



**U.S. National Park Service**

# **Fire Management Plan**

**Valles Caldera National Preserve, New Mexico**



**Valles Caldera National Preserve  
Wildland Fire Management Plan  
2025**

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## **Land Acknowledgement Statement**

Valles Caldera is of spiritual and ceremonial importance to numerous American Indian peoples in the greater Southwest region. We recognize this is a regionally significant geographic and cultural focal point and a pivotal sacred place for numerous tribal groups. These cultural connections are both contemporary and of great antiquity, and we respectfully seek to uphold the values and prioritize the voices of the tribes and pueblos for whom this special place continues to be part of their practices, beliefs, identity, and history.

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## Executive Summary

Valles Caldera National Preserve (Valles Caldera) is an 88,900-acre park located in the Jemez Mountains of north-central New Mexico. It is surrounded by Santa Fe National Forest (SFNF), except where it shares boundaries with the Pueblo of Santa Clara to the northeast and Bandelier National Monument to the southeast. Valles Caldera “protects, preserves, and restores ecosystems and cultural landscapes within an outstanding example of a volcanic caldera for the purpose of education, scientific research, public enjoyment and use, and cultural continuity” (NPS, 2018). The high-elevation ecosystem contains traditional cultural landscapes, expansive vistas, numerous volcanic domes, canyons, ridges, streams and wetlands, and a diverse assemblage of vegetation communities, including wetlands and wet meadows, montane grasslands and forest meadows, riparian shrublands, Gambel oak/mixed montane shrublands, ponderosa pine forests and savanna, mixed-conifer forests, aspen forests, and spruce-fir forests. The park spans an elevational gradient from approximately 8,000 to 11,300 feet and supports a diversity of plants, fungi, and wildlife, and special status plants and wildlife such as the wood lily, Jemez Mountains salamander, Mexican spotted owl, and New Mexico meadow jumping mouse.

Frequent fire has shaped and maintained the vegetation communities and landscapes of Valles Caldera. Many factors, including climatic conditions, a high occurrence of lightning strikes, availability of surface fuels and flammable vegetation, and topography make fire one of the dominant natural disturbance processes. Consequently, most of the vegetation communities and wildlife are fire tolerant, fire-dependent, or enhanced by fire. Historic fire regimes have been disrupted for more than one hundred years due to 19<sup>th</sup> and 20<sup>th</sup> century land-use practices including intensive livestock grazing, clear-cut logging, road building, and widespread fire suppression beginning in the early 1900s. Departure from historic fire regimes has resulted in accumulation of surface fuels and increases in understory and midstory tree density. These forest conditions create potential for high-severity fires that can damage vegetation, produce adverse effects on plant root systems and soil properties, impact watersheds, and threaten human life, property, and wildlife.

Valles Caldera was designated a national preserve on July 25, 2000, when the federal government acquired the land. The Valles Caldera Trust (VCT) was established to provide management of the park while being overseen by a board of trustees. In 2010, the VCT, Jemez Ranger District of the SFNF, and 30 additional agencies and organizations collaborated on a proposal titled *Southwestern Jemez Mountains Landscape Restoration Strategy*. The proposal was funded through the Collaborative Forest Landscape Restoration Program. Between 2012 and 2014, the VCT completed the draft of Valles Caldera’s Landscape Restoration and Stewardship Plan (LRSP) and Environmental Impact Statement (EIS). The LRSP EIS describes the long-term restoration and integrated stewardship strategy for Valles Caldera, which includes prescribed fire, naturally ignited (lightning) fire, and forest thinning as essential tools for restoration and stewardship of park ecosystems and for achieving management objectives.

In December 2014, the National Defense Authorization Act for Fiscal Year 2015 (Public Law 113-291, Sec. 3043) transferred administration of the park from VCT to the NPS. The NPS assumed management on October 1, 2015. Although the LRSP and EIS were developed prior to NPS management of the park, the 2014 enabling legislation (Public Law 113-291, Sec. 3043) allows for administering management plans and activities adopted by VCT. The LRSP and EIS were then used to direct fire management actions and treatments from 2015-2022. Later in 2022, it was determined that under NPS fire management policy, including NPS RM-18 (NPS, 2023) and the 2009 Guidance for Implementation of Federal Wildland Fire Management Policy (DOI, 2009), the LRSP did not meet standards to serve as an operational Fire Management Plan (FMP). It could, however, continue to provide the foundation for restoration and stewardship actions in the park in conjunction with a new FMP and NEPA compliance.

Under the 2025 FMP, goals and objectives focus on prioritizing safety and managing risk to people, natural, biological, and cultural resources, and infrastructure; enhancing relationships and collaboration in all fire management actions and activities; prioritizing ecosystem stewardship; allowing naturally ignited

fire to function in fire-dependent ecosystems; employing monitoring, research, and adaptive management; and incorporating adaptation to changing environmental conditions. Wildfire may be managed for one or more objectives and the objectives may change as fire moves across the landscape. Strategies can range from fire suppression to allowing a naturally ignited (lightning) fire to burn in a defined geographic area, under specific conditions, to accomplish fire and resource management goals and objectives. Manual and mechanical thinning, removal or redistribution thinned materials, and prescribed fire is permitted in Valles Caldera with an approved treatment plan. Treatments are used to minimize risk to life, property, and resources; achieve structural protection and safety objectives; reduce hazardous fuels; create and maintain defensible space and in the Wildland Urban Interface; mimic beneficial fire regimes; reduce potential for future high-severity wildfires; promote ecosystem resiliency and biodiversity; improve watershed function; and to facilitate ecosystem stewardship. Treatments are also used in fire suppression actions and as a pre-treatment for prescribed fire. Treated areas function as a fuel break to facilitate management of future wildland fires and may create conditions that would allow naturally ignited (lightning) fires to function in Valles Caldera's fire-dependent ecosystems.

## **1.0 INTRODUCTION, LAND MANAGEMENT PLANNING, AND COMMUNICATION**

Valles Caldera National Preserve (Valles Caldera) (Figure 1) is located at the southern edge of the Rocky Mountains, in the Jemez Mountains of north-central New Mexico. It is approximately 18 miles west of Los Alamos and 22 miles northeast of Jemez Springs, along New Mexico Highway 4. Most of the park is in Sandoval County, with a small portion in Rio Arriba County. It is surrounded by Santa Fe National Forest, except where it shares boundaries with the Pueblo of Santa Clara to the northeast and Bandelier National Monument to the southeast (Figure 2).

As part of its mission, the National Park Service (NPS) Wildland Fire Program manages wildland fire to protect the public, park communities, and infrastructure; conserve natural and cultural resources; and maintain and restore natural ecosystem processes ([NPS Wildland Fire: Plans and Policy](#)). Each NPS unit with burnable vegetation must have an approved fire management plan (FMP). The FMP describes policy, goals, and objectives and establishes strategies and tactics for managing wildland fire. The FMP is based on direction from existing park planning documents, such as a general management plan and resource stewardship plan. The FMP provides for firefighter and public safety and addresses the need for adequate funding and staffing to support the fire management program ([Directors Order #18, Wildland Fire Management, 2008](#)). FMPs must be in alignment with the Department of Interior (DOI) FMP Framework and NPS fire management planning guidance as described in [Reference Manual \(RM\)-18, Chapter 4, Fire Management Plans](#).

NPS units having an approved FMP and accompanying National Environmental Policy Act (NEPA) compliance may utilize wildland fire to achieve resource benefits in predetermined fire management units, in alignment with land and resource management plans ([NPS Directors Order #18, Wildland Fire Management, 2008](#)).

Valles Caldera's FMP establishes strategies and tactics for managing wildland fire (including wildfire and prescribed fire) and non-fire fuel treatments, such as manual and mechanical thinning. The FMP includes goals and objectives that are designed to prioritize safety and manage risk to people, natural, biological, and cultural resources, and infrastructure; enhance relationships and collaboration in all fire management actions and activities; prioritize ecosystem stewardship; allow naturally ignited fire to function in Valles Caldera's fire-dependent ecosystems; employ monitoring, research, and adaptive management; and incorporate adaptation to changing environmental conditions.

Valles Caldera's FMP addresses values to be protected and is consistent with park resource stewardship goals and objectives and environmental laws and regulations such as the [NEPA](#), the

National and State Historic Preservation Acts, the Clean Air Act, and the Endangered Species Act (ESA).

Valles Caldera’s Fire Management Officer (FMO) is responsible for maintaining and annually evaluating the FMP through an annual review process to ensure accuracy and validity ([Interagency Standards for Fire and Fire Aviation Operations \(Red Book\), Chapter 3, NPS Program Organization and Responsibilities](#)).

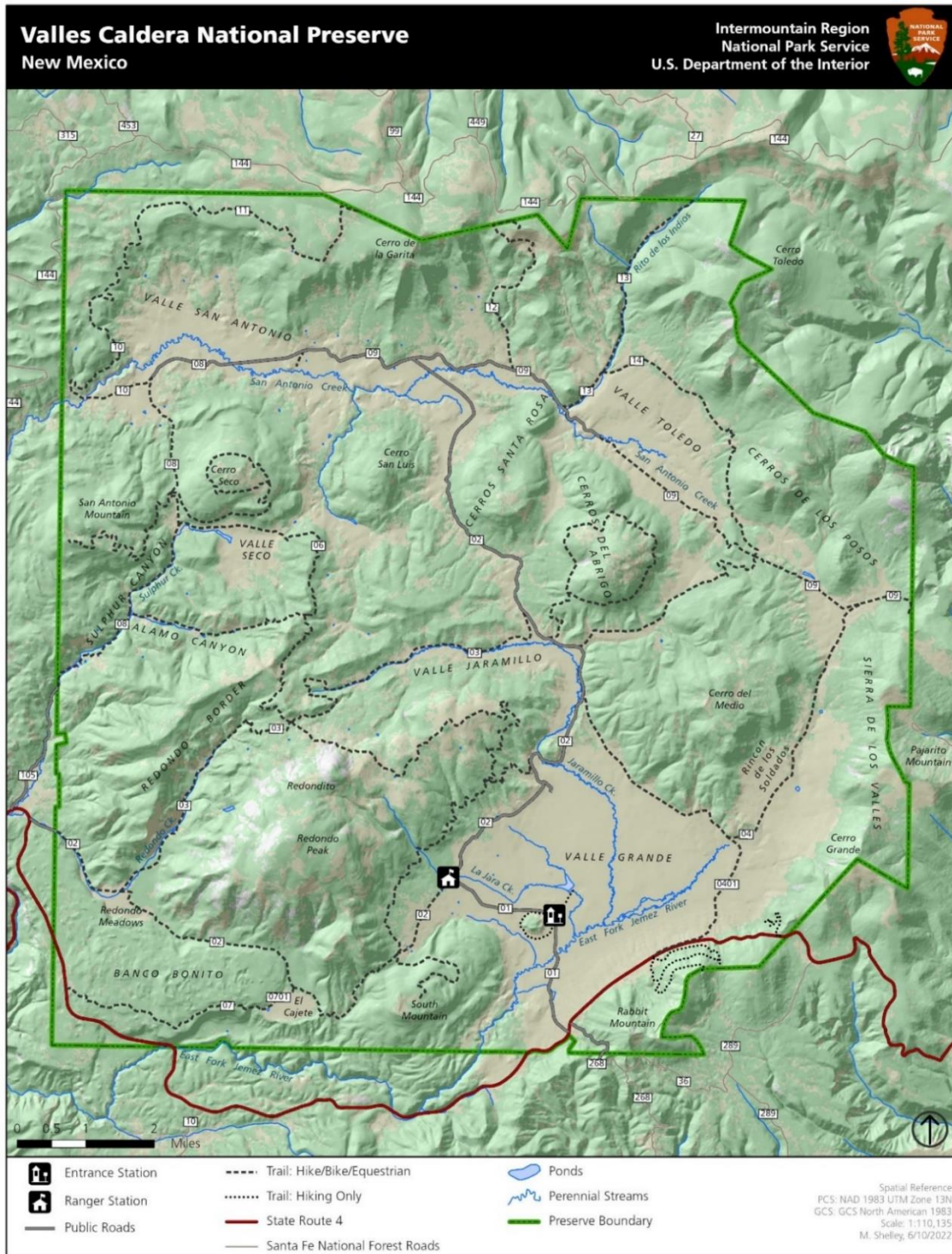
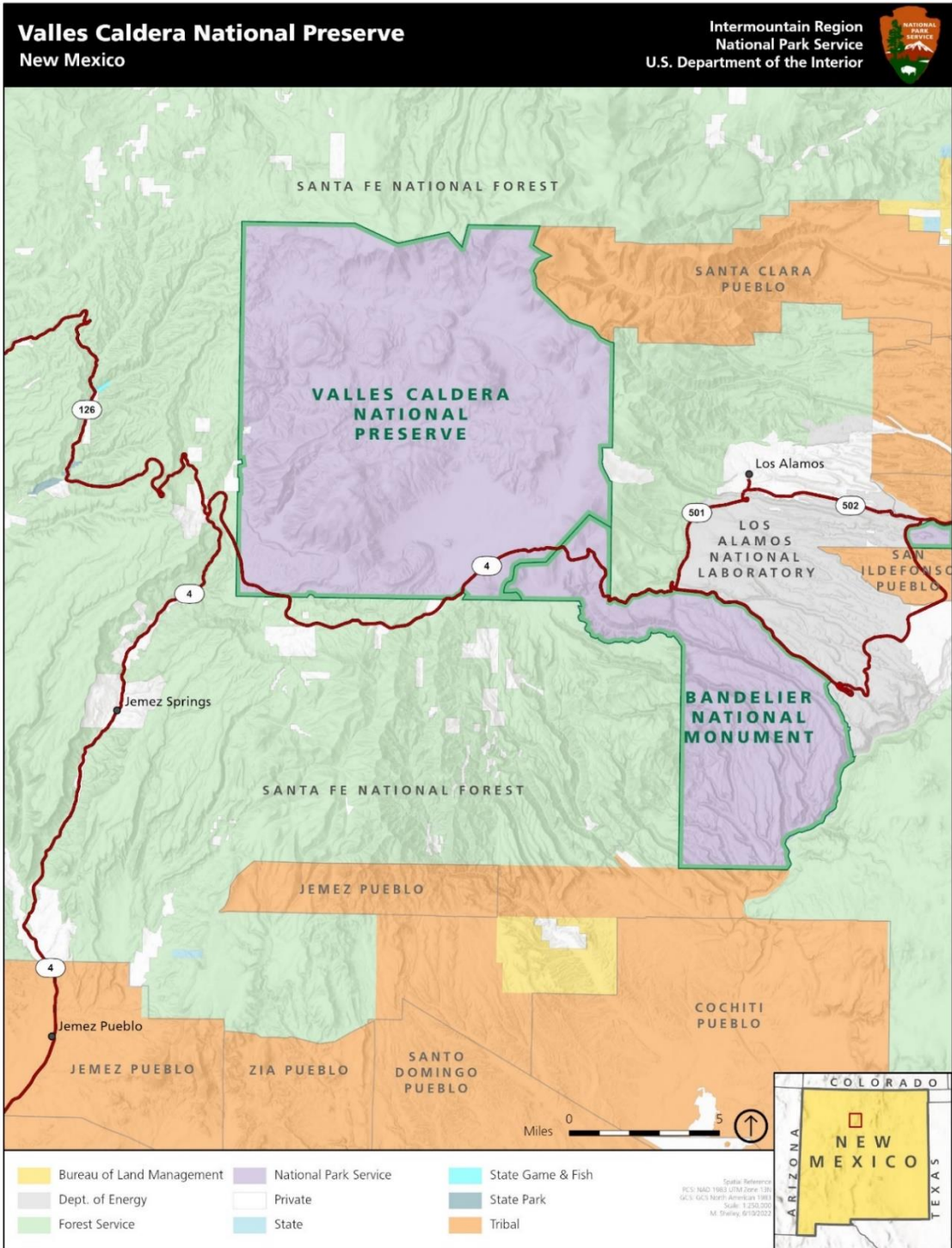


