

DECEMBER 2023

MOUNTAIN VIEW
FIRE PROTECTION DISTRICT



COMMUNITY WILDFIRE PROTECTION PLAN

Working together to build
fire adapted communities,
resilient to wildfire



SWCA[®]
ENVIRONMENTAL CONSULTANTS

We would like to formally thank the Core Team and all stakeholders for contributing their time and expertise throughout the planning process. Your participation has contributed to creating resilient landscapes, implementing public education, reducing structural ignitability, and ensuring safe and effective wildfire response.

For additional information, questions, or concerns regarding this project, please contact Project Manager Arianna Porter at arianna.porter@swca.com or Assistant Chief Special Operations Keith Long at klong@mvfpd.org.

For all your planning and implementation needs, please visit www.swca.com.

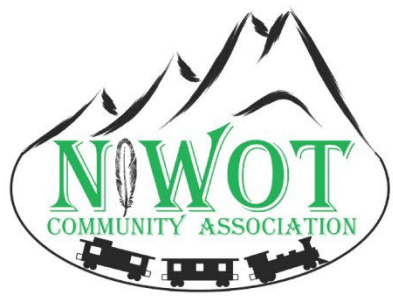
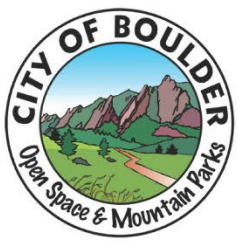


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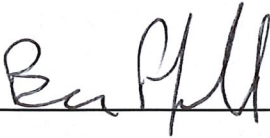
The purpose of the risk assessment contained in this Plan is solely to provide a community and landscape-level overview of general wildfire risks within the assessment area as of the date hereof and to provide a potential resource for community pre-fire planning. This risk assessment is premised on various assumptions and models that include and are based on data, software tools, and other information provided by third parties (collectively, "Third-Party Information and Tools"). SWCA, Incorporated, doing business as SWCA Environmental Consultants ("SWCA"), relied upon various Third-Party Information and Tools in the preparation of this risk assessment, and SWCA shall have no liability to any party in connection with this risk assessment including, without limitation, as a result of incomplete or inaccurate Third-Party Information and Tools used in the preparation hereof. This risk assessment may not be relied on by any party without the express written consent of SWCA. SWCA hereby expressly disclaims any responsibility for the accuracy or reliability of the Third-Party Information and Tools relied on by SWCA in preparing this risk assessment. SWCA shall have no liability for any damage, loss (including loss of life), injury, property damage, or other damages whatsoever arising from or in connection with this risk assessment, including any person's use or reliance on the information contained in this risk assessment. Any reproduction or dissemination of this risk assessment or any portion hereof shall include the entirety of this plan disclaimer.

MOUNTAIN VIEW FIRE PROTECTION DISTRICT

IN COLLABORATION WITH:



The entities listed below participated in the development of and/or reviewed and are in support of the Mountain View Fire Protection District Community Wildfire Protection Plan and agree that the CWPP is viable, complete, and realistic in terms of risk reduction and implementation:



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12/14/23

Date

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Agency/Position (printed)



Signature

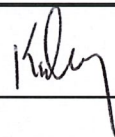
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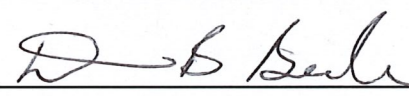
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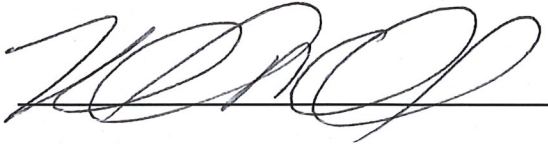
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EXECUTIVE SUMMARY

WHAT IS THE PURPOSE OF THIS COMMUNITY WILDFIRE PROTECTION PLAN?

The purpose of the 2023 Mountain View Fire Protection District (FPD) Community Wildfire Protection Plan (CWPP) update is to

- provide an FPD-wide scale of wildfire risk and protection needs;
- bring together all responsible land use planning, wildfire management, and suppression entities in the Planning Area to address the identified needs;
- provide a framework for future planning and implementation of necessary mitigation measures; and
- provide information to inform future land use planning, building codes, and wildfire mitigation and prevention related ordinances.

This CWPP aims to assist in protecting human life and reducing property loss due to wildfire throughout the FPD. This 2023 plan was compiled from reports, documents, data, and Core Team and public input. The plan was developed in response to the Federal Healthy Forests Restoration Act of 2003 (HFRA).

The CWPP meets the requirements of the HFRA by addressing the following:

1. Having been developed collaboratively by multiple agencies at the state and local levels in consultation with federal agencies and other interested parties.
2. Prioritizing and identifying fuel reduction treatments and recommending the types and methods of treatments to protect at-risk communities and pertinent infrastructure.
3. Suggesting multi-party mitigation, monitoring, and outreach.
4. Recommending measures and action items that residents and communities can take to reduce the ignitability of structures.
5. Soliciting input from the public on the draft CWPP.

WHAT ARE THE KEY ISSUES ADDRESSED?

Issues addressed in this CWPP include:

- Wildfire issues at the landscape level, across multiple jurisdictions within the Mountain View FPD.
- Fuel treatment recommendations for land management agencies and property owners to mitigate hazard and risk.
- Increasing public understanding of the fire response process.
- Prioritizing hazardous fuels reduction in the wildland-urban interface (WUI) and grassland-urban interface (GUI).
- Recent fire occurrences and associated changes to the wildland fire environment due to climate patterns.

- Raising awareness about the natural role that fire plays in the ecosystem and maintaining resilient landscapes.
- Public education and outreach to property owners to better enable individuals to reduce the risk of fire to their properties.
- Investing and supporting fire response at all levels, including resources for local fire departments, to increase capacity to serve the community.
- Managing fire to protect values and accomplish resource management goals, including protection and enhancement of wildfire habitat, water supply and quality, and forest health.

HOW IS THE PLAN ORGANIZED?

The CWPP provides a Quantitative Risk Assessment, action items, project recommendations, and background information about the FPD's wildland fire environment as well as land management plans and agencies. Most background information is housed in the appendices.

Chapter 1 provides a general overview of CWPPs, the Core Team, the Planning Area, land ownership, and public involvement.

Chapter 2 presents an overview of the WUI, GUI, and fire environment and specific information about vegetation and fire history, as well as fire management and response.

Chapter 3 describes the Quantitative Risk Assessment, results of the assessment, and community values at risk.

Chapter 4 provides mitigation strategies in accordance with the National Cohesive Wildfire Strategy, as well as post-fire protocols and rehabilitation strategies.

Chapter 5 presents monitoring strategies to assist in tracking project progress and in evaluating work accomplished.

Appendix A contains background information on the Mountain View FPD including fire policy, past planning efforts, and federal and state land management practices.

Appendix B contains additional background and resources for community members, covering a variety of topics.

Appendix C outlines modeling and geographic information system (GIS) processes and methodologies.

Appendix D details potential fuel treatment types and methods for application.

Appendix E provides resources for property owners on preparing their houses and properties for wildfire.

Appendix F contains information on recovery and restoration following a wildfire.

Appendix G presents information on public outreach and engagement with regard to this CWPP.

Appendix H provides additional mapping.

Appendix I details funding opportunities.

Appendix J lists individuals who contributed to preparation of the CWPP.

WHAT IS THE GOAL OF A CWPP?

The goal of a CWPP is to enable local communities, civic groups, and governments to improve their wildfire-mitigation capabilities and capacity, while working with fire protection agencies to identify high fire risk areas and prioritize areas for structure hardening, mitigation, fire suppression, and emergency preparedness projects. Another goal of the CWPP is to enhance public awareness by helping residents, visitors, and homeowners better understand the natural- and human-caused risks of wildland fires that threaten lives, safety, and the local economy. The minimum requirements for a CWPP, as stated in the HFRA, are the following (Society of American Foresters [SAF] 2004):

- **Collaboration:** Local and state government representatives, in consultation with federal agencies or other interested groups, must collaboratively develop a CWPP.
- **Prioritized Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous fuels reduction and treatments and recommend the types and methods of treatment that will protect one or more communities at risk (CARs) and their essential infrastructures.
- **Treatments of Structural Ignitability:** A CWPP must recommend measures that property owners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

HOW WAS THE 2023 MOUNTAIN VIEW FPD CWPP DEVELOPED?

The CWPP planning process had multiple purposes, including modeling and mapping wildfire hazards, and identifying physical characteristics that increase the threat of wildfire to communities. This allowed the Core Team, a diverse group of relevant project stakeholders, to prioritize treatments tailored for each community to reduce fire risk. Public engagement was a crucial aspect of the 2023 CWPP development, with community members actively providing input through various outreach events and engagement through online surveys. The process aimed to facilitate collaboration between wildfire responders, land managers, and the Core Team and foster lasting working relationships. By incorporating input from both the public and Core Team, the recommendations led to tailored treatments for specific areas and scenarios. The Mountain View FPD CWPP is the product of collaboration across jurisdictional agencies and with the public in developing effective wildfire mitigation programs.

WHY CREATE A STORY MAP FOR THE PROJECT?

The Mountain View FPD opted to develop a hub site, where project-related resources can easily be accessed by the community. Within the hub site is a story map (online web content) that presents the CWPP in a web layout with accompanying web maps. The purpose of the story map is to disseminate information to the public and allow for public input. In addition to facilitating information sharing, the story map also provides the FPD with a platform that can be readily revised to keep the CWPP document current. The CWPP is shared on the Mountain View FPD hub site at <https://mountain-view-fpd-cwpp-mvfpd.hub.arcgis.com/>.

WHO WILL LEAD THE IMPLEMENTATION OF THIS CWPP?

Implementation of most projects identified in this CWPP will require the collaboration and cooperation of multiple individuals and entities such as community residents, private organizations, the Mountain View FPD, counties within the district, and local, state, and federal agencies. However, to ensure that projects move forward, the plan will be governed by the Mountain View FPD and require coordination with the emergency management entities for each county within the district.

WHO PARTICIPATED IN DEVELOPING THE PLAN?

Land managers, government representatives, and local representatives from across the Mountain View FPD participated in this CWPP planning process. Organizations, municipalities, and agencies such as the Mountain View FPD, Colorado State Forest Service (CSFS), U.S. Forest Service (USFS), Denver Water, Boulder Watershed Collective, Boulder County CWPP Coordinator, Boulder Office of Disaster Management, Town of Superior, Town of Erie, Weld County Emergency Management/Town of Mead, Carbon Valley Emergency Management/City of Dacono, Niwot Community Association, Marshall, Xcel Energy, City of Boulder Open Space and Mountain Parks, Town of Superior, Niwot Community Association, and Boulder County Parks and Open Space, along with other additional community or organization representatives, served as the Core Team for this CWPP and drove the decision-making processes.

WHERE IS THE PLANNING AREA?

The Planning Area includes the Mountain View FPD as delineated by its official geographic boundaries (Figure ES.1).

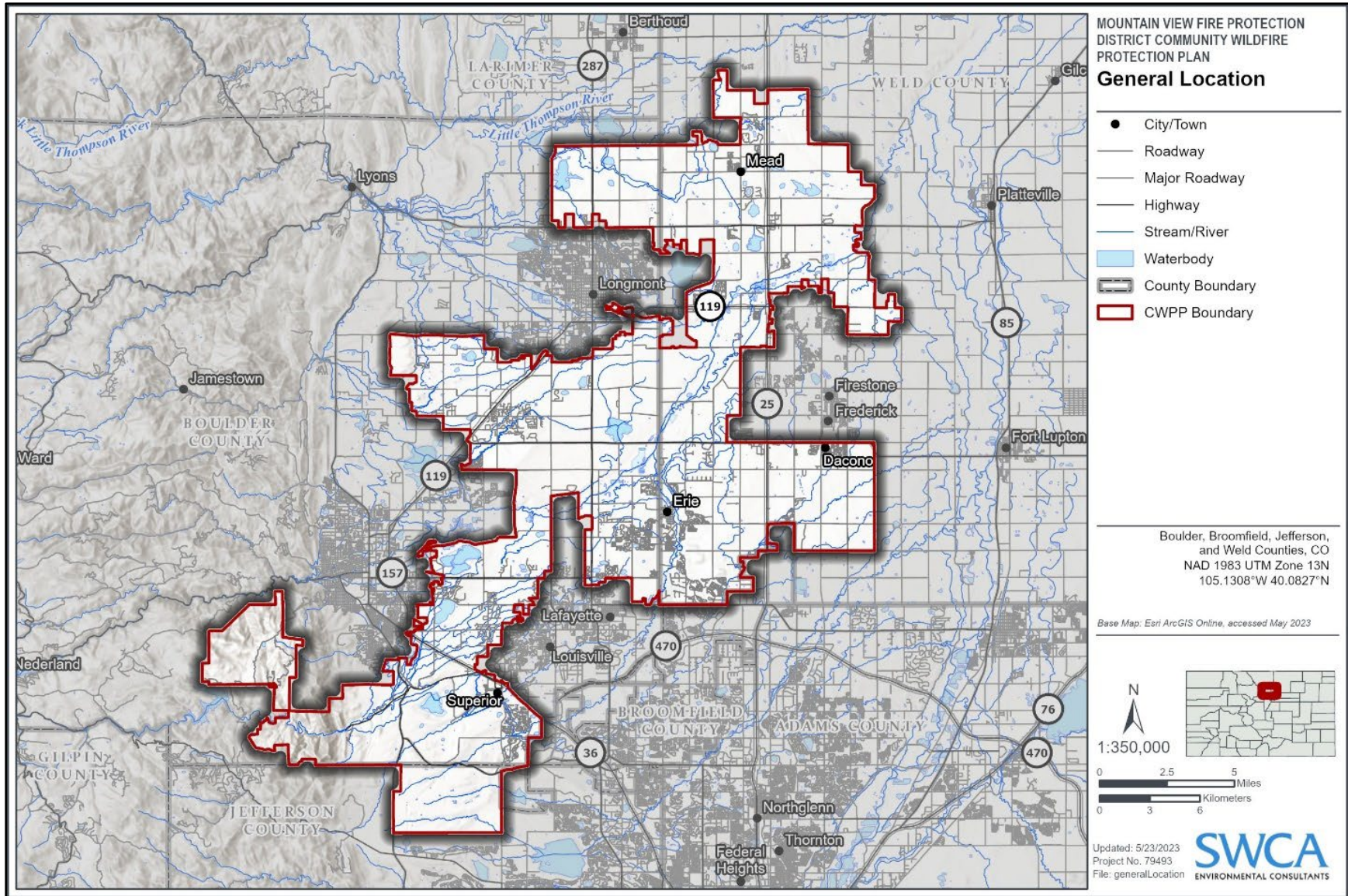


Figure ES.1. Mountain View FPD CWPP Planning Area.

WHAT WAS THE PUBLIC INVOLVEMENT?

The CWPP process emphasizes meaningful discussions among community members about local fire protection and forest management priorities. The draft CWPP and an accompanying online draft story map were open for public review from October 30, 2023, through November 13, 2023. The Mountain View FPD utilized various communication channels, including a public survey and two public events, to engage a diverse range of community members in the outreach process. Public comments from relevant events, comment forms, and surveys were incorporated into the final CWPP as appropriate.

WHAT IS THE CURRENT WILDFIRE SITUATION?

The Planning Area is home to both fire-prone and non-burnable landscapes. While large fires have devastated local communities within the district, their occurrence, as well as the future occurrence of similar fires within the district, is not unexpected considering the fire dependence and adaptation of species present in the region and climate trends that are likely to exacerbate the behavior of future fires. Open space and forested areas directly abutting human development and recent challenges with fire suppression regimes have also potentially pointed the district toward a hazardous and less predictable wildfire situation.

WHAT RECENT FIRES OCCURRED HERE?

The Marshall Fire, the most recent and destructive wildfire in the Mountain View FPD, occurred on December 30, 2021. It encompassed 6,026 acres and resulted in the destruction or damage of over 1,000 homes and structures due to extreme winds and dry grass fuels. The fire emerged from two separate incidents that later combined (Gabbert 2022). Notably, the National Renewable Energy Laboratory recorded 111 wind gusts exceeding 75 mph on that day, making wildfire suppression extremely challenging. This event highlighted that destructive wildfire can occur throughout the year, even outside the typical fire season, due to the presence of dry burnable fuel. Another example, the NCAR Fire, which ignited on March 26, 2022, in the same vicinity, burned 196 acres and caused the evacuation of 19,000 people (Gabbert 2022).

WHAT IS THE PURPOSE OF THE QUANTITATIVE RISK ASSESSMENT?

The purpose of the Colorado All Lands (COAL) Quantitative Risk Assessment is to model, visualize, and assess the risk of wildland fires within the Mountain View FPD. The Quantitative Risk Assessment is a collaborative project that combines a geographic information system (GIS) model of hazard based on calibrated fuel models, severe weather conditions, and topography to calculate a probability of fire to proliferate on the landscape. This burn probability is utilized alongside highly valued resources and assets (HVRAs), the WUI, and the GUI, all of which are established by wildfire professionals across Colorado to create comprehensive wildfire risk products to inform all stakeholders.

The Quantitative Risk Assessment includes the following:

- Modeled probability of a fire occurring

- Modeled fire behavior
- WUI delineations (derived from COAL and Core Team input)
- GUI delineations (derived from COAL and Core Team input)
- Risk of wildfire to structures and VARs based on their exposure and susceptibility to wildfire hazards and the likelihood of fire occurring.

The purpose of the COAL Quantitative Risk Assessment is to provide information about wildfire risk to HVRAs in a standardized format across Colorado.

WHAT ARE THE STRATEGIES TO ADDRESS WILDFIRE HAZARDS?

Goal 1 of the Cohesive Strategy and the Western Regional Action Plan is to **Create Resilient Landscapes**: Landscapes, regardless of jurisdictional boundaries are resilient to fire, insect, disease, invasive species, and climate change disturbances, in accordance with management objectives.

Recommendations for hazardous fuels treatments include the following:

- Vegetation maintenance and reduction projects
 - a. Local and private lands
 - b. Cross-boundary
 - c. Roadways
 - d. Open space
- Mitigation along ditches and drainage points
- Conduct post-wildfire mitigation
- Conduct field-based risk assessments

Goal 2 of the Cohesive Strategy/Western Regional Action Plan is **Fire-Adapted Communities**: Human populations and infrastructure are as prepared as possible to receive, respond to, and recover from wildland fire.

Recommendations for public outreach/education and structural ignitability include the following:

- Developing and promoting wildfire education
- Improve signage and other wildfire warnings
- Defensible space enforcement and maintenance
- Create smoke-ready communities
- Identify alignment between existing building and vegetation codes
- Increase Firewise (USA) support to communities

Goal 3 of the Cohesive Strategy/Western Regional Action Plan is **Safe, Effective, Risk-based Wildfire Response**: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

Recommendations for improving fire response capabilities include the following:

- Improve local wildfire response capabilities
- Improve pre-evacuation planning and evacuation planning
- Identify and improve roadway access to WUI areas
- Increase National Wildfire Coordinating Group training
- Increase water resource availability throughout the district

WHAT DOES POST-FIRE RESPONSE AND RECOVERY INVOLVE?

There are many aspects to post-fire response recovery, including but not limited to:

- Returning home and checking for hazards.
- Coordinating and mobilizing a group of teams in the community to respond to emergencies.
- Rebuilding communities and assessing economic needs—securing the financial resources necessary for communities to rebuild homes, business, and infrastructure.
- Restoring the damaged landscape—restoration of watersheds, soil stabilization, and tree planting.
- Prioritizing the needs of vulnerable and disadvantaged communities during response and disaster recovery efforts.
- Evaluating and updating disaster recovery plans every 5 years to respond to changing needs and characteristics of the community.
- Coordinating with planning, housing, health, and human services, and other local, regional, or state agencies to develop contingency plans for meeting short-term, temporary housing needs of those displaced during a catastrophic wildfire event.

HOW WILL THE PLAN BE IMPLEMENTED?

The CWPP does not mandate implementation of any of the recommendations, but the message is that fire mitigation could be achieved through joint actions of property owners and local governments.

Recommendations for fuels reduction projects are general; site-specific planning considering location, access, land ownership, topography, soils, and fuels would be needed. The recommendations are specific to WUI and GUI areas and aim to reduce loss of life and property.

Implementation of fuels reduction projects must be tailored to the specific project and location, based on available resources and regulations. To streamline project implementation, this CWPP identifies pertinent land management/ownership agencies for each recommendation. On-the-ground implementation requires an action plan and assessment strategy for each project.

WHEN DOES THE CWPP NEED TO BE UPDATED?

The CWPP should be treated as a living document to be updated annually or immediately following a significant fire event. The plan should continue to be revised to reflect changes, modification, or new information. These elements are essential to the success of mitigating wildfire risk throughout the district and will be critical in maintaining the ideas and priorities of the plan in the future. Chapter 5 provides an evaluation framework that can help guide the CWPP update process.

PROJECT STAKEHOLDERS

Name	Organization	Title	Project Role
Chief Keith Long	Mountain View FPD	Assistant Chief - Special Ops	Core Team Member
Allison James	Town of Superior	Disaster Preparedness Recovery Manager	Core Team Member
Leslie Clark	Town of Superior	Director of Parks, Rec. and Open Space	Core Team Member
Patrick Hammer	Town of Erie	Director of Parks and Recreation	Core Team Member
David Limbach	Niwot Community Association	President	Core Team Member
Denise Bradshaw	Weld County Emergency Management/Town of Mead	Coordinator	Core Team Member
Kathy Koehler	Niwot Community Association	Director at Large	Core Team Member
Merrie Garner	Carbon Valley Emergency Management/City of Dacono	Coordinator	Core Team Member
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Ashley Denault	Denver Water	Public Outreach	Core Team Member
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Kerry Webster	Boulder Fire-Rescue	Fire Operations Specialist	Core Team Member
Maya MacHamer	Boulder Watershed Collective	Director	Core Team Member
Kirin Riddell	Boulder Watershed Collective	Fire Adaptive Communities Coordinator	Core Team Member
Megan Monroe	Marshall	Representative	Core Team Member
Eric Phillips	Xcel Energy	Sr. Manager High Pressure Gas Ops.	Core Team Member
Ben Pfohl	CSFS	Supervisory Forester	Core Team Member
Daniel Godwin	USFS	Sub-regional Fire Planner	Core Team Member
Victoria Amato	SWCA	Principal Fire Planner	Plan Preparer
Arianna Porter	SWCA	Project Manager	Plan Preparer



Name	Organization	Title	Project Role
Mallory Phillips	SWCA	Assistant Project Manager	Plan Preparer
Liz Hitzfelder	SWCA	Lead Geospatial Analyst	Plan Preparer
Tim Clute	SWCA	Fire Planner	Plan Preparer
Sam Lashley	SWCA	Fire Planner	Plan Preparer
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CHAPTER 1 – INTRODUCTION

The United States is facing urgent forest and watershed health concerns. While the number of annual wildfires throughout the United States has been slightly decreasing (71,500 fires in 2016 vs. 59,000 fires in 2022), the number of acres burned has been on the rise (Congressional Research Service [CRS] 2022). An average of 7.4 million acres is burned every year due to wildfire, more than doubling the annual average of acres burned in the 1990s (CRS 2022). Communities are seeing the most destructive wildfire seasons in history. The 2015 fire season had the most acreage impacted in a single year since 1960 at 10.13 million acres. 2020 was the second most extensive year for wildfire with 10.12 million acres burned (CRS 2022). These statistics demonstrate that wildfires are becoming larger and harder to control.

Colorado's Forest Action Plan of 2020 states that forests and rangelands in Colorado, like those of other western states, face urgent issues concerning longer fire seasons and uncharacteristic wildfires that threaten the sustainability and ecological function of the state's ecosystems. These issues require an analysis of the current gap between existing and necessary wildland fire management strategies. A top priority in Colorado is coupling current and future wildland fire management strategies with wildland fire and fuel priority areas to guide federal, state, and private program funds toward projects that restore natural forest conditions, help communities live with wildfire, protect watersheds, conserve wildlife, and enhance the public benefits from trees and forests (Colorado State Forest Service [CSFS] 2020).

As wildfire severity and extent increases, communities need a plan to help prepare for, reduce the risk of, and adapt to wildland fire events. Community wildfire protection plans (CWPPs) help accomplish these goals. A CWPP provides recommendations that are intended to reduce, but not eliminate, the extreme severity or risk of wildland fire.

The development of the CWPP is rooted in meaningful collaboration among many stakeholders, including members of the public and local, state, and federal officials. The planning process involves looking at past fires and treatment accomplishments using the knowledge and expertise of the professional fire managers who work for the various agencies and governing entities in the Planning Area. From there, the CWPP ultimately identifies the current local wildfire risks and needs that occur in the Planning Area, which is further supported with relevant science and literature from the western region of the United States.

In addition, this document, the 2023 Mountain View FPD CWPP, identifies priority areas where mitigation measures are needed to protect from wildfire the irreplaceable life, property, and critical infrastructure in the Planning Area. However, this CWPP does not attempt to mandate the type and priority for treatment projects that will be carried out by the land management agencies and private landowners.

The responsibility for implementing wildfire mitigation treatments lies at the discretion of the landowner; the 2023 Mountain View FPD CWPP will only identify potential treatments and a suggested priority for these projects.

GOAL OF A COMMUNITY WILDFIRE PROTECTION PLAN

The goal of a CWPP is to enable local communities to improve their wildfire-mitigation capacity, while working with government agencies to identify high fire risk areas and prioritize areas for mitigation, fire suppression, and emergency preparedness. Another goal of the CWPP is to enhance public awareness by helping residents better understand the natural and human-caused risk of wildland fires that threaten lives, safety, and the local economy. The minimum requirements for a CWPP, as stated in the Healthy Forests Restoration Act of 2003 (HFRA), are the following:

Collaboration: Municipalities in consultation with federal agencies or other interested groups, must collaboratively develop a CWPP (SAF 2004).

Prioritized Fuel Reduction: A CWPP must identify and prioritize areas for hazardous fuels reduction and treatments and recommend the types and methods of treatment that will protect one or more communities at risk (CARs) and their essential infrastructures (SAF 2004).

Treatments of Structural Ignitability: A CWPP must recommend measures that local governments, property owners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan (SAF 2004).

It is the intent of this 2023 Mountain View FPD CWPP to provide a summation of the wildfire risk and protection needs and to support the district in planning and implementing the necessary mitigation measures. Additional information on the planning process is available in Appendix A.

ALIGNMENT WITH COHESIVE STRATEGY

The 2023 CWPP is aligned with the Cohesive Strategy and its Phase III Western Regional Action Plan by adhering to the nationwide goal “to safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and collectively, live with wildland fire.” (Forests and Rangelands 2014:3).

The primary, national goals identified as necessary to achieving the vision are:

- **Resilient Landscapes** – Landscapes, regardless of jurisdictional boundaries are resilient to fire, insect, disease, invasive species and climate change disturbances, in accordance with management objectives.
- **Fire Adapted Communities** – Human populations and infrastructure are as prepared as possible to receive, respond to, and recover from wildland fire.

- **Safe, Effective, Risk-based Wildfire Response** – All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

For more information on the Cohesive Strategy, please visit:

<https://www.forestsandrangelands.gov/documents/strategy/natl-cohesive-wildland-fire-mgmt-strategy-addendum-update-2023.pdf>

Alignment with these Cohesive Strategy goals is described in more detail in Chapter 4, Mitigation Strategies.

In addition to aligning with the Cohesive Strategy, the CWPP also incorporates information on post-fire recovery, the significant hazards of a post-fire environment, and the risk that post-fire effects pose to communities (Figure 1.1)



Figure 1.1. The CWPP incorporates the three primary goals of the Cohesive Strategy with post-fire recovery to serve as holistic plan for fire prevention and resilience.

ALIGNMENT WITH PLANS AND AGREEMENTS

This CWPP is aligned with multiple local, state, and federal planning documents. These documents or agreements are summarized in Appendix A. In addition, fire policy and legislative direction is also summarized in Appendix A.

PLANNING AND REGULATORY BACKGROUND

Detailed information regarding planning and regulatory background and land management strategies can be found in Appendix A, Planning and Policy Background.

CORE TEAM

Mountain View FPD personnel invited engagement from government agencies and other stakeholder groups in the development of this 2023 CWPP, forming the “Core Team.” Stakeholder involvement is critical in producing a meaningful document that includes all collaborators’ diverse perspectives. The Core Team drives the planning process through decision making, data sharing, experience, and communication with community members. The project was kicked off on March 10, 2023; the Core Team met for the first time on March 24, 2023, and convened again on June 15, 2023, and October 20, 2023.

The Core Team List is provided in Appendix J.

PLANNING AREA

The Planning Area includes the entirety of the Mountain View FPD as delineated by its geographic and political boundaries (Figure 1.2).

Mountain View FPD encompasses approximately 220 square miles across Colorado’s Boulder, Jefferson, Weld, and Broomfield Counties. The Planning Area comprises urban and rural landscapes, foothills, and valleys, and provides access to many seasonal recreation opportunities due to its proximity to the Rocky Mountain region. While much of the district covers entirely developed landscape, there are large portions of the Planning Area that fall within the wildland-urban interface (WUI) and grassland-urban interface (GUI), or the area where the wildland and/or grassland meet human development. Additional Information is provided in Appendix B, Community Background and Resources.

LAND OWNERSHIP

Land ownership in Mountain View FPD is diverse, with lands within the district being owned and managed by both private entities and an assortment of government agencies (Figure 1.3). Most land within the Mountain View FPD, approximately 61%, is privately owned. Of the lands owned and managed by governmental bodies, approximately 3% is managed by the U.S. Fish and Wildlife Service’s (USFWS’s) Rocky Flats National Wildlife Refuge; less than 1% (approximately 0.5%) of the land within the district is managed by the U.S. Forest Service (USFS); less than 1% (approximately 0.06%) is managed by the Bureau of Land Management’s (BLM’s) Royal Gorge Field Office; less than 1% (approximately 0.5%) is managed by the State of Colorado, and 34% is managed by local agencies. An additional 1% of land within the Mountain View FPD is owned and managed by other entities than those mentioned above.

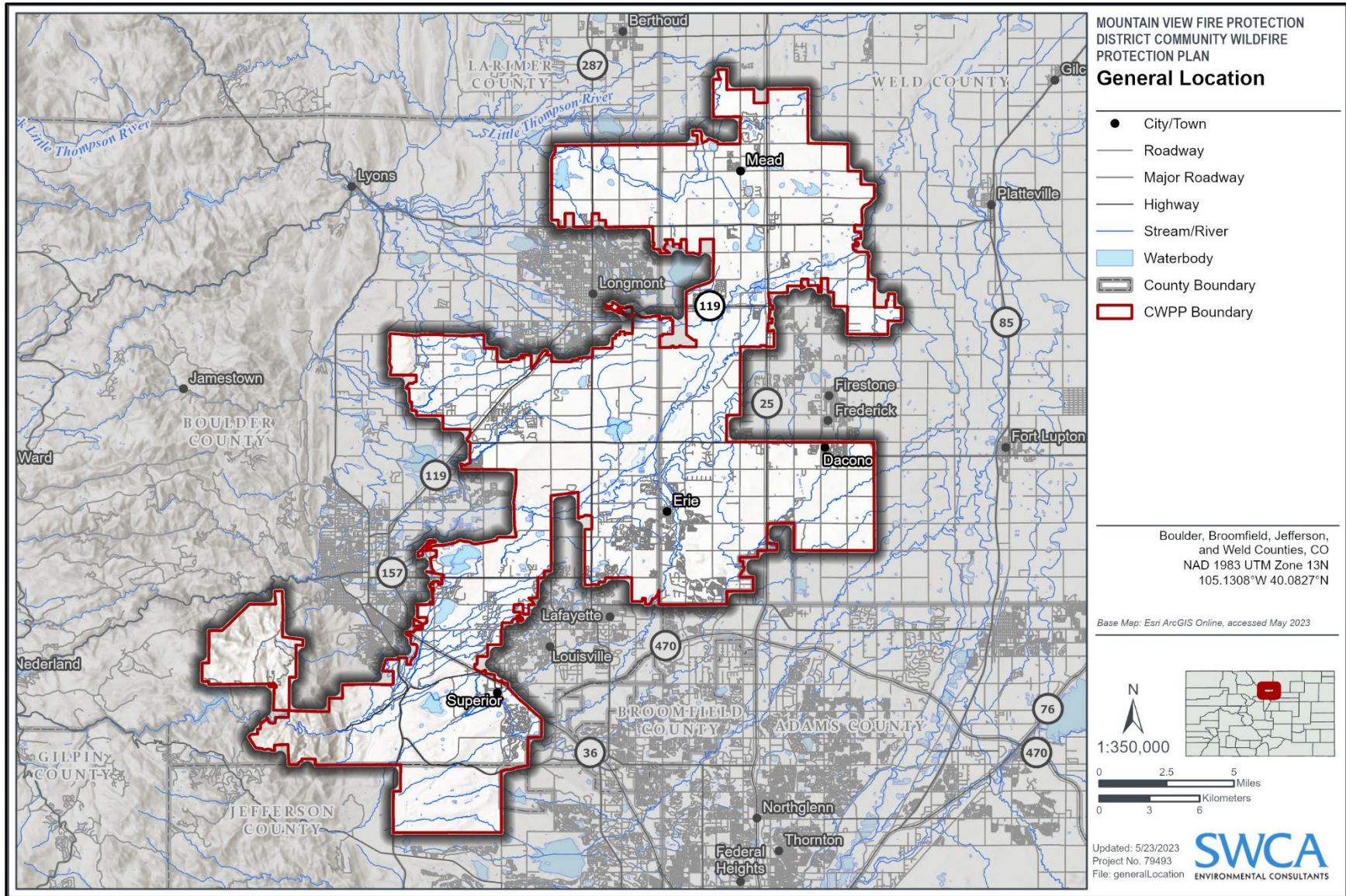


Figure 1.2. Mountain View FPD general location.

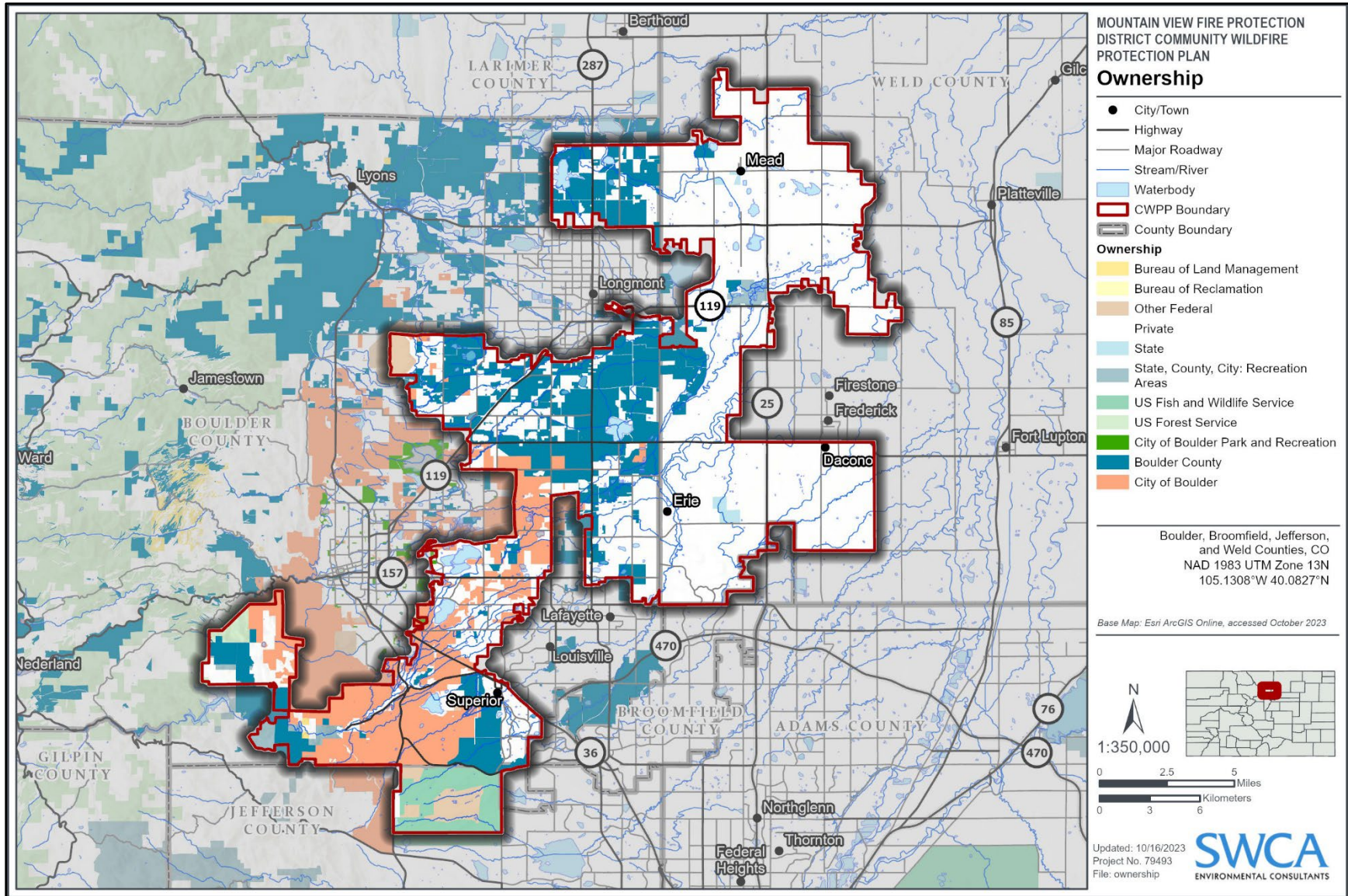


Figure 1.3. Mountain View FPD land ownership.

Additional details regarding land in the Mountain View FPD, such as topography and land management direction, are summarized in Appendix B.

PUBLIC INVOLVEMENT

A key element in the CWPP process is the meaningful discussions it generates among community members regarding their priorities for local fire protection and forest management (SAF 2004). The draft CWPP was made available for public review from October 30, 2023, through November 13, 2023. In addition to the CWPP report, Mountain View FPD developed a [hub site](#) and CWPP story map (online content) to provide opportunities for information sharing and gathering. The story map and draft were announced through several different media outlets for review (Appendix G). The story map can be viewed here: [Mountain View FPD Story Map](#).

The CWPP Core Team worked to include a broad cross section of the community in the outreach process, and different communication channels were used to engage as many members of the public as possible (e.g., community survey, in-person open house engagement events, a public review period for the draft CWPP). Community members were welcomed and encouraged to participate in activities and were provided multiple opportunities to provide both virtual and in-person input. Community feedback from the various public outreach venues was incorporated into the final CWPP as applicable. Additional information regarding public involvement and outreach can be found in Appendix G.

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WILDLAND-URBAN INTERFACE

The WUI is defined by areas where human habitation and development meet or intermix with wildland fuels (U.S. Department of the Interior and U.S. Department of Agriculture [USDA] 2001:752–753). Intermix areas are those areas where structures and other human developments meet or intermingle with wildland vegetation. Also important for consideration within Mountain View FPD is the grassland-urban interface (GUI). Similar to the WUI, the GUI refers to the areas where grass and shrub wildland fuels directly interface and intermix with urbanized or developed areas. Addressing the GUI is a crucial factor in mitigating the wildfire threat throughout Mountain View FPD due to the presence of expansive grasslands in the Planning Area. The WUI/GUI creates an environment in which fire can move quickly between structural and vegetative fuels, increasing the potential for wildland fire ignitions to become out of control. As human development into areas of wildland fuels has progressed in the last 20 years, GUI has become increasingly prevalent throughout the Mountain View FPD (Figures 2.1 and 2.2), which has strained wildland fire management resources.

The expansion of the WUI/GUI into areas with high fire risk, combined with the collective effects of aggressive suppression policies, resource management practices, land use patterns, climate change, and insect and disease infestations, has created an urgent need to modify fire management practices and policies and to understand and manage fire risk effectively in the WUI/GUI (Pyne 2001; Stephens and Ruth 2005). The WUI/GUI is an area where wildfire hazards pose a risk to HVRAs. Therefore, fuel treatments should be prioritized to provide additional protection to the community from potential wildfire occurring within, or spreading to, the WUI/GUI. Mitigation techniques for fuels and fire management can be strategically planned and implemented in WUI/GUI areas (e.g., with the development of defensible space around homes and structures).

A CWPP offers the opportunity for collaboration of land managers to establish a definition and a boundary for the local WUI/GUI; to better understand the unique resources, fuels, topography, and climatic and structural characteristics of the area; and to prioritize and plan fuels treatments to mitigate for fire risks. At least 50% of all funds appropriated for projects under the HFRA must be used within the WUI/GUI.

According to the HFRA, the WUI/GUI can be defined by a CWPP. In this CWPP, the WUI/GUI was derived from several collaboratively created data layers provided by the Colorado All Lands (COAL) Risk Assessment, as described below.

The Mountain View FPD CWPP WUI/GUI map was developed by SWCA under the guidance of the Mountain View FPD and project Core Team and using COAL's Burn Probability Layer overlaid with spatial housing density and fuels data. All but the lowest landscape burn probability areas were considered, defining the wildland fuel and fire potential component of WUI/GUI. This burn probability layer was then clipped to only those areas where developments and structures existed, to incorporate the urban component. Finally, the data were manually adjusted to remove dense interior urban developments, far from wildland fuels, that do not meet the interface or intermix definition. With the main components of the WUI/GUI mapped, these data were further categorized into WUI or GUI, the latter being delineated based on grass and grass-shrub fuels from the fuels layer.

It is important to note that the WUI/GUI boundaries established for this CWPP were developed using landscape burn probabilities that incorporated empirical weather data collected from remote automated weather stations (RAWS) across the state of Colorado. The areas within Mountain View FPD that have not been identified as WUI/GUI either have no fuels, few structures, or have a presence of burnable fuels that are not a direct threat to structures under typical fire season weather conditions. While these areas have not been delineated as WUI/GUI for the purposes of this plan, they can still potentially impact developed areas under extreme weather conditions.

Extreme weather events may increase the distance at which burning wildland fuels can impact structures (e.g., drought, high wind, extreme heat). Alternatively, other scenarios, such as snowstorms, may lead to a decrease or even elimination of the WUI/GUI entirely by making fire impossible to spread. The impact of extreme weather events is exemplified by the Marshall Fire, a wildfire that was preceded by dry conditions and coincided with high winds measuring over 100 miles per hour. It was then followed by snowfall that ultimately reduced the fuel's ability to contribute to fire spread. For more information on methodology behind developing the WUI/GUI boundary, please see Appendix C.

The WUI and GUI are shown categorized based on fuel type in Figure 2.1. The WUI and GUI combined into one layer can be viewed in Figure 2.2.

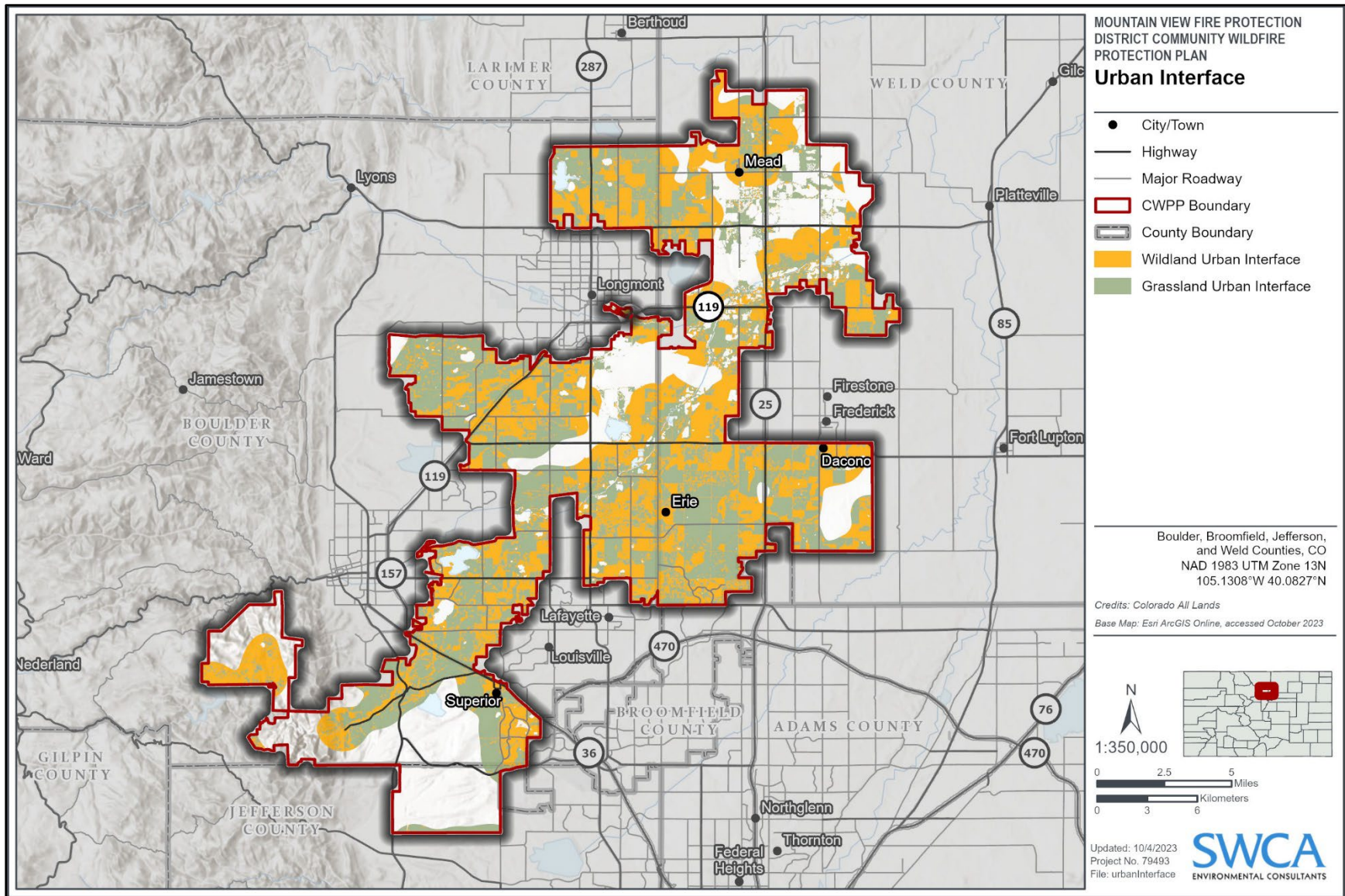


Figure 2.1. Mountain View FPD WUI and GUI map.

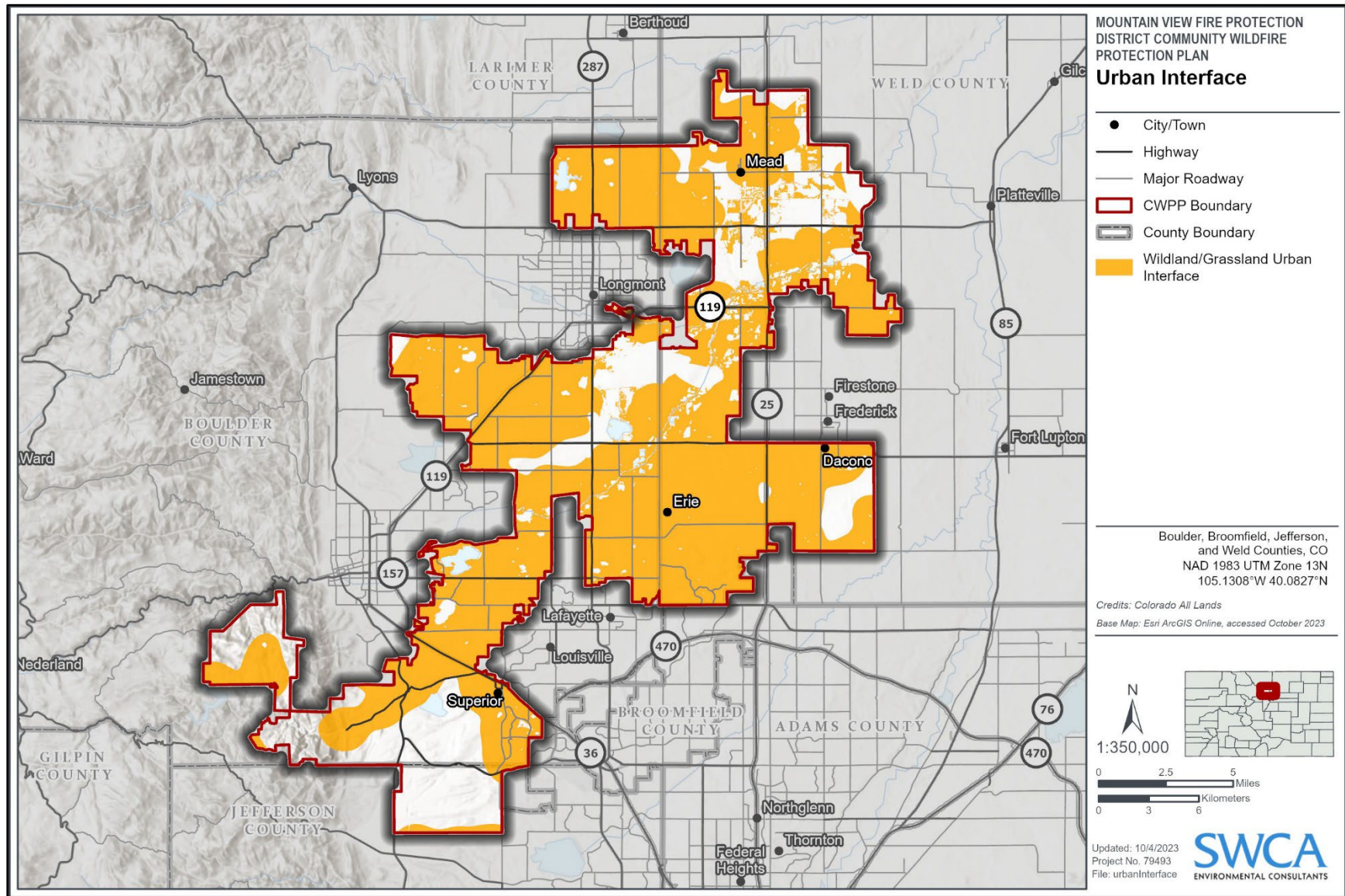


Figure 2.2. Mountain View FPD combined WUI and GUI map.

WILDLAND-URBAN INTERFACE LAND USE

Cities and counties are continuously challenged to accommodate both current and future residents in need of safe and affordable housing. Between 2010 and 2020, Colorado's population increased by nearly 745,000 people, while the development of new housing has not increased at the rate needed to meet this demand (U.S. Census Bureau 2020). Over the past few decades, jurisdictions across the state have approved numerous new housing units, many of which are within or near wildland areas to accommodate the public's desire to be adjacent to open space land. Such housing units result in WUI/GUI conditions, and today, more than 46 million residences in 70,000 communities across the United States are at risk for WUI/GUI fires (U.S. Fire Administration [USFA] 2021a). When it comes to wildfire, this trend is of special concern since WUI/GUI conditions are linked with an increased risk of loss of human life, property, natural resources, and economic assets.



Figure 2.3. Example of the WUI in Mountain View FPD.



Figure 2.4. Example of the GUI in the Mountain View FPD.

VEGETATION AND LAND COVER

Vegetation zones within the Planning Area are primarily a function of elevation, slope, aspect, substrate, associated climatic regimes, and land use. Since a broad range in elevation and topography exists across the Planning Area, characteristics in vegetative communities are variable (Figures 2.5 and 2.6). It should be noted that Figure 2.5 includes data prior to 2021 and does not illustrate the impacts that the 2021 Marshall Fire had on vegetative communities in the southern portion of the of the district.

Dominant vegetation types within the Planning Area are described based on a large spatial scale and represent the overall vegetation community structure, which plays a general role in fire occurrence and behavior. Although the vegetation types are outlined for the Planning Area, site-specific evaluations of the vegetative composition and structure in each area of focus should be taken into consideration when planning fuels treatments.

According to the Southwest Regional Gap Analysis Project (SWReGAP) (2023), the dominant vegetation types in the Planning Area are Agriculture, Invasive Perennial Grasslands, Developed Open Space, and Rocky Mountain Ponderosa Pine Woodlands.

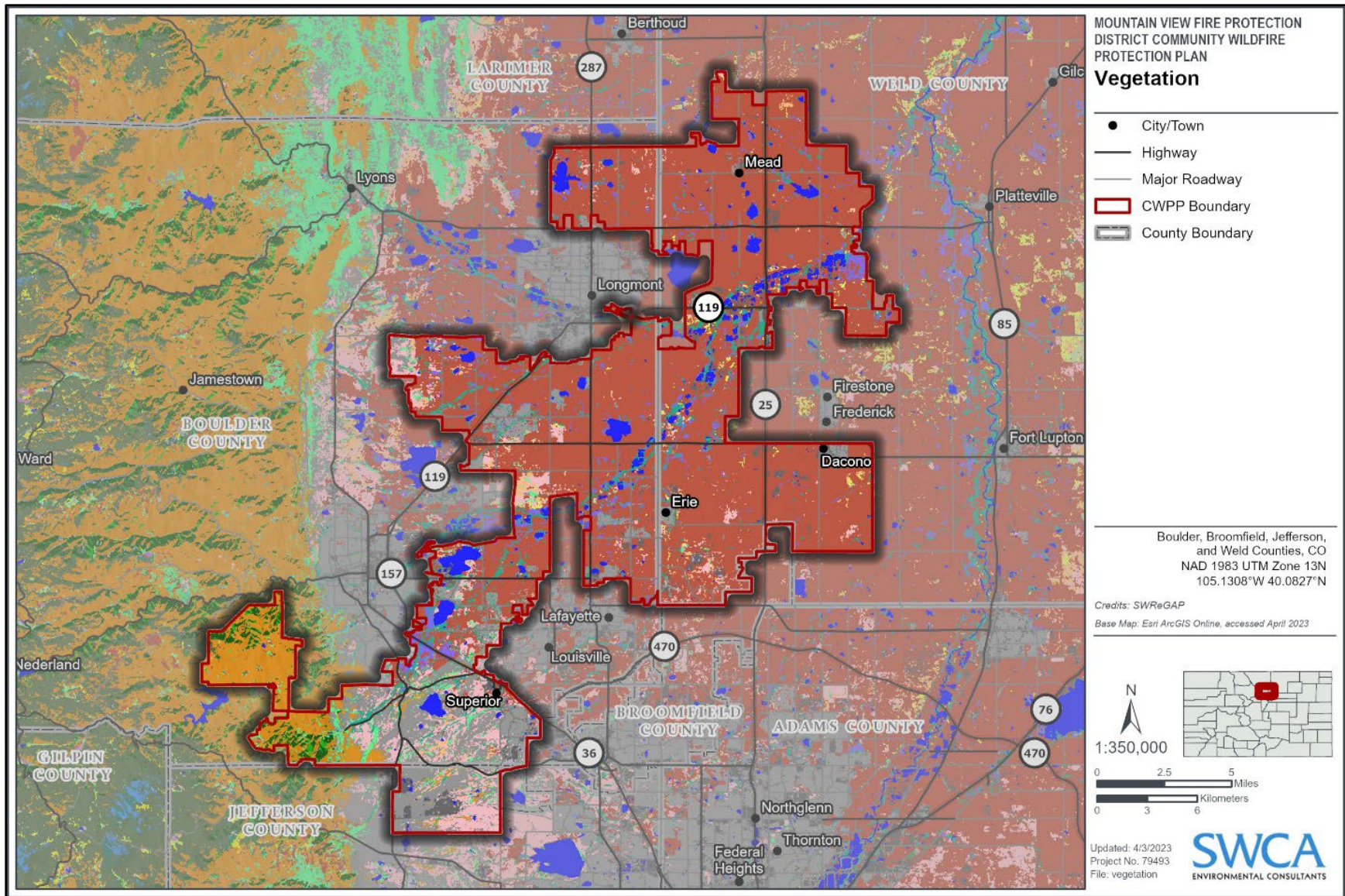


Figure 2.5. Estimated vegetation types in the Planning Area.



Figure 2.6. Legend for the estimated vegetation types in the Planning Area.

FUELS AND TOPOGRAPHY

Fuels in Mountain View FPD were estimated using the updated Scott and Burgan (2005) 40 fuels model (Table 2.1). Most of the district is composed predominantly of grass (GR), non-burnable (NB), and agricultural (AG) fuels. The grass fuels are typically associated with the ranches and farmlands occurring through the topographically flat areas of the district, though they also occur sparsely in more sloped areas. Exhibiting a highly varied topography, the western portions of the district that encroach upon the Rocky Mountain foothills are occupied by grass shrub (GS) fuels, timber-understory (TU) fuels, timber-litter (TL) fuels, and non-burnable (NB) fuels.

The areas timber and scrub fuels are characterized by rising elevation montane forests, while the non-burnable areas are largely composed of inflammable, rocky surface on hill faces and peaks. Figure 2.7 illustrates the Scott and Burgan 40 fire behavior fuel models throughout Mountain View FPD. Additionally, the probability of extreme fire behavior within the district is quantified in Figure 2.8. These probabilities of extreme fire behavior were calculated using simulated flame lengths under various weather scenarios throughout the Planning Area. It should be noted that Figures 2.7 and 2.8 both include data prior to 2021 and do not illustrate the impacts of the 2021 Marshall Fire.

To learn more about the how the wildfire hazard was measured, please visit:

http://pyrologix.com/reports/COAL_HazardReport.pdf

Additional information on fuels within Mountain View FPD is in Appendix C, Fire Behavior Modeling/GIS Background and Methodology.

Table 2.1. Most Common Fuel Types in Mountain View FPD

Existing Fuel Type	Acres	Percent
GS2 – Grass-shrub, shrubs are 1 to 3 feet high, moderate grass load. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (2.1 tons/acre).	57,693.94	38.55
NB3 – Agricultural field, maintained in non-burnable condition.	31,324.19	20.93
BU1 – Burnable developed areas.	11,083.28	7.41
AG2 – Burnable wheat fields.	10,554.37	7.05
GS1 – Grass-shrub, shrubs are about 1 foot high, low grass load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (1.35 tons/acre).	8,780.56	5.87
GR2 – Grass, moderately coarse continuous grass, average depth about 1 foot. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (1.10 tons/acre).	7,355.51	4.92
NB8 – Open water.	5,465.44	3.65
BU2 – Burnable roads.	3,047.54	2.04
TU1 – Fuel bed is low load of grass and/or shrub with litter. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (1.3 tons/acre).	2,582.13	1.73
TL8 – Long needle litter; long needle fuel. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet).	1,815.07	1.21
TU5 – Fuel bed high load conifer with shrub understory. Spread rate moderate (5–20 chains/hour); flame length moderate (4–8 feet).	1,653.42	1.10

Existing Fuel Type	Acres	Percent
GS1 – Shrubs are about 1-foot high, low grass load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (1.35 tons/acre).	1,492.39	1.00
Other – various fuel types	6,801.49	4.54

Source: Scott and Burgan (2005), Pyrologix (2022b)

EMBER IGNITION HAZARDS

Ember exposure from wildland fires can pose a significant threat to homes and other structures in the WUI (Maranghides and Mell 2013). Spotting occurs when embers travel in advance of the flaming front; long-range spotting can be miles ahead of the main fire. Many factors determine whether an ember will result in an ignition (firebrand source and size, wind, receiving materials, exposure duration, etc.). Burning structures and other materials (vehicles and ornamental vegetation) have been identified as another source of embers that can ignite additional combustible materials in the WUI, particularly when there is a low structure separation distance (Maranghides et al. 2022; Suzuki and Manzello 2021).

Land managers and homeowners should take note of vegetation, landscape, and atmospheric conditions that are conducive to firebrand production and travel distance as these directly influence spotting fire behavior. Strategic landscape fuel reduction activities such as fuel breaks and thinning can help reduce the likelihood of firebrand production and spotting. Homeowners should note surrounding tree species and implement home hardening practices, such as installing vent covers, regularly clearing gutters, and sweeping leaf litter from decks and foundation, to reduce structural ignitions from ember wash. Programs to aid landowners in preventative efforts and cases of wildfire are provided in Appendix G, Homeowner Resources.

For a map of ember load index accompanied by more detailed information and explanations on ember ignition hazards, see Appendix B.

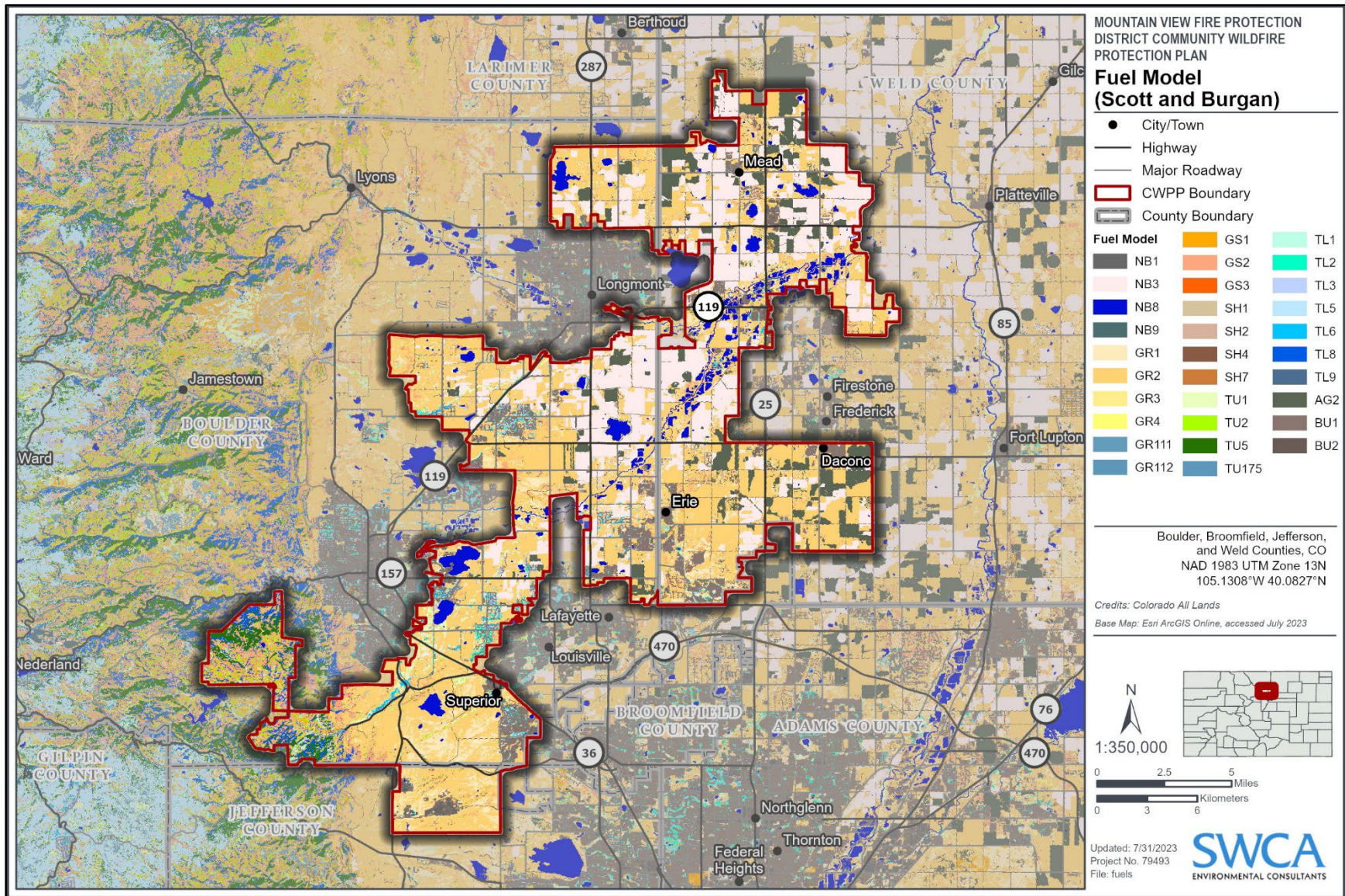


Figure 2.7. Scott and Burgan 40 fire behavior fuel models within Mountain View FPD.

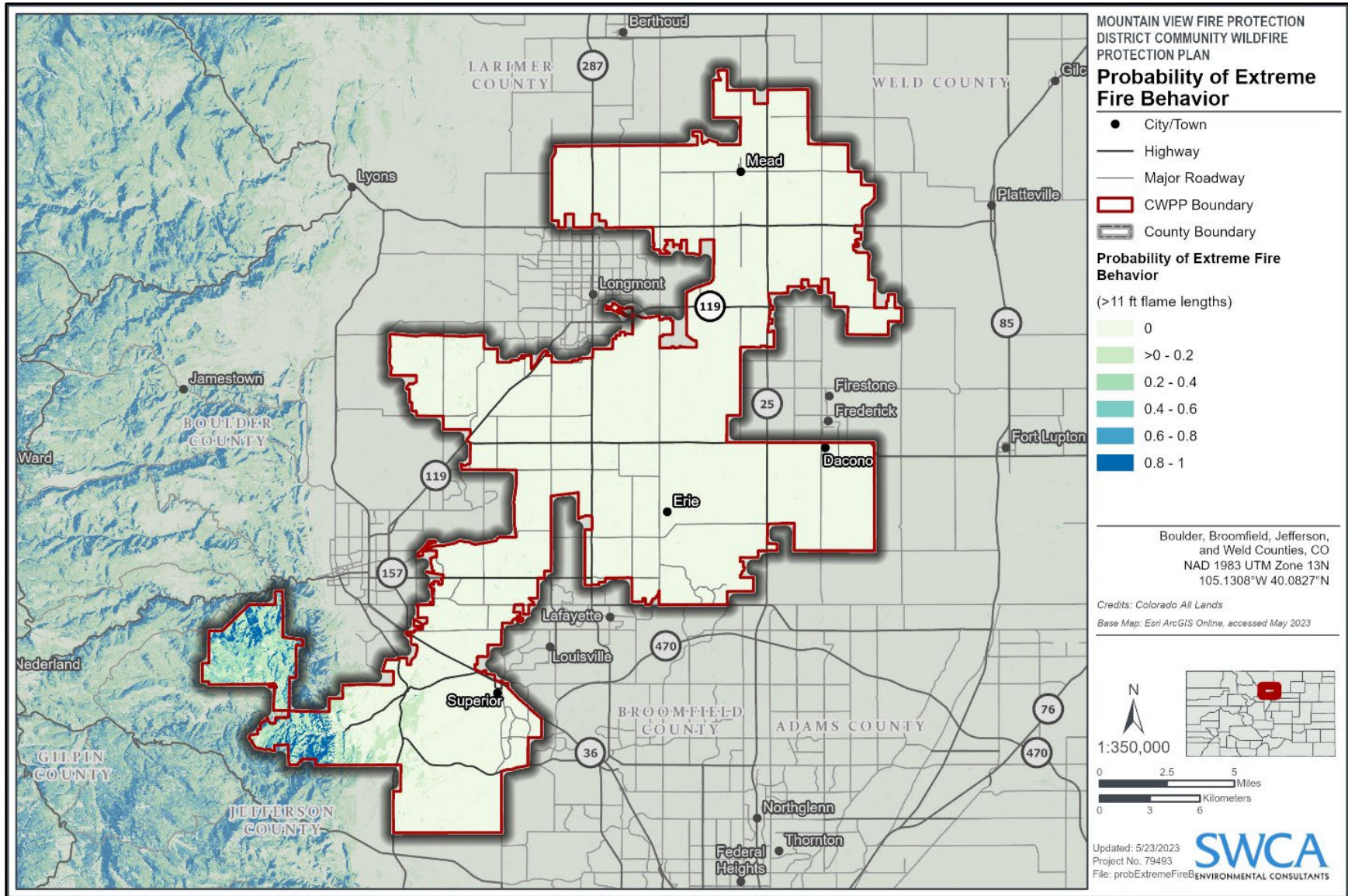


Figure 2.8. Probability of extreme fire behavior within Mountain View FPD.

FIRE ECOLOGY

Fires are characterized by their intensity, the frequency with which they occur, the season in which they occur, their spatial pattern or extent, and their type. Combined, these attributes describe the fire regime.

In order to classify, prioritize, and plan for fuels treatments across a fire management region, methods have been developed to stratify the landscape based on physiographic and ecological characteristics.

The Planning Area vegetation types (see Figure 2.5) have their own unique fire regimes and ecology and have played an important role in shaping the ecology of the Planning Area. Agricultural land cover is the dominant vegetation cover in the Planning Area. Other common vegetation types include Invasive Perennial Grasslands, Developed Open Space, and Rocky Mountain Ponderosa Pine Woodlands (SWReGAP 2023).

Due to major changes in land use and fire suppression due to human development, most of the Planning Area has departed significantly from its natural vegetation ecology and fire regimes. Historically, much of the Planning Areas would have reflected high plains short-grass prairie vegetation and fire ecology. Dominant species would likely have been primarily composed of blue gramma (*Bouteloua gracilis*) and buffalo grass (*Bouteloua dactyloides*) (Chapman et al. 2006). Historically, fire regimes in these grasslands would be short-interval (typically less than 20 years) stand replacement events that could vary in size due topography weather effects (Zouhar 2021). The size of the fire in these grasslands would vary substantially. Large, extensive wildfires would typically occur during dry years following a fuel build up during antecedent wetter growing seasons (NatureServe 2023). Fire suppression in the Planning Area and changes in land use have increased the fire return interval and have likely limited the potential size of future wildfires compared to historic conditions (NatureServe 2023).

Agricultural areas are widespread throughout the majority of the Planning Area and are typically not subject to natural fire regimes (note: fires can and do occur on farmlands, especially during hot and dry conditions [Western Farm Press 2017]). The other common vegetation type in the Planning Area is Invasive Perennial Grassland. Here, species such as smooth brome (*Bromus inermis*) and crested wheatgrass (*Agropyron cristatum*) are the dominant species (SWReGAP 2023). Smooth brome has altered what was traditionally a prairie dominated by shortgrass bunch grasses into a prairie composed primarily of rhizomatous and continuous grass cover from one species. Extensive grass cover from a rhizomatous species, such as smooth brome, can result in above normal fine dead fuels, which are more likely to carry fire and result in faster rates of spread than traditional shortgrass prairie (Colorado Division of Fire Prevention and Control [DFPC] 2022a). The Marshall Fire of January 2022 predominately burned in the Invasive Perennial Grasslands vegetation type. For the Marshall Fire, preceding years in this vegetation were productive, which resulted in above normal fuel loading (DFPC 2022a).

The far western part of the Planning Area occurs in the Rocky Mountain Front Range foothills and is dominated by Rocky Mountain Ponderosa Pine Woodlands (SWReGAP 2023). Fire regimes in these woodlands can vary from low-severity to mixed-severity events. Studies conducted along the Front Range estimated that most ponderosa pine woodlands have mixed-severity events with variable return frequencies that are typically greater than 30 years (McKinney 2019). Low-severity and more frequent (less than 30 years) fire events typically occur in the lower elevations where the ponderosa pine woodlands border more fire-prone grasslands (McKinney 2019).

CLIMATE AND WEATHER PATTERNS

With the exception of the far western edge, most of the Planning Area has a relatively uniform topography and a similar climate. Thus, there is little to moderate variation in average climate and weather patterns for most of the Planning Area. Weather station data for the nearby cities of Boulder and Longmont demonstrate this (National Oceanic and Atmospheric Administration [NOAA] 2023) (Table 2.2).

Table 2.2. Mean Annual Temperature and Precipitation for Stations in Close Proximity to the Planning Area

Station	Period of Record	Mean Annual Precipitation (Inches)	Mean Annual Temperature (°F)		
			Max	Min	Mean Annual
Boulder	1991–2020	21.2	65.7	37.3	51.5
Longmont	1991–2020	15.2	65.9	34.0	50.0

Source: NOAA (2023)

July is typically the hottest month of the year in the Planning Area, with average July maximum temperatures ranging from 88.0°F in in the western portion of the Planning Area to 90.8°F in the eastern portion. December and January are usually the coldest months of the year, with the western portion of the Planning Area experiencing warmer temperatures around 21°F and the eastern portion experiencing colder temperatures around 14.5°F. Figures 2.9 and 2.10 depict climate averages within the cities of Boulder and Longmont.

Mean annual precipitation varies moderately between the western and eastern portion of the Planning Area, with the western portion typically receiving 6 additional inches of precipitation per year than the eastern portion of the Planning Area. The western portion of the Planning Area receives the majority of its precipitation during April and May, while the eastern portion receives most of its precipitation from April through August. Years where late summer precipitation is well below average and dry years preceded by very wet, productive conditions create some of the most hazardous conditions in grassland dominated areas. The winter months of December and January are typically the driest months of the year. Particularly dry winters combined with strong, gusty winds can greatly increase the risk of wildfire spread during the winter months, as was seen with the Marshall Fire (DFPC 2022).

Monthly climate normals (30-year averages) are graphed by weather stations below (Figures 2.9–2.10).

