing trails would remain, and the park would formalize the Jemez River Trail (previously known as the Missing Cabin / Hidden Valley trail). The pullouts along NM-4 would be paved, and striped parking spaces would be added. These modifications to trails and pullouts would result in beneficial impacts to the visitor experience by creating additional opportunities for visitors with physical limitations.

This alternative also modifies roads within the park. The entrance road (VC01) would be realigned and paved from the entrance to a parking lot behind the cabin district. North Valle Grande Road (VC02) would be widened and maintained as an improved gravel road from the South Mountain trailhead to the Cerro Piñon trailhead. Redondo Creek Road (the west branch of VC02) would also be widened and improved from the western park entrance to the Redondo Meadow trailhead parking area, retaining its status as a gravel road.

These modifications would benefit the visitor experience by allowing all vehicles to access the paved entrance road (VC01) and the widened and improved North Valle Grande Road (VC02). This would also eliminate impacts to visitor access that currently occur during wet periods when the entrance road (VC01) can flood. The stabilization of six historic structures would enhance the visitor experience, as these structures would be maintained for future generations to enjoy. Additionally, the addition of an ABAAS-compliant parking lot near History Grove would

provide beneficial impact to the visitor experience because it increases opportunities for visitors of all abilities in the area.

Establishing zoning, desired conditions, thresholds, and visitor capacity allows the park to manage a spectrum of visitor experiences more effectively. This approach better defines visitor use management direction and protect and preserve resources for the enjoyment of future generations, providing a beneficial impact on visitor use and experience. Visitor capacities identified include 400 people at one time in the North Valle Grande area and 2,500 people per day in the South Valle Grande area. Current use is well below these capacities, so managing within them would have no impact on opportunities for visitor use in the foreseeable future.

Although the experience associated with use levels closer to these capacities would differ from the current condition, it would not be different from the expected future condition if no action is taken. Therefore, there is no effect. The experience would also be consistent with desired conditions for these portions of the visitor engagement zone, which describe "high levels of visitor use and density."

The thresholds related to visitor experience quality include limited numbers of hiking parties encountered per day in the backcountry/self-reliance zone and self-guided zone, as well as limits on the amount of time sound levels exceed certain decibels in History Grove and in the East Fork Jemez River (see appendix B). Managing within these thresholds ensures that visitors seeking a less crowded experience with opportunities to experience natural quiet and natural sounds would continue to have those opportunities in the future.

The park's monitoring program would identify any future impacts resulting from changes in visitor behavior and would inform appropriate changes to management if needed. Changes to park plans and operations based on the establishment of zoning, desired conditions, thresholds, and visitor capacity would be subject to further compliance review. Ongoing actions, such as providing visitor information, orientation, and enforcement, would continue to provide beneficial impacts on visitor use and experience.

Construction of the entry road and visitor services area would impact visitor use and experience through disruption of visitor movements on infrastructure and noise and visual impacts. The disruption to visitor movement from the closure of the entrance road would be very short in duration, likely around a week, and could be addressed through a temporary gravel access road.

The road closures would be minimal because visitor vehicle access would generally be on a separate alignment from the construction. This separation means that construction vehicles and visitors would not share the road. The most relevant impact from construction-related activities would be the noise and visual impact. These impacts may last for several years during a seven-to-eight-month construction season.

Visitors to the park during this multiyear period would experience noises, sights, and potentially dust inconsistent with the typical park setting. However, these impacts would be concentrated geographically near the entrance to the park and would not be experienced as visitors proceed further into the park. Additionally, these impacts would be mitigated by customary activities such as trip planning communication, visual screening, and limits on the time of day when construction occurs. When combined with past impacts from the management eras of the Valles

Caldera Trust and the National Park Service and paired with the ongoing and reasonably foreseeable future actions, the new appropriate facilities alternative would result in an overall positive impact on visitor use and experience compared to current conditions.

Although this alternative would have some temporary adverse impacts from closures, noise, and visual impacts during the construction of new facilities, roads, and other infrastructure, once construction is complete, there would be beneficial impacts that result from creating a more welcoming, purpose-built environment and providing additional amenities that better engage and help visitors enjoy the park and its resources. As a result, overall impacts on visitor use and experience would be beneficial under the new appropriate facilities alternative.

Adaptive Reuse Alternative

Impacts under this alternative would largely be the same as those under the new appropriate facilities alternative, but with some key differences related to the visitor services area and North Valle Grande Road (VC02).

Under this alternative, visitor services, including visitor contact and exhibits, would be increased in the cabin district. The adaptive use of facilities in the cabin district for visitor services, including administrative spaces for park staff, would have a beneficial impact on visitor experiences by better protecting historic landscapes for visitor enjoyment. However, potential adverse impacts could arise from crowded visitor services since the ranger station would have limitations on indoor and outdoor space due to its location. This may lead to crowding, making it difficult for visitors to obtain the information they need.

Construction activities would also result in short-term noise and visual impacts that could affect the quality of the visitor experience. These impacts would be mitigated by customary activities, including trip planning communication, visual screening, and limits on construction times.

The only difference regarding roads would be that North Valle Grande Road (VC02) would be realigned as a paved road passing behind the cabin district. The existing alignment of the road would be closed to vehicle traffic and maintained with its current width as an unpaved road allowing for pedestrian use. This would likely create a beneficial impact on the visitor experience by removing cars from the main viewshed in the cabin district, providing a safer environment for pedestrians, and creating an additional multiuse trail.

As discussed under the new appropriate facilities alternative, changes to zoning, desired conditions, and visitor capacity would constitute a beneficial impact.

When combined with past impacts from the management eras of the Valles Caldera Trust and the National Park Service and paired with the actions common to all alternatives and ongoing and reasonably foreseeable future actions, the adaptive reuse alternative would result in positive impacts on visitor use and experience. The adaptive reuse alternative in the cabin district would help ensure the protection of the cultural landscape for future visitor experience and overall impacts would be beneficial.

Conclusion

The no-action alternative would continue current management. No new actions would occur, and thus, there would be no new impacts on visitor use and experience under this alternative.

Both the new appropriate facilities and adaptive reuse alternatives would result in beneficial impacts to visitor use and experience, with some temporary and short-duration adverse impacts. The primary difference between the two alternatives regarding impacts on visitor use and experience is the orientation of the hub of visitor activity.

The new appropriate facilities alternative would concentrate visitor use closer to NM-4 and away from the cabin district, while the adaptive reuse alternative would concentrate visitor use in the cabin district. Both alternatives compared to the no-action alternative would have an overall beneficial impact on visitor experiences by creating additional visitor services and opportunities. The new appropriate facilities alternative would likely have a greater beneficial impact on visitor experiences because its location is more easily accessed by visitors year around, and the space would be purpose-built to enhance the visitor experience.

FEDERALLY LISTED SPECIES

Current and Expected Future Condition of Federally Listed Species if No Action Is Taken

An official species list (consultation code 2024-0098225) was obtained from the US Fish and Wildlife Service Information for Planning and Conservation (IPaC) website (https://ecos.fws.gov/ipac/) on May 31, 2024. The list identified 10 threatened, endangered, or candidate species with the potential to occur in the proposed action area:

- Mexican wolf (*Canis lupus baileyi*)
- New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)
- tricolored bat (*Perimyotis subflavus*)
- Mexican spotted owl (*Strix occidentalis lucida*)
- southwestern willow flycatcher (*Empidonax traillii extimus*)
- yellow-billed cuckoo (*Coccyzus americanus*)
- Jemez Mountains salamander (*Plethodon neomexicanus*)
- Rio Grande cutthroat trout (*Oncorhynchus clarkii virginalis*)
- Rio Grande silvery minnow (*Hybognathus amarus*)
- monarch butterfly (*Danaus plexippus*)

The National Park Service initiated discussions in June 2024 with the US Fish and Wildlife Service New Mexico Ecological Services Field Offices to discuss the plan and its potential impact on federally listed species and their critical habitats.

Based on an assessment of known habitat types in the project area and previous NPS survey efforts, the following federally listed species and critical habitats are known to occur within the general management plan and development concept plan study area (see Table 2 below). Of the listed, proposed, and candidate species, the New Mexico meadow jumping mouse, Mexican spotted owl, and Jemez Mountains salamander are evaluated in detail in this environmental assessment. Species with no potential or suitable habitat in the project area and species with distributional and/or elevation ranges outside the project location were dismissed from further review.

In addition to indicating the presence or absence of federally listed species in the park and whether suitable habitat is present for each, table 2 includes rationales for excluding seven listed species from further analysis in the plan.

Table 2. Threatened, Endangered, Proposed, and Candidate Species and Critical Habitat with the Potential to Occur within the Study Area

Species Common and Scientific Name	Status*	Potential to Occur?	Critical Habitat in Study Area?	Reason for Exclusion (if applicable)	Habitat Description and Range in Park
Mammals—Mexican wolf (*Canis lupus baileyi*)	Federally listed endangered	Yes	No	Outside known distributional range of the species	Montane woodlands, adjoining grasslands, and forests in Valles Caldera likely constitute suitable habitat.
Mammals—New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)	Federally listed endangered	Yes	No		Habitat specialist dependent on riparian wetland vegetation including sedge and scrub-shrub vegetation communities. Uses adjacent dry upland for day nests and hibernacula.
Mammals—tricolored bat (*Perimyotis subflavus*)	Federally proposed for listing	No	No	Outside known distributional range of the species; no habitat present in park	No suitable habitat in study area. Valles Caldera is no longer within the bat's mapped range.

Species Common and Scientific Name	Status*	Potential to Occur?	Critical Habitat in Study Area?	Reason for Exclusion (if applicable)	Habitat Description and Range in Park
Birds— Mexican spotted owl (*Strix occidentalis lucida*)	Federally listed threatened	Yes	No		Spotted owls are residents of old-growth or mature forests that have complex structural components (unevenly aged stands, high canopy closure, multistoried levels, high tree density).
Birds— southwestern willow flycatcher (*Empidonax traillii extimus*)	Federally listed endangered	No	No	Outside known distributional range of the species; no habitat present in park; outside elevational range of species	No suitable habitat in study area. For nesting, requires dense riparian habitats (cottonwood/willow and tamarisk vegetation); habitat not suitable for nesting may be used for migration and foraging. Typically found at elevations below 8,500 ft.
Birds— yellow-billed cuckoo (*Coccyzus americanus*)	Federally listed threatened	No	No	Outside known distributional range of the species; no habitat present in park; outside elevational range of species	No suitable habitat in proposed action area. Uses wooded habitat with dense cover and water nearby, including woodlands with low, scrubby vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes.
Amphibians— Jemez Mountains salamander (*Plethodon neomexicanus*)	Federally listed endangered	Yes	Yes		This strictly terrestrial species predominantly inhabits mixed-conifer forest. Although pure stands of ponderosa pine may not be considered ideal habitat, the species has occasionally been found in these woodlands; it has also occasionally

Species Common and Scientific Name	Status*	Potential to Occur?	Critical Habitat in Study Area?	Reason for Exclusion (if applicable)	Habitat Description and Range in Park
					been found in spruce-fir and aspen stands and high-elevation meadows.
Fishes—Rio Grande cutthroat trout (*Oncorhynchus clarkii virginalis*)	Federal candidate for listing	Yes	No	Outside known distributional range of the species; no habitat present in park	Exists in a variety of habitat types, from rivers to small tributaries, but currently no presence in the park based on several years of fish shocking survey data.
Fishes—Rio Grande silvery minnow (*Hybognathus amarus*)	Federally listed endangered	No	No	Outside known distributional range of the species; no habitat or species present in park	Species is currently found in one reach of the Rio Grande River, and this reach is outside park boundaries. Over 15 years of fish shocking survey data indicate no presence in the park.
Insects—monarch butterfly (*Danaus plexippus*)	Federal candidate for listing	Yes	No	Outside known distributional range of the species; no habitat present in park	Outside known range. In western North America, nectar and milkweed resources are often associated with riparian corridors, and milkweed may function as the principal nectar source for monarchs in more arid regions.

New Mexico Meadow Jumping Mouse

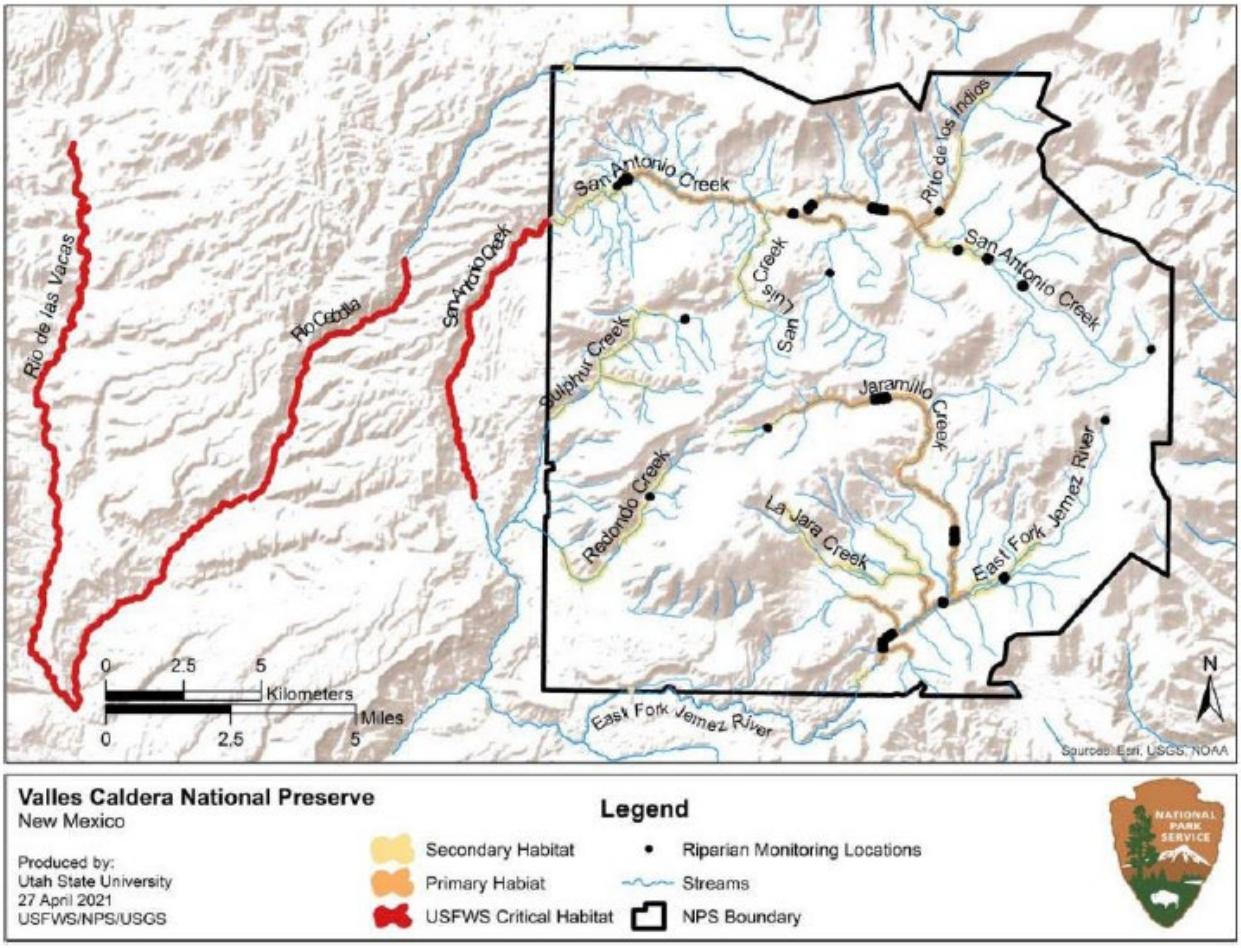
Federally listed as endangered in 2014, with critical habitat designated in 2016, the New Mexico meadow jumping mouse inhabits riparian areas as well as upland sedge and scrub-shrub communities for day nests and hibernacula (NPS 2022c). This species is a true hibernator, typically active from late May or early June to early October. Its active period is influenced by factors such as elevation and possibly age, with breeding occurring from June through August.