Figure 1. Valles Caldera National Preserve, New Mexico



**Figure 2.** Valles Caldera National Preserve and Vicinity, New Mexico

## 1.1 Program Organization

Valles Caldera is located within DOI Intermountain Regions 6, 7, and 8 and is one of four NPS units served by the Pueblo Parks Fire Group (Pueblo Parks Fire), also including Bandelier National Monument (Bandelier), Fort Union National Monument, and Pecos National Historical Park.

Pueblo Parks Fire is served by a single Fire Management Program, stationed at Bandelier, with some staff operations based in Valles Caldera. Pueblo Parks Fire Management Program is a division at Bandelier, coordinating and implementing wildland fire and aviation operations for Pueblo Parks Fire. Responsibilities are detailed in Appendix B, *Inter-Park Agreement*.

The FMO of Pueblo Parks Fire is delegated responsibilities for fire, fuels, and aviation activities in Valles Caldera. Bandelier's Superintendent supervises the FMO, who oversees all fire staff including an Assistant Fire Management Officer (AFMO), Fire Ecologist and Fire Ecology Crew, Fire Planner, Prescribed Fire and Fuels Specialist, and a Wildland Fire Module. Additionally, the program provides support and funding to the Santa Fe Interagency Helitack Crew.

Organizationally, Pueblo Parks Fire receives support and oversight from the Intermountain Regional Office (DOI Region 7), under the Branch of Wildland Fire and Aviation, Division of Fire and Aviation Management, Directorate of Visitor and Resource Protection. Pueblo Parks Fire is supported by several zone-based positions including the Southwest Zone Fire Budget Analyst and Fire Business Assistant and the South Zone Fire Planner and Geographic Information Systems (GIS) Specialist.

## 1.2 Fire Management Actions

Response to wildfire in Valles Caldera may range across a spectrum of strategic and tactical options, including monitor, confine, point or zone protection, and fire suppression. Fire may be managed for one or more objectives that may change as fire moves across the landscape. This flexible range of options may be used to allow a naturally ignited (lightning) fire to burn in a defined geographic area under specific conditions to accomplish fire and resource management goals and objectives. The strategic and tactical options may be employed in any combination to manage wildfire as it moves across the landscape. All human-caused wildfires will be suppressed.

Response to wildfire in Valles Caldera is based on public and firefighter safety and welfare; cooperator input; specific needs of individual firefighting efforts; fire location; time of year; weather; climate; changes in climate and environmental conditions; resource availability; values at risk; potential impacts to natural, biological, and cultural resources; the environmental, ecological, and social consequences of fire; and costs.

Fuels treatments, such as manual and mechanical thinning, redistribution of thinned materials, and prescribed fire are permitted in Valles Caldera with an approved treatment plan. Prescribed fire includes slash and wood pile burning, jackpot burning, and broadcast burning. Manual thinning includes chainsaws and hand tools. Mechanical thinning includes low soil impact mechanized apparatus.

Fuel treatments are used to minimize risk to life, property, and resources; achieve structural protection and safety objectives; reduce hazardous fuels; create and maintain defensible space and in the Wildland Urban Interface; mimic beneficial fire regimes; reduce potential for future high-severity wildfires; promote ecosystem resiliency and biodiversity; improve watershed function; and to facilitate ecosystem stewardship. Treatments are also used in fire suppression

actions and as a pre-treatment for prescribed fire. Treated areas function as a fuel break to facilitate management of future wildland fires and may create conditions that would allow naturally ignited (lightning) fires to function in Valles Caldera's fire-dependent ecosystems.

### **1.3 Environmental Compliance**

The *Valles Caldera National Preserve Fire Management Plan Environmental Assessment* (EA) (Appendix G) describes and evaluates potential environmental consequences of the proposed action (this FMP) and the alternatives on the natural, biological, cultural, social, and economic environments related to Valles Caldera. The preferred alternative selected from the Finding of No Significant Impact is the basis for this FMP. The EA meets the requirements of the NEPA. Projects implemented under this FMP are evaluated to ensure all NEPA, National Historic Preservation Act (NHPA), and ESA requirements have been addressed. If projects outside the scope of the EA are necessary, additional NEPA, NHPA, and ESA consultation and documentation will be completed.

As of 2025, species that warrant consultation under the ESA include Jemez Mountains salamander (Endangered with designated critical habitat), Mexican spotted owl (Threatened), Mexican wolf (Endangered), monarch butterfly (proposed Threatened), and New Mexico meadow jumping mouse (Endangered with designated critical habitat).

The following documents are associated with this FMP:

- Valles Caldera National Preserve Fire Management Plan Environmental Assessment and Finding of No Significant Impact (8/6/2025). [Planning, Environment & Public Comment \(PEPC\)](#) ID 126574.
- Signed letter (dated 3/13/2024) from New Mexico State Historic Preservation Officer (Michelle Ensey for Dr. Jeff Pappas) indicating concurrence that establishment of Valles Caldera's Fire Management Plan will have No Adverse Effect on historic properties.
- Valles Caldera National Preserve Landscape Restoration and Stewardship Plan Environmental Impact Statement and Record of Decision (11/23/2014).
- U.S. Fish and Wildlife Service Biological Opinion on the Valles Caldera National Preserve Landscape Restoration and Stewardship Plan (7/13/2015).
- Letter (dated 1/24/2025) from New Mexico Department of Game and Fish and their Terrestrial Habitat Specialist (Erin Salano) indicating support for this Fire Management Plan and including project recommendations in accordance with the Endangered Species Act, Wildlife Conservation Act, and New Mexico State Wildlife Action Plan.

### **1.4 Resource Management Planning**

Valles Caldera's FMP implements goals, objectives, fuel treatments, conservation measures, performance requirements, best management practices, and mitigations as described in the following documents.

#### **Valles Caldera Trust Multiple Use and Sustained Yield of Forage (Environmental Assessment, 2009)**

This document was developed prior to NPS management of Valles Caldera (2015) and adopted under the NPS thereafter. It describes Valles Caldera's management of ecosystem plant productivity, including livestock grazing programs. Herbaceous vegetation management influences fine fuel levels and distribution across the landscape.

### **Valles Caldera National Preserve Landscape Restoration and Stewardship Plan and Environmental Impact Statement (2014)**

This document was developed prior to NPS management of Valles Caldera in 2015; however, the 2014 enabling legislation (Public Law 113-291, Sec. 3043) allows for administering management plans and activities adopted by Valles Caldera Trust. Therefore, the LRSP and EIS were used to direct fire management actions and treatments from 2015 to 2022. In conjunction with the 2025 FMP and EA, the LRSP continues to provide the long-term restoration and integrated stewardship strategy for Valles Caldera, which includes prescribed fire, naturally ignited (lightning) fire, and forest thinning as essential tools for restoration and stewardship of park ecosystems and for achieving management objectives.

### **U.S. Fish and Wildlife Service Biological Opinion on the Valles Caldera National Preserve Landscape Restoration and Stewardship Plan (2014)**

This document was developed prior to NPS management of Valles Caldera in 2015; however, the 2014 enabling legislation (Public Law 113-291, Sec. 3043) authorizes continuation of management plans adopted by Valles Caldera Trust. Accordingly, the Biological Opinion (BO) has guided mitigations for fire management actions and activities under NPS management. The BO provides detailed wildlife effects analysis related to long-term landscape restoration actions described in Valles Caldera's Landscape Restoration and Stewardship Plan.

### **Valles Caldera Foundation Document (2018)**

This document provides guidance for planning and management decisions. Core components of the document include a description of Valles Caldera, the purpose and significance, resources and values, and interpretive themes. It also includes special mandates and administrative commitments, and an assessment of planning and data needs identifying planning issues, products to be developed, associated studies, and required data. Fire Management planning is identified as a planning need. Both the core components and the assessment provide a focus for Valles Caldera planning activities and establish a baseline for the development of planning documents.

### **Valles Caldera Strategic Action Plan (2022)**

This document describes the core purpose and values, vision, five-year goals, strategic focus areas, and timeline for implementation for Valles Caldera. Ecosystem restoration and stewardship and fire and fuels management are listed in this document.

### **Natural resource conditions at Valles Caldera National Preserve: Findings and management considerations for selected resources (2022)**

This collection of documents provides a condition assessment for many Valles Caldera resources and natural phenomena, including landscape permeability, visual resources, restored wetlands, songbirds, Jemez Mountains salamander, New Mexico meadow jumping mouse, and the biodiversity of Redondo Peak.

### **Valles Caldera National Preserve Climate Futures Summary (2024)**

This document describes the historical trends, recent changes, and potential futures of climate in Valles Caldera. It also includes a brief description of the impacts of potential climate futures on wildfires.

## 1.5 Collaborative Planning

Internal and external collaboration in fire management actions and activities is supported and enhanced through the following actions:

- Cooperate extensively with tribes and pueblos, adjacent landowners, and land management agencies regarding all wildland fires.
- Allow naturally ignited fire to function when possible and in a safe manner, in collaboration with tribes and pueblos, adjacent landowners, and land management agencies.
- Foster understanding and support among employees, visitors, neighbors, and partners for wildland fire, fuels management, fire ecology, and aviation programs.
- Cultivate and maintain inclusive, authentic, and durable partnerships with Native American communities, supporting cultural practices and honoring the sacredness of the land in all fire management actions and activities.
- Emphasize interagency communications and cross-boundary collaboration for fire management activities, training, sharing of resources, and evaluation of fire management actions and activities.
- Communicate both Firewise and fire ecology information in local communities, working in collaboration with tribes and pueblos, and county, state, and federal agencies.

### Internal Collaboration

Internal collaborative planning and implementation of fire management actions and activities, such as wildfire and prescribed fire, thinning, and fire monitoring and research is strengthened by establishing a Valles Caldera and Pueblo Parks Fire Interdisciplinary Team (Fire IDT) to engage in the fire management program. Key program elements, roles, and responsibilities of Valles Caldera and Pueblo Parks Fire personnel are described in Appendix H (*Valles Caldera National Preserve and Pueblo Parks Fire Group Interdisciplinary Team Roles and Responsibilities*). The roles and responsibilities provide clear direction to help facilitate a collaborative and responsive fire management program.

### External Collaboration

Pueblo Parks Fire offices are located at the East Jemez Interagency Fire Center, at Technical Area 49, on Department of Energy land, co-located with Santa Fe National Forest and Los Alamos National Laboratory personnel. This shared interagency building promotes collaboration and cooperation between agencies for fire and fuels management planning, actions, and activities.

Pueblo Parks Fire is a member of the Santa Fe Zone Coordination Group, an interagency group with overall responsibility for coordination of fire and incident management actions for agencies represented in a geographical zone, including:

- Bureau of Indian Affairs: Northern Pueblos Agency
- Bureau of Land Management: Taos Field Office
- Los Alamos National Laboratory
- New Mexico State Forestry: Chama District, Las Vegas District
- National Park Service: Pueblo Parks Fire Group
- Santa Fe Interagency Dispatch
- U.S. Fish and Wildlife Service: Las Vegas National Wildlife Refuge
- U.S. Forest Service: Santa Fe National Forest

Pueblo Parks Fire is also engaged in fire management planning with additional local and state agencies, for example Los Alamos County Fire Department, Sandoval County Fire

Department, La Cueva Volunteer Fire Department, Forest Stewards Guild, and New Mexico Energy, Minerals, and Natural Resources Department. In addition, Valles Caldera and Pueblo Parks Fire maintain on-going collaboration for fire and fuels management projects with tribes and pueblos through the Reserved Treaty Rights Lands program (Russell, 2021). Collaborative actions include wildfire response, prevention, preparedness, prescribed fire, burned area emergency response and rehabilitation, and management of all-risk incidents. Collaborative planning efforts include Community Wildfire Protection Plans, Mutual Aid Agreements, Multi-Agency Coordination Group membership, and Interagency Coordination and Dispatch Center participation.