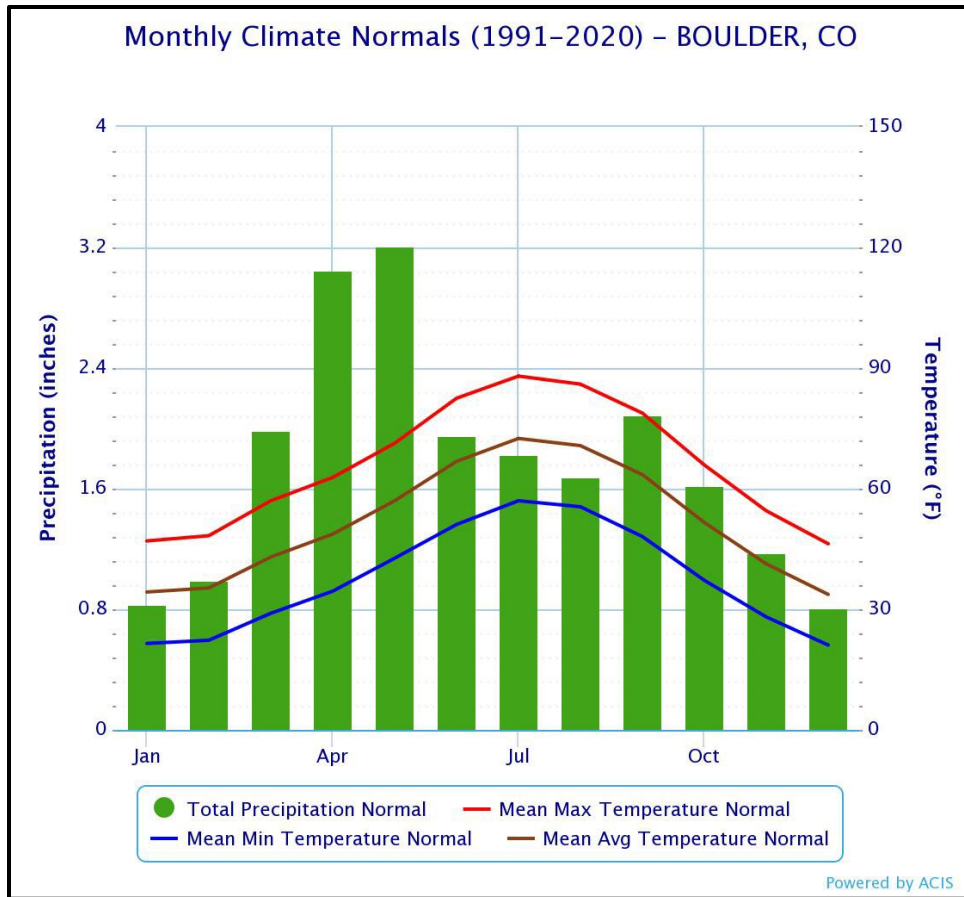


Figure 2.9. Monthly climate averages for the city of Boulder, Colorado, 1991–2020 (source: NOAA 2023).

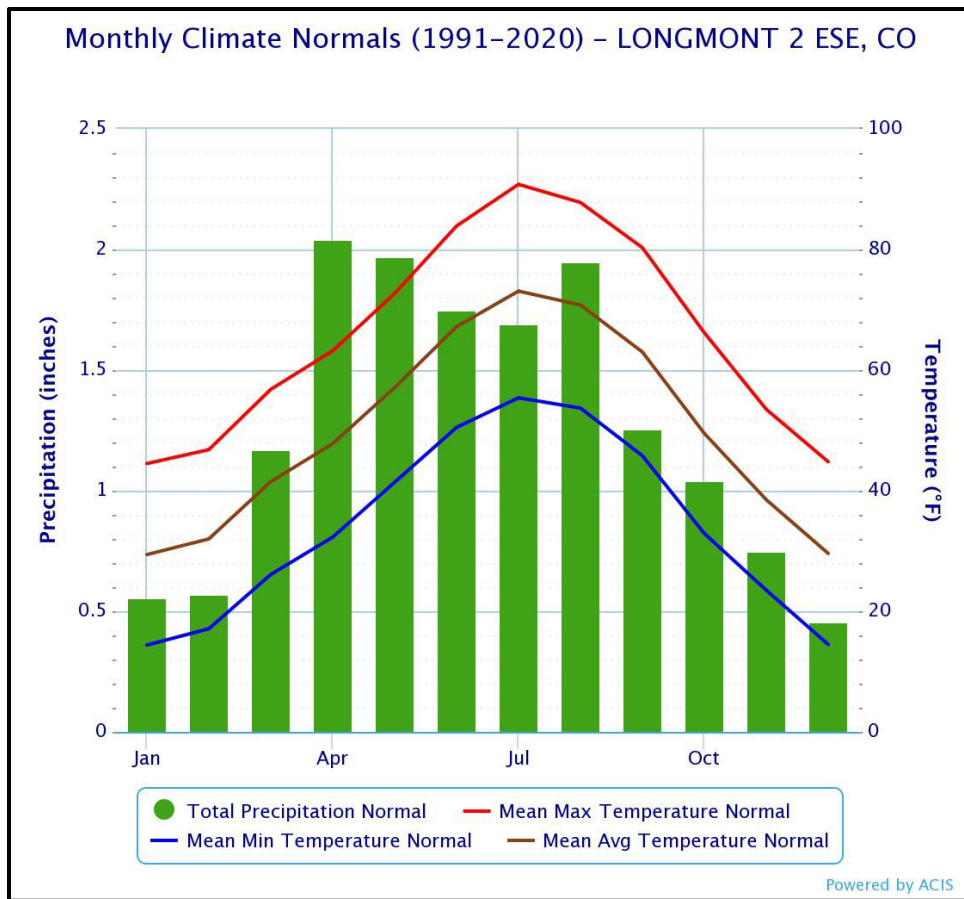


Figure 2.10. Monthly climate averages for the city of Longmont, Colorado, 1991–2020 (source: NOAA 2023).

It should be noted that, with climate change, Colorado is expected to experience significant changes in weather, which will likely exacerbate future fire behavior. Under all climate change scenarios, Colorado is expected to have increased summer temperatures and lengthening of the fire season. Precipitation totals are less likely to change, but the timing and duration of precipitation events will be more variable (Colorado Water Conservation Board 2023). Overall, the warmer temperatures will bring about drier weather in the Planning Area, which will exacerbate the fire risk.

WIND

In addition to temperature and precipitation, wind is an extremely important factor in fire behavior. Wind is notoriously difficult to predict and is a product of several factors including topography, orography, atmospheric pressure, convective energy, and the Earth’s rotation. High winds can dramatically increase fire intensity and spread as shown by the 2021 Marshall Fire and 2023 Lahaina Fire. It is important to be aware of prevailing wind directions and note the time of day and year when gusty conditions are most likely. In the Mountain View FPD, winds generally prevail from the north to northeast during the colder months; southwestern winds are more common in the spring and summer months. Very strong and sustained foehn winds can erupt in the western portion of the district as a result of cold air descending rapidly from the Rocky Mountains. Figures 2.10, 2.11, and 2.12 display wind data for the Mountain View FPD sourced from the Global Wind Atlas (2023).

Every notable fire in the Boulder area since 1989 has been caused or fueled by high winds. These include the Calwood and Lefthand Canyon Fires (Boulder County 2023e), Cold Spring Fire, Fourmile Canyon Fire, Overland Fire, Olde Stage Road Fire, and Black Tiger Fire. In the cases of the Marshall, Olde Stage Road, and Overland Fires, high winds were responsible for knocking over power lines, which ultimately ignited the wildfires (5280fire 2009; Boulder County 2023e; Wildfire Today 2016).

Wind data, as shown in Figures 2.11 through 2.13, and wind speeds recorded during past fires provide evidence to suggest that the most dangerous and destructive fires in the Planning Area are fast-moving, wind-driven fires that travel from forested regions in the west to grasslands in the east (5280fire 2009; Wildfire Today 2016).

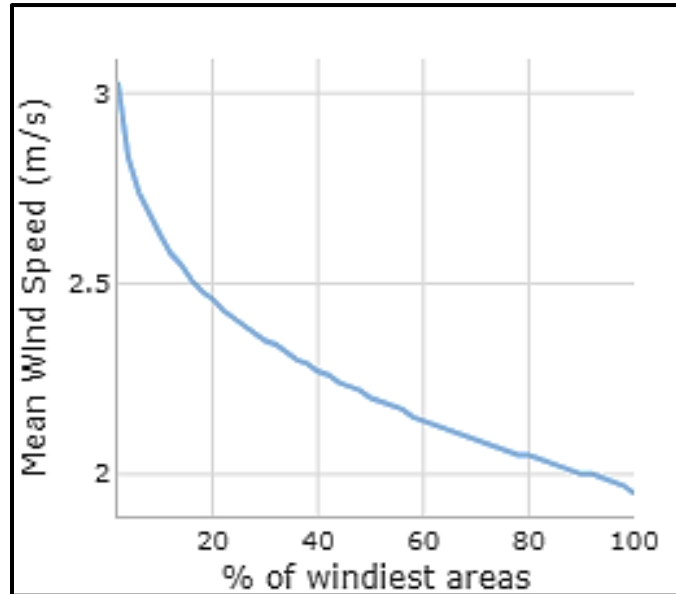


Figure 2.11. Mean wind speed (in meters per second) for different percentiles of windy areas within the Mountain View FPD. The average wind speed in the windiest areas of the district is about 3 m/s, while the average windspeed for most of the FPD is about 2 m/s (source: Global Wind Atlas 2023).

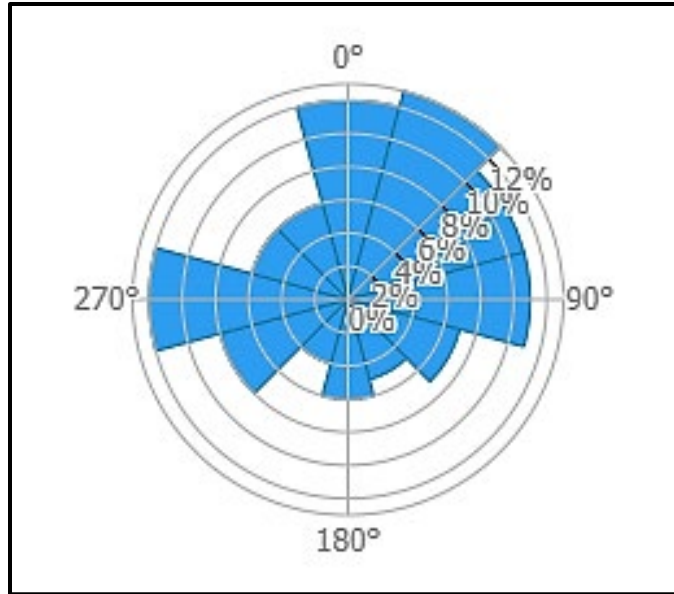


Figure 2.12. Wind frequency rose showing the prevailing wind direction as an average percentage of daily wind direction. 12.5% of the wind blowing on the Mountain View FPD comes from 270° West (source: Global Wind Atlas 2023).

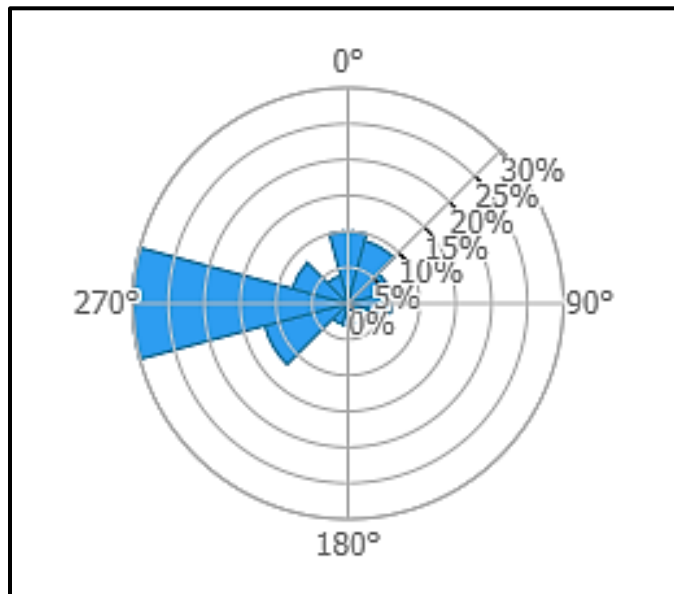


Figure 2.13. Wind speed rose showing the direction from which different percentages of wind speed prevail. 30% of the total wind speed experienced by the Mountain View FPD prevails from 270° West (source: Global Wind Atlas 2023).

FIRE HISTORY

Fire is a natural part of Colorado's diverse landscapes and is essential to many ecosystems across the state. Almost all of Colorado's diverse ecosystems are fire-dependent or fire-adapted. For centuries, many Colorado Native American tribes recognized this interdependence between fire and the ecosystem and used prescribed burning to maintain and restore ecosystem health. However, in the 1800s, a shift in management actions—settlers began enforcing strict fire suppression regimes—led to challenges such as dense stand conditions, unhealthy rangelands, and increased ecosystem and community vulnerability to fire. Evidence suggests that the fire exclusion can lead to increased fire intensity, severity, and size as well as an increased likelihood of disease epidemic and severe watershed impacts. Furthermore, other actions such as human expansion into wildlands, climate change, and forest health degradation have likely resulted in an imbalance between wildfire and ecosystem interactions (Higuera et al. 2021).

PAST FIRE MANAGEMENT POLICIES AND LAND MANAGEMENT ACTIONS

Fire management in Colorado and the western United States has evolved based on advancing knowledge of forest ecosystems. After massive fires in 1910, federal fire suppression policies were established to protect ecosystem services and timber stands (USFS 2017). The National Park Service (NPS) and BLM adopted similar approaches. In the 1970s, research highlighted the natural role of wildfires (USFS 2017). By the turn of the century, complete fire suppression tactics on public land shifted to a combination of suppression, containment, and mitigation measures like fuel treatments and prescribed burning (Forests and Rangelands 2021). These adaptive strategies balance fire risk reduction with ecosystem health. The Mountain View FPD has embraced updated fire management practices and adheres to the policy guidelines of the various jurisdictions within its service area.

RECENT FIRE OCCURRENCE

The most recent, largest, and most destructive wildfire to occur in the Mountain View FPD was the Marshall Fire, which resulted in 6,026 acres burned and over 1,000 homes and commercial structures destroyed or damaged (Boulder County 2023a). On December 30, 2021, the Marshall Fire ignited near the intersection of Colorado State Highway 93 and Eldorado Springs Drive and comprised two separate fires that later merged (Boulder County 2023b, 2023c). Extremely high winds and cured dry winter grass fuels contributed to rapid spread and long flame lengths. The National Renewable Energy laboratory recorded 111 separate wind gusts exceeding 75 mph on December 30, 2021 (Boulder County 2023c). Under these conditions, wildfire suppression was extremely difficult, and evacuations became a priority.

Colorado's fire season has been estimated to occur between mid-May and mid-October (Wei et al. 2017). However, as the Marshall Fire shows, fires can occur at any time of the year when continuous burnable fuel is present. Recent examples include the Marshall Fire and NCAR Fire, which started near the ignition zone of the Marshall Fire on March 26, 2022, and burned 196 areas, prompting the evacuation of 19,000 people (Gabbert 2022).

Figures 2.14 through 2.19 display historical wildfire data and statistics in the district. The data illustrated within these figures have been derived from point data sourced from Mountain View FPD, National Interagency Fire Center (NIFC), and Colorado Forest Atlas.

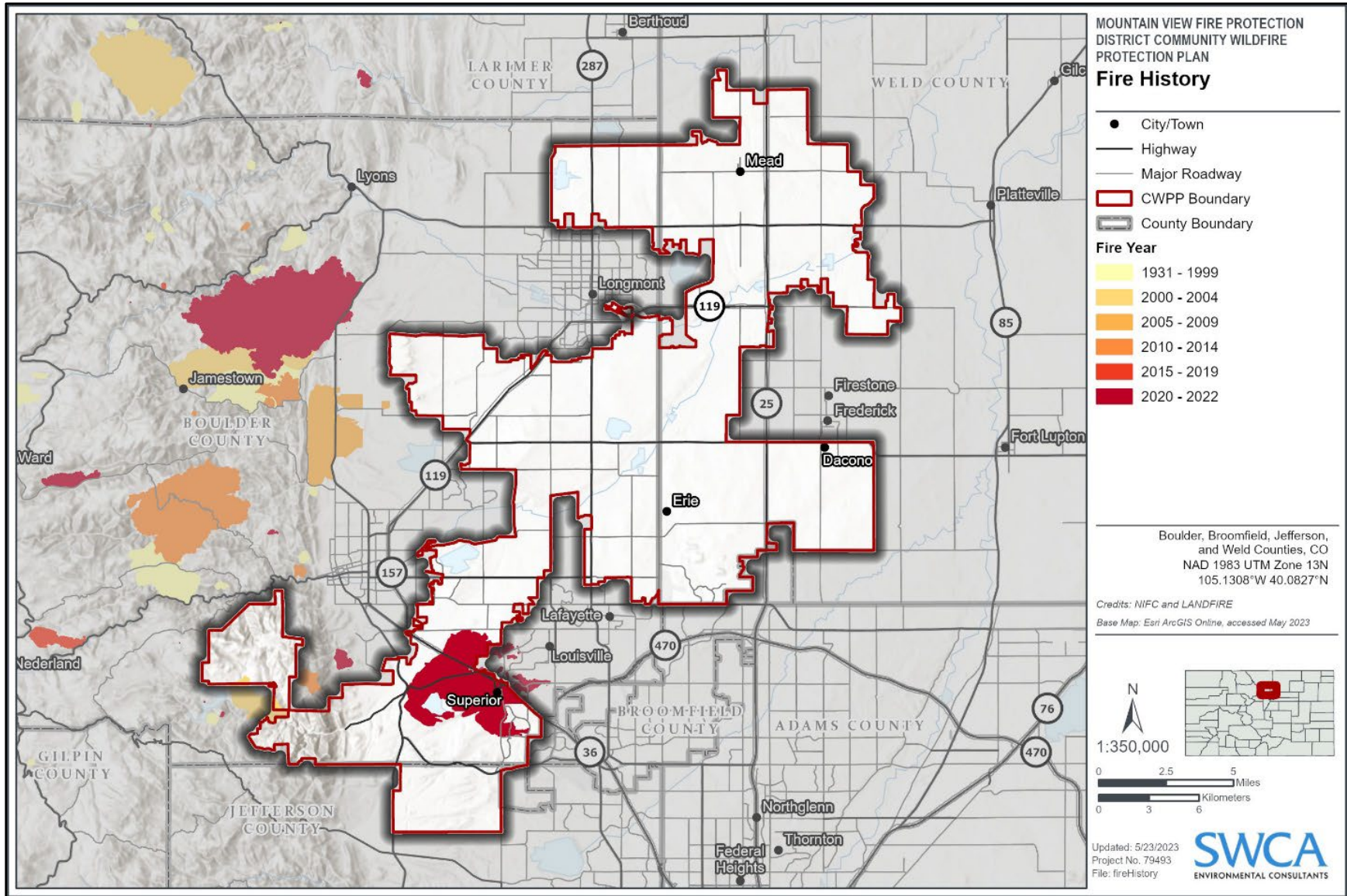


Figure 2.14. Recent wildfire history in the Mountain View FPD.

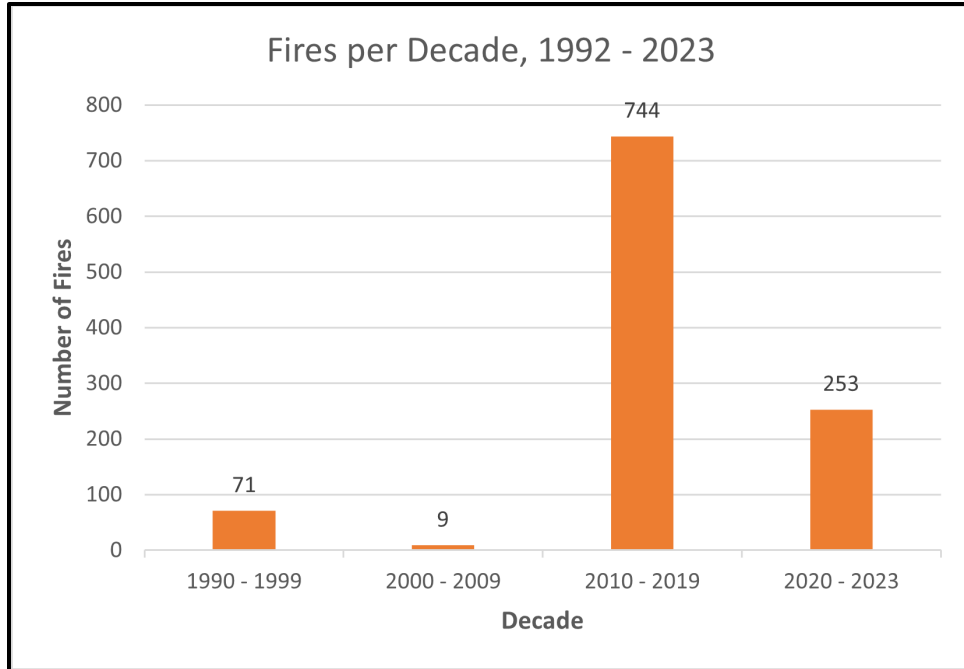


Figure 2.15. Decadal wildfire frequency for Mountain View FPD based on available data from 1992 through 2023.

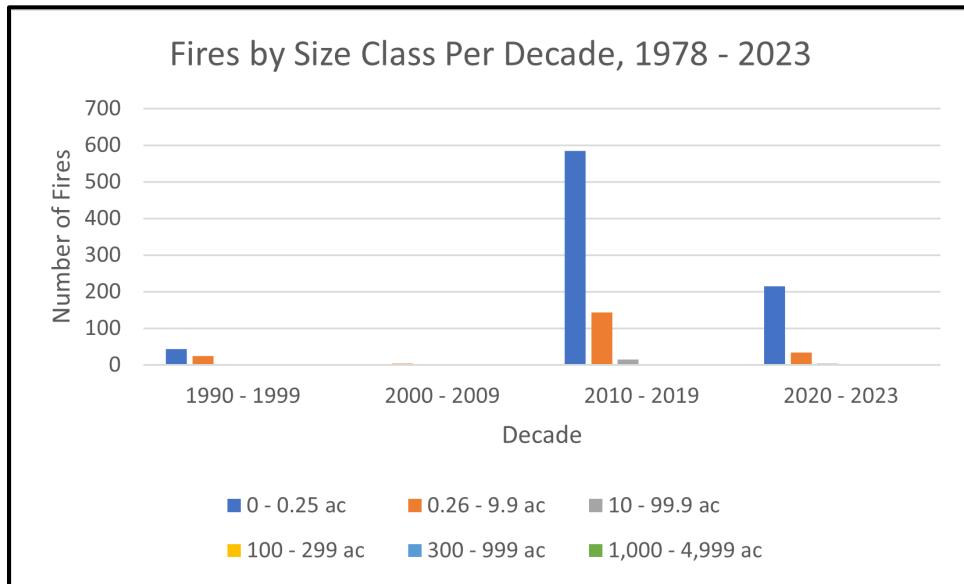


Figure 2.16. Fire size statistics for Mountain View FPD based on fire history data from 1978 through 2023 (ac = acres).

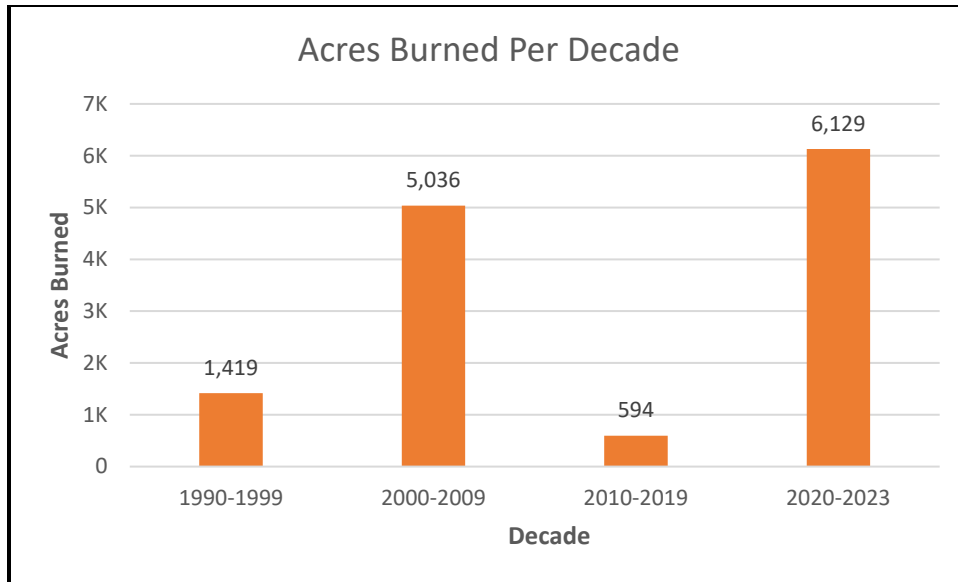


Figure 2.17. Acres burned per decade for Mountain View FPD based on fire history data from 1990 through 2023.

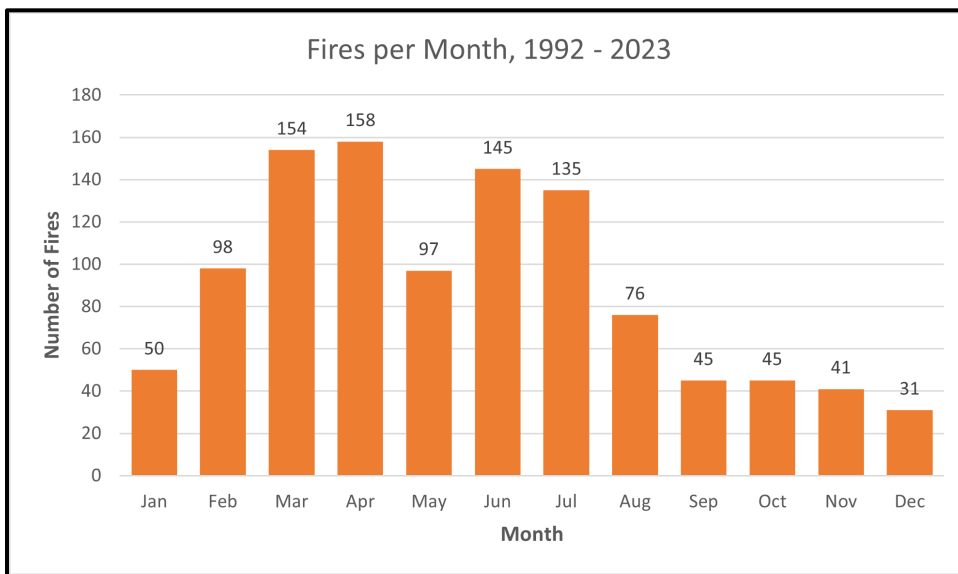


Figure 2.18. Number of recorded fires per month in the Mountain View FPD from 1992 through 2023.

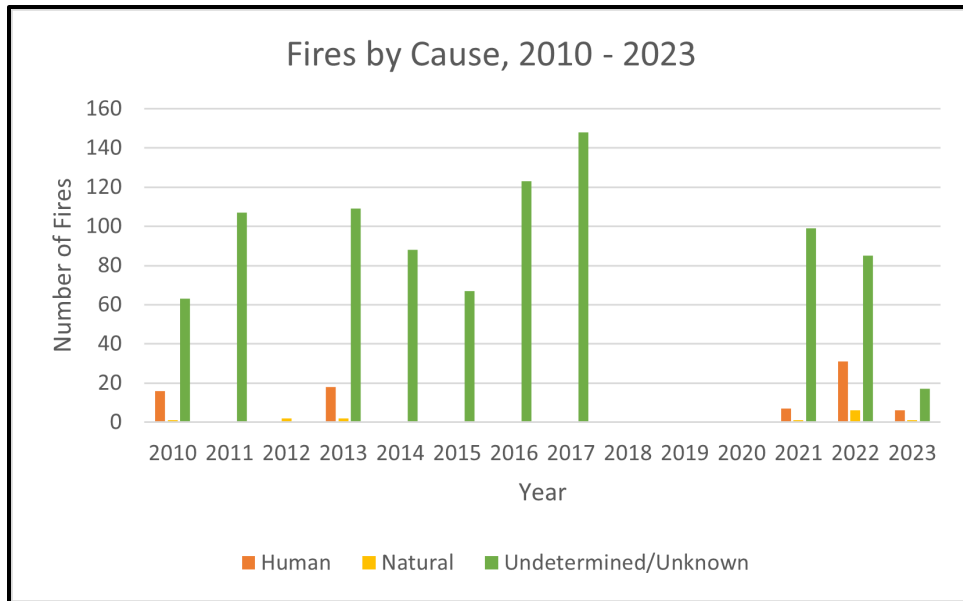


Figure 2.19. Cause of wildfire ignitions in the Mountain View FPD from 2010 through 2023.

FIRE RESPONSE CAPABILITIES

PLANNING DECISION AND SUPPORT

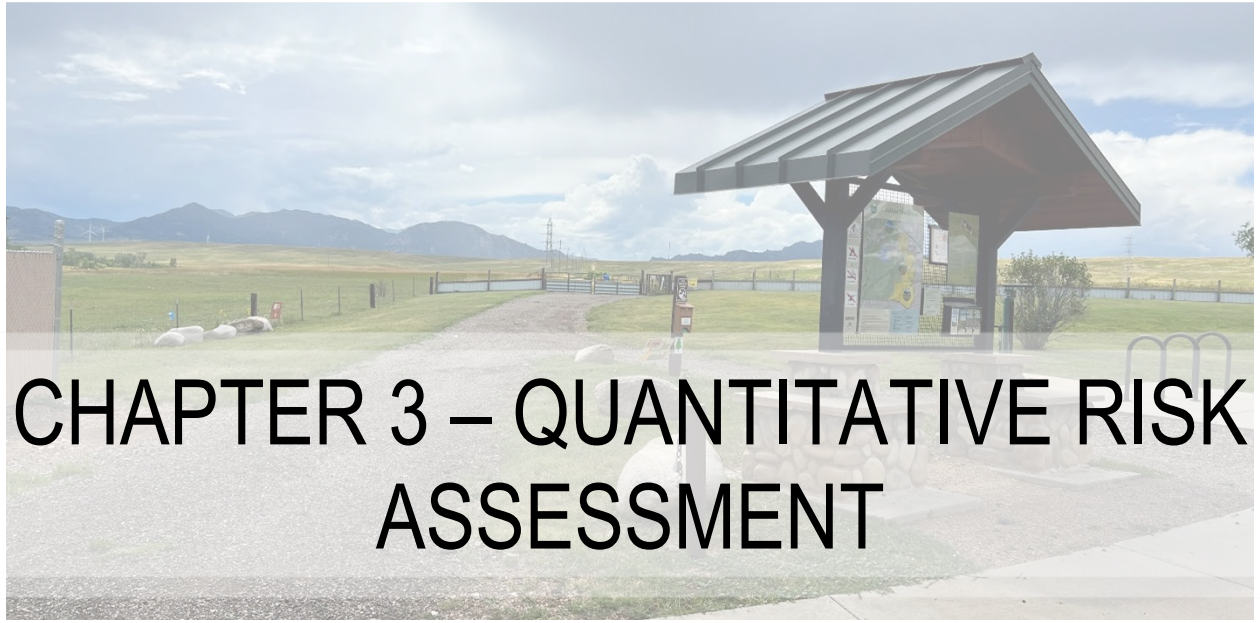
Wildfires have continued to grow in size and severity over the last decade, requiring fire managers to institute more robust pre-fire planning as well as adapt and improve decision-making tools to reduce risk to fire responders and the public and assess impacts to ecological processes.

A primary decision tool utilized by fire managers across all agencies is the Wildland Fire Decision Support System (WFDSS), a system that assists fire managers and analysts in making strategic and tactical decisions for fire incidents (WFDSS 2021). WFDSS combines desktop applications for fire modeling into one web-based system. It provides a risk-informed decision process and documentation system for all wildland fires, and it also introduces economic principles into the fire decision process to improve efficiency while also ensuring safe and effective wildfire response.

FIRE RESOURCES

Fire management in Colorado is accomplished through a cooperative interagency partnership among federal, state, and local entities. Wildland fire response is directed and managed by regional interagency fire centers in Colorado. These dispatch centers are part of the larger Rocky Mountain Area Coordination Center. The dispatch centers in Colorado include the Fort Collins, Craig, Grand Junction, Montrose, Durango, and Pueblo Interagency Dispatch Centers. Wildfire response in Mountain View FPD is provided by the Fort Collins Interagency Dispatch Center (Geographic Area Coordination Centers [GACC] 2022). Additional details regarding fire response resources are provided in Appendix B, and Map H.11 of Appendix H outlines local fire station service areas.

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CHAPTER 3 – QUANTITATIVE RISK ASSESSMENT

Disclaimer

The purpose of this risk assessment is solely to provide a community and landscape-level overview of general wildfire risks within the assessment area as of the date hereof, and to provide a potential resource for community pre-fire planning. This risk assessment is premised on various assumptions and models that include and are based on data, software tools, and other information provided by third parties (collectively, “Third-Party Information and Tools”). SWCA, Incorporated, doing business as SWCA Environmental Consultants (“SWCA”), relied on various Third-Party Information and Tools in the preparation of this risk assessment, and SWCA shall have no liability to any party in connection with this risk assessment including, without limitation, as a result of incomplete or inaccurate Third-Party Information and Tools used in the preparation hereof. This risk assessment may not be relied on by any party without the express written consent of SWCA. SWCA hereby expressly disclaims any responsibility for the accuracy or reliability of the Third-Party Information and Tools relied on by SWCA in preparing this risk assessment. SWCA shall have no liability for any damage, loss (including loss of life), injury, property damage, or other damages whatsoever arising from or in connection with this risk assessment, including any person’s use or reliance on the information contained in this risk assessment. Any reproduction or dissemination of this risk assessment or any portion hereof shall include the entirety of this plan disclaimer.

PURPOSE

Upon completion of a quantitative wildfire risk assessment, land use managers, fire officials, planners, and others can begin to prepare strategies and methods for reducing the threat of wildfire, as well as work with community members to educate them about methods for reducing the damaging consequences of fire. Fuel reduction treatments are a good tool to be used for reducing wildfire hazards. The Quantitative Risk Assessment can aid in the identification and prioritization of fuel treatments based on where risk is greatest. The fuels reduction treatments can be implemented on both private and public land, so community members can actively apply the treatments on their properties, as well as recommend treatments on public land that they use or care about.

Areas of high wildfire hazard and risk are identified by the Quantitative Risk Assessment through the modeling and mapping of fire behavior, analysis of highly valued resources and assets (HVRAs), and incorporation of stakeholder and expert input.

MODELING THE FIRE ENVIRONMENT

The wildland fire environment consists of three factors that influence the spread of wildfire: fuels, topography, and weather (see Chapter 2). Understanding how these factors interact to produce a range of fire behavior is fundamental to determining treatment strategies and priorities in the WUI/GUI (WUI). In the wildland and grassland environment, vegetation is synonymous with fuels. When sufficient fuels for continued combustion are present, the level of risk for those residing in the WUI is heightened.

Fire spreads in three ways: 1) surface fire spread, in which the flaming front remains on the ground surface (in grasses, shrubs, small trees, etc.) and resistance to control is comparatively low; 2) crown fire, in which the surface fire “ladders” up into the upper levels of the forest canopy and spreads through the tops (or crowns) independent of or along with the surface fire, and when sustained is often beyond the capabilities of suppression resources; and 3) spotting, in which embers are lifted and carried with the wind ahead of the main fire and ignite in receptive fuels; if embers are plentiful and/or long range (>0.5 mile), resistance to control can be very high. Ember load index throughout Mountain View FPD is quantified and illustrated in Figure 3.1. Indices are derived from several fire behavior and landscape datasets; a high ember load index is indicative of a large number of embers during a wildfire.

Crown fire and spotting activity have been a concern for fire managers, particularly under extreme weather conditions. In areas where homes are situated close to timber fuels and/or denser shrubs and trees, potential spotting from intensely burning fuels to adjacent fuels should always be acknowledged.

Information regarding the WUI and GUI, fire history, and response resources is provided in Chapter 2 and Appendix B.

Detailed information on fuels analysis and calibration, topography, and weather is provided in Appendix C.

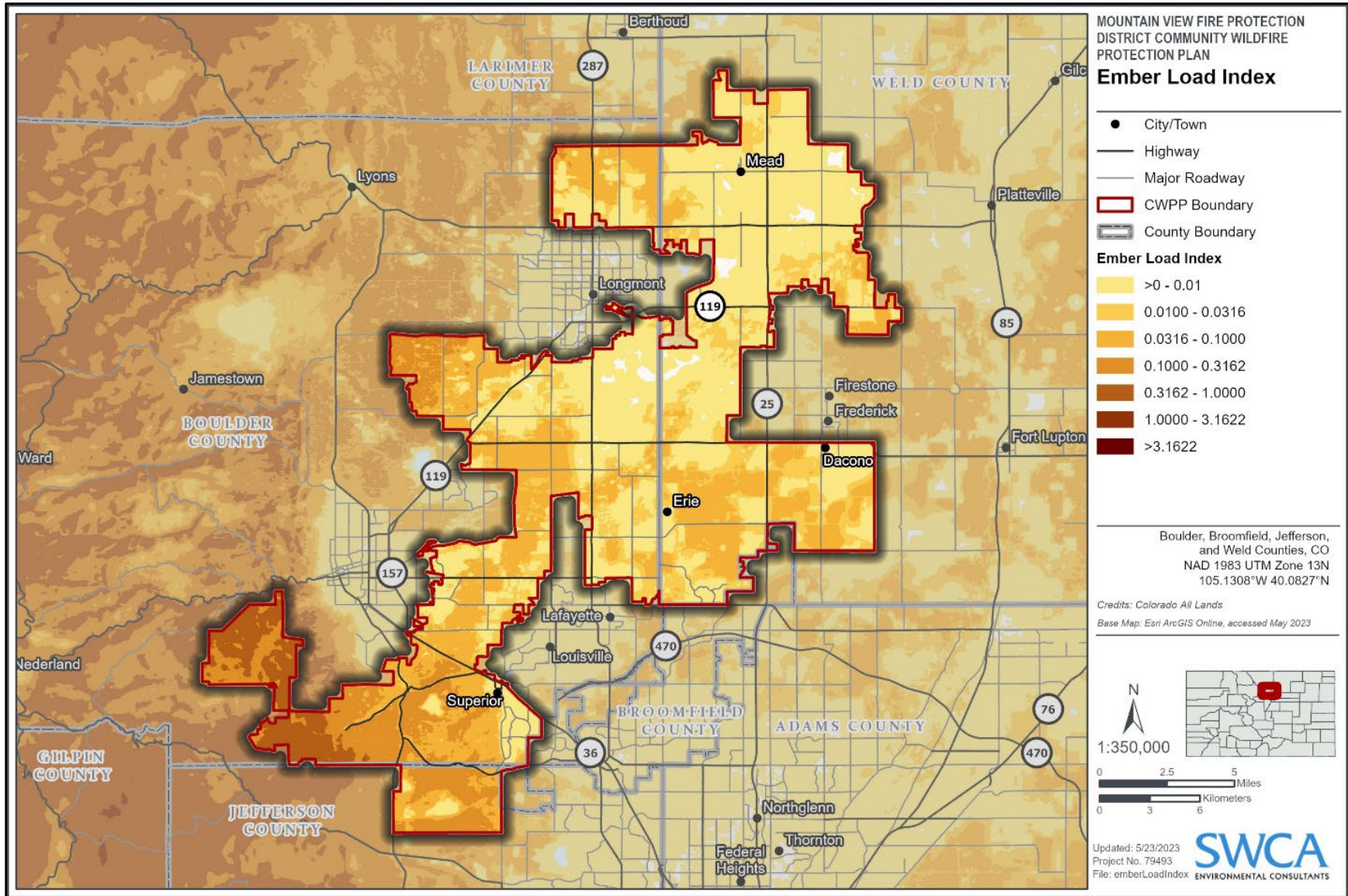


Figure 3.1. Ember load index throughout Mountain View FPD.

COLORADO ALL LANDS QUANTITATIVE RISK ASSESSMENT

The COAL Quantitative Risk Assessment developed by Pyrologix was created collaboratively with CSFS and USFS experts. The purpose for developing this risk assessment was to provide the communities of Colorado with a standardized assessment of hazard, vulnerability, and risk across the landscape using state of the art modeling methods and up to date source data on existing conditions. This allows officials and land managers to compare risk across jurisdictional boundaries and apply successful strategies in reducing wildfire risk in multiple communities throughout Colorado. Many of the shortcomings of previous wildfire risk assessments have been addressed and accounted for in the COAL Risk Assessment.

Important examples include:

- Recalibrating the Colorado fuelscape to account for past disturbances (wildfires)
- Recalibrating the burnability of urban and agricultural fuels in fire behavior modeling
- Removing data seam lines
- Utilizing a set of collaboratively approved HVRA standardized across Colorado

The COAL Quantitative Wildfire Risk Assessment is a unique tool for evaluating the risk of wildland fires to communities within the WUI and GUI areas of the Mountain View FPD. In the context of wildfire risk modelling, risk is a combination of hazard and vulnerability. Although many definitions for risk exist, for the purpose of this document, risk is a product of four factors defined by the Quantitative Wildfire Risk Framework (Figure 3.2):

Burn probability is the likelihood of burning (Map H.2).

Intensity is a combination of wildfire behavior metrics such as flame length, crown fire activity, and rate of spread (Maps H.1, H.3, and H.4).

Exposure is the proximity of an HVRA to hazards on a landscape (e.g., homes in the WUI or a source watershed in an alpine environment) (see Figure 2.1).

Susceptibility is a measure of how easily an HVRA is damaged by wildfire. Resiliency is a common term used to describe the susceptibility of an HVRA (Maps H.5–H.10).

A detailed methodology of the COAL Quantitative Risk Assessment can be found in Appendix C, Fire Behavior Modeling/GIS Background and Methodology.

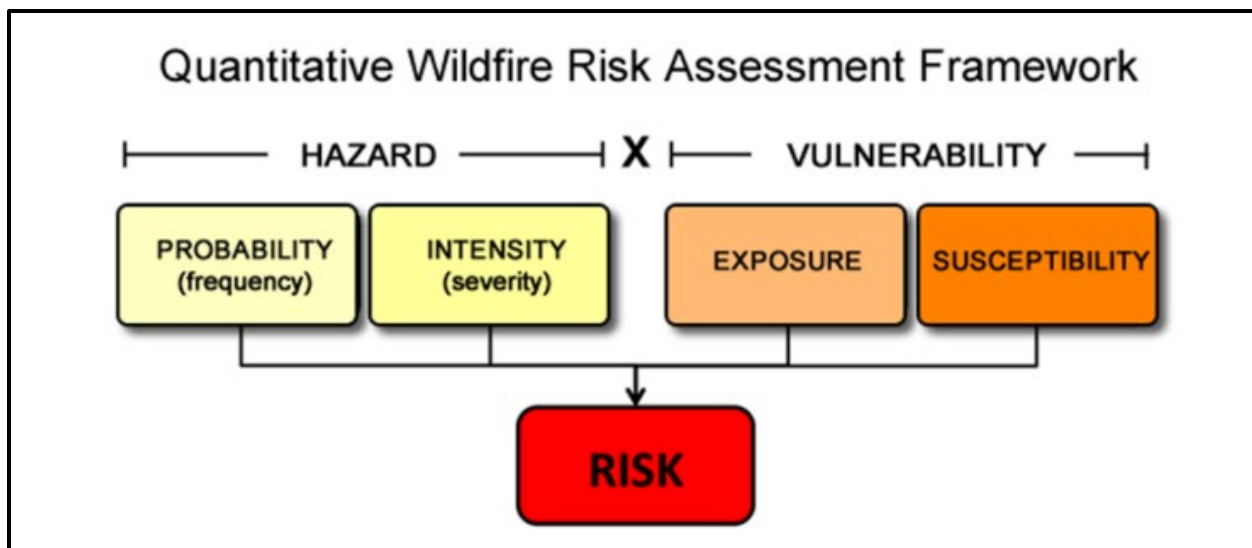


Figure 3.2. Pyrologix's Quantitative Wildfire Risk Framework for the COAL Quantitative Risk Assessment, derived from Scott et al. (2013).

An overview of wildfire hazards (frequency and severity) can be found below in Figure 3.3. Notice that wildfire hazard is greatest in areas with steep topography and high fuel loading such as the forested drainages near Eldorado Springs.

Alternatively, the vulnerability of structures and infrastructures is a function of building materials (susceptibility), their position on the landscape, and the prevalence of WUI/GUI (exposure). Figure 3.4 showcases expected risk to potential structures by determining the wildfire hazards that would put a structure at risk if that structure were to occur in the landscape.

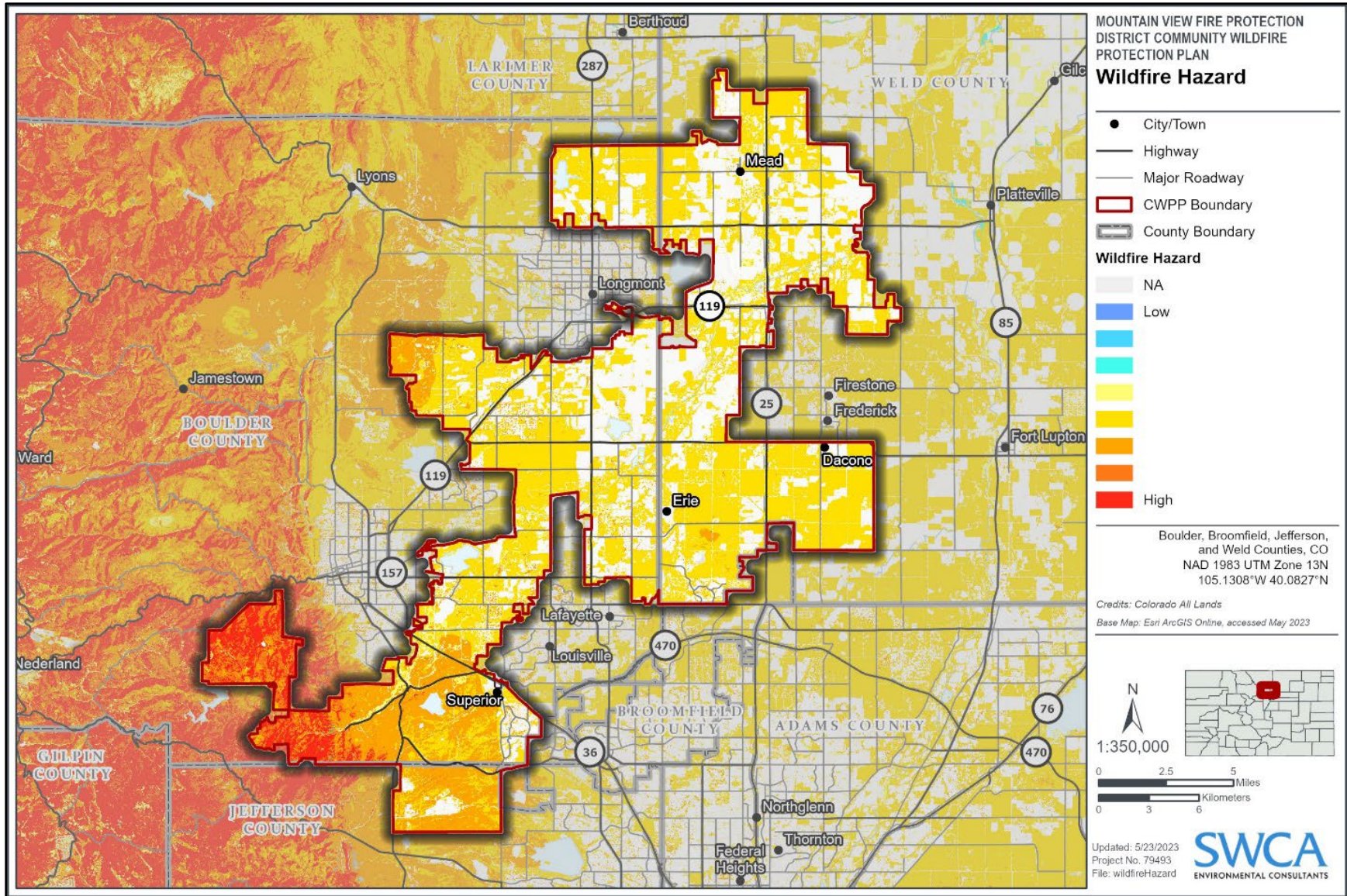


Figure 3.3. A map of Wildfire Hazard as a part of the COAL quantitative risk assessment.

WILDFIRE RISK IN THE MOUNTAIN VIEW FPD

Quantitative assessments of wildfire risk depend heavily on two factors: 1) the type of fuel that can burn and 2) the delineation of the WUI and GUI, or where developed areas intermix with natural fuels. The type of fuel on the landscape is a reliable factor for determining hazard, as opposed to weather and topography which are more unpredictable and difficult to model. Furthermore, humans can directly influence fuels to reduce wildfire hazards. Next, the delineation establishes the likely exposure that susceptible structures may experience during a wildfire. The combination of wildfire hazard and vulnerability (exposure) are helpful in determining risk to structures (Figure 3.2).

The Expected Risk to Structures dataset assesses wildfire risk by considering likelihood of ignition, intensity, and potential structural impact. The dataset utilizes flame-length probabilities from WildEST to determine vulnerability through the multiplication of conditional risk to structures with the probability of a burn. Typically, unburned forested regions within the WUI that contain coniferous fuels face the highest risk of wildfire. For example, Figure 3.4 shows that unburned forested areas within the WUI in the western parts of the district have a high wildfire risk to structures.

Recently burned areas, rangelands, and agricultural lands within the WUI generally have a moderate level of wildfire risk. These areas typically consist of grass-shrub fuels, which can promote rapid fire spread but usually result in shorter flames. However, under windy conditions, grass-fueled fires can spread extremely quickly with intense flames. The behavior of wildfires, also known as wildfire hazards, can be significantly intensified by extreme weather conditions often referred to as "red flag conditions." This subsequently escalates the risk to areas where communities are adjacent to wildland spaces. Thus, it is crucial to establish defensible spaces around properties, implement effective alert systems, and have well-defined evacuation protocols.

Areas with the lowest wildfire risk are typically situated far away from the interface between developed areas and wild landscapes. These regions might encompass bodies of water, densely populated urban zones, and surfaces that are not prone to burning. Efforts to reduce wildfire risk should primarily prioritize the forests and rangelands located within the WUI and GUI that pose a significant risk of high to extreme wildfire impact on communities. A key strategy for reducing the vulnerability of structures to ignition during wildfires involves reducing the presence of flammable materials within the immediate vicinity of homes, known as the home ignition zone.

It is important to note these risk assessments are focused on land within the district; lands adjacent to the district are also important to consider. For more in-depth guidance on these strategies, Chapter 4 provides mitigation strategies, and Appendix E offers resources tailored to property owners seeking to minimize their exposure to wildfire risks.

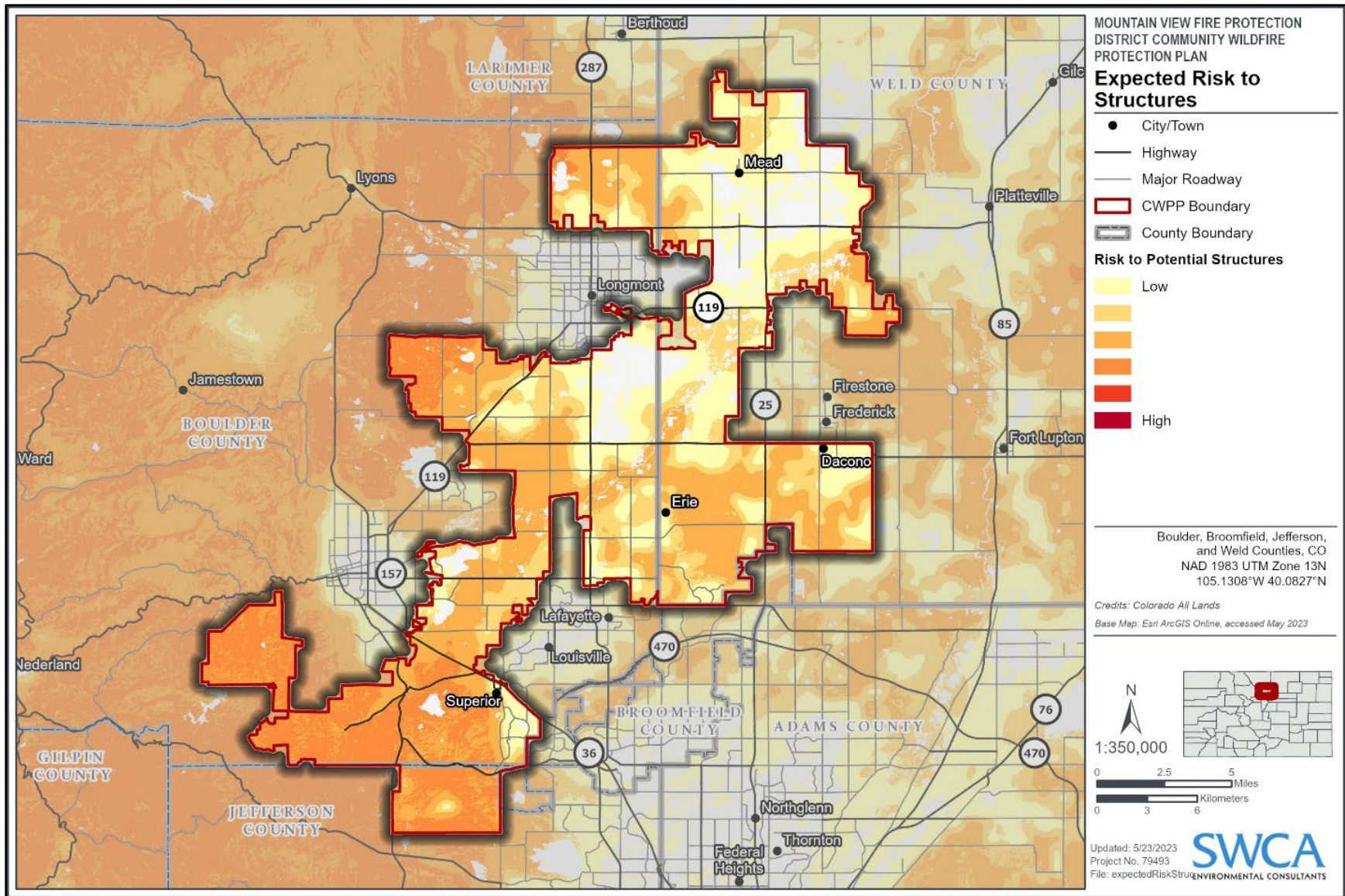


Figure 3.4. Wildfire risk to structures sourced from the COAL Quantitative Risk Assessment (Pyrologix 2022a).

CWPP COMMUNITY RISK ASSESSMENTS

The following community Quantitative Risk Assessment descriptions focus on wildfire risk within specific communities throughout the Mountain View FPD based on the district-wide risk assessment in Figure 3.4. Community boundaries were delineated based on building clusters, fuels, and jurisdictional boundaries and then adjusted based on Core Team input (Figure 3.5). These descriptions provide a more granular look at risk throughout the Mountain View FPD and can inform community leaders, Firewise communities, property owners associations (HOAs), and other local councils who can make use of their community assessment when prioritizing actions and applying for grant funding. See Appendix I for a list of funding sources. Community descriptions will include a small-scale map of expected risk to structures along with a narrative describing existing conditions, wildfire hazards, and a description of wildfire risk within the community.

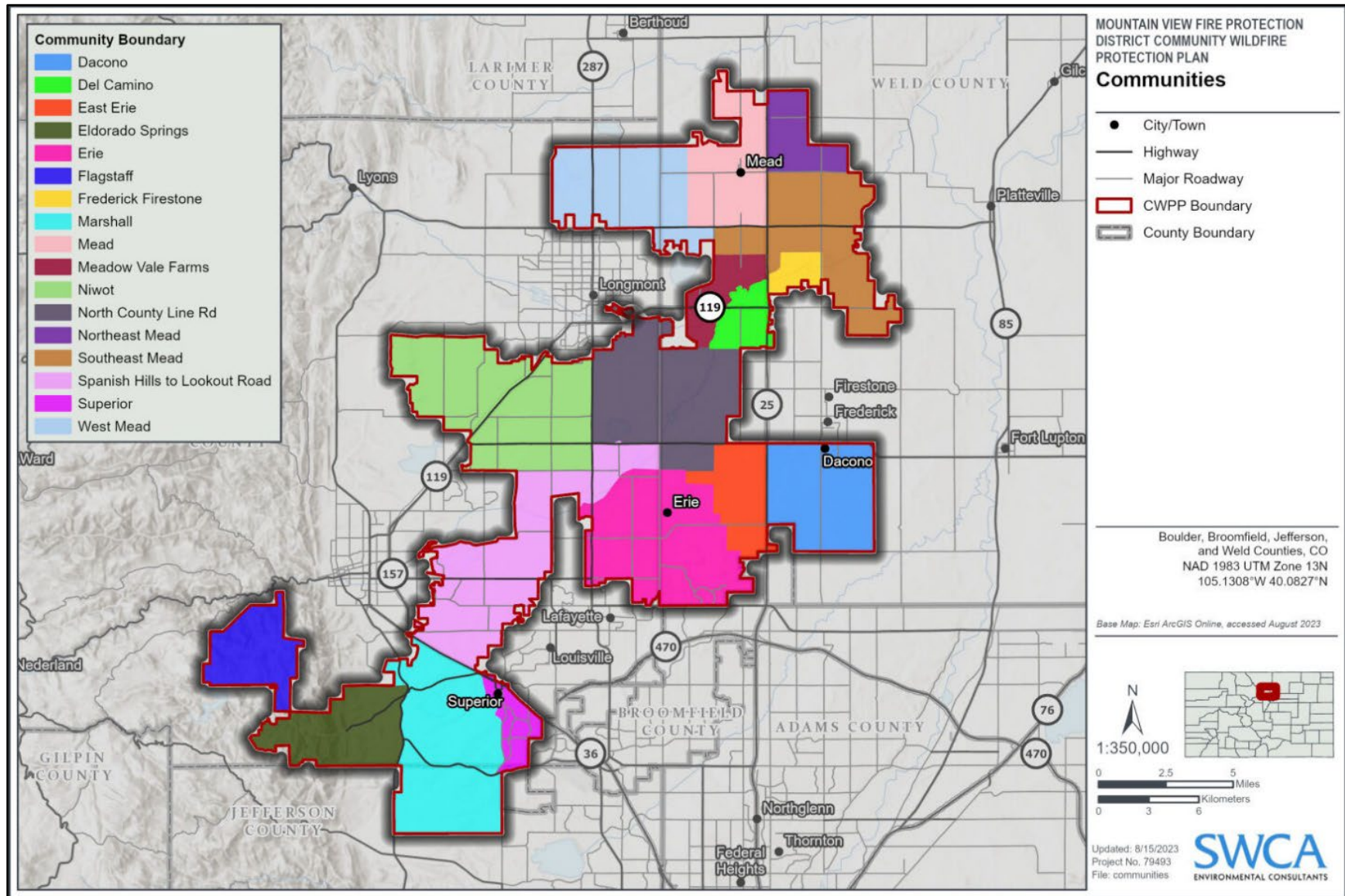


Figure 3.5. Delineated communities within Mountain View FPD.

DACONO

The Dacono community is in the eastern portion of the district and occupies approximately 15 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 2,000 buildings. The building density is 134 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.6). Within the last 2 years, the Dacono community has reported 18 fire incidents; the majority of these incidents were grass or dumpster fires in rural/urban or suburban areas.

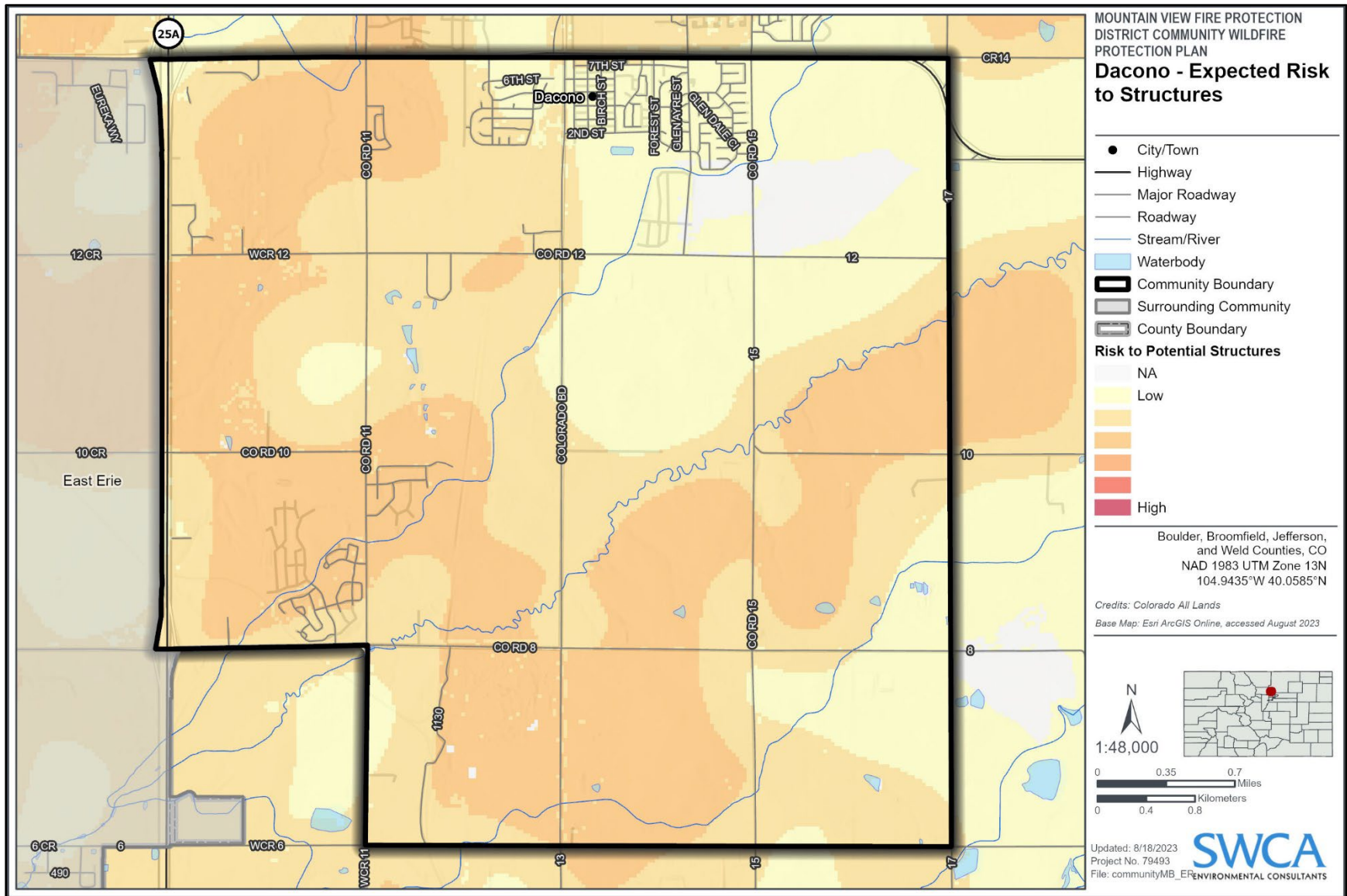


Figure 3.6. Quantitative Risk Assessment for the Dacono community.

DEL CAMINO

The Del Camino community is in the northeastern portion of the district and occupies approximately 4 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 750 buildings. The building density is 183 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.7). Within the last 2 years, the Del Camino community has reported nine fire incidents; the majority of these incidents were grass, dumpster, or storage fires in rural/urban or suburban areas.

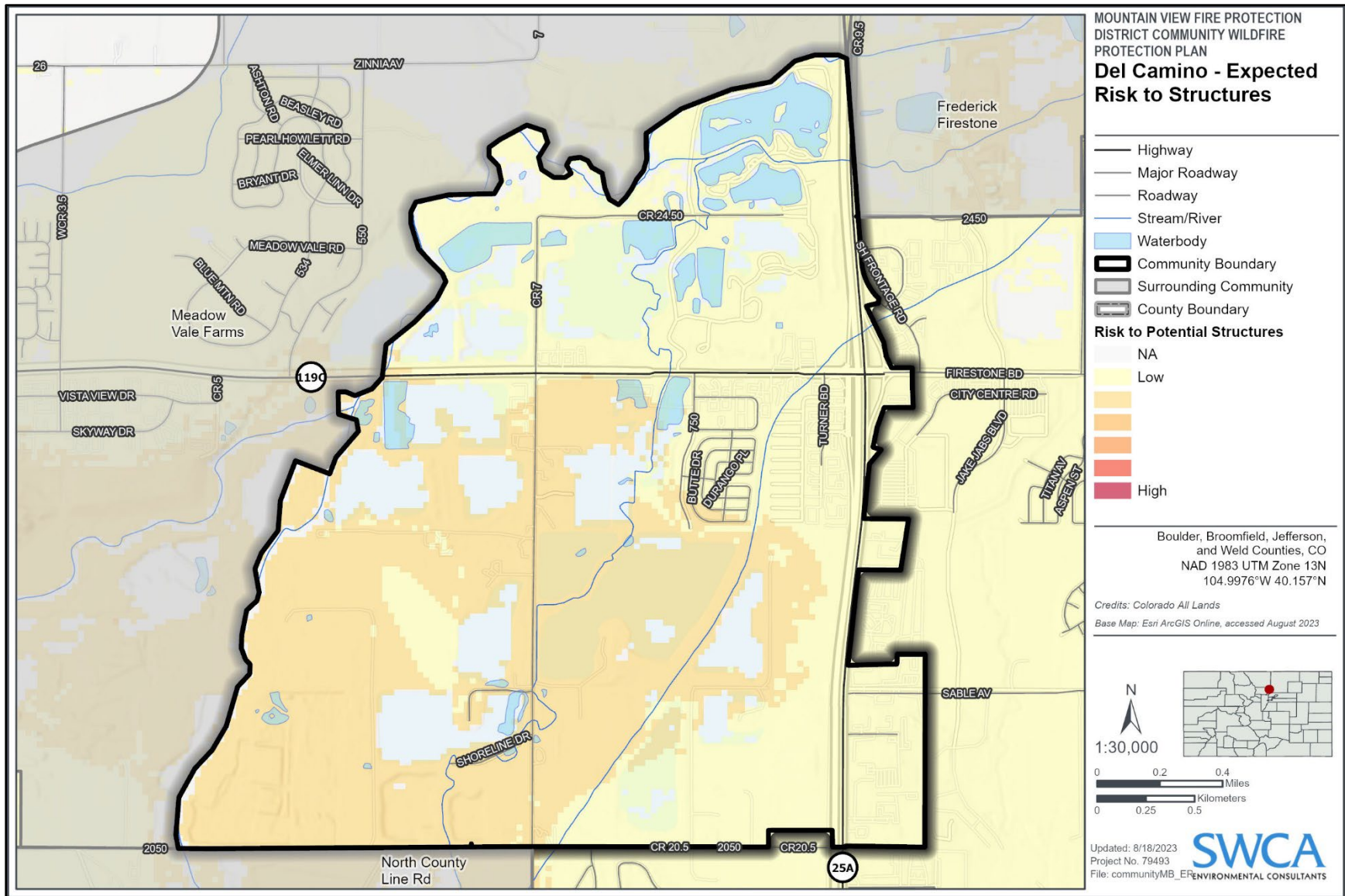


Figure 3.7. Quantitative Risk Assessment for the Del Camino community.

EAST ERIE

The East Erie community is in the eastern portion of the district and occupies approximately 8 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 700 buildings. The building density is 88 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.8). Within the last 2 years, the East Erie community has reported 14 fire incidents; the majority of these incidents were grass fires in rural/urban or suburban areas.

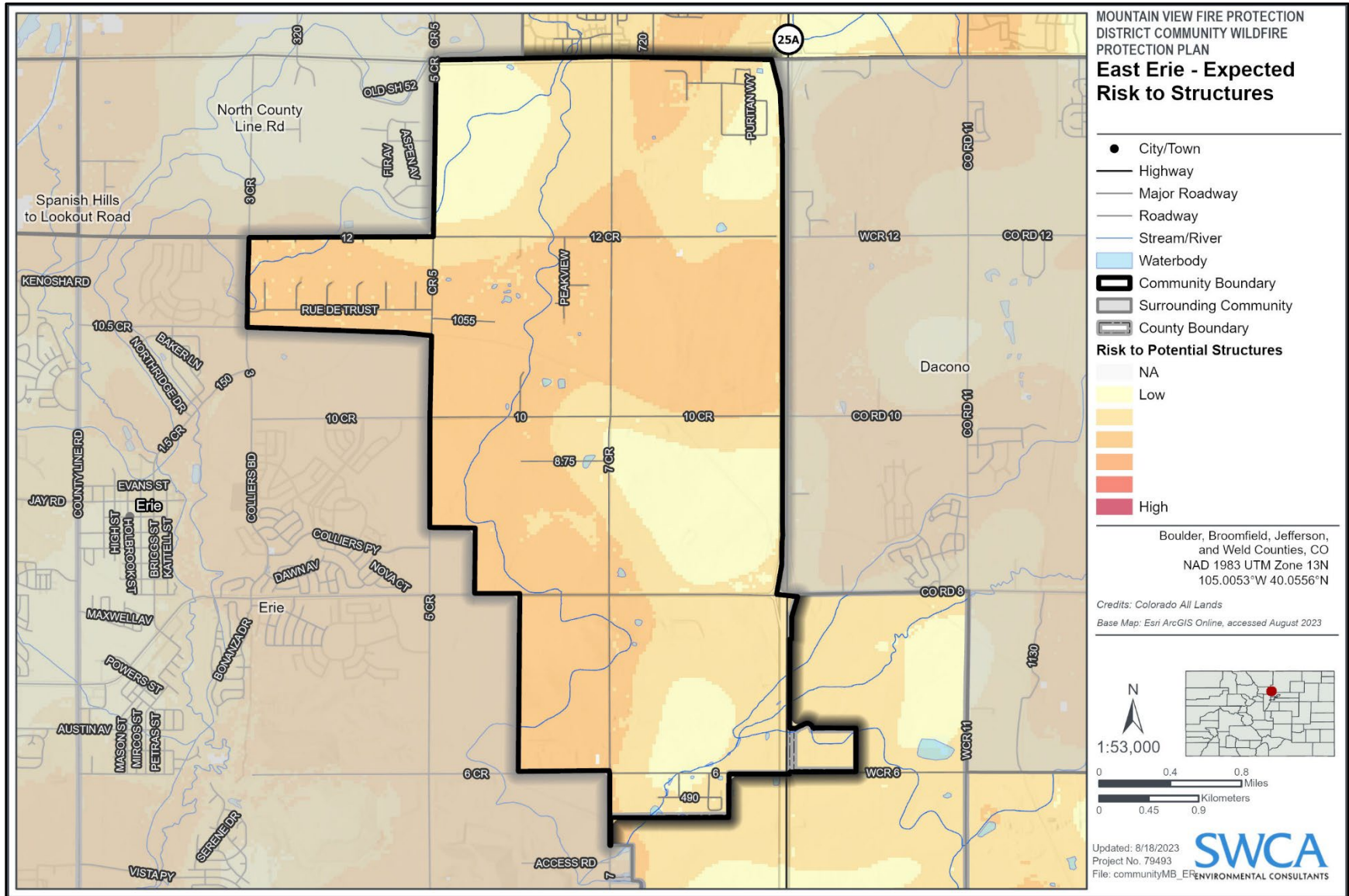


Figure 3.8. Quantitative Risk Assessment for the East Erie community.

ELDORADO SPRINGS

The Eldorado Springs community is in the northwestern portion of the district and occupies approximately 12 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 360 buildings. The building density is 88 units per square mile. The Quantitative Risk Assessment results show a moderate expected risk to structures within the community (Figure 3.9). Within the last 2 years, the Eldorado Springs community has reported four fire incidents; the majority of these incidents were forest, woods, or wildland fires in rural/urban or suburban areas.

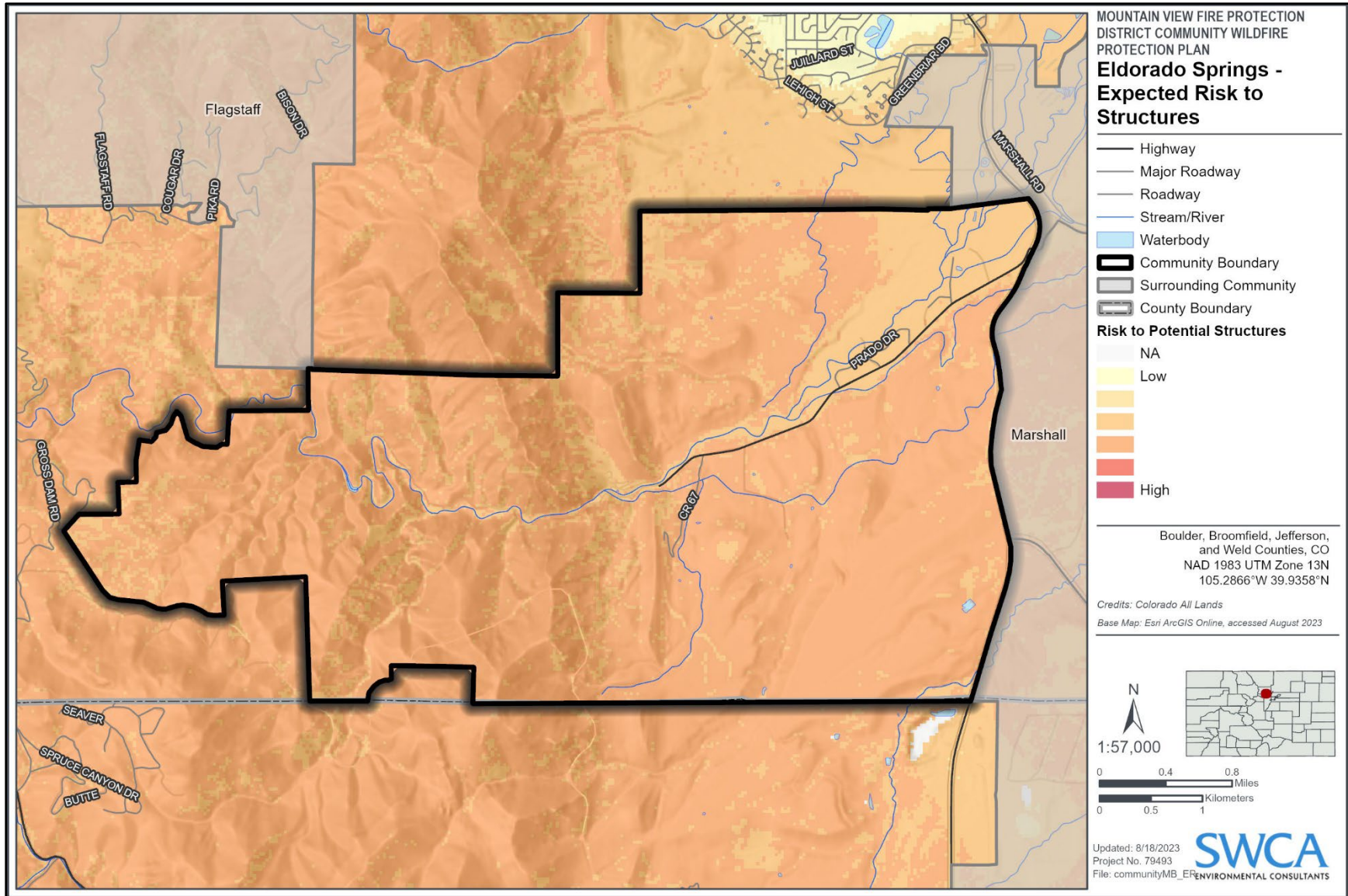


Figure 3.9. Quantitative Risk Assessment for the Eldorado Springs community.