These small, dark-brownish rodents, with a white underside and yellowish-brown sides, are approximately 7 to 9 in. long and characterized by their nearly 5-in.-long, bicolored tail (USFWS 2023). They occur at elevations from 4,500 ft to approximately 9,500 ft.

While detailed surveys for the jumping mouse have not been completed parkwide, the park is conducting jumping mouse surveys (as of July 2024) along the base of South Mountain in Valle Grande. The survey team has focused on this area to study the potential entrance road relocation proposed in the general management plan and development concept plan. Current surveys follow a critical habitat reconnaissance study conducted by a regional team of biologists from the US Forest Service, US Fish and Wildlife Service, and the National Park Service for the jumping mouse in the fall of 2023 (S. Zanoni, pers. comm., 2 May 2024).

This specialist rodent depends on sedge and scrub-shrub vegetation communities as part of its critical habitat, using dry upland areas for day nests and hibernacula. According to figure 1, jumping mouse habitat exists along several creeks throughout the park. However, this habitat is mainly "patchy" and does not meet the minimum criteria set by the US Fish and Wildlife Service for patch size and connectivity requirements to support viable and healthy populations of the jumping mouse.

These patches may provide limited connectivity between creeks, such as La Jara Creek and nearby streams in Valle Grande (NPS 2022b). Under the no-action alternative, habitat for the jumping mouse would remain small and patchy. Park managers would continue to seek sufficient connectivity for viable and healthy populations.



Source: FCIIP Biological Assessment (NPS 2022)

FIGURE 1. IDENTIFIED NEW MEXICO MEADOW JUMPING MOUSE HABITAT ON VALLES CALDERA NATIONAL PRESERVE AND ADJACENT SANTA FE NATIONAL FOREST

A final recovery plan for the New Mexico meadow jumping mouse was issued in 2023, indicating a high degree of threat from habitat loss, degradation, and modification. Key stressors include grazing pressure, which denudes vegetative habitat and food sources; water management and use, which causes vegetation loss from maintenance mowing and drying of soils; lack of water from drought, which is exacerbated by climate change; severe wildfires, also exacerbated by climate change; and scouring floods following wildfire events. In contrast, the recovery plan indicates high recovery potential as well, based on the dynamic nature of the area's predominately early-stage riparian habitat, which can rapidly develop into suitable habitat in a few years when protected.

Restoration of degraded habitat along streams, ditches, and canals, such as those in the park, plays an important role in the viability and recovery of populations by improving or creating additional habitat to support the species (USFWS 2023). Recent data indicate that the use of prescribed fire, allowing naturally ignited fire to burn, and thinning treatments are expected to encourage vegetation regrowth and increase landscape and ecosystem connectivity (NPS

2022d). In the long term, these actions would improve hydrology, enhance riparian and aquatic habitat, and support fish populations (NPS 2024).

Mexican Spotted Owl

The Mexican spotted owl has been documented within park boundaries; however, there is no designated critical habitat within Valles Caldera National Preserve for this federally threatened species (USFWS 2012b). These owls consume a variety of prey throughout their range. They commonly eat small- and medium-sized rodents such as woodrats, deer mice, pocket gophers, and voles, but they also consume bats, birds, reptiles, and arthropods (NPS 2022b).

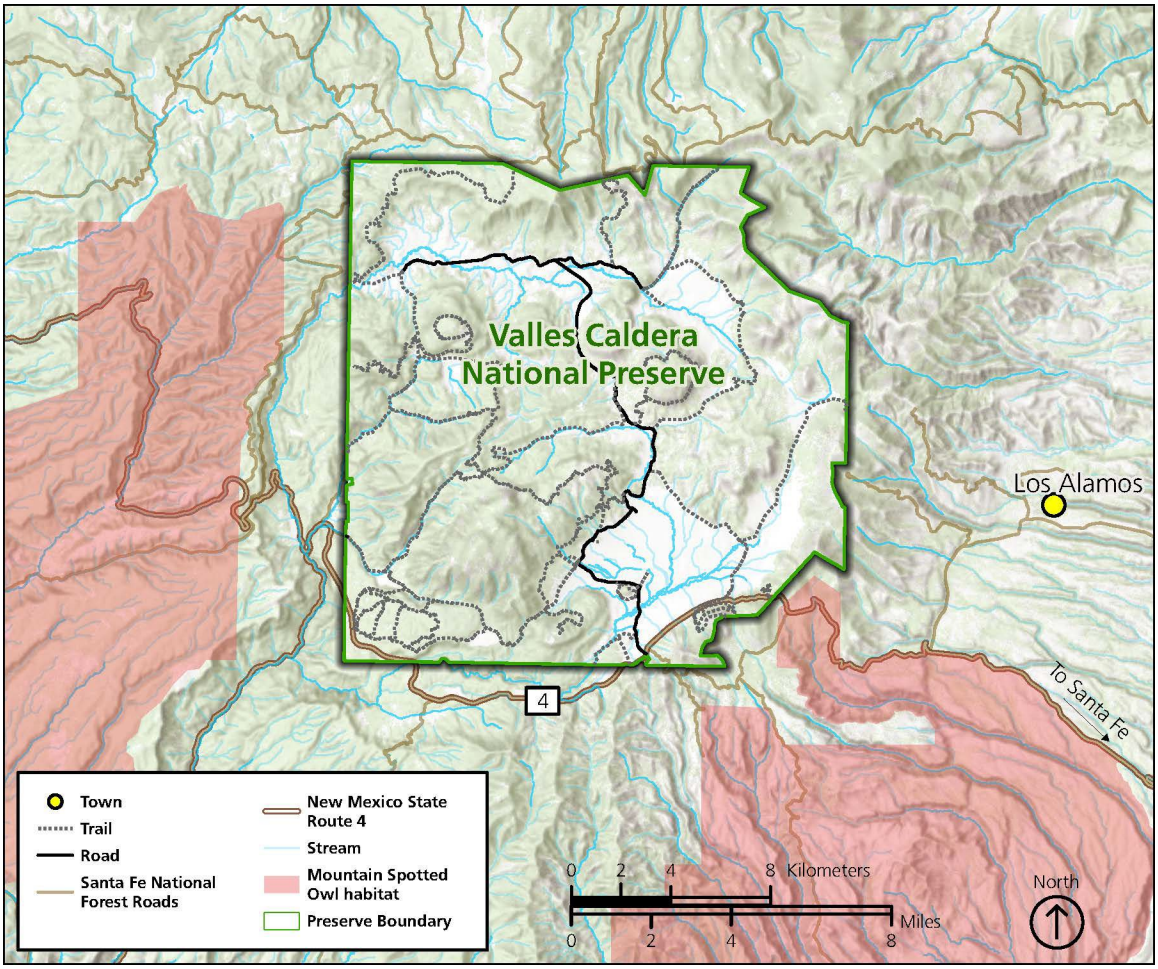
Mexican spotted owls nest in stick nests built by other species, cliff ledges, caves, debris platforms, and tree cavities. Generally, this species begins courtship in March and lays eggs in late March and early April. Eggs hatch approximately 30 days after laying, and brooding typically lasts until early to mid-June, when owlets fledge to nearby branches or cliff ledges. During this time, fledglings depend on their parents for food and may continue begging until early fall, when dispersal occurs (NPS 2022b).

Adult Mexican spotted owls disperse to winter habitat in November or December and return to breeding territories between January and April. Juvenile Mexican spotted owls typically leave their natal territories in September and October. Most radio-marked adult Mexican spotted owls moved between 3 and 30 mi from their breeding territories, typically to lower elevations (USFWS 2012b).Owls may use other woodland types that do not exhibit habitat characteristics associated with breeding territories during dispersal, migration, and overwintering months. However, specific information regarding habitat use in the nonbreeding season is not well known (USFWS 2012b).

In the Southern Rocky Mountains, including New Mexico, Mexican spotted owls occur in steep, forested terrain and canyons. The suitability of Mexican spotted owl habitat in forests is primarily limited by three factors: (1) availability of nesting and roosting sites, (2) availability of foraging habitat/prey items, and (3) competition for habitat among other raptors (USFWS 2012b).

Hawks Aloft, Inc. conducted Mexican spotted owl surveys at 40 nocturnal call points in Valles Caldera from 2020 to 2024 (Hawks Aloft, Inc. 2025). These surveys occurred in conjunction with surveys for other owl species known to occur in the Valles Caldera area, using different methods on different nights than surveys for Mexican owls. Mexican spotted owls were detected at five different call points from 2021 to 2023, but none of these detections were associated with active breeding territories (Hawks Aloft, Inc. 2025).In 2024, NPS biologists conducted three Mexican spotted owl surveys at four locations along the potential entrance road (VC01) realignment corridor, resulting in no Mexican spotted owl detections (NPS unpublished). Additional surveys will be conducted at these same locations in 2025.

Within the much larger spatial extent of critical habitat for the Mexican spotted owl in the park vicinity (see figure 2), suitable habitat and a range of low to high probability for spotted owl sightings (see figure 3) exists in the South Mountain and cabin district areas (NPS 2022b).



Source: US Fish and Wildlife Service Mexican Spotted Owl Species Profile (https://ecos.fws.gov/ecp/species/8196#crithab)

FIGURE 2. MEXICAN SPOTTED OWL CRITICAL HABITAT NEAR VALLES CALDERA NATIONAL PRESERVE

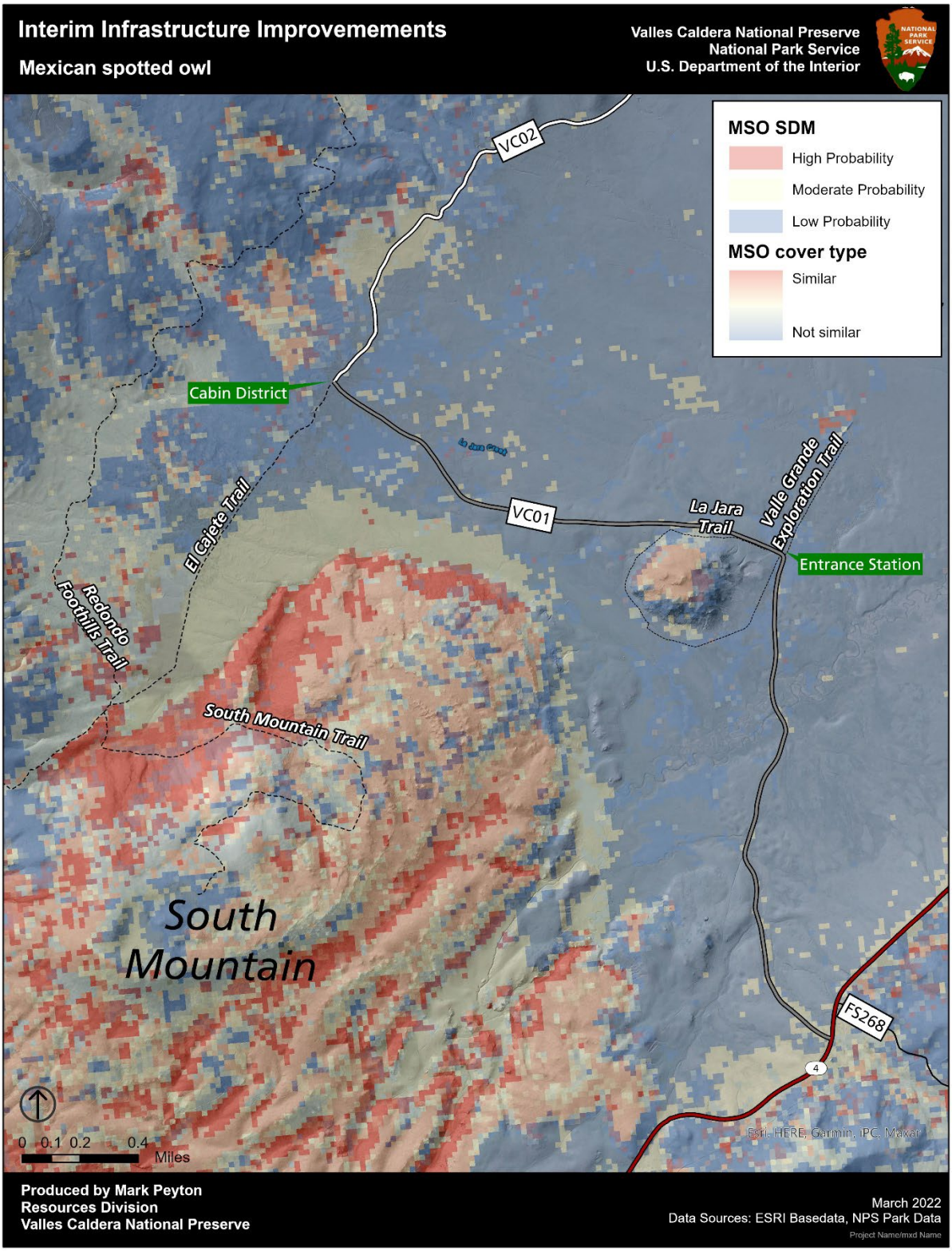


FIGURE 3. MEXICAN SPOTTED OWL HABITAT MODEL NEAR SOUTH MOUNTAIN AND THE CABIN DISTRICT

In addition to the probability model developed for the presence of the Mexican spotted owl in the park's Valle Grande area, NPS and US Fish and Wildlife Service staff have documented the presence of the owl in Sulphur Springs. In a June 2024 meeting with NPS, US Fish and Wildlife Service biologists noted that a juvenile (nonbreeding) pair was observed there in 2022 and has not returned. Park staff are not aware of other spotted owl occurrences within Valles Caldera boundaries. US Fish and Wildlife Service biologists suspect the juvenile pair moved deeper into the adjacent forest. This particular sighting is important because it provides clues that suitable habitat exists within the park (NPS 2024).

Threats to the Mexican spotted owl include habitat loss through timber extraction, even-aged silviculture, and catastrophic wildfire; scientific overutilization; disease; and predation. In addition to the potential for visual or auditory disturbance of owls by nonmotorized recreationists, recreation also has the potential to disturb or degrade suitable habitat elements including downed woody debris, if visitors leave existing backcountry roads. This includes the use of historic logging roads to facilitate motorized and nonmotorized recreation (e.g., hiking, bicycling, horseback riding).

In these areas, visitors would be encouraged to remain on existing trails through educational activities provided at the ranger station and with maps, trail kiosks, trail markers, and published trail guides. Citizen scientists and NPS staff would monitor roads and trails for signs of social trail development or other undesired resource impacts. Management steps to remedy resource damage would be necessary if impacts are observed. To maintain nonmotorized recreational use of logging roads, it is reasonably foreseeable that trail clearing of occasional fallen trees or removal of hazard trees would be performed. Trail maintenance best management practices will be integrated into any future maintenance efforts to reduce potential harm to at-risk species or their habitat.

Common to all alternatives in the general management plan and development concept plan, mitigation includes ongoing monitoring and future surveys for the presence of the Mexican spotted owl in nearby suitable habitat (i.e., Sulphur Canyon and South Mountain). Park managers may implement seasonal public access restrictions as necessary, in consultation with the US Fish and Wildlife Service, if a Mexican spotted owl is detected. These actions would reduce, but not eliminate, the potential for disturbing this species.

Jemez Mountains Salamander

The Jemez Mountains salamander is a slender, dark brown, federally endangered amphibian that is strictly terrestrial. It primarily occurs at the edges of the park's abundant mixed conifer forest and grassland ecotones, as well as in high-elevation meadows. This species prefers stands of fir, spruce, and aspen habitat, with stands of ponderosa pine being less favorable. Ideal coniferous habitats have abundant rocks and surface logs, especially on steep, north-facing slopes. Jemez Mountains salamanders typically occur between 7,200 and 9,500 ft but have been found as low as 6,998 ft and as high as 10,990 ft (NPS 2022b).