In support of collaborative planning, Valles Caldera and Pueblo Parks Fire follow recommendations from the [National Cohesive Wildland Fire Management Strategy](#) (Cohesive Strategy), a framework to seek national, all-lands solutions to wildland fire management issues.

The Cohesive Strategy encourages collaboration among all stakeholders and across all landscapes using sound science to address four broad challenges: managing vegetation and fuels; protecting homes, communities, and other values at risk; managing human-caused ignitions; and effective and efficient response to wildfire.

The vision of the Cohesive Strategy is to extinguish fire safely and effectively when needed; use fire where allowable; manage natural resources; and as a nation live with wildland fire.

Primary goals identified to achieve the vision are:

1. Resilient Landscapes: Landscapes, regardless of jurisdictional boundaries are resilient to fire, insect, disease, invasive species and climate change disturbances, in accordance with management objectives.
2. Fire Adapted Communities: Human populations and infrastructure are as prepared as possible to receive, respond to, and recover from wildland fire.
3. Safe, Effective, Risk-based Wildfire Response: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

## **1.6 Communication and Education**

Valles Caldera and Pueblo Parks Fire prioritizes communication, collaboration, and education, as identified in the following actions:

- Communicate to the public the goals and objectives related to all fire management actions and activities.
- Foster fire-adapted human communities.
- Allow naturally ignited fire to function when possible and in a safe manner, in collaboration with tribes and pueblos, adjacent landowners, and land management agencies.
- Promote monitoring, science, and Traditional Ecological Knowledge and encourage employees, associated tribes and pueblos, and visitors to learn and engage in the process of land stewardship.
- Share success stories and outcomes of fire and resource management treatments and projects.
- Foster understanding and support among employees, visitors, neighbors, and partners for wildland fire, fuels management, fire ecology, and aviation programs.
- Emphasize interagency communications and cross-boundary collaboration for fire management activities, training, sharing of resources, and evaluation of fire management actions and activities.

- Communicate both Firewise and fire ecology information in local communities, working in collaboration with tribes and pueblos, and county, state, and federal agencies.
- Facilitate the integration of Traditional Ecological Knowledge and fire science to improve understanding of the role of fire in ecosystem stewardship.
- Engage and utilize the collective knowledge base of the Southwest Jemez Mountains Collaborative and Jemez Mountains Research Learning Center.

Providing timely and accurate information related to fire management actions and activities is a key strategy for educating park staff, visitors, and neighbors and for gaining public support. Valles Caldera strives to be inclusive in its fire prevention and incident information efforts by employing strategies and tactics that reach entire communities, including non-English speaking, deaf or hard of hearing, and other populations.

Fire communication and education is an ongoing strategic effort. Valles Caldera’s Public Information Officer (PIO) is responsible for providing timely and accurate information to visitors, neighbors, and the public regarding all fire management actions and activities. This includes press releases related to initial responses to wildfire, fire suppression actions, situational updates, prescribed fire, thinning, treatment goals and objectives, fire danger ratings, fire restrictions, smoke, closures, and other impacts to the public. Information is posted on information boards in Valles Caldera and on Valles Caldera’s website and social media accounts. During a large or complex wildfire, public information and guidance may be delegated by the Superintendent to the Incident Management Team.

NPS Regional Fire Communication and Education Specialists are available to assist fire programs with fire prevention and education materials and support. Additional information can be found in [RM-18, Chapter 20, Communication and Education](#).

## **2.0 WILDLAND FIRE PROGRAM MANAGEMENT GOALS AND OBJECTIVES**

Valles Caldera and Pueblo Parks Fire designed goals and objectives to prioritize safety and manage risk to people, natural, biological, and cultural resources, and infrastructure; enhance relationships and collaboration in all fire management actions and activities; prioritize ecosystem stewardship; allow naturally ignited fire to function in fire-dependent ecosystems; employ monitoring, research, and adaptive management; facilitate the integration of Traditional Ecological Knowledge; and incorporate adaptation to changing environmental conditions.

Goals and objectives are in alignment with the Valles Caldera National Preserve Landscape Restoration and Stewardship Plan (LRSP) EIS (NPS, 2014); Valles Caldera Strategic Action Plan (NPS, 2022b); Guidance for Implementation of Federal Wildland Fire Management Policy (DOI, 2009); NPS Wildland Fire Strategic Plan 2020-2024 (NPS, 2020b); The National Cohesive Wildland Fire Management Strategy (DOI, 2014); Presidential executive orders (Exec. Order No. 13728, 2016); Secretary of the Interior’s Priorities (NPS, 2020b); and Southwest FireCLIME Adaptation Strategies (Sample et al., 2022).

Goals and objectives created for Valles Caldera’s FMP were reviewed and refined by Valles Caldera’s FMP Interdisciplinary Team and external reviewers. The goals and objectives are the foundation of Valles Caldera’s FMP and provide a holistic view of the aim and focus of Valles Caldera’s Fire Management Program.

## 2.1 Goals and Objectives

### **Goal 1: Manage risk to employees and the public and ensure safety is the highest priority in all fire management actions and activities**

#### **Objectives:**

- Utilize the most current risk management techniques in all fire management actions and activities.
- Suppress all wildland fires with a high probability of undesired outcomes.
- Communicate to the public the goals and objectives related to all fire management actions and activities.
- Cooperate extensively with tribes and pueblos, adjacent landowners, and land management agencies regarding all wildland fires.
- Conduct post-fire reviews to evaluate firefighter and public safety.

### **Goal 2: Utilize the full range of fire management actions and activities in the stewardship of ecosystems**

#### **Objectives:**

- Restore or modify forest structure and composition to reduce the risk of uncharacteristically severe fire.
- Use thinning and fire to create and maintain a diversity of meadow, grassland, shrubland, and forest vegetation communities that represent a spectrum of successional stages at the landscape scale.
- Use fire to mimic beneficial fire regimes.
- Use fire to promote native vegetation and implement post-fire actions to discourage non-native invasive species.
- Use thinning and fire to increase landscape resilience and resistance to pests and pathogens.
- Use thinning and fire to maintain or improve characteristics of terrestrial and aquatic wildlife habitat, water quality, and watershed function.

### **Goal 3: Promote cultural, social, and ecological conditions that allow naturally ignited fires to function in fire-dependent ecosystems**

#### **Objectives:**

- Maintain vegetative structure and composition that allows naturally ignited (lightning) fire to function in fire-adapted ecosystems to the maximum extent possible.
- Allow naturally ignited fire to function when possible and in a safe manner, in collaboration with tribes and pueblos, adjacent landowners, and land management agencies.
- Foster fire-adapted human communities.
- Promote monitoring, science, and Traditional Ecological Knowledge and encourage employees, associated tribes and pueblos, and visitors to learn and engage in the process of land stewardship.
- Share success stories and outcomes of fire and resource management treatments and projects.

#### **Goal 4: Manage fire risk to infrastructure and sensitive natural, biological, and cultural resources**

##### **Objectives:**

- Reduce hazardous fuels and create defensible space zones in developed areas, including the Cabin District, Welcome Station, road corridors, utility corridors, Banco Bonito primitive campground, backcountry cabins, scientific instrument installations, radio repeaters, other historic assets such as San Antonio Cabin, and the Wildland Urban Interface.
- Implement fire and resource management treatments in forest refugia and in buffers surrounding fire-sensitive areas and species.
- Develop and implement preservation and protection measures for natural, biological, and cultural resources.
- Adhere to conservation and protection measures, performance requirements, best management practices, and mitigations for threatened and endangered species as described in the U.S. Fish and Wildlife Service Biological Opinion and for cultural resources as described in National Historic Preservation Act Section 106 agreement documents.
- Employ Minimum Impact Strategy and Tactics to avoid adverse impacts to natural, biological, cultural resources, and wilderness values and character.
- Ensure a Resource Advisor is present and consulted on all major fire management program actions and activities.

#### **Goal 5: Enhance internal and external relationships through collaboration, communication, and education**

##### **Objectives:**

- Foster understanding and support among employees, visitors, neighbors, and partners for wildland fire, fuels management, fire ecology, and aviation programs.
- Cultivate and maintain inclusive, authentic, and durable partnerships with Native American communities, supporting cultural practices and honoring the sacredness of the land in all fire management actions and activities.
- Emphasize interagency communications and cross-boundary collaboration for fire management activities, training, sharing of resources, and evaluation of fire management actions and activities.
- Communicate both Firewise and fire ecology information in local communities, working in collaboration with tribes and pueblos, and county, state, and federal agencies.
- Facilitate the integration of Traditional Ecological Knowledge and fire science to improve understanding of the role of fire in ecosystem stewardship.

#### **Goal 6: Use monitoring, research, and partnerships to advance science-based wildland fire management decision-making and facilitate adaptation to changing environmental conditions**

##### **Objectives:**

- Promote inquiry and flexibility in fire and ecosystem stewardship, considering historic ranges of variation, a changing climate, and a future range of variability.
- Use available environmental, natural, and cultural resource datasets to develop site-specific fire and resource management objectives for each treatment plan.
- Engage in adaptive management by collectively evaluating pre- and post-treatment datasets and consider using fire and fuel treatments in innovative ways.

- Consider future and changing ecological, climate, and fuel conditions, and fire regimes during the planning process and adaptive management cycle.
- Consider the Resist-Accept-Direct framework for ecosystem and land stewardship, particularly in ecosystems facing rapid ecological change.
- Develop wildland fire strategies in altered or novel ecosystems where fire can play a beneficial role.
- Engage and utilize the collective knowledge base of the Southwest Jemez Mountains Collaborative and the Jemez Mountains Research Learning Center.

Refer to section 4.3, *Climate Change*, for a description of the Resist-Accept-Direct framework.

### **3.0 WILDLAND FIRE OPERATIONAL GUIDANCE**

[Interagency Standards for Fire and Fire Aviation Operations \(Red Book\)](#) describes national wildland fire policy and includes detailed language for wildland fire response. The Red Book receives annual updates. [Reference Manual \(RM\)-18, Wildland Fire Management](#), and [Reference Manual \(RM\)-60 Aviation Management](#) provide policy for the NPS. Valles Caldera's FMP is consistent with national and agency policy and provides guidance specific to Valles Caldera.

One Fire Management Unit (FMU), the Multiple Strategy FMU, is identified for Valles Caldera (Figure 3). The Multiple Strategy FMU encompasses all of Valles Caldera, at 88,900 acres. Wildfire, prescribed fire, and non-fire treatments (thinning) are managed in the Multiple Strategy FMU as described in sections 3.1 and 3.2.



**Figure 3.** Multiple Strategy Fire Management Unit, Valles Caldera National Preserve

### 3.1 Management of Wildfires

The Fire Executive Council's [Guidance for Implementation of Federal Wildland Fire Management Policy](#) (February 2009) specifies that, in accordance with local land and resource management plans, the full range of strategic and tactical options may be considered in the response to every wildfire. Further, a wildfire may be concurrently managed for one or more objectives and objectives may change over space and time as fire spreads across the landscape.

In alignment with the implementation guidance, response to wildfire in Valles Caldera's Multiple Strategy FMU may range across a spectrum of strategic and tactical options, from monitoring to intensive management actions (e.g. fireline construction), and fire may be managed for one or more objectives which may change as fire moves across the landscape. This flexible range of options may be used to suppress a wildfire or to allow a naturally ignited (lightning) wildfire to burn in a defined geographic area, under specific conditions, to accomplish fire and resource management goals and objectives. The strategic and tactical options may be employed in any combination to manage wildfire as it moves across the Multiple Strategy FMU. All human-caused wildfires will be suppressed.

Flexible fire management strategies and tactics may include (Also refer to the National Wildfire Coordinating Group [Glossary of Wildland Fire](#)):

Monitor: The systematic process of observing, collecting, and recording of fire-related data, particularly regarding fuels, topography, weather, fire behavior, fire effects, smoke, and fire location. This may be done onsite from a nearby or distant vantage point, or off-site using a sensor or through remote sensing (aircraft or satellite).

Confine: A wildfire response strategy of restricting a wildfire to a defined area, primarily using natural barriers to restrict wildfire spread under the prevailing and forecasted weather conditions. It may also include a combination of natural and constructed barriers to stop the spread of fire. Actions to suppress portions of the fire perimeter may include handline construction, water and retardant drops from aircraft, and/or ignitions by fire crews to create boundary or internal blacklines.

Point or Zone Protection: A wildfire response strategy that protects specific assets or highly values resources without directly halting the spread of the fire. It can include a variety of suppression actions to protect a specific area while not actively lining the entire fire perimeter, usually with tactics that contain progressive fire encroachment away from values at risk such as homes, communities, and areas of high resource value.

Fire Suppression: Actions and activities connected with fire-extinguishing and control operations, beginning with the discovery of a fire and continuing until the fire is completely extinguished, including all "hot spots" that are an immediate threat to control lines or are outside the fire perimeter. Suppression can include a fire that is burning outside of prescription parameters, is not meeting fire and resource objectives, or may pose an immediate threat to life or property. All human caused wildfires will be suppressed. Tactics for suppression are varied and depend on the situation (e.g., location, weather, safety considerations.) for each individual fire. Suppression actions can include hand crews cutting a line around a fire perimeter to halt fire spread; water and retardant drops from aircraft; manual and mechanical thinning; "burn out" situations in which fire is used to remove live and dead vegetation to stop the fire; and "cold trailing" in areas of low fuel loads, where crews physically feel the ground and put out "hot spots."