ERIE

The Erie community is in the central portion of the district and occupies approximately 23 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to 8,242 buildings. The building density is 359 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.10). Within the last 2 years, the Erie community has reported 44 fire incidents; the majority of these incidents were grass, brush, or rubbish/trash fires in rural/urban or suburban areas.

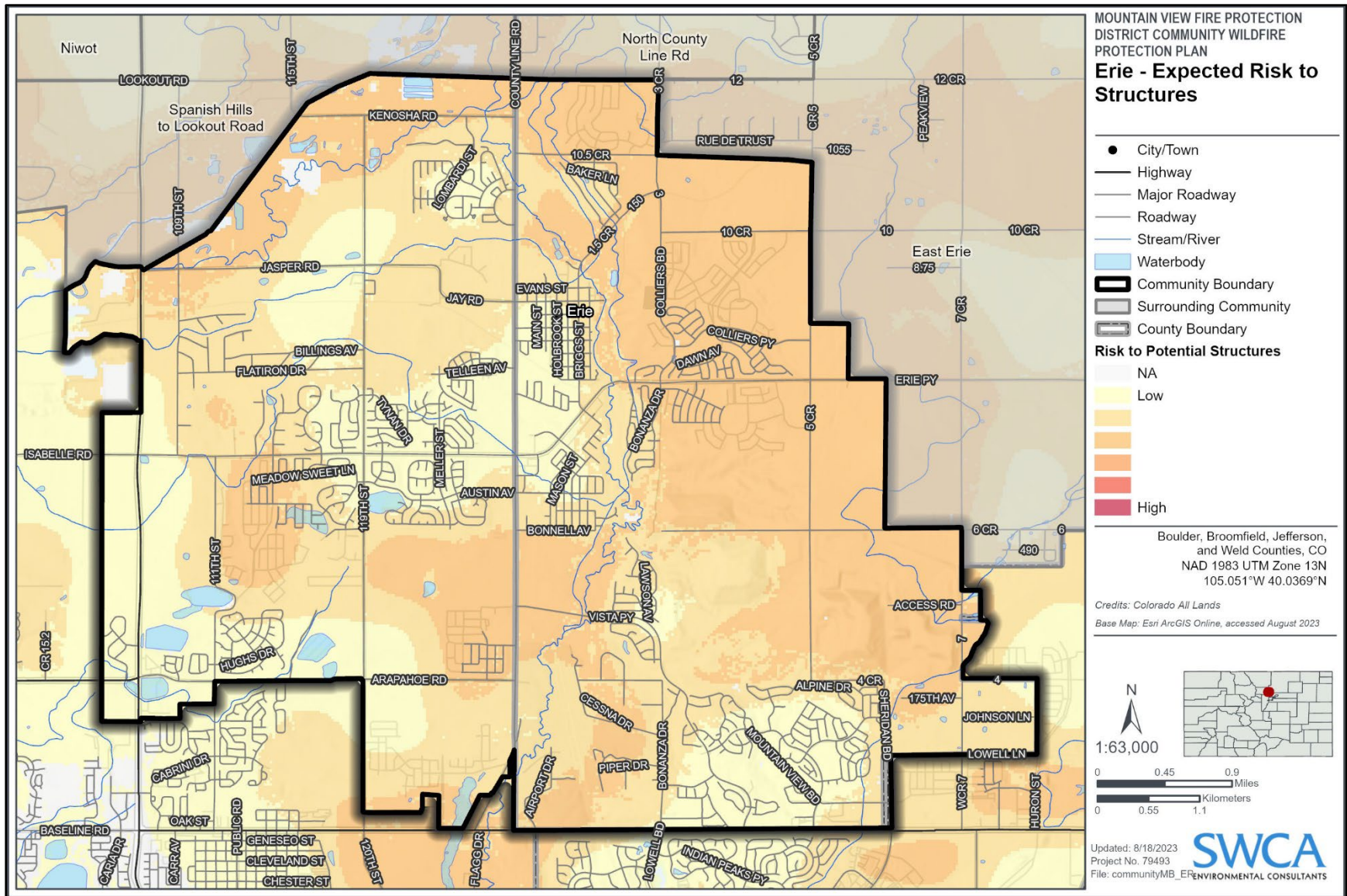


Figure 3.10. Quantitative Risk Assessment for the Erie community.

FLAGSTAFF

The Flagstaff community is in the southeastern portion of the district and occupies approximately 9 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 215 buildings. The building density is 25 units per square mile. The Quantitative Risk Assessment results show a moderate expected risk to structures within the community (Figure 3.11). Within the last 2 years, the Flagstaff community has reported two fire incidents; these two incidents were brush or brush-and-grass mixture fires in rural/urban or suburban areas.

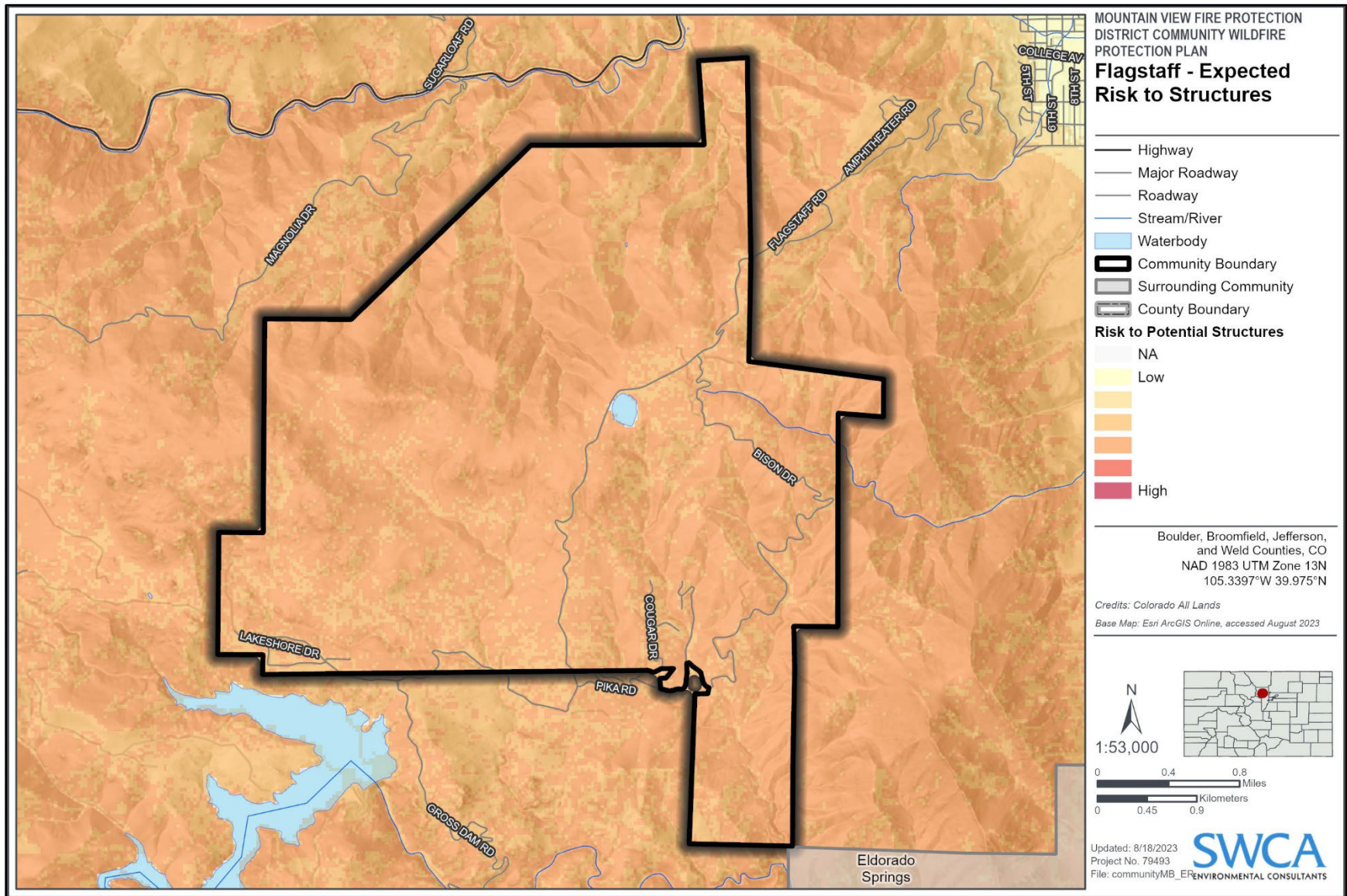


Figure 3.11. Quantitative Risk Assessment for the Flagstaff community.

FREDERICK FIRESTONE

The Frederick Firestone community is in the northeastern portion of the district and occupies approximately 2 square miles of the Planning Area. The dominant fuel type is moderate load, grass-shrub (GS2), and the community is home to 76 buildings. The building density is 32 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.12). Within the last 2 years, the Frederick Firestone community has reported one fire incident; this was an outside equipment fire in a rural area.

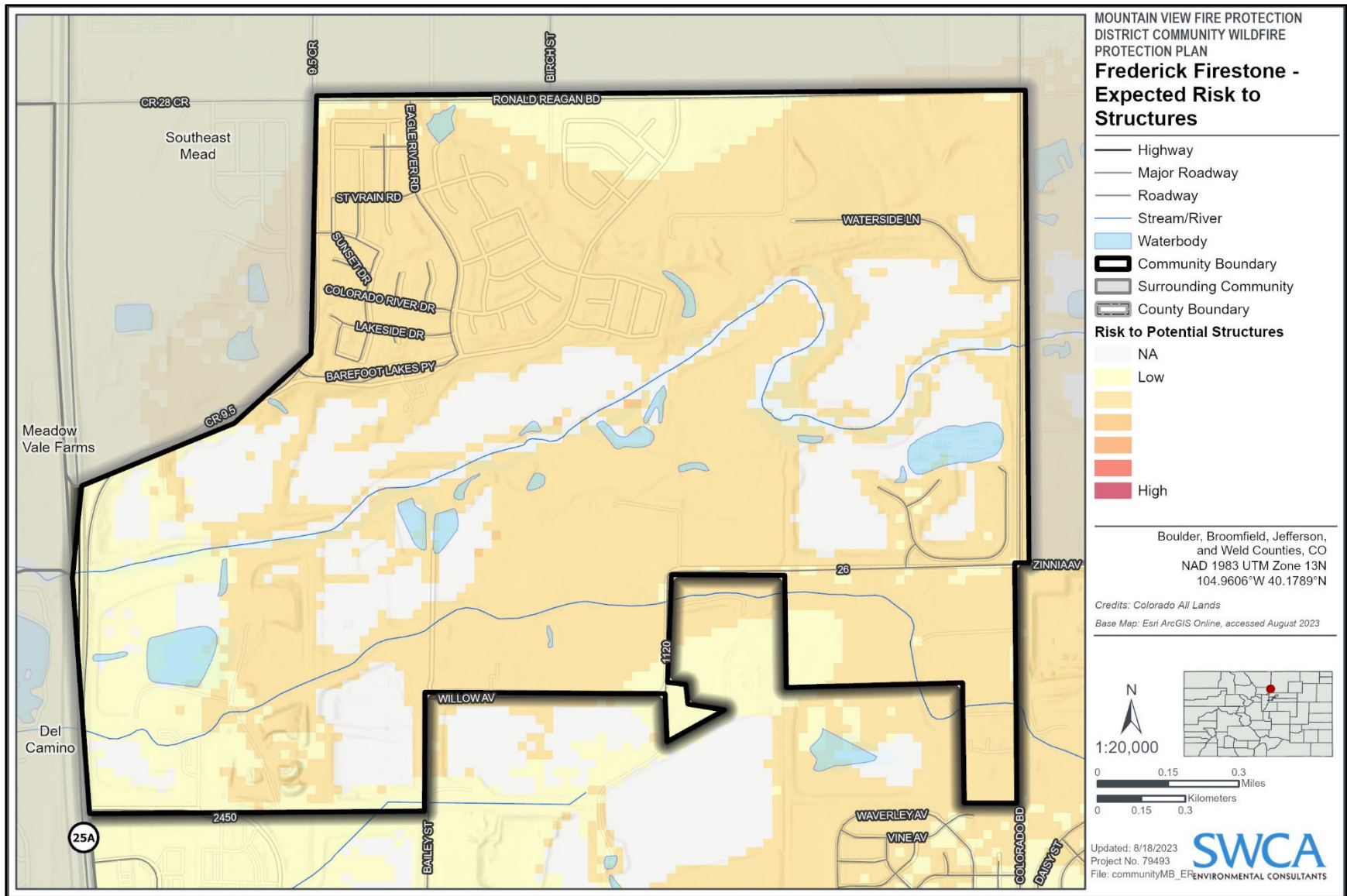


Figure 3.12. Quantitative Risk Assessment for the Frederick Firestone community.

MARSHALL

The Marshall community is in the southern portion of the district and occupies approximately 24 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 325 buildings. The building density is approximately 14 units per square mile. The Quantitative Risk Assessment results show a medium expected risk to structures within the community (Figure 3.13). Within the last 2 years, the Marshall community has reported 16 fire incidents, including the Marshall Fire; the majority of these incidents were grass or dumpster fires in rural/urban or suburban areas.

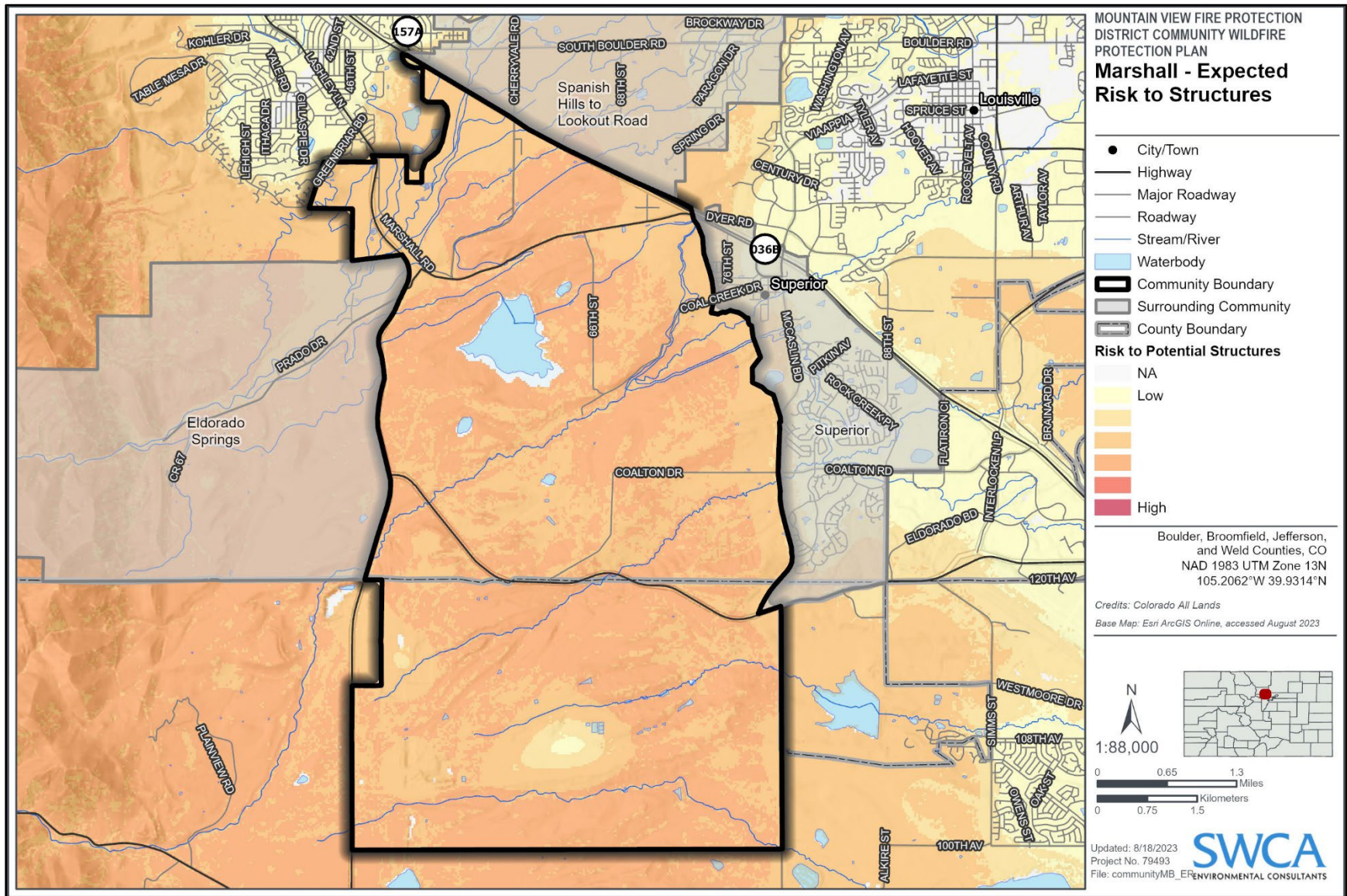


Figure 3.13. Quantitative Risk Assessment for the Marshall community.

MEAD

The Mead community is in the northern portion of the district and occupies approximately 12 square miles of the Planning Area. The dominant fuel type is non-burnable agricultural (NB3), and the community is home to just over 1,600 buildings. The building density is 134 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.14). Within the last 2 years, the Mead community has reported 20 fire incidents; the majority of these incidents were grass, brush, or dumpster fires in rural/urban or suburban areas.

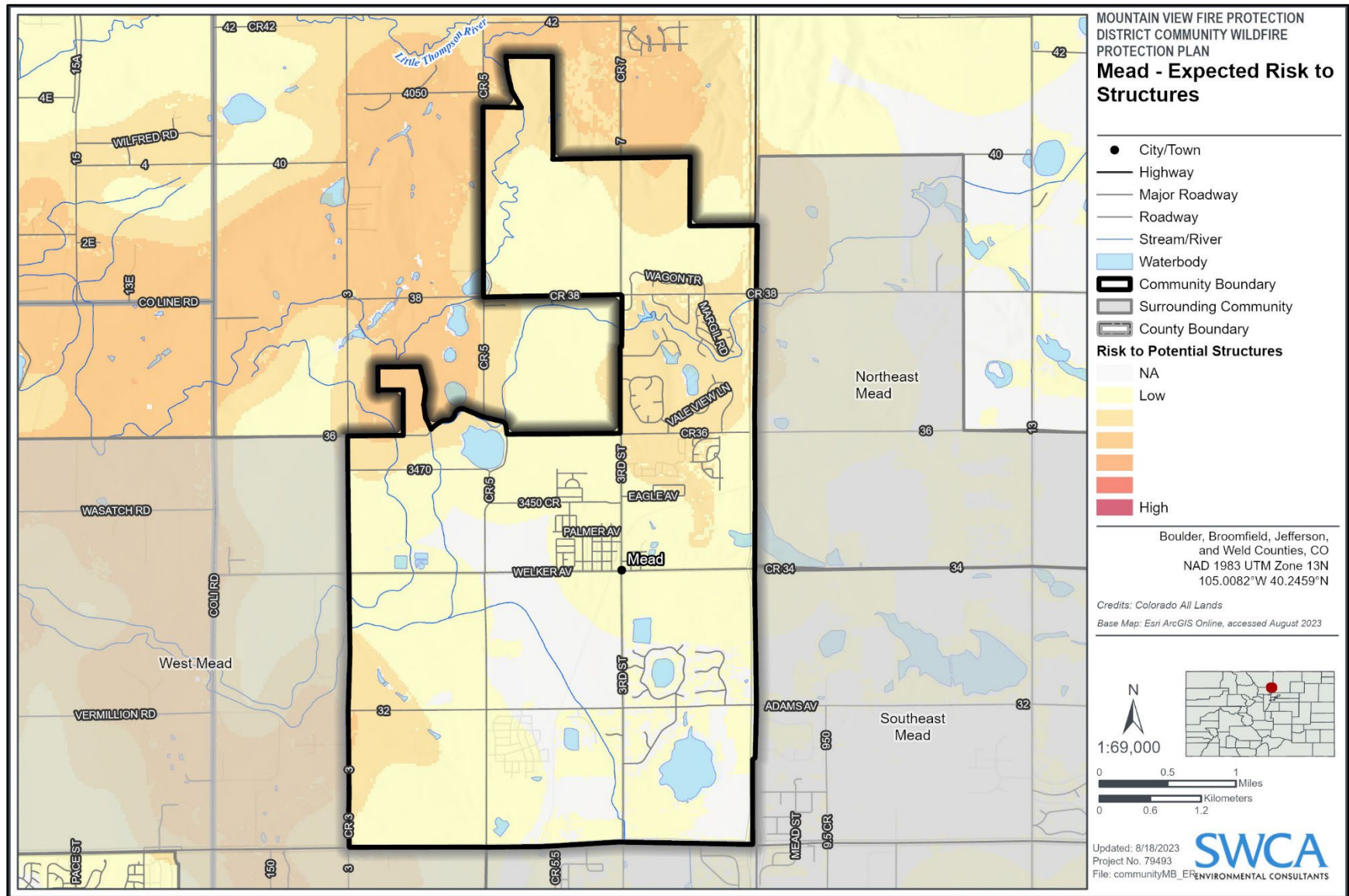


Figure 3.14. Quantitative Risk Assessment for the Mead community.

MEADOW VALE FARMS

The Meadow Vale Farms community is in the north-central portion of the district and occupies approximately 5 square miles of the Planning Area. The dominant fuel type is non-burnable agricultural (NB3), and the community is home to just over 900 buildings. The building density is 173 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.15). Within the last 2 years, the Meadow Vale Farms community has reported four fire incidents; these incidents were brush or outside rubbish in rural/urban or suburban areas.

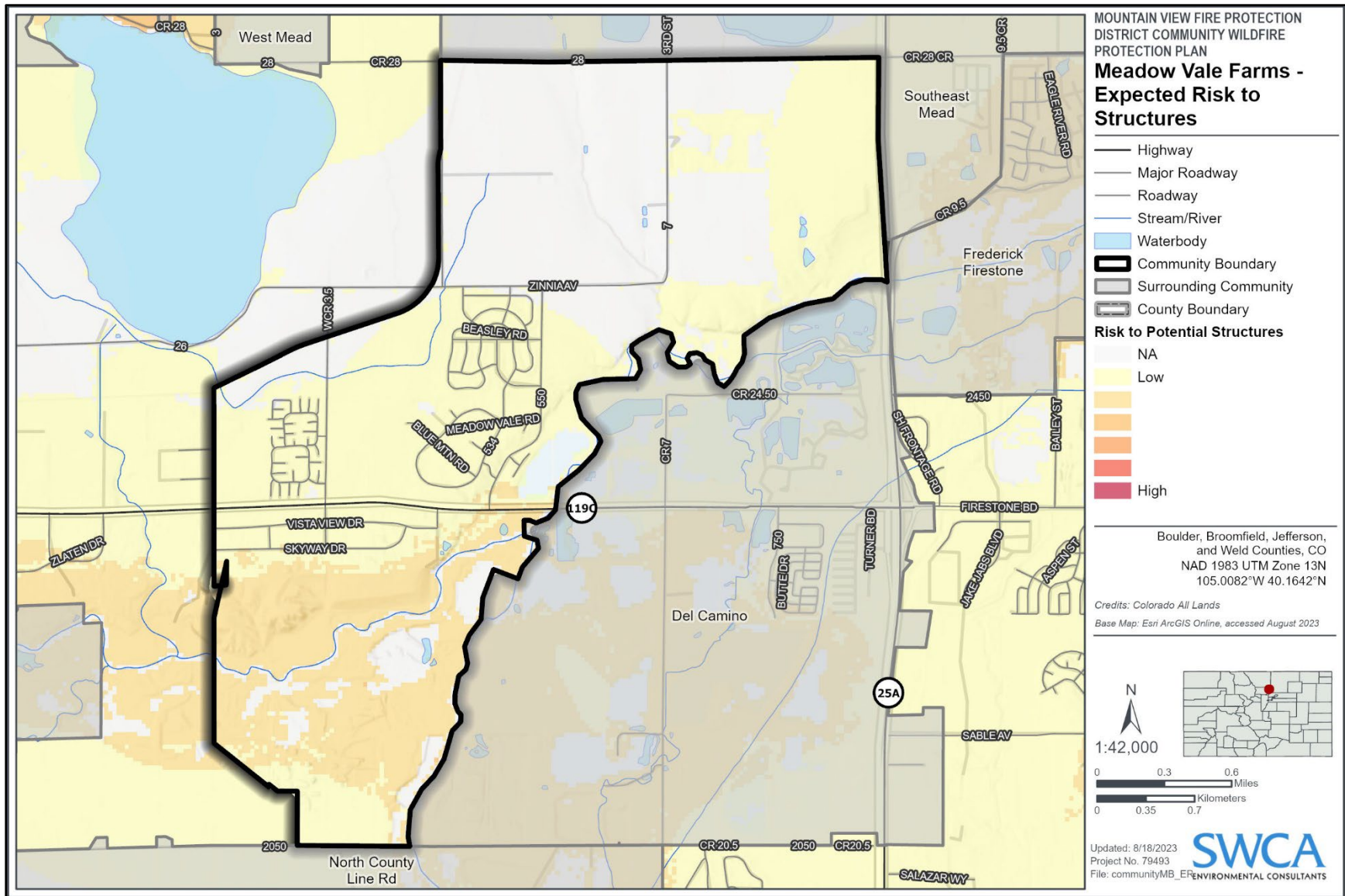


Figure 3.15. Quantitative Risk Assessment for the Meadow Vale Farms community.

NIWOT

The Niwot community is in the western portion of the district and occupies approximately 27 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 3,500 buildings. The building density is 128 units per square mile. The Quantitative Risk Assessment results show a medium expected risk to structures within the community (Figure 3.16). Within the last 2 years, the Niwot community has reported 13 fire incidents; the majority of these incidents were grass, forest, or dumpster fires in rural/urban or suburban areas.

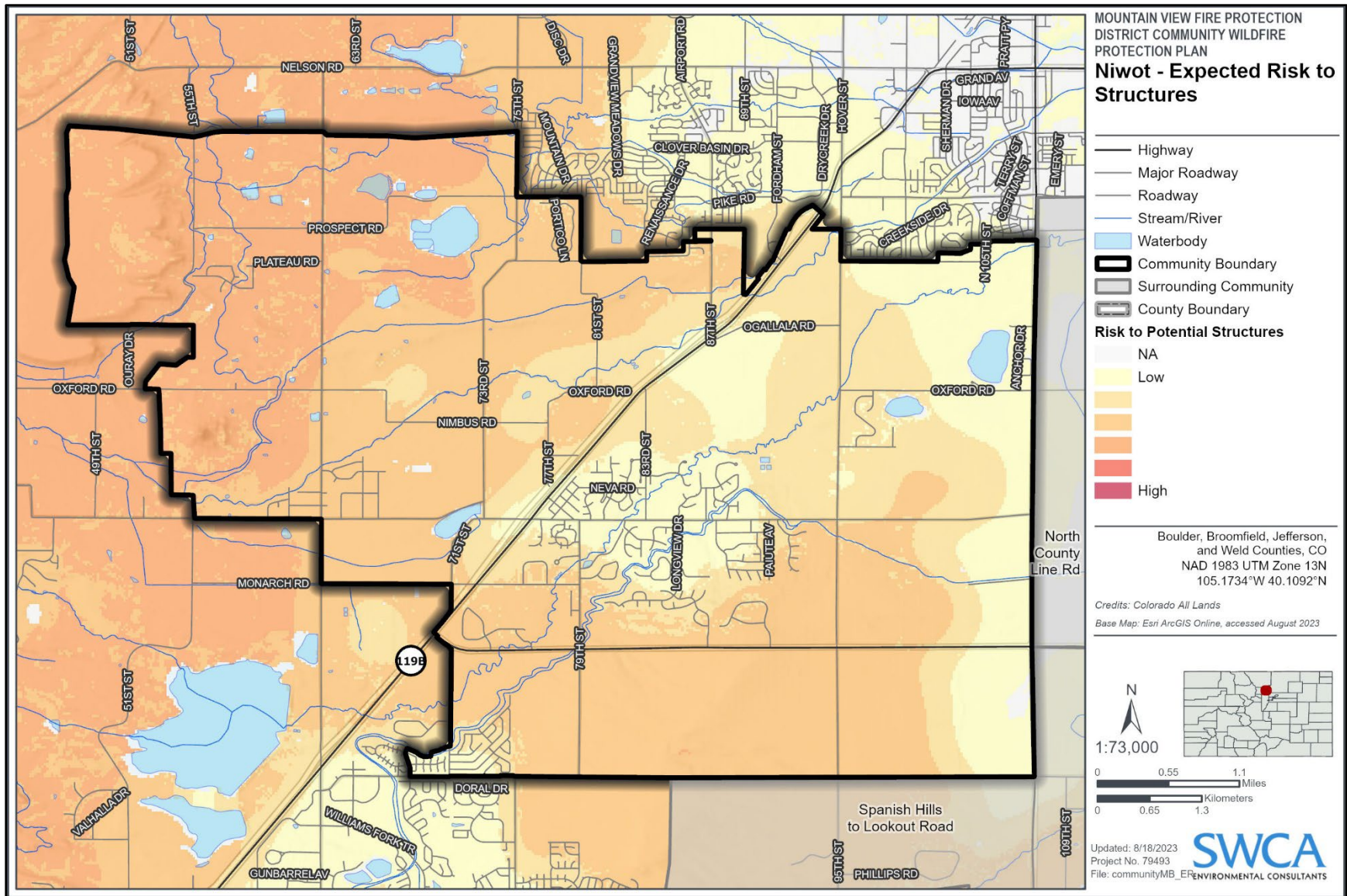


Figure 3.16. Quantitative Risk Assessment for the Niwot community.

NORTH COUNTY LINE ROAD

The North County Line Road community is in the central portion of the district and occupies approximately 23 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 1,140 buildings. The building density is 50 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.17). Within the last 2 years, the North County Line Road community has reported 17 fire incidents; the majority of these incidents were grass, brush, or dumpster fires in rural/urban or suburban areas.

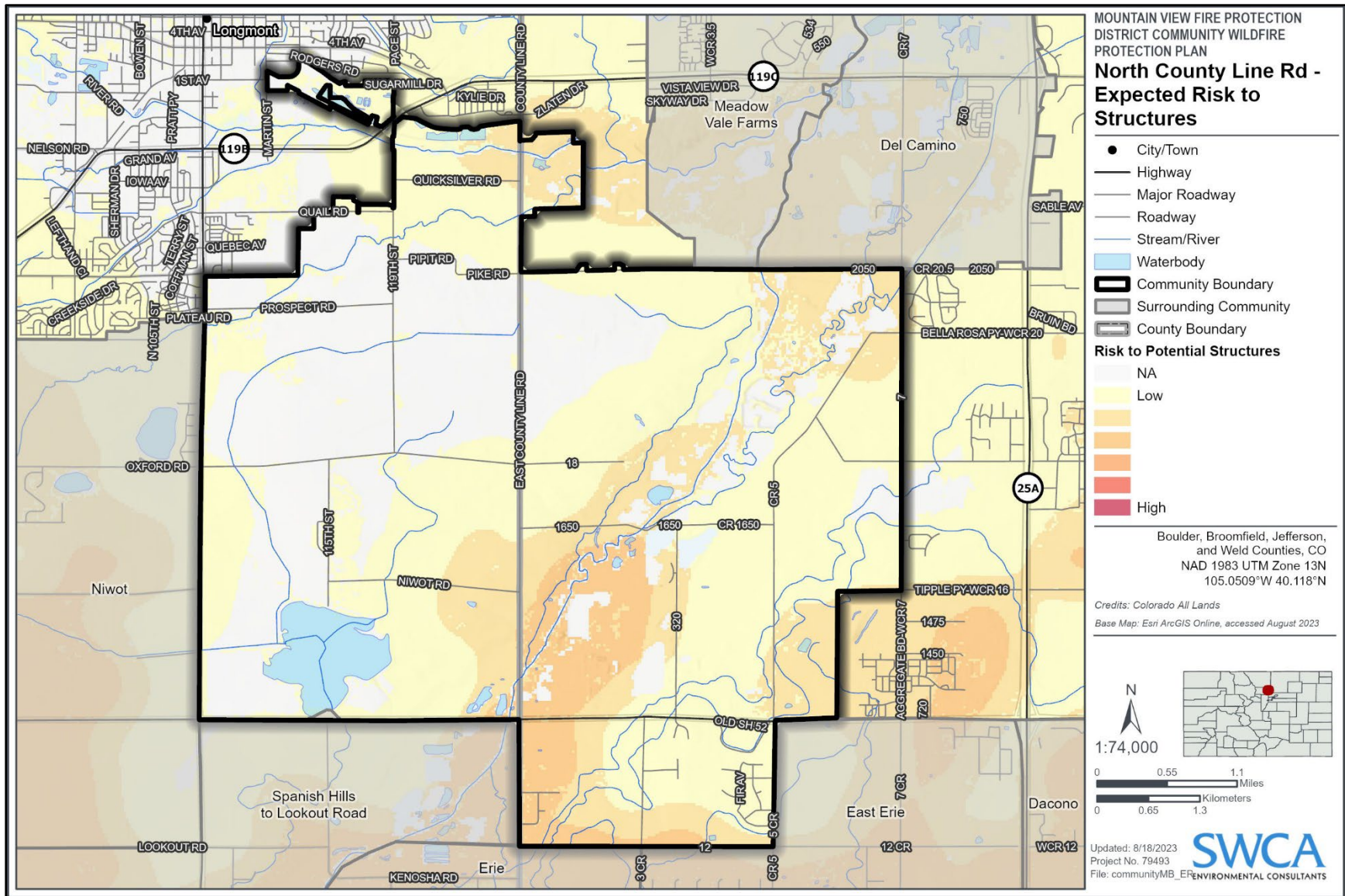


Figure 3.17. Quantitative Risk Assessment for the North County Line Road community.

NORTHEAST MEAD

The Northeast Mead community is in the northeastern portion of the district and occupies approximately six square miles of the Planning Area. The dominant fuel type is nonburnable agricultural (NB3), and the community is home to 247 buildings. The building density is 41 units per square mile. The Quantitative Risk Assessment results show a low expected risk to structures within the community (Figure 3.18). Within the last 2 years, the Northeast Mead community has reported four fire incidents; the majority of these incidents were grass or dumpster fires in rural/urban or suburban areas.

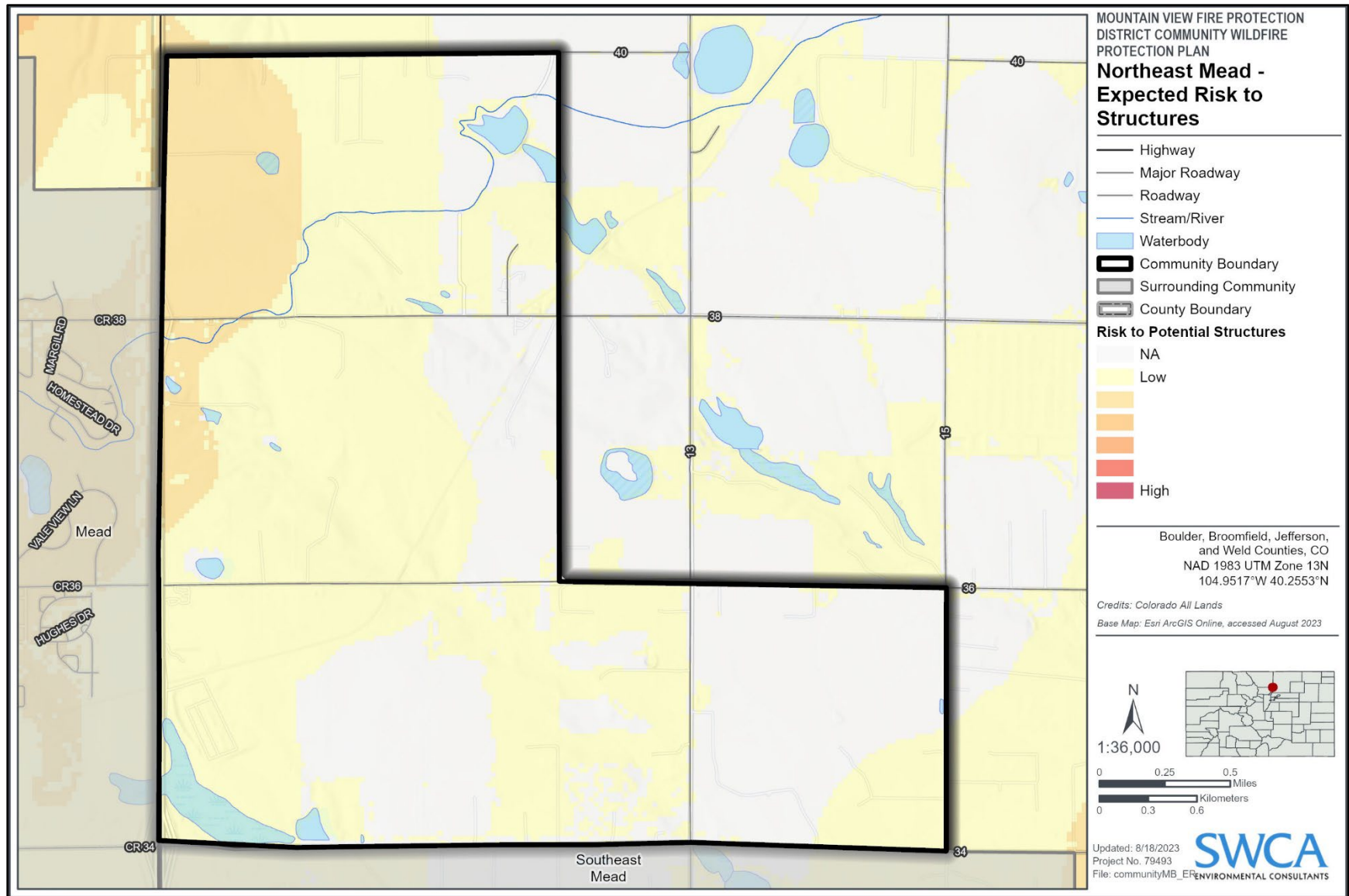


Figure 3.18. Quantitative Risk Assessment for the Northeast Mead community.

SOUTHEAST MEAD

The Southeast Mead community is in the northeastern portion of the district and occupies approximately 18 square miles of the Planning Area. The dominant fuel type is nonburnable agricultural (NB3), and the community is home to just over 1,050 buildings. The building density is 57 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.19). Within the last 2 years, the Southeast Mead community has reported 22 fire incidents; the majority of these incidents were grass, brush, or dumpster fires in rural/urban or suburban areas.

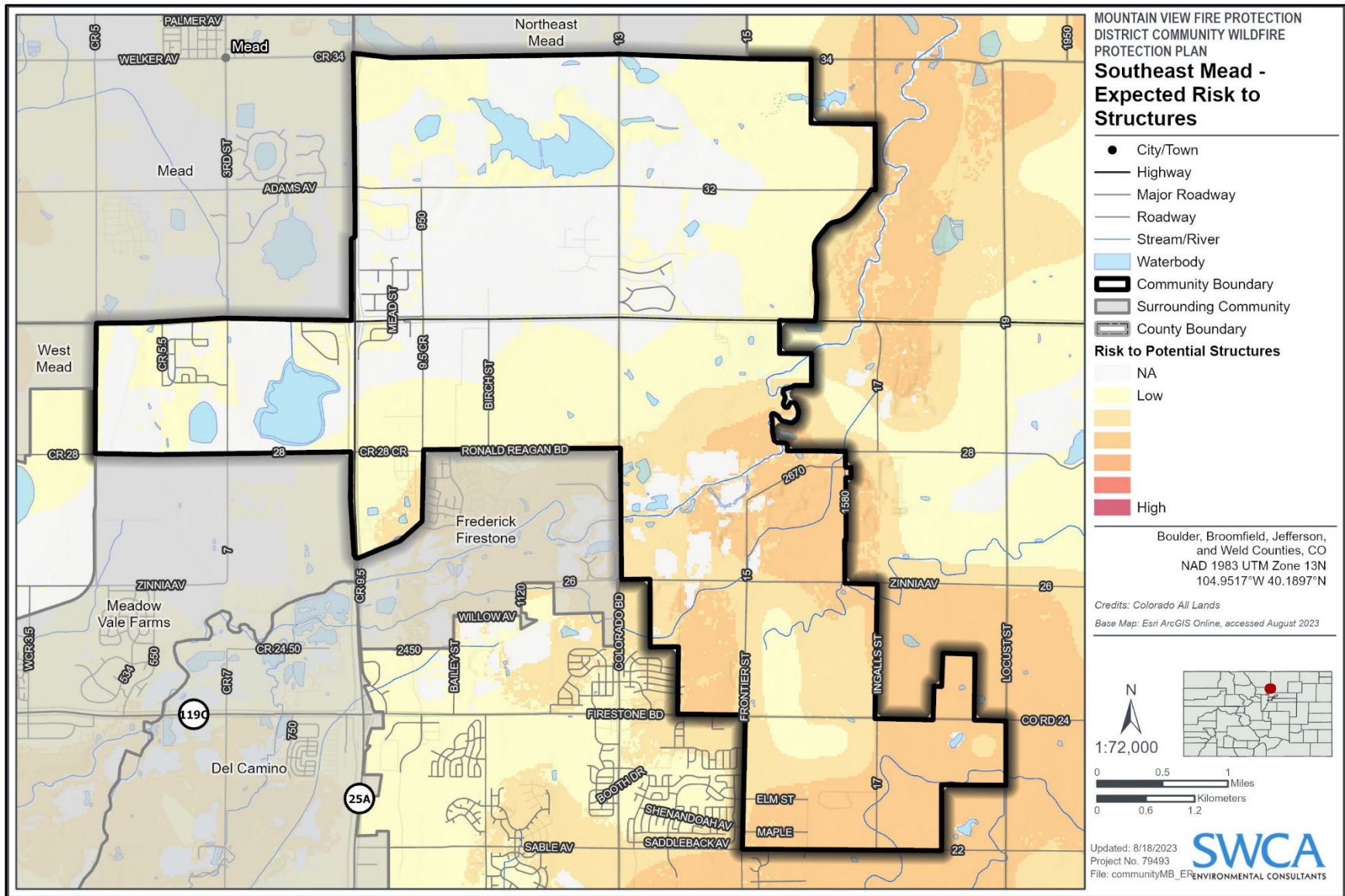


Figure 3.19. Quantitative Risk Assessment for the Southeast Mead community.

WEST MEAD

The West Mead community is in the eastern portion of the district and occupies approximately 16 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 1,050 buildings. The building density is 64 units per square mile. The Quantitative Risk Assessment results show a medium to low expected risk to structures within the community (Figure 3.20). Within the last 2 years, the West Mead community has reported 17 fire incidents; the majority of these incidents were brush or brush-and-grass fires in rural/urban or suburban areas.

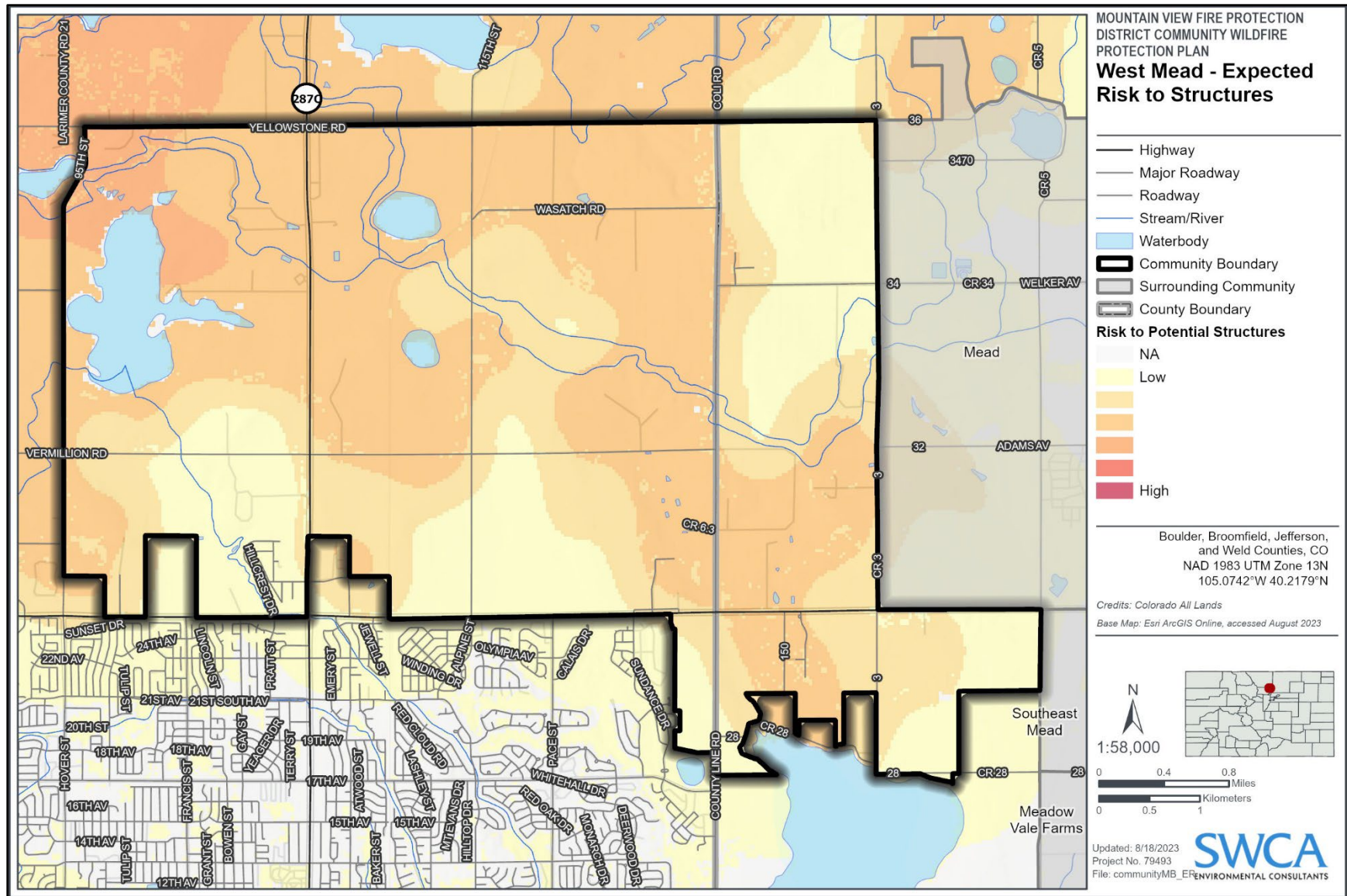


Figure 3.20. Quantitative Risk Assessment for the West Mead community.

SPANISH HILLS TO LOOKOUT ROAD

The Spanish Hills to Lookout Road community is in the southern portion of the district and occupies approximately 24 square miles of the Planning Area. The dominant fuel type is low load, dry climate grass (GR2), and the community is home to just over 3,000 buildings. The building density is 126 units per square mile (Figure 3.21). The Quantitative Risk Assessment results show a medium expected risk to structures within the community. Within the last 2 years, the Spanish Hills to Lookout Road community has reported 26 fire incidents; the majority of these incidents were grass, brush, or dumpster fires in rural/urban or suburban areas.

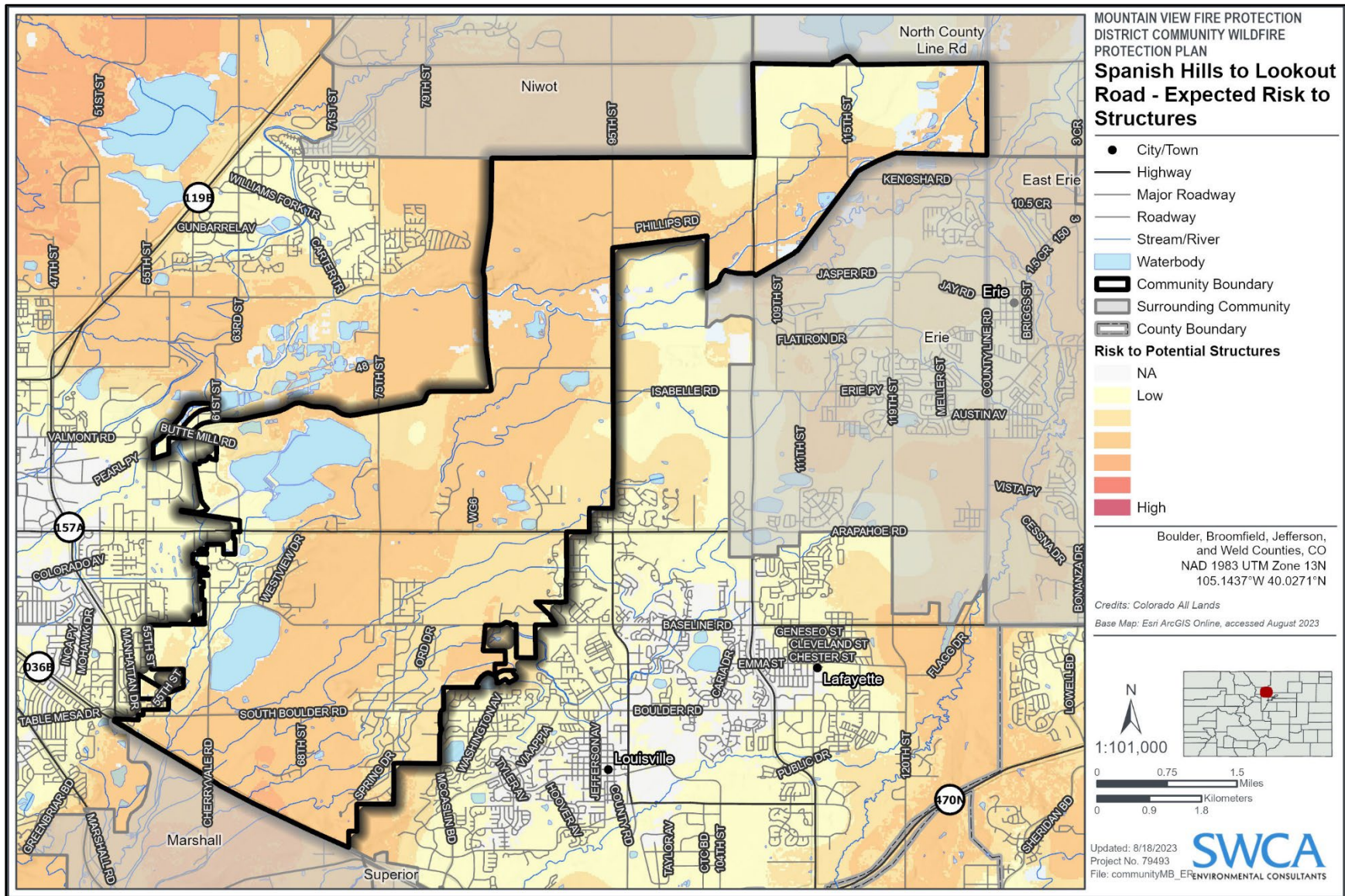


Figure 3.21. Quantitative Risk Assessment for the Spanish Hills to Lookout Road community.

SUPERIOR

The Superior community is in the south-central portion of the district and occupies approximately 4 square miles of the Planning Area. The dominant fuel type is burnable developed areas (BU1), and the community is home to just over 3,350 buildings. The building density is 849 units per square mile. The Quantitative Risk Assessment results show a medium expected risk to structures within the community (Figure 3.22). Within the 2 two years, the Superior community has reported 11 fire incidents; these incidents include grass, brush, forest/woods, or dumpster fires in rural/urban or suburban areas. Additionally, it is important to note the higher risk to potential structures present in open spaces west of the community. Due to the prevailing westerly winds of the area, these open spaces can contribute to heightened wildfire risk under certain weather scenarios.

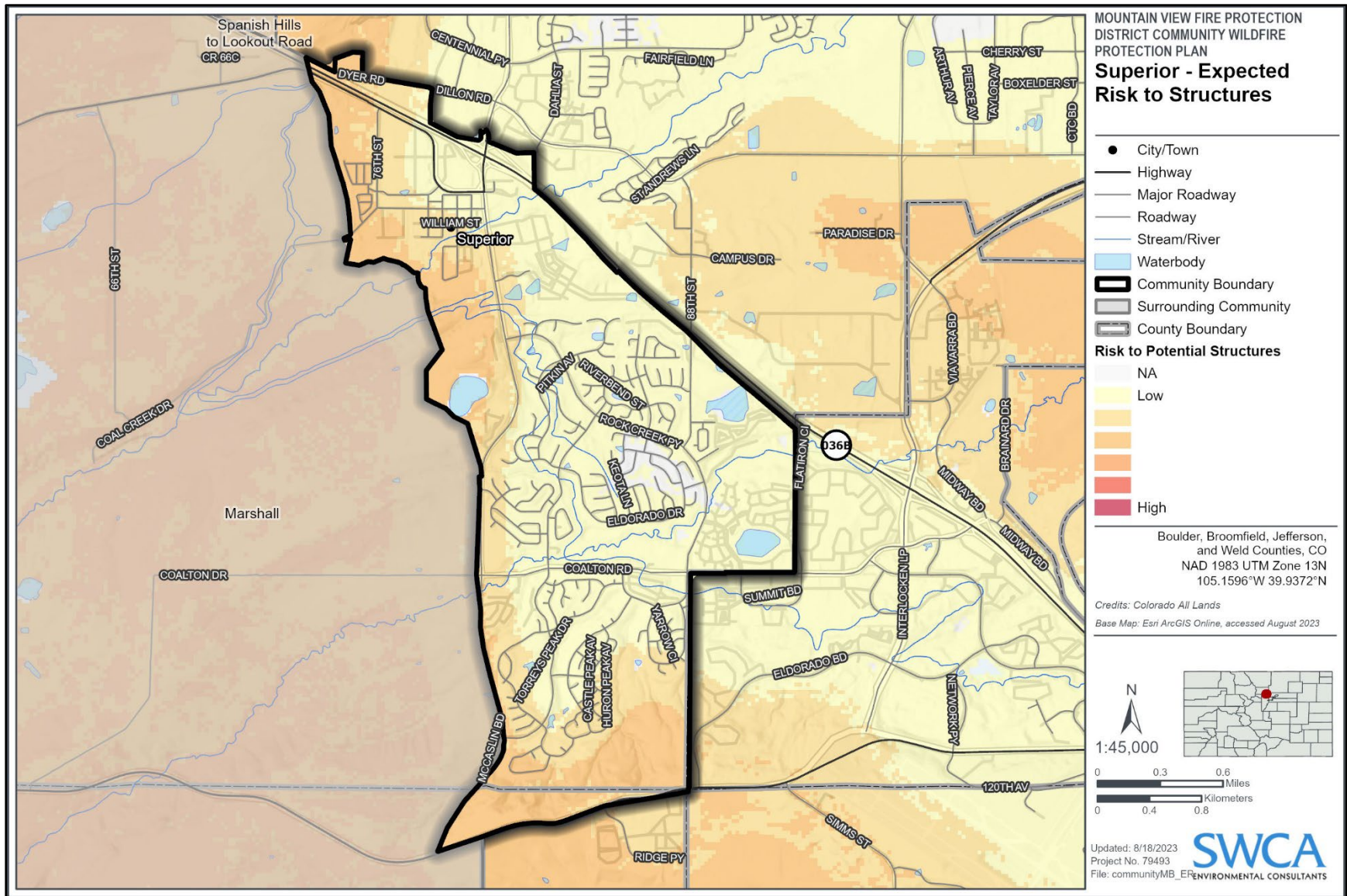


Figure 3.22. Quantitative Risk Assessment for the Superior community.

SOCIALLY VULNERABLE POPULATIONS

It is essential to identify socially vulnerable populations accurately and comprehensively within the Mountain View FPD when considering wildfire risk. Such populations can be assessed using a social vulnerability index (SVI), which approximates the social vulnerability of a location based on multiple indicators (Figures 3.23–3.27). Wildfire can disproportionately affect the underserved because of factors such as inadequate housing, social exclusion, lack of property, and inability to evacuate effectively (Fothergill and Peek 2004). Furthermore, those with fewer assets and lower financial security will have less ability to absorb losses and maintain resilience to additional hazard impacts. Other vulnerable groups include individuals with disabilities and the elderly, who often face additional hardships regarding evacuations and elevated health impacts from smoke inhalation (Palaiologou et al. 2019). Note: SVI is based on survey responses and subject to sampling error and response biases.

It is important to acknowledge that socially vulnerable populations exist throughout the Planning Area, and while vulnerable populations may not reside in the WUI, this does not exclude them from wildfire hazard impacts. Large wildfires can be transboundary in nature and may negatively impact many different demographic groups over varying time scales (Palaiologou et al. 2019). Therefore, it is important that local land managers, fire response agencies, and community resource groups are prepared to mitigate wildfire hazards in vulnerable communities and establish programs to help those that are the most susceptible to drastic life changes due to a wildfire disaster.

Socially vulnerable populations were considered while drafting this plan through public engagement and outreach; however, this CWPP does not attempt to identify all the socially vulnerable populations in the Mountain View FPD. Additional information on how wildfire may affect socially vulnerable populations can be found at Wildfire Risk to Communities here: <https://wildfirerisk.org/>

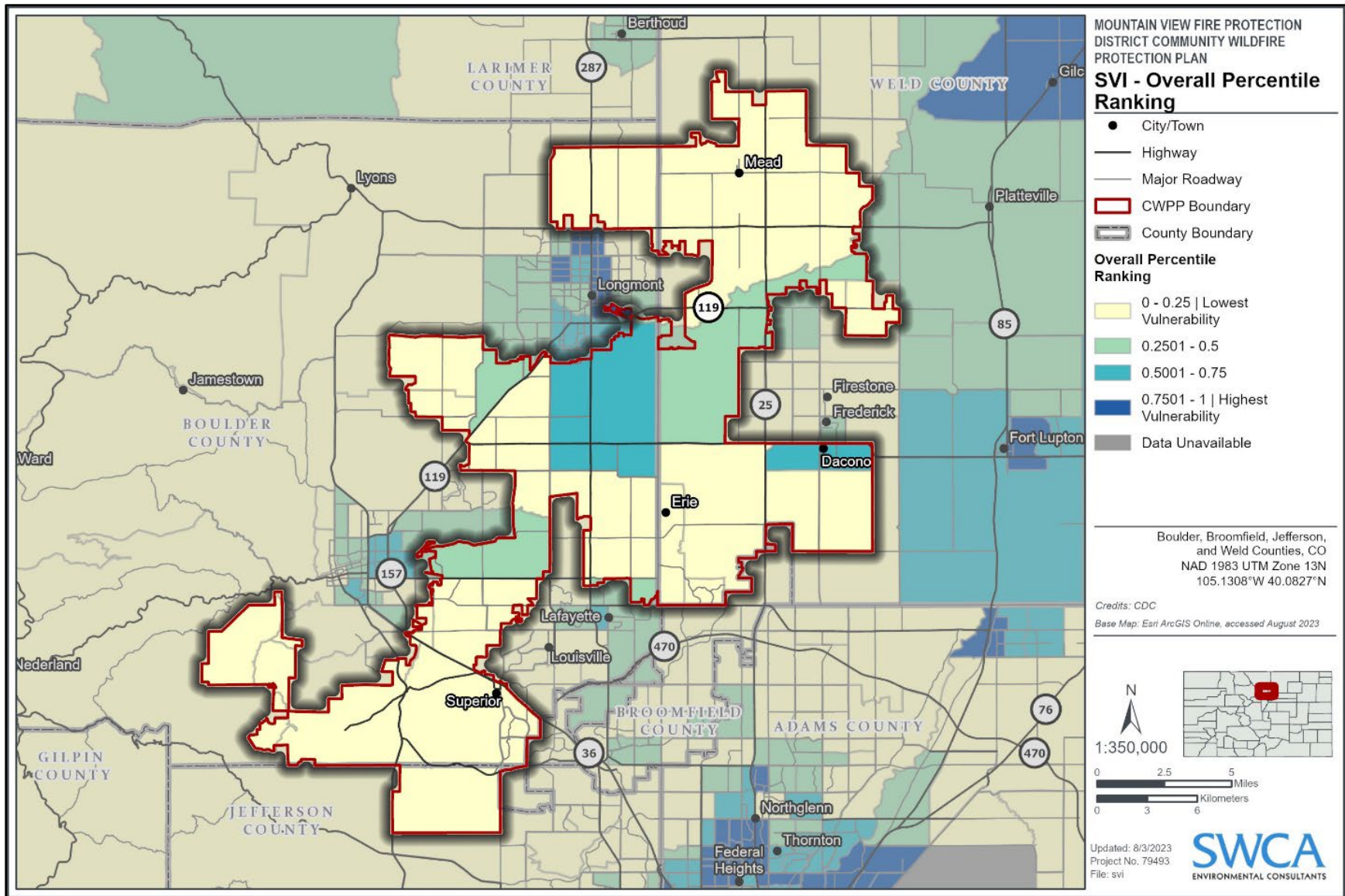


Figure 3.23. Overall SVI percentile ranking for the Mountain View FPD (source: Centers for Disease Control and Prevention 2023).

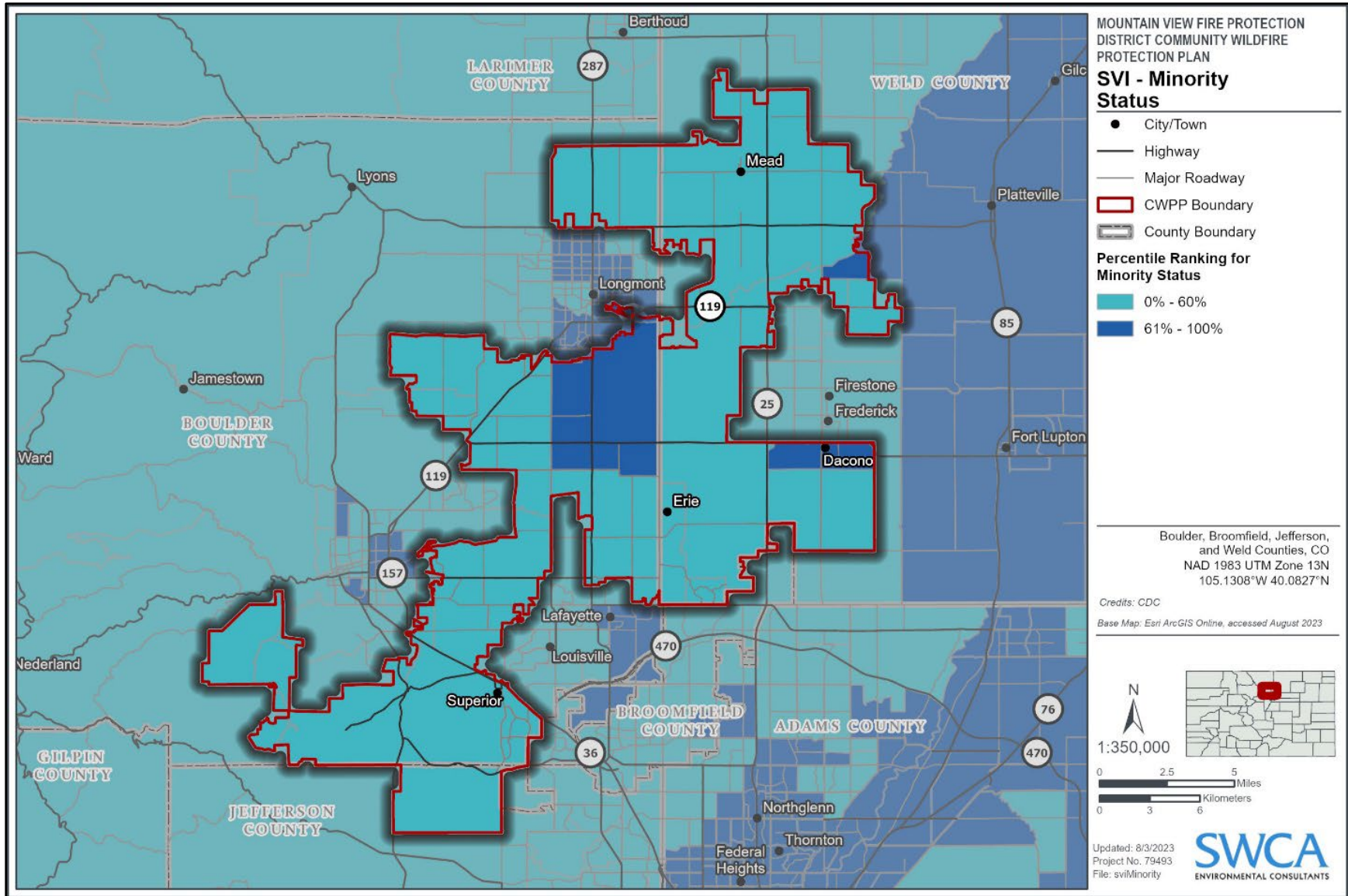


Figure 3.24. Minority status (non-white) SVI for the Mountain View FPD (source: Centers for Disease Control and Prevention 2023).

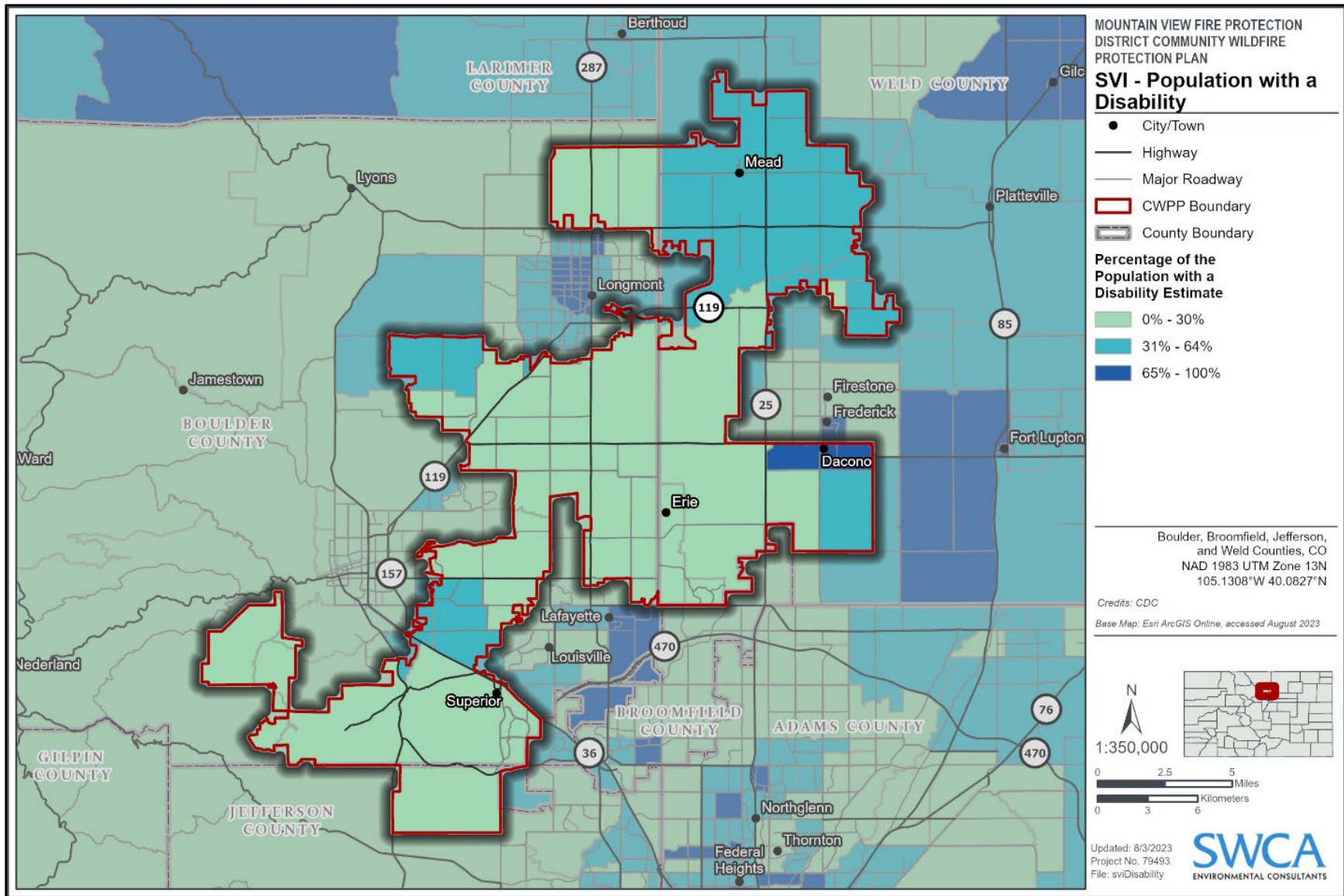


Figure 3.25. Estimated percentage of the population with a disability SVI for the Mountain View FPD (Source: Centers for Disease Control and Prevention 2023).

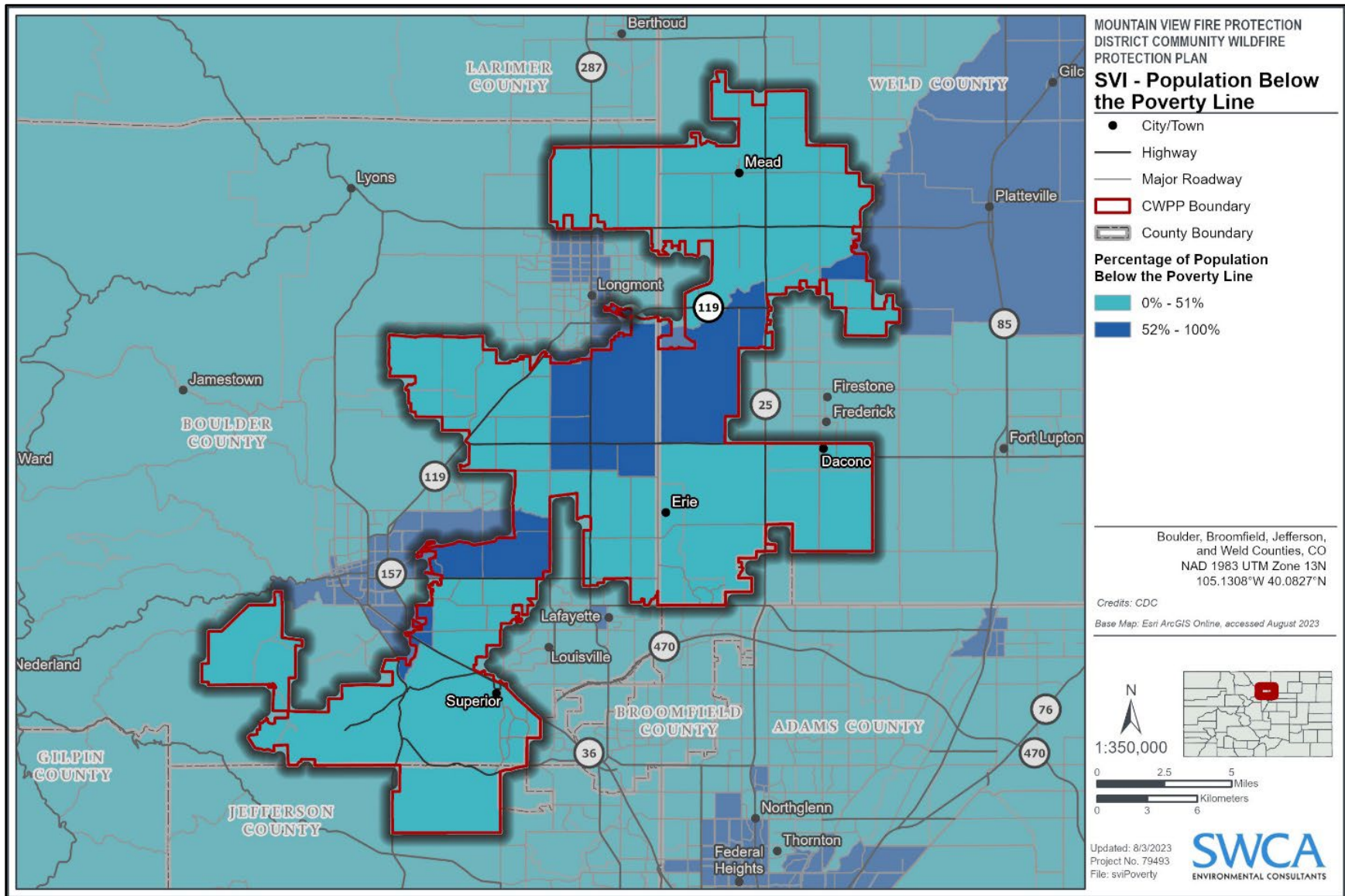


Figure 3.26. Percentage of population below the national poverty line SVI for the Mountain View FPD (Source: Centers for Disease Control and Prevention 2023).