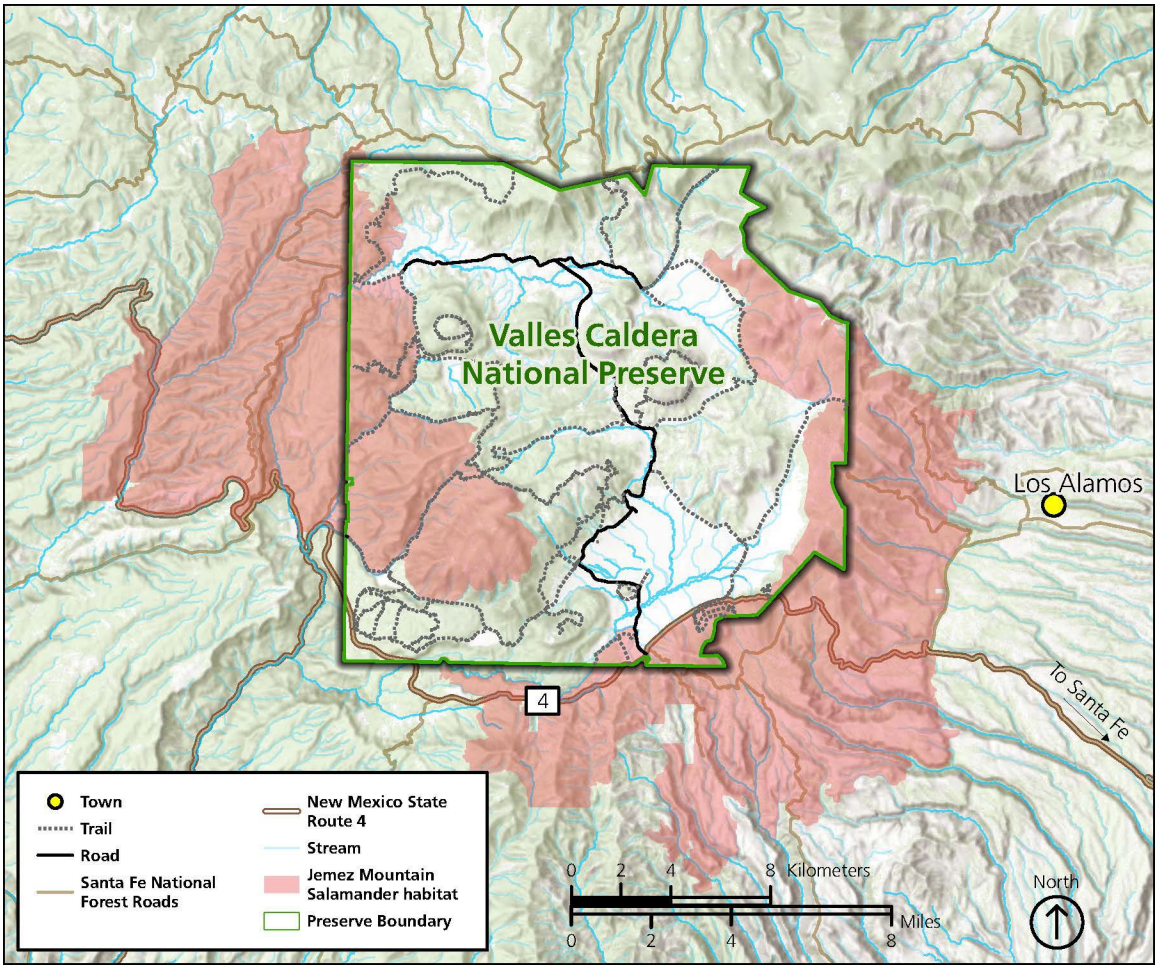
Valles Caldera provides numerous suitable habitat niches for this salamander species, given its unique microhabitats and soils containing deep, fractured, igneous subsurface rock that allows salamanders to retreat underground. Much of their life cycle occurs underground, with surface activity inside rotted coniferous logs or under rocks during a brief period in the summer when

conditions are warm and wet (NPS 2022b). Designated critical habitat for Jemez Mountains salamanders includes much of the park's south-central and western lands (e.g., Redondo Peak, Alamo Canyon, Sulphur Canyon, San Antonio Mountain) and areas on the park's southern and eastern boundaries, such as Rabbit Mountain, Cerro Grande, and Cerros De Los Posos (see figure 4).

Detections have occurred on the lower slopes of South Mountain and Redondo Peak. The most recent observation of the Jemez Mountains salamander in this area occurred in July 2015 near the North Valle Grande Road (VC02) and entrance road (VC01) hiking trails. However, surveys conducted in the cabin district vicinity between July 2017 and September 2020 resulted in no positive detections, and continued occupancy is unknown (NPS 2022b).

Impacts under the no-action alternative

Under the no-action alternative, the species would continue to be threatened by wildfire, habitat loss (e.g., road construction and development), and chytridiomycete fungal (*Batrachochytrium dendrobatidis*) infection (USFWS 2012a). Additional threats affecting the salamander and its associated habitat include alterations to habitat of varying magnitude from fire suppression, forest composition and structure conversions, fire management actions, habitat fragmentation, and recreation. Some of these threats may be intensified by the current and projected effects of climate change, such as increasing drought and wildfire and related shifts in forest type and extent.



Source: US Fish and Wildlife Service Jemez Mountains Salamander Species Profile (https://ecos.fws.gov/ecp/species/4095)

FIGURE 4. JEMEZ MOUNTAINS SALAMANDER CRITICAL HABITAT IN AND NEAR VALLES CALDERA NATIONAL PRESERVE

Past land uses and management actions by federal, state, and private entities within the park have impacted federally listed species. Consideration of these actions forms an important component of the environmental baseline for this plan and species analysis. Substantial facilities development, restoration, and other stewardship projects occurring from 2009 to the present were determined to have some level of impact, ranging from beneficial to adverse, on the three federally listed species carried forward in this analysis.

Under the Valles Caldera Trust, private vehicle access was restricted beyond the entrance station to 35 vehicles at any given time. Initially, this vehicular access facilitated fishing entry to streams within Valles Caldera (e.g., San Antonio Creek, East Fork Jemez River). Over time, it became common for recreational visitors not participating in fishing or hunting to obtain backcountry permits to drive farther into the park for sightseeing, additional hiking, biking, or equestrian opportunities. After years of management in this manner, the Valles Caldera Trust decided that public vehicle access was appropriate to occur along roads in Valles Caldera at the same levels while continuing to protect resources, including federally listed species. When

Valles Caldera National Preserve transitioned to NPS management in 2015 and 2016, the practice of issuing backcountry vehicle permits continued (NPS 2022b).

The 2013 Thompson Ridge Fire burned through the cabin district and scoured much of the watershed on Redondo Peak above the cabin district. The fire consumed much of the understory and downed woody debris, removing many potential cover objects for salamanders, although rock and a few large, downed trees do remain. Additional impacts from the Thompson Ridge Fire on species identified in this analysis likely include impacts to Mexican spotted owl habitat and prey base (NPS 2022b).

The high-severity impacts of the Thompson Ridge Fire on the watershed, along with subsequent rain events and erosion of La Jara Creek, have negatively affected physical habitat components for the New Mexico meadow jumping mouse. Periodic high-water flow may have flooded nests or hibernacula if mice were present (NPS 2022b). In response, the park completed a project to restore a section of La Jara Creek following the fire. Approximately 0.75 mi of La Jara Creek above the cabin district area were restored to a stable channel with appropriate elevation, width-to-depth ratio, and associated entrenchment. The objective was to return La Jara Creek to a healthy, meandering channel that would not remain entrenched and could safely spread floodwaters across the bajada.

In 2020, the park constructed a new maintenance facility that serves as the operations center for the park's Facility Management Division. This project required work over a 12-acre area within the cabin district, with trenching, soil compaction, and the loss and degradation of mixed-conifer salamander habitat occurring on approximately 4.4 acres (NPS 2022b). Ongoing impacts from this project include the permanent full-time use of this building as administrative offices and a maintenance garage, including daily vehicular use and seasonal maintenance activities.

In 2019, stream and wetland restoration and pond repair occurred along La Jara Creek, a tributary to the East Fork Jemez River. These restoration activities were necessary to repair impacts associated with the Thompson Ridge Fire. Beneficial effects from these repairs include stabilizing and improving overall stream function along La Jara Creek and an increase of an estimated 65 acres of wetlands (NPS 2022b).

Ongoing or reasonably foreseeable plan implementations around the park may impact federally listed species. It is reasonably foreseeable that the park would continue to implement a sustainable approach to managing uses such as grazing. Authorized grazing in Valle Grande may also cause loss of ground-cover vegetation, soil compaction, soil erosion, or sediment transport, which could diminish or potentially threaten the habitats of the New Mexico jumping mouse and Jemez Mountains salamander. The park's landscape restoration and stewardship approach is likely to remain active. As these planning actions are implemented, there would be the potential for small, localized impacts from ground-disturbing fuel reduction activities, but potential beneficial impacts parkwide due to the anticipated reduction in the intensity and severity of future wildfires.

The park is currently implementing a Front Country Infrastructure Improvement Project that focuses on the cabin district and Cerro La Jara areas. Some negative impacts to federally listed species are expected, primarily due to ground-disturbing activities, which include the installation of discreet features, tree stump removal, and subsurface fiber-optic cable

installation. Proposed aboveground trails and parking areas within the cabin district also have the potential to affect listed species such as the New Mexico jumping mouse.

Three new trails in the cabin district and parking lot infrastructure to accommodate up to 40 vehicles at one time would be constructed by adding fill to achieve the desired grade and capping the trails with crushed rock to provide a firm surface for visitors to walk on (NPS 2022b).. Each trail would measure 5 ft wide to meet accessibility standards, and the Cabin District Trail, the longest of the new trails, would stretch approximately 1,600 ft in length. The Front Country Infrastructure Improvement Project would be implemented concurrently with certain undertakings proposed in the general management plan and development concept plan. Certain actions in the Front Country Infrastructure Improvement Project would require separate compliance needs, and additional monitoring may be needed during the implementation of those specific actions.

Monitoring and survey efforts would continue for federally listed species under the no-action alternative. The park would continue to prioritize monitoring and surveying for the presence of the jumping mouse, Mexican spotted owl, and Jemez Mountains salamander in suitable habitats. Park managers would authorize seasonal restrictions for public access and recreational use as necessary, in consultation with the US Fish and Wildlife Service, if federally listed species are detected.

Finally, the park is planning a utilities improvement project that would be implemented concurrently with the proposed road realignment in the general management plan and development concept plan. Final details of the utilities project would depend on the outcomes of the plan and outcomes of current and future jumping mouse and Mexican spotted owl surveys in Sulphur Canyon and near South Mountain. The utilities project plan would undergo a separate compliance process, and additional regulatory guidance and monitoring may be needed during plan implementation.

Effects of the Action Alternatives

New Appropriate Facilities Alternative

In addition to preparing NEPA analysis for federally listed species in this plan, the Endangered Species Act of 1973 (16 U.S.C. 153 *et seq.*), as amended (ESA or Act), in section 7(a)(1) directs federal agencies to conserve and recover listed species. The Act requires agencies to use their authorities to further the purposes of the Act by carrying out programs for the conservation of endangered and threatened species so that listing is no longer necessary (50 CFR §402). Furthermore, section 7(a)(2) of the Act directs federal agencies to consult (referred to as section 7 consultation) with the US Fish and Wildlife Service when their activities "may affect" a listed species or designated critical habitat. Additionally, NPS Management Policy (2006) directs the NPS to "inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible."

Under section 7 of the Endangered Species Act (ESA), the new appropriate facilities alternative would have a "may affect but is not likely to adversely affect" determination for the Mexican spotted owl and Jemez Mountains salamander. Currently, there is not a sufficient level of design detail or site-specific data to quantify potential impacts and make a determination under Section

7 of the ESA for the New Mexico meadow jumping mouse. Environmental analysis per NEPA requirements and Section 7 requirements for the ESA determination are provided below for each species based on proposed actions for the alternative.

Visitor Services Area and Valle Grande Entrance Road Realignment

Changes to zoning, desired conditions, and visitor capacity are administrative actions, and any resultant changes to visitor behavior that may impact federally listed species cannot be reasonably and accurately predicted. In and of themselves, these administrative changes constitute a neutral impact. The park's monitoring program would identify any future impacts resulting from changes in visitor behavior and would inform appropriate changes to management, if needed. Changes to park plans and operations based on these administrative actions would be subject to further compliance review.

New Mexico meadow jumping mouse: Proposed ground-disturbing activities, such as widening and improving roads—e.g., North Valle Grande Road (VC02) and Sulphur Creek Road (VC08)—constructing new parking lots, picnic areas, and trails (including the proposed boardwalk along NM-4), and demolishing structures could adversely impact the New Mexico meadow jumping mouse. However, these actions would not occur in known habitat.

Visitor services facilities, including a contact station, restrooms, and staff administrative space that would move to a site near NM-4, and a road spur connecting the entrance road (VC01) to the visitor services area would occur away from known jumping mouse habitat. The proposed outdoor plaza, parking lot, and trailhead would be constructed in the same vicinity and outside of known habitat.

The potential realignment and paving of the entrance road (VC01), the inclusion of utilities upgrades in the road's right-of-way, and changing uses of legacy logging and mining roads could have short-term destructive impacts on vegetation and wildlife habitat during construction and long-term adverse impacts on the jumping mouse (if present) where the proposed roadway corridor would converge upon and ultimately displace the amount of suitable habitat near the East Fork Jemez River. Conversely, removing vehicle use from the existing park entrance road could have long-term benefits for natural habitat restoration along the corridor as well. Converting the former gravel park entrance road to an ABAAS-compliant trail in the new visitor services area could require short-term trampling, soil compaction, and construction-related impacts to jumping mouse habitat near the East Fork Jemez River. However, this conversion would likely alleviate long-term erosion and compaction impacts from existing automobile and truck use in the vicinity of the Jemez River, particularly during spring thaw and other wet, muddy conditions when vehicles use the road.

Currently, there is not a sufficient level of design detail or site-specific data to quantify potential impacts to the jumping mouse and make a determination under Section 7 of the Endangered Species Act. Park resource staff would seek technical guidance from US Fish and Wildlife Service species leads and initiate informal consultation with the agency's New Mexico Ecological Services Field Office to develop conservation strategies when this plan's conceptual proposals are developed as proposed actions.

The National Park Service would prepare construction-level designs and pursue a tiered compliance approach to meet Endangered Species Act and other regulatory requirements for these efforts. A tiered compliance approach to implement development activities proposed in this plan would apply to the other federally listed species included as well. In the near term, the park would continue to monitor and conduct surveys for the presence of the jumping mouse in suitable habitat throughout the Valle Grande District.

As discussed under new appropriate facilities, changes to zoning, desired conditions, and visitor capacity constitute a neutral impact.

Mexican spotted owl: Under the new appropriate facilities alternative, construction of the proposed entrance road (VC01) alignment could impact Mexican spotted owls in the Valle Grande vicinity; however, this new corridor is not within known owl habitat. The proposed route would place facilities, related construction noise impacts, and ultimately visitors slightly closer to known owl habitat. Human recreation could disturb suitable habitat elements, including downed woody debris, if visitors leave existing public roads and trails. This includes the use of historic logging roads to facilitate motorized and nonmotorized recreation (e.g., hiking, bicycling, horseback riding).