In addition, response to wildfire in Valles Caldera's Multiple Strategy FMU:

- Is based on firefighter and public safety and welfare; cooperators input; specific needs of individual firefighting efforts; fire location; time of year; weather; climate; changes in climate and environmental conditions; resource availability; values at risk; potential impacts to natural, biological, and cultural resources; the environmental, ecological, and social consequences of fire; and costs.
- Is consistent with fire management goals and objectives (Refer to section 2.0) and Valles Caldera's resource management planning documents (Refer to section 1.4).
- Uses a decision support process to guide and document wildfire management decisions, including situational assessments, analyzing hazards and risks, defining implementation actions, and documenting decisions and rationale for decisions.
- Is implemented cooperatively with tribes and pueblos, adjacent landowners, and land management agencies.
- Includes cultivating and maintaining inclusive, authentic, and durable partnerships with Native American communities, supporting cultural practices, and honoring the sacredness of the land in all fire management actions and activities.
- Includes Minimum Impact Strategy and Tactics (MIST) to avoid adverse impacts to wilderness values, and natural, biological, and cultural resources. MIST is implemented as described by NPS policy in [RM-18, Chapter 2, Managing Wildland Fire, Exhibit 1](#) and as detailed in Appendix I, *Minimum Impact Strategy and Tactics Guidelines for Valles Caldera National Preserve*.

### 3.1.1 Wildfire Response Planning

#### **Expected Fire Behavior**

Refer to Appendix J, *Expected Fire Behavior and Climate Change in Valles Caldera National Preserve* for an expanded version of this section.

Primary drivers of fire occurrence, patterns, and behavior in Valles Caldera include past land use practices; weather and climate; topographic features; availability of surface fuels and flammable vegetation; and climate change. The variable combination or alignment of these biotic and abiotic factors contribute to expected fire behavior and fire magnitude in Valles Caldera.

When combining predictions of climate futures, such as increases in temperatures, precipitation variability, and aridification, with the primary biotic and abiotic factors that drive fire occurrence, patterns, and behavior, the expectation is longer fire seasons and wildfires that burn more intensely. It is likely that fires similar to the 2011 Las Conchas Fire and 2013 Thompson Ridge Fire will become more frequent in this landscape where fires of this intensity and severity were once anomalous. The Las Conchas and Thompson Ridge fires combined burned approximately 60% of the park. Approximately 28% of the Las Conchas Fire burned at high-severity and 26% at moderate (MTBS, 2011). Thompson Ridge burn severity was less, with 3% at high-severity and 23% at moderate. However, moderate- and high-intensity fire on steep, forested slopes contributed to post-fire erosion and adverse impacts on park resources.

The following fuel and weather conditions have been identified as critical local thresholds that, when occurring simultaneously, can increase fire magnitude.

- 20-foot winds over 20 mph
- Relative humidity less than 10%
- Temperatures over 80°F
- 1000-hour fuel moisture less than 11%

Additional critical elements to consider:

- Typical critical burn period is noon to sunset
- Large fires typically occur with an unstable atmosphere and strong west winds
- Backdoor cold fronts can produce strong east winds with rapid onset

Vegetation communities in Valles Caldera (Muldavin, 2006) (Figure 4) span an elevational gradient from approximately 8,000 feet up to 11,254 feet at the highest elevation (Redondo Peak). Fire history studies in this high-elevation ecosystem reveal a long history of fire on the landscape with a range of fire return intervals and fire behavior, intensity, severity, and extent (Appendix P, *Fire Science and Research at Valles Caldera national Preserve*).

**Wetlands and wet meadows:** Infrequent, low-intensity fire is expected in and near wetlands and wet meadows. However, climate change may influence moisture availability, resulting in increases in fire events and fire behavior.

**Montane grassland** fires are typically of varying intensities with a return interval of two to ten years in lower elevations (Falk et al., 2011) and longer in higher elevations. When fine fuels are abundant, continuous, and dry, and winds are strong, grassland fires can spread rapidly.

**Forest meadows** are generally the result of past logging practices and higher severity fire. Fire intensity is expected to vary depending on surrounding forest type, fuel continuity, and time since last fire.

**Riparian shrublands:** While frequent low-intensity fire historically surrounded riparian shrublands, it is expected they burned infrequently due to moisture availability. Similar to wetlands and wet meadows, climate change may influence moisture availability, resulting in increases in fire events and fire behavior.

**Gambel oak/mixed montane:** Historically, Gambel oak/mixed montane shrublands were maintained primarily as an understory component in ponderosa pine and xeric mixed-conifer forests through frequent low-intensity surface fire and shading by overstory tree canopy. However, high-severity fire events have resulted in forest conversions to shrubland which may be reinforced more permanently by climate change. Fire behavior in these communities is expected to be of mixed-intensity, likely higher on southerly aspects, particularly with windy and dry conditions in the spring or late fall.

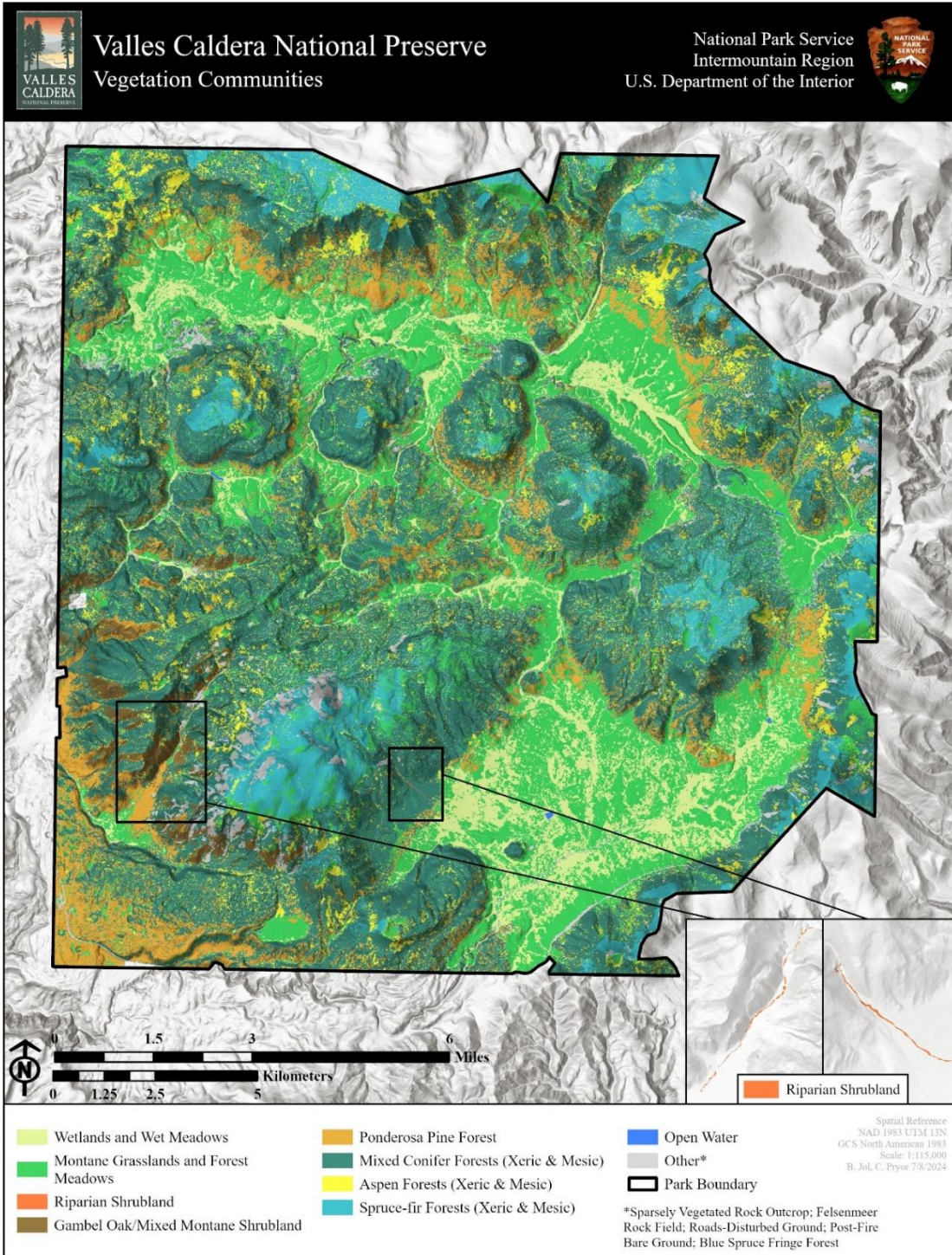
**Ponderosa pine forests and savannas:** Ponderosa pine is a highly fire tolerant species, historically experiencing low-intensity surface fire every five to seven years. In untreated ponderosa pine forests, passive crown fire has potential to occur more often than historically, particularly if the factors that contribute to fire magnitude are aligned. Ponderosa pine savannas are expected to burn at low intensity if fine fuels are abundant and continuous enough to carry fire.

**Mixed-conifer forests** (xeric and mesic): Ladder fuels in mixed-conifer forests provide vertical fuel continuity and can facilitate transfer of fire from the forest surface to the canopy. Passive and/or active crown fire and spot fires ignited by transported firebrands are possible, depending on the alignment of factors that contribute to fire magnitude. Pests and pathogens are other important drivers of disturbance in both xeric and mesic mixed-conifer that contribute to fire intensity.

**Aspen forests** (xeric and mesic): Fire return intervals in aspen forests without conifers can vary from an average of 150 to 600 years and 75 to 100 years when conifers are present in the understory (Fryer & Luensmann, 2012). Fuel moisture content in aspen forests tends to be higher, resulting in more resistance to extreme fire behavior. However, if the factors that contribute to fire magnitude are aligned, high-intensity fire will carry through aspen forests. Climate change may contribute to the occurrence of high-intensity fire in aspen.

**Spruce-fir forests** (xeric and mesic) were historically characterized by infrequent (often greater than 100 years), mixed-severity and occasional stand-replacing fires of smaller extent. Fire behavior in spruce-fir forests has potential for both passive and active crown fire when under the influence of higher temperatures, increased winds, and lower fuel moisture. Spot fires ignited by transported firebrands are also a consideration. These conditions will likely be exacerbated by climate change.

Untreated forests in Valles Caldera with a high degree of ecological and fire return interval departure will likely exhibit increased fire behavior potential, particularly in areas of the park where the alignment of untreated forest, prevailing west and southwesterly winds, and steep slopes create higher fire risk. Fires in these areas have potential to be long-duration events. Fuel treatments have been implemented in some of these areas and will be maintained into the future (Appendix E, *Multi-year Treatment Plan for Valles Caldera National Preserve*).



**Figure 4.** Vegetation Communities in Valles Caldera National Preserve

## **Initial Response Procedures**

All wildfires occurring within Valles Caldera receive an initial response and size-up using the *Taos/Santa Fe Incident Organizer* (Appendix K). Initial Attack Resources, including aviation support, are ordered through the Santa Fe Interagency Dispatch Center by the initial attack Incident Commander or the Pueblo Parks Fire Duty Officer using the Initial Response Actions identified in the *Staffing and Response Plan for Pueblo Parks Fire Group* (Appendix D.3).

The *Taos/Santa Fe Incident Organizer* (Appendix K) includes an Initial Fire Size-up to be completed by the first resources on-scene and communicated to Santa Fe Dispatch and Pueblo Parks Fire Duty Officer. Each response to a reported fire may include one or more management strategies approved by the Fire Duty Officer and/or Park Superintendent.

All fire responders follow procedures and policy delineated in the current year's [Interagency Standards for Fire and Fire Aviation Operations | National Interagency Fire Center \(nifc.gov\)](#) (Red Book).

Pueblo Parks Fire Duty Officer coordinates directly with Valles Caldera's Superintendent or their designated acting during the initial response phase of a fire to address the goals and objectives identified within this plan.

Strategic Direction and Required Mitigations for resource protection have been identified for wildfire response (Appendix L, *Strategic Direction and Required Mitigations for Valles Caldera National Preserve*), for example:

- The use of water drops are prioritized to suppress fire over the use of fire retardant unless critical resources or human life and property are threatened. The use of fire retardant requires authorization by the Superintendent. If approved, impacts to critical and sensitive resources are avoided by limiting direct application. For example, fire retardant should not be dropped within 300 feet of waterways.
- The use of heavy equipment and off-road vehicles requires approval from the Superintendent.
- Resource Advisors are made available during wildfire events.

Also refer to Appendix M, *Conservation and Protection Measures, Performance Requirements, Best Management Practices, and Mitigations for Valles Caldera National Preserve*.

## **Transition to Extended Response**

Transitioning from initial response to extended response occurs when:

- A fire exceeds initial response and the initial management objectives for the fire have not been met.
- The fire has not been contained by initial resources and an alternative strategy replaces initial control efforts.
- The fire exceeds management capabilities assigned to the fire.
- The fire has not been contained within the first 48 hours and there is no reasonable estimate of containment or control.

When initial actions taken on a wildfire remain unsuccessful, a new course of action is developed utilizing the Wildland Fire Decision Support System (WFDSS). Continual monitoring and regular fire assessments inform the determination of a fire's evolving

complexity. The Duty Officer in coordination with the Incident Commander and the Agency Administrator utilize the [PMS 236 Wildland Fire Risk and Complexity Assessment](#) process to evaluate firefighter safety issues, assess risk, and identify the appropriate incident management organization.

During transition periods, assigned resources manage the fire until a transfer of command to an incoming Incident Commander or Incident Management Team can be safely engaged. A thorough operational briefing occurs between outgoing and incoming resources. Clear lines of authority are established quickly to minimize confusion, maintain operational control, and ensure firefighter safety. As a fire moves into extended response, the park Duty Officer considers which resources to retain on the incident and which to release. Refer to the [Red Book, Chapter 11, Incident Management and Response](#), for current direction on incident command and organizational structure.

#### **Minimum Impact Strategy and Tactics**

MIST is the policy of the NPS. MIST is a framework for identifying and applying strategies and tactics to manage wildland fire while minimizing long-term effects of management actions. The aim is to identify the minimum tools to accomplish tasks safely and effectively and to meet management objectives while having the least environmental, cultural, and social impacts. Use of MIST must never compromise firefighter safety or the effectiveness of management efforts.

MIST is employed when managing wildland fire in Valles Caldera, as described by NPS policy in [RM-18, Chapter 2, Managing Wildland Fire, Exhibit 1](#) and as detailed in Appendix I, *Minimum Impact Strategy and Tactics for Valles Caldera National Preserve*.