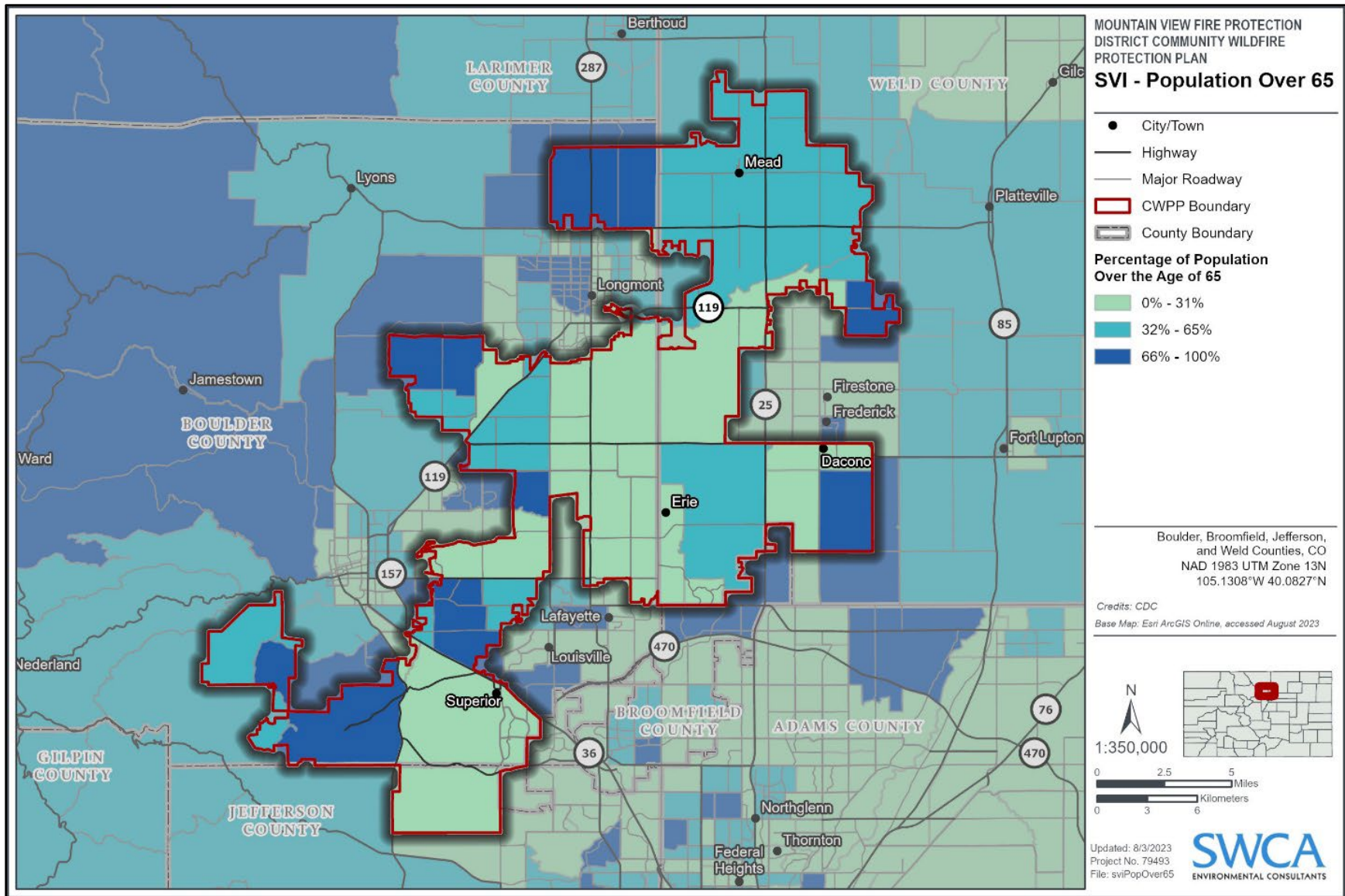


Figure 3.27. Percentage of the population over the age of 65 SVI for the Mountain View FPD (Source: Centers for Disease Control and Prevention 2023).

HIGHLY VALUED RESOURCES AND ASSETS

Highly Valued Resources and Assets (HVRAs) are commonly included in wildfire risk assessments to determine how wildfire hazards influence wildfire risk to different assets across a landscape and within communities. The COAL Quantitative Risk Assessment utilizes HVRAs for determining wildfire risk, and this approach has been integrated within the Mountain View FPD CWPP. The HVRAs included in the COAL quantitative risk assessment were determined for the state of Colorado by an interagency group of statewide representatives and wildfire experts during a two-part fire effects workshop held in July 2021.

HVRAs were identified based on readily available national spatial datasets that were evaluated for response to wildfire. Additionally, Line Officers, Area Fire Management Officers, and interagency leadership placed relative importance (RI) values on each HVRA for the purpose of weighting and ranking HVRAs (Figure 3.28). RI allows all of the HVRAs to be combined into a single, weighted, data product called Expected Transmitted Risk (Figure 3.29) where total wildfire risk for all values can be viewed on a spectrum of least to greatest. Through the incorporation of burn probability and HVRAs, the Expected Transmitted Risk map shows the likelihood of ignitions and the resulting consequences under iterative wildfire simulations (see Appendix C for detailed modeling methodology).

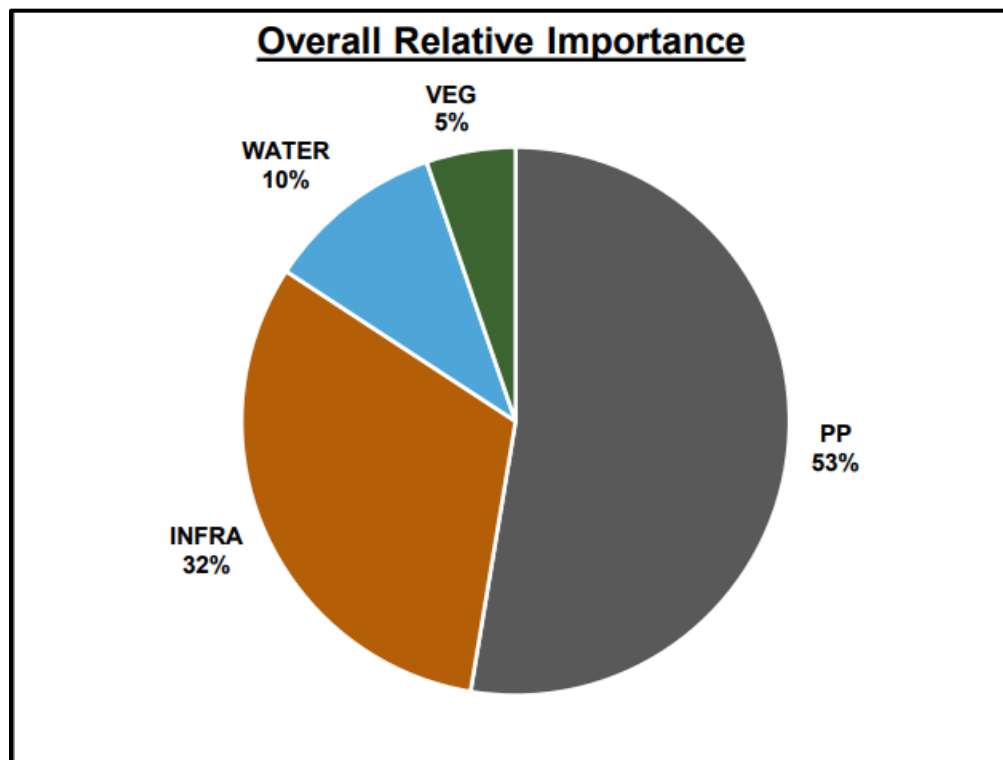


Figure 3.28. Overall RI weighting (ranking) of collaboratively determined HVRAs for the state of Colorado (Reference: Pyrologix 2022c)

The resources and assets included in the risk analysis for the COAL quantitative risk assessment and incorporated into the Expected Transmitted Risk data product within this CWPP are people and property, infrastructure, water, and vegetation. See below for a brief explanation of each HVRA.

- **People and Property (PP)** – This data represents housing data calculated from building footprints and U.S. Census Bureau 2018 county population estimates and census block level datasets.
- **Infrastructure (INFRA)** – This data represents high- and low-voltage electric transmission lines, communication sites, and power infrastructure (power plants and substations) all sourced from the Homeland Infrastructure Foundation-Level Data (HIFLD) program.
- **Water** – This data represents surface drinking water protection areas sourced from the EPA Source Water Protection Area program. Potential watershed impacts were evaluated based on intake location and population served.
- **Vegetation (VEG)** – This data represents ecosystem function sourced from LANDFIRE’s 2016 biophysical setting layer.

It is important to note that many Colorado CWPPs use the same HVRA datasets and RI weighting. This allows for accurate comparisons and sharing of solutions across jurisdictions. Net value change (NVC) analyses for each individual HVRA are available from the COAL dataset, allowing local fuel planners to design future projects using more specific datasets as they pertain to their treatment area. For the purposes of this CWPP, the Expected Transmitted Risk is included to represent the wildfire risk to all HVRAs across the Mountain View FPD combined. (Figure 3.29).

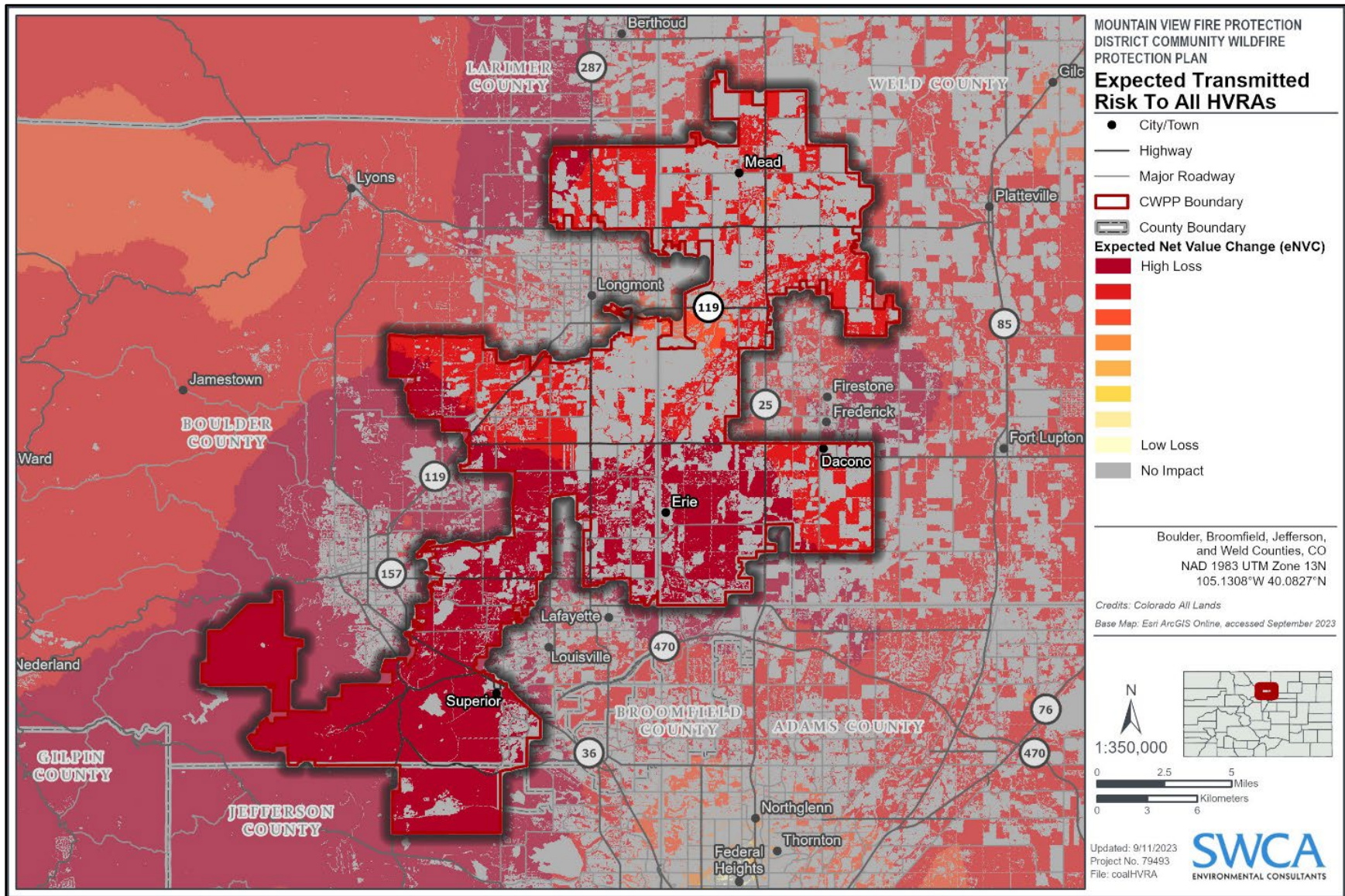


Figure 3.29. A map of Expected Transmitted Risk to all HVRAs symbolizing expected net value change on a relative scale.

VALUES AT RISK

Earlier compilation of the critical infrastructure in the Planning Area, coupled with public outreach and Core Team input, has helped in the development of a list of values at risk (VARs) from wildland fire. These data are also supplemented with the COAL HVRA data explained above. The public was encouraged to provide additional VARs via a public survey hosted on the project ArcGIS Hub Site. Based on feedback provided, this section and the associated mapping was revised.

In addition to critical infrastructure (see Maps H.8–H.10 in Appendix H), VARs can also include natural, cultural, and socioeconomic resources (see Maps H.5, H.6, and H.7, respectively). It is important to note that although an identification of VARs can inform treatment recommendations, a number of factors must be considered in order to fully prioritize areas for treatment; these factors include treatment type, land ownership constraints, locations of ongoing projects, available resources, and other physical, social, or ecological barriers to treatment.

The scope of this CWPP does not allow determination of the absolute natural, socioeconomic, and cultural values that could be impacted by wildfire in the Planning Area. In terms of socioeconomic values, the impact due to wildfire would cross many time scales and sectors of the economy and call upon resources locally, regionally, and nationally.

NATURAL VALUES AT RISK

The CWPP Planning Area has a variety of natural resources of particular concern to land managers, such as endangered species habitats, surface water and aquatic resources, hiking trails, and listed plant and wildlife species (see Map H.5). Public outreach throughout the district has emphasized the importance of protecting natural/ecological values to the general public (Figure 3.30), and therefore, these resources are included among the prioritized actions for wildfire mitigation. Examples of natural values identified by the public and the Core Team include the following:

- Local parks and open spaces
- Trail systems
- Agricultural land
- Scenic viewsheds
- Critical habitat for wildlife



Figure 3.30. Example of a natural VAR in the Mountain View FPD, a waterbody.

SOCIOECONOMIC VALUES AT RISK

Socioeconomic values include population, recreation, infrastructure, and the built environment (Figure 3.31; see Map H.7 in Appendix H). Socioeconomic values are particularly important within Mountain View FPD because a large portion of housing falls within the WUI/GUI. Examples of socioeconomic values include the following:

- Communications infrastructure (e.g., cell phone and radio towers)
- Tourism values (e.g., restaurants and recreational facilities)
- Schools
- Public safety infrastructure
- Public works (e.g., transmission lines, railroads, pipelines, and landfills)
- Highways
- Grocery and hardware stores
- Social support structures
- Care homes, senior housing, day care, and other group homes
- Water storage
- Recreation sites (e.g., campgrounds, trails, parks)



Figure 3.31. Example of a socioeconomic VAR in the Mountain View FPD, a recreation site.

CULTURAL VALUES AT RISK

Many historical landmarks, cultural resource districts, and cemeteries are scattered throughout the Mountain View FPD (see Map H.6). Examples of cultural VARs (Figures 3.32 and 3.33) that have been identified by the Core Team and the public in the CWPP Planning Area are the following:

- Wise Homestead Museum
- Dougherty Museum
- Historic Valmont School House 1911
- Old homesteads
- Historic buildings
- National Register of Historic Places sites



Figure 3.32. Example of a cultural VAR, Wise Homestead Museum in Weld County.

Source: <https://www.eriehistoricalsociety.org/erie-wise-homestead-museum/>



Figure 3.33. Example of a cultural VAR, Dougherty Museum in Weld County.



CHAPTER 4 – MITIGATION STRATEGIES

This chapter provides project recommendations, implementation guidance, and conceptual fuel treatment recommendations. A comprehensive mitigation strategy not only includes recommendations to mitigate wildfire hazards but also actions to improve preparedness and resiliency. This well-rounded approach involves being prepared both pre- and post-fire. Past planning efforts can be found in Appendix A, and post-fire response and rehabilitation information can be found at the end of this chapter and in Appendix F.

This plan has been aligned with the Wildland Fire Leadership Council's National Cohesive Strategy and its Phase III Western Regional Action Plan by adhering to the nationwide goal:

“To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and collectively, learn to live with wildland fire.” (Forests and Rangelands 2014:3).

Thus, CWPP recommendations have been structured around the three main goals of the Cohesive Strategy: resilient landscapes; fire-adapted communities; and safe, effective, risk-based wildfire response. Many of the recommendations listed can be implemented at the homeowner or community level (homeowner resources can be found in Appendix E). Projects requiring large-scale support can be prioritized based on the COAL Quantitative Risk Assessment detailed in Appendix C and funding resources summarized in Appendix I.

Recommendation matrixes are used throughout this chapter to serve as an action plan for implementation. Recommendations adhere to the minimum requirements for CWPPs established by the CSFS (2022) and have been aligned with the strategies in the 2020 Colorado Forest Action Plan (CSFS 2020) wherever possible.

COHESIVE STRATEGY GOAL 1: RESILIENT LANDSCAPES

Goal 1 of the National Cohesive Strategy is Resilient Landscapes: Landscapes, regardless of jurisdictional boundaries are resilient to fire, insect, disease, invasive species and climate change disturbances, in accordance with management objectives (CSFS 2022).

“Sustaining landscape resiliency and the role of wildland fire as a critical ecological process requires a mix of actions that are consistent with management objectives. The West will use all available methods and tools for active management of the landscape to consider and conserve a diversity of ecological, social, and economic values. The West will coordinate with all partners and seek continued stakeholder engagement in developing market-based, flexible and proactive solutions that can take advantage of economies of scale. All aspects of wildland fire will be used to restore and maintain resilient landscapes. Emphasis will be placed on protecting the middle lands near communities.” (Western Regional Strategy Committee [WRSC] 2013:14).

In this CWPP, recommendations to restore and maintain landscapes focus on vegetation management, hazardous fuel reduction, and restoration.

RECOMMENDATIONS FOR HAZARDOUS FUEL REDUCTION

Fuels management of both public and private land in the WUI/GUI is essential to reducing risk to homes during a wildfire event, as well as meeting the criteria of the National Cohesive Strategy Goal 1. Research has shown how fuel treatments in the WUI can change fire behavior to support suppression activities and protect homes (Evans et al. 2015). The importance of fuels management is reflected in policy at the federal level, with the HFRA requiring that federal land management agencies spend at least 50% of their fuels reduction funds on projects in the WUI.

In the Mountain View FPD and surrounding region, specifically the southwestern portion of the district, land managers have been conducting fuel thinning projects on tall shrub and forested fuels and implementing prescribed herbivory (grazing) in grassland open spaces (Figure 4.1). This information is derived from DFPC, CSFS, Team Rubicon, and USFS. Refer to agency websites and the [Federal Register](#) for the latest information regarding planned or ongoing actions on adjacent public land (see Figure 4.1). Homes in WUI areas that are delineated as high risk should be assessed for defensible space and structural ignitability. These assessments can help inform and prioritize homeowner actions and future fuel treatment planning efforts.

See Appendix D, Fuel Treatment Types and Methods, and Appendix E, Homeowner Resources.

Recommendations included in Table 4.1 are written to be geospatially broad and can be implemented in various communities and spatial contexts depending on available funding and capacity. When applying fuel treatments, every effort should be made to align treatments with the Colorado State Forest Action Plan (CSFS 2020) with consideration of all appropriate best management practices and sound science. In addition, treatments should be strategically located in areas to maximize effectiveness of other existing and ongoing projects (see Figure 4.1). A list and detailed descriptions of fuels treatment types and methods, including defensible space practices and larger-scale projects, is housed in Appendix D.

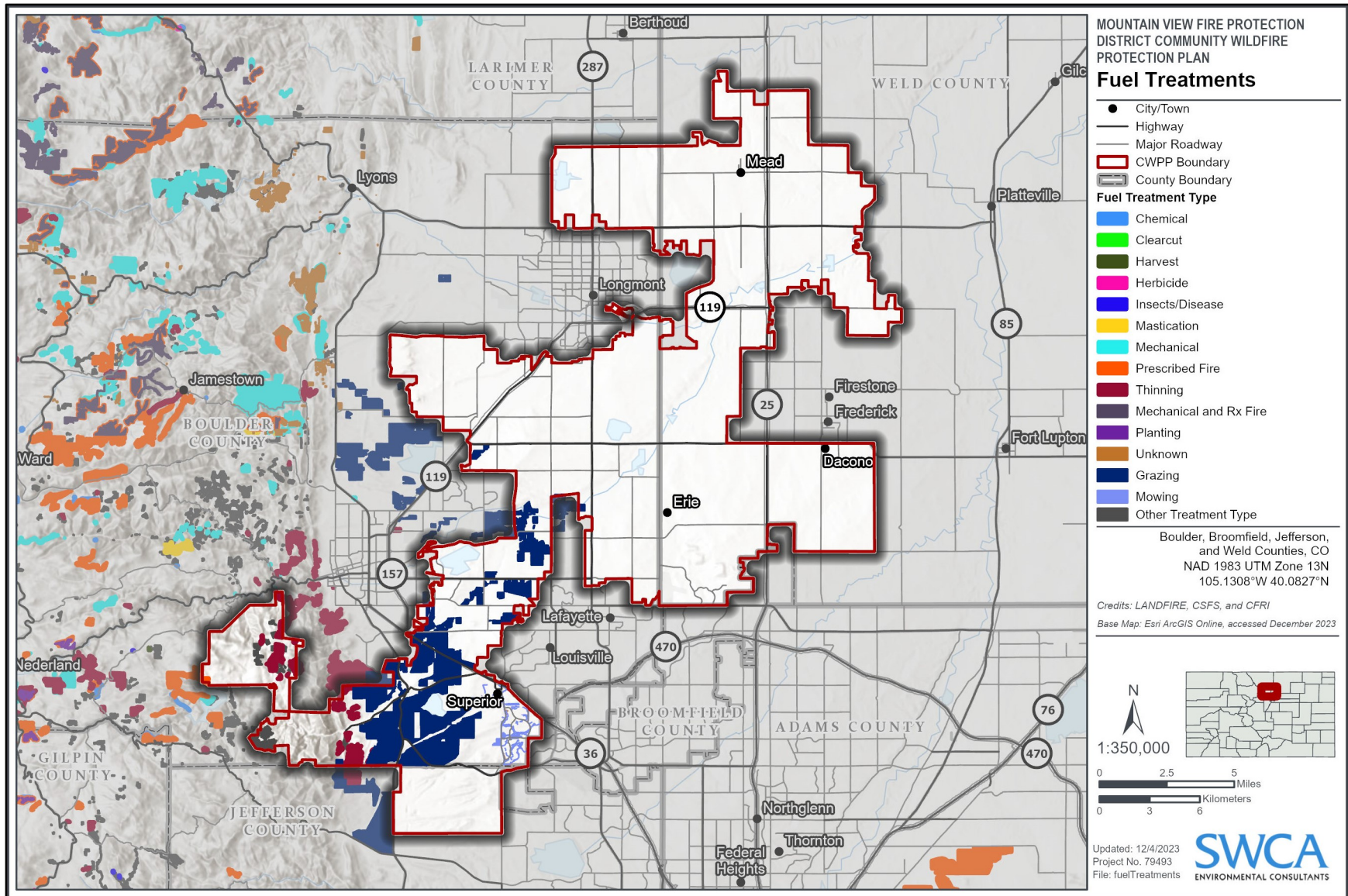


Figure 4.1. Existing fuel treatments across all jurisdictions.

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Table 4.1. Recommendations to Create Resilient Landscapes (Fuel Treatments)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
RL1		H	0–2 years	Implement and prioritize local fuel reduction projects within MVFPD and surrounding lands	MVFPD, prioritizing high risk areas as identified in the risk assessment	MVFPD, with CSFS support and private and federal cooperation.	<p>Utilize PODs for risk management approach where applicable.</p> <ul style="list-style-type: none"> Create a common understanding of risks present throughout MVFPD Strengthen POD boundaries where appropriate Conduct a collaborative workshop to delineate and expand upon the PODs as applicable <p>Utilize mechanical, manual, biological and chemical means to control problematic invasive species, which contribute to hazardous fine fuel loading</p> <p>Build upon prescribed fire program</p> <ul style="list-style-type: none"> Implementation and methods should consider fuels, hazards, and community concerns <p>Collaborate with land management agencies and private landowners to align fuel treatments with the Colorado Forest Action Plan on a landscape scale.</p> <ul style="list-style-type: none"> Break down plans into high-risk communities to prioritize efforts. Collaboratively identify vegetation and fuels management needs based on risk assessment and input from local officials and land managers, utilizing mechanical, manual, or biological methods. Implement shaded fuel breaks, reduce ladder fuels, promote cross-boundary actions, target vacant lots with vegetation, and provide incentives for private landowners to participate in fuel reduction projects. Utilize PODs as a pre-planning framework in developing wildfire projects where applicable. 	<p>Reduce wildfire risk in and around the FPD WUI.</p> <p>Collaboratively design fuel treatments for multi-use benefit</p>	<p>Yearly maintenance and monitoring of post-treatment conditions</p> <p>Frequent communication, collaboration, and cooperation with landowners.</p> <p>Monitor and treat invasive species.</p> <p>Continued management of fire breaks maintained by grazing, brush breaking, controlled burns.</p> <p>Record number of acres treated (by fuel type, treatment method)</p>	<ul style="list-style-type: none"> Environmental Quality Incentives Program (EQIP) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
RL2		H	0-2 years	Mitigate hazardous fuels on private lands using a range of treatment types	Private lands within MVFPD, prioritizing highest risk communities as identified in the assessment.	Private, Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), MVFPD, CSFS, federal agencies, County Wildfire Councils, CSU Extension	<p>Strategic placement of fuel treatments and fuel breaks on private lands will help to limit the spread of wildland fire and increase access to difficult areas.</p> <p>Fuel break prescriptions should be site-specific depending on the fuel type, topography, soils, adjacent land management practices and environmental regulations.</p> <p>When possible and if solicited, agencies should work with private landowners to provide technical guidance in the implementation of projects.</p> <ul style="list-style-type: none"> Create an educational tool/handout for land/property owners focused on various methods, techniques, and cost for various fuel treatments. 	<p>Protect life and property by mitigating fuels, providing defensible space for firefighters protecting structures.</p> <p>Create a fuel arrangement unlikely to support crown fire or fast rates of spread.</p> <p>Reduce the risk of home and structure ignitions.</p>	<p>Follow up with post-treatment stabilization practices.</p> <p>Frequent communication, collaboration, and cooperation with landowners.</p> <p>Regular maintenance to ensure the fuel break remains clear of vegetation.</p> <p>Monitor and treat invasive species.</p> <p>Continued management of fire breaks maintained by grazing, brush breaking, controlled burns.</p> <p>Record number of acres treated (by fuel type, treatment method)</p>	<ul style="list-style-type: none"> U.S. Endowment for Forestry and Communities Community Wildfire Defense Grants (CWDG) Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) National Fire Plan (NFP) Grants Building Resilient Infrastructure and Communities (BRIC)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
RL3		H	0–5+ years	Collaborate between private, local, state, and federal partners to plan and conduct cross-boundary fuel treatments	County (private and local) and adjacent state and federally managed lands (i.e., public and private lands, including lands managed by Denver Water). Prioritizing highest risk communities as identified in the assessment <u>Priority areas:</u> Eldorado Springs, Marshall, Superior, and north of Rocky Flats National Wildlife Refuge	MVFPD, Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), local jurisdictions, CSFS, federal agencies, non-profits	<p>Collaboratively identify vegetation and fuels management needs based on the risk-hazard assessment and input from local officials and land managers.</p> <ul style="list-style-type: none"> Locate parcels on private and public lands where targeted fuel treatments can be performed that will connect pre-existing treatments. Develop equipment needs to accomplish work (including maintenance) and seek funding for purchase. Cultivate and support partnerships with NGOs and volunteer groups to support implementation of projects. Consider implementing and maintaining fuel breaks around the boundaries of federally owned land and critical infrastructure. Develop long-term maintenance and monitoring plan with each project, including funding sources. Integrate treatments with POD boundaries as appropriate 	<p>Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI.</p> <p>Create and maintain accountability with local landowners/managers.</p>	<p>Arrange a standing multi-agency meeting each year to review accomplishments and address future needs.</p> <p>Perform defensible space inspections.</p> <p>Monitor and treat invasive species annually.</p> <p>Utilize project tracker to document updates for stakeholders and other entities throughout the project's lifetime.</p>	<ul style="list-style-type: none"> Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) GSA Federal Excess Personal Property (FEPP) Firewise Grants BRIC Regional Catastrophic Preparedness (RCP) grants Fire Prevention and Safety (FP&S) Grants (FEMA) Community Wildfire Defense Grants (CWDG)
RL4		H	0–10 years	Conduct post-wildfire restoration work in areas impacted by fire in recent years (ex. Marshal Fire)	Areas of MVFPD impacted by recent fire. This should be prioritized in areas of concern.	MVFPD, USFS, private, CSFS, local jurisdictions	<p>Efforts should focus on post-wildfire landscape rehabilitation in urban areas with elevated risk to postfire impacts in the WUI and important watersheds</p> <ul style="list-style-type: none"> Conduct regular post-fire monitoring efforts. Track /vegetation recovery and succession. Utilize management interventions in degraded areas to ensure successful recovery (e.g., monitor and control for invasive plants, plant native plants in areas experiencing erosion). Conduct public outreach and education concerning post-wildfire hazards (e.g., falling trees, heightened flooding risk, and higher likelihood of road washout). Consider fuel reduction projects in WUI areas with considerable slash and blow down to reduce potential for future wildfire as recovery is ongoing. Determine current status of completed BAER and BAR work and assess needs for future efforts. 	Aid in restoration and rehabilitation of landscape impacted by wildfire.	<p>Regular monitoring of post-fire environment.</p> <p>Committed long term effort to tracking post-wildfire recovery and assessing post-wildfire risks.</p> <p>Assessment of WUI and watersheds at risk in the post-fire environment</p>	<ul style="list-style-type: none"> Forest Restoration & Wildfire Risk Mitigation (CSFS) U.S. Endowment for Forestry and Communities Colorado Healthy Forests and Vibrant Communities Act Environmental Quality Incentives Program (EQIP) Red Cross: Disaster Relief and Recovery Services Red Cross Before, During & After Wildfire

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
RL5		M	0–5 years	Reduce the potential for wildfire ignitions along roadways	MVFPD. Focus on primary transportation corridors	CDOT for Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), private companies, federal agencies	<p>Road ROW vegetation improvements:</p> <ul style="list-style-type: none"> Frequent maintenance of ROW vegetation Treat surface fuels within a minimum of a 10-foot buffer and up to 30 feet where possible. Focus on fine/flashy fuels on roadsides, especially invasive plants. Create a secondary roads maintenance and safety initiative aimed at reducing fire hazards and enhancing ecological health. Treat fuels in non-paved parking areas and pull-offs to reduce potential for unintentional grass/weed fires. Trim fuels (ladder fuels/overhanging vegetation) to allow safe passage of emergency vehicles and to prevent potential for entrapment. Control for roadside invasive species that may contribute to rapid fire spread or ignitions (i.e., weeds and grasses). Consider the use of herbicide. 	<p>Reduce roadside wildfire risk and hazards</p> <p>Reduce number of human- caused wildfire ignitions</p> <p>Provide improved ingress/egress capabilities during wildfire</p>	Yearly maintenance and monitoring of roads	<ul style="list-style-type: none"> BRIC NFP RCP Firewise Grants Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) CDOT (Boulder, Broomfield, Jefferson, and Weld Counties)
RL6		M	1–5 years	Address hazardous fuels along ditches, irrigation channels and riparian corridors in coordination with ditch companies	MVFPD. Prioritize ditches, irrigations channels, and riparian areas that have experience fuel buildup.	Ditch companies, counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), private landowners, companies, public landowners.	<p>MVFPD to collaborate with ditch companies, landowners, corporations, and jurisdictions to delineate areas along ditches, irrigation channels and riparian corridors for potential treatment based on compliance requirements and suitability.</p> <ul style="list-style-type: none"> Conduct a thorough assessment of hazardous fuel conditions. Develop understanding of resource needs and build capacity to carry out projects as necessary Implement a combination of mechanical, chemical, biological and manual methods to clear and maintain vegetation along ditches, irrigation channels, and riparian corridors. Prioritize the establishment and maintenance of shaded fuel breaks and reduction of ladder fuels in these sensitive areas. Provide education and outreach programs to promote awareness and involvement of local communities in fuel reduction efforts along ditches, irrigation channels, and riparian corridors. Potential methods or combinations include selective thinning, removal of hazardous snags, removal of dead and downed vegetation, chip and haul, herbivory control (goats, sheep and/or cattle), and prescribed burning <p>Create a full- or part-time position funded by the District and tasked with coordinating wildfire mitigation activities and maintenance for ditches, irrigation channels and riparian corridors across jurisdictions</p> <ul style="list-style-type: none"> Collaborate with the Northern Colorado Fireshed Collaborative to identify opportunities for funding and hiring 	<p>Reduce fuel continuity within communities and create resilient landscapes</p> <p>Restore riparian ecosystem health</p> <p>Provide for safe and effective wildfire response capabilities</p>	<p>As needed; frequent maintenance may be required as vegetation in riparian areas grows quickly</p> <p>Record Number of acres treated (by fuel type, treatment method)</p>	<ul style="list-style-type: none"> BRIC NFP RCP Firewise Grants Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
RL7		H	0–2 years	Conduct fuel reduction projects in open space, targeting grasses and light fuels	Open space and grasslands within MVFPD. Following assessment of feasibility, prioritize treatment in areas of concern and specifically adjacent to areas classified as 'high and extreme risk' in the risk-hazard assessment	MVFPD, state and regional land managers Local/state parks and jurisdictions, water utilities, district properties, ranching and agricultural community, private landowners	<p>Collaboratively identify vegetation and fuels management needs based on the risk/hazard assessment and input from local officials and land managers.</p> <ul style="list-style-type: none"> Consider mechanical and chemical treatments (e.g., mowing and herbicide) Consider the use of prescribed fire Consider the use of biological treatments (ex. Grazing) Develop equipment needs to accomplish work (including maintenance) and seek funding for purchase. <p>Assess open space risk areas and develop a coordinated approach for delineating project areas and conducting fuel reduction projects in these areas.</p> <ul style="list-style-type: none"> Utilize both mechanical and manual methods to target grasses and light fuels, ensuring effective removal and reduction. Implement prescribed burning techniques where appropriate Monitor and maintain fuel reduction areas regularly to prevent fuel accumulation and promote long-term effectiveness. <p>Utilize prescribed herbivory as fuel reduction and maintenance technique in grasslands.</p> <ul style="list-style-type: none"> Implement grazing plans to eliminate dry grass and remove weeds and/or establish irrigation to regreen the parcel. Employ grazing as a solution for treating areas of high concern topography that would be unsafe for hand treatment 	<p>Protect life and property by mitigating fuels and reduce wildfire risk and hazards</p> <p>Reduce fuel loading of fine fuels that could increase wildfire spread to WUI areas.</p> <p>Reduce fuel loading and continuity within and around communities</p> <p>Enhance regional landscape resiliency</p>	<p>Yearly maintenance and monitoring</p> <p>Follow up with post-treatment stabilization practices.</p> <p>Frequent communication, collaboration, and cooperation with landowners.</p> <p>Regular monitoring needed to ensure against environmental damage and invasive species</p> <p>Record number of acres treated (by fuel type, treatment method)</p>	<ul style="list-style-type: none"> Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) GSA Federal Excess Personal Property (FEPP) Firewise Grants BRIC Regional Catastrophic Preparedness (RCP) grants Fire Prevention and Safety (FP&S) Grants (FEMA) Community Wildfire Defense Grants (CWDG)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
RL8		H	0–10 years	Conduct fuel management in and around important water resources and other critical infrastructure	High risk water resources within MVFPD as identified by local practitioners.	MVFPD, Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), CSFS, federal agencies, CFRI, non-profits, Denver Water, Northern Colorado Water, local jurisdictions	<p>Collaborate with hydrologists and land managers to address restoration efforts in valued watersheds and WUI areas to accelerate forest recovery.</p> <p>Identify vulnerable water infrastructure and conduct periodic maintenance, inspection, and monitoring of key water resource infrastructure</p> <ul style="list-style-type: none"> Incorporate vegetation management plan for water resource agencies and organizations <p>Work such as revegetation and tree planting can reduce debris flow risk, flooding risk, erosion, sedimentation, and protect water quality.</p> <ul style="list-style-type: none"> Incorporate Stormwater Pollution Prevention Plan's (SWPPs). Prioritize fuel reduction efforts based on the risk assessment and the significance of the watersheds. <p>Implement watershed mitigation activities, prioritizing maintenance of watershed health and evaluating the effectiveness in protecting the watersheds and adjust as needed.</p> <ul style="list-style-type: none"> Utilize a combination of mechanical, manual, biological and chemical fuel management. Consider prescribed fire in and around the watersheds. Coordinate with water resource agencies to ensure that fuel management activities do not negatively impact water quality or availability. Provide public outreach programs to increase understanding of fuel management and watershed health. 	<p>Protect water resources by mitigating fuels and reduce wildfire risk and hazards</p> <p>Aid in the protection and restoration of water resources impacted by wildfire.</p>	<p>Regular monitoring of post-fire environment.</p> <p>Assessment of WUI and water resources at risk in the post-fire environment</p> <p>Record Number of acres treated (by fuel type, treatment method)</p>	<ul style="list-style-type: none"> Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) GSA Federal Excess Personal Property (FEPP) Firewise Grants BRIC Regional Catastrophic Preparedness (RCP) grants Fire Prevention and Safety (FP&S) Grants (FEMA) Community Wildfire Defense Grants (CWDG)

Note: See Appendix A to consult relevant regulations and past planning efforts, Appendix D for fuel treatment methodologies, and Appendix F for post-fire recovery and restoration.

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Priority Areas of Concern

To better prioritize resilient landscape recommendations, areas of concern have been delineated using a variety of mapping products including expected risk to structures, WUI/GUI, wildfire hazards, fuel models, probability of control, and aerial imagery (Figure 4.2). High-priority areas of concern are places with high fuel loading, expansive WUI, high wildfire risk, and valuable assets such as energy infrastructure.

Lower-priority areas are often areas where the probability of control is high and where the expected risk to structures is moderate to low. These areas are often made up of dispersed developments with light fuels such as grass. However, high winds and ignition hazards can quickly change wildfire risk and prioritization of areas of concern should be fluid and change based on existing conditions. See Table 4.2 for brief descriptions of each area of concern.

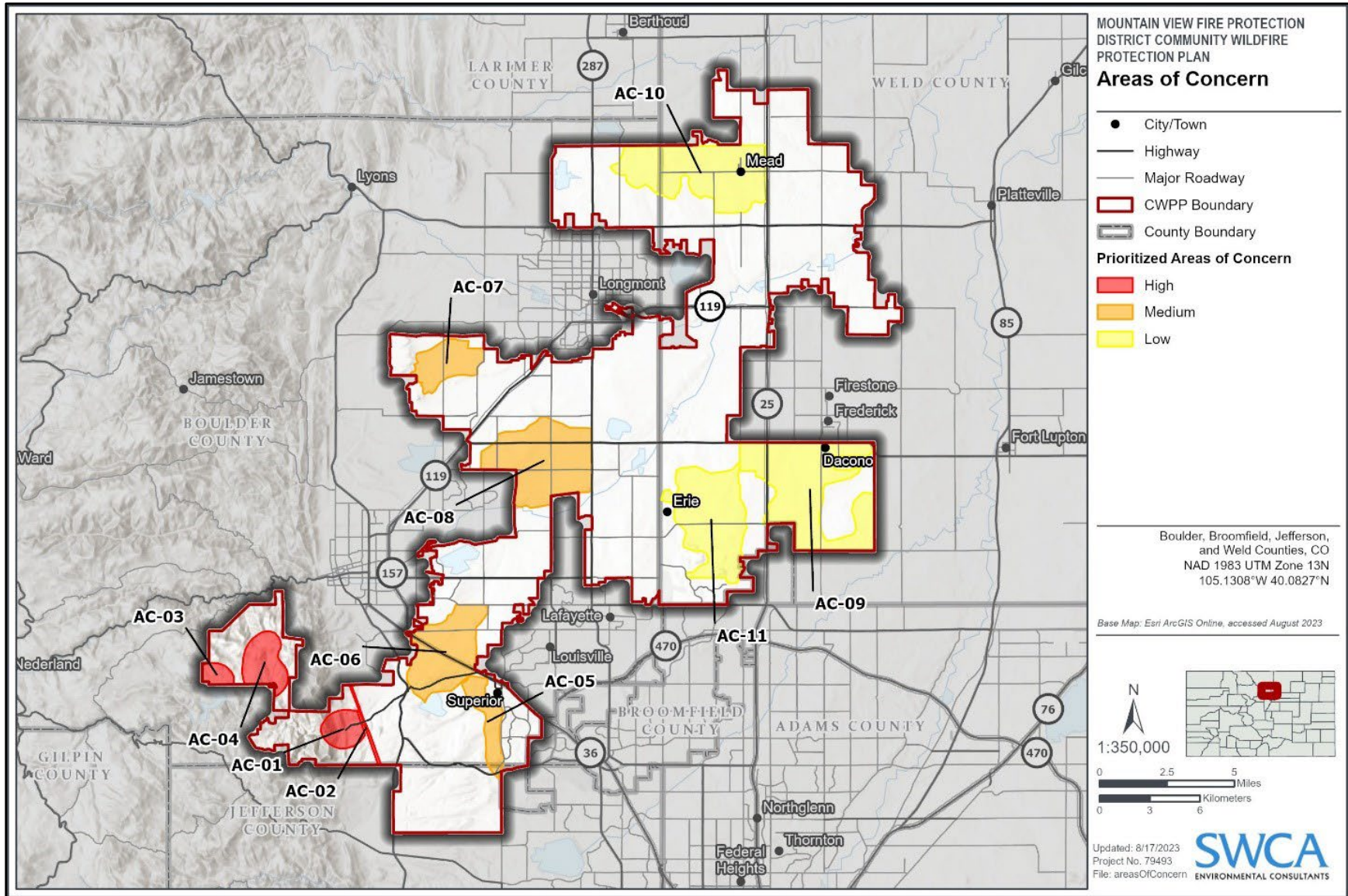


Figure 4.2. Prioritized areas of concern within the Mountain View FPD.

Table 4.2. Areas of Concern, Priority Levels, and Recommendations

Area of Concern ID	Priority Level	Associated Project Recommendations (Table 4.1)	Recommendations
AC-01	High	RL1, RL2	Homes in this area should be assessed for wildfire risk. Fuel reduction in the home ignition zones is recommended. Fuel loading and continuity should be reduced in the steep drainage containing structures.
AC-02	High	RL1, RL3	Critical infrastructure transmission should be evaluated for ignition hazards and wildfire resiliency. Consider using the right-of-way (ROW) as a fuel break.
AC-03	High	RL1, RL3, RL7	High fuel loading and continuous fuels from the wildlands to the WUI/GUI. See conceptual fuel treatments for more.
AC-04	High	RL1, RL3, RL7	High fuel loading and continuous fuels from the wildlands to the WUI/GUI. See conceptual fuel treatments for more.
AC-05	Medium	RL1, RL3, RL4, RL7	Continuous grass fuels located west of several communities. The prevailing winds in the area can quickly spread fire into neighboring WUI/GUI. As shown by the Marshall Fire, management of grass fuels is necessary to reduce wildfire risk. Consider implementing mowing and establishing fuel breaks in this area.
AC-06	Medium	RL1, RL3, RL7	Large and continuous swathes of WUI/GUI. Fuel reduction methods such as grazing, mowing, prescribed fire, and fuel break construction should be implemented to break up grass fuel continuity and loading. Existing roads and non-burnable features can be used as anchor points for fuel breaks.
AC-07	Medium	RL2, RL7	Scattered homes in this area are at risk due to continuous grass fuels to the west. Property owners should maintain home ignition zone clearances and implement home hardening upgrades. Consider reducing the continuity of grass fuels to the west.
AC-08	Medium	RL3, RL7	Grassland fuels as well as burnable vegetation within home ignition zones 1 and 2 should be mitigated. Consider prescribed herbivory and fire. Existing roads can be used as anchor points for burn units.
AC-09	Low	RL1, RL2, RL3, RL7	This area contains intermixed WUI/GUI with low to moderate wildfire hazard and fireline intensities. Residents should be notified of evacuation/alert protocols. Work to educate property owners on defensible space and maintaining vegetation. Mowing along roads and property boundaries can be effective in reducing wildfire risk. Consider prescribed herbivory.
AC-10	Low	RL3, RL2	Property owners in this area should reduce fuels in the home ignition zone. Fuels such as debris, dead trees, and hay should be kept away from structures. Officials should consider mowing along busy roads and assessing power lines for potential ignition risks.
AC-11	Low	RL1, RL2	Reduce the chance for ignitions by ensuring energy infrastructure can withstand high winds and is not in proximity to hazards such as weakened trees. Inform property owners on evacuation routes and defensible space treatments. Encourage structure hardening.

Conceptual Fuels Treatment Recommendations

The conceptual, community-scale, fuel treatments aim to reduce wildfire risk to specific communities by utilizing an array of mitigation tools that can be implemented by homeowners, landowners, and agencies. Community-scale treatments are often most effective at reducing wildfire hazards and risk when planned and paired with adjacent landscape-level fuel treatment efforts. Land managers should prioritize employing mitigation measures to protect life, property, and other values within identified areas of concern. It is recommended that treatment plans be developed to execute mitigation measures in these areas. Treatment types will be site-specific and should address a need to slow fire spread or mitigate potential extreme fire behavior parameters, such as high flame lengths or fireline intensity.

Figure 4.3. and Table 4.3. identify conceptual fuel treatments that can be implemented to reduce the continuity and loading levels of fuels on the landscape. Fuel treatment locations were established by consulting a variety of wildfire modeling layers such as burn probability, flame length, wildfire hazard, and expected risk to structures. Furthermore, HVRA locations such as energy infrastructure were factored into spatial delineations as well as fuel treatment and reduction methods. Structure density, topography, and fuel type were also important factors in determining fuel treatment boundaries.

Treatment types will be site specific but are generally aimed at slowing fire spread or mitigating extreme fire behavior parameters. Wildfire does not stop at jurisdictional boundaries; therefore, it is crucial that projects are implemented across borders with coordination at all jurisdictional levels and spatial scales. Examples of varying spatial scales include treatments around homes (defensible space), within community boundaries (fuel breaks, cleanup of adjacent open spaces), and finally in the wildlands beyond community boundaries (larger-scale forest health and restoration treatments).

When considering these recommended fuel treatments, it is important to consider the differences between public and private land. For example, prescribed fire treatments are designed for application on landscape-level, publicly owned land. Recommendations for private land include individual safeguarding measures such as mowing around parcel boundaries and creating defensible space. Consultation with experts and compliance with local regulations are essential for the safe and effective implementation of these treatments.

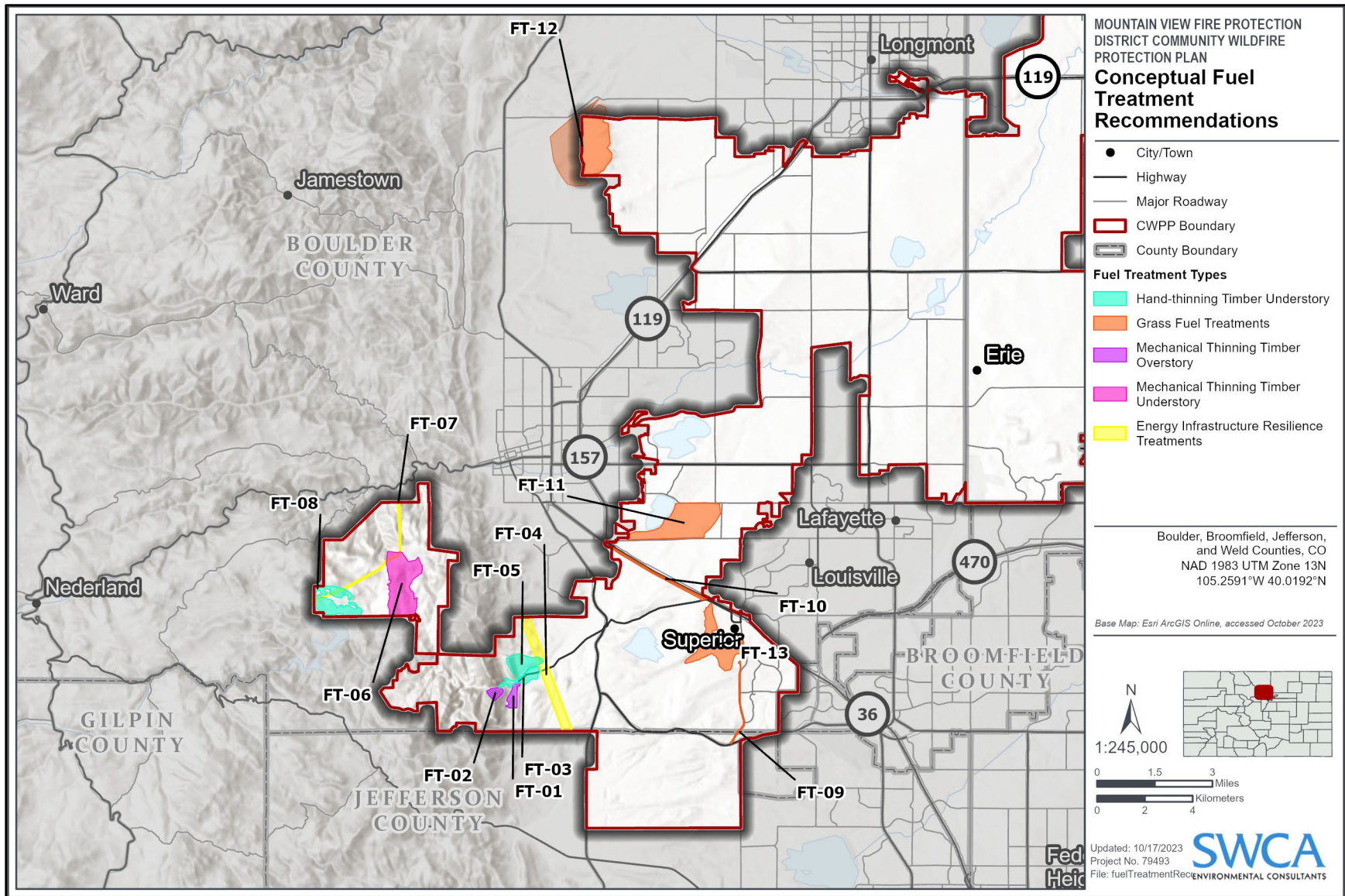


Figure 4.3. A map of conceptual fuel treatments based on an analysis of wildfire hazards and wildfire risk to the WUI and GUI.

Table 4.3. Descriptions of Conceptual Fuel Treatment Polygons Delineated using Areas of Concern, Fuel Models, Wildfire Risk, Wildfire Hazard, and Burn Probability

Fuel Treatment Polygon ID	Fuel Treatment Method	Fuel Reduction Method	Recommendation
FT-01	Mechanical thinning timber overstory	Pile and burn	Consider treating dense and continuous timber fuels with mechanical methods. Existing roads offer good access points. Consider chipping slash or pile and burning.
FT-02	Mechanical thinning timber overstory	Pile and burn	Dense and continuous timber fuels are upwind of the community in a steep drainage increasing the risk of high intensity wildfire from reaching structures and reducing probability of control. Consider treating dense and continuous timber fuels with mechanical methods. Existing roads offer good access points. Consider chipping slash or pile and burning.
FT-03	Hand-thinning timber understory	Mechanical mastication	This community is composed of dense housing in a steep drainage surrounded by continuous fuels. Wildfire hazard and fireline intensity values are high throughout the area. Consider educating property owners on evacuation/alert protocols. Work to reduce vegetation in the home ignition zones. Home hardening upgrades should be considered due to spotting potential and high fireline intensities.
FT-04	Energy Infrastructure Resilience Treatments	Lop and scatter	Increase the resiliency of critical transmission infrastructure to wildfire by thinning understory fuels in proximity to power lines and transmission ROW. Work on reducing the likelihood of ignitions by mitigating hazard trees and hazardous fuels close to energy infrastructure.
FT-05	Hand-thinning timber understory	Prescribed low-intensity fire	Reducing fuel loading and continuity on this aspect can decrease wildfire risk to the communities south of the area in the drainage. This area could benefit from prescribed fire. The ridgeline and riparian area may serve as containment lines. Consider prepping the unit by reducing fuel loading in timbered areas close to containment lines.
FT-06	Mechanical thinning timber understory	Pile and burn	Reduce hazardous fuels in and around residential properties. Focus fuel reduction efforts within the home ignition zones and along main roads. Consider a 10–20-foot fuel break for Flagstaff Road. Focus on establishing signage and egress for this WUI area. Understory thinning and lop and scatter techniques can be effective in breaking up fuel continuity and reducing fuel loads.
FT-07	Energy Infrastructure Resilience Treatments	Lop and scatter	Maintain ROW clearances for power lines. Remove hazard trees and any vegetation in close proximity to power lines. This ROW could act as a basis for a fuel break to reduce wildfire intensities in close proximity to the nearby WUI/GUI. Power lines should be assessed for wildfire hazards.
FT-08	Hand-thinning timber understory	Mechanical mastication	Work with property owners in the area to reduce hazardous fuels in the 3 home ignition zones. Conduct understory thinning paired with chipping and pile burning to reduce fuel continuity and wildfire risk. Home hazard assessments should be conducted in the area. The mixed WUI/GUI paired with high wildfire hazard makes this area at risk to wildfire.

Fuel Treatment Polygon ID	Fuel Treatment Method	Fuel Reduction Method	Recommendation
FT-09	Grass Fuel Treatments	Prescribed low-intensity fire	Prevailing winds and continuous GUI places the communities east of McCaslin Boulevard at risk of wildfire. Reducing the momentum of potential wildfires moving west to east across the grasslands in this area should be a priority in reducing wildfire risk. Consider mowing grass fuels west of McCaslin Boulevard. Low-intensity prescribed fire in conjunction with fuel breaks can decrease the wildfire risk in this area.
FT-10	Grass Fuel Treatments	Prescribed low-intensity fire	Consider using existing Highway 36 to create a fuel break. Mowing along the south side of the road can reduce the potential for wildfire to spread into the WUI/GUI to the north and east. Low-intensity prescribed fire can be effective here. Care should be taken to establish strong anchor points with adequate unit preparation. Burn units should not exceed 20 acres at a time. Reducing the momentum of fire in grass fuels should be a priority.
FT-11	Grass Fuel Treatments	Prescribed low-intensity grazing	Consider utilizing mowing and prescribed herbivory for grass fuels close to homes. Natural fuel breaks should be identified and improved to reduce the spread of fast-moving grass fires.
FT-12	Grass Fuel Treatments	Prescribed low-intensity fire	Implement a prescribed burn treatment utilizing small burn units. Mowed areas and existing roads may serve as containment lines. Reducing the momentum of fast-moving grass fires is critical for preventing fire from entering urban areas. To accomplish this, a combination of grazing, prescribed fire, mowing, and fuel breaks should be implemented.
FT-13	Grass Fuel Treatments	Prescribed low-intensity grazing	Grass fuels should be managed with grazing and mowing. Prescribed fire may be effective in treating shrub fuels in and around ditches. Existing roads and trails can be used as treatment boundaries. It is important to create a sufficient fuel break from potential grassland fires heading west to east that may impact structures in the Superior community.

COHESIVE STRATEGY GOAL 2: FIRE-ADAPTED COMMUNITIES

Goal 2 of the National Cohesive Strategy is Fire-Adapted Communities: Human populations and infrastructure are as prepared as possible to receive, respond to, and recover from wildland fire. The basic premise of this goal is:

“Preventing or minimizing the loss of life and property due to wildfire requires a combination of thorough pre-fire planning and action, followed by prudent and immediate response during a wildfire event. Post-fire activities can also speed community recovery efforts and help limit the long-term effects and costs of wildfire. CWPPs should identify high-risk areas and actions residents can take to reduce their risk. Fuels treatments in and near communities can provide buffer zones to protect structures, important community values and evacuation routes. Collaboration, self-sufficiency, acceptance of the risks and consequences of actions (or non-action), assisting those who need assistance (such as the elderly), and encouraging cultural and behavioral changes regarding fire and

fire protection are important concepts. Attention will be paid to values to be protected in the middle ground (lands between the community and the forest) including watersheds, viewsheds, utility and transportation corridors, cultural and historic values, etc.” (WRSC 2013:15).

In this CWPP, recommendations for fire-adapted communities include public education and outreach actions and actions to reduce structural ignitability.

RECOMMENDATIONS FOR PUBLIC EDUCATION AND OUTREACH

Just as environmental hazards need to be mitigated to reduce the risk of fire loss, so do human hazards. Lack of knowledge, lack of positive actions (e.g., failing to create adequate defensible space), and negative actions (e.g., keeping leaf litter and exposed propane tanks close to structures) all contribute to increased risk of loss in the WUI.

Methods to enhance public education encompass various strategies. These may involve coordinating workshops and trainings to spread awareness of home hardening strategies and Firewise building and landscaping techniques, or hosting community cleanups. It is important to highlight the availability of government funds for treatments on private land. Equally significant is the improvement of communication between property owners and local land management agencies. This becomes crucial, especially given the need for effective implementation of fuel treatments and better maintenance within the interface of public and private land. Public education should also include significant involvement from town and local officials and civic groups.

Mountain View FPD currently utilizes educational activities throughout the service area, such as public engagement events, Fire Prevention Week, and various safety classes. The district also maintains a web page containing useful information and contacts regarding support services such as wildfire prevention and community outreach.

Wildfire Partners in Boulder County is a wildfire preparedness organization committed to building wildfire-resilient communities by educating, motivating, and supporting a diverse range of residents. Through collaboration with public and private sector agency partners, they promote collective action for effective wildfire mitigation. More information on the resources provided by Boulder County Wildfire Partners is available in Appendix E, and information regarding the Boulder County Wildfire Partners Mitigation Program can be found in Appendix I.

Please see Appendix B for a comprehensive list of local, statewide, and national educational resources.

Table 4.4 lists public education recommendations to be implemented in the FPD.

Table 4.4. Recommendations for Creating Fire-Adapted Communities (Public Education and Reducing Structural Ignitability)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC1		H	0–2 years	Increase capacity for wildfire mitigation outreach and education within the district.	MVFPD	MVFPD, community organizations, local jurisdictions	<p>Enhance capabilities to inform and educate the public regarding wildfire safety, hazards, and mitigation practices.</p> <ul style="list-style-type: none"> Collaborate with local schools and community organizations to organize workshops, training sessions Establish partnerships with local media outlets to create and disseminate educational content (ex. TV, radio, social media) Implement a community ambassador program, recruiting and training volunteers who can serve as advocates for wildfire outreach Establish a dedicated online platform where residents can access educational resources (ex. page on MVFPD website) 	<p>Reduce risk of human-caused wildfire ignitions.</p> <p>Educate citizens about wildfire hazards.</p> <p>Empower local communities and visitors.</p>	<p>Conduct regular review of applicable ordinances and update outreach materials and efforts as needed.</p> <p>Maintain working relationship with community leaders and land management agencies so materials can be disseminated to the public.</p> <p>Track attendance and local engagement</p>	<ul style="list-style-type: none"> Community Planning Assistance for Wildfire (CPAW) BRIC FP&S Firewise grants National Urban and Community Forest Program Challenge Cost Share Grant Program Community Wildfire Defense Grants Wildfire Mitigation Incentive for Local Government (CSFS)
FAC2		H	0–2 years	Establish funding pathway for underserved homeowners and vulnerable populations	MVFPD-wide. Prioritize high-risk areas as identified in the risk assessment.	MVFPD, HOAs, community leaders County OEMs within MVFPD (Broomfield, Jefferson, Weld), Boulder County ODM	<p>Provide financial assistance to underserved homeowners who may need additional help to mitigate home hazards and to evacuate during a wildfire.</p> <ul style="list-style-type: none"> Identify vulnerable populations (elderly, disabled, low income) Seek grant opportunities to support assistance for these at-risk populations. 	<p>Protect life and property of the most vulnerable members of the community</p>	<p>Annual review of number of actions taken to address vulnerable populations and underserved homeowners</p>	<ul style="list-style-type: none"> BRIC Community Development Block Grants Firewise grants National Urban and Community Forest Program Challenge Cost Share Grant Program Community Wildfire Defense Grants

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC3		H	0–2 years	Reduce potential for human-caused wildfire ignitions in urban environments and along recreational trails.	MVFPD	MVFPD, County OEMs within MVFPD (Broomfield, Jefferson, Weld), Boulder County ODM, local governments, CSFS, USFS	<p>Increase public awareness of the human causes of ignitions in the surrounding environment:</p> <ul style="list-style-type: none"> Consider targeted restrictions (e.g., use of gates) on recreational trails use during periods of heightened wildfire risk, especially on backcountry trails with high fuel loads. Communicate heightened wildfire ignition risk when motorized vehicles travel near dry fuels during warmer periods of the year (e.g., utilize flyers). Highlight hazardous conditions surrounding homes/structures (e.g., exposed propane tanks, electrical hazards, hazard trees, limited defensible place, etc.) Utilize temporary and/or permanent trail closures in high-to extreme- fire risk areas. <p>Inform and educate the public about methods to reduce human-caused wildfire ignitions.</p> <ul style="list-style-type: none"> Educate around sources of human-caused wildfire ignitions (e.g., target practice, cigarette butts, fireworks, etc.). Provide materials with resources for the public to understand how and with what funding they can take action to reduce risks. Conduct community training courses and workshops Utilize Appendix E of the CWPP: Homeowner Resources 	<p>Reduce human caused wildfire ignitions.</p> <p>Improve public knowledge about wildfire risk for the environment they live in</p>	<p>Regular monitoring of recreational trail conditions.</p> <p>Regular public outreach.</p>	<ul style="list-style-type: none"> USFS Community Wildfire Defense Grants Wildfire Mitigation Incentive for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices Grants (CSFS) Firewise Communities Grants
FAC4		M	1–5 years	Communicate fire risk to real estate agents, developers, architects, insurance agents, and potential sellers/buyers	Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld) and local municipalities	County (Boulder, Broomfield, Jefferson, Weld) and town planning commissions with MVFPD, local governments	<p>Develop and distribute information regarding environmental factors (ex. topography, slope, and vegetation) and associated impacts on individual properties and their risk levels and defensible space needs.</p> <ul style="list-style-type: none"> Have wildfire risk and WUI delineation for listed properties included as an element of the Master Listing Service (MLS) – the master listings for sale utilized by the real estate industry. Include Firewise assessments and recommendations to potential buyers Provide link to applicable CWPPs on real-estate websites 	<p>Increase pre-purchase knowledge of fire environment and post-purchase action by new homeowner.</p> <p>Educate property owners.</p> <p>Reduce threats to life and property.</p>	<p>Assess and improve communication between real estate sellers/buyers and county emergency planning</p>	<ul style="list-style-type: none"> BRIC Firewise Grants FP&S EPA Environmental Education Grants Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC5		H	1–3 years	Monitor and enforce defensible space standards. Encourage home hardening. Improve homeowner mitigation efforts and opportunities.	WUI, MVFPD, prioritize high-risk areas as identified in the risk assessment. Flagstaff neighborhoods.	Private Landowners, County Planning Commissions (Boulder, Broomfield, Jefferson, Weld), MVFPD, HOAs and community leaders, local governments, Boulder County Wildfire Partners	<p>Strongly promote defensible space:</p> <ul style="list-style-type: none"> Consider adhering to CSFS recommended defensible space standards (e.g., enforce 100 feet of defensible space). Assess wildfire risk to infrastructure vulnerabilities and identify critical projects to mitigate impacts. Consider landscaping methods across multiple properties that reduce fire potential (e.g., connect fuel treatments across different properties). Work with insurance commission and companies to determine the potential to provide incentives for defensible space associated with reduced insurance premiums. Consider fuels pickup/disposal options. Promote education of the reduction of structural ignitability and enact WUI codes. Educate homeowners on methods and resources to reduce their home's risk through defensible space improvements and structure hardening. <p>Establish a program to work with landscapers, architects, fence companies, etc. to educate them on Firewise designs and activities</p> <ul style="list-style-type: none"> Develop program materials in partnership with existing staff, utilizing Firewise practices and guidance Train home repair contractors to assess and harden homes to build local capacity and capability. Create programs for home and neighborhood assessments Conduct facility hardening for existing structures 	Reduce loss of life and structures through increased resident understanding and participation in defensible space and home hardening.	Annual program evaluation and updates as necessary. Track and record community participation, identify effective outreach strategies	<ul style="list-style-type: none"> Firewise FP&S (FEMA) EPA Environmental Education Grants CWDG BRIC Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC6		M	0–10 years	Increase Firewise (USA) support to communities throughout MVFPD	MVFPD	Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), subdivisions (HOAs, organized homeowners, etc.), local governments, developers, realtors, MVFPD	<p>Improve education and knowledge of Firewise practices</p> <ul style="list-style-type: none"> Continue current Firewise practices. Include Firewise information in short-term rental contracts. Conduct Firewise/Ready, Set, GO! Workshops. Offer hands-on workshops to highlight individual home vulnerabilities and how-to techniques to reduce ignitability of common structural elements. Conduct more public meetings to educate citizens about Firewise. Provide free neighborhood and property assessments and mitigation planning. Utilize website sign-ups. Provide wildfire assessor training. Provide home hardening resource lists/examples/cost estimates. Provide links to Firewise websites, downloadable forms, and other resources at meetings or workshops. Consider direct mailers. Distribute Firewise information to school children during Fire Prevention Week. Establish a part-time Firewise coordinator. Explore funding options from both CSFS and counties within MVFPD Identify potential subdivisions with the cohesion and momentum to seek Firewise Communities USA recognition Collaborate with the Northern Colorado Firewise Collaborative to identify opportunities for funding and hiring 	<p>Reduce wildfire risk through greater adoption of Firewise and structure hardening measures.</p>	<p>Annual review of number of events implemented.</p> <p>Conduct regular surveys to assess effectiveness.</p> <p>Conduct Firewise Survey for the following metrics:</p> <ul style="list-style-type: none"> Number of recognized communities, percentage of subdivisions in MVFPD Number of Firewise homes, percentage of homes in MVFPD Total cost and hours spent by Firewise communities 	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FAC7		M	1–5 years	<p>Utilize and improve existing wildfire risk signage</p> <p>Explore additional means of disseminating wildfire warnings and information (social media, local news outlets, etc.)</p>	MVFPD	Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), state, and federal agencies MVFPD	<p>Communicate wildfire risk using strategically placed signage and other materials</p> <ul style="list-style-type: none"> Spread seasonally adjusted flyers and prevention messages along highways and in public open space areas to reduce human ignitions and promote defensible space. Continue the use of existing electronic signs at firehouses and other locales to display fire prevention information, safety messages, and fire danger ratings linked to safety actions. <p>Communicate wildfire risk using various social media and local news outlets, tracking community engagement, and encouraging dialogue between the district and members of the community.</p>	<p>Reduce wildfire risk through public education and outreach.</p> <p>Reduce threats to life and property.</p>	<p>Assess current situation and determine where signage can be improved (e.g., increasingly popular recreation areas).</p> <p>Provide information on pertinent county webpages and webpages of local businesses.</p> <p>Assess and utilize current popular information sources (Nextdoor, social media, X (formerly known as Twitter), etc.)</p>	<ul style="list-style-type: none"> Community Planning Assistance for Wildfire (CPAW) BRIC FP&S Firewise grants National Urban and Community Forest Program Challenge Cost Share Grant Program CDWDG Wildfire Mitigation Incentive for Local Government (CSFS)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC8		H	1–2 years	Evaluate existing building and vegetation codes to identify alignment between counties, municipalities, and HOAs	MVFPD	Local governments	<p>Conduct comprehensive review and evaluation of building and vegetation codes across entities within MVFPD.</p> <ul style="list-style-type: none"> Assess the degree of alignment between the codes by comparing key parameters Engage stakeholders to gather insights and perspectives on the effectiveness existing codes (ex. Fire marshals) Identify areas of inconsistency or conflicting regulations Consider possible benefits to standardization and cohesive fire planning Review enforcement mechanisms 	<p>Reduce wildfire risk and loss of structures through effective regulation</p> <p>Encourage collaboration between entities and facilitate sustainable and cohesive urban development.</p>	<p>Annual updates to codes as necessary.</p> <p>Perform regular inspections to ensure codes are being adhered to.</p>	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program FP&S (FEMA) Environmental Protection Grants (EPA) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FAC9		M	1–5 years	<p>Conduct education and outreach for evacuation protocols through trainings and workshops</p> <p>Improve evacuation zone education and outreach to the public.</p>	Municipalities within MVFPD	MVFPD; county emergency management personnel; federal, state, and local agencies.	<p>Set up meetings and events at the community level, tailor to the evacuation and emergency service protocols for each jurisdiction.</p> <ul style="list-style-type: none"> Develop engaging and interactive training modules Collaborate with local authorities, emergency management agencies, and educational institutions Utilize a variety of instructional methods (ex. Video tutorials, in-person activities) Implement a comprehensive evaluation system to assess the trainings effectiveness and the participants' retention of the materials Regularly update the educational materials as protocols change and advance <p>Enhance public awareness of evaluation protocols across jurisdictions.</p> <ul style="list-style-type: none"> Develop and distribute public education and outreach materials concerning evacuation zones and routes and best practices. Utilize common information resources to spread information on evacuation best practices and routes such as social media, news (TV and radio), Nextdoor, X (formerly known as Twitter), and others. Consider measures which need to be taken for socially vulnerable populations. Make specific evacuation plans for various population groups (earlier departure time, earlier notification, notification method, etc.) Engage HOA's and neighborhoods in community-specific education. Familiarize public with FEMA's Integrated Public Alert and Warning System (IPAWS) Explore opportunities to enhance the reverse 911 system. 	<p>Ensure public and first responder safety in the event of a wildfire or other emergency.</p>	<p>Develop and distribute a survey to understand and adapt best practices for communication and teaching.</p> <p>Assess and adapt methodologies and current information annually to ensure information is up to date.</p> <p>Annual lessons learned review</p>	<ul style="list-style-type: none"> FEMA Building Resilient Infrastructure and Communities Grants USFS Community Wildfire Defense Grant FEMA FP&S Grants Wildfire Mitigation Incentive for Local Government (CSFS) Firewise Communities Grants

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC10		M	1–5 years	Develop an outreach and education coordinator position for Boulder County Wildfire Team to collaborate with municipalities, non-government organizations, communities	Boulder County	Boulder County, MVFPD, local governments	Establish funding for an outreach and education coordinator position in Boulder County Identify duties and responsibilities for the outreach coordinator position for the Boulder County Wildfire Team <ul style="list-style-type: none"> Conduct a comprehensive needs assessment, identifying current levels of outreach and education requirements of municipalities, and highlighting high-risk areas. Develop a strategy focused around raising awareness, providing resources, and fostering collaboration among stakeholders. Establish strong partnerships and collaborations with relevant organizations (ex. local government agencies, community groups, and educational institutions). Continuously evaluate the impact and effectiveness of the outreach and education initiatives through feedback loops (ex. surveys, data analysis, and stakeholder engagement). Make changes to duties and responsibilities as necessary. 	Increase local and county level planning Build resilient landscapes by increasing outreach coordination	Annual review of outreach materials Schedule frequent check-in to monitor progress and effectiveness	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program FP&S (FEMA) Environmental Protection Grants (EPA) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FAC11		M	1–5 years	Expanding grant writing capacity within the FPD	MVFPD	MVFPD	Identify funding capabilities for a grant writing position or a partnership with an organization that can assist in the grant acquisition process.	Enhance wildfire preparedness and contribute to community wildfire resilience with funding assistance from various grant opportunities.	Analyze successful and unsuccessful applications, and incorporate lessons learned into future efforts Proper monitoring of grant status and updates from the organization administering the grant	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FAC12		H	0–1 years	Create a framework for changing covenants within HOAs and subdivisions	MVFPD	HOAs, MVFPD, local jurisdictions	Develop a structure for altering covenants in homeowners' associations (HOAs) and residential subdivisions to best suit a cohesive planning approach within the district. <ul style="list-style-type: none"> Identify potential planning vulnerabilities within HOAs and subdivisions (ex. proximity to wildland areas, vegetation management planning, and evacuation capabilities). Engage with community members through (ex. surveys, town hall meetings, and workshops) Collaborate with fire safety experts, urban planners, and other land managers to build a framework for changing covenants within HOAs and addressing conflicts hindering cohesive planning Ensure changes to covenants comply with local jurisdictional ordinances Provide residents with knowledge and resources to prioritize fire prevention and response in their community 	Reduce wildfire risk and loss of structures through effective regulation. Facilitate sustainable and cohesive urban development.	Assess and improve communication between HOAs and wildfire managers Annual review for effectiveness Frequent public outreach	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC13		H		Create smoke-ready communities through facilitating smoke education and providing educational resources.	MVFPD	MVFPD, local governments	<p>Identify smoke-prone regions and socioeconomically disadvantaged communities that are most vulnerable to impacts of smoke.</p> <p>Provide resources (e.g., air cleaners, filtration systems) to vulnerable and at-risk communities.</p> <p>Disseminate educational information through various channels, including:</p> <ul style="list-style-type: none"> • Social Media • Public Events • In-Person Training and Workshops • School Curriculum integration 	<p>Provide the community with knowledge and strategies to reduce health impacts associated with smoke from wildfires.</p>	<p>Annual program evaluation and updates as necessary.</p> <p>Annual lessons learned review</p>	<ul style="list-style-type: none"> • Firewise • FP&S (FEMA) • EPA Environmental Education Grants • CWDG • BRIC • Wildfire Mitigation Incentives for Local Government (CSFS) • Wildfire Mitigation Resources & Best Practices (CSFS)
FAC14		M	5–10 years	Conduct field-based risk assessments focused on structural ignitability and vulnerable infrastructure	High risk communities within MVFPD	MVFPD, Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), local governments	<p>Update this CWPP with field-based risk assessment data in high-risk communities as outlined in this 2023 plan.</p> <ul style="list-style-type: none"> • Conduct windshield surveys using NFPA 1144 or similar methodologies to ground-truth the desktop modeling presented in this 2023 CWPP and assess site-specific on-the-ground conditions in high-risk WUI communities. • Identify vulnerable areas and high-risk communities. • Identify community-specific actions and recommendations (e.g., improved road signage, improved defensible space, etc.). <p>Implement community education and outreach to raise awareness and gather feedback from residents.</p>	<p>Identify wildfire hazards within the district and understand how to best mitigate the wildfire risk on the ground.</p>	<p>Regular updates and recurring reassessments, especially in heavily vegetated areas</p> <p>Frequent communication, collaboration, and cooperation with landowners and managers.</p> <p>Photographic record (hazard areas, pre- and post-fuels reduction work, evacuation routes, changes in open space, etc.)</p>	<ul style="list-style-type: none"> • U.S. Endowment for Forestry and Communities • Community Wildfire Defense Grants (CWDG) • Forest Restoration & Wildfire Risk Mitigation (CSFS) • Wildfire Mitigation Incentives for Local Government (CSFS) • Wildfire Mitigation Resources & Best Practices (CSFS) • National Fire Plan (NFP) Grants • Building Resilient Infrastructure and Communities (BRIC)

Note: See Appendix A to consult relevant regulations and past planning efforts.