These impacts can be largely avoided by implementing ongoing resource protection measures and other best management practices. Visitors would be encouraged to remain on existing trails, for example, through educational activities provided at the ranger station and with maps, trail kiosks, trail markers, and published trail guides. Citizen scientists and NPS staff would monitor roads and trails for signs of social trail development, habitat disturbance in suitable owl habitat, and other undesired resource impacts. Trail maintenance best management practices will be integrated into any future maintenance efforts to reduce the potential harm to at-risk species or their habitat. In the near term, the park would continue to monitor and conduct surveys for spotted owls throughout the park.

With the new visitor services area functioning as the future primary starting point for recreational visitors under this alternative, the increase in visitor density and noise levels could potentially affect owls. Noise is an acute stressor for Mexican spotted owls (NPS 2022a), and elevated human activity levels and periods of increased loudness could adversely impact owls in the greater Valle Grande area.

Jemez Mountains salamander: Future construction and uses of the proposed facilities in the new appropriate facilities alternative within the Valle Grande District would result in a "may affect, not likely to adversely affect" Section 7 determination for Jemez Mountains salamanders. Similar to the Mexican spotted owl, Jemez Mountains salamanders are nocturnal, so additional vehicles, traffic, and increases in daytime visitor use would pose low levels of disturbance for them. Potential road closures during the mating season could further limit disturbance from visitor uses in this alternative.

The National Park Service would continue to monitor and conduct surveys for the presence of Jemez Mountains salamanders in suitable habitat in and around the cabin district, as well as on the lower slopes of Redondo Peak and South Mountain.

Sulphur Springs Backcountry Road Access and Improvements

New Mexico meadow jumping mouse: Park staff conducted jumping mouse surveys in the Sulphur Springs area in 2023 and 2024 but detected no occurrences. Suitable habitat may exist, but no recent occurrences have been documented. Under this alternative, habitat for the jumping mouse would be limited to small patch sizes that lack sufficient connectivity for viable and healthy populations. Nonetheless, increased recreational activity pressure has the potential to increase human disturbance, especially where visitors might leave backcountry roads and authorized trails and damage jumping mouse habitat. This includes the use of historic logging roads to facilitate motorized and nonmotorized recreation (e.g., hiking, bicycling, horseback riding).

In these areas, visitors would be encouraged to remain on existing trails through educational activities provided at the ranger station and with maps, trail kiosks, trail markers, and published trail guides. Citizen scientists and NPS staff would monitor roads and trails for signs of social trail development and other undesired resource impacts. Management steps to remedy resource damage would be necessary if impacts are observed. Trail maintenance best management practices would be integrated into any future maintenance efforts to reduce the potential harm to at-risk species or their habitat.

Mexican spotted owl: Motorized use in Sulphur Canyon would increase under this alternative, and daytime noise levels here might disturb the owls. However, it is unlikely this disturbance would cause displacement because spotted owls are nocturnal and additional vehicles, traffic, and increases in daytime visitor use would pose low levels of disturbance for them. Potential road closures during the nesting season could further limit human noise and disturbance from visitor uses in this alternative.

While official spotted owl surveys have not been conducted in Sulphur Canyon, a juvenile Mexican spotted owl pair were documented in Sulphur Springs in 2022 (NPS 2022b). No detections have been recorded since then despite ongoing surveys.

Increased visitor activity, particularly human noise that would occur within known spotted owl habitat in this alternative and these stressors could disrupt natural behavior and interactions if owls are present (NPS 2022b). Anthropogenic noise can acoustically mask and decrease the efficacy of the owl's vocal communication. Warning calls, territorial defense, and mating signals can be affected, for example. The park would survey for Mexican spotted owls in Sulphur Canyon and consider seasonal recreational restrictions as necessary, in consultation with the US Fish and Wildlife Service, if spotted owls are detected. Park managers would expand acoustic monitoring to document potential impacts to the acoustic environment for the Mexican spotted owl.

Nonmotorized recreational use of the surrounding landscape, including Sulphur Canyon, South Mountain, and other areas within Valle Grande, would also occur under the new appropriate facilities alternative. Mitigations to monitor and conduct surveys for the presence of the Mexican spotted owl in nearby suitable habitats (i.e., Sulphur Canyon and South Mountain) would reduce the potential to disturb this species. Similarly, seasonal recreation and access restrictions may be implemented, in consultation with the US Fish and Wildlife Service, where a Mexican spotted owl is detected. Additionally, the park would expand acoustic monitoring to

document potential impacts to the acoustic environment and soundscape. Therefore, the new appropriate facilities alternative may affect, but is not likely to adversely affect, the Mexican spotted owl.

Jemez Mountains Salamander: While the salamander's critical habitat map includes Sulphur Springs, the area is not considered primary salamander habitat (USFWS 2024). This alternative would have a "may affect, not likely to adversely affect" determination for the Jemez Mountains salamander. Backcountry vehicle permits would encourage visitors to stay on park roads, which would limit, but not eliminate, salamander exposure to potentially disruptive human activities. Some visitors may casually park their vehicles to explore landscape features off the Sulphur Creek Road (VC08) corridor, which could inadvertently damage coniferous logs, woody debris, rocks, moss mats, and rotted tree root channels that provide food and cover (USFWS 2013).

When added to past impacts from the management eras of the Valles Caldera Trust and the National Park Service, potential impacts from continued management actions (e.g., a sustainable approach to managing uses such as grazing and landscape restoration and stewardship approach), and reasonably foreseeable or ongoing impacts from plan implementation, the proposals in the Valle Grande District development concept plan would contribute to an overall negligible impact by developing additional land area and increasing overall human use and activities near, but not within important habitat for the federally listed species in the plan.

Although this alternative would have some temporary impacts from noise during the construction of new facilities, roads, and other infrastructure, these actions would not occur during sensitive periods, such as mating season, to further limit disturbance to federally listed species in this management alternative.

Adaptive Reuse Alternative

Adverse impacts to federally listed species under the adaptive reuse alternative would be slightly less than the new appropriate facilities alternative for each focal species. This is mainly because visitor services would remain focused in the cabin district under the adaptive reuse alternative, having fewer potential impacts to Mexican spotted owl and Jemez Mountains salamander due to the more vulnerable habitat in the visitor services area proposed in the new appropriate facilities alternative. The proposed North Valle Grande Road (VC02) realignment in the adaptive reuse alternative would not likely impact federally listed species or critical habitat as no recent species detections have occurred. The park would continue to monitor and conduct surveys for the presence of federally listed species.

Similar to analysis included for New Mexico Meadow Jumping Mouse in the new appropriate facilities alternative, there is not a sufficient level of design detail to make a determination under Section 7 of the Endangered Species Act. This alternative would have a "may affect, not likely to adversely affect" determination for Mexican Spotted Owl and Jemez Mountains Salamander.

Similarly to the new appropriate facilities alternative, the park would continue to monitor and conduct surveys for the presence of Jemez Mountains salamanders in suitable habitat throughout the park. The park would modify or amend development plans based on those findings to avoid impacts to the salamanders.

When combined with past impacts from the management eras of the Valles Caldera Trust and the National Park Service and paired with the actions common to all alternatives and ongoing and reasonably foreseeable future actions, the adaptive reuse alternative would result in an overall negligible impact by developing additional land area and increasing overall human use and activities near, but not within important habitat for the federally listed species in the plan. Although this alternative would have some temporary impacts from noise during the construction of new facilities, roads, and other infrastructure, these actions would not occur during sensitive periods, like mating, to further limit disturbance to federally listed species in this management alternative.

Conclusion

Monitoring and survey efforts would continue for federally listed species under the new appropriate facilities and adaptive reuse alternatives. The park would continue to prioritize monitoring and surveying for the presence of New Mexico meadow jumping mouse, Mexican spotted owl, and Jemez Mountains salamander in suitable habitats.

For all federally listed species, park managers might authorize seasonal public access restrictions, in consultation with the US Fish and Wildlife Service, if listed species are detected. Additionally, the park would expand acoustic monitoring to document potential impacts to the acoustic environment and soundscape, particularly for the Mexican spotted owl.

For all federally listed species indicated in this assessment, changes to zoning, desired conditions, and visitor capacity proposed in this alternative are administrative actions, and any related changes to visitor behavior that may impact federally listed species cannot be reasonably and accurately predicted. In and of themselves, these administrative changes constitute a neutral impact. The park's monitoring program would identify any future impacts resulting from changes in visitor behavior and would inform appropriate management actions, if needed. Changes to park plans and operations based on these administrative actions would be subject to further compliance review.

Overall, the new appropriate facilities and adaptive reuse alternatives would have a "may affect, not likely to adversely affect" Section 7 determination for the Mexican spotted owl and Jemez Mountains salamander. There is not currently a sufficient level of design detail or site-specific data to quantify potential impacts and make a determination under Section 7 of the Endangered Species Act for the New Mexico meadow jumping mouse.

Park resource staff would seek technical guidance from US Fish and Wildlife Service species leads and initiate informal consultation with the agency's New Mexico Ecological Services Field Office to develop conservation strategies when this plan's conceptual proposals are developed as proposed actions. The National Park Service would prepare construction-level designs and pursue a tiered compliance approach to meet Endangered Species Act and other regulatory requirements for those efforts. A tiered compliance approach to implement development activities proposed in this plan would apply to the other federally listed species as well. In the near term, the park would continue to monitor and conduct surveys for the presence of federally listed species in suitable habitat throughout the Valle Grande District.

New Mexico Meadow Jumping Mouse: In all three alternatives, habitat for the New Mexico jumping mouse is limited to small patch sizes that lack sufficient connectivity for viable and healthy populations. There is not currently a sufficient level of design detail or site-specific data to quantify potential impacts and make a determination under Section 7 of the Endangered Species Act for the New Mexico meadow jumping mouse. Nonetheless, increased recreational activities have the potential to result in increased impacts in suitable habitat with disturbance or degradation of habitat if visitors depart existing backcountry roads and authorized trails. This includes use of historic logging roads to facilitate motorized and nonmotorized recreation (e.g., hiking, bicycling, horseback riding). In these areas, visitors would be encouraged to remain on existing trails through educational activities provided at the ranger station and with maps, trail kiosks, trail markers, and published trail guides. Citizen scientists and NPS staff would monitor roads and trails for signs of social trail development and other undesired resource impacts. Management steps to remedy resource damage would be necessary if impacts are observed. Trail maintenance best management practices would be integrated into any future maintenance efforts to reduce the potential harm to at-risk species or their habitat.

Mexican spotted owl: The "may affect, not likely to adversely affect" determination for spotted owls in the new appropriate facilities and adaptive reuse alternatives is based on the low probability of suitable habitat in proposed development areas, as well as negative detection results from surveys conducted from 2020 to 2024. Mitigation measures to continue future survey efforts in potential habitat within the park would ensure any occurrences are reported to the US Fish and Wildlife Service, and appropriate management actions are taken. For example, potential road closures during the nesting season could further limit disturbance to owls from visitor uses.

Jemez Mountains salamander: Implementation of the new appropriate facilities and adaptive reuse alternatives would result in a "may affect, not likely to adversely affect" determination for the Jemez Mountains salamander, based on the small footprint of proposed management actions in suitable salamander habitat. Compared to the no-action alternative, the majority of proposed actions would be constrained to areas that currently provide visitor access and support visitor uses (such as special use permit access to Sulphur Canyon on Sulphur Creek Road (VC08)). Mitigation measures would reduce the potential to impact individual salamanders and their habitat.

Monitoring and survey efforts would continue for federally listed species under each management alternative. In particular, park managers would prioritize monitoring and survey efforts for the presence of the New Mexico meadow jumping mouse, Mexican spotted owl, and Jemez Mountains salamander in suitable habitats. The park may implement seasonal public access restrictions, in consultation with the US Fish and Wildlife Service, if federally listed species are detected.

Similarly to the Mexican spotted owl, because Jemez Mountains salamanders are nocturnal, additional vehicles, traffic, and increases in daytime visitor use would pose low levels of disturbance for them. Potential road closures during the mating season could further limit disturbance from visitor uses in this management alternative.

FLOODPLAINS

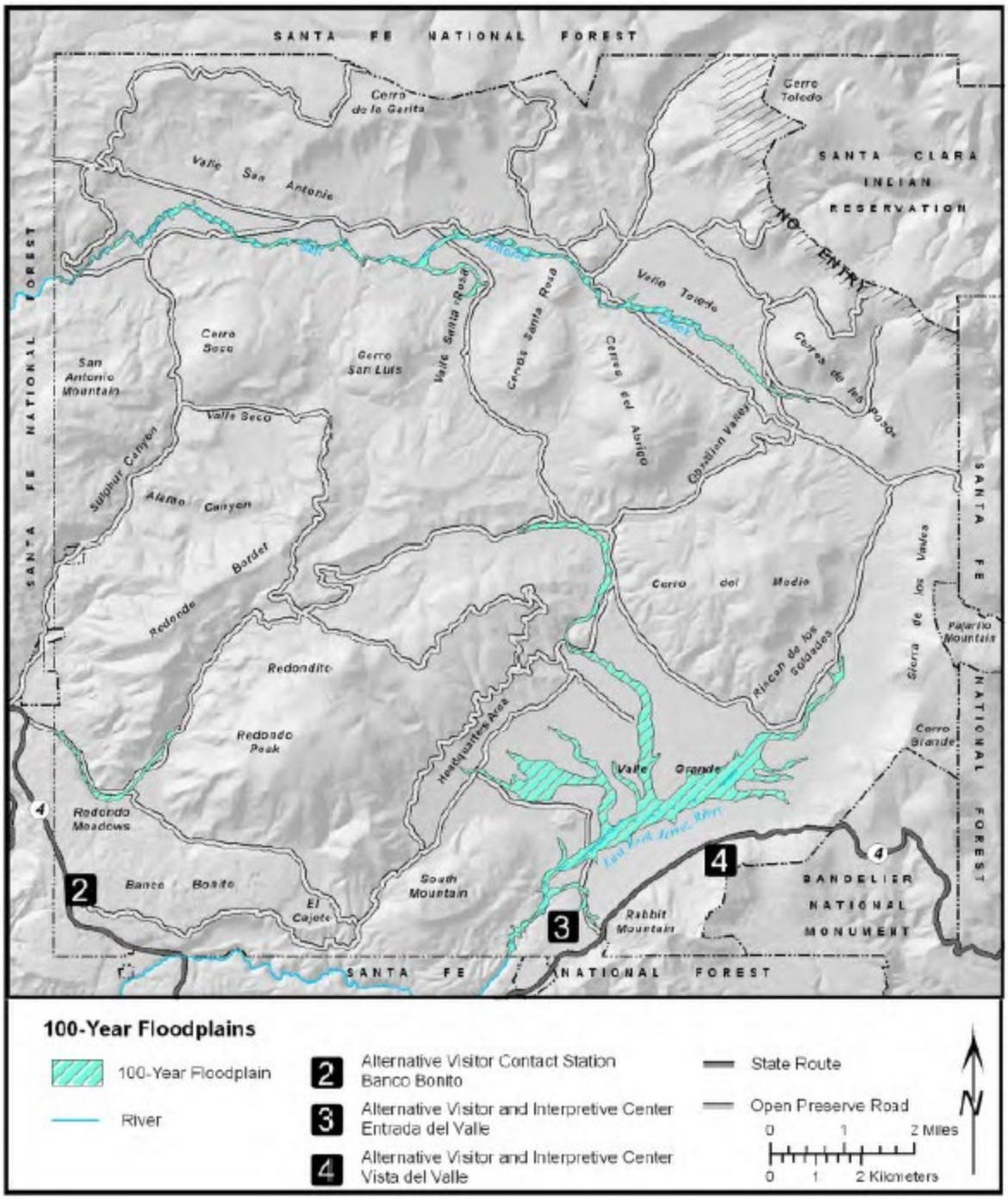
Current and Expected Future Condition of Floodplains if No Action Is Taken

In general, floodplains in southwestern United States are highly threatened ecosystems that support high levels of biodiversity. However, many rivers in the Jemez Mountains, including those within Valles Caldera, have become channelized. This restricts flows to main channels and prevents beneficial pulses of precipitation from swelling onto floodplains and spreading sediments along the way (Lehnert et al. 2021). Impacts from the 2013 Thompson Ridge Fire, for example, denuded mountainside vegetation, leading to the formation of many incised, eroded channels from heavy rain events. As a result, nutrient depletion can occur on the floodplain, cutting supplies to riparian vegetation and wetland plant communities.