#### **3.1.2 Wildland Fire Decision Support System**

The [WFDSS](#) is used for Valles Caldera to document management objectives, strategies, and decision making if a wildfire escapes initial attack, exceeds initial response, or if management objectives contain elements of protection and resource benefit.

WFDSS is a risk informed decision support process for wildland fire, incorporating local land management and fire management plans, compliance documents, spatial data, fire behavior modeling, information technology, and economic principles. The process provides a situational assessment, hazard and risk analysis, and defined objectives, constraints, and implementation actions. It assists analysts, fire and resource managers, and agency administrators in making strategic and tactical decisions for wildland fire incidents. Decisions and the rationale for those decisions are documented in WFDSS.

Current direction on WFDSS about the NPS can be found in the [Red Book, Chapter 3 NPS Program Organization and Responsibilities and Chapter 11, Incident Management and Response](#). The Intermountain Region has also developed [Supplemental WFDSS guidance](#).

#### **Strategic Direction and Required Mitigations**

Strategic Direction and Required Mitigations originate from land and resource management plans and related compliance and consultation documents. They provide the framework, limitations, and challenges for wildfire response and are included in WFDSS to provide the foundation of the decision.

Strategic Direction and Required Mitigations for Valles Caldera represent technical and scientific specifications for fire management actions and activities in specific locations, for example equipment or fire-retardant restrictions in specific areas.

Both Strategic Direction and Required Mitigations are communicated textually and spatially for use in Spatial Fire Planning in WFDSS and are incorporated into WFDSS pre-season to facilitate the process of incident decision-making and publication. Refer to Appendix L, *Strategic Direction and Required Mitigations for Valles Caldera National Preserve* and Appendix M, *Conservation and Protection Measures, Performance Requirements, Best Management Practices, and Mitigations for Valles Caldera National Preserve*.

### **Interagency Spatial Fire Planning Service**

As noted above, wildfire incident decisions are consistent with local land and fire management plans and associated compliance documents. This information is incorporated into WFDSS decisions both spatially and textually. The [Interagency Spatial Fire Planning Service](#) is the ArcGIS Online Web Application used to manage both spatial and textual fire planning data.

## **3.2 Fuels Treatments**

### **Fuels Management Goals and Objectives**

Broad programmatic fuels management goals are described in this section. Specific goals and measurable objectives for fuels treatments are created by Valles Caldera's Fire IDT and included in each individual treatment plan.

Fuels treatments, including prescribed fire, manual and mechanical thinning, and removal or redistribution of thinned materials are used in Valles Caldera to minimize risk to life, property, and resources; achieve structural protection and safety objectives; reduce hazardous fuels; restore and maintain beneficial fire regimes; and facilitate ecosystem stewardship. Treated areas can function as a fuel break to facilitate management of future wildland fires and may create conditions that allow naturally ignited (lightning) fires to function in Valles Caldera's fire-dependent ecosystems.

Thinning and prescribed fire treatments in Valles Caldera move the structure, composition, and function of the park's ecosystems toward more resilient conditions that have the adaptive capacity to recover from wildfire, insect and disease outbreaks, and climate change. Treatments reintroduce fire as a natural disturbance and beneficial process on the landscape, resulting in reduced risk of unusually severe or extensive wildfire that could negatively impact human communities and damage water, soil, wildlife, scenery, heritage resources, recreation opportunities, tourism, and other values. Treatments also repair and rehabilitate areas adversely affected by past wildfire and post-fire flooding and erosion.

Thinning and prescribed fire treatments play a critical role in addressing a multitude of ecosystem stewardship needs for Valles Caldera. Treatments are expected to reduce the over-abundance of smaller diameter trees and closed-canopy forest that dominates the landscape; increase the amount of mature and old growth forest characteristics including the number of large trees, snags, and downed logs; reduce inter-tree competition for water, nutrients, and light; increase tree water balance, growth rates, and carbon sequestration; increase the abundance and diversity of herbaceous vegetation; increase regeneration of ponderosa pine seedlings and aspen; increase the relative abundance of thick-barked fire-resistant tree species; reestablish or expand historic meadow and grassland ecosystems; improve wildlife habitat quality and diversity for native species; reduce soil erosion and increase soil productivity; and

improve hydrologic function and soil moisture recharge. Thinning and burning to achieve these conditions can increase biological diversity and species richness for flora and fauna.

### **Desired Conditions**

Strategically located combinations of thinning and prescribed fire treatments have synergistic results in restoring resiliency to ecosystems in Valles Caldera. The restored landscape will be more diverse, dominated by a mosaic of forest age-classes and densities. Ponderosa pine and xeric mixed conifer forests will be dominated by large fire-adapted species, variable-size canopy openings, and an understory of herbaceous vegetation. Reducing conifer density will improve water quality and availability and restore habitat for special status and sensitive species. Patches of young aspen will emerge from mid- and high-elevation forests and the landscape will show greater dominance of large trees, downed logs, and snags. Higher elevation spruce-fir forests will retain greater tree densities although treatments will improve structural complexity and patchiness such that those ecosystems can recover from naturally less frequent, mixed-severity fire. The structurally, compositionally, and biologically diverse landscape will support more productive soils, natural hydrologic regimes, and a rich array of native flora and fauna. Fire will be allowed to play its natural and beneficial role in sustaining ecosystem resiliency. The restored landscape will have a reduced risk of experiencing high intensity and severity wildfire, providing protection against damage to natural, cultural, and biological resources, and human communities.

### **Fuels Treatments**

Locations for fuels treatments in Valles Caldera are identified and prioritized based on risk to life, property, and resources, including areas where: defensible space is needed to facilitate management of wildland fire; hazardous fuels reduction is needed for structure protection; fire behavior potential is high; natural, biological, and cultural resources are at risk; forests have a high degree of ecological and fire return interval departure. Priority is also given to maintain desired conditions in areas that have been treated in the past. Slope percent is considered when identifying areas for manual and mechanical thinning. For example, steeper slopes may be avoided due to potential treatment effects or for safety reasons.

In particular, forests in the southwest corner of Valles Caldera are a priority for fuel treatments due to a high incidence of fire occurrence in areas south and west of the park. Predominant winds are from the west and southwest and the area is characterized by west and south facing slopes. The alignment of forest, wind, slope, and high fire occurrence create high fire risk. Fuel treatments began in the southwest corner, will continue to the north and east, and will be maintained over time. Treatments are focused on using thinning, removal or redistribution of thinned materials, and fire to modify forest structure and composition and mimic beneficial fire regimes, alleviating potential for future extreme fire behavior. Collaborative and effective cross-boundary fuels treatments both within Valles Caldera and on lands adjacent to the park will decrease the likelihood of high-intensity fire spreading within Valles Caldera, from Valles Caldera to adjacent lands, and from adjacent lands into Valles Caldera. Overall, fuel treatments will create conditions that may allow management of lower-intensity fire across boundaries.

Refer to Appendix M for Conservation and Protection Measures, Performance Requirements, Best Management Practices, and Mitigations for fuels treatments in Valles Caldera.

### ***Prescribed Fire***

Prescribed fire may be implemented in Valles Caldera's Multiple Strategy FMU with an approved plan. A prescribed fire is intentionally lit in a predefined area, under specific conditions, to meet fire and resource management goals and objectives.

Prescribed fire includes:

Slash and wood pile burning: vegetation is cut and/or moved to a central location (a pile) and burned.

Jackpot burning: naturally existing accumulations of fuels and/or vegetation are targeted for ignition.

Broadcast burning: fire is ignited within well-defined boundaries and allowed to move through the area to reduce hazardous fuels or as a resource management treatment, or both.

Target vegetation communities for prescribed fire include (Refer to NPS, 2014):

Ponderosa pine savanna and forest, xeric mixed conifer, and montane grasslands  
Prescribed fire is used in these vegetation communities alone or following thinning treatments. Prescription parameters emphasize low intensity fire across the landscape to reduce hazardous fuels, modify or restore composition and structure, and dispose of biomass from thinning treatments.

Aspen forest and mesic mixed conifer forests  
Prescribed fire is used in these forest types alone or following thinning treatments. Prescriptions promote low to mixed severity and intensity fire with patchy continuity to reduce hazardous fuels, modify or restore structure and composition, and dispose of biomass from thinning treatments.

Gambel oak-mixed montane woodlands  
Prescribed fire is used to enhance structural diversity and wildlife habitat improvements initiated by thinning treatments. Prescriptions promote low intensity fire with patchy and discontinuous burning across the landscape to modify or restore structure and composition and dispose of biomass from thinning treatments.

Spruce-fir forests (xeric and mesic)  
Prescribed fire is used in these forest types alone or following thinning treatments. Prescriptions promote low to mixed severity and intensity fire with patchy continuity to reduce hazardous fuels, modify or restore structure and composition, and dispose of biomass from thinning treatments.

#### ***Non-Fire Fuels Treatments***

Non-fire fuels treatment options in Valles Caldera's Multiple Strategy FMU include manual and mechanical thinning and removal or redistribution of thinned materials. Thinning involves removing live and dead vegetation according to a prescribed plan to meet specific objectives. Thinning is used as a pre-treatment for prescribed fire to remove smaller diameter trees, shrubs, and snags to keep fire within a designated area or to protect specific resources. Thinning is also used in suppression actions and as an effective treatment for defensible space and in the Wildland Urban Interface.

Manual Thinning: A method used to trim limbs from trees as well as cut down individual trees and other vegetation using a chainsaw, crosscut saw, or axe.

Mechanical Thinning: A method used to cut down trees and other vegetation using vehicles, equipment, and other low soil impact mechanized apparatus.

Disposal, Removal, or Redistribution of Thinned Materials includes:

Piling: Moving thinned or downed vegetation and logs to a central location (a pile).

Haul Out: A method used to dispose of thinned forest vegetation by removing (or hauling) it from the site. Removal may include yarding or skidding (transporting trees or parts of trees by trailing or dragging them to a road or landing site).

Lop and Scatter: A method of forest treatment where thinned trees and other vegetation (slash) are manually lopped and limbed into smaller pieces (so the materials lay flatter to the ground) and distributed across the site. Lop and scatter can increase surface fuel loading, however, benefits can include breaking up concentrations of fuel, reducing soil erosion, and retaining water and nutrients on-site.

Mechanical Scattering: A method of using mechanized equipment to chunk or chop (not shred or chip) thinned trees and other vegetation into smaller pieces and distributing the materials across the site.

Thinning treatments in Valles Caldera are designed to retain large trees, logs, and snags, reduce densities of smaller diameter trees, and emphasize retention of fire-resistant species like thick-barked ponderosa pine and Douglas fir species. Target vegetation communities and general prescription guidelines for manual and mechanical thinning include: (Refer to Appendix N, *Prescriptions and Guidelines for Forest Thinning in Valles Caldera National Preserve* (NPS, 2014))

#### Ponderosa Pine Woodland and Savanna, Dry Mixed Conifer Forests

These vegetation communities are assigned a “Restoration” prescription, where the largest and healthiest trees are left in groups with 10-20 feet between tree canopies and 25-50 feet between groups of trees. The largest and most vigorous ponderosa pine and Douglas-fir, as well as aspen, are favored for retention. Small diameter white fir and ponderosa pine are targeted for removal.

#### Montane Grasslands

This vegetation community is assigned a “Restoration” prescription, where small well-spaced groups of large diameter trees are retained and encroaching smaller diameter trees are thinned.

#### Aspen and Mesic Mixed Conifer Forests

This vegetation community is assigned a “Forest Health, “Aspen Regeneration,” and “Hazardous Fuels Reduction” prescription, where the focus is to remove ladder fuels, trees impacted by insects, trees with signs of damage or disease, and fire-intolerant species. Small diameter conifers are targeted for removal. Large diameter aspen, Douglas-fir, ponderosa pine, limber pine, and southwestern white pine are retained.

#### Gambel Oak-Mixed Montane Woodlands

This vegetation community is assigned a “Forest Health” and “Hazardous Fuels Reduction” prescription, where small diameter conifers are targeted for removal and mature conifers, oak trees, and shrubs are retained.

#### Dry and Mesic Spruce-fir Forests

This vegetation community is assigned a “Hazardous Fuels Reduction” prescription, where small, diseased, or damaged trees are removed, targeting white fir, subalpine fir, and Engelmann spruce. Larger and healthier trees of all species are retained. Fuel breaks are

strategically located to create a patchy landscape of forest stands and meadows, improving safety and effectiveness for wildland fire management.

### **General Fuels Management Implementation Procedures**

Fuels treatment planning, including project prioritization, design, and description, goal and objective development, implementation, and monitoring, are collaborative, through Valles Caldera's Fire IDT. Fuels treatment planning follows the adaptive management framework established in Appendix O, the *National Park Service Fuel Treatment Flow Diagram*. Data collected by the Pueblo and Four Winds Fire Ecology Program (Pueblo and Four Winds Fire Ecology) and Valles Caldera's RSS Division is used as a baseline to guide fuels treatment planning. Fuels treatment planning also considers the Resist-Accept-Direct (RAD) framework as described in section 4.3, Climate Change.

Treatment plans include site-specific, measurable objectives created by Valles Caldera's Fire IDT through examination of site-specific data collected by Pueblo and Four Winds Fire Ecology and Valles Caldera's RSS Division. After a treatment is implemented, post-treatment data is collected and used to evaluate if objectives are met, to measure the effectiveness of prescriptions, and to determine if additional research is needed.

When developing all treatment plans, Valles Caldera and Pueblo Parks Fire consult with New Mexico Department of Game (NMDGF) and Fish regarding impacts to state listed species, U.S. Fish and Wildlife Service (USFWS) regarding impacts to federally listed species, and the State Historic Preservation Office and Tribal Nations regarding cultural resources. Implementation of treatments adhere to conservation and protection measures, performance requirements, best management practices, and mitigations as described in the U.S. Fish and Wildlife Service Biological Opinion and in section 106 agreement documents.

All compliance is met prior to treatment implementation and a written and approved treatment plan with detailed prescription parameters exists. Actions and activities proposed in Valles Caldera are planned and implemented in accordance with [RM 18, Chapter 7, Fuels Management](#), the [NWCG Standards for Prescribed Fire Planning and Implementation](#), and the [Red Book, Chapter 17, Fuels Management](#).