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RECOMMENDATIONS FOR REDUCING STRUCTURAL IGNITABILITY

The effectiveness of fuels reduction treatments on public land depends on homeowner actions; if owners have failed to harden their homes and implement mitigation techniques on their own land, the risk of home ignition remains high, and firefighter lives are put at risk while carrying out structural defense. Table 4.4 provides a list of community-based recommendations to reduce structural ignitability that should be implemented throughout the Mountain View FPD service area. Reduction of structural ignitability depends largely on public education that provides property owners the information they need to take responsibility for protecting their own properties.

Preparing for wildland fire by creating defensible space around the home is an effective strategy for reducing structural ignitability as discussed under Cohesive Strategy Goal 1: Resilient Landscapes. Studies have shown that burning vegetation beyond 120 feet of a structure is unlikely to ignite that property through radiant heat (Butler and Cohen 1996), but fire bands that travel independently of the flaming front have been known to destroy houses that have not been impacted by direct flame impingement. In essence, reducing structural ignitability and creating defensible space are key for minimizing potential loss and damage. Detailed information regarding defensible space practices as well as a list of actions for reducing structural ignitability can be found in Appendix D.

COHESIVE STRATEGY GOAL 3: SAFE, EFFECTIVE, RISK-BASED, WILDFIRE RESPONSE

Goal 3 of the National Cohesive Strategy is Safe, Effective, Risk-Based, Wildfire Response: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions:

“A balanced wildfire response requires integrated pre-fire planning with effective, efficient, and coordinated emergency response. Pre-fire planning helps tailor responses to wildfires across jurisdictions and landscape units that have different uses and management objectives. Improved prediction and understanding of weather, burning conditions, and various contingencies during wildfire events can improve firefighting effectiveness, thereby reducing losses and minimizing risks to firefighter and public health and safety. Wildfire response capability will consider the responsibilities identified in the Federal Response Framework. Local fire districts and municipalities with statutory responsibility for wildland fire response are not fully represented throughout the existing wildland fire governance structure, particularly at the NWCG, NMAC, and GACC levels.” (WRSC 2013:15).

This section provides recommended actions that jurisdictions could undertake to improve wildfire response.

RECOMMENDATIONS FOR IMPROVING FIRE RESPONSE CAPABILITIES

Often during wildfires, resources are stretched thin due to limited personnel; education to enhance community preparedness is a key factor in supporting local fire departments. In fire response particularly, educating residents about emergency notifications and evacuation protocols can help emergency

responders focus on protecting life and property. Additionally, local wildfire response capabilities can be improved by increasing personnel, obtaining more equipment, and maintaining vital ingress and egress routes. Active collaboration between wildfire response agencies can also help to boost response capabilities.

Table 4.5 provides recommendations for improving firefighting capabilities.

Table 4.5. Recommendations for Safe and Effective Wildfire Response

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FR1		H	1–2 years	Improve local wildfire response capabilities	MVFPD, local, state, and federal lands	County (Boulder, Broomfield, Jefferson, Weld), and local governments, MVFPD, federal agencies	<p>Enhance wildfire and emergency response capabilities within MVFPD</p> <ul style="list-style-type: none"> Increase number of persons on seasonal severity crew, increase number of local firefighters Obtain more equipment for wildfire mitigation (e.g., water tenders and woodchippers) Leverage grants/funding opportunities to increase seasonal firefighting capacity Provide more NWCG based training/qualification/certification opportunities for county firefighters and county staff (e.g., provide year-round training, hire/retain training officers and instructors, obtain more NWCG task books) Collaborate with the Northern Colorado Fireshed Collaborative to identify opportunities for funding and hiring Prioritize funding, hiring, and mitigation work in local FPDs. Apply for and obtain funding to increase number of water resources for suppression in rural areas of the fire protection district. Utilize mapped fuels to focus fuel treatments to improve response time. 	<p>Enhance public and firefighter safety and mitigate wildfire risk within the district</p> <p>Improve local ability and self-reliance of MVFPD to address its own wildfire concerns</p>	<p>Convene annually to assess and document status of county-specific firefighting capabilities.</p> <p>Maintain list of trained personnel and volunteers that can be utilized across all field and incident command positions.</p> <p>Regularly update the Incident Qualification Plan (IQP).</p> <p>Track career advancement of wildland firefighting personnel.</p>	<ul style="list-style-type: none"> Emergency Management Performance Grant (EMPG) (FEMA) RCP BRIC Firewise grants Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) Volunteer Fire Assistance (VFA) Grant (Colorado DFPC) Colorado House Bill 22-1194 Congressionally Directed Spending
FR2		H	1–2 years	Increase direct and ancillary wildfire personnel. Provide inhouse and online personnel training.	MVFPD, state fire responders, and federal agencies	County (Boulder, Broomfield, Jefferson, Weld) and local governments, MVFPD, federal agencies	<p>Increase number of firefighting jobs and volunteer firefighting opportunities</p> <ul style="list-style-type: none"> Improve collaboration/cooperation capabilities between firefighting agencies. Train physically capable workers from other departments to fight fire on fire lines (e.g., roads, train workers from vegetation, wildlife, and weed crews) Achieve funding through fundraising/grant applications (e.g., federal, state, local, and independent grants and private donations). 	<p>Enhance public safety, improve wildfire response, and limit size of wildfires</p> <p>Increase capacity to address growth of new residential areas in the WUI</p>	<p>Provide annual red card training/refresher/pack test events before start of fire season.</p> <p>Provide annual online wildfire training classes/refresher courses.</p> <p>Annual assessment of personnel and equipment capacity.</p> <p>Track number of jobs created, contracts, and grants</p>	<ul style="list-style-type: none"> FEMA, State funds, and private grants Emergency Management Performance Grant (EMPG) (FEMA) RCP BRIC Firewise grants Volunteer Fire Assistance (VFA) Grant (Colorado DFPC) Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FR3		H	1–2 years	Enhance pre-evacuation planning and evacuation planning	MVFPD	Emergency managers, county planning commissions (Boulder, Broomfield, Jefferson, Weld), MVFPD, state and federal agencies, local governments	<p>Identify areas of improvement with regard to evacuation planning</p> <ul style="list-style-type: none"> Identify evacuation routes. Fuel treatments adjacent to roads can reduce fire behavior along important travel routes used for ingress by emergency vehicles and egress by residents. Identify parcel-owners along primary evacuation routes. Seek grant opportunities to support priority project implementation. Have emergency responders/planners practice IPAWS, the Emergency Alert System (EAS), and CodeRED (e.g., drills and test notifications) Construct a livestock and pet evacuation and sheltering plan Utilize USDA's disaster planning for animal facilities; CSU Extension's livestock resources webpage; and PetAid Colorado Disaster Services Consider a comprehensive evacuation plan for Boulder County and others that includes a road risk analysis, traffic control, re-routing, and risk mitigation. Define emergency evacuation center and medical treatment support options. Identify vulnerable individuals and processes for their evacuation support. 	<p>Protect life by reducing high-risk fire behavior along important roads.</p> <p>Protect public and first responder life and safety</p>	<p>Annual maintenance</p> <p>Yearly updates to materials</p>	<ul style="list-style-type: none"> EMPG RCP BRIC Firewise grants National Urban and Community Forest Program FP&S (FEMA)
FR4		M	1–5 years	Identify and improve roadway access to WUI areas. Reduce risk in areas identified as high risk or high likelihood of road entrapment in roads and evacuation analysis.	MVFPD. Primary transportation corridors, bypass routes, and community specific egress routes. This should be prioritized in areas of concern.	MVFPD, private (private roads), federal agencies and CDOT (Boulder, Broomfield, Jefferson, Weld), local governments	<p>Implement roadway improvements</p> <ul style="list-style-type: none"> While increasing roadway width may not be feasible in many locations, creation of passing areas where possible should be prioritized Consider roadway improvements that increase ingress/egress in popular recreation areas in case of emergency Grade and maintain roads to reduce hazards to emergency apparatus (potholes and poor surfacing) Install proper signage and turn around points where appropriate. Perform roadside fuels treatments to reduce wildfire behavior along major ingress and egress routes. 	<p>Provides for safe and effective wildfire response capabilities</p> <p>Provides safe and effective means of evacuation in case of emergencies</p>	<p>Regular monitoring and maintenance to ensure roads are drivable for emergency response vehicles</p>	<ul style="list-style-type: none"> BRIC NFP RCP Firewise Grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FR5		M	1–5 years	Increase National Wildfire Coordinating Group Training	MVFPD	MVFPD	<p>Fund and implement year-round trainings focused on wildfire assessments, response, incident command, logistics coordination, and resource management in order to improve:</p> <ul style="list-style-type: none"> Public education and outreach, Funding acquisition Collaboration between all stakeholders. 	<p>Reduce risk of loss of life and property from wildfire.</p>	<p>Assess annual effectiveness and adjust approaches based off of current needs and lessons learned.</p>	<ul style="list-style-type: none"> FEMA BRIC Grants Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) FEMA RCP Grants EPA Environmental Education Grants

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FR6		M	1–5 years	Improve wildfire response coordination efforts and bolster pre-planning amongst collaborating response jurisdictions	MVFPD, federal and state fire crews, interagency dispatch centers, utility companies as applicable	MVFPD and federal agencies	<p>Enhance response capabilities through the implementation of a coordinated approach to wildfire preparedness and response.</p> <ul style="list-style-type: none"> Engage in regular joint training and drill exercises (e.g., desktop exercises). Ensure up-to-date communications, equipment, and procedures between federal, state, and local wildland fire responders (e.g., regularly update employee phone and email lists) Regularly update mutual aid/cooperative agreements between local, state, and federal fire responders Guarantee access to lands for fire response. Map out gates or other potential access issues and gain agreements for access during emergencies. Map and delineate regions for water intake for fire suppression. Guarantee access to water supply during wildfire incidents (e.g., know how to unlock access gates) Consider equipment caches in strategic locations to improve wildfire response times 	<p>Improve efficiency and speed of wildfire response and suppression</p> <p>Reduce wildfire threats to life and property</p> <p>Clarify party responsibilities for wildfire response</p>	<p>Annually review and update cooperative and mutual aid agreements</p> <p>Annual review of water resources</p> <p>Training for new staff on roles and responsibilities</p> <p>Host pre-season coordination meetings between response agencies and other stakeholders</p>	<ul style="list-style-type: none"> Emergency Management Performance Grant (EMPG) (FEMA) BRIC NFP RCP 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FR7		H	0–1 years	Add three full-time equivalent (FTE) personnel to the MVFPD wildland Division	MVFPD	MVFPD	<p>Recruit two additional FTEs for wildland division</p> <ul style="list-style-type: none"> Conduct a comprehensive assessment of the current workload and demands Analyze the budgetary constraints for fulltime positions Develop a detailed job understanding and description of qualifications and required duties Establish a selection process aimed at maximizing the effectiveness and safety of the wildland division. Provide comprehensive training and onboarding programs that equip them with the necessary knowledge, skills, and tools to carry out their responsibilities. Collaborate with the Northern Colorado Fireshed Collaborative to identify opportunities for funding and hiring 	<p>Improve local ability and self-reliance of MVFPD to address its wildfire concerns</p> <p>Reduce risk of loss of life and property from wildfire</p>	<p>Training for new staff on roles and responsibilities</p> <p>Annual assessment of personnel and equipment capacity.</p>	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FR8		H	1–2 years	Collaborate with regional land ownership agencies and organizations to increase water resource availability throughout the district for firefighting	Flagstaff, Eldorado Springs, Marshall	MVFPD, private, Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), state and federal agencies, local jurisdictions	<p>Increase water resources (ex. 20,000-gallon tanks) for suppression in Flagstaff, Eldorado Springs, and Marshall.</p> <ul style="list-style-type: none"> Apply for and obtain funding through grants or local, state, and federal programs Establish partnerships with landowners and/or local organizations 	Improve local ability and self-reliance of Mountain View FPD to address its own wildfire concerns	Annual assessment/review of water resources	<ul style="list-style-type: none"> Emergency Management Performance Grant (EMPG) (FEMA) RCP BRIC Firewise grants Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FR9		M	1–2 years	Train all members of the district in accordance with NWCG Standards for Wildland Fire Position Qualifications, PMS 310-1	MVFPD	MVFPD	<p>Trains members of MVFPD to reach NWCG standards.</p> <ul style="list-style-type: none"> Develop a comprehensive training plan in alignment with PMS 310-1, Implement a combination of instructional approaches and provide regular progress assessments and feedback to participants Organize periodic refresher courses and ongoing training sessions 	Enhance wildfire response capabilities	<p>Training for all staff on roles and responsibilities in alignment with PMS 310-1</p> <p>Annual assessment and review of effectiveness and training materials</p>	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FR10		M	1–2 years	Establish a common communication channel	MVFPD	MVFPD	<p>Establish a system through which the department will communicate using common pre-built frequencies</p> <ul style="list-style-type: none"> Identify the specific communication needs Develop a centralized system of standardized communication Implement training programs to educate department members on appropriate and effective use Regularly monitor and update the pre-built frequencies system to adapt to changing departmental needs 	Enhance emergency response communications and capabilities	<p>Assess annual effectiveness</p> <p>Establish a feedback mechanism to gather input from department members</p>	<ul style="list-style-type: none"> BRIC Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FR11		H	1–2 years	Train command staff to be proficient in the ICS system	MVFPD	MVFPD	<p>Provide comprehensive training to command MVFPD staff to enhance their proficiency in the ICS.</p> <ul style="list-style-type: none"> Assess the current skill levels and knowledge gaps of MVFPD staff in the ICS Develop a training curriculum that covers all key aspects of the ICS, highlighting those identified in knowledge gap analysis Work with experienced ICS trainers and/or subject matter experts Establish a continuous learning culture by providing regular refresher courses and continued learning as ICS is updated 	Enhance wildfire response capabilities	<p>Training for all staff on roles and responsibilities in alignment with PMS 310-1</p> <p>Annual assessment and review of effectiveness and training materials</p>	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FR12	Current	L	0–5 years	Yearly reviews to auto and mutual aid agreements for the district	MVFPD	Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), MVFPD	Perform assessments of auto and mutual aid processes <ul style="list-style-type: none"> Analyze financial records and budgets to assess need for auto and mutual aid operations Ensure that the district and personnel are conducting necessary action to participate in auto and mutual aid efforts. Collaborate with neighboring fire protection districts to share best practices and enhance the overall effectiveness and efficiency of auto and mutual aid operations. 	Acquire funding to enhance emergency response capabilities	Assess annual effectiveness	<ul style="list-style-type: none"> BRIC Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
FR13		M	0–5 year	Implement community safe refuge areas and consider them in future community development and expansion	MVFPD	Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), MVFPD	Conduct careful planning, collaboration with stakeholders, and a focus on ensuring the safety of residents. <ul style="list-style-type: none"> Gather and analyze the proper demographic data (density, vulnerability, etc.) to assess the geographic needs need for refuge sites Involve and gather input from stakeholders Collaborate with urban planners, architects, and engineers to design safe refuge areas that can withstand wildfire and other hazards Ensure compliance with current standards and ordinances and incorporate these areas in future planning 	Provide residents with the ability to seek safe refuge during natural disasters.	Assess annual effectiveness following evacuations and disaster events.	<ul style="list-style-type: none"> Emergency Management Performance Grant (EMPG) (FEMA) RCP BRIC Firewise grants Wildfire Mitigation Incentives for Local Government (CSFS)
FR14		H	0–3 years	Provide emergency transportation to vulnerable population during disaster events	MVFPD	Counties within MVFPD (Boulder, Broomfield, Jefferson, Weld), MVFPD	Ensure safety and well-being of vulnerable populations through emergency transportation. <ul style="list-style-type: none"> Identify and categorize vulnerable populations in the area (elderly, disabled individuals, children, etc.) Outline the resources, protocols, and responsibilities with a comprehensive emergency transportation plan. Assess available modes of transportation (Bus, van, ambulance, helicopter, etc.) Make information easily accessible to all members of the public, especially the targeted vulnerable populations 	Provide vulnerable and underserved populations with safe transportation during natural disasters.	Assess annual effectiveness following evacuations and disaster events.	<ul style="list-style-type: none"> Emergency Management Performance Grant (EMPG) (FEMA) RCP BRIC Firewise grants Wildfire Mitigation Incentives for Local Government (CSFS)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FR15		M	1–5 years	Addressing the impacts of extreme wind on wildfire response	MVFPD	MVFPD	Implement a multi-pronged approach to mitigate the effect of extreme wind on wildfire response and improve containment efforts during winder event <ul style="list-style-type: none"> Integrate weather data and wind forecast into response plan Utilize wind modeling programs- i.e., Wind Ninja Utilize satellite imaging, drones, and remote sensors for early detection and monitoring. Implement fuel treatments and fuel breaks aimed at reducing spread under high wind conditions Train and equip firefighting force to respond to wind driven wildfire incidents rapidly (during safe periods in where winds have receded) Establish efficient communication channels between fire response entities 	Enhance wildfire response capabilities and reduce extreme wind impacts	Train and educate all staff Assess annual effectiveness	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Note: See Appendix A to consult relevant regulations and past planning efforts.



Developing an action plan and an assessment strategy that identifies roles and responsibilities, funding needs, and timetables for completing highest-priority projects is an important step in organizing the implementation of the 2023 Mountain View FPD CWPP. The previous chapter identifies tentative timelines and monitoring protocols for project recommendations, the details of which are outlined below.

All stakeholders and signatories to this CWPP desire worthwhile outcomes. It is also known that risk reduction work on the ground, for the most part, is often not attainable in a few months—or even years. The amount of money and effort invested in implementing a plan such as this requires that there be a means to describe, quantitatively and/or qualitatively, whether the goals and objectives expressed in this plan are being accomplished according to expectations.

Monitoring and reporting contribute to the long-term evaluation of changes in ecosystems, as well as the knowledge base about how natural resource management decisions affect both the environment and the people who live in it. Although the HFRA does not include specified requirements for CWPP project tracking, it is important that project outcomes are monitored and evaluated as a regular practice. Furthermore, as the CWPP evolves over time, there may be a need to track changes in policy, requirements, stakeholder changes, and levels of preparedness. These can be significant for any future revisions and/or addendums to the CWPP.

It is recommended that project monitoring be a collaborative effort. There are many resources for designing and implementing community-based, multi-party monitoring that could support and further inform a basic monitoring program for the CWPP (Egan 2013). Multi-party monitoring involves a diverse group consisting of community members, community-based groups, regional and national interest groups, and public agencies. Using this multi-party approach increases community understanding of the effects of restoration efforts and trust among restoration partners. Multi-party monitoring may be more time consuming due to the collaborative nature of the work; therefore, a clear and concise monitoring plan must be developed.

Table 5.1 Identifies monitoring strategies for various aspects of all categories of CWPP recommendations and the effects of their implementation, both quantifiable and non-quantifiable, for assessing the progress of the CWPP and increase sustainability of projects. It must be emphasized that these strategies are 1) not exhaustive and 2) dependent on available funds and personnel to implement them.

Table 5.1. Recommended Monitoring Strategies

Strategy	Task/Tool	Lead	Remarks
Project tracking system embedded in hub site	Online web app to track hazardous fuels projects spatially, integrating wildfire risk layer to show progress toward wildfire hazard and risk reduction. Web app includes attribute tables that outline project details	Mountain View FPD and stakeholders	Interactive tool is easily updated and identifies areas that require additional efforts, update monthly if possible
Photographic record (documents pre- and post-fuels reduction work, evacuation routes, workshops, classes, field trips, changes in open space, treatment type, etc.)	Establish field GPS location; photo points of cardinal directions; keep photos protected in archival location.	Core Team members	Moderate cost, repeatable over time; used for programs and tracking objectives
Number of acres treated (by fuel type, treatment method)	GPS/GIS/fire behavior prediction system – this can be monitored within the project tracking system	Core Team members	Evaluating costs, potential fire behavior
Number and acres of home ignition zones/defensible space treated to reduce fuels Number and \$ of home treatments to reduce ignitability	GPS – This can be monitored within the project tracking system	Community members, Core Team members, District personnel	Fuels reduction Structure protection
Number of residents/citizens participating in any CWPP projects and events	Meetings, media interviews, articles	Core Team members	Evaluate culture change objective Annual lessons learned review encouraged among stakeholders
Number of homeowner contacts (brochures, flyers, posters, etc.)	Visits, phone	Core Team members	Evaluate objective Annual lessons learned review encouraged among stakeholders
Number of jobs created, contracts, grants	Project tracking system	Core Team members	Evaluate local job growth
Education and outreach: number, kinds of involvement	Workshops, classes, field trips, signage; project tracking system	Core Team members	Evaluate objectives Annual lessons learned review encouraged among stakeholders
Emergency management: changes in agency response capacity	Collaboration, grants to fund fire department needs such as new personnel and equipment	Agency representatives	Evaluate mutual aid Annual review
Codes and policy changes affecting CWPP	Qualitative	Core Team	CWPP changes
Number of stakeholders Number of Firewise communities and percentage of all county neighbors	Added or dropped	Core Team	CWPP changes

Strategy	Task/Tool	Lead	Remarks
Wildfire acres burned, human injuries/fatalities, infrastructure loss, environmental damage, suppression, and rehabilitation costs	Wildfire records	FPD	Compare with 5- or 10-year average

FUELS TREATMENT MONITORING

It is important to evaluate whether fuel treatments have accomplished their defined objectives and whether any unexpected outcomes have occurred.

The strategies outlined in this section consider several variables:

- Do the priorities identified for treatment reflect the goals stated in the CWPP? Monitoring protocols can help address this question.
- Can there be ecological consequences associated with fuels work? Items to consider include soil movement, protected species management, and/or invasive species encroachment post-treatment. Relatively cost-effective monitoring may help reduce long-term costs and consequences.
- Vegetation will grow back. Thus, fuel break maintenance and fuels modification in both the home ignition zone and at the landscape scale require periodic assessment. Monitoring these changes can help decision-makers identify appropriate treatment intervals.
- Monitoring for all types of fuels treatment is recommended. For example, in addition to monitoring mechanical treatments, it is important to carry out comprehensive monitoring of burned areas to establish the success of pre-fire fuels reduction treatments on fire behavior, as well as monitoring for ecological impacts, repercussions of burning on wildlife, and effects on soil chemistry and physics.
- Adaptive management is a term that refers to adjusting future management based on the effects of past management. Monitoring is required to gather the information necessary to inform future management decisions. Economic and legal questions may also be addressed through monitoring. In addition, monitoring activities can provide valuable educational opportunities for students.

The monitoring of each fuels reduction project would be site-specific, and decisions regarding the timeline for monitoring and the type of monitoring to be used would be determined by project. Monitoring schedules will be developed utilizing knowledge of past projects that employed best practices to achieve similar goals. These schedules may also be adjusted to accommodate special requirements for the targeted landscape as well as the responsible party. The most important part of choosing a fuels project monitoring program is selecting a method appropriate to the people, place, and type of project. Several levels of monitoring activities meet different objectives, have different levels of time intensity, and are appropriate for different groups of people. They include the following:

Minimum—Level 1: Pre- and Post-project Photographs

Appropriate for many individual property owners who conduct fuels reduction projects on their properties.

Moderate—Level 2: Multiple Permanent Photo Points

Permanent photo locations are established using rebar or wood posts, GPS-recorded locations, and photographs taken on a regular basis. Ideally, this process would continue over several years. This approach might be appropriate for more enthusiastic property owners or for agencies conducting small-scale, general treatments.

High—Level 3: Basic Vegetation Plots

A series of plots can allow monitors to evaluate vegetation characteristics such as species composition, percentage of cover, and frequency. Monitors then can record site characteristics such as slope, aspect, and elevation. Parameters would be assessed pre- and post-treatment. The monitoring agency should establish plot protocols based on the types of vegetation present and the level of detail needed to analyze the management objectives. This method is appropriate for foresters or other personnel monitoring fuel treatments on forested land.

Intense—Level 4: Basic Vegetation Plus Dead and Downed Fuels Inventory

The protocol for this level would include the vegetation plots described above but would add more details regarding fuel loading. Crown height or canopy closure might be included for live fuels. Dead and downed fuels could be assessed using other methods, such as Brown's transects (Brown 1974), an appropriate photo series (Ottmar et al. 2000), or fire monitoring (Fire Effects Monitoring and Inventory System [FIREMON]) plots. This method is ideal for foresters or university researchers tracking vegetation changes in forested lands.

IMPLEMENTATION

The 2023 Mountain View FPD CWPP makes recommendations for prioritized fuels reduction projects, measures to reduce structural ignitability, and methods with which to carry out public education and outreach (see Tables 4.1–4.3). Implementation projects need to be tailored to the specific project and will be unique to the location depending on available resources and regulations. As aforementioned, on-the-ground implementation of the recommendations in the 2023 Mountain View FPD CWPP Planning Area will require development of an action plan and assessment strategy for completing each project. This step will identify the roles and responsibilities of the people and agencies involved, as well as funding needs and timetables for completing the highest-priority projects (SAF 2004). Information pertaining to funding is provided in Appendix I.

CWPP EVALUATION

CWPPs are intended to reduce the risk from wildfire for a community and surrounding environment. However, over time, communities change and expand, vegetation grows back, and forests and wildlands evolve. As such, the risk of wildfire to communities is constantly changing. The plans and methods to reduce risk must be dynamic to keep pace with the changing environment. An annual evaluation of the CWPP should be carried out by the FPD and/or the Core Team, to gather information and identify whether the recommendations and strategies are on course to meet the desired outcomes or if modifications are needed to meet expectations.

Four general steps can be used to evaluate the CWPP:

<p>1. Identify objectives: What are the goals identified in the plan? How are they reached? Is the plan performing as intended?</p>	<ul style="list-style-type: none"> a. Structural ignitability b. Fuel treatments (landscape and home ignition zone) c. Public education and outreach d. Multi-agency collaboration e. Emergency notifications / response
<p>2. Assess the changing environment: How have population characteristics and the wildfire environment changed?</p>	<ul style="list-style-type: none"> a. Population change <ul style="list-style-type: none"> i. Increase or decrease ii. Visitor levels iii. Demographics b. Population settlement patterns <ul style="list-style-type: none"> i. Distribution ii. Expansion into the WUI c. Vegetation <ul style="list-style-type: none"> i. Fuel quantity and type ii. Drought and disease impacts
<p>3. Review action items: Are actions consistent with the plan's objectives?</p>	<ul style="list-style-type: none"> a. Check for status, i.e., completed/started/not started b. Identify completed work and accomplishments c. Identify lessons learned: challenges and best practices d. Identify next steps
<p>4. Assess results: What are the outcomes of the action items?</p>	<ul style="list-style-type: none"> a. Multi-agency collaboration <ul style="list-style-type: none"> i. Who was involved in the development of the CWPP? ii. Have partners involved in the development process remained involved in the implementation? iii. How has the planning process promoted implementation of the CWPP? iv. Have CWPP partnerships and collaboration had a beneficial impact to the community? b. Quantitative Risk Assessment <ul style="list-style-type: none"> i. How is the Quantitative Risk Assessment utilized to make decisions about fuel treatment priorities? ii. Have there been new wildfire-related regulations? iii. Are at-risk communities involved in mitigating wildfire risk? c. Hazardous fuels <ul style="list-style-type: none"> i. How many acres have been treated? ii. How many projects are cross-boundary? iii. How many residents have participated in creating defensible space?

	<ul style="list-style-type: none"> d. Structural ignitability <ul style="list-style-type: none"> i. Have there been updates to fire codes and ordinances? ii. How many structures have been lost to wildfire? iii. Has the CWPP increased public implementation of structural ignitability and hazard reduction strategies? e. Public education and outreach <ul style="list-style-type: none"> i. Has public awareness of wildfire and mitigation strategies increased? ii. Have residents and visitors been involved in wildfire mitigation activities? iii. Has there been public involvement? iv. Have vulnerable populations been involved? f. Emergency response <ul style="list-style-type: none"> i. Has the CWPP been integrated into relevant plans (e.g., hazard mitigation or emergency operations)? ii. Is the CWPP congruent with other hazard mitigation planning efforts? iii. Has availability and capacity of local fire departments changed since the CWPP was developed? iv. Have egress routes been publicized and mitigated?
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TIMELINE FOR UPDATING THE CWPP

The HFRA allows for maximum flexibility in the CWPP planning process, permitting the Core Team to determine the time frame for updating the CWPP. However, it is suggested that a formal revision be made on the fifth anniversary of signing and every 5 years following. Furthermore, due to the dynamic nature of wildfire mitigation and the natural landscape, there are several triggers that may warrant a CWPP update before the 5-year mark. Among these triggers are extensive wildfire or another disaster event, changes to the local planning outlook (e.g., significant update to Hazard Mitigation Plan), and local adoption of the international WUI code.

To ensure the ongoing effectiveness of the CWPP and demonstrate their commitment to the safety and resilience of the community, Mountain View Fire Protection District will annually review and update the CWPP. Each year, the Core Team will assess the plan's components to incorporate recent data, technology, the latest community feedback, and other important factors to ensure that the CWPP remains a dynamic and responsive tool for mitigating wildfire risks and protecting the well-being of the district's residents. Each year the Core Team members will review the project list, discuss project successes, strategize regarding project implementation funding, and revise the CWPP as needed.

ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
AMMs	avoidance and minimization measures
ATV	all-terrain vehicle
BAER	Burned Area Emergency Rehabilitation
BLM	Bureau of Land Management
BMP	best management practice
Boulder ODM	Boulder Office of Disaster Management
CAR	community at risk
CDHSEM	Colorado Division of Homeland Security and Emergency Management
CE	categorical exemption
CERT	Community Emergency Response Team
ch/hr	chains per hour
CIDC	Craig Interagency Dispatch Center
CIG	Conservation Innovation Grants
COAL	Colorado All Lands
Cohesive Strategy	National Cohesive Wildland Fire Management Strategy
CRS	Congressional Research Service
CSFS	Colorado State Forest Service
CWA	Clean Water Act
CWPP	community wildfire protection plan
DEM	digital elevation model
DFPC	Colorado Division of Fire Prevention and Control
DHS	Department of Homeland Security
EAS	Emergency Alert System
EIR	Environmental Impact Report
EMS	Emergency Management System
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESRI	Environmental Systems Research Institute
FAC	fire-adapted community
FCIDC	Fort Collins Interagency Dispatch Center
FEMA	Federal Emergency Management Agency
FIREMON	Fire Effects Monitoring and Inventory System

FLAME	Federal Land Assistance, Management and Enhancement Act
FP&S	Fire Prevention and Safety
FPD	Fire Protection District
FRI	fire return interval
GACC	Geographic Area Coordination Centers
GAID	Geographic Area Interagency Division
GIS	geographic information system
GPS	global positioning system
GUI	grassland-urban interface
HFRA	Healthy Forests Restoration Act of 2003
HIZ	home ignition zone
HMP	hazard mitigation plan
HOA	homeowners association
HVRA	highly valued resource or asset
ICC	International Code Council
IFTDSS	Interagency Fuel Treatment Decision Support System
ISO	Insurance Services Office
JPA	Joint Powers Agreement
MFI	mean fire interval
MND	mitigated negative declaration
NCFC	Northern Colorado Fireshed Collaborative
NEPA	National Environmental Policy Act
ND	negative declaration
NFP	National Fire Plan
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWCG	National Wildfire Coordinating Group
ODM	Office of Disaster Management
OEM	Office of Emergency Management
PERI	Public Entity Risk Institute
POD	Potential Operational Delineation
PPE	personal protective equipment

PRISM	PRISM Climate Group
RAWS	remote automated weather station
RFA	Rural Fire Assistance
ROW	right-of-way
SAF	Society of American Foresters
SAFER	Staffing for Adequate Fire and Emergency Response
SE	statutory exemption
SHPO	State Historic Preservation Office
SVI	social vulnerability index
SWCA	SWCA Environmental Consultants
ULI	Urban Land Institute
USDA	U.S. Department of Agriculture
USDOJ	U.S. Department of the Interior
USFA	U.S. Fire Administration
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VAR	value at risk
VCC	Vegetation Condition Class
VDEP	Vegetation Departure
WFDSS	Wildland Fire Decision Support System
WRSC	Western Regional Strategy Committee
WUI	wildland-urban interface

GLOSSARY

Aspect: Cardinal direction toward which a slope faces in relation to the sun (NWCG 2021b).

Active Crown Fire: A crown fire in which the entire fuel complex is involved in flame, but the crowning phase remains dependent on heat released from surface fuel for continued spread. An active crown fire presents a solid wall of flame from the surface through the canopy fuel layers. Flames appear to emanate from the canopy as a whole rather than from individual trees within the canopy. Active crown fire is one of several types of crown fire and is contrasted with **passive crown fires**, which are less vigorous types of crown fire that do not emit continuous, solid flames from the canopy (SWCA).

Available Canopy Fuel: The mass of canopy fuel per unit area consumed in a crown fire. There is no post-frontal combustion in canopy fuels, so only fine canopy fuels are consumed. It is assumed that only the foliage and a small fraction of the branchwood is available (Wooten 2021).

Available Fuel: The total mass of ground, surface, and canopy fuel per unit area available for a fire, including fuels consumed in postfrontal combustion of duff, organic soils, and large woody fuels (Wooten 2021).

Backfiring: Intentionally setting fire to fuels inside a control line to contain a fire (Wooten 2021).

Biomass: Organic material. Also refers to the weight of organic material (e. g. biomass roots, branches, needles, and leaves) within a given ecosystem (Wooten 2021).

Burn Severity: A qualitative assessment of the heat pulse directed toward the ground during a fire. Burn severity relates to soil heating, large fuel and duff consumption, consumption of the litter and organic layer beneath trees and isolated shrubs, and mortality of buried plant parts (SWCA).

Canopy: The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand. Where significant height differences occur between trees within a stand, formation of a multiple canopy (multi-layered) condition can result (SWCA).

Chain: Unit of measure in land survey, equal to 66 feet (20 m) (80 chains equal 1 mile). Commonly used to report fire perimeters and other fireline distances. Popular in fire management because of its convenience in calculating acreage (example: 10 square chains equal one acre) (New Mexico Future Farmers of America 2010).

Climate Change: A change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods (CA GOPR 2020).

Community Assessment: An analysis designed to identify factors that increase the potential and/or severity of undesirable fire outcomes in WUI communities (SWCA).

Communities at Risk: Defined by the HFRA as “Wildland-Urban Interface Communities within the vicinity of federal lands that are at high risk from wildfire.”

Community Emergency Response Team (CERT): The CERT program educates volunteers about disaster preparedness for the hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT offers a consistent, nationwide approach to volunteer training and organization that professional responders can rely on during disaster situations, allowing them to focus on more complex tasks (Ready 2021).

Community Wildfire Protection Plan (CWPP): A planning document that seeks to reduce the threat to life and property from wildfire by identifying and mitigating wildfire hazards to communities and infrastructure located in the WUI. Developed from the HFRA, a CWPP addresses issues such as wildfire response, hazard mitigation, community preparedness, or structure protection (SWCA).

Conditional Surface Fire: A potential type of fire in which conditions for sustained conditional surface fire active crown fire spread are met but conditions for crown fire initiation are not. If the fire begins as a surface fire, then it is expected to remain so. If it begins as an active crown fire in an adjacent stand, then it may continue to spread as an active crown fire (Wooten 2021).

Contain: A tactical point at which a fire's spread is stopped by and within specific containment features, constructed or natural; also, the result of stopping a fire's spread so that no further spread is expected under foreseeable conditions. For reporting purposes, the time and date of containment. This term no longer has a strategic meaning in federal wildland fire policy (Wooten 2021).

Control: To construct fireline or use natural features to surround a fire and any control spot fires therefrom and reduce its burning potential to a point that it no longer threatens further spread or resource damage under foreseeable conditions. For reporting purposes, the time and date of control. This term no longer has a strategic meaning in federal wildland fire policy (Wooten 2021).

Cover type: The type of vegetation (or lack of it) growing on an area, based on cover type minimum and maximum percent cover of the dominant species, species group or non-living land cover (such as water, rock, etc.). The cover type defines both a qualitative aspect (the dominant cover type) as well as a quantitative aspect (the abundance of the predominant features of that cover type) (Wooten 2021).

Creeping Fire: A low-intensity fire with a negligible rate of spread (Wooten 2021).

Crown Fire: A fire that advances at great speed from crown to crown in tree canopies, often well in advance of the fire on the ground (National Geographic 2021).

Defensible Space: An area around a structure where fuels and vegetation are modified, cleared, or reduced to slow the spread of wildfire toward or from a structure. The design and distance of the defensible space is based on fuels, topography, and the design/materials used in the construction of the structure (SWCA).

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil (SWCA).

Ecosystem: An interacting natural system including all the component organisms together with the abiotic environment and processes affecting them (SWCA).

Environmental Conditions: That part of the fire environment that undergoes short-term changes: weather, which is most commonly manifest as windspeed, and dead fuel moisture content (Wooten 2021).

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area. When escape routes deviate from a defined physical path, they should be clearly marked (flagged) (SWCA).

Evacuation: The temporary movement of people and their possessions from locations threatened by wildfire (SWCA).

Fire-Adapted Community: A fire-adapted community collaborates to identify its wildfire risk and works collectively on actionable steps to reduce its risk of loss. This work protects property and increases the safety of firefighters and residents (USFA 2021b).

Fire Behavior: The manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena as determined by the interaction of fuels, weather, and topography (Fire Research and Management Exchange System 2021).

Fire Break: Areas where vegetation and organic matter are removed down to mineral soil (SWCA).

Fire Environment: The characteristics of a site that influence fire behavior. In fire modeling the fire environment is described by surface and canopy fuel characteristics, windspeed and direction, relative humidity, and slope steepness (Wooten 2021).

Fire Frequency: A broad measure of the rate of fire occurrence in a particular area. For historical analyses, fire frequency is often expressed using the fire return interval calculation. For modern-era analyses, where data on timing and size of fires are recorded, fire frequency is often best expressed using fire rotation (SWCA).

Fire Hazard: Fire hazard is the potential fire behavior or fire intensity in an area, given the type(s) of fuel present—including both the natural and built environment—and their combustibility (CA GOPR 2020).

Fire History: The chronological record of the occurrence of fire in an ecosystem or at a specific site. The fire history of an area may inform planners and residents about the level of wildfire hazard in that area (SWCA).

Fire Intensity: A general term relating to the heat energy released in a fire (SWCA).

Fireline Intensity: Amount of heat release per unit time per unit length of fire front. Numerically, the product of the heat of combustion, quantity of fuel consumed per unit area in the fire front, and the rate of spread of a fire, expressed in kilowatts per minute (SWCA). This expression is commonly used to describe the power of wildland fires, but it does not necessarily follow that the severity, defined as the vegetation mortality, will be correspondingly high (Wooten 2021).

Fire Prevention: Activities such as public education, community outreach, planning, building code enforcement, engineering (construction standards), and reduction of fuel hazards that are intended to reduce the incidence of unwanted human-caused wildfires and the risks they pose to life, property, or resources (CA GOPR 2020).

Fire Regime: A measure of the general pattern of fire frequency and severity typical to a particular area or type of landscape: The regime can include other metrics of the fire, including seasonality and typical fire size, as well as a measure of the pattern of variability in characteristics (SWCA).

Fire Regime Condition Class: Condition classes are a function of the degree of fire regime condition class departure from historical fire regimes resulting in alterations of key ecosystem components such as composition structural stage, stand age, and canopy closure (Wooten 2021).

Fire Return Interval: Number of years (interval) between two successive fires in a designated area (SWCA).

Fire Severity: A qualitative measure of the immediate effects of fire on the fire severity ecosystem. It relates to the extent of mortality and survival of plant and animal life both aboveground and belowground and to loss of organic matter. It is determined by heat released aboveground and belowground. Fire severity is dependent on intensity and residence dependent of the burn. For trees,

severity is often measured as percentage of basal area removed. An intense fire may not necessarily be severe (Wooten 2021).

Fire Risk: “Risk” takes into account the intensity and likelihood of a fire event to occur as well as the chance, whether high or low, that a hazard such as a wildfire will cause harm. Fire risk can be determined by identifying the susceptibility of a value or asset to the potential direct or indirect impacts of wildfire hazard events (CA GOPR 2020).

Flammability: The relative ease with which fuels ignite and burn regardless of the quantity of the fuels (SWCA).

Flame Length: The length of flames in the propagating fire front measured along the slant of the flame from the midpoint of its base to its tip. It is mathematically related to fireline intensity and tree crown scorch height (Wooten 2021).

Forest Fire: Uncontrolled burning of a woodland area (National Geographic 2021).

Fuel Break: A natural or human-made change in fuel characteristics that affects fire behavior so that fires burning into them can be more readily controlled (NWCG 2021c).

Fuel Complex: The combination of ground, surface, and canopy fuel strata (Wooten 2021).

Fuel Condition: Relative flammability of fuel as determined by fuel type and environmental conditions (SWCA).

Fuel Continuity: A qualitative description of the distribution of fuel both horizontally and vertically. Continuous fuels readily support fire spread. The larger the fuel discontinuity, the greater the fire intensity required for fire spread (Wooten 2021).

Fuel Loading: The volume of fuel in a given area generally expressed in tons per acre (SWCA). Dead woody fuel loadings are commonly described for small material in diameter classes of 0 to 0.25, 0.25 to 1, and 1 to 3 inches and for large material greater than 3 inches (Wooten 2021).

Fuel Management/Fuel Reduction: Manipulation or removal of fuels to reduce the likelihood of ignition and to reduce potential damage in case of a wildfire. Fuel reduction methods include prescribed fire, mechanical treatments (mowing, chopping), herbicides, biomass removal (thinning or harvesting or trees, harvesting of pine straw), and grazing. Fuel management techniques may sometimes be combined for greater effect (SWCA).

Fuel Model: A set of surface fuel bed characteristics (load and surface-area-to-fuel model volume ratio by size class, heat content, and depth) organized for input to a fire model (Wooten 2021).

Fuel Modification: The manipulation or removal of fuels (i.e., combustible biomass such as wood, leaves, grass, or other vegetation) to reduce the likelihood of igniting and to reduce fire intensity. Fuel modification activities may include lopping, chipping, crushing, piling and burning, including prescribed burning. These activities may be performed using mechanical treatments or by hand crews. Herbicides and prescribed herbivory (grazing) may also be used in some cases. Fuel modification may also sometimes be referred to as “vegetation treatment” (CA GOPR 2020).

Fuel Moisture Content: This is expressed as a percent or fraction of oven dry fuel moisture content weight of fuel. It is the most important fuel property controlling flammability. In living plants, it is physiologically bound. Its daily fluctuations vary considerably by species but are usually above 80 to 100 percent. As plants mature, moisture content decreases. When herbaceous plants cure, their moisture

content responds as dead fuel moisture content, which fluctuates according to changes in temperature, humidity, and precipitation (Wooten 2021).

Fuel Treatment: The manipulation or removal of fuels to minimize the probability of ignition and/or to reduce potential damage and resistance to fire suppression activities (NWCG 2021d). Synonymous with fuel modification.

Grassland Urban Interface (GUI): The GUI is a term used to describe areas where grass and shrub wildland fuels directly interact or interface with urbanized or developed regions. This interface is similar in concept to the Wildland Urban Interface (WUI), where natural vegetation and urban or developed areas come into close proximity. In the GUI, the specific emphasis should be placed on identifying the potential for wildfire risk and addressing the need for wildfire mitigation and management where potentially highly flammable vegetation meets human development (SWCA).

Grazing: There are two types of grazing: traditional grazing and targeted grazing. Traditional grazing refers to cattle that are managed in extensive pastures to produce meat. Targeted grazing involves having livestock graze at a specific density for a given period of time for the purpose of managing vegetation. Even though both kinds of grazing manage fuel loading in range- and forested lands, targeted grazing is different in that its sole purpose is to manage fuels. Targeted grazing is done by a variety of livestock species such as sheep, goats, or cows (University of California, Agriculture and Natural Resources [UCANR] 2019).

Ground Fire: Fire that burns organic matter in the soil, or humus; usually does not appear at the surface (National Geographic 2021).

Ground Fuels: Fuels that lie beneath surface fuels, such as organic soils, duff, decomposing litter, buried logs, roots, and the below-surface portion of stumps (Wooten 2021).

Hazard: A “hazard” can be defined generally as an event that could cause harm or damage to human health, safety, or property (CA GOPR 2020).

Hazardous Areas: Those wildland areas where the combination of vegetation, topography, weather, and the threat of fire to life and property create difficult and dangerous problems (SWCA).

Hazardous Fuels: A fuel complex defined by type, arrangement, volume, condition, and location that poses a threat of ignition and resistance to fire suppression (NWCG 2021e).

Hazardous Fuels Reduction: Any strategy that reduces the amount of flammable material in a fire-prone ecosystem. Two common strategies are mechanical thinning and controlled burning (Wooten 2021).

Hazard Reduction: Any treatment that reduces the threat of ignition and spread of fire (SWCA).

Highly Valued Resources and Assets: Landscape features that are influenced positively and/or negatively by fire. Resources are naturally occurring, while Assets are human-made (IFTDSS 2021).

Ignition: The action of setting something on fire or starting to burn (SWCA).

Incident: An occurrence or event, either natural or person-caused, which requires an emergency response to prevent loss of life or damage to property or natural resources (Wooten 2021).

Influence Zone: An area that, with respect to wildland and urban fire, has a set of conditions that facilitate the opportunity for fire to burn from wildland fuels to the home and or structure ignition zone (NWCG 2021a).

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire (SWCA).

Invasive Species: An introduced, nonnative organism (disease, parasite, plant, or animal) that begins to spread or expand its range from the site of its original introduction and that has the potential to cause harm to the environment, the economy, or to human health (USGS 2021).

Ladder Fuels: Fuels that provide vertical continuity allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease (SWCA).

Litter: Recently fallen plant material that is only partially decomposed and is still discernible (SWCA).

Manual Treatments: Felling and piling of fuels done by hand. The volume of material generated from a manual fuel treatment is typically too small to warrant a biomass sale therefore collected material is disposed of by burning or chipping. The work can be performed by either a single individual or a large, organized crew with powered equipment (UCANR 2021a).

Mechanized Treatments: Mechanical treatments pulverize large continuous patches of fuel to reduce the volume and continuity of material. Mechanical treatments can be applied as either mastication or chipping treatments. Both treatments shred woody material, but mastication leaves residue on-site while chipping collects the particles for transportation off site. Similar to hand treatments, mechanical treatments can target specific areas and vegetation while excluding areas of concern. In addition, mechanical treatment is easily scalable to large areas (>30 acres) with little added cost. (UCANR 2021b).

Mitigation: Action that moderates the severity of a fire hazard or risk (SWCA).

Mutual Aid: Assistance in firefighting or investigation by fire agencies, irrespective of jurisdictional boundaries (NWCG 2021f).

Native Revegetation: The process of replanting and rebuilding the soil of disturbed land (e.g., burned) with native plant species (USDA 2005).

Native Species: A species that evolved naturally in the habitat, ecosystem, or region as determined by climate, soil, and biotic factors (USDA 2005).

National Cohesive Strategy: The National Cohesive Wildland Fire Management Strategy is a strategic push to work collaboratively among all stakeholders and across all landscapes, using best science, to make meaningful progress toward three goals:

- Resilient Landscapes
- Fire-Adapted Communities
- Safe and Effective Wildfire Response

Vision: To safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a nation, to live with wildland fire (Forests and Rangelands 2021).

Overstory: That portion of the trees in a forest which forms the upper or uppermost layer (SWCA).

Passive Crown Fire: A type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods. Passive crown fire encompasses a wide range of crown fire behavior, from occasional torching of isolated trees to nearly active crown fire. Passive crown fire is also called torching or candling. A fire in the crowns of the trees in

which trees or groups of trees torch, ignited by the passing front of the fire. The torching trees reinforce the spread rate, but these fires are not basically different from surface (SWCA).

Prescribed Burning: Any fire ignited by management actions under specific, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. Usually, a written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually, it is expressed in chains or acres per hour for a specific period in the fire's history (NWCG 2021g).

Resilience: Resilience is the capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience (CA GOPR 2020).

Response: Movement of an individual firefighting resource from its assigned standby location to another location or to an incident in reaction to dispatch orders or to a reported alarm (SWCA).

Safety Element: One of the seven mandatory elements of a local general plan (a county plan that forms the foundation for future development), the safety element must identify hazards and hazard abatement provisions to guide local decisions related to zoning, subdivisions, and entitlement permits. The element should contain general hazard and risk reduction strategies and policies supporting hazard mitigation measures (CA GOPR 2020).

Slash: Debris left after logging, pruning, thinning, or brush cutting. Slash includes logs, chips, bark, branches, stumps, and broken trees or brush that may be fuel for a wildfire (SWCA).

Slope Percent: The ratio between the amount of vertical rise of a slope and horizontal distance as expressed in a percent. One hundred feet of rise to 100 feet of horizontal distance equals 100 percent (NWCG 2021h).

Suppression: The most aggressive fire protection strategy, it leads to the total extinguishment of a fire (SWCA).

Surface Fire: fire that typically burns only surface litter and undergrowth (National Geographic 2021).

Surface Fuel: Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low stature living plants (SWCA).

Structural Ignitability: The ability of structures (such as homes or fences) to catch fire (SWCA).

Topography: The arrangement of the natural and artificial physical features of an area (SWCA).

Total Fuel Load: The mass of fuel per unit area that could possibly be consumed in a hypothetical fire of the highest intensity in the driest fuels (Wooten 2021).

Tree Crown: The primary and secondary branches growing out from the main stem, together with twigs and foliage (SWCA).

Understory: Low-growing vegetation (herbaceous, brush or reproduction) growing under a stand of trees. Also, that portion of trees in a forest stand below the overstory (SWCA).

Understory Fire: A fire burning in the understory, more intense than a surface fire with flame lengths of 1 to 3 m (Wooten 2021).

Values and Assets at Risk: The elements of a community or natural area considered valuable by an individual or community that could be negatively impacted by a wildfire or wildfire operations. These values can vary by community and can include public and private assets (natural and manmade) – such as homes, specific structures, water supply, power grids, natural and cultural resources, community infrastructure-- as well as other economic, environmental, and social values (CA GOPR 2020).

Vulnerable Community: Vulnerable communities experience heightened risk and increased sensitivity to natural hazard and climate change impacts and have less capacity and fewer resources to cope with, adapt to, or recover from the impacts of natural hazards and increasingly severe hazard events because of climate change. These disproportionate effects are caused by physical (built and environmental), social, political, and/ or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality (CA GOPR 2020).

Wildfire: A “wildfire” can be generally defined as any unplanned fire in a “wildland” area or in the WUI (CA GOPR 2020).

Wildfire Exposure: During fire suppression activities, an exposure is any area/property that is threatened by the initial fire, but in National Fire Incident Reporting System (NFIRS) a reportable exposure is any fire that is caused by another fire, i.e., a fire resulting from another fire outside that building, structure, or vehicle, or a fire that extends to an outside property from a building, structure, or vehicle (USFA 2020).

Wildfire Influence Zone: A wildland area with susceptible vegetation up to 1.5 miles from the interface or intermix WUI (CA GOPR 2020).

Wildland: Those unincorporated areas covered wholly or in part by trees, brush, grass, or other flammable vegetation (CA GOPR 2020).

Wildland Fire: Fire that occurs in the wildland as the result of an unplanned ignition (CA GOPR 2020).

Wildland Fuels (aka fuels): Fuel is the material that is burning. It can be any kind of combustible material, especially petroleum-based products, and wildland fuels. For wildland fire, it is usually live, or dead plant material, but can also include artificial materials such as houses, sheds, fences, pipelines, and trash piles. In terms of vegetation, there are 6 wildland fuel types (Fuel Type: An identifiable association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause a predictable rate of spread or resistance to control under specified weather conditions.) The 6 wildland fuel types are (NWCG 2021i):

- Grass
- Shrub
- Grass-Shrub
- Timber Litter
- Timber-Understory
- Slash-Blowdown

Wildland-Urban Interface (WUI): The WUI is the zone of transition between unoccupied land and human development. It is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels (USFA 2021a). In the absence of a CWPP, Section 101 (16) of the Healthy Forests Restoration Act defines the WUI as “ (I) an area extending ½ mile from the boundary of an at-risk community; (II) an area within 1 ½ miles of the boundary of an at-risk community, including any land that (1) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community; (2) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or (3) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; (III) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuels reduction to provide safer evacuation from the at-risk community.” A CWPP offers the opportunity to establish a localized definition and boundary for the WUI (USFA 2020).



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APPENDIX A: Planning and Policy Background

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PLANNING PROCESS

The SAF, in collaboration with the National Association of Counties and the National Association of State Foresters, developed a guide entitled *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities* (SAF 2004) to provide communities with a clear process in developing a CWPP. The guide outlines eight steps for developing a CWPP, which have been followed in preparing the 2023 Mountain View FPD CWPP:

Step One: Convene Decision-makers. Form a Core Team made up of representatives from the appropriate local governments, local fire authorities, and state agencies responsible for forest management.

Step Two: Involve Federal Agencies. Identify and engage local federal representatives and contact and involve other land management agencies as appropriate.

Step Three: Engage Interested Parties. Contact and encourage active involvement in plan development from a broad range of interested organizations and stakeholders.

Step Four: Establish a Community Base Map. Work with partners to establish a base map(s) defining the community's WUI and showing inhabited areas at risk, wildland areas that contain critical human infrastructure, and wildland areas at risk for large-scale fire disturbance.

Step Five: Develop a Community Quantitative Risk Assessment. Work with partners to develop a community Quantitative Risk Assessment that considers fuel hazards; risk of wildfire occurrence; homes, businesses, and essential infrastructure at risk; other values at risk (VARs); and local preparedness capability. Rate the level of risk for each factor and incorporate this information into the base map as appropriate.

Step Six: Establish Community Priorities and Recommendations. Use the base map and Community Quantitative Risk Assessment to facilitate a collaborative community discussion that leads to the identification of local priorities for treating fuels, reducing structural ignitability and other issues of interest, such as improving fire response capability. Clearly indicate whether priority projects are directly related to the protection of communities and essential infrastructure or to reducing wildfire risks to other community values.

Step Seven: Develop an Action Plan and Assessment Strategy. Consider developing a detailed implementation strategy to accompany the CWPP as well as a monitoring plan that will ensure its long-term success.

Step Eight: Finalize Community Wildfire Protection Plan. Finalize the CWPP and communicate the results to community and key partners.

FIRE MANAGEMENT POLICY

The responsibility for WUI fire prevention and protection lies with property owners and municipalities. Property owners must comply with existing state statutes and local regulations. These responsibilities should be carried out in partnership with the federal government and the private sector. The current federal fire policy states that protection priorities are 1) life, 2) property, and 3) natural resources. These priorities often limit flexibility in the decision-making process, especially when a wildland fire occurs within the WUI.

LEGISLATIVE DIRECTION

Fire District Local Direction

Mountain View FPD

The Fire Code of the Mountain View FPD is adopted from the 2018 International Fire Code Amendments, though Mountain View FPD staff recommended in a 2023 Fire Code Review Committee meeting that the district adopt the 2021 edition of the International Fire Code. The current 2018 Fire Code is effective within the boundaries of the FPD, including on private land, and implementation, administration, and enforcement of provisions are carried out at the county level. The Fire Code applies to all new construction and contains provisions for, but not limited to, water flushing, aboveground tanks, storage of flammables, and sprinkler system installation.

You can find more information on the adoption of the 2021 International Fire Code here:

<https://assets.bouldercounty.gov/wp-content/uploads/2023/06/fcrc-23-0001-fcrc-23-0002-20230523.pdf>.

County Direction

Broomfield has incorporated a modified 2021 International Fire Code, while Jefferson County has adopted the 2018 version of the same code. In contrast, Boulder and Weld Counties have not implemented the International Fire Code, with Boulder County using a modified 2015 international building code and Weld County adopting the 2018 International Building Code.

Boulder County's Land Use and Building Code address wildfire risk in certain areas of the county by mandating the use of fire-resistant materials in construction and restrict flammable vegetation. The County developed these in accordance with findings from wildfire science entities such as the USFS, NIST, IBHS, NFPA, Cal-Fire, and UC Berkeley. Following the 2022 Marshall Fire, which ravaged over a thousand homes, the codes were extended to include ignition resistant requirement for a greater portion of the County (Boulder County 2023d).

To learn more about the legislative action toward wildfire mitigation in each county serviced by Mountain View FPD, please visit the following webpages:

[Boulder County Building Code Amendments](#)

[Broomfield County Amendments to the International Fire Code](#)

[Jefferson County Ordinance](#)

[Weld County Building Codes](#)

State Direction

Colorado 2023 Legislation

Colorado Governor Jared Polis signed 11 wildfire prevention and recovery bills in 2023 as part of the state's ongoing efforts to combat wildfires in Colorado. The legislation includes the establishment of an emergency insurance plan, tax incentives for specific reconstruction or repair materials, standardized fire-resistant building codes, homeowner financial assistance for structure hardening, wildfire investigations,

evacuation modeling, and the purchase of a \$26 million firefighting helicopter, among others. These 11 wildfire prevention and recovery bills are described below.

Fire response

SB23-161: Senate Bill 23-161, allocates \$26 million for the purchase of a Firehawk helicopter, doubling its existing fleet. The converted Black Hawk military helicopters are equipped with infrared sensors for night operations and can rapidly dispense 1,000 gallons of water. The addition of the Firehawk will help reduce the need for Colorado to compete with other states for temporary aircraft contracts, as the state's independent fleet will be readily available.

Insurance and rebuilding codes

HB23-1288: House Bill 23-1288 aims to establish a public insurance plan as a final option for homeowners who are unable to secure coverage due to wildfires or other natural risks. The bill seeks to provide a safety net for homeowners facing difficulties in obtaining insurance due to such risks.

HB23-1174: House Bill 23-1174 mandates insurance carriers to provide homeowners with extended notice prior to canceling or allowing their insurance policy to expire. Furthermore, the measure establishes clear guidelines concerning reconstruction costs. This bill aims to enhance consumer protection by ensuring homeowners have adequate time to make alternative arrangements and understand the financial implications of policy cancellations or expirations, while also addressing specific concerns related to reconstruction expenses.

HB23-1240: House Bill 23-1240 establishes a sales and use tax exemption specifically for construction and building materials utilized in the reconstruction or repair of structures that were affected by a declared wildfire disaster in the years 2020, 2021, or 2022. The law aims to alleviate the financial burden on individuals or communities affected by wildfires by providing tax relief on necessary materials for rebuilding or repairing damaged structures.

HB23-1254: House Bill 23-1254 requires landlords to address and remediate residential units that have been impacted by environmental public health events. It also includes provisions that protect tenants from retaliation by landlords in response to complaints regarding the condition of their units. The bill seeks to ensure the well-being and safety of tenants by holding landlords accountable for maintaining habitable living spaces and fostering a supportive environment for tenants to voice concerns without fear of reprisal.

Fire prevention

SB23-166: Senate Bill 23-166 establishes a board responsible for setting building codes aimed at reducing fire risk and fortifying structures within Colorado's WUI. The initial task for the board is to define the specific areas within the state that fall under this interface, with the objective of constructing homes in a manner that is mindful of the persistent threat of wildfires.

HB23-1273: House Bill 23-1273 establishes a grant program designed to provide financial assistance to homeowners who undertake upgrades and improvements to their properties, making them more resilient against the risks posed by wildfires. The program initially receives \$100,000 in funding. However, additional federal funds are expected to become accessible in the near future, further augmenting the program's resources.

Fire investigations and workforce capacity

SB23-013: Senate Bill 23-013 mandates the director of the DFPC to provide reports on wildfire investigations and allocates over \$2.7 million for funding these investigations. The bill emphasizes the importance of investigations and analysis of wildfires, ensuring dedicated resources to support thorough investigations in the state.

SB23-005: Senate Bill 23-005 aims to strengthen the timber, wildfire mitigation, and forest health industries through various initiatives. The bill includes the development of educational materials, the establishment of an internship reimbursement program for employers, and efforts to recruit more college-level educators in these fields. By investing in education and incentivizing workforce development, the bill aims to support and bolster these critical industries in addressing wildfire risks and promoting forest health.

Emergency preparedness

HB23-1075: House Bill 23-1075 directs the state Emergency Management Office to assess the utilization of technology to expedite evacuation modeling. The study mandated by the bill will explore the feasibility of making it a requirement for building developers to conduct the modeling themselves. By examining the potential use of technology and exploring developer involvement, the legislation aims to enhance evacuation planning and response strategies, ultimately ensuring the safety and well-being of individuals during emergencies.

HB23-1237: House Bill 23-1237 focuses on expanding the inclusion of additional languages in emergency alerts. The bill calls for a study to determine which agencies and governmental entities should be responsible for providing multi-lingual alerts. By addressing the need for diverse language accessibility in emergency communications, the legislation aims to enhance the effectiveness of alerts and ensure the safety of a broader range of individuals during critical situations.

Colorado Minimum CWPP Standards

The 2022 Colorado State Forest Service (CSFS) Minimum Standards for Developing CWPPs provide basic guidelines that have been updated per Colorado Senate Bill 09-001. The purpose of the described standards is to provide a foundation for supporting healthy, resilient, and fire-adapted communities. The plan has been developed into three overarching goals, which are broken down into sub-goals as well as related action items (CSFS 2022a). These goals include but are not limited to:

1. **Promote Community Fire Adaptation:** Through a deeper understanding of living with wildfire, facilitate social community adjustments, wildfire risk reduction through community enhancement, and an increase of pace and scale of wildfire risk reduction efforts.
2. **Reduce the Risk of Uncharacteristic Wildfire:** Reduction of wildfire severity through forest alteration, maintenance and enhancement of species and structural diversity, and revegetation of sites through species transitions before and after disturbances.
3. **Promote the Role of Fire in Ecological Processes:** Fundamental sustainability through ecological functions, Improving the understanding of the role of fire in Colorado's ecosystems, and increasing the use of managed and prescribed wildfire.

The standards specify that the planning process should be as inclusive as possible to address the needs of socially vulnerable populations and ensure all residents' concerns are represented in the plan. CSFS also requires mapping of the WUI, completion of a Quantitative Risk Assessment, and identification of priority projects to provide the community with actionable recommendations on risk reduction and

resilience. The CSFS recommends updating CWPPs at 5-year intervals to ensure project objectives, demographics, and Quantitative Risk Assessments are relevant (CSFS 2022a).

Colorado Strategic Wildfire Action Program

In 2021, Colorado Senate Bill 21-258 was signed by Governor Polis. This bill designates \$17.5 million to immediately address the wildfire crisis in Colorado through mitigation and community resilience work. This objective will be realized by increasing funding to the Forest Restoration and Wildfire Risk Mitigation Grant Program and other fire-related funding mechanisms, providing funds to hire additional mitigation and firefighting personnel, and establishing a hazard mitigation and capacity development fund. This bill marks a statewide recognition of the extreme hazards wildfires create and an investment in creating more fire resilient landscapes (Colorado Department of Natural Resources 2022). The scope of the bill is focused heavily on the counties lying on the eastern base of the Front Range, opening a multitude of opportunities for communities within Mountain View FPD to, in partnership with the CSFS and CDNR, establish funding pipelines for locations with significant tourism/recreation and watersheds providing trans-basin diversions.

Colorado Forest Action Plan

In 2020, the CSFS developed Colorado's Forest Action Plan (CSFS 2020). The purpose of the plan was to provide a framework for addressing the "current conditions and trends in Colorado's forests, as well as the current threats and challenges the state's forests face across political, jurisdictional and ecological boundaries." Priorities of the Forest Action Plan include the following: "Conserve and manage working forest landscapes", "protect forests from threats", and "enhance public benefits from trees and forests". This plan is centered around six themes, but the four themes most important this CWPP are:

1. **Forest Conditions** focuses on the current conditions of Colorado's forests, including present and future pressures, are facing from climate change (e.g., longer fire seasons, and more uncharacteristic wildfires).
2. **Living with Wildfire** focuses on the natural role wildfire plays in Colorado's forests and rangelands. It emphasizes that fire exclusion and suppression efforts of the past are no longer appropriate and, when combined with the impacts of climate change, have put communities at heightened risk from wildfire. It also states that communities must practice wildfire risk reduction strategies as WUI expand across the state.
3. **Watershed Protection** focuses on the risks that uncharacteristic droughts and wildfires pose to Colorado's watersheds. This theme emphasizes the link between forest health and watershed health.
4. **Forest Products** focuses on the importance of the logging industry in Colorado and describes the economic impact that declines in forest health (e.g., wildfire, overgrowth, and disease and insect associated mortality) have had on the industry.

This plan estimates that 10% of Colorado's 24 million acres of forest are in "urgent need of treatment to address forest health, wildfire risk and watershed protection threats, at a cost of approximately \$4.2 billion." This plan provides detailed direction for Colorado to meeting its forest treatment goals.

HB22-1111 (Insurance Coverage for Loss Declared Fire Disaster)

In 2022, Colorado passed HB-1111 which increases the amount of lost property insurers must cover upfront and extends the timeframe that victims of wildfire have to rebuild their homes. This Bill was signed by Governor Polis in 2022 and outlines standards and restrictions for home insurers when covering

instances of total loss from wildfire events. This bill includes, but is not limited to, the following requirements:

- There will be a minimum of 24 months to collect Additional Living expense Coverage with 2 extensions of 6 months
- A homeowner may not be denied insurance payment if they decide to rebuild in a different location than their previous home or if building code updates will make rebuilding costs higher than the home value.
- If a policy requires repair or rebuild in order for the owner to collect payments, the owner shall be allowed 36 months to submit invoices.
- The right to use all available rebuild benefits to buy a replacement home.
- The right to collect 65% of contents benefits without having to inventory a lifetime of possession.
- The right to know how an insurer calculated depreciation.

Additional measures of this bill ensure homeowners can recoup money from furniture and other items lost in a fire and establishes a mandatory time that insurers must cover living expenses. This Bill only applies to future declared fire disasters (Colorado General Assembly 2022a).

Federal Direction

Federal wildfire planning has evolved over time, guided by the U.S. Department of the Interior (USDOI) and influenced by significant events. In 1998, the USDOI mandated Fire Management Plans for all public lands with burnable vegetation. The National Fire Plan (NFP), established in response to the intense 2000 fire season, promoted collaboration among governmental agencies to effectively combat severe wildfires and ensure future firefighting capacity.

In 2001, a Review and Update of the 1995 Federal Wildland Fire Management Policy was released. The updated document, known as the 2001 Federal Wildland Fire Management Policy, provides a broad policy foundation for fire management programs and activities at the federal level, including those conducted under the National Fire Plan. The plan focuses on broad, internal strategic direction for fire management activities.

Recognizing declining forest health, the U.S. Congress passed the Healthy Forests Restoration Act (HFRA) in 2003 and President Bush signed the act into law (Public Law 108–148, 2003). Amendments in 2009 addressed funding changes and renewed focus on wildfire mitigation (H.R. 4233 - Healthy Forest Restoration Amendments Act of 2009). The HFRA facilitated expedited development and implementation of hazardous fuels reduction projects on federal lands, emphasizing collaborative efforts between federal agencies and communities.

Community Wildlife Protection Plans (CWPPs) were integral to the HFRA, enabling communities to collaborate with federal agencies on prioritized hazardous fuels reduction projects. CWPPs allowed communities to define the WUI and identified priority treatment areas. Priority was given to municipal watersheds, critical wildlife habitat, and areas impacted by natural factors. Communities with established CWPPs received funding priority for hazardous fuels reduction projects aligned with the HFRA. These federal policies and acts have fostered collaborative approaches, prioritized risk reduction, and enhanced wildfire management strategies, ensuring the protection of communities and the environment.

In 2023, the Wildfire Leadership Council sought to update and enhance the strategic direction of the 2014 National Cohesive Wildland Fire Management Strategy framework. This was done through the 2023 National Cohesive Wildland Fire Management Strategy Addendum Update (Forests and Rangelands

2023). The updated strategy highlights critical emphasis areas that were not identified in the previous framework.

Included among these emphasis areas are:

1. Climate change
2. Workforce capacity, health, and well-being
3. Community resilience (preparation, response, and recovery)
4. Diversity, equity, inclusion, and environmental justice

Thorough analysis of these emphasis areas is provided for within the Addendum Update report, along new management options to address them. Also identified within the update are numerous implementation challenges faced by the 2014 Cohesive Strategy. Examination of these challenges guided the enhancements that were made to the 2023 Cohesive Strategy. The national strategy takes a holistic approach to the future of wildfire management, as outlined through the updated vision statement:

To extinguish fire safely and effectively, when needed; use fire where allowable; manage our natural resources; and collectively, learn to live with wildland fire.

In order to achieve this vision, the updated national strategy goals 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.

PAST PLANNING EFFORTS

Local

Boulder County

Boulder County Community Wildfire Protection Plan: The Boulder County Wildfire Protection Plan was finalized in 2011. The purpose of the plan is to identify wildfire risks within the County and strategies for hazard mitigation (Boulder County 2011). This document is currently undergoing an update and will be available in 2024.

Boulder County Hazard Mitigation Plan: The current Boulder County Hazard Mitigation Plan was finalized in 2022 and will remain in place through 2027. The purpose of the plan is to better protect the people and property of Boulder County from the effects of hazard events (Boulder Office of Disaster Management [Boulder ODM] 2022).

Boulder County Comprehensive Plan: The Boulder County Planning Division adopted the Boulder County Master Plan in 2020. The plan's purpose is to guide and accomplish coordinated, adjusted, and harmonious development of the county. The plan includes a series of goals to effectively continue guiding

land use in Boulder County, countywide elements for both fire and natural hazards (Boulder County 2020).

Boulder County’s Sort Yard and Chipping Programs: Boulder County provides free drop-off at two Community Forestry Sort Yards. New users must register before unloading. Contractors need client-specific registration. Guidelines: clean vehicles, tie down loads, separate materials. No heavy machinery. Accepted: logs, chunk wood, decayed wood, with specific rules for each category. Conifer and broadleaf materials have designated disposal piles.

Boulder Urban Forest Strategic Plan: In 2016, Boulder County developed the Urban Forest Strategic Plan to address urban forest challenges. Boulder's urban forest has 650,000 trees, 50,800 publicly managed by Boulder Forestry Division (\$110 million value). The plan aims to sustain tree health, canopy, and services via proactive management.

Broomfield County

Broomfield Hazard Mitigation Plan: The current Broomfield County Hazard Mitigation Plan was adopted in 2022. The purpose of the plan is to better protect the people and property of Broomfield County from the effects of hazard events (Broomfield County OEM 2022).

Broomfield Emergency Operations Plan: The City and County of Broomfield Emergency Operations Plan was adopted in 2013. The plan provides a framework for how the City of Broomfield and Broomfield County coordinates emergency responses by identifying general hazards and outlining necessary actions to enhance the safety security of its resident. Guidelines for emergency recovery are also a central topic of this plan (Broomfield County OEM 2013).

Broomfield County Comprehensive Plan: The Broomfield County Planning Division adopted the Broomfield County Master Plan in 2016. The plan’s purpose is to guide and accomplish coordinated, adjusted, and harmonious development of the county (Broomfield County 2016).