Subsequent post-fire flooding resulted in erosion and flood risk in the cabin district area and prompted the installation of protection features such as sandbags and Jersey barriers, intended to divert water away from facilities. These actions resulted in modified hydrological conditions within the cabin district, keeping some areas unnaturally dry while other areas were increasingly wet (NPS 2022a). Recent data indicate that the use of prescribed fire and allowing naturally ignited fire to burn, and thinning treatments are expected to encourage vegetation regrowth and increase landscape and ecosystem connectivity (NPS 2022d). In the long term, these actions would improve hydrology, enhance riparian and aquatic habitat, and support fish populations (NPS 2024).

Climate change in Valles Caldera is characterized by a 1.4-degree Fahrenheit increase in mean annual temperature over the last century, but relatively stable yearly precipitation (Carlson and Gross 2019). There is some indication that climate change is causing more intense and sporadic rain events in the Jemez Mountains. While precipitation is stable, the increased temperatures have adverse impacts on snowpack and winter storm systems (NPS 2024). Valles Caldera is largely a monsoon-dominated watershed, meaning that peak flows occur with the summer monsoon rather than from spring snowmelt. Current hydrologic data collected by the National Park Service confirms the trends that are reported on a regional scale: peak snowmelt is happening earlier, high flow events are more significant and more sporadic, and overall stream discharge is slowly decreasing (NPS 2024).

The Federal Emergency Management Agency has mapped floodplains along several major streams in the park, including San Antonio Creek, Jaramillo Creek, and the East Fork Jemez River in Valle Grande (figure 5). Approximately 2,280 acres of the park fall within a mapped 1% annual chance (AKA 100-year) floodplain. Seventy-five percent of these floodplains are in the Valle Grande (Valles Caldera Trust 2014). These sweeping floodplains and montane wetlands are characterized by stands of herbaceous vegetation that grow along valley bottom drainageways.



Source: Valles Caldera Trust (2012)

FIGURE 5. 100-YEAR FLOODPLAINS

Executive Order 11988, "Floodplain Management," and Executive Order 13690, "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input," require the National Park Service and other federal agencies to evaluate the likely impacts of actions in floodplains. Accordingly, NPS floodplain policy, administered through Director's Order 77-2, aims to preserve floodplain functions and values while

minimizing potentially hazardous conditions associated with flooding. These considerations include threats to human life and health, risks to capital investment, and impacts on natural and beneficial floodplain values.

The Federal Emergency Management Agency map depicting the floodplain has not been updated in many years, and the floodplain has likely been modified due to fire history and more recent restoration activities. These changes further reduce the potential for impacts to the function of floodplains if no action is taken. Note that development in the floodplain adversely impacts its function, for example, by inhibiting the floodplain's ability to distribute sediment. Current management practices, such as the use of sandbags and other purposeful diversions to direct water away from park facilities, such as the current entrance station at Cerro La Jara, would continue to have negligible impacts on floodplain functions. Based on these factors and the assessment from the park hydrologist, the no-action alternative would not affect the natural resources and functions of floodplains.

With minor exceptions, the headwaters of park streams are contained within its boundaries, making Valles Caldera a self-contained watershed unit. Changes to floodplain function, including water quality and the ecological condition of aquatic and riparian communities, are attributable to the interplay of human activities, ecological succession, geology, climate, and other natural processes occurring in the park (Valles Caldera Trust 2014). Trends related to climate change are difficult to predict due to the many other inputs to a watershed system (Ryberg 2022).

Improvements associated with the Front Country Infrastructure Improvement Project (NPS 2022a), such as footings for footbridges, could impact floodplain functions and values. This includes the permanent loss of soil resources within the footprint of these developments, as well as compaction, decreased water permeability, and localized changes in water drainage. Future efforts may include restoring floodplain processes and functions, particularly in the lower portions of the park's watersheds by management methods to stabilize and reduce erosion in upland areas (i.e., lands above the park's valles).

Burying utilities along the western edge of Valle Grande, from State Route NM-4 to the cabin district, would include removal of utility poles and temporarily impact soil resources and possibly wetlands during the construction period. These actions are expected to have long-term beneficial impacts on the park's natural resources, including wetlands, due to the closure of powerline access roads. Other long-term benefits to park ecosystems include reducing hazardous fuels and creating defensible space zones in developed areas.

Effects of the Action Alternatives

New Appropriate Facilities Alternative

In general, the flood hazard and potential for flooding to adversely impact park resources under the new appropriate facilities alternative would be low, depending on the location and design of proposed facility and infrastructure improvements. Because design details and site-specific data to fully quantify the potential impacts on floodplains from proposed facilities are not currently available, the analysis below is largely qualitative. Once site-specific designs are developed for the entry road realignment and visitor services area, the NPS will prepare additional compliance

documentation, as appropriate, including a floodplain statement of finding to meet regulatory and procedural requirements before these facilities could be developed.

Developing the proposed access road realignment and new facilities in the visitor services area (e.g., visitor contact station, outdoor plaza, parking lot, spur road, and drop-off area) could compact floodplain soils and create new impervious surfaces. Additional soil compaction would occur from proposed development activities in the Valle Grande District and cabin district, including constructing new parking areas at the cabin district lodge and near History Grove.

When compacted, soils pack together more tightly, impeding soil aeration and water percolation. This reduction in water infiltration rates results from compaction, which increases runoff, which in turn greatly increases the potential for erosion. Because erosion is the most long-term impact to the landscape as a whole, it poses potentially serious consequences for channelization and related floodplain alteration within the proposed development areas. Potential subsidence of building foundations, limited depth to hard bedrock for shallow excavations (such as utility lines), filtering capability, bottom layer seepage, and slow water movement for septic tank absorption are related environmental engineering challenges for these proposed developments within the floodplain (Valles Caldera Trust 2014).

The formulation of appropriate mitigation measures would be required for project implementation prior to constructing facilities under this alternative. These measures would decrease and possibly negate adverse impacts. Similarly, the design of the proposed facilities and infrastructure improvements would allow, to the extent possible, natural surface water flows and natural and beneficial floodplain values to continue.

The plan also proposes three management zones—the visitor engagement zone, the self-guided zone, and the backcountry/self-reliance zone—to define specific resource conditions and visitor experiences to achieve and maintain in each area of the park. Development is precluded in certain zones, such as the Backcountry/Self-Reliance Zone, would continue the current condition of floodplains' functional values in this zone.

There is a potential benefit to floodplains by removing the existing road from its current location and restoring some level of natural grade to the new visitor services area. Compared to the no-action alternative, the new appropriate facilities alternative could compact new areas of floodplain soils and create new impervious surfaces. However, these surfaces would also benefit floodplain functions in this area through restoration and grade engineering improvements. Compliance with applicable standards, regulations, and policies to minimize impacts on floodplain resources and the loss of property or human life would continue under this alternative. With these measures, the new appropriate facilities alternative would have relatively small effects on floodplain functions and values.

Realigned entrance road (new, paved): 17,500 linear ft; 420,000 sq ft (9.64 acres) [based on 22-ft paved roadway width with 1-ft shoulders; 24 ft total]

Entrance road pullouts (new, paved): 10,000 sq ft (0.23 acres) [based on 2 large pullouts with interpretive signs, etc.]

North Valle Grande Road (VC02) **(widen existing road, retain gravel surface):** 29,500 linear ft; 59,000 sq ft (1.35 acres) [based on 20-ft roadway width from the South Mountain Trailhead to Cerro Piñon Trailhead

FIGURE 6. ESTIMATED AREAS OF NEW DISTURBANCE IN FLOODPLAINS

Changes to visitor capacity proposed in this alternative is an administrative action, and any related changes to visitor behavior that may impact floodplains cannot be reasonably and accurately predicted. In and of themselves, these administrative changes constitute a neutral impact. The park's monitoring program would identify any future impacts resulting from changes in visitor behavior and would inform appropriate management actions if needed. Changes to park plans and operations based on these administrative actions would be subject to further compliance review.

When added to past impacts from the management eras of the Valles Caldera Trust and the National Park Service, potential impacts from continued management actions (e.g., hundreds of acres of floodplain restoration projects, the sustainable approach to managing uses such as grazing, landscape restoration and stewardship approach, and fire management actions), and reasonably foreseeable or ongoing impacts from the implementation of the Front Country Infrastructure Improvement Project, the new appropriate facilities alternative would have an overall beneficial impact on floodplains with the construction of new facilities. These impacts could be mitigated through careful site selection, mitigation measures, and better management of visitor circulation patterns.

Adaptive Reuse Alternative

The adaptive reuse alternative would have fewer impacts on floodplains than the new appropriate facilities alternative since visitor services would be provided in adaptively reused buildings in the cabin district instead of at new facilities. However, the proposed North Valle Grande Road (VC02) realignment in the adaptive reuse alternative would contribute more disturbed surface area at the upland margins of the floodplains than the new appropriate facilities alternative.

These marginal increases in compaction of new areas of floodplain soils along the North Valle Grande Road (VC02) realignment would likely be outweighed by benefits to floodplain functions through restoration and grade engineering improvements included in the adaptive reuse alternative.

The overall impacts of the new appropriate facilities alternative, combined with the impacts of past and ongoing actions, would apply to the adaptive reuse alternative as well, except with a higher intensity of impacts in the cabin district is expected under the adaptive reuse alternative. There would be no impacts near NM-4 since no new construction is proposed there under this alternative.

Conclusion

For floodplains, little difference exists between the adverse impacts from the new appropriate facilities alternative and the adaptive reuse alternative, based on preliminary, rough estimates of ground disturbance for the proposed development in each management alternative. More importantly, the flood hazard and potential for proposed projects to adversely impact the regulatory floodplain depends largely on siting the facilities and incorporating mitigative design features that would decrease potential impacts.

Both action alternatives would result in greater adverse impacts compared to the no-action alternative, primarily due to increased ground disturbance from the proposed park entrance road realignment through the low portion of the Valle Grande floodplain and less so from the widened cabin district road, which is located within the regulatory floodplain but is not nearly as prone to flood hazards and impacts.

WETLANDS

Current and Expected Future Condition of Wetlands if No Action Is Taken

Hardy wetland and riparian habitats exist throughout the park, but the park's higher elevation does not support thickets of plant communities like cottonwood/willow and tamarisk, which are typically found at elevations below 8,500 ft. Wetlands and wet meadows cover approximately 6,853 acres (7.7%) of the park's total acreage (Valles Caldera Trust 2014). The majority of these wetlands are located along the network of rivers, creeks, and streams in Valle Grande, although San Antonio Creek's meandering bends through Valle Toledo and Valle San Antonio also supports an abundant expanse of wetlands and riparian areas (see figure 7). Those wetland areas exemplify herbaceous vegetation of valley bottoms and swales, dominated by grasses, rushes, and sedges, many of which are wetland-associated species. These vegetative communities extend up and down drainageways and in springy areas of the surrounding valle slopes. Most of these communities are on sites subject to periodic flooding or where the soils can become saturated at some point during most years.

Riparian conditions along the East Fork Jemez River and its tributary, Jaramillo Creek, have improved by reducing soil erosion from the impacts of high-severity fires in the perennial reaches from below the headwater springs to the park's southern boundary. However, in the intermittent reaches above the springs, riparian conditions have not improved and are classified as "functioning at risk" due to impacts from legacy land uses, extensive wildfire impacts, and increasing aridity (Valles Caldera Trust 2014; Carlson and Gross 2019).

Meanwhile, San Antonio Creek and its four perennial tributaries, including Sulphur Creek, San Luis Creek, Rito de los Indios, and an unnamed tributary, are also improving in overall wetland

habitat function and water quality condition, but other wetland parameters such as sediment content, pool development, and water temperature are not properly functioning (Valles Caldera Trust 2014).

Recent data indicate that the use of prescribed fire, allowing naturally ignited fire to burn, and thinning treatments are expected to encourage vegetation regrowth and increase landscape and ecosystem connectivity (NPS 2022d). In the long term, these actions would improve hydrology, enhance riparian and aquatic habitat, and support fish populations (NPS 2024).

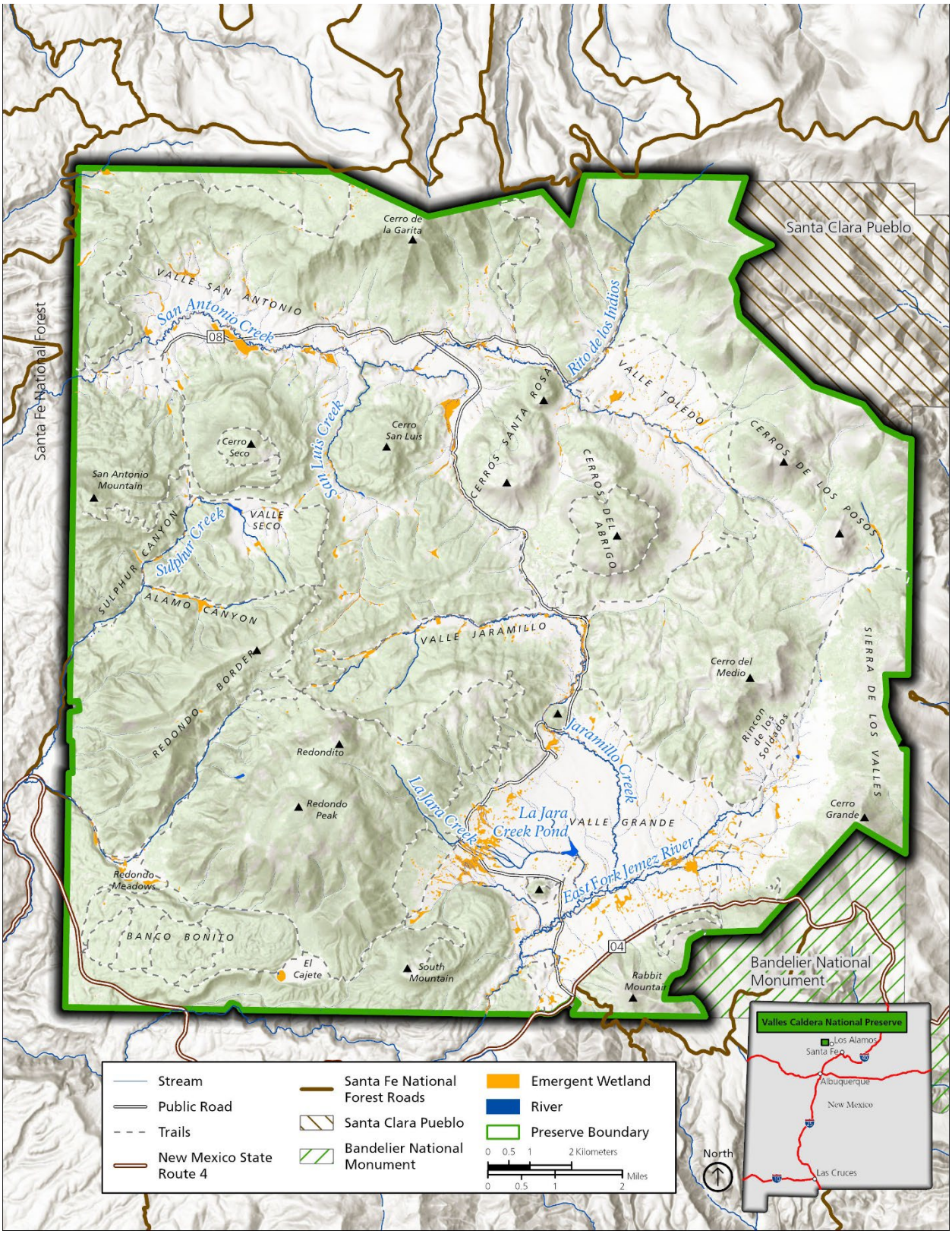


FIGURE 7. WETLAND AND VEGETATION TYPES AT VALLES CALDERA NATIONAL PRESERVE

Impacts from the 2013 Thompson Ridge Fire, for example, denuded mountainside vegetation, which led to the formation of many incised, eroded channels from heavy rain events. As a result, nutrient depletion can occur within the floodplain, cutting supplies to riparian vegetation and wetland plant communities.