### **Risk-Informed Decision-Making and Accountability Requirements**

The NPS Fuels Management Program Planning and Reporting Requirements [memorandum](#) (memo) (DOI, 2024) provides “national intent and direction for fuels management program planning, reporting, and financial requirements. It reinforces “current fuels program policy while introducing new guidelines and clarifying priorities to enhance project prioritization, planning, and accountability.”

The memo identifies NPS Fuels Management Program priorities including (1) NPS lands identified by the 2024 Wildland Fire Risk Assessment (WFRA) as having the highest concentration of infrastructure and hazard potential (top 1%) and (2) NPS lands identified by the WFRA as having a high concentration of infrastructure and hazard potential (top 2-10%).

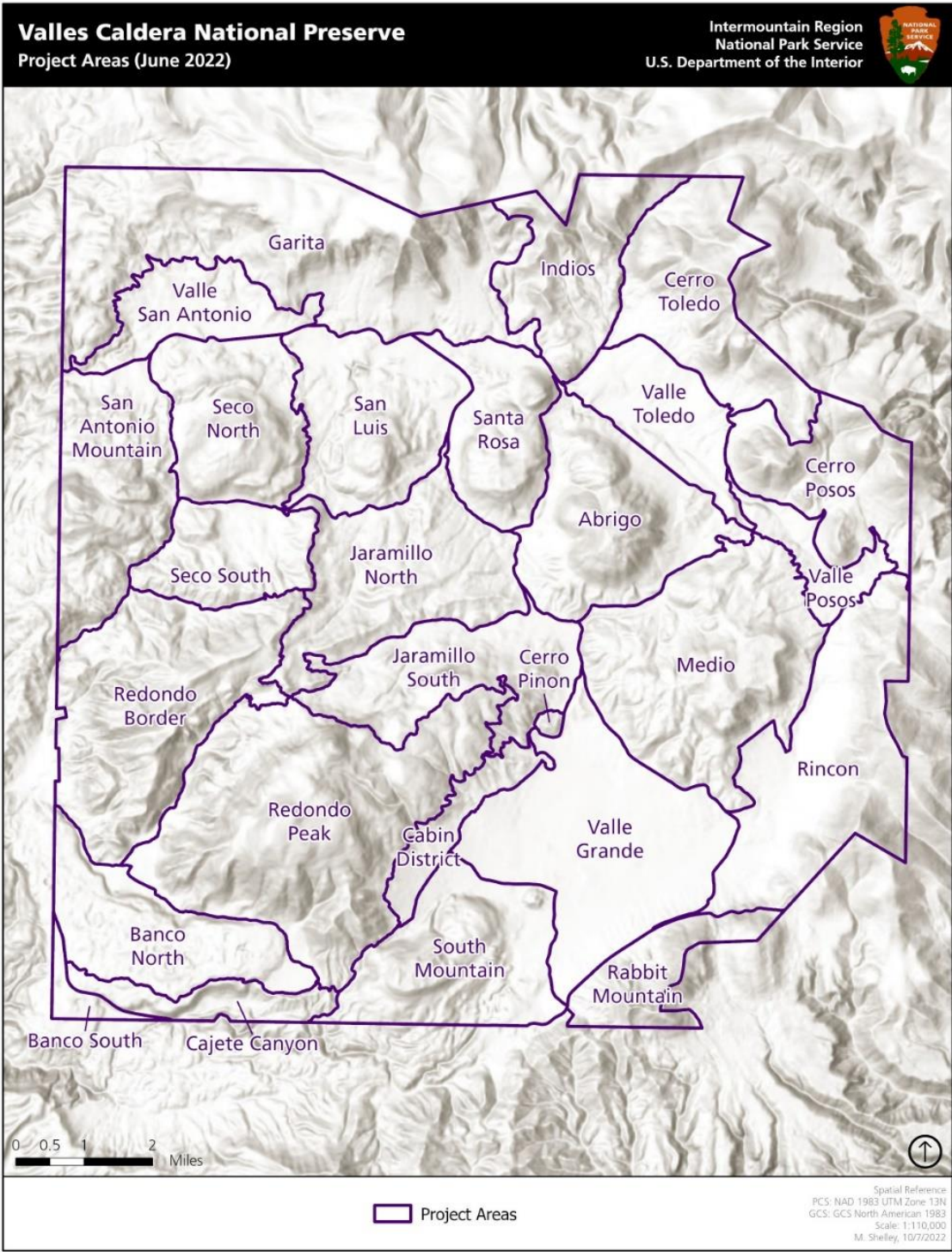
The memo also establishes a framework to guide the NPS Fuels Management Program including (1) Using a risk-informed decision-making process by utilizing the WFRA and localized wildfire hazard assessments for project prioritization and funding; (2) Creating a three-year Program of Work that aligns with NPS strategic goals and the National Cohesive Wildland Fire Management Strategy; (3) Using all funding sources in strict accordance with the authorization language and project specific requirements; (4) Ensuring transparency and accountability by conducting regular audits and reviews and adhering to the Interior Fuels and Post-Fire Reporting System requirements.

According to the WFRA, Valles Caldera contains high priority (in the top 10%) areas for treatments.

### **Fuels Management Planning, Reporting Requirements, and Multi-year Treatment Plan**

Using a collaborative process, Valles Caldera's Fire IDT conducts comprehensive fuels management planning on an annual basis. As part of this process, the Fire IDT creates and maintains a Multi-year Treatment Plan, refer to Appendix E, *Multi-year Treatment Plan for Valles Caldera National Preserve*. Prescribed fire and thinning treatments and structure and/or risk assessments are planned in Valles Caldera's Project Areas (Figure 5) for multiple years and occur as part of a moving "window" of current and out-year treatments. The Multi-year Treatment Plan is updated annually or more frequently if needed, and submitted to the [Interior Fuels and Post-fire Reporting System \(IFPRS\)](#) for proposed project approval, tracking accomplishments, and reporting performance, and measuring success. The [Active Management \(Fuels\) v 2.0 ArcGIS Dashboard](#) displays fuels treatments accomplished by the NPS Wildland Fire Management program.

Valles Caldera's Project Areas (Figure 5) are specific geographic locations that include boundaries, typically delineated using roads, trails, and/or natural features. Treatments and activities are implemented in Project Areas. The Project Areas have standardized names that are persistent through time to ensure a collective understanding of geographic locations and to facilitate communication and planning for all divisions and programs in the park. Consistent Project Area names also allow records to be maintained in a consistent, organized manner and provide a structure for managing GIS and treatment data and information. They establish the link between treatments, treatment plans, contracts, fire ecology and vegetation program databases, data analysis reports, fire effects monitoring reports, annual reports, and presentations to park staff and partners. They also ensure a logical and transparent system for future employees.



**Figure 5.** Fire Management Project Areas in Valles Caldera National Preserve

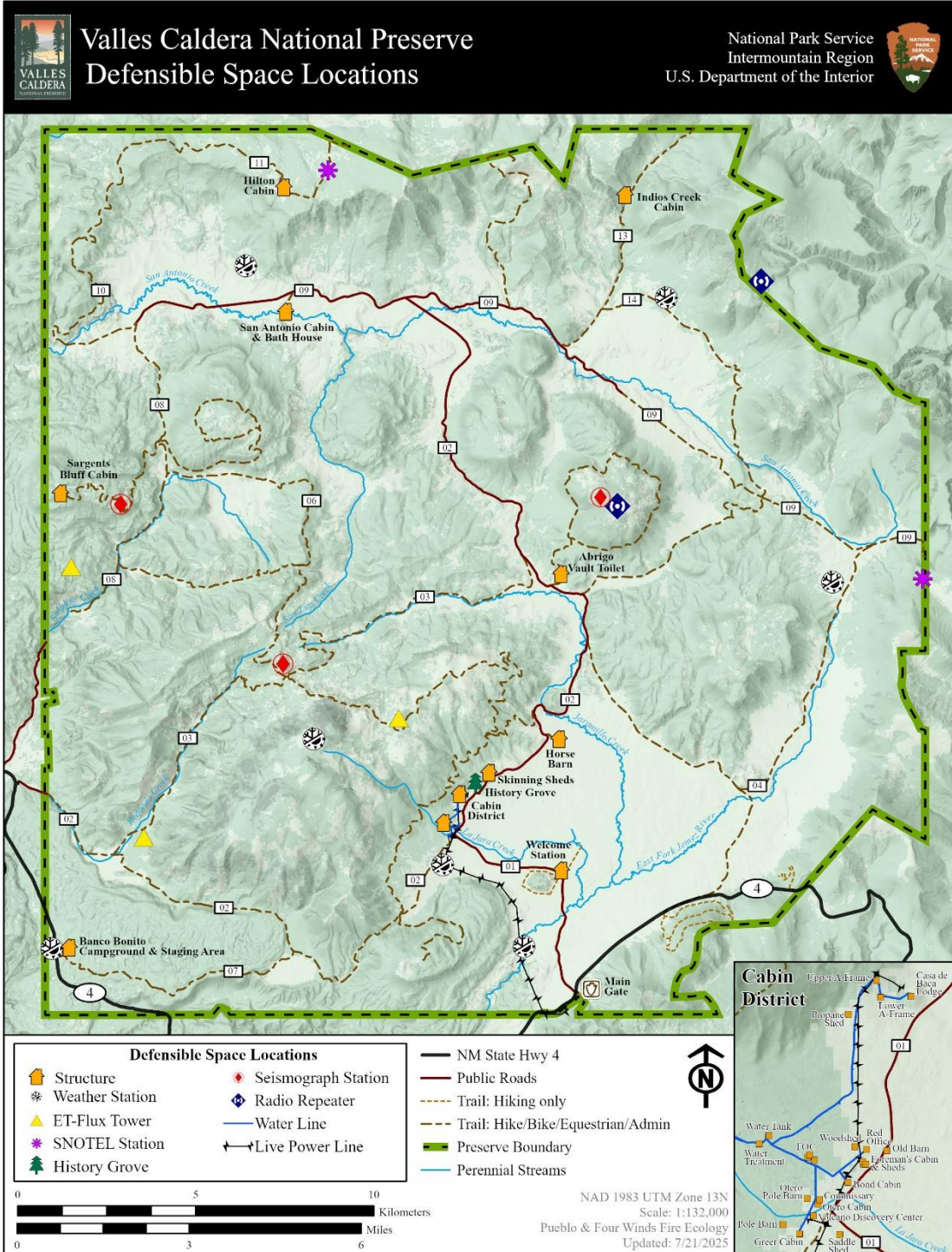
## **Defensible Space**

Defensible space treatments reduce the likelihood of a structure igniting during a wildfire and provide firefighters with safe opportunities for effective suppression actions.

Defensible space and structure protection in Valles Caldera's Multiple Strategy FMU (Figure 6) generally includes manual and mechanical thinning treatments such as mowing, trimming, limbing, and removal or redistribution of vegetation and hazardous fuels. Thinning treatments occur where needed for defensible space, but focus on the Cabin District, Welcome Station, road corridors, utility corridors, Banco Bonito primitive campground, backcountry cabins, scientific instrument installations (e.g., weather stations, flux towers, SNOTEL sites, seismograph stations), radio repeaters, and other historic assets such as San Antonio Cabin.

The NPS has adopted the [International Code Council's \(ICC's\) International Urban-Wildland Interface Code \(2021\)](#) through the parameters described in [Executive Order Wildland-Urban Interface Federal Risk Mitigation](#) (May 18, 2016). Contained in the ICC's code ([sections 603 and 604](#)) are descriptions of defensible space and maintenance requirements for wildland urban interface (WUI) areas. Reference [RM-18, Chapter 7, Fuels Management](#) for additional information.

Current information on NPS Structure Protection needs can be found at [NPS Wildland Fire Risk Assessment \(WFRA\)](#)



**Figure 6. Defensible Space Locations in Valles Caldera National Preserve**

### 3.3 Preparedness

The *Annual Delegation of Authority from Superintendent to Fire Management Officer* (Appendix A), *Inter-Park Agreement* (Appendix B), *New Mexico Master Cooperative Wildland Fire Management Response Agreement* (Appendix C.1), *Santa Fe Zone Annual Operating Plan* (AOP) (Appendix C.2), *Taos-Santa Fe Dispatch Zone Interagency Fire Danger Operating Plan* (FDOP) (Appendix D.1), *Preparedness Plan for Pueblo Parks Fire Group* (Appendix D.2), and *Staffing and Response Plan for Pueblo Parks Fire Group* (Appendix D.3) are found in the appendices. Refer to [RM-18, Preparedness, Chapter 5](#), and the [Red Book, Preparedness, Chapter 10](#) for preparedness planning requirements.

The Preparedness Plan for Pueblo Parks Fire provides direction for fire prevention actions and effective response to wildfires given local area and zone fuel conditions, fire activity, and resource availability and commitment. The Preparedness Plan is tiered from the Taos-Santa Fe Dispatch Zone Interagency FDOP and the Santa Fe Zone AOP.

#### Preparedness Activities

Preparedness requires a continuous process of internal and external communication and collaboration; hiring, training, equipping, and developing firefighters; identifying risks and values to be protected; purchasing and maintaining firefighting equipment; implementing fire prevention actions; analyzing and predicting fire activity; pre-positioning and deploying firefighters and equipment; and evaluating performance, identifying issues, and improving operations.