Jefferson County

Jefferson County Community Wildfire Protections Plan: The Jefferson County Wildfire Protection Plan was finalized in 2011. The purpose of the plan is to identify wildfire risks within the county and highlight strategies for hazard mitigation. Also included in the wildfire planning of Jefferson County are regional CWPPs for the following communities: Coal Creek, Elk Creek, Evergreen, Fairmount, Foothills, Genesee, Golden, Golden Gate, Indian Hills, Inter-Canyon, North Fork, West Metro (Jefferson County 2011).

Jefferson County Hazard Mitigation Plan: The current Jefferson County Hazard Mitigation Plan was adopted in 2021. The purpose of the plan is to better protect the people and property of Jefferson County from the effects of hazard events (Jefferson County Sheriff’s Office 2021).

Jefferson County Comprehensive Emergency Management Plan: The Jefferson County Comprehensive Emergency Management Plan was adopted in 2021. The plan provides a framework for how Jefferson County coordinates emergency responses by identifying general hazards, discussing organizations responsible for responding to incidents, and outlining necessary approaches and actions the organizations should take (Jefferson County Sheriff’s Office 2021).

Jefferson County Comprehensive Master Plan: The Broomfield County Planning Commission initially drafted the Jefferson County Comprehensive Master Plan in 2010, and the current edition was amended in 2020. The plan's purpose is to guide and accomplish coordinated, adjusted, and harmonious development of the county (Jefferson County 2020).

Weld County

Weld County Multi-jurisdictional Hazard Mitigation Plan: The current Weld County Hazard Mitigation Plan was adopted in 2021. The purpose of the plan is to better protect the people and property of Weld County from the effects of hazard events (Weld County 2021).

Weld County Comprehensive Plan: The Weld County Department of Planning services initially developed the Weld County Comprehensive Plan in 1973, and would be updated in 1987, 1995, 2002, 2008, and 2020. The plan's purpose is to guide and accomplish coordinated, adjusted, and harmonious development of the county. The plan is a public document; however, it must be requested from the Weld County OEM (Weld County 2020).

State

2023 Wildfire Preparedness Plan: The 2023 Wildfire Preparedness Plan was prepared by the DFPC and provides an overview of the Division's wildfire response capabilities. Specific numbers and types of ground, aviation, and other support resources are outlined, along with additional needs and considerations (DFPC 2023).

Colorado State Forest Action Plan: The Colorado State Forest Action Plan was developed by the CSFS in 2020. The plan provides a framework for identifying forest stewardship priorities within the state by accounting for forest constraints, threats, trends, and jurisdictional boundaries. The plan breaks forest management into six categories: conditions, living with wildfire, watershed protection, wildlife, urban and community forestry, and forest products. Strategies for cooperatively addressing these categories while achieving healthy forest goals are also discussed. Key wildfire priorities outlined in the plan include promoting community wildfire adaptation, reducing risks of severe wildfires, and promoting the ecological role of wildfires (CSFS 2020).

State Emergency Operations Plan: The State Emergency Operations Plan was implemented in 2019 by the Colorado Division of Homeland Security and Emergency Management. The purpose of the plan is to establish guidelines on how Colorado provides response and recovery actions for emergencies and disasters. The plan provides a single framework for response, with specific details of response varying based on the type and severity of incident. For wildfire, the plan emphasizes the importance of preparedness, coordinated interagency response, and clear assignment of responsibilities (Colorado Division of Homeland Security and Emergency Management 2022).

2018-2023 Colorado Hazard Mitigation Plan: The 2018–2023 Colorado Hazard Mitigation Plan was developed by the Colorado Department of Public Safety in 2023. The plan is designed to maintain a framework for implementing hazard mitigation actions and minimizing the impacts of hazards across the state. The plan breaks down planning into categories regarding identifying hazards, implementation and response capabilities, planning at local levels, and maintaining plans. Wildfire is identified as a high annual hazard with large associated economic losses. Recommended mitigation actions include developing and maintaining CWPPs (Colorado Department of Public Safety 2018).

Northwest Colorado Fire Program Area Fire Management Plan: The Northwest Colorado Fire Program Area Fire Management Plan was produced by the Northwest Colorado Fire Management Unit in

2016 and provides wildfire management guidance for BLM- and USFWS-managed lands. The plan is designed to ease the development and implementation of wildfire management strategies by consolidating relevant information into a single, accessible document, which includes discussions of land management policy, Fire Management Unit characteristics, and wildland fire operational guidance (Northwest Colorado Fire Management Unit 2016).

Eastern Colorado Resource Management Plan: The Eastern Colorado Resource Management Plan is a comprehensive strategy developed to guide the management of public lands in eastern Colorado covered by both the Royal Gorge Field Office. It aims to balance resource conservation and multiple land uses, including recreation, energy development, agriculture, and wildlife habitat. The plan focuses on preserving sensitive ecosystems, such as wetlands and riparian areas, while also accommodating responsible energy exploration and development. It encourages collaboration among stakeholders, including local communities, tribes, and industries, to ensure sustainable resource management and economic growth in the region (BLM 2019).

Federal

The National Cohesive Wildland Fire Management Strategy: The Strategy outlines a holistic approach to the future of wildfire management, with the goal of managing forests to coexist with wildland fire but containing incidents when necessary. The Strategy maintains that this goal will be achieved by restoring and maintaining landscapes, developing fire-adapted communities, and maintaining sufficient wildfire response capabilities (Forests and Rangelands 2021).

A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-year Implementation Strategy: This plan was most recently updated in 2006 and focuses on using a collaborative framework for restoring fire-adapted ecosystems, reducing hazardous fuels, mitigating risks to communities, providing economic benefits, and improving fire prevention and suppression strategies. The plan also emphasizes information sharing and monitoring of accomplishments and forest conditions, a long-term commitment to maintaining the essential resources for implementation, a landscape-level vision for restoration of fire-adapted ecosystems, the importance of using fire as a management tool, and continued improvements to collaboration efforts (Forests and Rangelands 2006).

National Fire Plan: The National Fire Plan (Managing the Impact of Wildfires on Communities and the Environment) was implemented by the U.S. Department of the Interior and the USFS in 2000. The plan was established to develop a collaborative approach among various governmental agencies to actively respond to severe wildland fires and ensure sufficient firefighting capacity for the future. Focuses of the plan are on firefighting preparedness and accountability, forest restoration, hazardous fuels reduction, community assistance, and research (Forests and Rangelands 2000).

PUBLIC LAND MANAGEMENT

LAND MANAGEMENT STRATEGIES

Local and State Land

Local land within the Planning Area is managed following guidance provided by the CWPPs of each county within Mountain View FPD's service area. This includes Boulder, Broomfield, and Jefferson Counties. These documents recommend strategies for developing parcel-level and landscape-scale wildfire mitigation projects that can be completed on public (and private) land within their county to develop resilient ecosystems and fire-adapted communities (Boulder County 2011; Broomfield County

2016; Jefferson County 2011). At the time of writing this report, Weld County does not have a CWPP in place.

Public land in the Planning Area is also managed with regard to state guidance. In 2020, the CSFS published a Forest Action Plan with the overarching goal of maintaining forest ecosystems and improving the health of local watersheds. The foundation of the plan is built on six central themes: forest conditions, living with wildfire, watershed protection, forest wildlife, urban and community forestry, and forest products (CSFS 2020). The Colorado Department of Public Safety also develops an annual wildfire preparedness plan aims to forecast yearly wildfires and determine the amount and availability of aerial firefighting resources, state wildfire engines, wildfire hand crews, and modify the dispatching process/mobilization plan as needed. It also provides a breakdown of the hierarchy of local, County, and State jurisdictions when dealing with fires as well as any additional needs or important information based on the yearly conditions (DFPC 2022b).

The state of Colorado has joined forces with major federal agencies, namely the BLM, USFWS, U.S. Department of Agriculture, Bureau of Indian Affairs, and National Park Service, to form the Colorado Cooperative Wildland Fire Management and Stafford Act Response Agreement. The agreement focuses on interagency cooperation, the use of interagency fire resources, operations, and preparedness (DFPC 2021).

Federal Land

Arapahoe-Roosevelt National Forests (USFS)

The Arapaho and Roosevelt National Forests cover a vast area of 1.5 million acres in north central Colorado and are located in the western portion of the district (see USFS land in Figure 1.3). Managed by the USFS, these forests showcase the diverse ecosystems found along the Continental Divide, including glacial peaks, snowfields, alpine tundra, and a rich variety of vegetation. These forests are popular destinations for outdoor recreation due to their natural beauty and proximity to metropolitan areas. With ten federally designated wilderness areas and close proximity to Rocky Mountain National Park, the Arapaho and Roosevelt National Forests offer abundant opportunities for exploration and adventure (USFS 2022b). The Arapahoe-Roosevelt National Forests Fire Management plan prioritizes wildfire management to reduce hazards and preserve forest health and prevent the spread of high-severity wildfire, employing strategies such as fuel reduction, prescribed burns, and invasive species control. Additionally, the plan emphasizes community protection, collaboration among various land managers, and public education regarding wildfire prevention (USFS 2019, 2022c).

Rocky Flats National Wildlife Refuge

The Rocky Flats National Wildlife Refuge, located in the southern portion of Mountain View FPD (see USFWS land in Figure 1.3), encompasses the former site of the Rocky Flats Plant, a nuclear weapons production facility. The site was cleaned up and designated as a national wildlife refuge in 2007, with the goal of preserving the area's unique ecosystem and providing habitat for a variety of wildlife species. The refuge consists of diverse habitats, including grasslands, wetlands, and shrublands, which support a range of plant and animal species, including federally threatened and endangered species. Efforts have been made to remediate and monitor any remaining contamination to ensure the safety of wildlife and visitors to the refuge. Public access to certain areas of the refuge has been restricted due to potential exposure risks, but educational programs and limited recreational activities are offered to the public to promote awareness and appreciation of the site's natural resources (USFWS n.d.).

Royal Gorge Field Office (BLM)

Wildfire management for lands operated by the Royal Gorge Field Office are located in the southwestern portion of the FPD (see BLM land in Figure 1.3), and its management is outlined with the Eastern Colorado Resource Management Plan. This plan takes a comprehensive approach to wildfire management through prioritizing public safety and building wildfire reliance across the Planning Area and surrounding landscapes. The plan aims to minimize the risks and impacts of wildfires in Eastern Colorado with a combination of prevention, preparedness, and response strategies. This includes measures such as fuel management prescribed burns or mechanical thinning, wildfire suppression where necessary, and rehabilitation for burned regions. The plan also emphasizes the importance of community protection, collaborative efforts among various stakeholders, and public education on wildfire prevention. Additionally, it addresses the need for effective coordination between federal, state, and local agencies to ensure a coordinated response to wildfires (BLM 2019).

STEWARDSHIP AGREEMENTS

For all wildfire hazards that are, or may become, declared as emergencies or major disasters under the Stafford Act, the state of Colorado (specifically the CSFS and the DFPC) has entered into a cooperative wildland fire management agreement with multiple federal agencies (e.g., BLM, USFS, NPS, USFWS, and the Bureau of Indian Affairs). The purpose of this agreement is to improve wildfire response and management efficiency by facilitating the coordination and exchange of equipment, personnel, supplies, services, and funds among the parties in the agreement. The details of this agreement are described in the “Colorado Cooperative Wild Land Fire Management and Stafford Act Response Agreement” (available at: <https://gacc.nifc.gov/rmcc/administrative/docs/COAgreement.pdf>).

Additionally, in 2018 the USFS released its national Shared Stewardship strategy that contains the following main goals: determine management needs on a state level, do the right work in the right places at the right scale, and use all available tools for active management. The strategy is based on the USFS seeking out state, tribal, and local input to best determine land management needs. The Shared Stewardship agreement was formalized in Colorado in 2019, establishing a Shared Stewardship framework between CSFS, Department of Natural Resources, DFPC, and other state agencies (Colorado Department of Natural Resources 2022a).

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APPENDIX B:

Community Background and Resources

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LOCATION AND GEOGRAPHY

The Mountain View FPD service area is 220 square miles (140,800 acres), providing fire and emergency medical response for Boulder, Dacono, Erie, Mead, Niwot, Superior, and unincorporated areas within Boulder and Weld Counties. The Planning Area encompasses urban and rural landscapes, foothills, and valleys.

While a significant portion of Mountain View FPD's service area is privately owned, there are several notably sized plots that fall under federal, state, county, or city ownership. Portions of the Planning Area are managed by the forest service within Arapaho & Roosevelt National Forest (Figure 1.3). Rocky Flats National Wildlife Refuge is also managed by the USFWS and located in the southernmost point of the district's service area. A summarized breakdown of land ownership in the Planning Area is provided in Table B.1. Land ownership data was provided by Boulder, Broomfield, Jefferson, and Weld Counties.

Table B.1. Breakdown of Land Ownership in Mountain View FPD

Land Ownership	Acres	% of Focus Area
Private	134,987.24	90.20
Local	6,515.42	4.35
USFW	4,063.39	2.72
Other	2,604.23	1.74
USFS	714.74	0.48
State	681.31	0.46
BLM	83.00	0.06
Total	149,649.34	100



Figure B.1. Typical landscape in Mountain View FPD.



Figure B.2. Typical landscape in Mountain View FPD.

ROADS AND TRANSPORTATION

The Mountain View FPD (Figure 1.2) contains several main transportation corridors including Interstate 25, Highway 119, Highway 52, and U.S. Route 36. Interstate 25 acts as the main north/south passage for drivers traveling along the Colorado Front Range, allowing for quick access to Denver and Fort Collins. Connecting Boulder and Longmont, Highway 119 stretches diagonally in a southwest–northeast direction and extends west to provide access to the mountains. Highway 52 allows for greater interconnectivity from east to west within the Planning Area by connecting Interstate 25 and Highway 199. Extending southeast to northwest, U.S. Route 36 connects Boulder to Denver and provides travelers with access to Rocky Mountain National Park. Access to Planning Area land within the mountains consists partially of narrow, winding roads that may require 4WD vehicle usage during harsh weather conditions.



Figure B.3. Photograph showing an unsurfaced road.

TOPOGRAPHY

The topography of the Mountain View FPD Planning Area is largely uniform excluding the relatively small portions that extend towards the mountains. The land spanning from Superior in the south to Mead in the north is largely characterized by plains and rangelands. The Planning Area rises to mid and high elevations in Eldorado Springs and Flagstaff, which are characterized by contoured foothills and alpine environments.

POPULATION

The Mountain View FPD extends into four counties in north-central Colorado: Boulder, Broomfield, Jefferson, and Weld Counties. Boulder and Weld Counties are most widely represented by the district,

with Broomfield and Jefferson Counties having relatively small land areas served by the district. The district is home to a mix of urban, suburban, and rural communities, providing a varied residential landscape that has experienced notable growth in recent years.

RECREATION

Outdoor recreation is extremely popular in the Planning Area, with the Routt and Arapaho National Forests, scenic trails, and other recreational areas bringing in high volumes of visitors each year. Hiking, biking, camping, hunting, fishing, and other activities are all popular in areas surrounding the Planning Area (Weld County 2021). The Mountain View FPD is also in close proximity to the Rocky Mountains, which provide residents and visitors with a multitude of recreational opportunities.



Figure B.4. Recreation infrastructure in Mountain View FPD.

WILDLIFE

Much of the Planning Area contains urban land or vast agriculture plots and rangelands, which provide marginally suitable habitats for wildlife populations. The Planning Area also includes mountainous open space and parks that support a variety of wildlife species. The open space within the Planning Area falls primarily within Boulder County, which has made it a mission to preserve and restore wildlife that has been impacted by development, climate change, and recreation (Boulder County 2020). Due to the diversity in landscapes within the Planning Area, wildlife habitat is generally fragmented with an abundance of habitat edges; vegetated ditches and riparian areas serve as wildlife corridors that connect fragmented habitat within the district.

THREATENED AND ENDANGERED SPECIES

Several federal and state threatened and endangered species reside in and around the counties that comprise the Mountain View FPD (Boulder, Broomfield, Jefferson, and Weld Counties) in the various parks, forests, wilderness areas. These include black-footed ferret (*Mustela nigripes*), Canada lynx (*Lynx canadensis*), gray wolf (*Canis lupus*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), eastern black rail (*Lateralus jamaicensis* ssp. *jamaicensis*), Mexican spotted owl (*Strix occidentalis lucida*), piping plover (*Charadrius melodus*), whooping crane (*Grus americana*), greenback cutthroat trout (*Oncorhynchus clarkii stomias*), pallid sturgeon (*Scaphirhynchus albus*), monarch butterfly (*Danaus plexippus*), and Pawnee montane skipper (*Hesperia leonardus montana*). In addition to mammals, birds, fishes, and insects, there are also listed flowering plants in the regions such as Ute ladies'-tresses (*Spiranthes diluvialis*) and western prairie fringed orchid (*Platanthera praeclara*) (USFWS 2023).

Recommendations for fuel treatments should be developed in alignment with all required compliance, and when possible, treatment approaches should be aligned with actions that provide for habitat enhancement for threatened and endangered species. Refer to guidance from local, regional, or state natural resource agencies before conducting fuel treatments, during active fire response, and during post-fire recovery efforts.

FOREST HEALTH CONSIDERATIONS

The Mountain View FPD is home to many different species of deciduous and coniferous trees spread throughout an urban environment. Both native and non-native species can be found throughout the Planning Area. This presents unique challenges for urban foresters who must contend with a multitude of native and introduced insects and diseases.

Not only are typical western insects and diseases such as mountain pine beetle (*Dendroctonus ponderosae*) and western gall rust (*Peridermium harknessii*) present in the Planning Area, but so are invasive insects and diseases affecting hardwoods such as emerald ash borer (*Agrilus planipennis*) and cottonwood canker (*Cytospora chrysosperma*). Proper planning and treatment are often more involved for urban forests due to the increased risk that weakened and damaged trees pose to people and infrastructure. It is important that woody debris is managed closely and collaboratively within the FPD especially in riparian areas where a buildup of dead and down material can increase the risk of wildfire.

INSECTS

It is important to monitor the health of urban trees and take appropriate measures, such as proper maintenance and timely insecticide treatments, to manage and mitigate insect infestations. Consulting with local arborists or forestry experts can provide more specific and up-to-date information on insect pests in the region.

Primary insects that have infested or have the potential to infect the forests within and around the Mountain View FPD CWPP Planning Area include (USFS 2020):

- Mountain Pine Beetle (*Dendroctonus ponderosae*) – Primarily affecting ponderosa pine and lodgepole pine
- Spruce Beetle (*Dendroctonus rufipennis*) – primarily affecting Engelmann and blue spruce

- Western Balsam Bark Beetle (*Dryocoetes confuses*) – primarily affecting subalpine fir
- Western Spruce Budworm (*Choristoneura freeman*) – primarily affecting Douglas-fir and spruce
- Emerald Ashborer (*Agilus planipennis*) – primarily affecting ash trees
- Cottonwood Borer (*Plectrodera scalator*) – primarily affecting cottonwoods and aspen

Primary. Additional information on tree mortality and beetle infestations can be found in the Tree Mortality section of this appendix.

DISEASES

Vegetation affected by fungi, parasites, and bacteria increase fire hazard within the Mountain View FPD. These diseases degrade the productivity and health of vegetation making it more susceptible to ignition. Some of the more common plant diseases that are found in Colorado are listed below.

- Ink Spot (*Ciborinia whetzellii*) primarily affecting aspen
- Cercospora Blight of Junipers (*Cercospora sequoiae var. juniperi*) – primarily affecting rocky mountain juniper
- Broom Rust of Spruce and Fir (*Melampsorella caryophyllacearum*, *Chrysomyxa arctostaphyli*) – primarily affecting Douglas-fir, spruce, and subalpine fir
- White Pine Blister Rust (*Cronartium ribicola*) – primarily affecting limber pine
- Cottonwood canker (*Cytospora chrysosperma*) – primarily affecting cottonwood, aspen, and alder
- Dwarf Mistletoe (*Arceuthobium* spp.) – primarily affecting ponderosa pine and lodgepole pine
- Dutch elm (*Ophiostoma ulmi*, *Ophiostoma himal-ulmi*, *Ophiostoma novo-ulmi*) – primarily affecting elm trees

Treatments for affected plants on federal land would be subject to the National Environmental Policy Act (NEPA); in areas that may impact threatened and endangered species, certain mitigation measures would be required to prevent habitat degradation.

EMBER IGNITION HAZARDS

Short-range spotting is not significant for wildfire growth and is accounted for in wildfire spread models. Long-range spotting, on the other hand, occurs when firebrands (flaming or glowing fuel particles that can be carried naturally by wind, convection currents, or gravity into unburned fuels) are lifted by convection columns and carried beyond the immediate fire area (NWCG 2021, 2023b). The extinction time and maximum distances traveled by firebrands are influenced by various factors.

Canopy characteristics of tree stands, including species, height, and diameter at breast height (DBH), affect the quantity and size of firebrands produced during a wildfire (NWCG 2021). Firebrands from thick-barked species like ponderosa pine and Douglas fir travel shorter distances compared to those from resinous species with lighter bark like sub-alpine fir and Gambel oak. Weather and landscape-related factors also play a role in firebrand travel distance. Wind speed and atmospheric stability impact the distance traveled. Atmospheric stability refers to the resistance to vertical motion and can be measured using indices like the Lower Atmosphere Stability Index (LASI) or Haines Index (NWCG 2022, USFS 1988). Hot, dry air and unstable atmospheres contribute to larger convective columns and greater ember

and firebrand travel distances. The absolute humidity of the air affects the extinction time of firebrands. Humid conditions extinguish airborne firebrands, while dry conditions allow them to smolder.

Structures can be protected from ember ignitions by raising the relative humidity of the surrounding air rather than wetting the structure itself, using a sprinkler system for instance (Nazare et al. 2021). Additionally local topography influences where embers may land. Ridges can catch firebrands, and steep valleys tend to collect embers. Wind slope alignment and the positioning of structures can impact ember production and potential ignition.

See Figure B.5 for a map of ember load index across the Mountain View FPD. An ember load index is a value describing the relative load of embers a pixel on the landscape experiences given landscape burn probability, weather, topography, and fuels. See Appendix C for a more detailed description of modeling methodology.

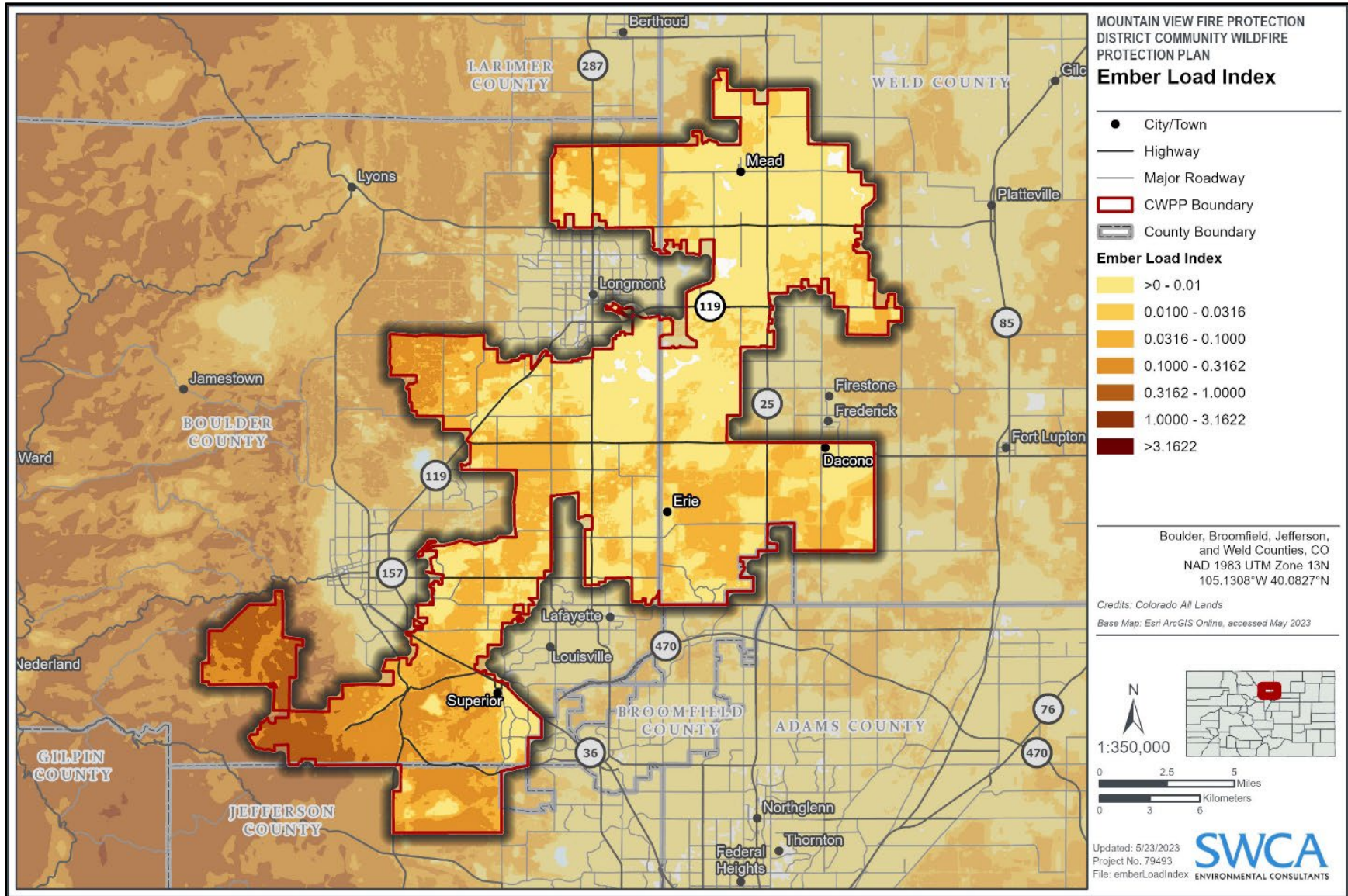


Figure B.5. Ember load index throughout Mountain View FPD.

ENVIRONMENTAL CHALLENGES

DROUGHT AND CLIMATE

Frequent drought, tree mortality, and climate change have all worked together to increase wildfire likelihood and community vulnerability to wildfire (CSFS 2020). These factors have interacted to increase the risk of uncharacteristically large high-severity fires (CSFS 2020). In the past few years, fires have grown to record sizes in Colorado and are burning longer, hotter, and more intensely than they have in the past (CSFS 2021). In Colorado, wildfires burned 665,454 acres of land in 2020, making it the largest and most destructive season recorded in Colorado's history (*Colorado Sun* 2020). The shifting climate, particularly rising temperatures, changing wind patterns, and increasing temporal and spatial variability of water availability, are considerably escalating wildfire risk across the state (CSFS 2020).

This impacts of highly variable winds and rising temperatures throughout the state are exemplified by the devastating Marshall Fire, which burned through the Town of Superior and unincorporated Boulder County. The fire's magnitude was a result of an unusually dry summer coupled with extreme wind events with gusts of up to 105 mph (AP News 2022). Destroying and damaging over 1,100 homes and commercial structures, the fire took one life and left another missing (9news 2022). Colorado's insurance commissioner, Michael Conway, stated that the Marshall fire amassed more than \$2 billion in losses, placing it within the top 10 most costly fires in U.S. history. Government agencies, businesses, and residents have since been working to recover and rebuild (Fox 31 2022).

Furthermore, Colorado is expecting more extreme and prolonged drought conditions in the coming decades. Warm drought periods in Colorado have already significantly increased the risk of wildfire across the state (CSFS 2020). Changing health of Colorado forests combined with increased development in the WUI and impacts from climate change suggest that large destructive fires will become more likely throughout Colorado. It is important to note that fire is a natural part of Colorado's diverse landscapes and is essential to many ecosystems across the state. Almost all of Colorado's diverse ecosystems are fire-dependent or fire-adapted; when not directly or indirectly intensified by human actions, wildfire works to balance ecosystems, and restore their natural functions (CSFS 2020).

DRY GRASSLANDS

Grasslands present unique challenges for wildfire mitigation due to the flammability of grass fuels and susceptibility to fire spread over large areas (Wragg et al. 2001). Historical fire patterns in the grasslands and prairies of central North America are characterized by frequent fires occurring every 1 to 35 years (Zouhar 2021). With climate change causing greater variability in precipitation and increasingly severe and frequent drought events, it is likely that grasslands across the United States will experience disruptions to their natural cycles, such as aquifer depletion due to soil erosion and increased wildfire occurrences (Bagne et al. 2012). Grassland fires are also more likely to take place when the dominant grass species have entered their dormant periods (mechanism used by grasses to protect from harsh or unfavorable conditions) in the late summer and fall months, after which they will have lost moisture and accumulated a fuel load composed of dry biomass (Zouhar 2021).

When factors such as extreme weather and dry fuel accumulation coincide, they formulate conditions that are conducive to wildfire spread that can be extremely destructive to populations that interface with grassland communities. The recent Marshall fire is described to have been a "perfect storm", as the

incident was preceded by historically warm temperatures, low amounts of precipitation and unusually strong winds, causing it to spread (Fovell et al. 2022).

Invasive grasses, such as cheatgrass (*Bromus tectorum*), are transforming native fire regimes, increasing ignition potential and fire occurrence (Cooperative Institute for Research in Environmental Sciences 2019; Boulder County 2021). To reduce flammability and the potential for rapid wildfire spread across grass dominated landscapes, land managers and landowners can employ various fuel mitigation practices. Prescribed grazing in shrub-grasslands during winter months has been shown to reduce fuel loads and increase fuel moisture when applied over extended periods (5 years) (Davies 2016). Other fuel reduction strategies such as fuel breaks and mowing can also be effective for reducing fire spread by reducing or even completely eliminating the burnable fuels within an area. For fuel breaks to effectively reduce the spread of wind-propelled flames, it is recommended that fuel breaks span 100 to 300 feet on each side of a roadway, with vegetation trimmed down to 6 to 12 inches in height (Moriarty et al. 2015).

TREE MORTALITY

Primarily linked to prolonged drought and bark beetle attacks, tree mortality in Colorado is largely exacerbated by climate change and subsequent shifts in beetle attack patterns (USFS 2022a). Although bark beetle attacks were once normal in Northern Colorado's forests, climate change has amplified their impact and expanded their reach (Anderson 2003; Mitton and Ferrenberg 2012). Trees killed by insects pose varying levels of fire risk, with increased potential for intense wildfires (Kulakowski and Veblen 2007; USFS 2019). To mitigate this threat, fuel reduction treatments like thinning and prescribed fires within the WUI can decrease both catastrophic wildfire risk and the severity of future beetle outbreaks (Goodwin et al. 2020). The USFS monitors tree mortality and beetle infestations yearly across millions of acres in Colorado. A documented surge in beetle infestations has been observed in 2021, contributing to Colorado's record-breaking wildfires (USFS 2022a). Areas of Mountain View FPD within the WUI face susceptibility to tree infestations, which heightens ignition chances, endangers lives, property (see Hazardous Trees below), and fuels accumulation.

Hazardous Trees

Hazardous trees are often responsible for wildland fire ignitions as well as damage to property and injury to people in urban, suburban, and exurban settings. It is important to be able to identify and report hazardous trees within the WUI or adjacent to critical infrastructure in exurban areas, such as power lines. During high wind events, hazardous trees often fall on power lines, potentially causing wildfire ignitions during which windy conditions may exacerbate the intensity and rates of spread. It is advised that property owners and land management groups understand how to identify hazardous trees and the best course of action for removing them. Property owners that have identified hazardous trees on their land are encouraged to consult licensed tree care professionals. The removal of hazardous trees is highly dangerous and should not be attempted without proper experience, knowledge, and equipment.

Tree height should be used to assess the potential impact zone. Trees are known to fall unpredictably and may slide, roll, and cause other trees to fall in thicker stands. The potential impact zone should be surveyed for values at risk such as power lines, vehicles, sleeping areas, structures, and high traffic zones. Additionally, it is best to look at trees from two to three different perspectives, close, at a distance and all around. Be on the lookout for characteristics such as dead tops, split trunks, and fungal fruiting bodies. Accurately determining tree defects requires advanced knowledge and skill. If a tree is suspected of having defects, it is advised to consult a licensed arborist or similar tree care professional.

A link to the National Wildfire Coordinating Group (NWCG) Hazard Tree Identification guide can be found here: <https://www.nwcg.gov/committee/6mfs/felling-safety/hazard-tree-identification>.

Additional information on forest health considerations and wildlife are summarized in Appendix A.

ECOSYSTEM SERVICES

Ecosystem services are the benefits to humans provided by natural resources. The Planning Area's diverse agricultural/rangeland, montane forest, and aquatic environments provide many ecosystem services. Residents and visitors enjoy the beauty of the natural landscape and many recreational opportunities that generate revenue for businesses within the Planning Area. The forested ecosystems within the Planning Area play important roles in sequestering carbon, providing clean air, and recreation opportunities. Extensive and uncharacteristic wildfires directly jeopardize these important ecosystem services and have the potential to impact economic prosperity.

In addition to direct damage (e.g., structure and property damage) caused by high-severity wildfires, there are indirect impacts on the environment and ecosystem services as well. High-severity wildfires are known to deteriorate local and regional air quality, pollute waterways, displace native animal and plant species, and increase carbon dioxide emissions. The increased carbon dioxide emissions are of special concern as carbon dioxide is a greenhouse gas and plays a major role in climate change. It is important to note that low-severity fire is a component of healthy rangelands and lower montane shrublands (see Fire Regimes in Chapter 2).

Residents in more urban areas should adhere to local building regulations and fire code guidelines to prevent high severity fire impact in residential areas, which can spread and cause damage to ecosystems in addition to life and property. Those living in rural areas should adopt management practices that both reduce wildfire risks and maintain native ecology.

FIRE RESPONSE CAPABILITIES

Fire management in Colorado relies on a cooperative, interagency partnership among federal, state, and local entities. Wildland fire response for large fires is typically supported and coordinated by regional interagency dispatch centers in Colorado. These dispatch centers are part of the larger Rocky Mountain Area Coordination Center. The dispatch centers in Colorado include Fort Collins, Craig, Grand Junction, Montrose, Durango, and Pueblo Interagency Dispatch Centers. The Fort Collins interagency dispatch center serves the Mountain View FPD within the Western Plains response zone 11 (Geographic Area Coordination Centers [GACC] 2023).

In the event of an emergency, always call 911. The 911 dispatcher will send the appropriate response resource to the incident. 911 calls reporting suspicious smoke or clouds are highly valued as they can help locate wildfire ignitions.

When a fire occurs within the jurisdictional boundaries of the Mountain View FPD, the responsibility of incident commander falls upon the FPD Fire Chief, who may assume command of the fire or assign a qualified incident commander to lead wildfire operations. However, if an incident exceeds the capacity of a district or occurs in an unincorporated area outside of a district, incident command defaults to the associated County Sheriff, who will identify a local incident commander whose qualifications are adequate for managing the wildfire complexity type. The Sheriff's Office will often assume evacuation management roles during wildfire incidents. Authority of fire chiefs and the Sheriff is derived from the Colorado Revised

Statutes (Colorado General Assembly 2022b). If an incident occurs on land managed by the USFS, BLM or NPS, the respective managing agency is responsible for response and establishment of an incident commander who bears the power of declaring evacuations.

Mountain View Fire staffs ten fire stations throughout the district that operate 24 hours per day, 7 days per week (Mountain View FPD 2023). Displayed in Figure 5.5 are the locations of each fire station within the district, including estimated service response times throughout the Planning Area (calculated via ESRI ArcGIS tool). In addition to structure fire and emergency medical service response, Mountain View Fire also supports a robust wildland fire division. See Table B.2. for additional statistics on fire response resources. Figure B.6 below depicts the fire suppression difficulty level across the district, which is calculated using various factors (e.g., flame length, topography, fire line production rates, and proximity to trails and roads). Fire suppression difficulty can be used to identify potential challenges of firefighting resource deployment and should not be utilized for evaluating burn probability structural fire risk.

Table B.2. Mountain View FPD Statistics

Fire Department Statistics:			
<u>Fire Protection District:</u> Mountain View			
<u>Communities Served:</u> Mead, Dacono, Erie, unincorporated Weld County, Niwot, Superior, Marshall, Eldorado Springs, Flagstaff Mountain communities, Lake Shore Drive, north side of Gross Reservoir, unincorporated Boulder County			
<u>Fulltime Firefighters:</u> 155	<u>Red-Carded Firefighters:</u> ~150	<u>Volunteer Firefighters:</u> 0	
<u>Water Tender:</u>		<u>Wildland Engines</u>	
Type 1: 6	<u>Total Number:</u>	<u>4WD/AWD:</u>	<u>Brush Breaker:</u>
Type 2: 0	Type 3: 5	5	0
Type 3: 0	Type 4: 0	0	0
<u>Structure Engines:</u>	Type 5: 0	0	0
Type 1: 11 (2 4wd)	Type 6: 7	7	0
Type 2: 1	Type 7: 0	0	0
<u>Port-A-Tanks:</u> 6+	<u>Fire Shelters:</u> 155+		
<u>Portable Pumps:</u> 15			

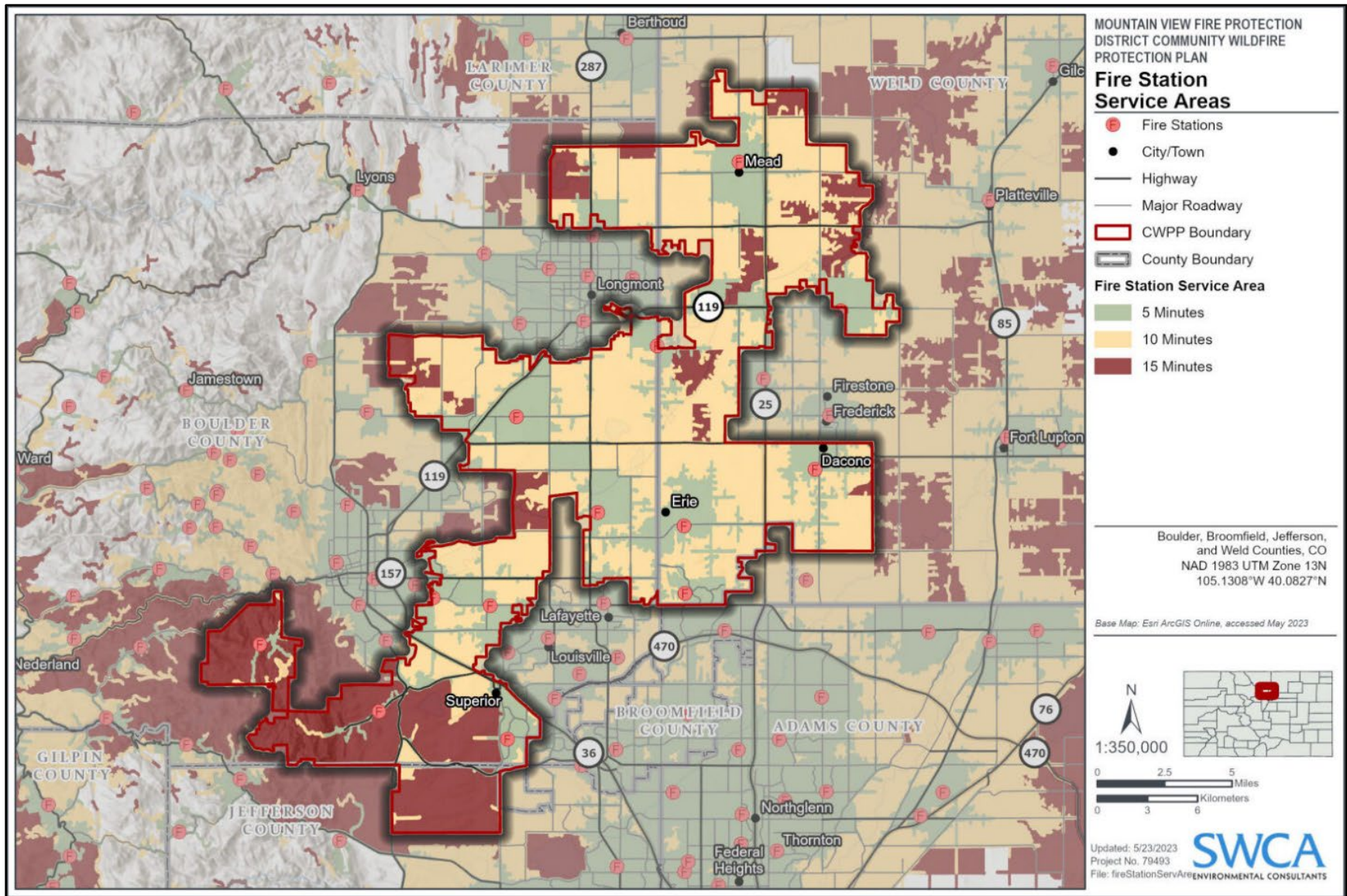


Figure B.6. Fire station locations and service areas.

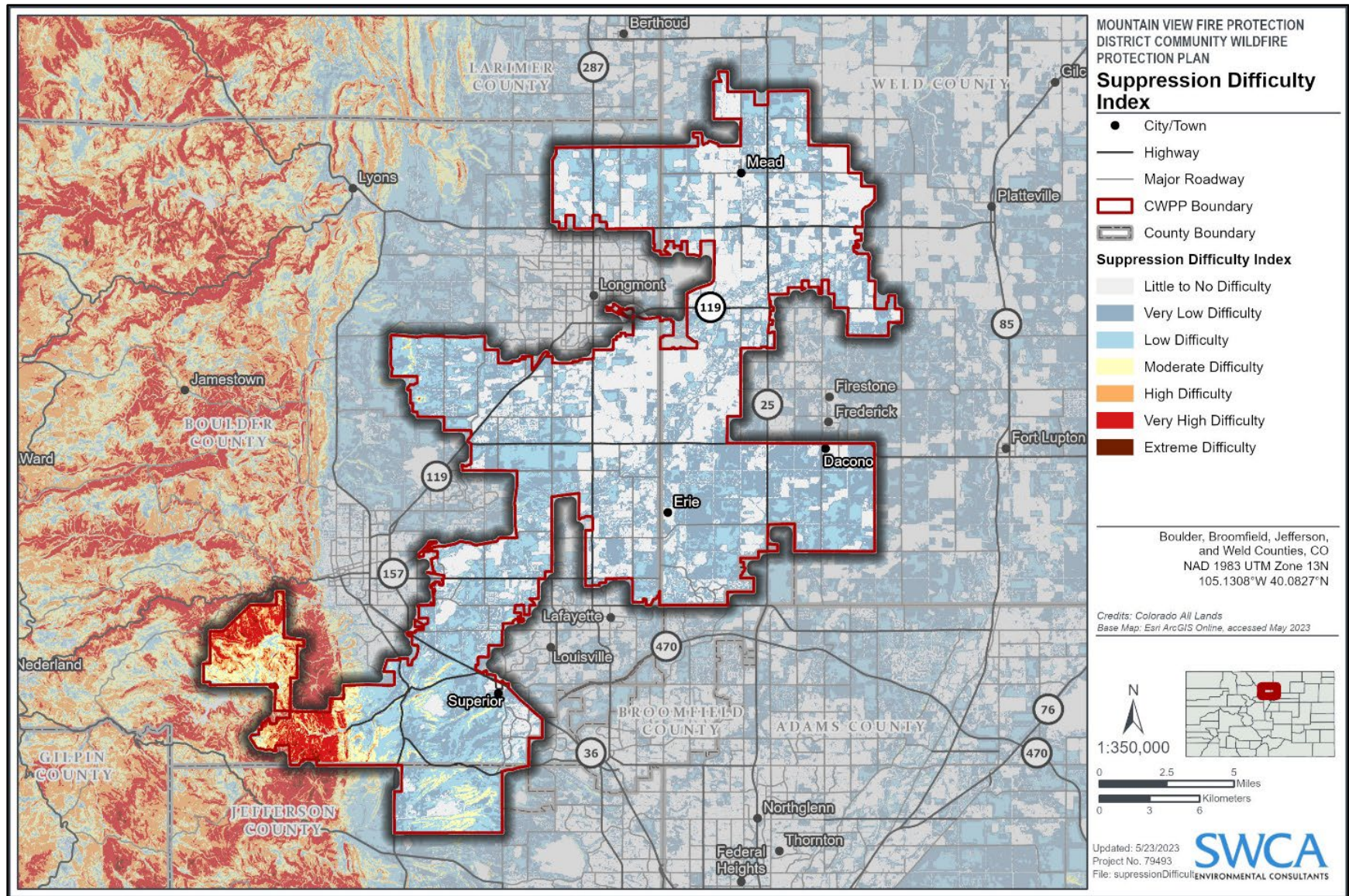


Figure B.7. Suppression difficulty index throughout Mountain View FPD.

STATE RESPONSE

Colorado Division of Fire Prevention and Control

The DFPC is the lead state agency for fire. DFPC's Wildland Fire Management Section (WFMS) is responsible for wildland fire management on local and state lands and aids in the coordination of wildfire management across local, state, and federal agencies. DFPC states that its priority wildland fire mission is "to assist and support local agencies and counties with a range of wildfire management programs including administrative, technical, preparedness and planning, funding, response, and prescribed fire functions" (DFPC 2022c).

On non-federal lands, wildfire management follows a hierarchy from local jurisdiction to County Sheriff, and finally, to the State of Colorado. The chief of the Mountain View FPD is responsible for fires that occur within the boundaries of their district. If a fire is outside of the chief's ability to manage, then it is the duty of the Boulder and Weld County Sheriffs to assume the responsibility of coordinating fire suppression efforts and requesting assistance from the DFPC.

The county sheriff is also responsible for coordinating fire suppression efforts in unincorporated areas of the county. If the county sheriff and DFPC have determined that the county capacity has been exceeded, then the DFPC director will approve state assistance based on the assessment of capacity and availability of funds. If approved, the fire becomes a state responsibility, and DFPC assumes cost and management along with ongoing involvement from local and county partners (DFPC 2022c). In Colorado, the state can either provide assistance or assume full responsibility for fighting fires.

State assistance for fires include the following management strategies and resources (DFPC 2022a):

- Encouraging rapid initial attack actions where fire is unwanted to reduce the size, duration, costs, and impacts of wildfires.
- Providing personnel, enabling local agencies to respond to their next incident, and volunteer firefighters to return to their regular jobs.
- Providing funding and resources for local and county managed fires. The fire does not have to exceed the capacity of the fire department or the county to receive funding.
 - Resource support can include DFPC engines, module, and overhead resources, as well as technical assistance from DFPC Fire Management staff.

WATER AVAILABILITY AND SUPPLY

The primary water source for fire suppression operations in the Mountain View FPD service area is municipal hydrants. Fire suppression operations in areas beyond hydrant service zones rely on cisterns and water shuttling via tenders and engines. An internal survey conducted in the spring of 2023 found that the Mountain View FPD fire chief rated available water resources for fire suppression efforts as acceptable and is working to improve the availability of water resources by adding cisterns in areas that lack hydrants. See Figure 1.2 for a map of the FPD general location including water resources. Water resources for fire suppression throughout the service area and surrounding region are displayed in Figure B.7.

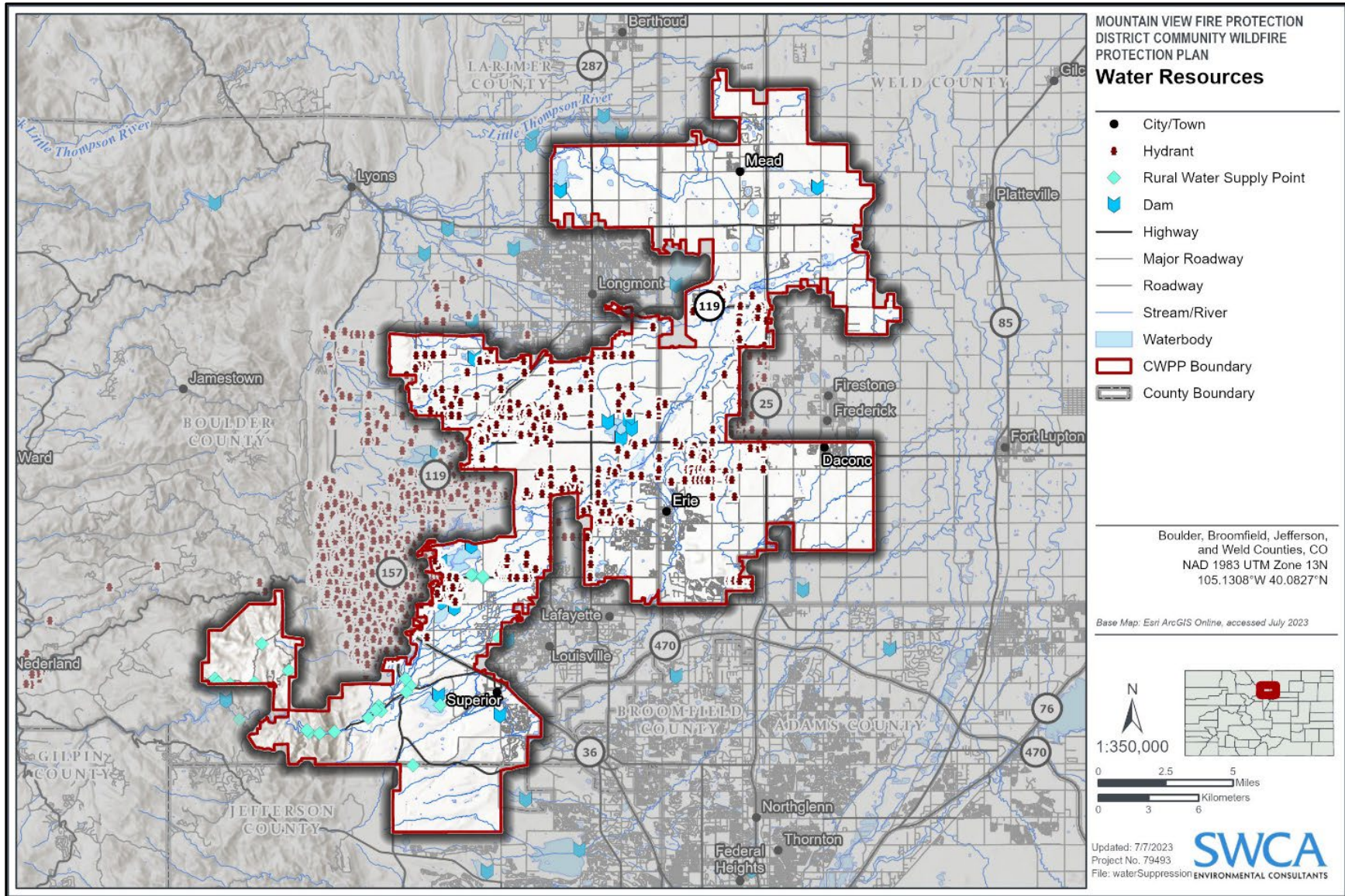


Figure B.8. Water resources throughout Mountain View FPD.

Note: Rural Water Supply Points denote specific locations of infrastructure providing domestic water services to unincorporated areas.

MUTUAL AID

The wildland fire community is well known for its development of mutual aid agreements at the federal, state, and local levels. Such automatic aid agreements allow for the closest forces to respond to an incident as quickly as possible regardless of jurisdiction. Figure B.5 depicts the fire stations within the district boundary along with service area response times.

Such agreements may also describe how reimbursement will be conducted; state resources responding to wildfires on federal land may have their associated costs reimbursed by the responsible federal agency, and the reverse is true for federal resources suppressing a wildfire on state land.

Mountain View FPD has current mutual aid agreements with the Boulder County Wildland Fire Duty Officer, the State of Colorado, and Boulder County.

EVACUATION RESOURCES

Evacuation relies on both cooperative planning and the capability of residents to effectively comprehend and execute planned evacuation procedures. Boulder County and Weld County's Offices of Emergency Management have developed Multi-Hazard Mitigation Plans that highlight the need for evacuation planning for disaster events that pose a threat to human life, including wildfire. Jefferson and Broomfield County's Hazard Mitigation Plans identify the level of risk to various hazards and provide a planning approach to best address the associated risk and reduce the loss of life and property.

Both Weld and Boulder counties provide Emergency Preparedness Guides that provide residents within each county with a comprehensive educative resource for planning individualized evacuation plans for wildfire and other emergency events. Jefferson county provides a wildfire emergency preparedness guide, encouraging its residents to learn how to properly prepare for wildfire impacts through a range of activities. Additionally, the Broomfield City and County website contains extensive information on wildfire preparedness.

Hazard mitigation plans for Boulder, Weld, Jefferson, and Broomfield Counties:

- [Boulder County 2022-2027 Hazard Mitigation Plan](#)
- [Weld County 2021 Multi-Jurisdictional Hazard Mitigation Plan](#)
- [Jefferson County 2021 Hazard Mitigation Plan](#)
- [City and County of Broomfield 2022 Hazard Mitigation Plan](#)

Emergency Preparedness Guides for Boulder, Weld, Jefferson, and Broomfield Counties:

- [Boulder County Emergency Preparedness Guide](#)
- [Weld County Emergency Preparedness Guide](#)
- [Jefferson County Disasters and Emergencies Guide](#)
- [Broomfield County Wildfire Preparedness](#)

Please note that the public should follow the latest guidance from trusted sources, such as official government agencies, with regard to evacuation orders, especially as emergency response plans change rapidly. Current evacuation orders should always be adhered to and supersede all information presented in the CWPP.

Road Systems

The majority of communities in the Planning Area are comprised of urban and rural road roadways with minimal hazardous features or other obstructions to emergency response vehicles and personnel. Certain structures in the portion of the Planning Area located in the foothills of the Rocky Mountains are accessed only via unsurfaced roads through variably forested areas, which are often narrow, long, and windy with many dead-ends and blind corners (Figure B.9). These access roads are particularly hazardous during emergency evacuation, especially where they are lined by thick, dense vegetation. Fuel treatments may be needed along some roads where vegetation is overhanging and could prevent safe evacuation of residents or safe access by emergency responders (see Chapter 3 or Appendix C for more information regarding roads hazard analysis).



Figure B.9. Example of a narrow access road within the Mountain View FPD.

People

The safe and efficient evacuation of people from wildfire requires emergency notification systems, preplanning of evacuation routes, and effective public education and outreach on emergency preparedness. The following sections detail these elements within the Planning Area.

Emergency notification methods:

The Counties within the Planning Area utilize multiple notification systems to alert residents of emergencies.

Weld County utilizes CodeRED, a reverse 911 public safety alerting system. Residents must register their numbers in CodeRED system, which can deliver time-sensitive, geo-targeted information using voice messaging via cell or landline, text messaging, or email.

Boulder County utilizes Everbridge for emergency notification and communication, which functions by sending text and voice messages from local emergency response agencies to the phone numbers and email addresses of those who have signed up and “opted in” for emergency alerts. To reach members of the community who use a primary language other than English, Boulder County also utilizes the ReachWell App, which allows users to receive emergency alert content in over 100 languages.

Jefferson and Broomfield Counties each utilize Lookout Alert, a mass emergency notification system integrated that allows emergency responders to send real-time alerts to the public and providing vital information for safety through text messages, emails, and voice messages.

See the following resources to sign up for emergency alerts for Boulder, Weld, Jefferson, and Broomfield Counties.

- [Boulder County Emergency Notification System](#)
- [Weld County Emergency Notification System](#)
- [Jefferson County Emergency Notification System](#)
- [Broomfield County Emergency Notification System](#)

In addition to the alert systems utilized by the counties within the Planning Area, word of mouth also plays a role in emergency notification, especially in more rural areas where residents may not be subscribers to opt-in alerting systems. When safe to do so, residents should call or text friends, neighbors, and contacts to ensure that they are aware of active alerts.

It is important to note that temporary residents or tourists may not be signed up for emergency alert notifications. It is recommended the FPD work with short-term rental owners and hotels to ensure the applicable emergency notification sign up resources are provided to all who rent a property or have a short-term stay within the county.

Preplanning by the public about how to evacuate and where to go:

Locked gates, poor or missing signage, and conflicts with emergency vehicles driving into communities versus the public trying to leave can complicate evacuation. Uncertainty about where to find temporary refuge can also cause families to become separated and delay reunions, and some individuals without transportation or with limited mobility may be accidentally left behind. Always make sure to have an evacuation plan, grab list items, and go bag(s) ready; know your evacuation routes and rallying points; and ensure you are signed up to receive emergency notifications. Be sure to bring important belongings such as irreplaceable items, prescriptions, documentation, or other life-dependent items.

Help your local community members only if it is safe to do so. It is also important to note that if a wildfire is in your area, you do NOT need to wait for government evacuation orders to evacuate. If you see, smell, hear, or otherwise sense that you are in danger, take action to keep yourself safe. Please see Appendix E, Homeowner Resources, or the story map, for links to resources mentioned above.

Public awareness:

Safe and effective evacuation will only occur if residents are aware of planning efforts and notification methods. Therefore, public education and outreach on these topics should be part of all efforts conducted by agencies such as fire departments in a wide variety of venues.

Community Emergency Response Team

Developed by the Federal Emergency Management Agency (FEMA), the Community Emergency Response Team (CERT) training is a program that educates community members about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical.

Supplemental training modules are available to better assist professional responders in a variety of emergency situations. Advance training includes such topics as animal response, emergency communications, traffic and crowd management, and flood response. If Mountain View FPD is searching for additional avenues to increase preparedness of individuals within the community, it is recommended that officials consider implementing the CERT program.

For more information, visit FEMA's CERT webpage: <https://www.fema.gov/emergency-managers/individuals-communities/preparedness-activities-webinars/community-emergency-response-team>

Disaster Strong Preparedness Series

In an effort to increase community preparedness, the Boulder Office of Disaster Management (Boulder ODM) has created the Disaster Strong Preparedness Series, which consists of workshops and resources to increase the public's knowledge and skills related to disaster preparedness. The Disaster Strong Series Workshops cover a variety of topics, including disaster preparedness basics, preparedness for access and functional needs, large animal preparedness and train-the-trainer education. New topics are continually added to meet the needs of the community.

Resource documents can also be found at <https://boulderodm.gov/preparedness/resource-library/>.

Animals and Livestock

In the event of a wildfire, it is important that residents and fire responders within Mountain View FPD have a plan for evacuation of pets and livestock. Evacuation planning often neglects to describe how animals will be evacuated and where they will be taken. The loading of horses, for example, during a fire and smoke situation, and transport of stock vehicles down narrow roads under stressful situations, can be very difficult.

The Colorado State University has additional resources for livestock and animals, you can view those resources here: <https://extension.colostate.edu/disaster-web-sites/fire-resources/fire-livestock-resources/>

However, additional public education could emphasize the need for individuals to have a plan for the evacuation of pets and horses in addition to their family, ensuring a lack of planning doesn't slow or prevent evacuation.

PUBLIC EDUCATION AND OUTREACH PROGRAMS

Public education and outreach programs are a common factor in virtually every agency and organization involved with wildfire response. The Mountain View FPD's mission is to "preserve and protect our community from all hazards through exceptional preparedness, prevention, education and emergency response" (Mountain View FPD 2023). Education plays a pivotal role in the FPD's approach to facilitating greater community safety and resilience to disasters and other emergencies.

LOCAL AND STATE PROGRAMS

Mountain View Fire Protection District

The Mountain View FPD is a committed organization providing fire protection and emergency medical services across multiple counties in northern Colorado. The district also places great emphasis on public education, with their webpage providing information regarding various courses and programs on emergency preparedness and fire safety. Informative videos developed by the district on their YouTube channel provide the community with engaging educational opportunities suitable for all age groups. The webpage also contains a section for news and announcements, highlighting new programs and special events.

You can access the Mountain View FPD's webpage at: <https://www.mvfpd.org/latest-news>

Boulder Office of Disaster Management

The Boulder ODM provides a webpage with numerous educational resources on disaster preparedness. General information on sheltering in place, hazard awareness, and other emergency guidance is available to the public through this resource. The Boulder ODM encourages the public to stay informed about emergency alert systems and the plans in place for disaster response.

You can access these resources and guidelines at the webpage located here: <https://boulderodm.gov/preparedness/>

Boulder County Wildfire Partners

The Boulder County Wildfire Partners is a wildfire mitigation and preparedness program funded by Boulder County, Colorado State Forest Service, and FEMA. The program provides residents of Boulder County with individualized home assessments that identify vulnerabilities to wildfire and available financial assistance for an approved contractor to perform forestry work on properties. Colorado State Forest service guidelines for defensible space and vegetation management are carried out by the program. Wildfire Partners advisors are available Monday through Friday from 9 a.m. to 4 p.m.

To learn more about the Boulder County Wildfire Partners Program, please visit: <https://wildfirepartners.org/about/>

Broomfield County Office of Emergency Management

The Broomfield OEM provides residents of the County with resources for various disaster and emergency scenarios including wildfires. Provided on the webpage are several resources for building community

resilience to disaster, including a list of steps to best prepare for emergencies, ways to reduce wildfire impacts on property, and information on countywide efforts made to enhance wildfire response.

For More information and to access these guidelines, please visit:

<https://www.broomfield.org/1234/Emergency-Management>

Jefferson County Emergency Management

The Jefferson County Emergency Management and Preparedness Team utilizes expertise in disaster preparedness for a variety of potential hazards. The team's mission areas include prevention, protection, mitigation, response, and recovery. The webpage offers information on fire restrictions and bans, wildfire planning, weather warnings, and evacuation guidelines. Also provided on the webpage is a link to a Colorado-centric interactive guide on wildfire preparedness.

You can access these resources and guidelines at the webpage located here:

<https://www.jeffco.us/508/Wildfire>

Weld County Office of Emergency Management

The Weld County OEM is responsible for disaster planning and coordinating response activities in the event of an emergency. Their mission is to provide the county's residents with support and information about prevention, mitigation, response, and recovery. Located on the webpage are numerous educational resources, training opportunities, and announcements, allowing the public to stay up to date with the county's emergency management goals.

For more information, please visit: <https://www.weld.gov/Government/Departments/Office-of-Emergency-Management>

Colorado Division of Homeland Security and Emergency Management

The Colorado Division of Homeland Security and Emergency Management offers numerous services, including those geared towards prevention, protection, mitigation, response, and recovery. They also help facilitate pre- and post-disaster funding to local governments. Their emergency management website can be accessed here: <https://dhsem.colorado.gov/emergency-management-office>.

Colorado Division of Fire Prevention and Control

The DFPC offers various resources for topics such as building safety, fire prevention, community risk reduction, firework safety, vehicle safety, and the fire safety evaluation system (FSES) (DFPC 2022c). The DFPC has its own wildland fire management communications and outreach specialist. Contact information is available here: <https://dfpc.colorado.gov/home/public-information>.

In addition, the DFPC hosts several campaigns throughout the year including building safety month, fire prevention week, community risk reduction week, and more. You can find more information on the DFPC campaigns and public education webpage located here:

<https://dfpc.colorado.gov/FLScampaigns?web=1&wdLOR=c61B38F2B-6998-4994-BC02-E114F1CDA5E3>

NATIONAL PROGRAMS

Ready, Set, Go!

The Ready, Set, Go! program, managed by the International Association of Fire Chiefs, was launched in 2011 at the WUI conference. The program seeks to develop and improve the dialogue between fire departments and residents, educating residents who live in high-risk wildfire areas on how to best prepare themselves and their properties for wildfire.

The tenets of Ready, Set, Go! as included on their website (<http://www.wildlandfirersg.org>) are:

Ready – Take personal responsibility and prepare long before the threat of a wildland fire so your home is ready in case of a fire. Create defensible space by clearing brush away from your home. Use fire-resistant landscaping and harden your home with fire-safe construction measures. Assemble emergency supplies and belongings in a safe place. Plan escape routes and ensure all those residing within the home know the plan of action.

Set – Pack your emergency items. Stay aware of the latest news and information on the fire from local media, your local fire department, and public safety.

Go – Follow your personal wildland fire action plan. Doing so will not only support your safety but will allow firefighters to best maneuver resources to combat the fire.

National Fire Protection Association (NFPA)

The NFPA is a global non-profit organization devoted to eliminating death, injury, and economic loss due to fire. Its 300 codes and standards are designed to minimize the risk and effects of fire by establishing criteria for building, processing, design, service, and installation around the world (NFPA 2013).

The NFPA develops easy-to-use educational programs, tools, and resources for all ages and audiences, including Fire Prevention Week, an annual campaign that addresses a specific fire safety theme.

The NFPA's Firewise Communities program (www.firewise.org) encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.

The NFPA is a premier resource for fire data analysis, research, and analysis. The Fire Analysis and Research division conducts investigations of fire incidents and produces a wide range of annual reports and special studies pertaining to fire hazards.

National Interagency Fire Center

The National Interagency Fire Center (NIFC) provides a wide array of fire resources and services and can provide communication assistance to over 32,000 firefighters and 50 major events at any given time (NIFC 2022). The program also offers wildfire forecasts and predictions using fuel and weather data collected from their remote automated weather base with over 2,000 weather stations. Additionally, the NIFC has a training branch where national curriculums are developed, including FireWorks, an educational program designed for kids K-12. The program teaches children about wildland fire science, ecosystem fluctuations, human interaction on the environment, and other environmental science topics.

NIFC public education resources can be found here: <https://disastersafety.org/wildfire/wildfire-ready/>

U.S. Fire Administration's WUI Toolkit

The U.S. Fire Administration (USFA) is an entity of the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) that aids in the preparation for and response to fire. Their WUI toolkit consists of websites and other information regarding risk assessments, public outreach, and community training. Find the toolkit here: <https://www.usfa.fema.gov/wui/>.

Wildfire Research Center (WiRē)

Wildfire Research Center (WiRē) is a non-profit organization that works with local wildfire services to highlight community-tailored pathways to reduce risk to wildfire while simultaneously promoting pathways to fire adaptation. WiRē's mission states that fire adaptation is "about living with fire", while "creating safe and resilient communities that reduce wildfire risk on their properties before a fire, and supporting effective response when fires threaten a community." WiRē states that wildfire is an integral component of many ecosystems, and that safe fire must be allowed to ensure healthy forests.

To achieve its goals and serve communities, WiRē typically assesses factors contributing to wildfire risks; factors include building materials, vegetation near homes, background fuels, local topography, and access to emergency fire services. Additionally, they conduct social surveys to gauge residents' perceptions about wildfire, wildfire risk, risk mitigation behavior, and assess their willingness to take action in reducing wildfire risks.

For more information, please visit <https://wildfireresearchcenter.org/>.

Community Navigators

The Community Navigators Program (CNP) supports historically underserved communities in collaboration with the USDA Forest Service. The CNP connects communities to appropriate resources for building climate resilience such as access funding and partnership support. The program aims to create mutually beneficial relationships between local communities, the USDA Forest Service, and other federal agencies that contribute to community and ecosystem resilience. Through their website, community leaders can request a navigator; resources are available in Spanish and English and accessibility accommodations are available.

For more information, please visit <https://communitynavigators.net/>

SWCA

APPENDIX C:

Fire Behavior Modeling/
GIS Background and Methodology

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FIRE BEHAVIOR MODELING AND METHODOLOGY

COLORADO ALL LANDS QUANTITATIVE RISK ASSESSMENT

Fire behavior models were sourced from the Colorado All Lands (COAL) Quantitative Risk Assessment developed by Pyrologix LLC in partnership with several federal and state land management agencies across Colorado. Efforts to create the quantitative wildfire risk assessment began in 2019 and concluded in 2021 (Pyrologix 2022a). The assessment utilizes a collaboratively calibrated fuelscape, state-of-the-art modeling methodologies, and a set of collaboratively defined HVRAs standardized across Colorado. This risk assessment improves upon previous risk assessment efforts by improving the burnable calibrations for various fuel types like urban and agricultural fuels in addition to removing data seam lines. The assessment incorporates both stochastic and deterministic models to accurately model wildfire behavior (deterministic) and then predict burn probabilities and integrated hazards (stochastic). Deterministic models utilize known inputs to calculate a single deterministic answer whereas stochastic models utilize known inputs in thousands of simulated scenarios, also known as a Monte Carlo simulation, to calculate the probability of different answers occurring. Additionally, the quantitative risk assessment makes use of conditional outputs and probabilistic outputs to inform users of objective hazards (conditional) and calculated risk (probabilistic). More on these statistical theories as well as modeling methodology is explained below.

Conditional Vs. Probabilistic Modeling Outputs

The COAL quantitative risk assessment makes use of conditional model outputs multiplied by probabilistic model outputs to produce spatial risk metrics for the operational, fire effects and integrated hazard products listed below. Conditional outputs show results for the entire landscape as if everything had the same chance of burning and show modeled wildfire behavior as a result of existing conditions. The probabilistic outputs are a product of conditional metrics multiplied by burn probability which is predicted by simulating thousands of fires based on historic weather and wind conditions for the area. This is done for each grid square (30 m) on the landscape to create a gradient (raster) of probability for metrics such as burning, operational control, and risk to structures. Conditional outputs are typically best utilized by land managers, developers, and fuel treatment planners who want to see what the fire behavior would be like, regardless of probability. Alternatively, probabilistic outputs give a more comprehensive representation of wildfire risk on the landscape and are best for prioritization and community planning efforts, as they incorporate the odds of any future fire impacts.

FIRE BEHAVIOR MODELS

The following fire behavior models were used in the COAL Quantitative Risk Assessment. These models have been continuously updated with improved algorithms, hardware, and real-world data. Each model has been used extensively in predicting wildfire risk across the United States.

LANDFIRE

LANDFIRE is a national remote sensing project that provides land managers with a data source for all inputs needed for fire behavior models (fuels, topography and canopy characteristics). The database is

managed by the USFS and the USDOJ and is widely used throughout the United States for land management planning. More information can be obtained from <http://www.landfire.gov>.

The COAL quantitative risk assessment utilized many of the fuel models housed within LANDFIRE but made significant adjustments to create a better match for Colorado's fire environment (Pyrologix 2022b). Specifically, Pyrologix has recalibrated previously non-burnable fuels to account for burnable agricultural and urban lands such as parks. Additionally, the updated fuelscape removes raster tile seamlines in raster datasets which have occurred throughout the district in base LANDFIRE remaps. To produce locally accurate fire behavior results, a 2-day fuel calibration workshop was held in Lakewood, Colorado, with a group of interagency fire and fuels experts from across Colorado (Pyrologix 2022b).

FSim

FSim ('Large Fire Simulator') is a wildfire simulation program developed by the USFS fire sciences laboratory in Missoula, Montana. The program utilizes a stochastic Monte Carlo method to simulate hundreds of thousands of fire events across large land areas using a variety of input parameters such as fire occurrence, terrain, weather, and fuel conditions (USFS 2023). This analysis method allows for the quantification of wildfire risk as it relates to fire impact probabilities and sizes. Pyrologix has used FSim for the COAL quantitative risk assessment to calculate outputs associated with wildfire likelihood and burn probability for the integrated hazard products (Pyrologix 2022c).

WildEST

Pyrologix recognized the challenges of estimating wildfire intensity with a stochastic simulator such as FSim. Stochastic models rely on a robust sample size, so, in low fire occurrence areas stochastic simulators will be less reliable due to the small sample size. Therefore, Pyrologix developed a custom utility called WildEST (Wildfire Exposure Simulation Tool). WildEST is a deterministic model that calculates intensity values from weighing spatially continuous weather input variables based on how likely they will occur on the landscape (Pyrologix 2022c).

Deterministic values are more robust than FSim's stochastic values, especially in areas with relatively low wildfire occurrences such as the Mountain View FPD. Pyrologix has used WildEST to calculate wildfire intensity outputs (flame front characteristics) such as flame lengths and rate of spread for the COAL quantitative risk assessment (Pyrologix 2022c). The deterministic fire behavior outputs were derived from WildEST simulations using 216 weather scenarios.

FIRE BEHAVIOR MODEL INPUTS

Fuelscape

The assessment utilizes LANDFIRE's 2016 fuel model remap for producing a current conditions fuelscape for the COAL statewide assessment. Significant updates to the fuelscape were conducted after the release of LANDFIRE's 2019 remap. Additionally, Pyrologix made use of 2021 satellite imagery to calculate continuous vegetation cover and height classifications to more accurately predict wildfire behavior. Furthermore, the 2020 fire season had a significant impact on fuels and in order to represent current conditions Pyrologix updated the fuelscape to incorporate changes in fuels resulting from the 2020 fire season (Pyrologix 2022a). Current conditions are constantly changing, and it is imperative to constantly update the source fuel model data for maintaining reliable fire behavior and wildfire risk results.

An in-depth overview of Pyrologix's fuelscape inputs are available here:

http://pyrologix.com/reports/COAL_FuelscapeReport.pdf

The following is a list of fuel characteristic inputs used in the creation of the COAL fuelscape:

- Surface Fuels
- Canopy Fuels
 - Canopy Cover
 - Canopy Height
 - Canopy Bulk Density
 - Canopy Base Height
 - Canopy Overrides
- Recent Disturbances
- Developed Ruderal Vegetation Types
- Canopy Bulk Density Adjustments for Insects and Disease
- Custom Fuel Model Assignments
 - High Elevation-Subalpine Vegetation
 - Burnable Agriculture and Urban Fuel Models

Topography

Topography is important in determining fire behavior and is a required input for FSim and WildEST models. Steepness of slope, aspect (direction the slope faces), elevation, and landscape features can all affect fuels, local weather (by channeling winds and affecting local temperatures), and rate of spread of wildfire (Figure C.1). The Mountain View FPD contains complex topography in the southwestern area of the district (such as Eldorado Canyon).

More detailed information regarding topography in the Mountain View FPD can be found in Appendix B.