Subsequent post-fire flooding resulted in erosion and flood risk in the cabin district area and prompted the installation of protection features such as sandbags and Jersey barriers, intended to divert water away from facilities. These actions resulted in modified hydrological conditions within the cabin district, keeping some areas unnaturally dry while other areas were increasingly wet (NPS 2022a).

Climate change in Valles Caldera is characterized by a 1.4-degree Fahrenheit increase in mean annual temperature over the last century, but relatively stable yearly precipitation (Carlson and Gross 2019). There is some indication that climate change is causing more intense and sporadic rain events in the Jemez Mountains. While precipitation is stable, the increased temperatures have adverse impacts on snowpack and winter storm systems (NPS 2024). Valles Caldera is largely a monsoon-dominated watershed, meaning that peak flows occur with the summer monsoon rather than from spring snowmelt. Current hydrologic data collected by the National Park Service confirms the trends that are reported on a regional scale: peak snowmelt is happening earlier, high flow events are more significant and more sporadic, and overall stream discharge is slowly decreasing (NPS 2024).

Construction of the Front Country Infrastructure Improvement Project in the cabin district and entrance station would not occur within suspected jurisdictional wetlands in the park. Project components occurring adjacent to La Jara Creek and the La Jara Creek Pond would be located outside of the riparian zone (NPS 2022a).

Aquatic resource compliance for NPS undertakings in wetlands is governed by Executive Order 11990. Actions that may impact wetlands must also meet the requirements of NPS Director's Order 77–1: *Wetland Protection* for NPS Wetlands (including streams and rivers), as well as permitting requirements (e.g., Section 404 of the Clean Water Act [33 USC 1344] for "Waters of the United States"). Methods for delineating NPS wetlands are defined in NPS Procedural Manual 77–1: "Wetland Protection," and methods for delineating waters of the United States are defined in the US Army Corps of Engineers Wetlands Delineation Manual (1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0) (2010).

Burying utilities along the western edge of the Valle Grande, from NM-4 to the cabin district, would include removal of utility poles and temporarily impact soil resources and possibly wetlands during the construction period. These actions are expected to have long-term beneficial impacts to the park's natural resources, including wetlands, due to the closure of powerline access roads. Other long-term benefits to park ecosystems include reducing hazardous fuels and creating defensible space zones in developed areas.

The existing park entrance road was designed to travel along the most upland course possible from NM-4 through the Valle Grande, with its low and sometimes problematic crossing point at the East Fork Jemez River. Once over the river, the gravel road gradually ascends toward the cabin district at the edge of the valley and forest transition zone. Not coincidentally, natural

hydrological processes persist along the East Fork Jemez River, including wetlands that encroach upon the road at certain times of the year, exercising the functionality of a healthy system and making the road impassable during the wettest periods. The existing road alignment continues to cause visitor and administrative access problems, and these issues would continue under current management.

Effects of the Action Alternatives

New Appropriate Facilities Alternative

Realigning and paving the park entrance road would likely have adverse impacts to wetlands due to the road's proposed alignment that must cross through (or over, or within depending on design) jurisdictional wetlands, which would require additional compliance and mitigation per Clean Water Act and federal administering agency requirements (i.e., NPS Director's Order #71, Wetland Statements of Findings). Developing new facilities in the visitor services area (e.g., visitor contact station, outdoor plaza, parking lot, spur road, and drop-off area) could compact hydric soils and vegetation and create new impervious surfaces. Additional soil compaction would occur from proposed development activities in the Valle Grande District and cabin district, including paved pullouts on NM-4 and constructing new parking areas at the cabin district lodge and near History Grove.

Like floodplains, because design details and site-specific data to fully quantify the potential impacts on floodplains from proposed facilities are not currently available, the analysis below is largely qualitative. Once site specific designs are developed for the entry road realignment and visitor services area, the NPS will prepare additional compliance documentation, as appropriate, including a wetland statement of findings, to meet regulatory and procedural requirements before these facilities could be developed.

Through the development of mitigation measures that would be required for project implementation and construction of facilities in this alternative, the design of the proposed facilities and infrastructure improvements would allow, to the extent possible, for natural wetland functions and natural and beneficial wetland values to continue. For example, there are several degraded wetland areas in the park to consider as potential restoration candidates when the conceptual facilities in this alternative progress toward viable construction projects. In addition to preparing construction-level design plans, a professional delineation of sites in this plan that may contain wetlands (e.g., proposed entrance road realignment and new facilities in the visitor services area) would be included in the wetland statement of findings to meet regulatory and procedural requirements before these facilities could be developed.

Similar to proposed facilities in the visitor services area, Valle Grande District, and cabin district, improving Sulphur Creek Road (VC08) from the western park entrance to Sulphur Springs and constructing a parking lot at Sulphur Springs could have adverse impacts to wetlands if wetlands are present. As with management actions identified in other areas of the park, design details or site-specific delineations currently are not available to assess potential impacts to wetlands quantitatively. Further analysis and regulatory compliance measures would need to be completed in future development phases prior to construction.

The plan also proposes three management zones—the visitor engagement zone, the self-guided zone, and the backcountry/self-reliance zone—to define specific resource conditions and visitor experiences to achieve and maintain in each area of the park. Development is precluded in certain zones, such as the backcountry/self-reliance zone, which would preserve wetlands in this zone.

Changes to visitor capacity proposed in this alternative is an administrative action, and any related changes to visitor behavior that may impact wetlands cannot be reasonably and accurately predicted. In and of themselves, these administrative changes constitute a neutral impact. The park's monitoring program would identify any future impacts resulting from changes in visitor behavior and would inform appropriate management actions if needed. Changes to park plans and operations based on these administrative actions would be subject to further compliance review.

When added to past impacts from the management eras of the Valles Caldera Trust and the National Park Service and paired with the ongoing and reasonably foreseeable future actions, the new appropriate facilities alternative would result in beneficial and adverse impacts from continuing management actions (e.g., wetland restoration projects; the sustainable approach to managing uses such as grazing and the landscape restoration and stewardship approach), and reasonably foreseeable or ongoing impacts from implementation of the buried utilities project, the proposals in the Valle Grande District development concept plan would have an overall adverse impact on wetlands. These impacts could be mitigated through careful site selection, design considerations, and other mitigation measures.

Adaptive Reuse Alternative

The adaptive reuse alternative would concentrate visitor uses and add a roadway in the cabin district, which would have adverse impacts on hydric soils and vegetation and create new impervious surfaces. However, this alternative would have fewer impacts on wetlands than the new appropriate facilities alternative because visitor services would be provided in adaptively reused buildings in the cabin district and this alternative would avoid the land-disturbing impacts for proposed facilities in the visitor services area.

The proposals for zoning, visitor capacity, the Sulphur Springs area, Cerro La Jara, entrance road (VC01) realignment, and opening the Sulphur Creek Road (VC08) and North Valle Grande Road (VC02) to the public would have the same impacts on wetlands as described in the new appropriate facilities alternative.

The overall impacts discussed for the new appropriate facilities alternative would apply to the adaptive reuse alternative as well, except with a higher intensity of impacts in the cabin district expected under the adaptive reuse alternative. There would be no impacts near NM-4 since no new construction is proposed there under this alternative.

Conclusion

Adverse impacts to wetlands would be similar in the new appropriate facilities and adaptive reuse alternatives, based on preliminary, rough estimates of ground disturbance for the proposed development in each alternative. Both action alternatives would result in greater

adverse impacts compared to the no action alternative, primarily due to increased ground disturbance from the proposed park entrance road realignment through the low portion of the Valle Grande, which would intersect and travel through wetlands on the East Fork Jemez River. Potential impacts to wetlands from widening the cabin district road under the new appropriate facilities alternative would be greater than those in the adaptive reuse alternative, which would maintain the road at its current width.

ARCHEOLOGICAL RESOURCES

Current and Expected Future Condition of Archeological Resources if No Action Is Taken

The rich animal, plant, and mineral resources of the Valles Caldera were utilized by humans throughout the precontact period and continue to be utilized to this day. Numerous archeological sites in the caldera provide evidence of thousands of years of human use of this landscape for hunting and gathering, seasonal habitation, and ceremonial pilgrimage. For millennia, people were drawn to the caldera for its abundant high-quality obsidian, which was used by ancient communities as far away as modern-day Nebraska, North Dakota, Texas, and Mississippi (Valles Caldera Trust 2014).

The earliest confirmed human activity in what is now the southwestern United States is currently dated at 21,000–23,000 years ago, but the first human occupants may have arrived much earlier (Pigati et al. 2023; Steeves 2021). The park's landscape provides a promising archeological context for Paleoindian period sites, although at present only isolated projectile points from this period (dating to after 10,000 years ago) have been found. Older specimens have been found in surrounding areas of the Jemez Mountains (Steffen et al. 2009; Pinson et al. 2009). Significantly more sites in the park date to the Archaic period, including seasonal camps used repeatedly over the course of centuries in some cases; site types indicate activities related to quarrying, toolmaking, and food preparation.

There are no known pueblos within the park, but communities continued to use the resources of the caldera on a seasonal basis during the Ancestral Pueblo period (ended 1540 CE). Fieldhouses and associated agricultural features are concentrated in one area of the park and represent the upper elevational limit for growing maize. Other Ancestral Pueblo period sites are found throughout the park and include pottery sherds representative of numerous cultural groups from the area (Valles Caldera Trust 2014). The park also holds archeological remnants of pre-1800s sheepherding, cattle grazing, timber harvest, and other activities, as well as remnants of early 20th-century development of the geothermal features at Sulphur Springs as a health resort.

Approximately 39% of park lands have been surveyed, with a primary focus on transportation corridors and high operations / visitor use areas such as the cabin district, Cerro La Jara, the temporary entrance station, Banco Bonito, the lower west slopes of Redondo Peak, Valle Seco south to Alamo Canyon, the lower elevations of Rabbit Mountain south of NM-4, and the areas between the entrance road and South Mountain (including candidate locations for the proposed visitor services area in this vicinity).

Some of these surveys do not meet current archeological survey standards, and their data has limited value for compliance analyses. Certain previously surveyed areas would require supplementary subsurface testing during compliance reviews to fully understand potential impacts (source: communication with park archeologists). The park continues to conduct updated surveys to increase its resource inventory and knowledge and inform project designs.

At least 90% of the cabin district has been surveyed to current standards and found to be rich in precontact archeological sites, all of which are characterized by obsidian tools and byproducts of toolmaking, some of which have Archaic-period components. The high-altitude precontact village(s) within the cabin district's Archaic-period archeological landscape is an excellent example of its type in the Jemez Mountains. Testing has indicated the potential for intact subsurface archeological deposits immediately below the ground surface (Decker 2010). Where ground-disturbing activities have not occurred, archeological deposits are generally stable and have not been exposed. The area of Cerro La Jara, including the temporary entrance station, has also been surveyed and tested and found to be archeologically sensitive, with high potential for intact subsurface deposits (NPS 2022a).

The cabin district is currently the park's primary visitor use and operations hub. Past projects during the Valles Caldera Trust and NPS management eras, including new construction (e.g., the facilities operations center) and utilities projects, have adversely impacted[3] archeological sites. The area's Archaic-period landscape continues to experience impacts from visitor use and park operations. Historical ranching activities, such as cattle operations and the construction of buildings, corrals, and roads, have also previously impacted archeological resources. At Cerro La Jara, past disturbances include (but are not limited to) the construction of the Valle Grande corral, the entrance road, and the temporary entrance station (NPS 2022a).

Ongoing, parkwide impacts to archeological resources include the potential for accidental or intentional removal of obsidian and obsidian artifacts. Natural processes also impact these resources; for example, erosion disrupts the physical integrity of sites and transports artifacts, a process which may be exacerbated by climate change. Visitor encounters with sensitive archeological sites, such as rock shelters and sites associated with the high elevations of Redondo Peak, hold the potential to cause or exacerbate trampling, artifact transport, and site erosion and may lead to adverse impacts.

Ongoing or reasonably foreseeable plan implementations around the park may impact archeological resources. It is reasonably foreseeable that the park would continue to implement a sustainable approach to managing uses such as grazing. If implemented in the future, precontact archeological sites throughout the cabin district could be affected by proposed improvements to historic ranching structures and features and subsequent use of the area. Grazing may also cause loss of ground-cover vegetation, soil compaction, soil erosion, or

[3] The term "adverse' has different meanings under NEPA and NHPA. In this archeological resources impact analysis, the term adverse impact is used in the sense defined under NEPA (even when used in the past tense: construction of the facilities operations center resulted in adverse impacts as defined by both NEPA and NHPA, but only the NEPA sense is important here). All assessment of effects for the plan under NHPA section 106 are deferred to the future implementation phase.

sediment transport, which would diminish or potentially threaten intact subsurface archeological deposits.

Likewise, the park's landscape restoration and stewardship approach is likely to continue, including the implementation of a new fire management plan. These approaches may create the potential for minor, localized impacts from ground-disturbing activities but also potential beneficial impacts parkwide due to the anticipated reduction in intensity and severity of future wildfires.

The park is currently implementing the FCIIP, which focuses on the cabin district and Cerro La Jara areas. Adverse impacts to archeological sites result primarily from ground-disturbing activities associated with the project, which include the installation of discreet features, tree stump removal, and subsurface fiber-optic cable installation. Proposed aboveground trails and parking areas within the cabin district also have the potential to affect known archeological resources. While constructing trail and parking lot infrastructure entirely above grade may reduce direct subsurface disturbance to underlying archeology, the three new trails in the cabin district would be constructed by adding fill to achieve the desired grade, which would create the potential for burying archeological artifacts. Sensitive archeological resources at Cerro La Jara would also be adversely impacted by ground-disturbing activity.

Finally, the park is planning a utilities improvement project that would be implemented concurrently with certain undertakings proposed in the general management plan and Valle Grande District development concept plan. The final details of the utilities project would depend on the outcomes of the plan, for example the location of the proposed visitor services area. The utilities project plan would undergo a separate compliance process, and additional compliance and monitoring may be needed during plan implementation.

Effects of the Action Alternatives

New Appropriate Facilities Alternative

Construction of a new visitor services area and a road spur to access it would cause adverse impacts through ground disturbance across an area that is more or less undisturbed and would result in high visitor use in an area that has experienced relatively little in the past. Previous surface surveys of the general location for this proposed construction revealed relatively low artifact density and archeological sites that appear limited in extent. Potential for unexpected discoveries during follow-up surveys and monitoring always exists should this alternative be implemented.

This alternative would remove visitor services from the cabin district, which may decrease the intensity of visitor use there, although it is not possible to predict with certainty. Increased intensity of usage generally leads to more disturbance since it raises the rate of visitor encounters with archeological sites and artifacts, which in turn, increases incidents of accidental and intentional disturbance through trampling and artifact dislocation or removal. This effect is reduced by encouraging visitors to remain on designated walkways or trails.

Proposed ground-disturbing activities, such as widening and improving roads—e.g., North Valle Grande Road (VC02) and Sulphur Creek Road (VC08); constructing new parking lots, picnic

areas, and trails (e.g., the proposed boardwalk along NM-4); and demolishing structures would adversely impact surface and subsurface archeological resources.