The primary preparedness actions and activities conducted by Pueblo Parks Fire generally occur early in the fire season (or when needed) and include the following:

- Reviewing and updating Pueblo Parks Fire Management Plans, including preparedness documents and other appendices. New signatures may be required annually. The Zone Fire Planner ensures that all preparedness documents are finalized and filed appropriately. Refer to SharePoint [NPS-IMR-Fire Managers-Annual Park Preparedness Docs](#).
- Completing preparedness and readiness reviews. These reviews are conducted by Pueblo Parks Fire annually, using the most current and approved [NPS Preparedness Review Checklists](#). The checklists reflect interagency standards for operations and performance in each area of review. They provide a comprehensive operational inspection of equipment and personnel and serve to maintain a consistent level of review across agencies and units. Santa Fe Interagency Helitack is reviewed with interagency cooperators. The U.S. Forest Service completes an internal review with Santa Fe Dispatch.
- Assessing current program Incident Qualifications and periodic medical exam needs. Refer to [DOI Wildland Fire Medical Standards](#).
- Scheduling fire training. Firefighter training and development is essential for the safe and effective implementation of Pueblo Parks Fire Management Program. All personnel taking part in the fire program meet current agency and National Wildfire Coordinating Group (NWCG) standards for training and job qualification. Annual training typically includes First Aid/CPR; wildland fire safety refresher (RT-130) for responders who require this training; basic wildland fire training courses (S-130/S-190) for employees new to wildland fire; and a variety of classroom and skills-based training courses to ensure the maintenance of qualifications. Refer to [Chapter 3: NPS Program Organization and Responsibilities-Training](#) for current training requirements.
- Scheduling and administering medical exams and Work Capacity Tests (WCT). All staff who have fitness requirements to maintain their qualifications pass an

annual WCT to ensure the physical fitness required to safely conduct job duties. Refer to [DOI Wildland Fire Medical Standards – Work Capacity Tests](#) for updated information.

- Completing pre-fire season reviews and Agency Administrator Checklist (and others, if appropriate) with each park unit, using the most current and approved [NPS Preparedness Review Checklists](#).
- Coordinating the Annual Red Card Administration Letter with non-fire funded park personnel and temporary Administratively Determined hires.
- Meeting with interagency partners to discuss current staffing, training, initial response actions, and treatment plans (prescribed fire and non-fire fuels treatments).
- Analyzing (or communicating) weather and historical fire occurrence data. This includes weather data from six Remote Automated Weather Stations (RAWS) that are distributed across the Santa Fe National Forest but combined into one group, The Santa Fe Special Interest Group, and fire history data that was obtained from the FAMWeb Data Warehouse from 2008-2019. Pueblo Parks Fire also engages local RAWS stations in weather analysis, including:
  - Tower (Bandelier) (35°46' 35", -106°15'56"). NWS ID 290801, elevation 6,500'
  - Jemez (Valles Caldera) (35°50'28", -106°37'08"). NWS ID 290702, elevation 7,999'

### **Coordination and Dispatching**

Under the umbrella of the National Interagency Fire Center and the National Wildfire Coordinating Group, Pueblo Parks Fire is located within the [Southwest Geographic Area](#) and is a member of the [Santa Fe Zone Coordinating Group](#). Dispatching within this zone is accomplished through the Santa Fe Interagency Dispatch Center (NM-SFC). The [Interagency Resource Ordering Capability \(IROC\)](#) application enables fire managers to request fire personnel and equipment and track their assigned location. Requests for additional resources can be made through Incident Command or Fire Duty Officer.

### **Duty Officer**

Duty Officer roles and responsibilities for Pueblo Parks Fire are shared among the FMO and AFMO and may be supplemented through incoming overhead resources. Duty Officers are given a written delegation of authority signed by all four of the parks' Superintendents (Appendix A). Refer to [Red Book, NPS Program Organization and Responsibilities, Chapter 3](#).

### **Agency Administrator**

Park Superintendents have the responsibility for fire management programs at their parks, "for the safe and efficient implementation of fire management activities within their unit, including cooperative activities with other agencies or landowners under delegations of authorities." Refer to the [Red Book, Chapter 3, NPS Program Organization and Responsibilities](#). NPS Agency Administrators (AADM) or their actings meet NWCG requirements to be qualified as such in the Incident Qualification and Certification System (IQCS) and have a WFDSS profile. The target training for Valles Caldera's Superintendent or acting is M-581, Fire Program Management-An Overview and M-582, Fire Program Management-Leading Complex Fire Programs. Valles Caldera's Superintendent is the AADM in the event of a wildfire and is responsible for delegating this role to another AADM if needed.

## **Prevention**

Prevention of unwanted, human-caused fire is a priority for Valles Caldera and Pueblo Parks Fire. Fire prevention activities are coordinated with neighboring cooperators in accordance with regional and national guidance. Timely and accurate fire prevention messaging is communicated to visitors, neighbors, and the public through Valles Caldera's PIO or interpretive staff. Information is posted on information boards in Valles Caldera and on Valles Caldera's website and social media accounts. Additional efforts include, but are not limited to inspections, community assistance, hazardous fuels reduction adjacent to structures and other values at risk, fire restrictions, area closures, and education programs. Fire prevention patrols may occur during periods of higher fire danger. The *Preparedness Plan for Pueblo Parks Fire Group* (Appendix D.2) includes fire danger analysis to support coordinated fire restriction implementation. The National Fire Danger Rating System is a tool to help prevent wildfires by keeping the public informed about fire potential so they can understand fire risk, make informed decisions, and prepare a clear plan of action if needed. Fire restrictions within Pueblo Parks Fire are coordinated with the Santa Fe Zone Coordinating Group during periods of high fire danger. Pueblo Parks Fire maintains Stage I Fire Restrictions year-round which restricts smoking to within a personal motor vehicle or designated smoking area; no open campfires; and no fireworks.

## **Safety Program and Plan**

The Safety, Health, and Wellness Plan for Valles Caldera National Preserve was updated in 2023. This plan complies with [Reference Manual 50B, National Park Service Occupational Safety and Health Program](#). The plan is reviewed annually with fire and aviation personnel to discuss issues that could compromise safety and effectiveness during the upcoming season. The plan is stored electronically on the shared network drive at the Interagency Fire Center. A hard copy is available in a shared binder, along with Fire Management Program Job Hazard Analysis.

## **Job Hazard Analysis**

As a requirement, Pueblo Parks FMO ensures completion of job hazard analysis (JHA) for fire and fire aviation actions and activities. For additional information refer to [Red Book, Chapter 3, NPS Program Organization and Responsibilities](#). JHA's are created for each work group in the Fire Management Program and are stored electronically with each group and on the shared network drive at the Interagency Fire Center. Hard copies of JHA's are available in offices and in a shared binder, along with the Safety, Health, and Wellness Plan for Valles Caldera National Preserve.

### **3.4 Post-Fire Programs and Response**

Valles Caldera and Pueblo Parks Fire are responsible for taking prompt action after a wildfire to minimize threats to life or property and prevent unacceptable degradation of natural and cultural resources. Damages resulting from wildfires are addressed through four actions:

**Suppression Repair:** The Incident Commander or assigned representative is responsible for ensuring the assessment and implementation of suppression repair work. Wildfire suppression funding pays for the repair.

**Emergency Stabilization:** Emergency Stabilization actions intend to protect life and property and critical resource values from additional damage by post-fire events such as flooding, or tree fall. An Emergency Stabilization (ES) Plan must be developed and proposed for funding. These actions are the responsibility of the Superintendent, who may designate a team of specialists to evaluate, propose, and carry out the ES plan. This activity is paid for from Emergency Stabilization (ES) funding.

**Rehabilitation:** The intent of rehabilitation is to repair wildfire-damaged lands that are unlikely to recover naturally to management approved conditions, or to repair or replace minor facilities damaged by wildfire. This activity must be proposed in a Burned Area Rehabilitation (BAR) plan to receive funding and is paid for through BAR funds.

**Restoration:** The intent of restoration is to continue the rehabilitation efforts started in the BAR process beyond the time-period limitation set by the Department. This activity is paid for from regular program funds.

[RM-18, Chapter 18, Post Wildfire Programs](#) and the [Red Book, Chapter 11, Incident Management and Response](#) provide direction on current processes and timeframes.

### 3.5 Air Quality and Smoke Management

The Clean Air Act (CAA) gives federal land managers legal responsibility to protect and prevent significant deterioration of air quality in national parks. Specifically, Section 118 of the CAA requires parks to meet federal, state, and local air pollution standards. The CAA also requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for six commonly occurring air pollutants to protect public health, safety, and welfare. The six criteria air pollutants are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM), and sulfur dioxide (SO<sub>2</sub>). Fine particulate matter, or particulate matter measuring 2.5 micrometers or less in diameter (PM<sub>2.5</sub>), is the primary constituent of wildland fire smoke that affects air quality and human health. Additional pollutants of concern from wildfire smoke include CO, nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), hazardous air pollutants (HAPs), carbon dioxide (CO<sub>2</sub>), and O<sub>3</sub>. Other criteria pollutants can also increase temporarily during wildfire events.

The EPA acknowledges that “prescribed fire and some wildfires can mimic the natural processes necessary to maintain fire-dependent ecosystems, minimizing catastrophic wildfires and the risks they pose to safety, property, and air quality” (EPA, 2016). In November of 2023, the EPA entered a Memorandum of Understanding (MOU) between the U.S. Department of Agriculture Forest Service, the U.S. Department of the Interior, and the U.S. Centers for Disease Control and Prevention to address wildland fire and air quality coordination between agencies. The MOU is designed to, “enhance coordination and communication while aligning air quality and land management goals for wildfire risk mitigation, including strategic increase in prescribed fires, and to establish joint strategies for achieving those goals” (USDA, DOI, EPA, CDC, 2023).

The New Mexico Environment Department’s (NMED) Air Quality Bureau (AQB) and the EPA established a New Mexico State Implementation Plan to allow the state to assume responsibilities for implementing the CAA. NMED’s AQB developed the New Mexico Smoke Management Program to “protect the health and welfare of New Mexicans from the impacts of smoke from all sources of fire” (NMED, 2005).

NMED’s AQB administers New Mexico’s Smoke Management Program to meet the requirements of the CAA and Regional Haze Rule and enforces New Mexico’s Smoke Management Regulation and Open Burning Regulation. As such, management of prescribed fire in Valles Caldera adheres to requirements of New Mexico’s Smoke Management Regulation. Primary elements of New Mexico’s Smoke Management Program and Smoke Management Regulation include considering alternatives to burning; using emission reduction techniques; evaluating smoke dispersion; monitoring air quality; notifying the public; obtaining burn authorizations; and tracking fire activity (NMED, 2005).

The goal of the Regional Haze Rule is to improve visibility in Class I areas. Although Valles Caldera is a Class II area, regional control measures are followed to reduce haze problems in nearby Class I areas, such as Bandelier National Monument and San Pedro Parks Wilderness, as well as seven additional Class I areas in the state of New Mexico.

Refer to Appendix M (*Conservation and Protection Measures, Performance Requirements, Best Management Practices, and Mitigations for Valles Caldera National Preserve*) for a detailed list of smoke management, monitoring, and mitigation actions that are implemented for wildfire suppression, allowing naturally ignited fire to burn, and prescribed fire.

### **Valles Caldera's Air Quality Status (Updated in 2025)**

- Valles Caldera is a Class II area under the CAA, which means moderate increases in new pollution may be allowed. The closest Class I areas are Bandelier National Monument, which shares a common boundary on the southeast corner of Valles Caldera, and San Pedro Parks Wilderness, approximately 12 miles to the Northwest of the park.
- In their "[Green Book](#)," the EPA designates areas that do not meet the NAAQS for a pollutant as "nonattainment" for that pollutant. Valles Caldera is in attainment (or is unclassifiable) for all pollutants (EPA, 2024).
- The NPS Air Resources Division tracks [air quality in Valles Caldera](#) by using an estimation method (spatial interpolation from nearby monitoring sites). Overall air quality is reported as "Poor," based on a 5-year (2018-2022) average assessment (NPS, 2021).

Additional Smoke Management information can be found in [RM-18, Chapter 9, Air Quality and Smoke Management](#).

#### **3.5.1 Air Quality Issues**

In Valles Caldera and the Jemez Mountains, past land use practices (fire suppression, clear-cut logging, road building, and intensive livestock grazing) have altered historical fire regimes, resulting in increased forest densities, fuel accumulations, and landscape-scale high-intensity fire events. Increases in high-intensity fires escalate emissions of air pollutants such as PM, CO, NO<sub>x</sub>, VOCs, HAPs, CO<sub>2</sub>, and O<sub>3</sub>, contributing to adverse air quality impacts.

In addition, the added complication of climate change has yielded drier fuels and longer, more extreme fire seasons, resulting in increases in harmful wildfire pollutants. Under predicted climate futures, the expectation is that temperatures and aridification will continue to escalate, followed by longer fire seasons and wildfires that burn more intensely. Increases in fire activity and added smoke emissions are expected to further reduce air quality and increase the number of days per year with degraded air quality.

Smoke generated from wildfires within Valles Caldera and in the Southwest as well as smoke transported from outside the region are a public health and safety concern. Hazardous smoke pollutants can spread and multiply to intersect with low population areas such as Jemez Springs and La Cueva, and higher population areas such as Los Alamos, Espanola, Santa Fe, and Albuquerque. Visibility can become impaired on roadways, such as New Mexico Highway 4.

Prescribed fire and naturally ignited fires that are allowed to burn under specific conditions also result in emissions of air pollutants. However, these localized and temporary impacts are mitigated by following federal regulations; managing under New Mexico AQB requirements; adhering to appropriate meteorological conditions such that smoke is adequately dispersed; and collaborating with pueblos and tribes and

other land management agencies on timing of fire operations. In addition, air quality impacts due to prescribed fire and naturally ignited fires that are allowed to burn under specific conditions are typically considerably lower than that of wildfires (EPA, 2021).

### **3.6 Data and Records Management**

Pueblo Parks Fire Management Program information, records, and data (printed and electronic) are organized and maintained according to [Director's Order #11D: Records and Electronic Information Management](#) to ensure short and long-term quality and availability of records. To maintain compliance with the most recent laws, guidance, and technology, records management practices also follow [Records Management Policy RMP-2021-02: Electronic Records Management](#).

All wildfires occurring within Pueblo Parks Fire are documented on the Taos-Santa Fe Incident Organizer by the Incident Commander. All wildfires and prescribed fires require a fire report. The FMO is responsible for the certification of all fire reports using [Interagency Fire Occurrence Reporting Modules \(InFORM\)](#).