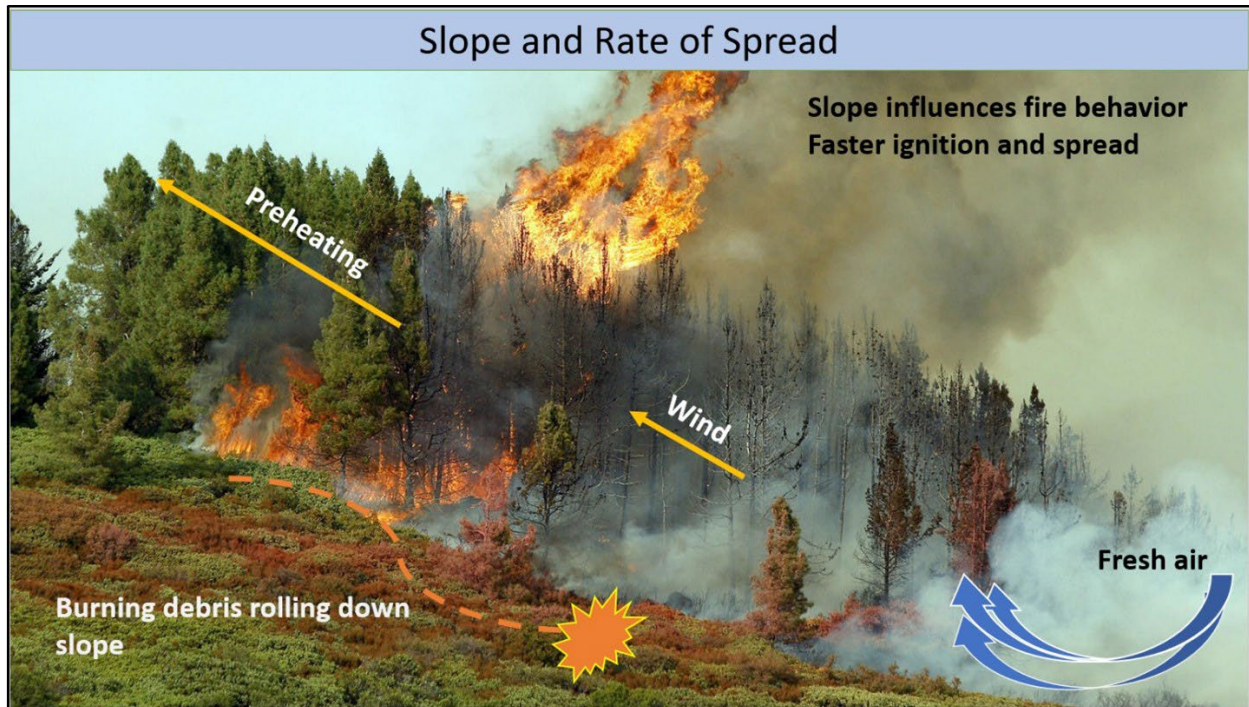


Figure C.1. Effect of topography on fire behavior.

Historical Wildfire Occurrence

Fire occurrence data spanning 26 years from 1992-2017 was used to develop model inputs, an ignition density grid, and model calibration targets (Pyrologix 2022c). For detailed information on historical wildfire occurrence methodology go to: http://pyrologix.com/reports/COAL_HazardReport.pdf

Ignition Density Grid

Pyrologix utilized the program FSim to create an ignition density grid to represent the relatively large fires that may occur across Colorado. The ignition density grid within FSim produced a spatial pattern of large fire occurrences which were calibrated with historical wildfire occurrences across 5 different calibration regions within Colorado to produce a viable prediction of large fires throughout Colorado. The Mountain View FPD is shown as having moderate to low likelihood for large fire occurrences (Pyrologix 2022c).

Historical Weather

Of the three fire behavior components, weather is the most likely to fluctuate. Accurately predicting fire weather remains a challenge for forecasters. As rising temperatures dry fuels in the late spring, summer and early fall, dry conditions can be exacerbated, creating an environment that is susceptible to wildland fire. Fine fuels (grass and leaf litter) can cure rapidly, making them highly flammable in as little as 1 hour following light precipitation. Low live fuel moistures of grass, shrubs, and trees can significantly contribute to fire behavior in the form of fast rates of spread, crowning and torching.

A selected list of ten Remote Automatic Weather Stations (RAWS) was used to produce FSim results. Selected RAWS were distributed across Colorado with relatively long and consistent records. RAWS were also selected using suggestions from local fire personnel with knowledge of RAWS with the most

representative data. FireFamilyPlus version 4.1 was used to generate fire risk files for each RAWS (Pyrologix 2022c). The weather inputs used within FSim were:

- Monthly distribution of wind speed and direction
- Live and dead fuel moisture content
- Seasonal trends in the mean and standard deviation of the Energy Release Component (ERC)
 - ERC values were sourced from Dr. Matt Jolly's publicly available ERC raster for the period 1992-2017.
 - ERC sample sites were distributed throughout Colorado similar to RAWS.

Additionally, Pyrologix utilized FSim to generate stochastic fire ignitions based on historical relationships between large fires and ERC. This was then used to determine burn probabilities.

FIRE BEHAVIOR MODEL OUTPUTS

Rate of Spread

Rate of Spread (Map 4 in Appendix H) is calculated by WildEST and is a weighted average rate quantified in meters per minute for each pixel in the fuelscape. Rate of Spread includes contributions from crown fire under given weather scenarios. For most of the Mountain View FPD, wildfire rates of spread are 4-8 meters per minute, and in more rural and densely vegetated areas, 8-16 meters per minute is common.

Flame Length

Flame Length (Map 2 in Appendix H) is calculated by WildEST and is a weighted-average flame length quantified in feet for each pixel in the fuelscape. Flame Length includes contributions from crown fire under severe weather scenarios. For example, high winds may cause fire to spread in the crown of trees. This crown fire flame length is then incorporated into the flame length output where topography, weather, and fuels are conducive to crown fire occurring. Flame lengths are highest (11-25 feet) in the forested southwestern area of the Mountain View FPD. Across most of the WUI/GUI and urban areas flame lengths are 0-4 feet.

Probability of Operational Control

The probability of exceeding flame length thresholds for manual control of wildfire is 4ft and for the mechanical control of wildfire it is 8ft (Maps 13 and 14 in Appendix H). Within the Mountain View FPD the area with the greatest probability of exceeding both manual and mechanical control is in the forested southwestern region of the Planning Area.

Ember Load Index

Ember load Index (ELI) is derived from modeled fire behavior at the head of the fire and represents the relative ember load being received at any given pixel (30m). To calculate this, simulated embers are produced and launched based on fire behavior, topography, wind, fuel, and canopy characteristics at the source. Burn probability is incorporated before the embers are distributed downwind where the model tracks the number of hot embers reaching the source to derive the ember load index.

The COAL modeling process allows ember production from grass and brush, in addition to timber. The ember load index map (Map 12 in Appendix H) identifies areas where buildings will need to resist ignition from embers, as well as the priority for doing so based on burn probability. Ember production is highly variable and difficult to model. This product should be used as a relative potential ember production, from few to many, rather than an actual real-world count of anticipated embers. Ember loads are moderate in grasslands and open spaces and highest in the forested areas found in the southwest region of the Planning Area.

INTEGRATED HAZARDS

Risk to Potential Structures

The Risk to Potential Structures (RPS) dataset (Figure 3.2) gauges the combined risk of wildfires based on their likelihood, intensity, and potential impact on structures. RPS was calculated using flame length probabilities generated from WildEST. RPS helps answer the question of, “How vulnerable would a house or building be if located here?” This helps compare wildfire risks in existing residential areas versus potential construction sites. RPS is determined by multiplying the conditional risk to structures (cRPS) with the probability of a burn.

Wildfire Hazard Potential

Wildfire hazard potential (WHP) is calculated from a combination of burn probability and conditional flame length converted into an index (Map 15 in Appendix H). A weighted resistance to control measure is applied based on the fire line production rates associated with the Scott and Burgan 40 fuel models. Wildfire hazard potential is a good output for determining the likelihood of a fire occurring, the intensity range if it did, and a rough measure of control difficulty. WHP is a useful tool for evaluating fuel treatment priorities based on burn probability.

Suppression Difficulty Index

Suppression Difficult Index (SDI) does not incorporate burn probability in the source data and is based on a severe fire weather scenario (Figure B.6). SDI is a function of flame length outputs, topography, fire line production rates, and the distance of evaluated cells (30 meter) from trails and roads. SDI is a good output for determining how difficult it would be for resources to park, hike to, and suppress a wildfire. This output should not be used to evaluate the risk to structures and instead shows areas where fires would be difficult to suppress under severe fire weather conditions.

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APPENDIX D:

Fuel Treatment Types and Methods

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FUELS TREATMENT TYPES

DEFENSIBLE SPACE

Defensible space is perhaps the fastest, most cost-effective, and most efficacious means of reducing the risk of loss of life and property. Although fire agencies can be valuable in providing guidance and assistance, creating defensible space is the responsibility of the individual homeowner (Figure D.1).

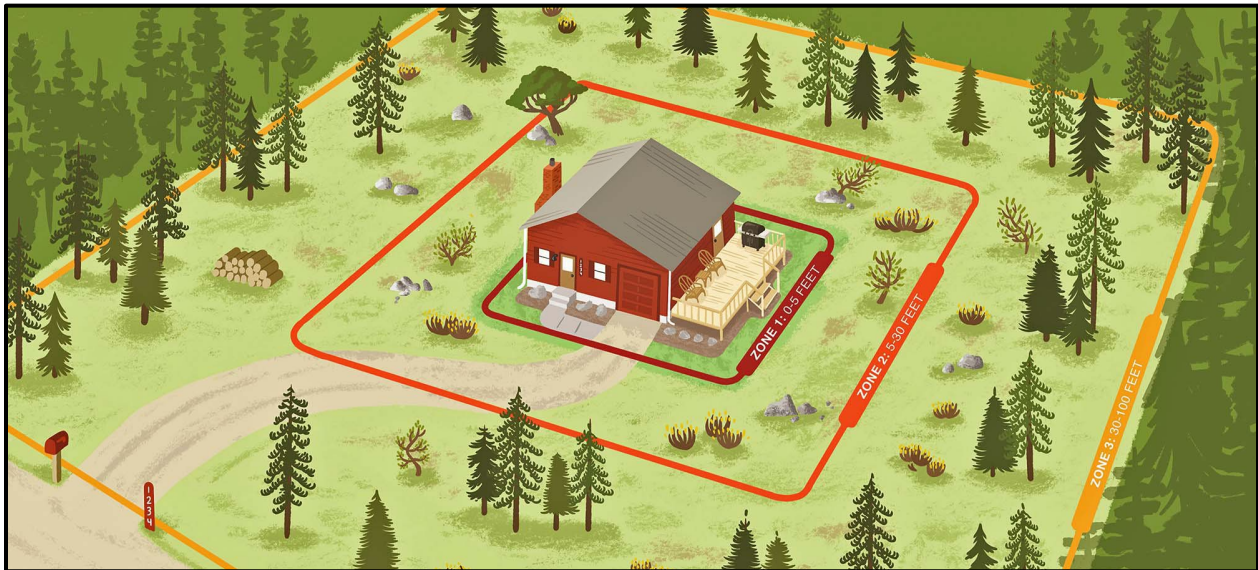


Figure D.1. Defensible space zones providing clearance between a structure and adjacent woodland or forest fuels.

Source: National Fire Protection Association [NFPA] 2022

Effective defensible space consists of creating an essentially fire-free zone adjacent to the home, a treated secondary zone that is thinned and cleaned of surface fuels, and (if the parcel is large enough) a transitional third zone that is basically a managed forest area (Figure D.1). These components work together in a proven and predictable manner. Zone 1 keeps fire from burning directly to the home; Zone 2 reduces the adjacent fire intensity and the likelihood of torching, crown fire, and ember production; and Zone 3 does the same at a broader scale, keeping the fire intensity lower by maintaining a more natural, historic condition (Figure F.1).

Three zones for defensible space actions are described. These include:

Zone 1 This zone, which consists of an area of 0-5 feet around the structure, is designed to prevent flames from coming in direct contact with the structure. Use nonflammable, hard surface materials in this zone, such as rock, gravel, sand, cement, bare earth or stone/concrete pavers.

Recommendations for treating Zone 1 include (NFPA 2022):

- Remove all flammable vegetation, including shrubs, slash, mulch and other woody debris.
- Do not store firewood or other combustible materials inside this zone.
- Prune tree branches hanging over the roof or decks and remove all fuels within 10 feet of the chimney.

- Regularly remove all pine needles and other debris from the roof, deck, and gutters.
- Rake and dispose of pine needles, dead leaves, mulch, and other organic debris within 5 feet of all decks and structures. Farther than 5 feet from structures, raking material will not significantly reduce the likelihood of ignition and can negatively affect other trees.
- Do not use space under decks for storage.

Zone 2 This zone, which consists of an area of 5-30 feet around the structure, is designed to give an approaching fire less fuel, which will help reduce its intensity as it gets nearer to your home or any structures.

Recommendations for treating Zone 2 include (NFPA 2022):

- Mow grasses to 4 inches tall or less.
- Avoid large accumulations of surface fuels such as logs, branches, slash, and mulch.
- Remove enough trees to create at least 10 feet* of space between crowns. Measure from the outermost branch of one tree to the nearest branch on the next tree.
- Small groups of two or three trees may be left in some areas of Zone 2. Spacing of 30 feet* should be maintained between remaining tree groups to ensure fire doesn't jump from one group to another.
- Remove ladder fuels under remaining trees. This is any vegetation that can bring fire from the ground up into taller fuels.
- Prune tree branches to a height of 6-10 feet from the ground or a third of the total height of the tree, whichever is less.
- Remove stressed, diseased, dead, or dying trees and shrubs. This reduces the amount of vegetation available to burn and improves forest health.
- Common ground junipers should be removed whenever possible because they are highly flammable and tend to hold a layer of flammable material beneath them.
- Isolated shrubs can be kept in Zone 2, as long as they are not growing under trees. Keep shrubs at least 10 feet* away from the edge of tree branches.
- Periodically prune and maintain shrubs to prevent excessive growth. Remove dead stems annually.
- Spacing between clumps of shrubs should be at least 2 ½ times* their mature height. Each clump should have a diameter no more than twice the mature height of the vegetation. Example: For shrubs that grow 6 feet tall, space clumps 15 feet apart or more (measured from the edge of the crowns of vegetation clumps). Each clump of these shrubs should not exceed 12 feet in diameter.

* Horizontal spacing recommendations are minimums and can be increased to reduce potential fire behavior, particularly on slopes. Consult a forestry, fire, or natural resource professional for guidance with spacing on slopes.

Zone 3 This zone, which consists of an area of 30-100 feet around the structure, focuses on mitigation that keeps fire on the ground, but it is also a space to make choices that can improve forest health. Healthy forests include trees of multiple ages, sizes, and species, where adequate growing room is maintained over time. If the distance of 100 feet to the edge of Zone 3 stretches beyond your

property lines, it is encouraged to work with adjoining property owners to complete an appropriate defensible space. If your house is on steep slopes or has certain topographic considerations, this zone may be larger.

Recommendations for treating Zone 3 include (NFPA 2022):

- Mowing grasses is not necessary in Zone 3.
- Watch for hazards associated with ladder fuels. The chance of a surface fire climbing into the trees is reduced in a forest where surface fuels are widely separated, and low tree branches are removed.
- Tree crown spacing of 6 to 10 feet is suggested. Consider creating openings or meadows between small clumps of trees so fire must transition to the ground to keep moving.
- Where practical, prune tree branches to a height of 6-10 feet from the ground or a third of the total height of the tree, whichever is less.
- Any approved method of slash treatment is acceptable in this zone, including removal, piling and burning, lop and scatter, or mulching. Lop-and-scatter or mulching treatments should be minimized in favor of treatments that reduce the amount of woody material in the zone. The farther this material is from the home, the better.

Please see the figures below for a visual representation of minimum vertical (Figure D.3) and horizontal spacing (Figure D.2), as well as spacing on slopes (Figure D.4).

Specific recommendations should be based on the hazards adjacent to a structure such as slope steepness and fuel type. Firewise guidelines and the Homeowner's Guide (see Appendix E) are excellent resources that make creating defensible space an achievable process. CSFS published a checklist for preparing your home for wildfire by addressing the home ignition zone (see Figure D.1). Additionally, the NFPA offers a free [Community Wildfire Risk Assessment Tutorial](#) and an online learning module: [Understanding the Wildfire Threat to Homes](#). Both tools are great resources for learning about, and implementing, defensible space. For district specific information, Wildfire Partners is a resource based out of Boulder County that offers free home assessments and information on home hardening, chipping programs, and forestry contractors.

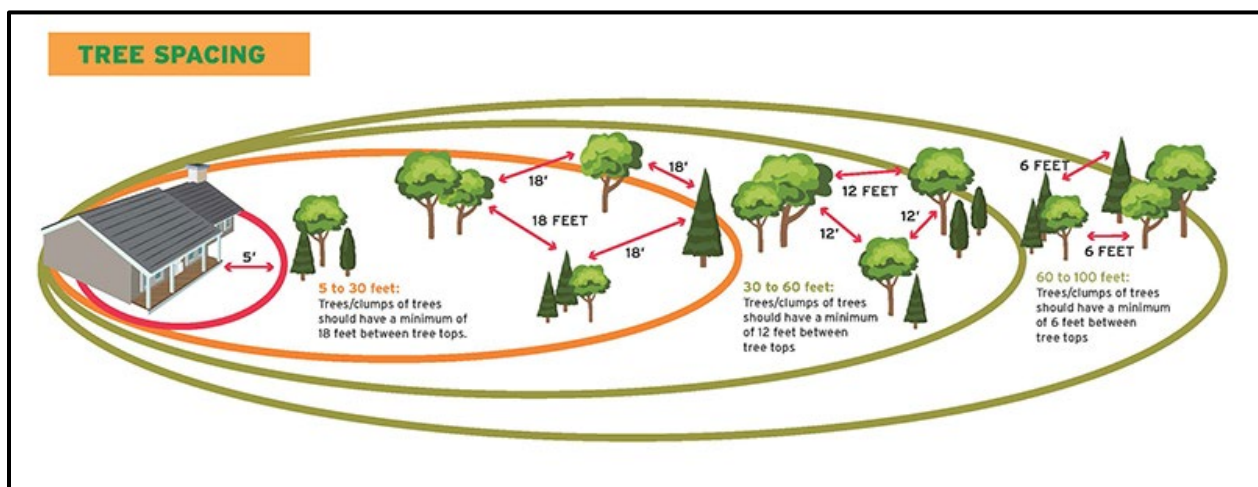


Figure D.2. Recommended tree spacing.

Source: NFPA 2022



Figure D.3. Recommended minimal vertical clearance.

Source: CAL FIRE 2022

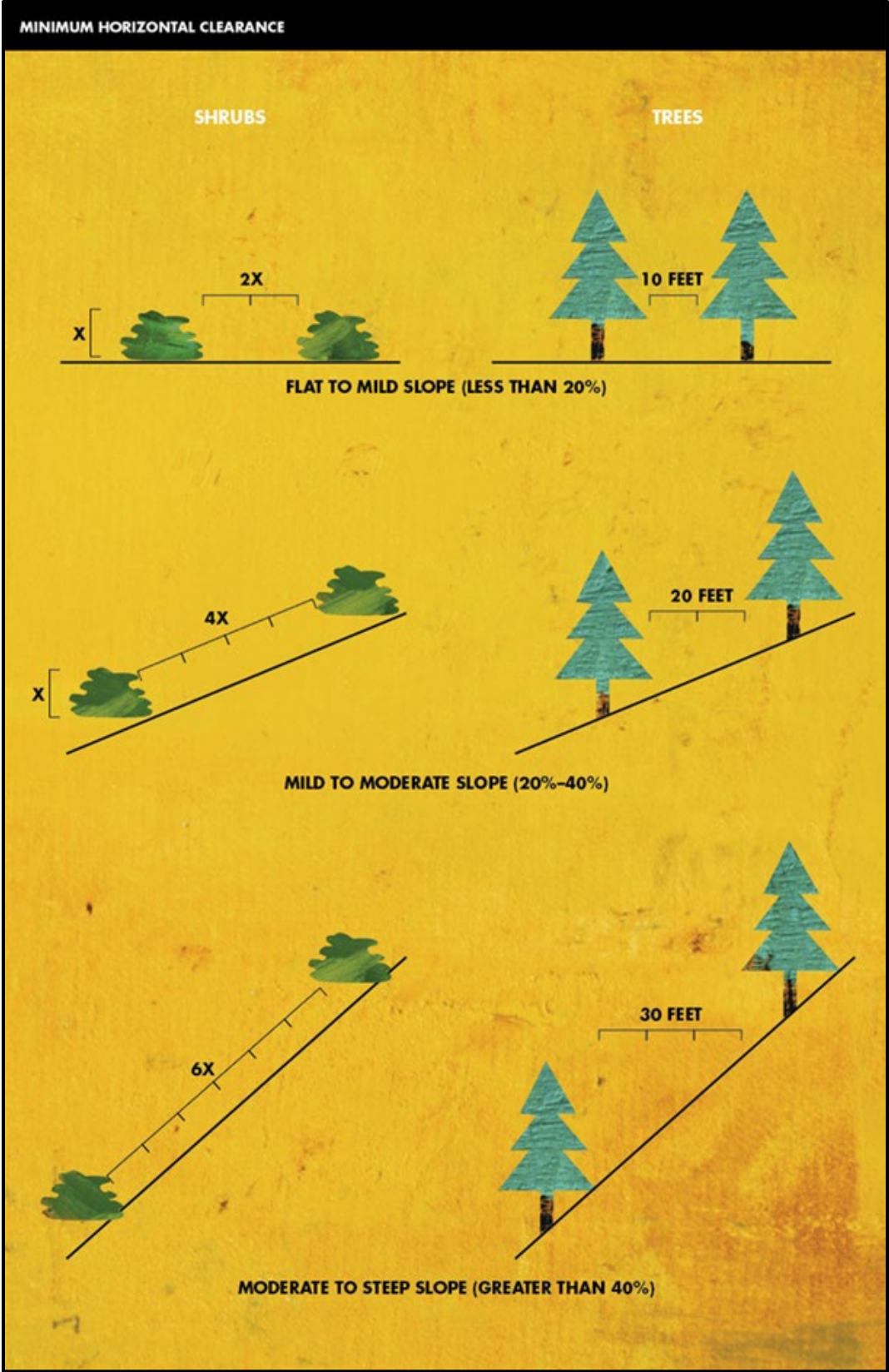


Figure D.4. Recommended minimal horizontal clearance.

Source: CAL FIRE 2022

Assisting neighbors may be essential in many cases. Property owners should consider assisting the elderly, sharing ladders for gutter cleaning, and assisting neighbors with large fuels thinning needs. Homeowner actions have been found to also motivate neighbors to act, increasing the scope of the wildfire mitigation across a community (Evans et al. 2015). Adopting a phased approach can make the process more manageable and encourage maintenance (Table D.1).

Table D.1. Example of a Phased Approach to Mitigating Home Ignitability

Year	Project	Actions
1	Basic yard cleanup (annual)	<ul style="list-style-type: none"> Dispose of clutter and dead branches in the yard and under porches. Move firewood to >30 ft from home Mow and rake grass. Clean off roofs and gutters. Remove combustible vegetation near structures, especially junipers. Coordinate fuels disposal as a neighborhood or community. Post 6-inch reflective address numbers visible from road.
1-2	Understory thinning near structures	<ul style="list-style-type: none"> Repeat basic yard cleanup. Limb trees up to 6–10 feet. Trim branches back 15 feet from chimneys. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
1-3	Understory thinning on private property along roads and drainages	<ul style="list-style-type: none"> Limb trees up to 6–10 feet. Trim or cut down brush. Evaluate the need to thin diseased trees. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
2-4	Overstory treatments on private property	<ul style="list-style-type: none"> Evaluate the need to thin mature or diseased trees. Prioritize and coordinate tree removal within neighborhoods to increase cost effectiveness.
5	Restart defensible space treatment cycle	<ul style="list-style-type: none"> Continue the annual basic yard cleanup. Evaluate need to revisit past efforts or catch those that were bypassed.

FUEL BREAKS AND OPEN SPACE CLEANUP

The next location priority for fuels treatments should be where the community meets wildland. This may be the outer margins of a town or an area adjacent to occluded open spaces such as a park. Fuel breaks (also known as shaded fuel breaks) are strips of land where fuel (for example, living trees and brush, dead branches, leaves or downed logs) has been modified or reduced to limit the fire’s ability to spread rapidly. Fuel breaks should not be confused with firebreaks, which are areas where vegetation and organic matter are removed down to mineral soil. Shaded fuel breaks may be created to provide options for suppression resources or to provide opportunities to introduce prescribed fire. In many cases, shaded fuel breaks may be created by thinning along roads. This provides access for mitigation resources and firefighters, as well as enhancing the safety of evacuation routes.

The Watershed Center developed an ArcGIS Story Map for [Grassland Management in Boulder County](#). The Story Map outlines the following mitigation actions that can be carried out by property owners in the Town of Superior or Unincorporated Boulder County with land adjacent to grassland ecosystems or other open spaces.

Town of Superior:

- Property owners can report concerns about potentially hazardous overgrown vegetation on nearby open space land to [Superior Click and Fix](#) at any time.

Unincorporated Boulder County:

- Property owners with irrigation ditches running through their property can clear overgrown vegetation, provided it does not disrupt water flow.
- Community members can contact the Boulder County Weed Control Department if they suspect vegetation in nearby open space is a fire hazard; the department will assess the risk and mow if needed.

LARGER-SCALE TREATMENTS

Farther away from WUI communities, the emphasis of treatments often becomes broader. While reducing the buildup of hazardous fuels remains important, other objectives are often included, such as forest health and resiliency to catastrophic wildfire and climate change considerations. Wildfires frequently burn across jurisdictional boundaries, sometimes on landscape scales. As such, these larger treatments need to be coordinated on a strategic level. This requires coordination between projects and jurisdictions, as is currently occurring.

Specifically, land managers have carried out numerous pre- and post-fire forest restoration projects across the district and have ongoing projects planned that are designed to reduce hazardous fuels to protect communities and resources, while restoring fire-adapted communities.



Figure D.5. Fuels reduction project in Harney Lastoka South open space, grazing utilized.



Figure D.6. Example of a fuels reduction project within the district.

ACTION ITEMS FOR PROPERTY OWNERS TO REDUCE STRUCTURAL IGNITABILITY

Limited Investment (<\$250)

- Regularly check fire extinguishers and have a 100-foot hose available to wet perimeter of home.
- Maintain defensible space within 30 feet around home. Collaborate with neighbors to provide adequate fuels mitigation in the event of overlapping property boundaries.
- Ensure that reflective 4-inch house numbers are easily readable from the street.
- Keep wooden fence perimeters free of combustible materials. If possible, 5 feet of non-combustible material should link the house and fence.
- Store combustible materials (liquid fuels, propane, grills, firewood) away from the house.
- Remove flammable material from around propane tanks.
- Clear out materials from under decks and near structures.
- Stack firewood at least 30 feet away from the house.
- Reduce your workload by considering local weather conditions. First, mitigate hazards on the side of your property that faces the prevailing wind direction. Then work around to cover the whole property.
- Keep gutters free of combustible material. Gutters can act as collection points for embers.
- Maintain roofs by flashing, fixing holes, replacing shingles, and closing gaps.
- Purchase or use a National Oceanic and Atmospheric Administration weather alert radio to hear fire weather announcements.

Moderate Investment (<\$1,500)

- When landscaping in the home ignition zone (HIZ) (approximately 30 feet around the property), select non-combustible plants, decks, lawn furniture, and landscaping material. Combustible plant material like ornamental conifers should be pruned and kept away from siding. If possible, trees should be planted in groups and no closer than 10 feet to the house. Tree crowns should have a spacing of at least 18 feet when within the HIZ. Vegetation at the greatest distance from the structure and closest to wildland fuels should be carefully trimmed and pruned to reduce ladder fuels, and density should be reduced with approximately 6-foot spacing between trees and crowns.
- Work on mitigating hazards on adjoining structures. Sheds, garages, barns, etc. These can act as ignition points to your home.
- Clear and thin vegetation along driveways and access roads so they can act as a safe evacuation route and allow emergency responders access to the home to at least 14-foot clear width and 14-foot height clearance.
- Construct a gravel turnaround in your driveway to improve access and mobilization of fire responders. (e.g., 100-foot-diameter cul-de-sac or T-shape with 28-foot radii).
- Install a roof irrigation system.

High Investment (\$1,500+)

- Install an environmentally friendly and fire-resistant xeriscape yard. \$5–\$20 per square foot.
- Install screen vents with non-combustible meshing. Mesh openings should not exceed nominal 1/8 - 1/16-inch size. \$2.50 per square foot. Average cost per home approximately \$5,000.
- Enclose open space underneath decks or permanently located manufactured homes using non-combustible skirting and ember resistant skirting vents.
- Install fire-resistant soffits and under eave vents to protect your home from heat and embers that can be trapped beneath roof overhangs.
- Replace exterior windows and skylights with tempered glass or multilayered glazed panels.
- Update your roof to a non-combustible construction. Look for materials that have been treated and given a fire-resistant roof classification of Class A.
- Upgrade exterior walls with fire resistant siding materials.
- Relocate propane tanks underground.

Additional resources regarding home hardening can be found in Appendix E.

FUEL TREATMENT METHODS

Since specifics of the treatments are not provided in detail in Table D.2, different fuels reduction methods are outlined in the following narrative.

Several treatment methods are commonly used for hazardous fuels reduction, including manual treatments, mechanized treatments, prescribed fire, and grazing (Table D.2). This brief synopsis of treatment options is provided for general knowledge; specific projects will require further planning. The appropriate treatment method and cost will vary depending on factors such as the following:

- Diameter of materials
- Proximity to structures
- Acreage of project
- Fuel costs
- Steepness of slope
- Area accessibility
- Density of fuels
- Project objectives

It is imperative that long-term monitoring and maintenance of all treatments is implemented. Post-treatment rehabilitation such as seeding with native plants and erosion control may be necessary. In addition, post-treatment fuel clean-up is a must as neglected piles of vegetation may result in increased fire risk.

Table D.2. Summary of Fuels Treatment Methods

Treatment	Comments
Machine mowing	Appropriate for large, flat, grassy areas on relatively flat terrain.
Manual treatment with chipping or pile burning	Requires chipping, hauling, and pile burning of slash in cases where lop and scatter is inappropriate. Slash tree limbs to 6 feet from ground or max of 1/3 of tree height Remove ladder fuels below / near trees. Pile burning must comply with smoke management policy.
Brush mastication	Brush species tend to re-sprout vigorously after mechanical treatment. Frequent maintenance of treatments is typically necessary. Mastication tends to be less expensive than manual (chainsaw) treatment and eliminates disposal issues.
Timber mastication	Materials up to 10 inches in diameter and slopes up to 30% can be treated. Eliminates disposal issues. Environmental impact of residue being left on-site is still being studied.
Prescribed fire	Ecologically beneficial. Can be used as training opportunities for firefighters. May require manual or mechanical pretreatment. Carries risk of escape. Unreliable scheduling due to weather and smoke management constraints.
Feller buncher	Mechanical treatment on slopes more than 30% or more of materials more than 10 inches in diameter may require a feller buncher rather than a masticator. Costs tend to be considerably higher than masticator.
Grazing	Can be cost effective. Ecologically beneficial. Can be applied on steep slopes and shrubby and flashy fuels. Requires close management.

MANUAL TREATMENT

Manual treatment refers to crew-implemented cutting with chainsaws. Although it can be more expensive than mechanized treatment, crews can access many areas that are too steep or otherwise inaccessible with machines. Treatments can often be implemented with more precision than prescribed fire or mechanized methods allow. Merchantable materials and firewood can be removed while non-merchantable materials are often lopped and scattered, chipped, or piled and burned on-site. Care should be exercised to not increase the fire hazard by failing to remove or treat discarded material in a site-appropriate manner.

Strategic timing and placement of fuels treatments is critical for effective fuels management practices and should be prescribed based on the conditions of each treatment area. Some examples of this would be to place fuel breaks in areas where the fuels are heavier and in the path of prevailing winds and to mow grasses just before they cure and become flammable. Another example is fuel reduction on slopes/ridgelines extending from the WUI to enhance community protection. In areas where the vegetation is sparse and not continuous, fuels treatments may not be necessary to create a defensible area where firefighters can work. In this situation, where the amount of fuel to carry a fire is minimal, it is best to leave the site in its current condition to avoid the introduction of exotic species.

MECHANIZED TREATMENTS

Mechanized treatments such as mowing, including skid steer, ATV and tractor-pulled mower decks, can effectively reduce grass and brush fuels adjacent to structures and along highway rights-of-way and fence lines. For heavier fuels, several different masticating machines can be used, including drum- or blade-type masticating heads mounted on machines and ranging in size from a small skid-steer to large front-end loaders. Some masticators can grind standing timber up to 10 inches in diameter. Other masticators are more effective for use in brush or surface fuels. Mowing and mastication do not actually reduce the amount of on-site biomass but alter the fuel arrangement to a less combustible profile.

In existing fuel break areas maintenance is crucial especially in areas of encroaching shrubs or trees. In extreme risk areas more intensive fuels treatments may be necessary to keep the fire on the ground surface and reduce flame lengths. Within the fuel break, shrubs should be removed, and the branches of trees should be pruned from the ground surface to a height of 4 to 8 feet, depending on the height of the fuel below the canopy, and thinned with a spacing of at least two to three times the height of the trees to avoid movement of an active fire into the canopy.

GRAZING

Fuel modifications targeted toward decreasing both vertical and horizontal continuity in fuels is critical as a prevention method against fire proliferation. The primary objectives for these modifications are treating surface fuels and producing low-density and vertically disconnected stands. Goat, sheep, or cattle grazing is an effective, nontoxic, nonpolluting, and practically carbon-neutral vegetation treatment method. A grazing system typically consists of a high density of animals enclosed by a metallic or electrified fence guided by herders. Benefits of prescribed herbivory include better air quality, less noise, ability to be utilized close to structures and on steep slopes, and reduced soil compaction. Limitations include timing constraints on treatment implementation regarding vegetation maturity and seasonal variations, treatment of 1-hour and 10-hour fuels only, and the possibility of herbivores girdling certain tree species (BOF 2015).

PRESCRIBED BURNING

Where possible, prescribed fire could occur on public land since fire is ecologically beneficial to this fire-adapted vegetation community and wildlife habitat. All prescribed fire operations will be conducted in accordance with federal and state laws and regulations. Public safety would be the primary consideration in the design of any prescribed burn plan so as to not negatively impact the WUI. Fire Department use of prescribed fire on public land would be carried out within the confines of the FPD's fire management planning documents and would require individual prescribed burn plans that are developed for specific burn units and consider smoke management concerns and sensitive receptors within the WUI. Smoke monitors could be placed in areas where smoke concerns have been raised in the past.

Following any type of fuels reduction treatment, post-treatment monitoring should continue to ensure that management actions continue to be effective throughout the fire season. The vegetation within this ecosystem can change rapidly in response to drought or moisture from year to year and during the course of the season, so fuels treatments should be adjusted accordingly. To learn more about fire techniques, visit the EFIRE Fire Techniques webpage: <https://efire.cnr.ncsu.edu/efire/fire-techniques/>.

Agricultural Burning

Agricultural burning of fields and ditches is a common practice among agricultural areas within the Mountain View FPD. The process typically functions to clear land, fertilize soil, or prepare for planting of new crops. Awareness of smoke dispersal, obtainment of proper permits, and alerting proper personnel prior to burn operations are critical components of agricultural burning. Historically, wildfire risks associated with agricultural burning have been low in the district but escape occasionally occurs.

Cultural Burning

Across the American west, fire has historically been a means forest management and restoration by indigenous communities for thousands of years across the western U.S (Carter et al. 2021; Roos et al. 2021). Research has demonstrated that use of wildfire by indigenous communities prior to European settlement frequently served to reduce fuel loads, maintain wildlife habitat, and reduce wildfire severity (Carter et al. 2021) Research suggests that utilizing these traditional indigenous wildfire management practices can help create and maintain fire resilient WUI communities.

Although cultural burning is included under the umbrella of prescribed burns, it holds a different meaning and has more purposes than a typical prescribed burn (Fire Adapted Communities New Mexico [FACNM] 2021). Cultural burns are “pertinent and substantial to the cultural livelihood” with over 70 identified purposes (FACNM 2021).

Rather than focusing solely on fuel reduction, or as a means of wildfire mitigation, cultural burning is done with a more holistic view, under the philosophy of “reciprocal restoration,” meaning, as stewardship responsibilities to the land are fulfilled, those actions will in turn benefit the peoples who depend on those ecosystems (Long et al. 2021). Cultural burning is typically performed with a variety of objectives, such as landscape management, ecosystem and species biodiversity and health, transmission of environmental and cultural knowledge, ceremonies and spiritual wellbeing, a sense of place, and material services (i.e., food, medicine, plant materials, etc.). Extensive site preparation is typically done before a burn, and post-burn monitoring and additional cultural practices are a common factor of the land stewardship tradition (Long et al. 2021).

“Cultural burning by Native Americans interconnected them not only to the land but to their animal, reptile, bird and plant spiritual relatives. Therefore, conducting a cultural burn relates to what they burned, how they burned it, and why they burned it.” - Ron W. Goode, Tribal Chair, North Fork Mono Tribe

Benefits of Prescribed Fire to Grasslands

The Watershed Center’s story map for [Grassland Management in Boulder County](#) highlights a range of benefits associated with conducting prescribed fire in grassland areas. Among these benefits is the promotion of native vegetation, particularly fire adapted species. Additionally, prescribed fires revitalize grass-dominant habitats by re-establishing keystone ecological processes and returning nutrients to the soil. Prescribed fires also play a crucial role in limiting the establishment and spread of invasive species and preventing the encroachment of trees and shrubs into grasslands. This reduction in woody undergrowth, known as ladder fuels, is particularly vital in foothill areas. Collectively, these benefits create a healthier ecosystem that positively impacts a range of wildlife, including native pollinators, small mammals, and various bird species.

For more information on managing grasslands, please visit the Watershed Center's ArcGIS Story Map: <https://bouldercounty.gov/news/grassland-management-in-boulder-county-story-map-now-available/>

Impacts of Prescribed Fire to Communities

Prescribed fires can have impacts on air quality that may impact local communities. Impacts on a regional scale are typically only acute when many acres are burned on the same day, which is uncommon in this region. Local problems are occasionally acute due to the large quantities of smoke that can be produced in a given area during a short period of time.

Residents with respiratory problems may be impacted during these burning periods since smoke consists of small particles of ash, partly consumed fuel, and liquid droplets that are considered air pollutants. Other combustion products include invisible gases such as carbon monoxide, carbon dioxide, hydrocarbons, and small quantities of nitrogen oxides. Oxides of nitrogen are usually produced at temperatures only reached in piled or windrowed slash or in very intense wildfires that are uncommon in the region. In general, prescribed fires produce inconsequential amounts of these gases. Inappropriate management of prescribed fires can be bothersome to residents, and it can negatively affect community health.

Smoke from burning vegetation produces air pollutants that are regulated by both the U.S. Environmental Protection Agency (EPA) and the State of Colorado (Colorado General Assembly 2020). Additionally, smoke can increase ambient air pollution levels to a point where it exceeds air quality standards (Colorado General Assembly 2020). Therefore, effective smoke management is a vital component of planning and conducting prescribed fires. The Colorado Department of Public Health & Environment has smoke management guidelines that protect the health and welfare of Coloradans from the impacts of smoke. In most cases a prescribed burn permit must be issued by the county before conducting prescribed burns.

In addition, the NWCG released the NWCG Smoke Management Guide for Prescribed Fire in 2020 (NWCG 2020). This plan is designed to act as a guide to all those who use prescribed fire. Smoke management techniques, air quality regulations, public perception of prescribed fire, foundational science behind prescribed fire, modeling, smoke tools, air quality impacts, and more are all discussed in this plan. The document is meant to pair with NWCG's Interagency Prescribed Fire Planning and Implementation Procedures Guide for planning and addressing smoke when prescribed fire is used (NWCG 2020). To view the plan, please visit: <https://www.nwcg.gov/sites/default/files/publications/pms420-3.pdf>.

Effects of smoke can be managed by burning on days when smoke will blow away from smoke-sensitive areas. Precautions are taken when burning near populated areas, highways, airports, and other smoke sensitive areas. Any smoke impact downwind is considered before lighting a fire. Smoke management is a significant component of all prescribed burn plans. Other mitigating actions include alerting the public of upcoming burning activities, including the purpose, best conditions for ensuring good smoke dispersal, duration, size, and location of projects. Local radio, newspapers, social media, and TV can provide broad coverage for alerts. Land management agencies in the Planning Area consistently work with concerned citizens regarding smoke management and attempt to provide solutions such as the placement of smoke monitors at sensitive sites.

Thinning and Prescribed Fire Combined

Combining thinning and prescribed fire can be the most effective treatment (Graham et al. 2004). In forests where fire exclusion or disease has created a buildup of hazardous fuels, prescribed fire cannot

be safely applied, and pre-burn thinning is required. The subsequent use of fire can further reduce residual fuels and reintroduce this ecologically imperative process.

MANAGEMENT OF NON-NATIVE PLANTS

The USDA maintains a list of introduced, invasive, and noxious plants by state (USDA 2023). Fuel treatment approaches should always consider the potential for introduction or proliferation of invasive non-native species as a result of management actions.

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APPENDIX E:
Homeowner Resources

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ADDITIONAL LINKS AND RESOURCES

LOCAL RESOURCES

Mountain View Fire Protection District

- CPR and First Aid Classes: <https://www.mvfpd.org/cpr-first-aid-classes>
- Prevention Planning within FPD: <https://www.mvfpd.org/prevention>
- Community Event Request: <https://www.mvfpd.org/community-event-request>
- Fire Prevention Week and School Visits: <https://www.mvfpd.org/fire-prevention-week-school-visits>
- File Of Life: <https://www.mvfpd.org/file-of-life>

Boulder Office of Disaster Management

- Emergency Updates: <https://boulderodm.gov/emergency-status/>
- County Information Map: <https://bouldercounty.maps.arcgis.com/apps/webappviewer/index.html?id=13ab214fe2bb4da5a850df0ca0f00fc5>
- View Recent Alerts: <https://member.everbridge.net/453003085612231/notif>

Boulder County Wildfire Partners

- Building Permits: <https://wildfirepartners.org/for-homeowners/building-permits/>
- Chipping Program: <https://wildfirepartners.org/for-homeowners/chipping-program/>
- Home assessment application: <https://wildfirepartners.org/application-form/>
- Mitigation Talk Events: <https://wildfirepartners.org/for-homeowners/mitigation-talk-events/>
- Sort Yards: <https://bouldercounty.gov/property-and-land/forest-health/community-forestry-sort-yards/>

Broomfield County Office of Emergency Management

- Resident/Business preparedness: <https://www.broomfield.org/1539/ResidentBusiness-Preparedness>
- Local Emergency Planning: <https://www.broomfield.org/1540/Local-Emergency-Planning-Committee>
- Current Emergency Status: <https://www.broomfield.org/3647/Current-Emergency-Status>

Jefferson County Emergency Management

- Comprehensive Emergency Management Plan: <https://www.jeffco.us/4495/Comprehensive-Emergency-Management-Plan>

- Emergency Operations Center: <https://www.jeffco.us/485/Emergency-Operations-Center>
- Incident Management Team: <https://www.jeffco.us/490/Incident-Management-Team>
- Emergency Preparedness: <https://www.jeffco.us/502/Emergency-Preparedness>
- Services Provided: <https://www.jeffco.us/683/Services>

Weld County Office of Emergency Management

- Community Preparedness Information Guides: <https://www.weld.gov/Government/Departments/Office-of-Emergency-Management/Community-Preparedness-Information-and-Guides>
- Community Involvement: <https://www.weld.gov/Government/Departments/Office-of-Emergency-Management/Community-Involvement-Photos>
- Training Opportunities: <https://www.weld.gov/Government/Departments/Office-of-Emergency-Management/Training-Page>
- Weather information: <https://www.weld.gov/Government/Departments/Office-of-Emergency-Management/Weather-Information>
- Marshall Fire and Wind Event Recovery: <https://bouldercounty.gov/disasters/wildfires/marshall/>
- Superior Recovers: <https://www.superiorcolorado.gov/community/superior-recovers>
- City of Louisville Recovery Plan for Marshall Fire: <https://www.louisvilleco.gov/home/showpublisheddocument/34565/637843319094870000>
- Superior Rising: <https://www.superiorrising.org/>
- Marshall Together: <https://marshalltogether.com/>
- Marshall ROC: <https://marshallroc.org/>
- Lutheran Family Services Rocky Mountain Marshall Fire and Wind Event Response: <https://www.lfsrm.org/marshall-fire-response>

STATE RESOURCES

Colorado Division of Fire Prevention and Control (DFPC)

- Community Preparedness – Living in the WUI and Vehicle Safety Tips: <https://dfpc.colorado.gov/communityfireprep>
- Colorado Wildfire Preparedness Plan: <https://dfpc.colorado.gov/colorado-wildfire-preparedness-plan>
- Wildfire Information Resource Center: <https://dfpc.colorado.gov/sections/wildfire-information-resource-center>

Colorado State Forest Service

For Property Owners

- Educational Resources and Publications: <https://csfs.colostate.edu/csfspublications/>
 - Includes wildfire mitigation and education for property owners
- Resources for Property Owners: <https://csfs.colostate.edu/homeowners-landowners/>
 - Includes resources to help you manage your property
- Resources for Communities: <https://csfs.colostate.edu/communities/>
- Programs for Property Owners: <https://csfs.colostate.edu/forest-management/programs-for-homeowners-landowners/>
 - Grant programs and homesite assessments
- Post-Fire Forest Restoration and Rehabilitation: <https://csfs.colostate.edu/forest-management/restoration-rehabilitation/>
 - Includes rehabilitation practices, restoration publications, and burned tree management for various species
- Home Ignition Zone and Defensible Space Guide
 - https://csfs.colostate.edu/wp-content/uploads/2021/04/2021_CSFS_HIZGuide_Web.pdf#:~:text=DEFENSIBLE%20SPACE%20is%20the%20area%20around%20a%20home,in%20a%20residential%20area%20to%20reduce%20wildfire%20risk.

Misc.

- Boulder County After the Disaster Guidebook: https://mcusercontent.com/2263fe298f4df255d22b80097/files/9262ab8f-acc3-2b00-5040-3a916c7c342b/Boulder_County_After_the_Disaster_Guidebook_CSU_Extension_V3.pdf
- Superior Click and Fix 24/7 support for weed overgrowth and debris or other code violations: <https://www.superiorcolorado.gov/services/superior-click-and-fix#:~:text=Report%20non-emergency%20issues%20or,and%20other%20code%20violation%20concernsIncludes>
- Colorado Forest Atlas: <https://coloradoforestatlas.org/>
 - Includes spatial maps for the 2020 Forest Action Plan, Wildfire Risk Reduction Planner, and Wildfire Risk Viewer
- Grassland Management in Boulder County: <https://storymaps.arcgis.com/stories/62435c5cd6554d4d8143dd0c967fc2d3>

Colorado Misc.

- Community Preparedness – Living in the WUI and Vehicle Safety Tips: <https://dfpc.colorado.gov/communityfireprep>

- Colorado Wildfire Preparedness Plan: <https://dfpc.colorado.gov/colorado-wildfire-preparedness-plan>
- Colorado Association of Realtors Colorado Project Wildfire: <https://coloradorealtors.com/projectwildfire/>
- Common Colorado Insects and Diseases: <https://csfs.colostate.edu/forest-management/common-forest-insects-diseases/>
- Ignition Resistant Construction Design Manual: https://coloradosprings.gov/sites/default/files/2020_ignition_resistant_design_manual_march_2020.pdf
- Colorado Property and Insurance Wildfire Preparedness Guide: https://93j20c.p3cdn2.secureserver.net/wp-content/uploads/2021/08/Wildfire_22x8.5_2021.pdf

NATIONAL RESOURCES

National Fire Protection Association (NFPA):

Protecting Your Home

- Preparing Homes for Wildfire: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Preparing-homes-for-wildfire>
- If your Home Doesn't Ignite, It Can't Burn: <https://www.youtube.com/watch?v=RqKFDDBGd5o>
- How do Homes Burn in a Wildfire? <https://www.youtube.com/watch?v=3QthynXyml>
- Wildfire Community Preparedness Day Toolkit: <https://go.nfpa.org//14662/2022-01-11/8j6nqh>
- 5 Key Areas Around the Home You Must Examine When Assessing Wildfire Risk: <https://www.youtube.com/watch?v=MIUQVL3BvVg>
- Your Home and Wildfire, Choices That Make a Difference: <https://www.youtube.com/watch?v=pfbEcMeYFFA>
- Home Hardening Fact Sheets: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA/Firewise-USA-Resources/Research-Fact-Sheet-Series>

Preparation and Evacuation

- Wildfire Preparedness Tips: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Wildfire-safety-tips>
- Wildfire Preparedness for Household Pets: <https://www.nfpa.org/education-and-research/wildfire/household-pets-and-horses?l=92>
- Wildfire Preparedness for Horses and Livestock: <https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionHorseChecklist.ashx>
- Outthink a Wildfire; Wildfire Action Policies: <https://www.nfpa.org/wildfirepolicy>

FEMA

- Protective Actions for Wildfires FEMA: <https://community.fema.gov/ProtectiveActions/s/article/Wildfire>
- Flood Insurance Information: <https://www.fema.gov/flood-insurance>
- Explore FEMA's National Risk Index by County for risk, expected annual loss, social vulnerability, and community resilience: <https://hazards.fema.gov/nri/map>

RED CROSS

- Red Cross – How to Prepare For Emergencies: <https://www.redcross.org/get-help/how-to-prepare-for-emergencies.html>
- Red Cross – Colorado Wildfire Handbook: <https://sheriff.mesacounty.us/globalassets/divisions/emergency-services/arc-brochure.pdf>
- Red Cross – Wildfire Checklist (English): <https://sheriff.mesacounty.us/globalassets/divisions/emergency-services/arc-wildfire.pdf>
- Red Cross – Wildfire Checklist (Spanish): https://sheriff.mesacounty.us/globalassets/divisions/emergency-services/arc-wildfire_spn.pdf
- Red Cross – Preparing for Disaster for People with Disabilities and Other Special Needs: <https://sheriff.mesacounty.us/globalassets/divisions/emergency-services/arc-special-needs.pdf>

EPA

- Smoke Ready Toolbox for Wildfires EPA: <https://www.epa.gov/smoke-ready-toolbox-wildfires>
- Airnow: <https://www.airnow.gov/>
- Airnow Fire and Smoke Map: <https://fire.airnow.gov/>
- Smoke Advisories: <https://www.airnow.gov/air-quality-and-health/fires/smoke-advisories/>
- Fires and Your Health: <https://www.epa.gov/pm-pollution/fires-and-your-health>
- Wildfires and Indoor Air Quality: <https://www.epa.gov/indoor-air-quality-iaq/wildfires-and-indoor-air-quality-iaq>
- Frequent Questions About Wildfire Smoke: https://usepa.servicenowservices.com/airnow?id=kb_search&kb_knowledge_base=798f5d172fa050102be2d2172799b6d8&spa=1&kb_category=23bbbd9f1b681c104614ddb6bc4bcb70
- Smoke Sense App: <https://www.epa.gov/air-research/smoke-sense-study-citizen-science-project-using-mobile-app>
- Prepare For Natural Disasters and Recovery: <https://www.epa.gov/natural-disasters>

READY.GOV

- Wildfires Ready.gov: <https://www.ready.gov/wildfires>
- Family Disaster Readiness: <https://www.ready.gov/kids>

- Kids: <https://www.ready.gov/kids/be-ready-kids>
- Teens: <https://www.ready.gov/kids/teens>
- Families: <https://www.ready.gov/kids/prepare-your-family>
- Educators and Organizations: <https://www.ready.gov/kids/educators-organizations>
- Wildfire Information Sheet: https://www.ready.gov/sites/default/files/2021-12/ready_wildfire_info-sheet.pdf

MISC.

- Climate Mapping for Resilience and Adaptation (CMRA) portal, which provides a live dashboard to help communities see extreme weather and other hazards from climate change: <https://resilience.climate.gov/#real-time-data>
- Community Planning for Wildfire Assistance Program (CPAW) – Assists the GCWC with wildfire risk-reduction communications, increasing land use planning capacity, and collaborating with agencies to identify overlaps in scopes of work: <https://cpaw.headwaterseconomics.org/>
- Instructor Guide – The ability to identifying, analyzing, and using relevant situational information about topographic features can help predict wildland fire behavior is the responsibility of everyone on the fireline: <https://www.nwcg.gov/sites/default/files/training/docs/s-190-ig04.pdf>
- WiRē – Wildfire Research, an interdisciplinary collaboration on community adaptability to wildland fire: <https://wildfireresearchcenter.org/>
- Wildfire Ready App:
 - App Store: <https://apps.apple.com/us/app/wildfire-ready-virtual/id1540773278?msclkid=4eac0069a71411ecb26fa03c0b08eba2>
 - Google Play: <https://play.google.com/store/apps/details?id=com.BaltiVirtual.Wildfire&gl=US&msclkid=4eabc8f6a71411ecbfe27aa64cd6d835>

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APPENDIX F:

Post-Fire Recovery and Restoration

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POST-FIRE RESPONSE AND RECOVERY

The recent increase in severe fires has highlighted the numerous complexities of post-fire response. Research indicates that high-severity burn areas may produce erosion and runoff rates five to ten times higher than the rates produced by moderate-severity burn areas (Sierra Nevada Conservancy 2021). The most recent fire in the FPD was the Marshall Fire, which resulted in 6,026 acres burned and destroyed or damaged over 1,000 homes and commercial structures (Boulder County 2023). The fire spread quickly due to high winds and dry conditions, and left debris, ash, and partially burnt vegetation in its wake. Additionally, the fire dramatically reduced vegetative cover, resulting in exposed mineral soils prone to water repellency and increasing runoff. This exposed mineral soil is readily transported during rain events and likely resulted in elevated soil erosion and sediment loading in streams, creeks, and rivers (BAER 2021).

A comprehensive dashboard showing progress towards recovering from the Marshall Fire can be found here: <https://bouldercounty.gov/marshall-fire-recovery-dashboard/>

NAVIGATING DISASTER FOR BOULDER COUNTY

The Recovery Navigator Program began on July 25, 2022; its goal is to guide residents and community members through the difficult process of recovering and rebuilding after the Marshall Fire (Boulder County 2023b). Recovery navigators are available to speak with anyone affected by the fire and provide references to rebuilding grants. As of April 2023, \$7,259,600 dollars of rebuilding funds have been approved; additionally, of 356 grant building applications submitted, 312 have been approved. If you or someone you know was affected by the Marshall Fire, reach out and schedule an appointment with a Recovery navigator.

Recovery navigator appointment form: <https://bouldercountynavigatingdisaster.gov/request-for-appointment/>

Call 303-446-7782 or email: NavigatingDisasterBOCO@lfsrm.org

COMMUNITY FOUNDATION BOULDER COUNTY

Community Foundation Boulder County has been a trusted philanthropic partner for over 30 years, collaborating closely with government, business, and nonprofit entities to address the immediate and long-term needs of the community, particularly during crises. They have raised over \$43 million from 82,000 donors through the Boulder County Wildfire Fund, disbursing \$20 million (47% of the funds) to prioritize rebuilding affected households impacted by the devastating Marshall Fire and supporting vulnerable populations. Mental health services, recovery navigation, and other vital initiatives have also been supported through this fund. The organization's emphasis on equity, transparency, and integrity is evident in their efforts to effectively distribute resources and meet diverse community needs.

To learn more and apply online for Wildfire Funds support online, please visit: <https://www.commfund.org/wildfirefund>

BOULDER COUNTY AFTER THE DISASTER GUIDEBOOK

Even after the flames are extinguished, several dangers persist after a wildfire. These hazards include potential flash flooding, structural damage, downed powerlines, unstable roads, weakened trees, remaining hot spots, and the presence of wildlife predators in the area. Property owners that have experience property damage during a wildfire event are advised to make an initial trip to assess the damage, identify post-fire hazards, and plan for necessary restoration tasks before starting cleanup or returning home. The recovery process begins with assessing and documenting losses, taking pictures, and notes. Re-entry safety tips and a post-fire supply list are available within the Guidebook to aid in this process.

Livestock and large pet owners delay bringing their animal back to the property until the extent of damage and existing hazards are well understood. Livestock should be shelter somewhere safe from post-postfire impacts until the hazards have subsided.

For more information in post-fire actions and a supply list, please visit:

https://mcusercontent.com/2263fe298f4df255d22b80097/files/9262ab8f-acc3-2b00-5040-3a916c7c342b/Boulder_County_After_the_Disaster_Guidebook_CSU_Extension_V3.pdf

WILDFIRE RECOVERY AND RETURNING HOME

Recovery from wildfire impacts can vary greatly across income levels and demographics. Rural areas, low-income neighborhoods, and immigrant communities generally do not have the necessary resources to cover insurance and rebuilding expenses that occur after a fire. As a result, many of these areas take more time to recover than those with greater access to resources. In addition, the occurrence of wildfire can worsen existing mental health conditions and lead to post-traumatic stress, low self-esteem, and depression for at-risk populations (CA GOPR 2020).

First and foremost, follow the advice and recommendations of emergency management agencies, fire departments, utility companies, and local aid organizations regarding activities following the wildfire. Do not attempt to return to your home until fire personnel have deemed it safe to do so.

When driving, watch for trees, brush, and rocks which may have been weakened or loosened by the fire. Be aware of any damage or debris on roads and driveways. Traffic may be delayed, or lanes closed due to firefighter operations. Use extreme caution around trees, power poles, and any other tall objects that may have been weakened by the fire (Colorado Silver Jackets 2021).

Even if the fire did not damage your house, do not expect to return to normal routines immediately. Expect that utility infrastructure may have been damaged and repairs may be necessary. When you return to your home, check for hazards, such as gas or water leaks and electrical shorts. Turn off damaged utilities if you did not do so previously. Request that the fire department or utility companies turn the utilities back on once the area is secured. Similarly, water supply systems may have been damaged; do not drink from the tap until you have been advised that it is safe to do so. Finally, keep a “fire watch”; look for smoke or sparks in houses and other buildings (CDHSEM 2022). Once at home, check for the following (CDHSEM 2022):

- Use caution when walking through burned areas. Hazards, such as hot spots and flare ups, may still exist.
- Keep a “fire watch” for several hours after returning to watch for smoke and sparks.

- Leave immediately if there is heat or smoke coming from a damaged structure.
- Avoid damaged or fallen power lines, poles, and downed wires.
- Mark ash pits properly and warn others of them. Stay clear of pits when possible.
- Keep animals close by- do not allow them to wander as hot spots and embers can burn their paws.
- Listen to instructions given by those in charge. Remain calm and deal with the most urgent issues first.
- If there is damage to your property, contact your insurance company.

LONG-TERM COMMUNITY RECOVERY

On non-federal land, recovery efforts are the responsibility of local governments and private landowners. Challenges associated with long-term recovery arise when homes were saved but are located in high severity burn areas or within other hazard prone areas. Economically, essential businesses that were burned, damaged, or otherwise forced to close pose a challenge to communities of all sizes. Given these complications, rebuilding and recovery efforts can last for years, with invasive species control and ecosystem restoration lasting even longer (CUSP 2016). It is critical that a long-term plan is in place and there is sufficient funding and support to properly restore the ecosystem and community.

To learn about more post-fire recovery resources, visit the After the Flames website here: <https://aftertheflames.com/resources/>.

INSURANCE CLAIMS

Your insurance agent is the best source of information for submitting a claim. If you do not have insurance, reach out to local disaster recovery groups, such as the Recovery Navigators listed above. It is recommended you take photos of your home, both inside and out, in preparation of an emergency. Keep the photos in a safe place as this will make the insurance claim process easier. Most expenses incurred during the time you are displaced may be reimbursed, so be sure to keep all receipts. Additional items that may be covered are extra transportation costs to and from work or school, telephone installation, furniture rental, extra food costs, and water damage. Do not start any repairs without the approval of your claims adjuster (Colorado Division of Insurance 2020).

Natural disasters aren't always predictable, but there are steps property owners can take to better prepare for an emergency.

- Review your insurance policy annually to see if your home is adequately insured
- Know your "loss of use" section – these cover living expenses should your home become unlivable due to fire, smoke, or otherwise

You can view a guide on creating a home inventory here: <https://www.iii.org/article/how-create-home-inventory>

Learn more about insurance decisions in the Colorado Property and Insurance Wildfire Preparedness Guide: https://93j20c.p3cdn2.secureserver.net/wp-content/uploads/2021/08/Wildfire_22x8.5_2021.pdf

COMMUNITY SAFETY: POST-FIRE FLOODS AND DEBRIS FLOWS

There are numerous natural hazards after a wildfire. The most dangerous are potential flash floods and landslides that can occur with rainfall in a burned area. Wildfires increase the risk of flooding because burned soil is unable to absorb rainfall and it becomes hydrophobic. Factors that contribute to flooding and debris flows are steep slopes, heavy rainfall, weak or loose rock and soil, and improper construction and grading. Even small rainfall can cause a flash flood, transporting debris and damaging homes and other structures. Following a wildfire, burned areas are susceptible to debris flows for 5-10 years, leaving downhill residents in danger. It is crucial to be aware of your surroundings and take note of steep, unstable slopes that could require hasty evacuation (Colorado Geological Survey 2021). Develop an evacuation plan with your family and stay away from waterways. Be aware of your risk, pay attention to weather forecasts, listen to local authorities, and have a household inventory with copies of critical documents (Colorado Geological Survey 2021).

MOBILIZING YOUR COMMUNITY

Wildfires that produce extensive damage require a community-scale response. The local Emergency Manager will collaborate with state and federal partners to manage disaster response and urgent needs. Additional mobilization of a response and recovery team or group of teams in a community can function as a vital part of the recovery procedure. Coordinated and informed direction throughout community-level volunteers and all levels of government are necessary for successful recovery (Colorado Silver Jackets 2021).

Community Emergency Response Team

Developed by the Federal Emergency Management Agency (FEMA), the Community Emergency Response Team (CERT) training is a program that educates community members about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, and team organization. Supplemental training modules are available to better assist professional responders in a variety of emergency situations. Advanced training includes topics such as animal response, emergency communications, traffic and crowd management, and flood response.

In addition, each community is encouraged to create its own type of a Post-Fire Coordination Group (PFCG) to direct the response to any ensuing post-wildfire natural hazards and aid in determining post-fire mitigation actions. The PFCG should work directly with local, state, or federal agencies, emergency response officials, and others to aid in a coordinated response. Primary duties of the PFCG include coordinating the exchange of information among agencies, assembling and exchanging geospatial data, assisting public communications, and coordinating with elected officials (Colorado Silver Jackets 2021).

The recovery coordinator should become familiar with representatives from local, state, and government agencies that will be helping with coordination or funding of post-fire recovery. Any large wildfire will also involve an Incident Command System (ICS), an appropriately sized team assigned to aid in post-fire recovery. Learn more are <https://www.nps.gov/articles/wildland-fire-incident-command-system-levels.htm>.

POST-FIRE REHABILITATION AND RESOURCES

The Natural Resource Conservation Service's (NRCS's) Emergency Watershed Protection (EWP) program provides technical and financial services for watershed repair on public (state and local) and private land. The goal is to reduce flood risk through funding and expert advice on land treatments. The EWP program can provide up to 75% of funds and remaining funds are often paid with in-kind volunteer labor (Coalition for the Upper South Platte [CUSP] 2016). This funding is used by the State Emergency Rehabilitation Team (a multi-agency group assembled by the NRCS) to develop specific recovery and treatment plans.

Examples of potential treatments include (USFS 2021b):

- Hillside stabilization (for example, placing bundles of straw parallel to the slope to slow erosion)
- Hazard tree cutting
- Felling trees perpendicular to the slope contour to reduce runoff
- Mulching areas seeded with native vegetation
- Stream enhancements and construction of catchments to control erosion, runoff, and debris flows
- Planting or seeding native species to limit spread of invasive species

The Colorado State Forest Service maintains a webpage with Colorado-specific forest restoration resources. This page includes guides on soil and erosion treatment techniques, rehabilitation and replanting for success guides, and a link to the Colorado Post-Fire Playbook. These resources are available here: <https://csfs.colostate.edu/forest-management/restoration-rehabilitation/>

A comparison of potential hillside, channel, and road treatments is available at: <https://www.afterwildfirenm.org/post-fire-treatments/which-treatment-do-i-use>

The effectiveness of various treatments is described at: https://www.fs.usda.gov/rm/pubs/rmrs_gtr240.pdf

Invasive Species Management and Native Revegetation

Wildfire provides opportunity for invasive species to dominate because many of these species thrive on recently burned landscapes. It is imperative that landowners prevent invasive establishment by eradicating weeds early, planting native species, and limiting invasive seed dispersal (CUSP 2016).

Planting native seeds is an economical way to restore a disturbed landscape. Vegetation provides protection against erosion and stabilizes exposed soils. To be successful, seeds must be planted during the proper time of year, using correct techniques. Use a native seed mixture with a diversity of species and consider the species' ability to compete with invasive species. If you choose to transplant or plant native species, consider whether the landscape has made a sufficient recovery to ensure the safety of the individuals (CUSP 2016).

Specific Treatment Details

Hillslope Treatments

Cover Applications:

Dry mulch: provides immediate ground cover with mulch to reduce erosion and downstream flow.

Wet mulch (hydromulch): provides immediate cover to hold moisture and seeds on slopes using a combination of organic fibers, glue, suspension agents, and seeds (most effective on inaccessible slopes).

Slash spreading: provides ground cover to reduce erosion by felling trees in burned areas.

Seeding: reduces soil erosion over time with an application of native seed mixtures (most successful in combination with mulching). Breaking up and loosening topsoil to break down the hydrophobic layer on top of the soil is also effective.

Erosion Barrier Applications:

Erosion control mat: organic mats staked on the soil surface to provide stability for vegetation establishment.

Log erosion barrier: trees felled perpendicular to the hillslope to slow runoff.

Fiber rolls (wattles): rolls placed perpendicular to the hillslope to reduce surface flows and reduce erosion.

Silt fencing: permeable fabric fencing installed parallel to the slope contour to trap sediment as water flows down the hillslope.

Channel Treatments

Check dam: small dams built to trap and store sediment in stream channels.

In-channel tree felling: felling trees in a staggered pattern in a channel to trap debris and sediment.

Grade stabilizer: structures made of natural materials placed in ephemeral channels for stabilization.

Stream bank armoring: reinforcing streambanks with natural materials to reduce bank cutting during stream flow.

Channel deflector: an engineered structure to direct flow away from unstable banks or nearby roads.

Debris basin: constructed to store large amounts of sediment moving in a stream channel.

Road and Trail Treatments

Outsloping and rolling dips (water bars): alter the road shape or template to disperse water and reduce erosion.

Overflow structures: protect the road by controlling runoff and diverting stream flow to constructed channels.

Low water stream crossing: culverts replaced by natural fords to prevent stream diversion and keep water in the natural channel.

Culvert modification: upgrading culvert size to prevent road damage.

Debris rack and deflectors: structure placed in a stream channel to collect debris before reaching a culvert.

Riser pipes: filter out debris and allow the passage of water in stream channels.

Catchment-basin cleanout: using machinery to clean debris and sediment out of stream channels and catchment basins.

Trail stabilization: constructing water bars and spillways to provide drainage away from the trail surface.

These treatments and descriptions are further detailed at: <https://afterwildfirenm.org/post-fire-treatments/treatment-descriptions>

For more information about how to install and build treatments, see the Wildfire Restoration Handbook at: https://www.rmfi.org/sites/default/files/hero-content-files/Fire-Restoration-HandbookDraft_2015_2.compressed_0.pdf

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APPENDIX G:
Project Outreach

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COMMUNITY OUTREACH

Table G.1 presents examples of the public outreach completed as part of the CWPP development. To maximize audience reached, online resources were used to provide information to the public and solicit feedback. Figures G.1 through G.3 show examples of online posts.

Table G.1. Public Outreach Resources

Resource Description	Location	URL	Date
Article from City of Boulder	City of Boulder	https://bouldercolorado.gov/news/boulder-update-its-community-wildfire-protection-plan	6/5/223
Article from <i>Boulder Weekly</i>	Boulder Weekly website	https://boulderweekly.com/boulderganic/living-with-fire/	6/8/2023
Public Survey	Online	Survey closed	June 2023
Mountain View FPD Hub Site	Online	https://mountain-view-fpd-cwpp-mvfpd.hub.arcgis.com/	8/16/2023
Mountain View FPD CWPP Story Map	Online	https://storymaps.arcgis.com/stories/2361c838d513461d83ae19f961f4d3dc	9/6/2023
Boulder County CWPP Update and Mountain View FPD CWPP Public Meeting	Superior Community Center	n/a	6/10/2023
Boulder County CWPP Update and Mountain View FPD CWPP Public Meeting	Erie Open Space Building	n/a	8/30/2023
Mountain View FPD CWPP Public Review Period of the Draft CWPP	n/a	Survey closed	10/30/2023

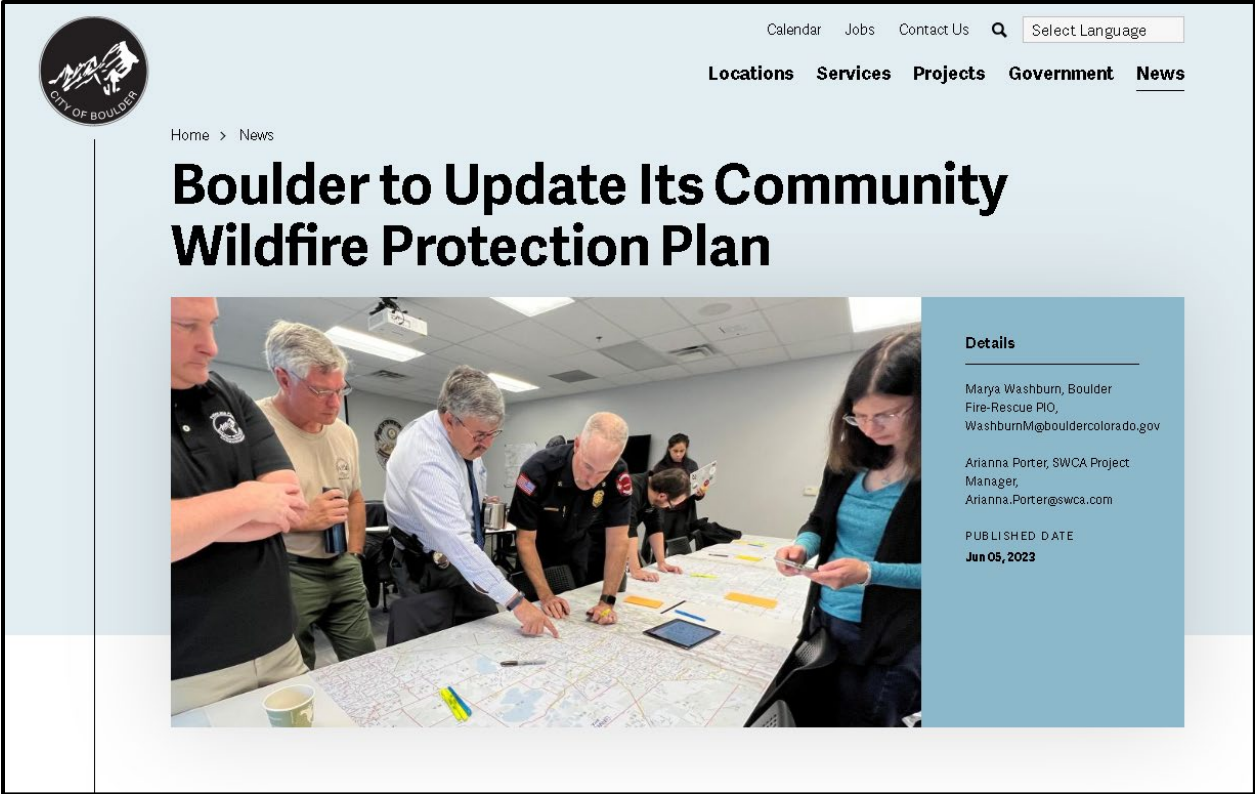


Figure G.1. City of Boulder collaboration with Mountain View FPD and Boulder County to update area CWPPs.

boulderganic

Living with fire

Documentary coming to Nederland fuels wildfire discussion as local resilience plans are underway

By Will Matuska - June 8, 2023



Courtesy: Elemental

Figure G.2. Article from Boulder Weekly mentioning Mountain View FPD CWPP development.



Figure G.3. Mountain View FPD CWPP hub site screen shot.

STORY MAP

Mountain View FPD developed the CWPP story map (online content, link in Table G.1) to facilitate engagement with the public. The story map provides opportunities for both information sharing and gathering between the public and the FPD. The story map has several tabs, each demonstrating information from various chapters in the CWPP document.

The introductory tab presents the purpose of the story map, project history, instructions for navigating the content, and the National Cohesive Wildland Fire Management Strategy framework. Next, the public involvement tab invites viewers to see a list of scheduled events, participate in the CWPP community survey, and view the CWPP hub site. The Fire Environment, Risk Assessment, Wildfire Mitigation Strategies, and Monitoring and Evaluation Strategies tabs present the bulk of the CWPP content (Figures G.4–G.7). These tabs introduce the WUI concept, fire regimes, values at risk and fire history in the district, information regarding Mountain View FPD fire planning and response, district values at risk from wildfire, areas with high versus low risk, wildfire mitigation actions, and monitoring strategies for applied treatments.

The story map also links the viewer to the CWPP document and contact information for the Mountain View FPD CWPP planning team. The figures below (G.4–G.7) demonstrate the spatial information that is conveyed through the story map. Each map is interactive, with several clickable layers providing information on numerous aspects of wildfire, including but not limited to communities in high-risk areas, vegetation and fuels, current mitigation projects, and fire behavior.