Construction of the new entrance road (VC01) alignment is particularly likely to impact known sensitive resources in the vicinity of its proposed route, although the severity of impacts would depend on the precise location of the right-of-way. The new route is also likely to place visitors in closer proximity to known sensitive sites, which may not increase impacts if the general locations of those sites are not disclosed and if measures are taken to deter or redirect foot traffic.

Improving Sulphur Creek Road (VC08) and broadening public access would increase visitor use intensity and therefore cause adverse impacts to archeological resources, potentially including certain sensitive sites that are visible from the road.

Removal of the visitor contact facility and parking lot near Cerro La Jara may result in beneficial impacts to known sensitive archeological resources in the area, since the removal of vehicle access may cause a decrease in visitation to the trailheads and the attendant visitor-resource encounters.

Changes to zoning, desired conditions, and visitor capacity are administrative actions, and any resultant changes to visitor behavior that may impact archeological resources cannot be reasonably and accurately predicted. In and of themselves, these administrative changes constitute a neutral impact. The park's monitoring program would identify any future impacts resulting from changes in visitor behavior and would inform appropriate changes to management, if needed. Changes to park plans and operations based on these administrative actions would be subject to further compliance review.

During the plan's design and implementation phase, the park will conduct review and consultation per 36 CFR 800, as discussed above in order to avoid, minimize, or mitigate adverse effects that may occur from undertakings tiering from this plan.

When added to past impacts from the management eras of the Valles Caldera Trust and the National Park Service, potential impacts from continued management actions (e.g., the sustainable approach to managing uses such as grazing, landscape restoration and stewardship approach, and a fire management plan), and reasonably foreseeable or ongoing impacts from plan implementation, the proposals in the Valle Grande District development concept plan would contribute to an overall adverse impact by continuing the pattern of disturbance to the Archaic landscape and village sites in the cabin district with new construction of small features and increased visitor activity.

These impacts can be mitigated through careful site selection for new features and controls on visitor circulation patterns. The road realignment would be implemented concurrently with a utilities project that will undergo separate compliance, and it is expected that the disturbance footprint would be the same for both. A new and separate compliance process for the proposed road realignment project would be conducted during its design and implementation phase and would include analysis of impacts, including potential long-term impacts.

There would also be impacts under this alternative from new ground disturbance, including construction of the new entrance road (VC01) alignment and the new visitor services area near

NM-4. As discussed above, ground disturbance would adversely impact surface and subsurface archeological resources.

Adaptive Reuse Alternative

This alternative may result in the highest visitation levels in the cabin district. Under this alternative, visitor services would be concentrated and enhanced there, which may increase the intensity of operations and visitor use. It is possible, but not reasonably foreseeable, that this would increase visitor-resource encounters (visitor encounters with archeological resources hold the potential to cause or exacerbate trampling, artifact transport, and site erosion) and intensify visitor and park operational impacts on a sensitive Archaic-period village and archeological landscape. Monitoring would detect actual new impacts, if any, and inform adaptive management. Realigning the stretch of North Valle Grande Road (VC02) that runs through the district would remove vehicle traffic from an archeologically sensitive area but would cause new disturbances to an area with known sites and a high probability of unknown, undisturbed sites. Additional archeological surveys conducted prior to identifying a right-of-way for the proposed road will identify any sites in the area so impacts could be avoided, minimized, or mitigated.

Anticipated impacts from implementing the entrance road (VC01) and Sulphur Creek Road (VC08) realignments and improvements and removing infrastructure at Cerro La Jara would be the same as under the new appropriate facilities alternative. As discussed under this alternative, changes to zoning, desired conditions, and visitor capacity constitute a neutral impact.

During the plan's design and implementation phase, the park will conduct review and consultation per 36 CFR 800 as discussed above, in order to avoid, minimize, or mitigate adverse effects that may occur from undertakings tiering from this plan.

When added to past impacts from the management eras of the Valles Caldera Trust and the National Park Service, potential impacts from continued management actions (e.g., the sustainable approach to managing uses such as grazing, landscape restoration and stewardship approach, and a fire management plan), and reasonably foreseeable or ongoing impacts from plan implementation, the proposals in the Valle Grande District development concept plan would contribute to an overall adverse impact by continuing the pattern of disturbance to the Archaic landscape and village sites in the cabin district with new construction of small features and increased visitor activity.

Impacts in the cabin district are expected to be more intensive under this alternative than under the new appropriate facilities alternative. These impacts can be mitigated through careful site selection for new features and controls on visitor circulation patterns. The road realignment would be implemented concurrently with a utilities project that will undergo separate compliance, and it is expected that the disturbance footprint would be the same for both. A new and separate compliance process for the proposed road realignment project would be conducted during its design and implementation phase and would include analysis of impacts, including potential long-term impacts.

There would also be impacts under this alternative from new ground disturbance, including construction of the new entrance road (VC01) alignment. As discussed above, ground disturbance would adversely impact surface and subsurface archeological resources.

Conclusion

The primary difference between the new appropriate facilities and the adaptive reuse alternatives with respect to impacts to archeological resources lies in ground disturbance in proposed visitor services area locations. Disturbances to the Archaic archeological landscape in the cabin district would be more intense under the adaptive reuse alternative than under the new appropriate facilities alternative. Based on existing survey data and what is known about sites in the vicinity of NM-4, that area is less archeologically sensitive than the cabin district.

The impacts of the new appropriate facilities alternative are less adverse for archeological resources than those under the adaptive reuse alternative. However, both action alternatives would result in greater adverse impacts compared to the no-action alternative because of increased disturbance in the cabin district and ground disturbance from road realignments—especially the entrance road (VC01)—through archeologically sensitive areas.

ETHNOGRAPHIC LANDSCAPE

Current and Expected Future Condition of the Ethnographic Landscape if No Action Is Taken

The park lacks sufficient ethnographic research to formally identify ethnographic resources but has tribal consultation records that positively identify certain cultural and natural resources of traditional significance. Consultation outcomes have clearly indicated that the caldera is an ethnographic landscape, so although it has not been formally documented, it will be treated as such for this analysis.

The ethnographic landscape encompasses all the cultural and natural resources and landscape features within the park that are of traditional significance to Tribal Nations, including sacred sites and landforms, some of which have been disclosed. All archeological resources of Indigenous origin are potentially ethnographic resources, pending direct, first-person verification through ethnographic research or consultation, as are (potentially) natural resources including landscape features and viewsheds. The park currently lacks any records in its Cultural Resource Information System—Ethnographic Resources (CRIS-ER) database, which is the primary tool for formally inventorying and documenting ethnographic resources.

The caldera is of spiritual and ceremonial importance to numerous Tribal Nations, for whom the landscape remains part of traditional practices, beliefs, identity, and history. Their ancestors have used the landscape and its resources since time immemorial. Redondo Peak (11,254 ft) is the highest point in the caldera and remains a regionally significant geographic and cultural focal point and a pivotal sacred place. The park's enabling legislation directs the protection of traditional cultural and religious sites and volcanic domes and peaks, including Redondo Peak.

The Archaic-period archeological landscape in the cabin district and obsidian sources and obsidian artifacts are ethnographically significant, and past and ongoing impacts to these

resources were discussed above. The summit of Redondo Peak, a sacred area, is under voluntary closure, and a special use permit is required to hike to the summit. No such permits have been issued to date. Visitor encounters with ethnographically significant or sacred areas throughout the park hold the potential to cause or exacerbate trampling, artifact transport, and site erosion and could result in adverse impacts.[4]

Although there is significant overlap between archeological and ethnographic resources, the latter are set apart by their intangible qualities. For example, intrusive noises or smells, or certain types of activities, may not impact an archeological district but may impact the integrity of a sacred site (aspects of setting and feeling). Archeological districts can be impacted by visual intrusions, but ethnographic resources may be more sensitive or sensitive in different ways. Identifying and avoiding, minimizing, or mitigating impacts to ethnographic resources necessitates consulting closely with Tribal Nations.

The ongoing or reasonably foreseeable plan implementations discussed above that may impact archeological resources may also impact the ethnographic landscape for the same reasons. More details about the implementation of the utilities improvement project are needed to assess its potential effects to the ethnographic landscape.

Effects of the Action Alternatives

New Appropriate Facilities Alternative

The analysis for archeological resources under this alternative also applies to the ethnographic landscape since that analysis largely concerns Indigenous archeology, which will be treated as traditionally significant for the purposes of this analysis. It is not possible to know at this time whether proposals under this alternative—for example, adjusting trailheads and circulation patterns and enhancing visitor services—would result in increased visitation to ethnographically sensitive areas.

As noted above, increases in visitation could increase visitor-resource encounters, which always carry the potential for adverse impacts to tangible resources and can also lead to adverse impacts to intangible qualities of ethnographic landscapes and sacred sites through noise, visual intrusions, and potentially through incompatible activities. The park will establish protocols to monitor for impacts, which could be reduced through adaptive measures or through preemptive measures such as collaboration between park cultural resource and interpretation specialists on visitor education content and resource protection messaging.

Geographic features in the vicinity of the proposed new facilities site suggest the potential for ethnographic significance beyond just the archeological landscape, but whether or not the area is, in fact, significant cannot be known for certain without consultation. Beyond the known or suspected ethnographic landscape features and other areas of traditional significance in the park, there is insufficient ethnographic research or consultation data about traditionally

[4] The term "adverse' has different meanings under NEPA and NHPA. In this ethnographic landscape impact analysis, the term adverse impact is used in the sense defined under NEPA. All assessment of effects for this plan under NHPA section 106 are deferred to the future implementation phase.

significant natural resources for the park to conduct further impact analysis at this time. The park would continue to consult with Tribal Nations to avoid impacts.

Anticipated impacts from implementing the entrance road (VC01) and Sulphur Creek Road (VC08) realignments and improvements and removing infrastructure at Cerro La Jara, would be the same as those to archeological resources. As discussed under the "Archeological Resources" section, changes to zoning, desired conditions, and visitor capacity constitute a neutral impact.

During the plan's design and implementation phase, the park will conduct review and consultation per 36 CFR 800, as discussed above in order to avoid, minimize, or mitigate adverse effects that may occur from undertakings tiering from this plan. The park would also continue to consult with Tribal Nations outside of formal compliance processes per Director's Order 71C *Consultation with Indian and Alaska Native Tribes*, to discuss in general the management of ethnographic resources and ongoing impact mitigation if needed.

The analysis above of past impacts to archeological resources from the management eras of the Valles Caldera Trust and the National Park Service, potential impacts from continued management actions (e.g., a sustainable approach to managing uses such as grazing, landscape restoration and stewardship approach, and a fire management plan), and reasonably foreseeable or ongoing impacts from plan implementation apply to this discussion of ongoing impacts to the ethnographic landscape as well: the proposals in the Valle Grande District development concept plan would contribute to an overall adverse impact by continuing the pattern of disturbance to the Archaic landscape and village sites in the cabin district with new construction of small features and increased visitor activity.

The impacts of these past, ongoing, and reasonably foreseeable actions on the intangible qualities of ethnographic resources or to traditionally significant natural resources cannot be anticipated with reasonable certainty at this time.

Adaptive Reuse Alternative

The analysis for archeological resources under this alternative also applies to the ethnographic landscape since that analysis largely concerns Indigenous archeology, which will be treated as traditionally significant for the purposes of this analysis. In addition, the archeological evidence of such long usage, combined with the proximity of certain specific landscape features, suggests the potential for ethnographic significance beyond just the archeological landscape, but whether or not this area (or specific locations within it) is, in fact, significant cannot be known for certain without consultation with Tribal Nations.

Anticipated impacts from implementing the entrance road (VC01) and Sulphur Creek Road (VC08) realignments and improvements and removing infrastructure at Cerro La Jara, would be the same as under the new appropriate facilities alternative. As discussed under the "Archeological Resources" section, changes to zoning, desired conditions, and visitor capacity constitute a neutral impact.

As discussed under the new appropriate facilities alternative, beyond the known or suspected ethnographic landscape features and other sacred sites or areas of traditional significance that contribute to the ethnographic landscape, there is insufficient ethnographic research or consultation data about traditionally significant natural resources for the park to conduct

further impact analysis at this time. The park would continue to consult with Tribal Nations to avoid impacts.

During the plan's design and implementation phase, the park would conduct review and consultation per 36 CFR 800 as discussed above in order to avoid, minimize, or mitigate adverse effects that may occur from undertakings tiering from this plan. The park would also continue to consult with tribal governments outside of formal compliance processes per Director's Order 71C, *Consultation with Indian and Alaska Native Tribes*, to discuss in general the management of ethnographic resources and ongoing impact mitigation if needed.

The analysis above of past impacts to archeological resources from the management eras of the Valles Caldera Trust and the National Park Service, potential impacts from continued management actions (e.g., a sustainable approach to managing uses such as grazing, landscape restoration and stewardship approach, and a fire management plan), and reasonably foreseeable or ongoing impacts from plan implementation, apply to this discussion of ongoing impacts to the ethnographic landscape as well: the proposals in the Valle Grande District development concept plan would contribute to an overall adverse impact by continuing the pattern of disturbance to the Archaic landscape and village sites in the cabin district with new construction of small features and increased visitor activity.

The impacts of these past, ongoing, and reasonably foreseeable actions on the intangible qualities of ethnographic resources or to traditionally significant natural resources cannot be anticipated with reasonable certainty at this time.

Conclusion

As for archeological resources, the significant difference between the new appropriate facilities and the adaptive reuse alternatives with respect to impacts to the ethnographic landscape lies in ground disturbance to proposed visitor services area locations. Disturbances to the ethnographically significant Archaic archeological landscape in the cabin district would be more intense under the adaptive reuse alternative than under the new appropriate facilities alternative.

Based on existing survey data and what is known about sites in the vicinity of NM-4, that area is less archeologically sensitive than the cabin district. The impacts of the new appropriate facilities alternative are less adverse for the ethnographic landscape than those under the adaptive reuse alternative. However, both action alternatives would result in greater adverse impacts compared to the no-action alternative because of increased ground disturbance in the cabin district and ground disturbance from road realignments—especially the entrance road (VC01)—through sensitive areas. There is insufficient ethnographic research or consultation data to fully understand potential impacts to the intangible qualities of ethnographic sites or to traditionally significant natural resources at this time. The park would continue to consult with Tribal Nations to avoid impacts prior to future plan implementation.

HISTORIC RANCHING STRUCTURES AND LANDSCAPES

Current and Expected Future Condition of Historic Ranching Structures and Landscapes if No Action Is Taken

The heirs of Luis María Cabeza de Baca secured a land grant in 1860 to the area now designated as Valles Caldera National Preserve. Originally used for sheep ranching, cattle were introduced in the mid-20th century after the purchase of the property by the Bond family. In 1909, the Oteros sold the property's timber rights to the Redondo Development Company, a group of investors from Pennsylvania, who began logging operations later in the 20th century.

Between 1915 and 1918, three cabins were constructed. In 1918, the property was purchased by George and Frank Bond, who continued ranching operations. In the 1940s, an additional cabin and a barn were constructed. In 1947, Rocky Mountain elk from the Greater Yellowstone Area were introduced by the State of New Mexico, and in 1951, two more buildings were added to the site.

James Patrick Dunigan purchased the property in 1963 and developed recreational opportunities in the area, including the construction of visitor housing for hunting and fishing. The Dunigan family also approved other commercial endeavors, including geothermal energy exploration and filmmaking. In 1971, logging operations were temporarily halted, and efforts to preserve the natural and cultural heritage of the area began to gain strength within national and state politics. Today, the park recognizes the Otero era (1899–1917), the Bond era (1917–1962), and the Dunigan era (1963–2000) as the three principal building periods of the cabin district. The current entrance road (VC01) alignment was constructed during the Bond era (NPS 2022b).