A GIS database is maintained locally for all wildfires, prescribed fires, and thinning projects implemented at Valles Caldera. Both park-level and regional GIS Specialists serve as stewards of Valles Caldera's fire GIS data, ensuring that standards for collection, naming, documentation, and storage are implemented. A GIS database containing Valles Caldera's Fire and Thinning Atlas is maintained by Valles Caldera's GIS Specialist. Pueblo Parks Fire works closely with Valles Caldera's GIS Specialist to ensure wildfire, prescribed fire, and thinning boundaries are accurate and shared.

GIS data for all wildfires, prescribed fires, and thinning treatments are uploaded and recorded upon completion to the [InFORM](#) and [NPS Active Management Dashboard](#) databases. Agency policy further defines how fire reports are managed, spatial data associated with wildland fires and fuels treatments are collected, stored, and shared following guidance in [RM-18, Information and Technology Management, Chapter 19](#).

Employee training, qualifications, and fire experience records are maintained by Pueblo Parks Fire Program, following current agency standards, using the [Incident Management Qualification and Certification System \(IQCS\)](#). IQCS is updated yearly or as needed. Incident Qualification cards are issued and certified by Pueblo Parks FMO.

## **4.0 PROGRAM MONITORING AND EVALUATION**

A focal point of Valles Caldera's FMP and Pueblo Parks Fire is monitoring, research, and partnerships to advance science-based wildland fire decision-making and facilitate adaptation to changing environmental conditions.

In addition, Valles Caldera's Strategic Action Plan (2022) (NPS, 2022b) includes a statement of vision to describe Valles Caldera's ideal future: "Valles Caldera National Preserve is a place of learning and inspiration, where focused, efficient, competent professionals implement adaptive management as an ecologically and economically viable method of public land management."

In alignment with Pueblo Parks Fire and Valles Caldera's focus on adaptive management, Pueblo and Four Winds Fire Ecology and Valles Caldera's Resource Stewardship and Science (RSS) Division conduct monitoring and research related to treatment effects, fire effects, fire science, and climate change in Valles Caldera. Both programs also conduct monitoring and research in direct support of

special status species as it relates to fire management actions and activities, in consultation with NMDGF and USFWS.

Pueblo and Four Winds Fire Ecology also coordinates with local tribal forestry crews to collect fire ecology data, helping to facilitate the integration of Traditional Ecological Knowledge and fire science to improve understanding of the role of fire in ecosystem stewardship.

#### **4.1 Monitoring**

Pueblo Parks Fire focuses on a science-based adaptive management concept and implements deliberate and measurable treatment actions that are monitored through Pueblo and Four Winds Fire Ecology and Valles Caldera's RSS Division. The science-based adaptive management framework is described in Appendix O, the *National Park Service Fuel Treatment Flow Diagram*. Data collected on Fire Ecology plots and through the RSS Division is used as a baseline to guide fire management planning and to create site-specific objectives for prescribed fire and thinning plans. After a treatment is implemented, the data is used to evaluate if objectives are met, to measure the effectiveness of fire and thinning prescriptions, and to determine if additional monitoring or research is needed.

Pueblo and Four Winds Fire Ecology conducts level 1, 2, 3, and 4 monitoring, using the NPS Fire Monitoring Handbook as a source of information for developing local monitoring strategies and protocols that are used to meet specific management objectives and information needs, see Appendix F, *Fire Ecology Monitoring and Research Plan for Valles Caldera National Preserve*. Level 1 is environmental monitoring and includes collection of baseline historical data such as weather, terrain, and socio-political factors. Level 2 is fire behavior monitoring and includes collecting data on fire behavior, weather, smoke, and other factors during fire operations. Level 3 is monitoring of short-term change in surface fuels and vegetation on permanent monitoring plots as a result of management actions. Level 4 includes monitoring of both short-term and long-term change in surface fuels and vegetation on permanent monitoring plots as a result of management actions.

Pueblo and Four Winds Fire Ecology installs and maintains a network of vegetation and fuel plots in Valles Caldera. Data collection and repeat photography is typically related to the following variables: seedling, midstory, and overstory trees, canopy closure, shrubs, herbaceous vegetation, surface fuels, and immediate postburn observations such as burn severity, scorch height, char height, and percent of crown scorched on trees. The Fire Ecology Program is further described in [RM-18, Fire Ecology and Monitoring, Chapter 8](#). Monitoring activities for Pueblo and Four Winds Fire Ecology are tracked through a comprehensive Microsoft Access database located in the Fire Ecology Program office at the Interagency Fire Center. The [NPS DataStore](#) is a digital repository for Fire Ecology data and documents such as annual reports, data analysis reports, and newsletters.

Valles Caldera's RSS Division's fire monitoring efforts are comprehensive and include: (1) weather and climate data across nine [remote weather stations](#), two snow telemetry (SNOTEL) Natural Resources Conservation Service sites, and one National Oceanic and Atmospheric Administration Climate Reference Network station; (2) stream water quality and stream discharge (water quantity); (3) semi-annual (spring and autumn) fish population dynamics; (4) plant community data (species composition, percentage cover, biomass, fuel loads) for forests, grasslands and wetlands; (5) wildlife population dynamics for large mammals (elk, deer, bears, cougars), birds, and arthropods, and Federal and State protected species (e.g., Jemez Mountains salamander, Mexican spotted owl, New Mexico meadow jumping mouse).

## 4.2 Research

Applied fire research conducted through Pueblo and Four Winds Fire Ecology and Valles Caldera's RSS Division is a focus of the science-based adaptive management process at Valles Caldera. Pueblo and Four Winds Fire Ecology conducts fire related research in Valles Caldera; supports university scientists to collect and analyze fire ecology data; and maintains collaborative partnerships for research with universities, outside researchers, and other governmental and non-governmental agencies (e.g., Los Alamos National Laboratory). Valles Caldera's RSS staff collaborate with universities and outside researchers on fire research including (1) soil chemistry and soil biota, (2) tree-ring and fire scar patterns to determine fire history, (3) impacts of fire on cultural resources, particularly obsidian artifacts, stone structures, and dendroglyphs, (4) populations of small mammals and their parasites, (5) resource use of post-fire vegetation by wildlife.

Fire research will continue in Valles Caldera as new research questions are identified. Refer to Appendix P, *Fire Science and Research at Valles Caldera National Preserve*. In addition, refer to section 3.1.1, Expected Fire Behavior and Appendix J, *Expected Fire Behavior and Climate Change in Valles Caldera National Preserve*. NPS guidance for research is further described in [RM-18, Fire Research, Chapter 17](#).

The signal of rapid, human-caused climate change has been documented across the Southwestern U.S. broadly, and Valles Caldera specifically. Climate change in Valles Caldera is characterized by increased mean temperatures, particularly since 2000. Between 1895 and 2018, mean temperatures have increased by 1.4°F per century due to warming in the spring and summer months (NPS, 2022a). Precipitation over the same period has remained relatively stable (Carlson & Gross, 2019); however, the proportion of precipitation received as snow has declined (NPS, 2022a). Although precipitation overall has not declined, higher temperatures increase evaporation rates, resulting in decreases in soil moisture and water availability for vegetation (NPS, 2022a). In the future, higher average temperatures and water deficit may result in increased aridification, lower fuel moistures, and extended periods of drought. The influence of these conditions will likely result in further increases in high-intensity landscape-scale fire in Valles Caldera.

In response to climate change and as part of the science-based adaptive management process, Valles Caldera and Pueblo Parks Fire consider the Resist-Accept-Direct (RAD) framework when making decisions regarding ecosystem and land stewardship, particularly in ecosystems facing rapid ecological change as a result of a changing climate or other drivers of change (NPS, 2020a).

The RAD framework includes stewardship options ranging from 1) *Resisting* ecosystem transformations by focusing actions on maintaining current or historical ecosystem conditions, 2) *Accepting* ecosystem transformations by not intervening and accepting the ecosystem conditions that result, and 3) *Directing* ecosystem transformations toward a desired outcome by actively intervening to shape ecosystem change in the direction of new conditions.

The RAD framework provides managers and decision-makers a pathway to manage for change, not just persistence. It encourages looking beyond traditional approaches of maintaining and restoring ecosystems based on historical conditions or snapshots in time to consider novel, forward-looking, and sustainable strategies that examine changing environmental conditions and future ranges of variability.

The RAD framework also provides managers and decision makers a strategic approach to collaboratively examine multiple pathways of land stewardship across boundaries and at a landscape scale.

In addition, the following goal and objectives were created by Valles Caldera and Pueblo Parks Fire to help address the impacts of climate change:

Goal: Use monitoring, research, and partnerships to advance science-based wildland fire management decision-making and facilitate adaptation to changing environmental conditions

Objectives:

- Promote inquiry and flexibility in fire and ecosystem stewardship, considering historic ranges of variation, a changing climate, and a future range of variability.
- Use available environmental, natural, and cultural resource datasets to develop site-specific fire and resource management objectives for each treatment plan.
- Engage in adaptive management by collectively evaluating pre- and post-treatment datasets and consider using fire and fuels treatments in innovative ways.
- Consider future and changing ecological, climate, and fuel conditions, and fire regimes during the planning process and adaptive management cycle.
- Consider the Resist-Accept-Direct framework for ecosystem and land stewardship, particularly in ecosystems facing rapid ecological change.
- Develop wildland fire strategies in altered or novel ecosystems where fire can play a beneficial role.
- Engage and utilize the collective knowledge base of the Southwest Jemez Mountains Collaborative and the Jemez Mountains Research Learning Center.

In alignment with goals and objectives, thinning and prescribed fire treatments in Valles Caldera are designed to move the structure, composition, and function of the park's ecosystems toward more resilient conditions that have the adaptive capacity to recover from wildfire, insect and disease outbreaks, and climate change.

### 4.3 Evaluations, Reviews, and Updates

#### **Fire Program Review**

The NPS has developed the [Wildland Fire Program Review Guide](#) to describe the program review framework. For additional information, refer to [RM-18, Chapter 16, Evaluations, Reviews, and Investigations](#).

The Intermountain Region conducts Annual Program Assessments to evaluate the status of a fire program across nine program areas, including 1) Leadership and Program Management; 2) Operations, Health, Safety, Equipment, and Facilities; 3) Fuels and Smoke Management; 4) Fire Ecology, Fire Effects, and Burned Area ER; 5) Wildland Fire Planning and Compliance; 6) Fire Communication and Education; 7) Information Resource Management and Support; 8) Fire Program Administration; and 9) Fire Aviation.

#### **Wildland Fire Incident Review**

All wildland fires and fire-related incidents are reviewed in accordance with [RM-18, Chapter 16, Evaluations, Reviews, and Investigations](#) and the [Red Book, Chapter 18, Reviews, and Investigations](#).

#### **Annual Fire Management Plan Update**

An annual review is required for this FMP. The review process is described in [RM-18, Chapter 4, Fire Management Plans](#). Any needed updates to the FMP such as new terminology, policy references, or changes to park specific information are identified by Valles Caldera's

Fire IDT and implemented as part of this process. After review by Regional Fire Planners, a new cover sheet for the FMP is signed by the FMO and Park Superintendent.

This FMP's appendices are also reviewed annually and replaced with current (signed, if applicable) documents as needed. Electronic copies of the FMP and required appendices with current signatures or certified electronic signatures are uploaded to the [NPS-IMRO-Annual Park Preparedness Docs Folder](#). FMP's that have not undergone an annual update within the specified timeframe are not considered current.

## National Wildfire Coordinating Group Glossary

The National Wildfire Coordinating Group (NWCG) [Glossary of Wildland Fire](#) provides an extensive listing of approved terms and definitions used by the NWCG community. It contains terms commonly used by NWCG in the areas of wildland fire and incident management and is not intended to list all terms used by NWCG groups and member agencies. The NWCG has directed that all committee and subgroup product glossaries be contained within the NWCG Glossary of Wildland Fire to maintain definition consistency and clarity among documents.

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## Useful Web Links

- [Directors Order #18: Wildland Fire Management; National Park Service](#)
- [Interagency Standards for Fire and Fire Aviation Operations, NFES 2724](#)
- [NWCG Standards for Prescribed Fire Planning and Implementation, PMS 484](#)
- [Reference Manual #18: Wildland Fire Management; National Park Service](#)

## **Required Appendices**

- A. Annual Delegation of Authority from Superintendent to Fire Management Officer
- B. Inter-Park Agreement
- C. Cooperative and Interagency Agreements
  - C.1 New Mexico Master Cooperative Wildland Fire Management Response Agreement
  - C.2 Santa Fe Zone Annual Operating Plan
- D. Preparedness Planning Documents
  - D.1 Taos-Santa Fe Dispatch Zone Interagency Fire Danger Operating Plan
  - D.2 Preparedness Plan for Pueblo Parks Fire Group
  - D.3 Staffing and Response Plan for Pueblo Parks Fire Group
- E. Multi-year Treatment Plan for Valles Caldera National Preserve
- F. Fire Ecology Monitoring and Research Plan for Valles Caldera National Preserve

## **Additional Appendices**

- G. Valles Caldera National Preserve Fire Management Plan Environmental Assessment
- H. Valles Caldera National Preserve and Pueblo Parks Fire Group Interdisciplinary Team Roles and Responsibilities
- I. Minimum Impact Strategy and Tactics Guidelines for Valles Caldera National Preserve
- J. Expected Fire Behavior and Climate Change in Valles Caldera National Preserve
- K. Taos/Santa Fe Incident Organizer
- L. Strategic Direction and Required Mitigations for Valles Caldera National Preserve
- M. Conservation and Protection Measures, Performance Requirements, Best Management Practices, and Mitigations for Valles Caldera National Preserve
- N. Prescriptions and Guidelines for Forest Thinning in Valles Caldera National Preserve
- O. National Park Service Fuel Treatment Flow Diagram
- P. Fire Science and Research at Valles Caldera National Preserve