"Cabin district" is a term of convenience used by the park to describe the general area of this ranching property. Within the cabin district is the Baca Ranch Cabin Area historic district, found eligible for listing in the National Register of Historic Places in 2024, and the Baca Cabin Area cultural landscape, which was documented in 2022 and has the same boundary as the historic district. This 603-acre historic vernacular landscape includes 13 buildings and features, including History Grove, that contribute to its period of significance from 1899 to 1965 (Steely et al. 2024).

The NRHP nomination (Steely et al. 2024) and the cultural landscape documentation (NPS 2022b) have not yet received consensus determinations of eligibility from the New Mexico state historic preservation officer. In the meantime, they are being treated as NRHP-eligible for compliance purposes. Since they share a common boundary and history, these two properties will be referred to collectively as the Baca Ranch historic landscape district.

In the northwest quadrant of the park is a potential historic ranching landscape along San Antonio Creek. The area features San Antonio Cabin and intact landscape features such as corrals and fencing, which have experienced relatively few impacts from visitor use or park operations. The landscape has not been documented or evaluated for NRHP eligibility.

Past projects in the cabin district during the Valles Caldera Trust and NPS management eras, including new construction (e.g., the facilities operations center in 2021) and utilities projects,

have adversely impacted[5] the historic landscape by introducing visual intrusions that disrupt its layout or by removing landscape features such as corrals and barbed wire fencing (NPS 2022b). The area is currently the park operations and visitor use hub and experiences mild ongoing impacts from routine use of historic roads and buildings. A historic structures report was completed in 2022 to guide preservation treatment on historic properties, and an adaptive reuse planning study for historic ranching buildings and structures was completed in 2020 and informed this current planning effort.

Ongoing or reasonably foreseeable plan implementations around the park may impact ranching era resources. It is reasonably foreseeable that the park would continue to implement a sustainable approach to managing uses such as grazing, which would be expected to have a neutral or potentially beneficial impact to historic structures and landscapes. The grazing usage is consistent with historical usage for the period of significance of the historic landscape, and the plan calls for maintaining historic ranching features to facilitate this usage.

Likewise, the park's landscape restoration and stewardship approach is likely to continue, including the implementation of a new fire management plan. These approaches may create beneficial impacts due to the anticipated reduction in intensity and severity of future wildfires that might threaten the historic landscape and its contributing structures and features.

Finally, the park is planning a utilities improvement project that would be implemented concurrently with certain undertakings proposed in the general management plan and Valle Grande District development concept plan. The final details of the utilities project would depend on the outcomes of the plan, for example, the location of the proposed visitor services area. The utilities project plan will undergo a separate compliance process, and additional compliance and monitoring may be needed during plan implementation.

Effects of the Action Alternatives

New Appropriate Facilities Alternative

This alternative would decrease the levels of visitor services and park operations in the cabin district compared to both other alternatives. Removing visitor services from the cabin district may decrease the intensity of visitor use there, although it is not possible to predict this with certainty. Beneficial impacts of decreased usage cannot be reasonably predicted. This alternative proposes to stabilize and preserve multiple historic buildings and structures, which would benefit these resources, and only a few, if any, would be adaptively reused.

Widening North Valle Grande Road (VC02), including the stretch that runs through the Baca Ranch historic landscape district, would alter its historic design, but North Valle Grande Road (VC02) would otherwise remain an unpaved road, consistent with its historic character, albeit with more traffic. The proposed construction of new features, such as picnic areas and small

[5] The term "adverse' has different meanings under NEPA and NHPA. In this historic ranching structures and landscapes impact analysis, the term adverse impact is used in the sense defined under NEPA (even when used in the past tense: construction of the facilities operations center resulted in adverse impacts as defined by both NEPA and NHPA, but only the NEPA sense is important here). All assessment of effects for the plan under NHPA section 106 are deferred to the future implementation phase.

parking areas in the cabin district, would represent intrusions in character-defining historic views. As park staff begin discussing details about the project during future implementation, they will consult with the state historic preservation officer and other stakeholders per 36 CFR 800, as noted above, to discuss avoidance and mitigation measures.

Most of the historic Bond-era entrance road (VC01) alignment would remain intact as an unpaved multiuse trail. In general, this is consistent with its historic character, especially given the removal of modern vehicle traffic. The new paved entrance road (VC01) alignment would remove a major road junction from the cabin district—the old entrance road (VC01)/ North Valle Grande Road (VC02) junction. While the realignment proposal would improve a historic view from the cabin district across Valle Grande towards Cerro La Jara, the proposal would create a new road surface with modern vehicular traffic along South Mountain, which may represent a new visual intrusion in the historic view in that direction. Removal of the visitor contact facility and entrance gate at Cerro La Jara would improve important views across Valle Grande.

As discussed under the "Archeological Resources" section, changes to zoning, desired conditions, and visitor capacity constitute a neutral impact.

During the plan's design and implementation phase, the park will conduct review and consultation per 36 CFR 800, as discussed above in order to avoid, minimize, or mitigate adverse effects that may occur from undertakings tiering from this plan.

When added to past impacts from the management eras of the Valles Caldera Trust and the National Park Service, potential impacts from continuing management actions (e.g., a sustainable approach to managing uses such as grazing ;landscape restoration and stewardship approach), and impacts from recent plan implementation (e.g., the FCIIP), the proposed actions under the new appropriate facilities alternative would further degrade the character of the Baca Ranch historic landscape district and the park's broader ranching landscape by creating new visual intrusions on top of existing ones and through the possible removal of historic buildings and ranching features (e.g., the corral at Cerro La Jara).

Adaptive Reuse Alternative

This alternative would increase visitor services and park operations in the cabin district more so than both other alternatives, leading to increased staff presence (e.g., offices in historic structures), expanded interpretive programming and infrastructure, and perhaps an intensification of visitor use. It is possible, but not reasonably foreseeable, that this in turn would increase wear and tear on historic structures and landscape features. Monitoring would detect actual new impacts, if any, and inform adaptive management.

The adaptive use of 11 historic structures may constitute a negative impact to historic ranching properties. Although adaptive use may result in more successful competition for preservation funding than if these structures were unused (preservation only), and although adaptations are expected to be sensitive to historic design, the modifications required for regular access and use (ABAAS compliance, fire code, utility upgrades, etc.) may nevertheless compromise aspects of integrity. As under the new appropriate facilities alternative, the additions of new parking areas and picnic facilities would intrude in historic views.

North Valle Grande Road (VC02) would be realigned under this alternative, which would likely benefit the historic character of the Baca Ranch historic landscape district. The new alignment behind the district is expected to be screened by vegetation, minimizing visual intrusion. Meanwhile, removing heavy vehicular traffic from the heart of the district and maintaining the road's current width and materials would improve the district's aspects of association, setting, and feeling. However, should old growth trees be removed as part of the realignment, this has the potential to adversely impact the cultural landscape.

The adverse and beneficial impacts described under the new appropriate facilities alternative from road realignment and widening and from actions at Cerro La Jara, would be the same under this alternative. The neutral impacts to ranching properties discussed under the new appropriate facilities alternative resulting from new trails and trailheads outside the district would be the same under this alternative. As discussed under the "Archeological Resources" section, changes to zoning, desired conditions, and visitor capacity constitute a neutral impact.

During the plan's design and implementation phase, the park will conduct review and consultation per 36 CFR 800, as discussed above in order to avoid, minimize, or mitigate adverse effects that may occur from undertakings tiering from this plan.

For the same reasons described under new appropriate facilities, when added to past impacts from the management eras of the Valles Caldera Trust and the National Park Service, potential impacts from continuing management actions (e.g., a sustainable approach to managing uses such as grazing; landscape restoration and stewardship approach), and impacts from recent plan implementation (e.g., the FCIIP), proposals under the adaptive reuse alternative would further degrade the character of the park's ranching landscapes by altering a landscape that has already experienced past and ongoing alterations to its contributing structures, features, and views.

Conclusion

The principal difference between the new appropriate facilities and the adaptive reuse alternatives with respect to impacts to historic ranching structures and landscapes lies in the treatment of the cabin district. Both action alternatives involve tradeoffs with respect to historic views in the cabin district and across Valle Grande. The adaptive reuse alternative would remove heavy vehicle traffic from the heart of the historic district and overall is more preservation-focused in the long term than the new appropriate facilities alternative, although initial modifications to historic structures required for human access and use under this alternative may result in adverse impacts that would not occur under the new appropriate facilities alternative.

The impacts of the no-action alternative are beneficial to historic ranching structures and landscapes compared to either action alternative since no-action alternative would result in fewer removals of historic structures and trees and fewer additions of non-conforming features.

Chapter Four: Coordination and Consultation

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CHAPTER 4: COORDINATION AND CONSULTATION

The following agencies and Tribal Nations were contacted during the planning process for purposes of coordination and consultation.

AGENCIES

New Mexico Department of Transportation

New Mexico State Historic Preservation Officer

US Fish and Wildlife Service

TRIBAL NATIONS

Apache Tribe of Oklahoma

Cheyenne and Arapaho Tribes, Oklahoma

Comanche Nation, Oklahoma

Fort Sill Apache Tribe of Oklahoma

Hopi Tribe of Arizona

Jicarilla Apache Nation, New Mexico

Kewa Pueblo, New Mexico

Kiowa Indian Tribe of Oklahoma

Mescalero Apache Tribe of the Mescalero Reservation, New Mexico

Navajo Nation, Arizona, New Mexico, and Utah

Ohkay Owingeh, New Mexico

Pawnee Nation of Oklahoma

Pueblo of Acoma, New Mexico

Pueblo of Cochiti, New Mexico

Pueblo of Isleta, New Mexico

Pueblo of Jemez, New Mexico

Pueblo of Laguna, New Mexico

Pueblo of Nambe, New Mexico

Pueblo of Picuris, New Mexico

Pueblo of Pojoaque, New Mexico

Pueblo of San Felipe, New Mexico

Pueblo of San Ildefonso, New Mexico

Pueblo of Sandia, New Mexico

Pueblo of Santa Ana, New Mexico

Pueblo of Santa Clara, New Mexico

Pueblo of Taos, New Mexico

Pueblo of Tesuque, New Mexico

Pueblo of Zia, New Mexico

San Carlos Apache Tribe of the San Carlos Reservation, Arizona

Southern Ute Indian Tribe of the Southern Ute Reservation, Colorado

Standing Rock Sioux Tribe of North and South Dakota

Tonto Apache Tribe of Arizona

Ute Indian Tribe of the Uintah and Ouray Reservation, Utah

Ute Mountain Tribe of the Ute Mountain Reservation, Colorado, New Mexico, and Utah

White Mountain Apache Tribe of the Fort Apache Reservation, Arizona

Ysleta Del Sur Pueblo of Texas

Zuni Tribe of the Zuni Reservation, New Mexico

Appendixes

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APPENDIX A: IMPACT TOPICS NOT CARRIED FORWARD IN THE ENVIRONMENTAL ASSESSMENT

Wildlife. According to NPS management policies (NPS 2006), the National Park Service strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals. Some areas in the park, such as the cabin district, have been occupied by people since the late 19th century, which has resulted in habitat degradation and vegetation modification, manipulation, and loss; it has affected the ways in which wildlife species use the park for natural processes. Since the National Park Service became the federal land manager at Valles Caldera, human use of these habitable areas has resulted in relatively continuous low-intensity use, with periods of moderate- to high-intensity activities (e.g., during construction periods for new facilities).

The entrance station area has been used as a livestock staging area since at least the mid-20th century and as a visitor contact center for Valles Caldera since the land transferred into federal ownership (under the Valles Caldera Trust from 2000 to 2015). Over the last 12 years, the park has experienced more intensive visitor use in the forms of vehicle and pedestrian activities, NPS management activities and programs, and staging areas for government-owned equipment. The use and activities conducted in these areas have resulted in modified wildlife behavior, including both spatial and temporal avoidance, tolerance, attraction, sensitization, and habituation (NPS 2022).

Similarly, wildfires such as the Las Conchas (2011) and Thompson Ridge (2013) fires removed much of the park's understory and overstory and downed woody debris. While ground-level habitat features sustained heavy impacts during the fires, the removal of much of the herbaceous understory vegetation in areas like the cabin district provided an overall improvement in foraging habitat in subsequent years (NPS 2022).

While wildlife might be broadly affected by ongoing visitor uses, management actions proposed in this plan, and potential wildfire impacts (ranging from beneficial to catastrophic), park managers would continue to implement existing practices for protection and management of faunal species under all plan alternatives. Analysis of potential impacts to threatened and endangered species that occur in the park are discussed in the "Federally Listed Species" impact topic section of this plan. Visitor-related impacts on wildlife would continue to occur under all alternatives, including the no-action alternative. For these reasons, impacts on wildlife were dismissed from further analysis.

Air Quality. Visitor activities discussed in the plan, including vehicle traffic and idling vehicles in and around the park, would continue to emit air pollutants through exhaust and reduce air quality in the immediate area. However, air quality impacts from vehicle traffic in the park are expected to be less than windblown air pollutants from Los Alamos and other communities in the park's vicinity. While the number of vehicles reaching farther into the park could increase under the preferred alternative due to new proposed location for the backcountry gate, air quality would not likely be impacted among alternatives, as the plan does not substantially change the number of vehicles entering the park. Construction activities may generate dust and

smoke, but these impacts would be limited and temporary. Therefore, air quality is dismissed from further analysis.

Water Quality. Rerouting and expanding the entrance road (VC01) and visitor services area facility construction and upgrades would expand impermeable surfaces and may assist runoff of petroleum and other contaminants. These impacts could potentially degrade water quality in vernal grassland pools. However, proposed infrastructure improvements in this plan may positively contribute to hydrologic flow by improving nearby wetland functions and habitat.

Park staff is committed to monitoring water quality, especially nitrates, because maintaining high water quality is a key aspect of both wilderness and wild and scenic river designations. Although neither designation currently exists in the park, the National Park Service is interested in pursuing these designations in the future. Additionally, the State of New Mexico has designated segments of the East Fork Jemez River, San Antonio Creek, and Redondo Creek as outstanding national resource waters. This state designation reinforces the park's commitment to managing eligible rivers and creeks to maintain values that qualify them for inclusion in the national wild and scenic rivers system. Despite lacking these designations, managing to these standards means that natural resources are managed for outstanding qualities and thus contribute to a positive visitor experience.

Maintaining good water quality is also essential for potential new park infrastructure, especially since the park currently has no system for potable water outside of filling water tanks. By understanding water quality, park staff will be able to make more informed decisions about resources and visitor use related to the rivers and streams in the park. Water quality checks would be performed both upstream and downstream of the septic system to provide a baseline comparison. The park may also check water quality at existing points along the river or any other problem spots identified by staff. As of 2023, the park was documenting water quality trends through a series of eight water quality monitors and 22 water quality gauging stations.

While proposed development activities would expand impermeable surfaces and possibly add to runoff of contaminants, upon completion of future design and construction plans, infrastructure improvements may positively contribute to hydrologic flow by improving nearby wetland functions and habitat. Therefore, water quality is dismissed from further analysis.

Soundscapes. Impacts on the soundscape are addressed under the "Visitor Use and Experience" and "Federally Listed Species" impact topics and therefore are dismissed from further analysis.

Views. Impacts on views in the Valle Grande District are addressed under "Visitor Use and Experience," and impacts to historically significant views are analyzed under "Historic Ranching Structures and Landscapes." Therefore, this topic is dismissed from further analysis. Although there are significant views elsewhere in the park, the development actions proposed in this plan are focused on the Valle Grande District, so they only have potential to impact those views associated with the district.

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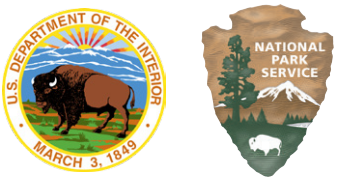

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

VALL 216/197603
July 2025

National Park Service
U.S. Department of the Interior

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