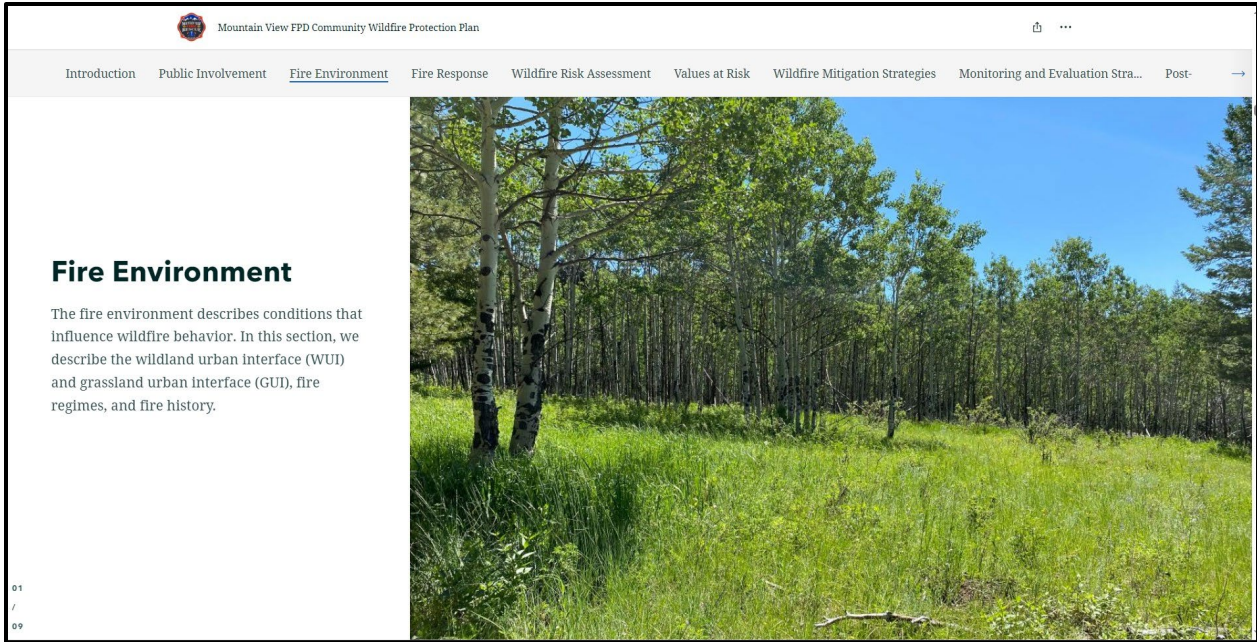


Figure G.4. Mountain View FPD story map fire environment tab.

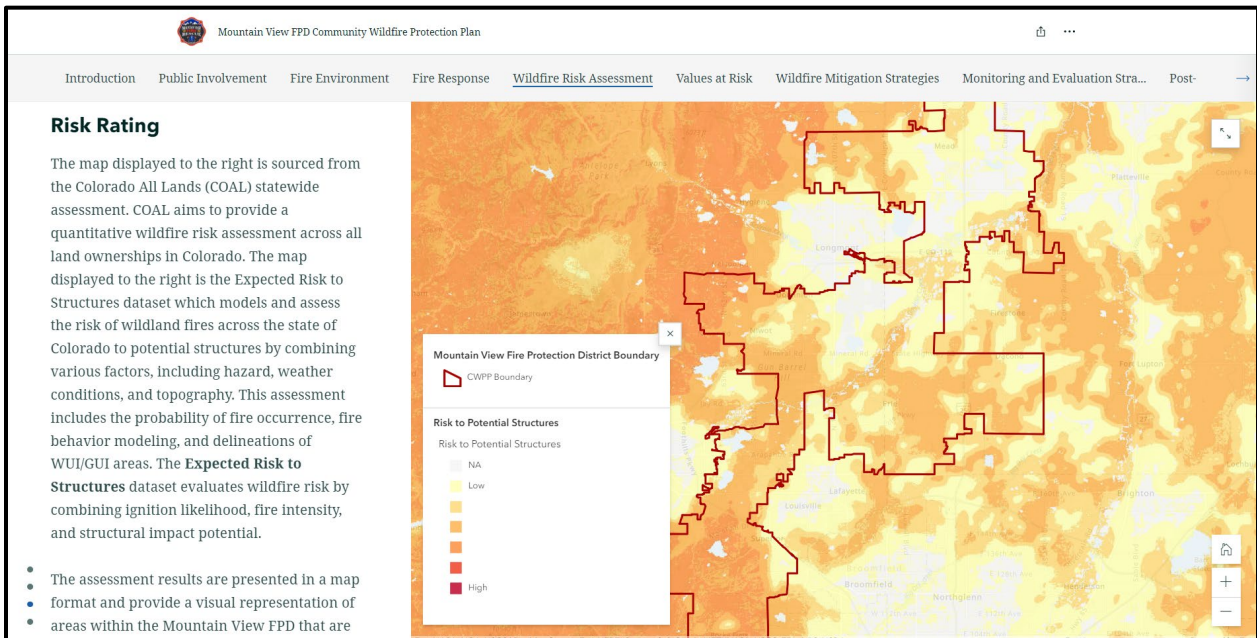


Figure G.5. Mountain View FPD story map wildfire risk assessment tab.

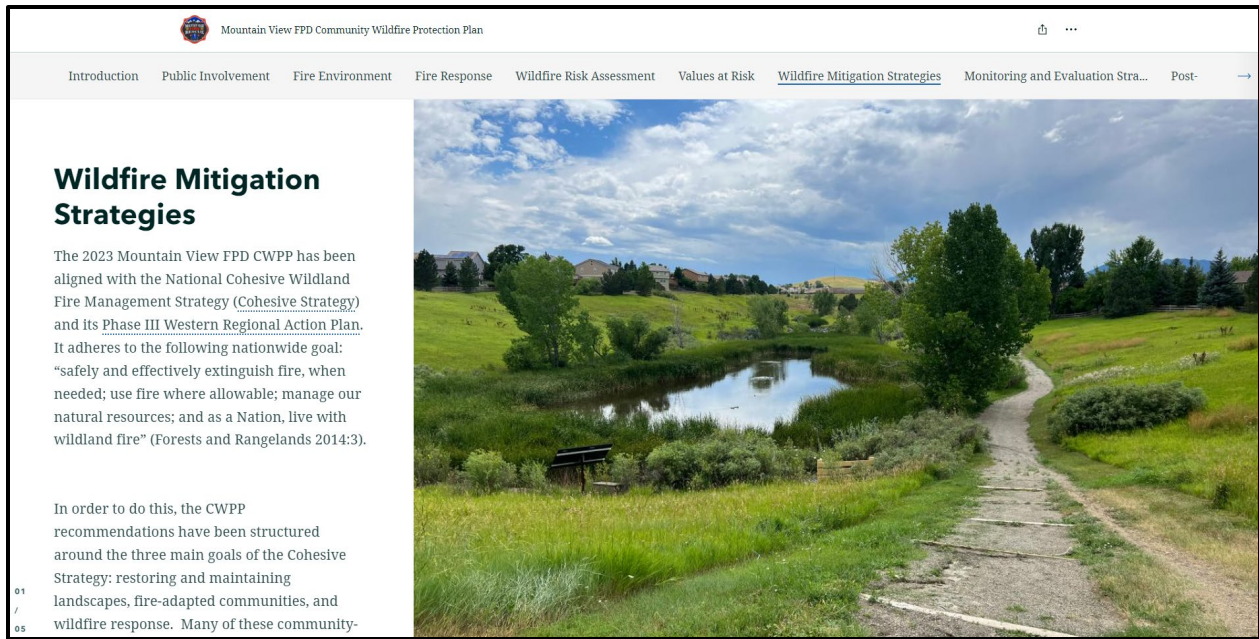


Figure G.6. Mountain View FPD story map wildfire mitigation strategies tab.

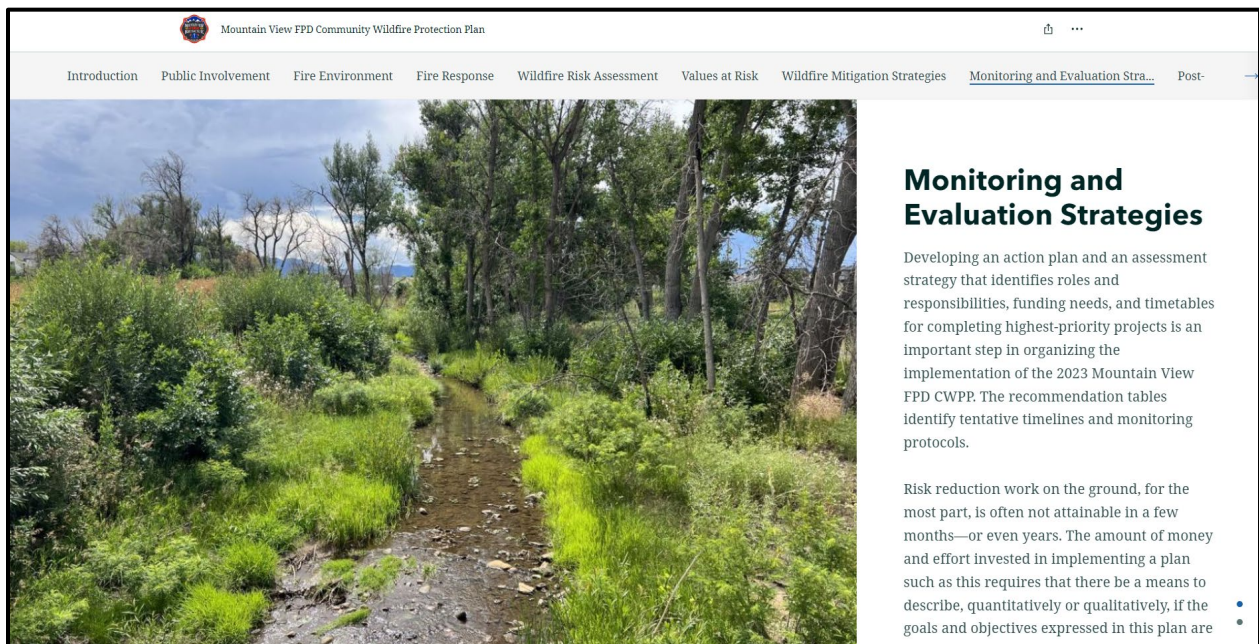


Figure G.7. Mountain View FPD story map monitoring and evaluation strategies tab.

COMMUNITY SURVEY

During the public review period of the CWPP process, community members provided feedback and information on various aspects related to wildfire preparedness in their community. This included assessments of community preparedness and house risk, concerns about wildfire vulnerability, prioritization of wildfire preparedness actions, challenges to making homes fire-safe, funding priorities, prescribed fire usage, evacuation planning, emergency kits, knowledge of evacuation routes, willingness to evacuate under different circumstances, familiarity with emergency notifications, and registration for

local emergency notifications. SWCA held the public survey period open from June 2023 through November 2023. Concerns raised during this feedback process were addressed through diligent adaptations and additions to the plan’s content and mitigative recommendations. Figures G.8 through G.34 provide visualizations of the data received through the public survey responses.

Note: Variations in the quantity of responses across survey questions are due to respondents abstaining from certain questions.

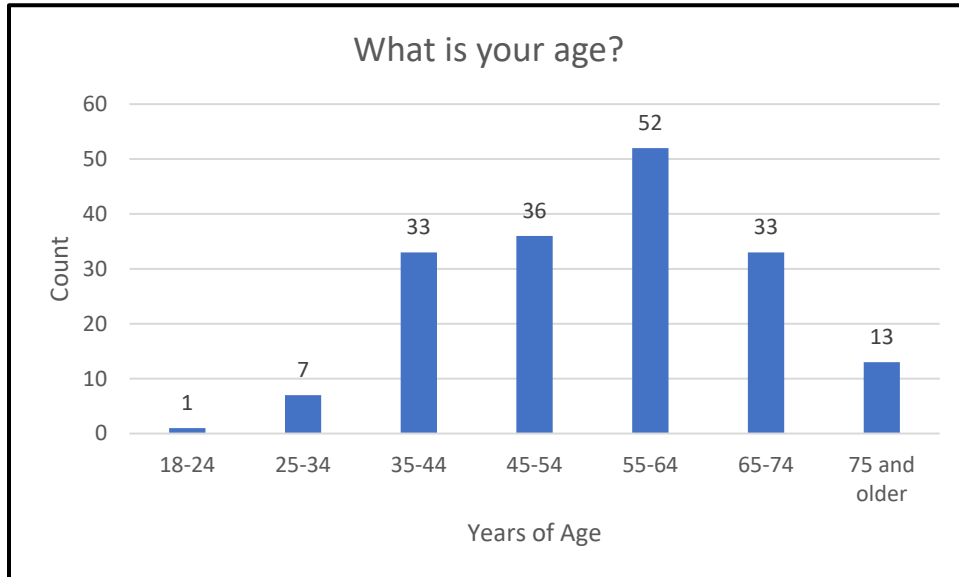


Figure G.8. Responses to public survey question “What is your age?”.

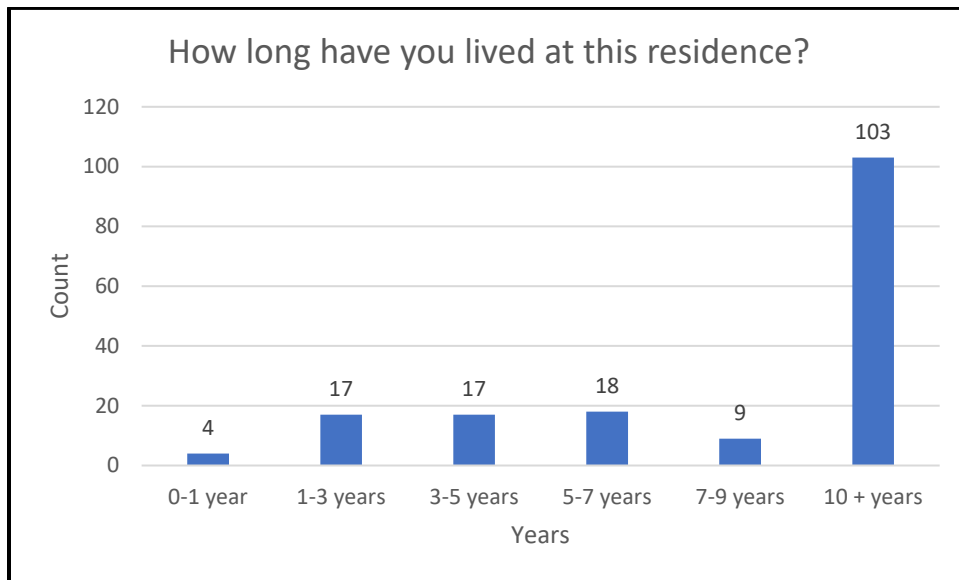


Figure G.9. Responses to public survey question “How long have you lived at this residence?”.

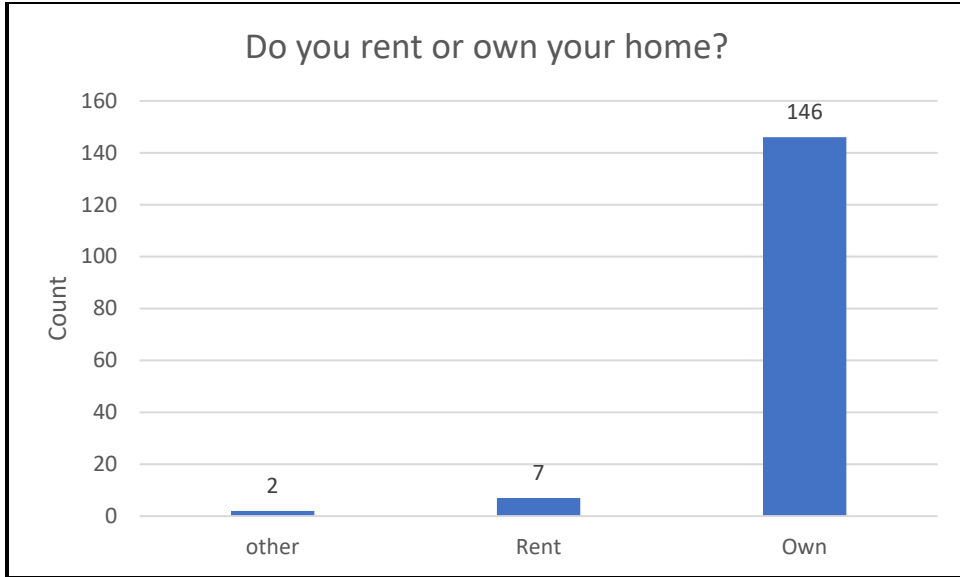


Figure G.10. Responses to public survey question “Do you rent or own your home?”.

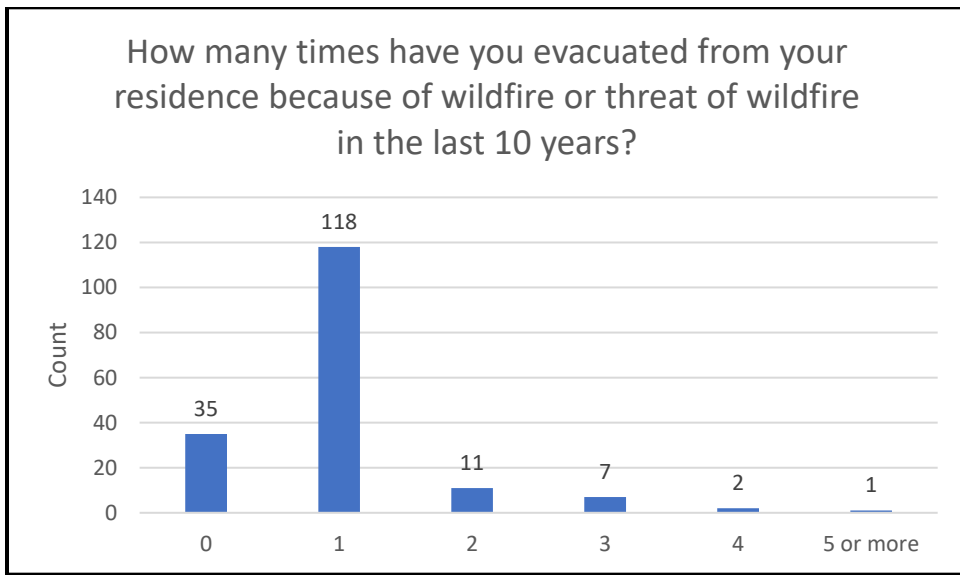


Figure G.11. Responses to public survey question “How many times have you evacuated from your residence because of wildfire or threat of wildfire in the last 10 years?”.

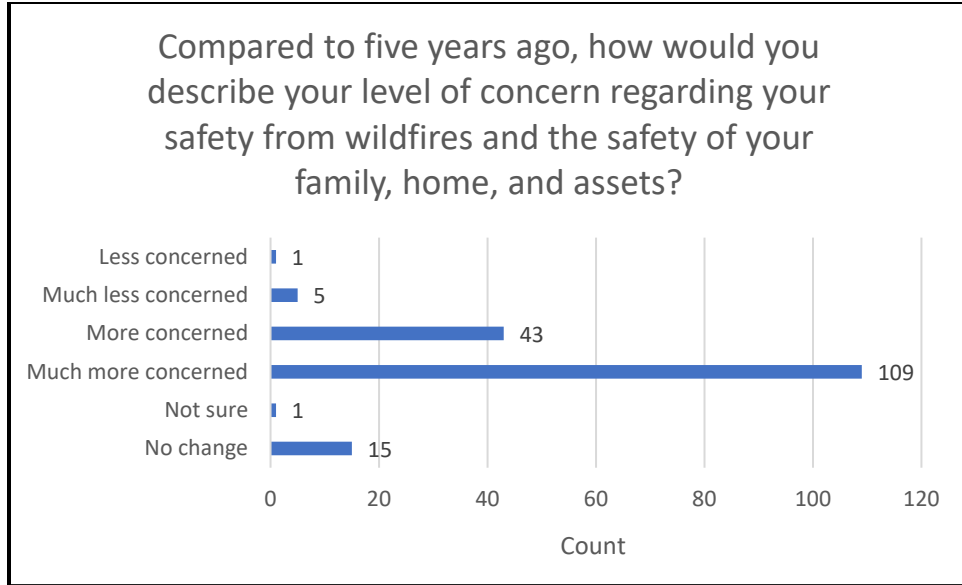


Figure G.12. Responses to public survey question “Compared to five years ago, how would you describe your level of concern regarding your safety from wildfires and the safety of your family, home, and assets?”.

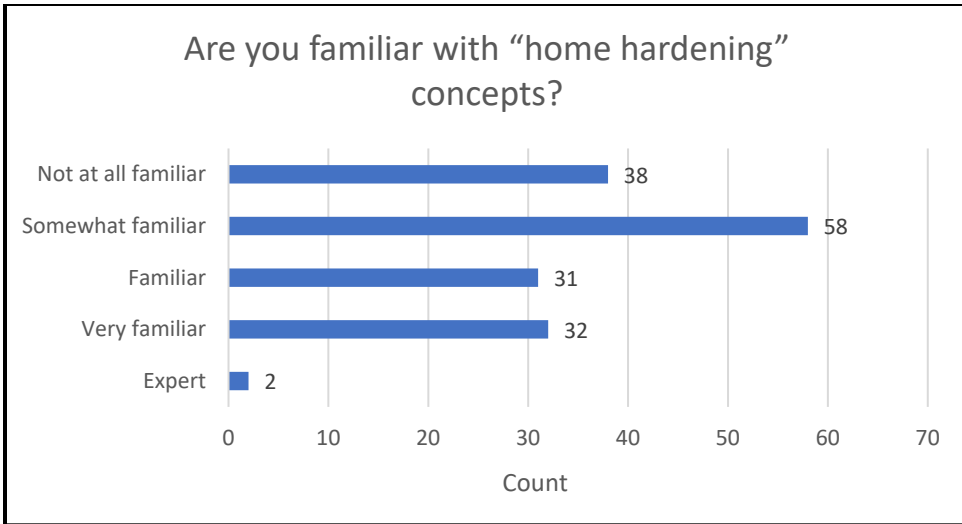


Figure G.13. Responses to public survey question “Are you familiar with “home hardening” concepts?”.

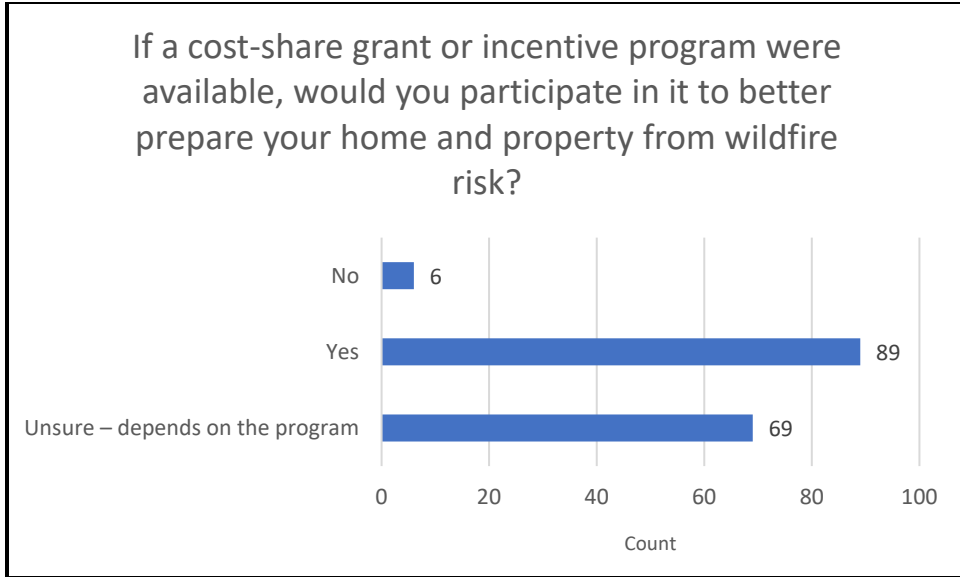


Figure G.14. Responses to public survey question “If a cost-share grant or incentive program were available, would you participate in it to better prepare your home and property from wildfire risk?”.

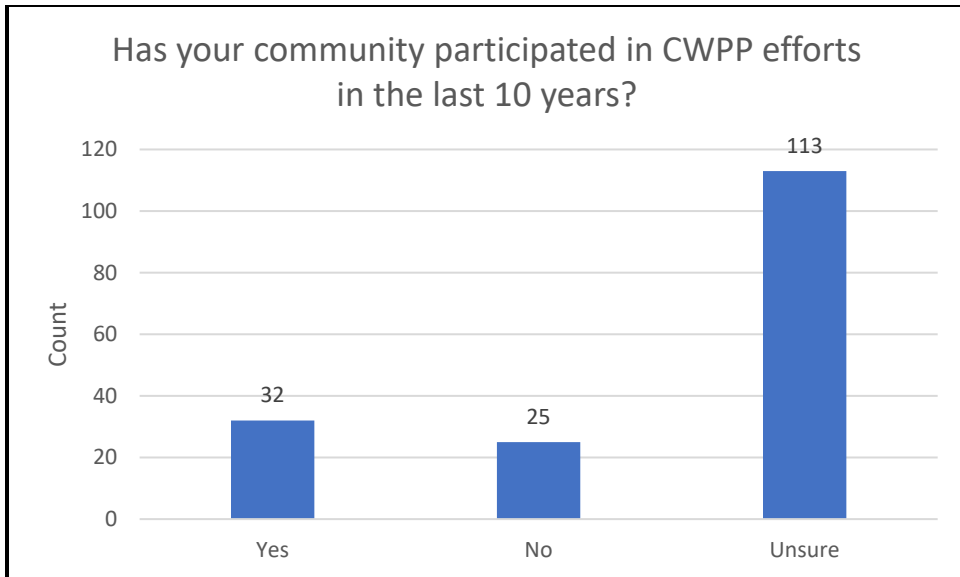


Figure G.15. Responses to public survey question “Has your community participated in CWPP efforts in the last 10 years?”.

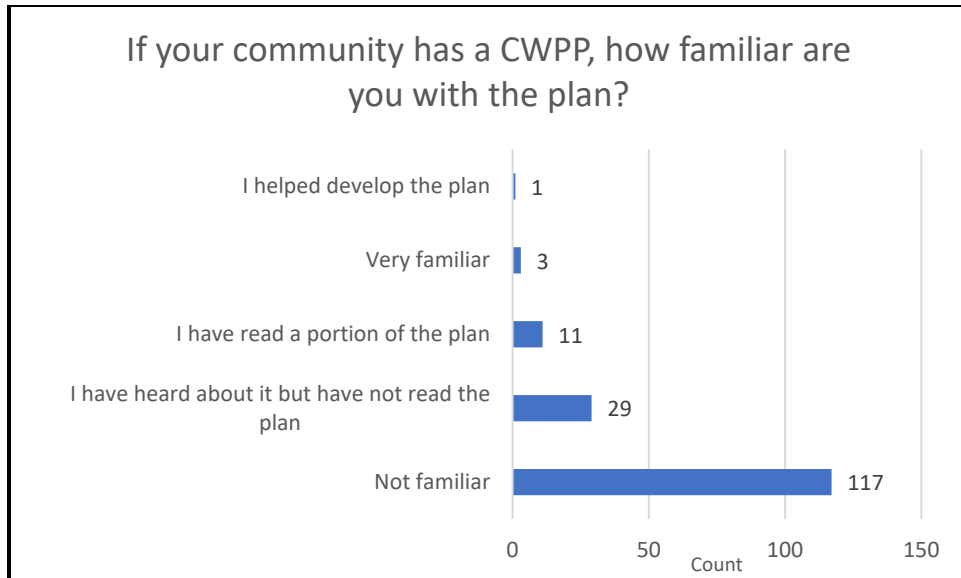


Figure G.16. Responses to public survey question “If your community has a CWPP, how familiar are you with the plan?”.

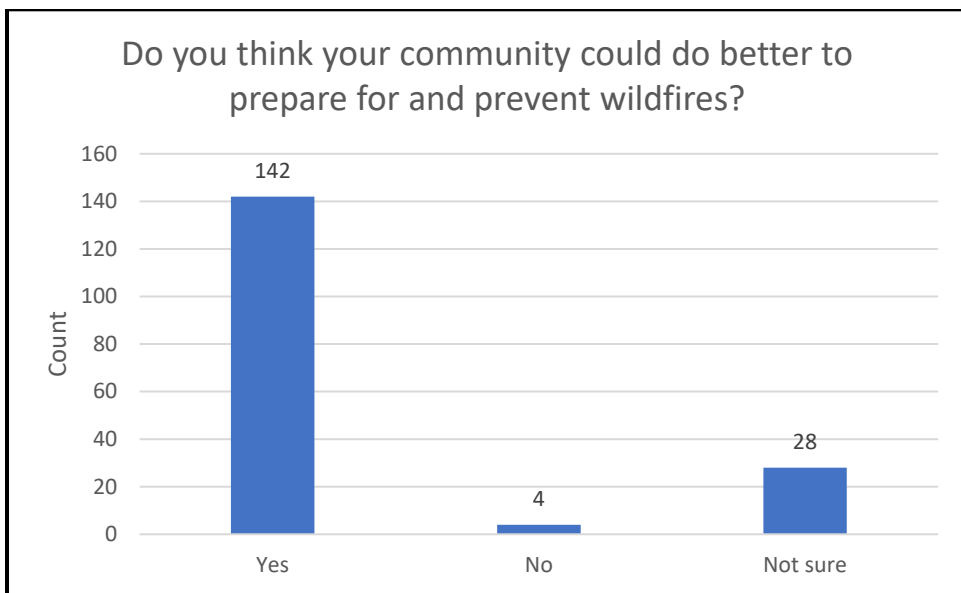


Figure G.17. Responses to public survey question “Do you think your community could do better to prepare for and prevent wildfires?”.

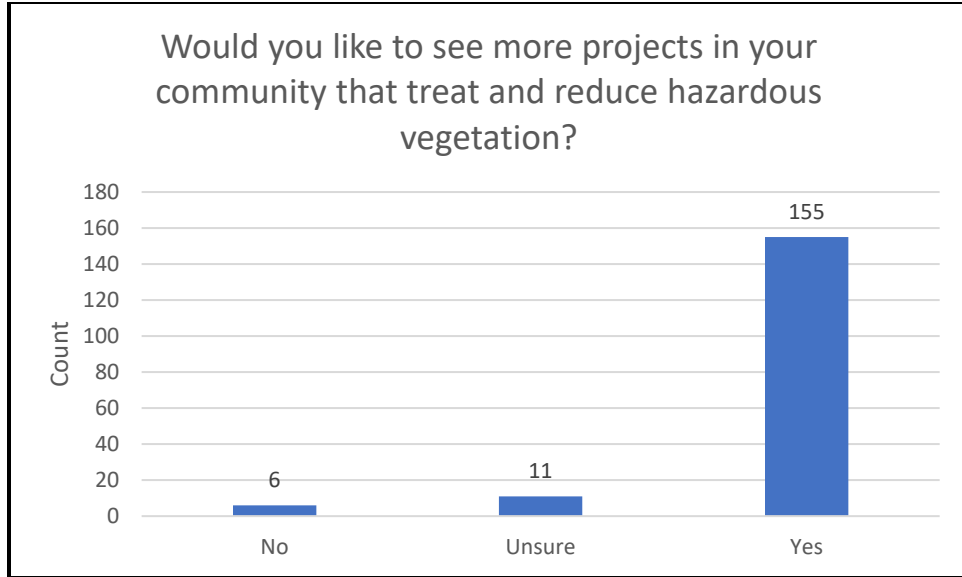


Figure G.18. Responses to public survey question “Would you like to see more projects in your community that treat and reduce hazardous vegetation?”.

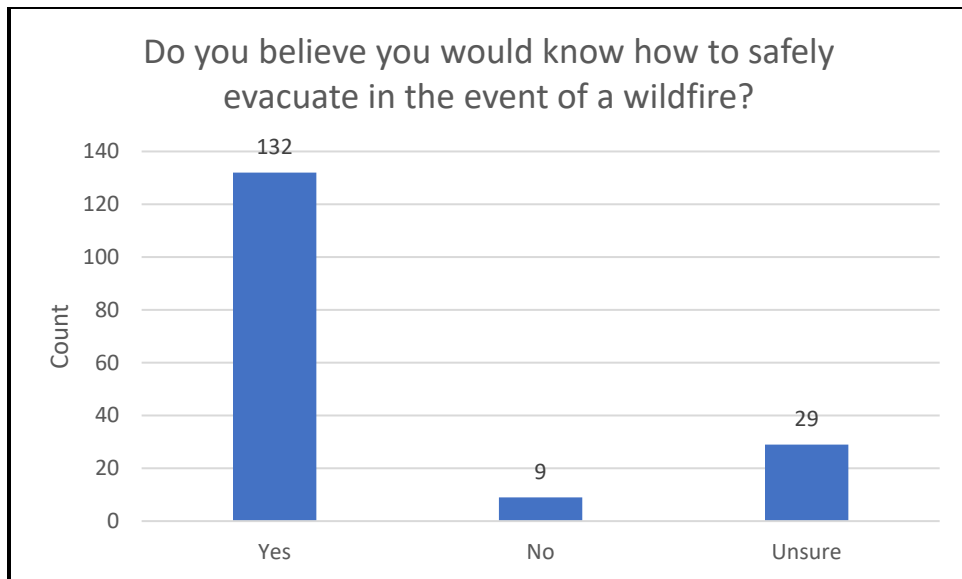


Figure G.19. Responses to public survey question “Do you believe you would know how to safely evacuate in the event of a wildfire?”.

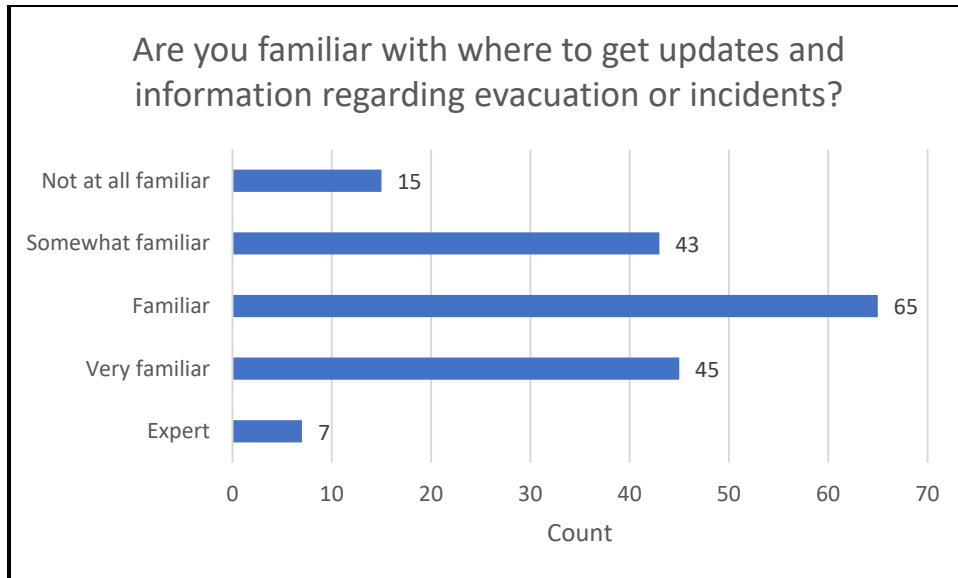


Figure G.20. Responses to public survey question “Are you familiar with where to get updates and information regarding evacuation or incidents?”

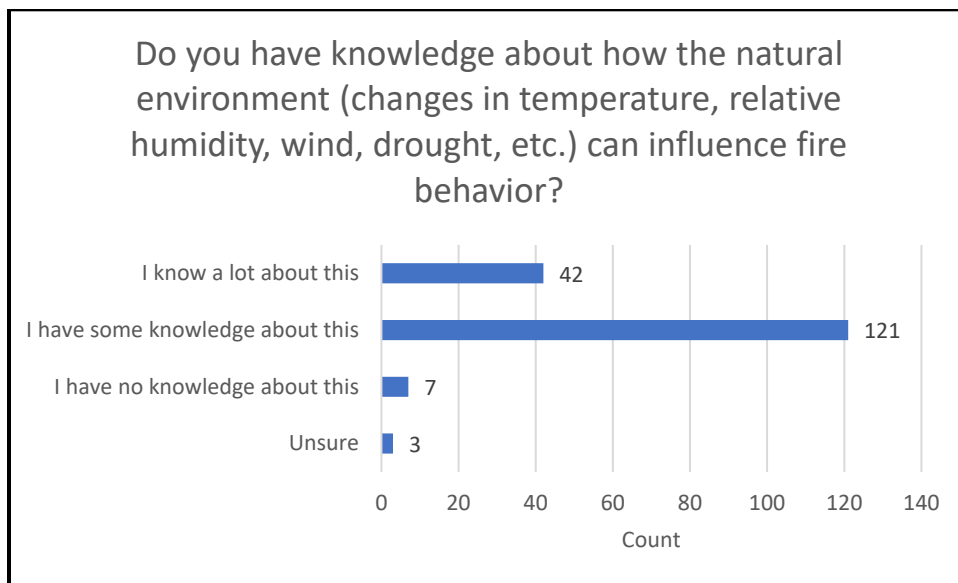


Figure G.21. Responses to public survey question “Do you have knowledge about how the natural environment (changes in temperature, relative humidity, wind, drought, etc.) can influence fire behavior?”.

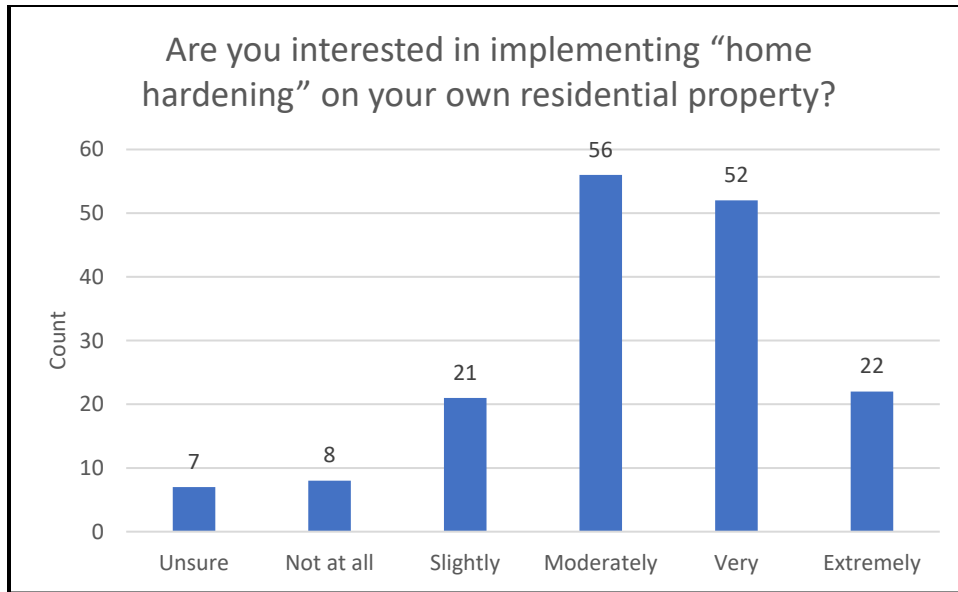


Figure G.22. Responses to public survey question “Are you interested in implementing “home hardening” on your own residential property?”.

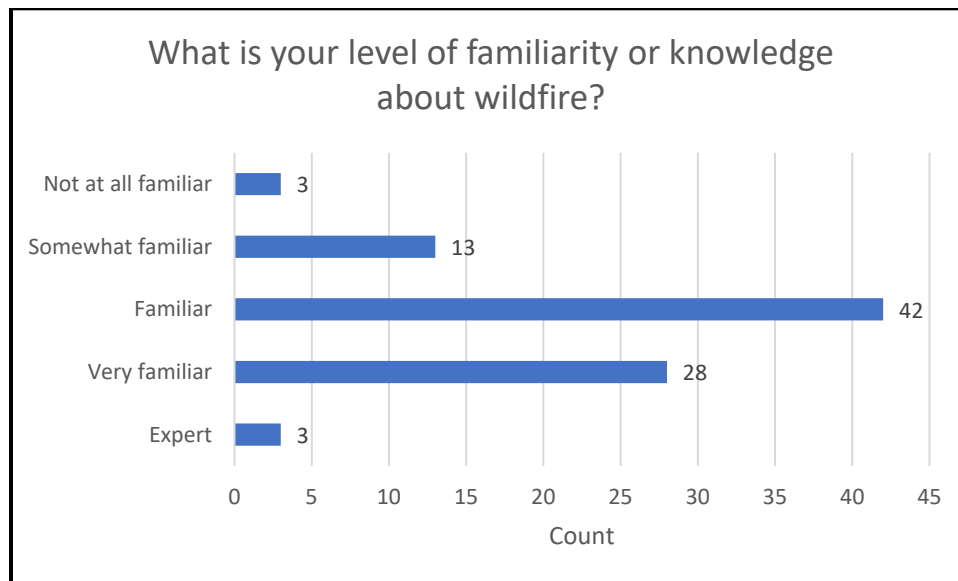


Figure G.23. Responses to public survey question “What is your level of familiarity or knowledge about wildfire?”.

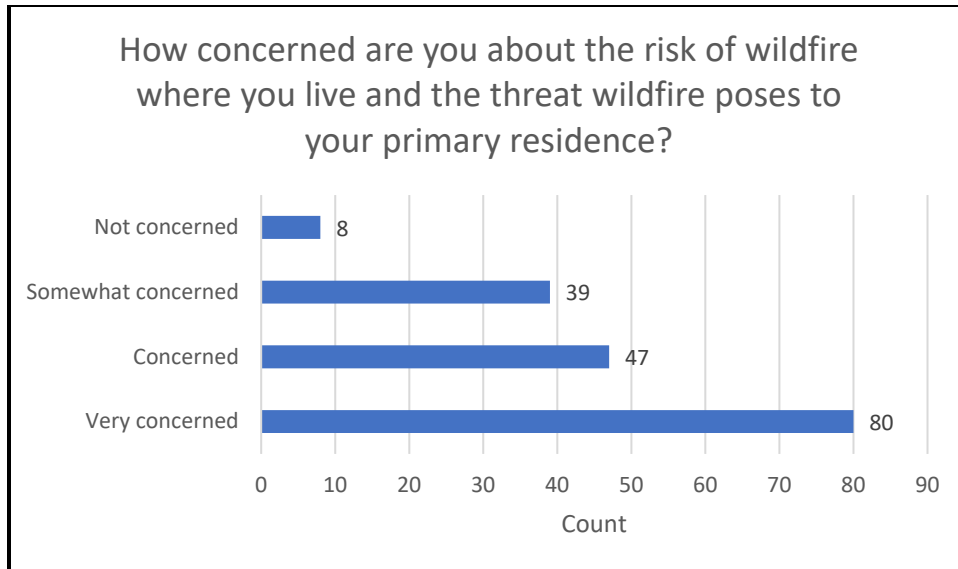


Figure G.24. Responses to public survey question “How concerned are you about the risk of wildfire where you live and the threat wildfire poses to your primary residence?”.

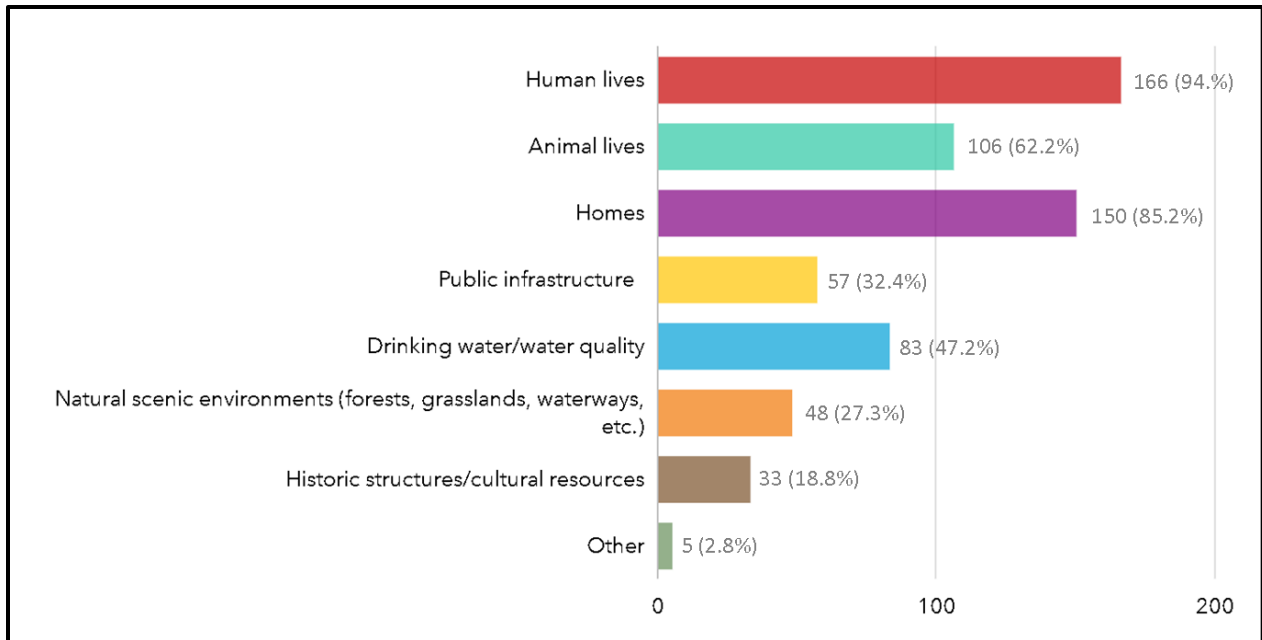


Figure G.25. Responses to public survey question “What are the values/assets that you want protected in the immediate area around your residence (~1 mile)?”. Respondents were allowed to make multiple selections. Count represents the number of times the choice was selected. Percentages represent the proportion of respondents that included the choice within their response.

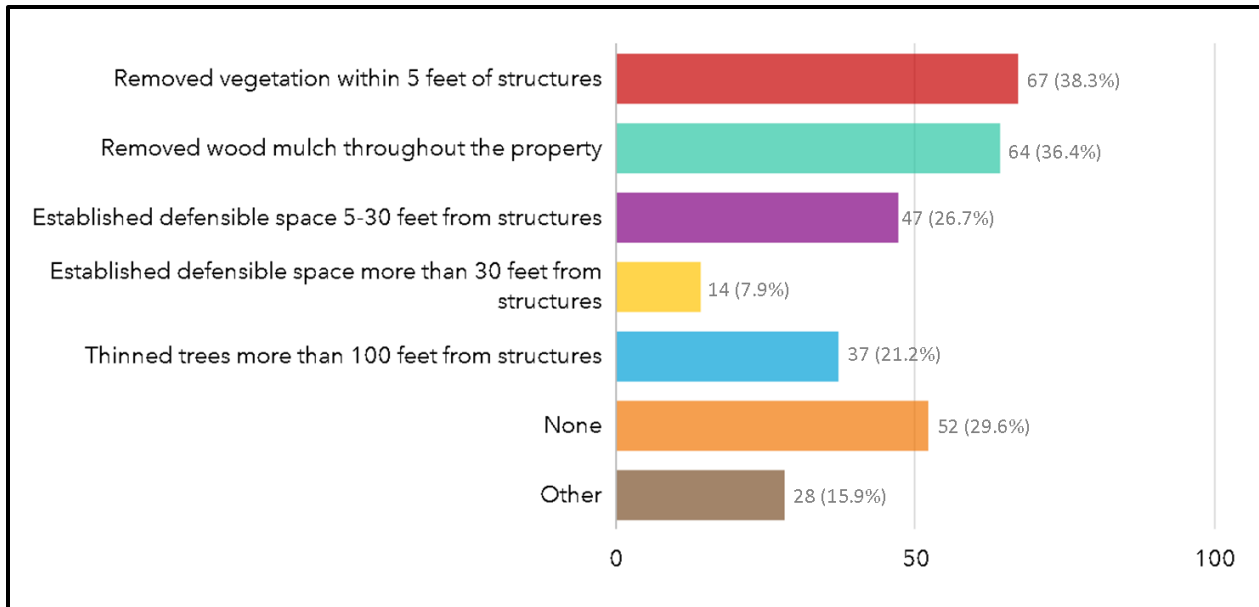


Figure G.26. Responses to public survey question “Defensible space is the 100 feet between your property and the surrounding area. Which of the following defensible space activities have you completed?”. Respondents were allowed to make multiple selections. Count represents the number of times the choice was selected. Percentages represent the proportion of respondents that included the choice within their response.

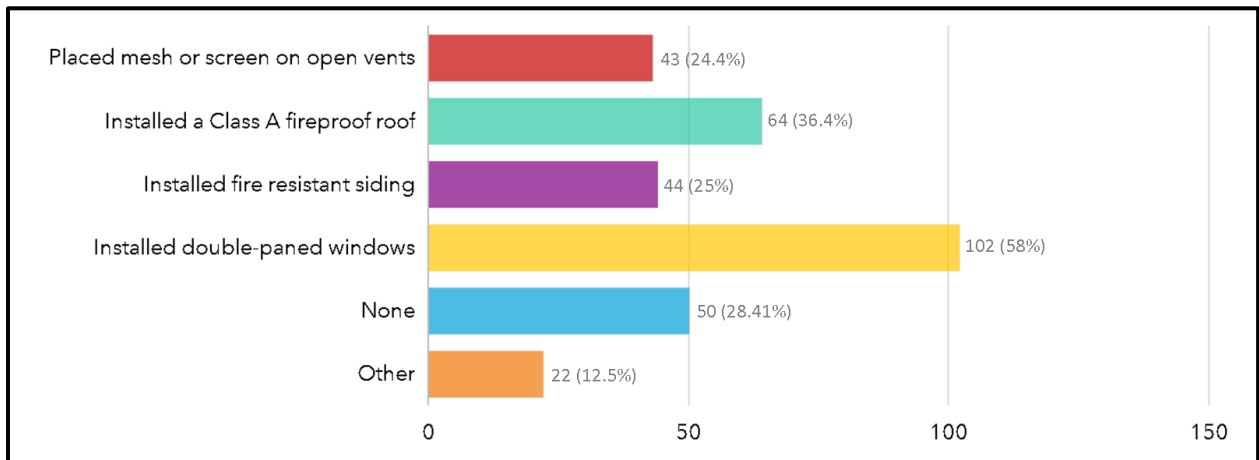


Figure G.27. Responses to public survey question “Which of the following home hardening activities have you completed?”. Respondents were allowed to make multiple selections. Count represents the number of times the choice was selected. Percentages represent the proportion of respondents that included the choice within their response.

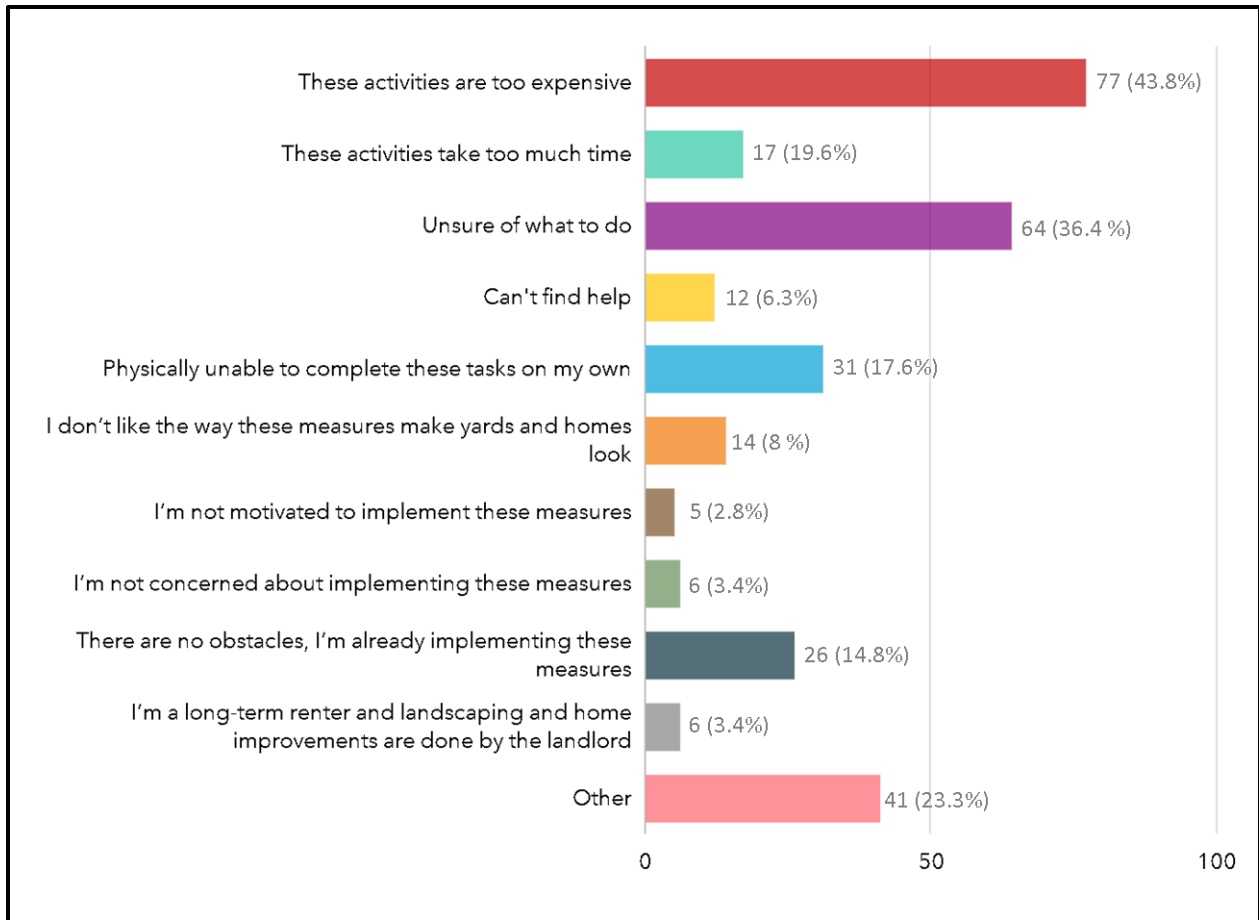


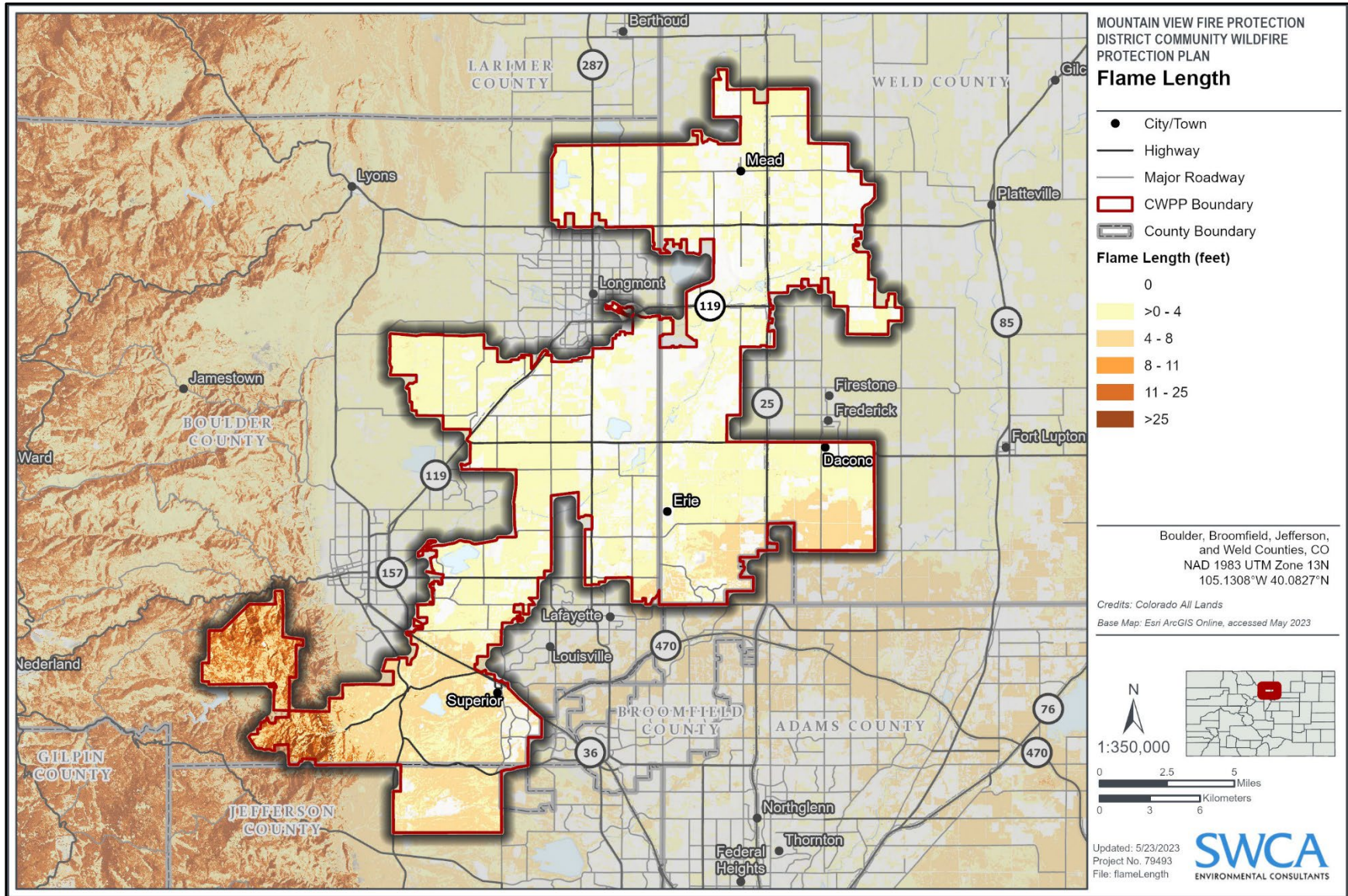
Figure G.28. Responses to public survey question “Are there any obstacles preventing you from implementing defensible space and home hardening measures on your home?”. Respondents were allowed to make multiple selections. Count represents the number of times the choice was selected. Percentages represent the proportion of respondents that included the choice within their response.

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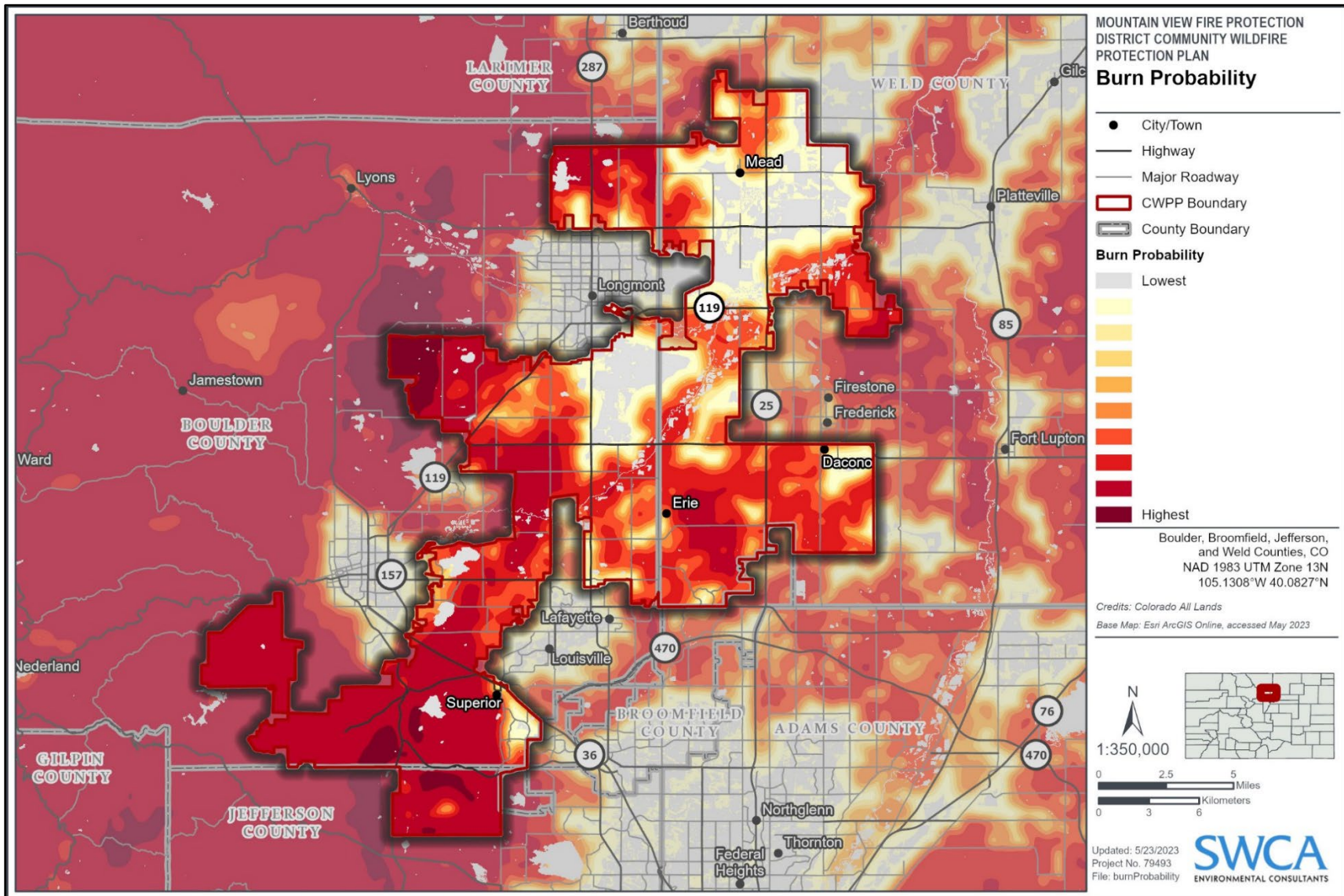
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APPENDIX H:
Additional Mapping

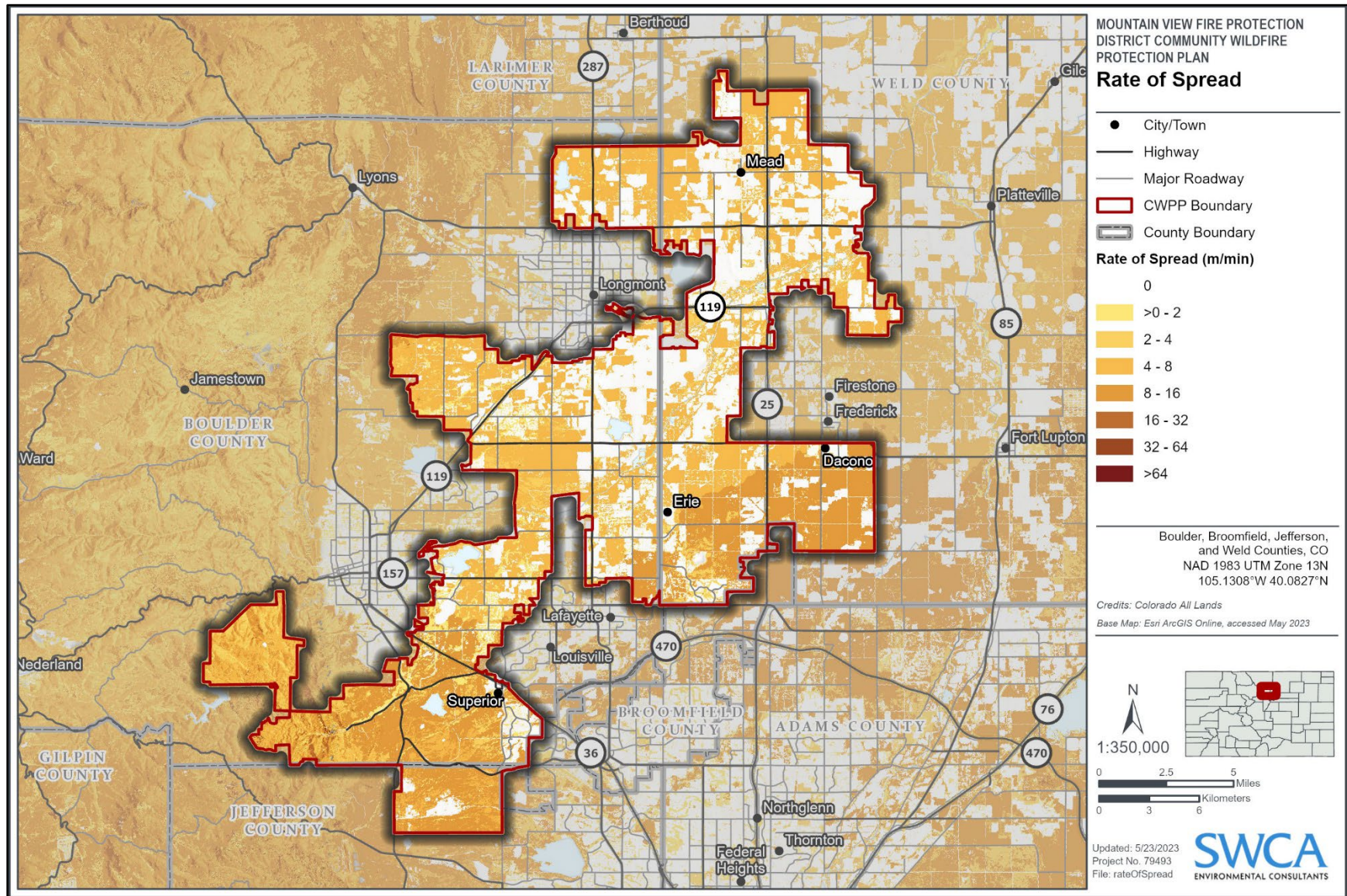
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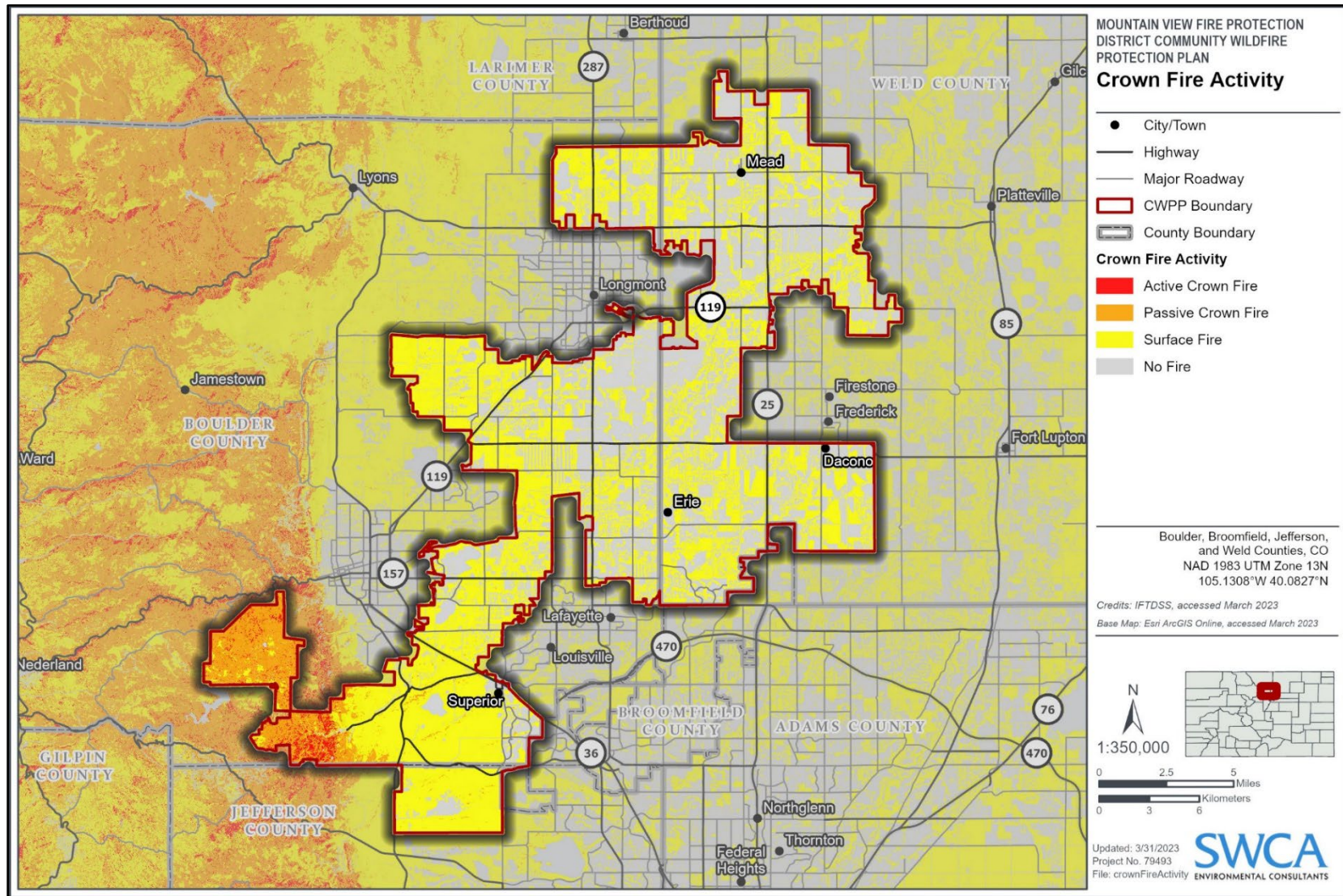
Map H.1. Quantitative Risk Assessment inputs: flame length. This map shows the simulated flame lengths produced by fuel models under measured weather parameters from a nearby RAWs station.



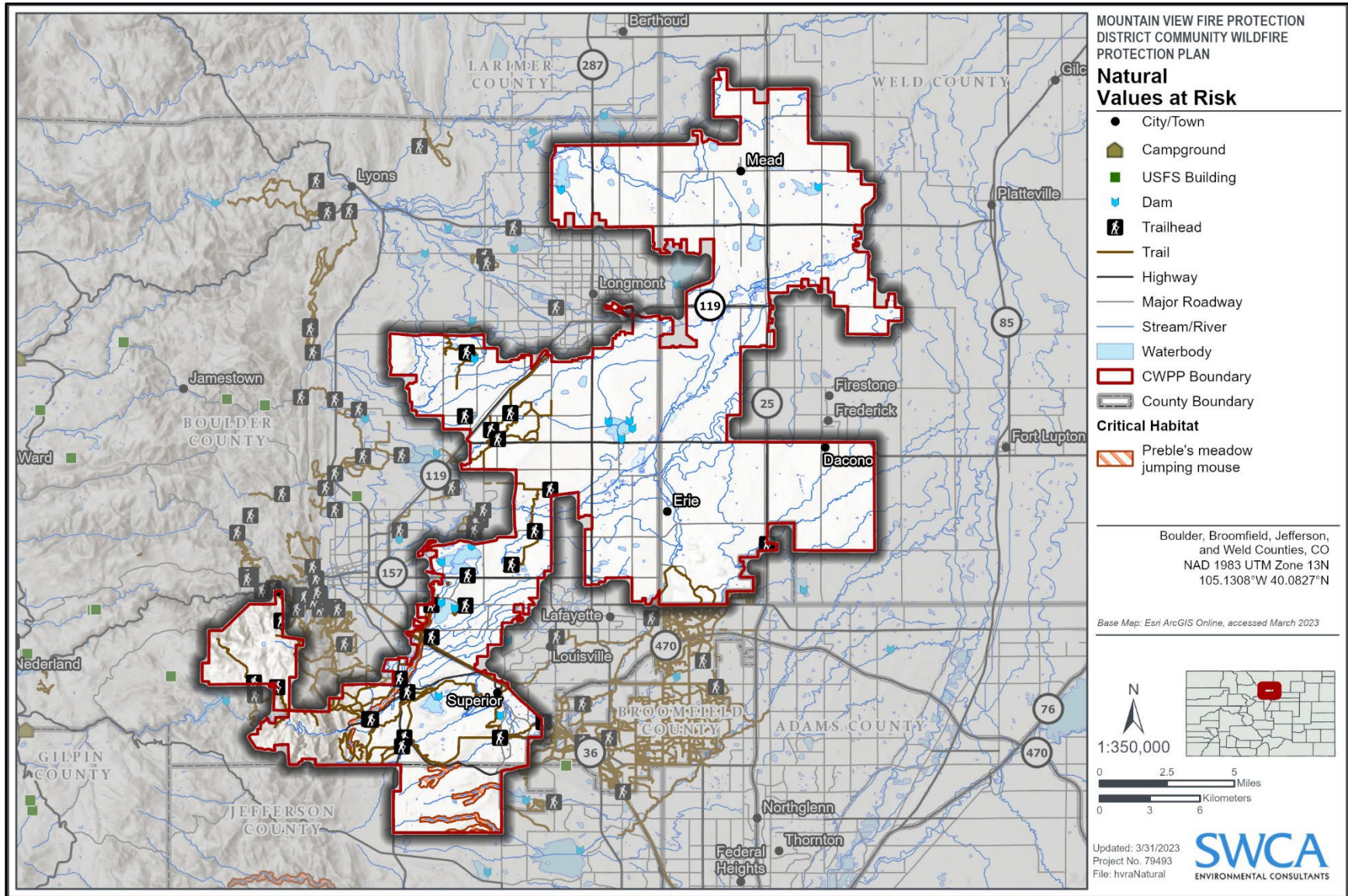
Map H.2. Quantitative Risk Assessment inputs: burn probability. This map depicts burn probability, which is calculated by using FSim to simulate thousands of fires under historic weather conditions for each 30-meter grid square in the planning area. The simulation results for each grid square are interpolated and classified into the raster image above.



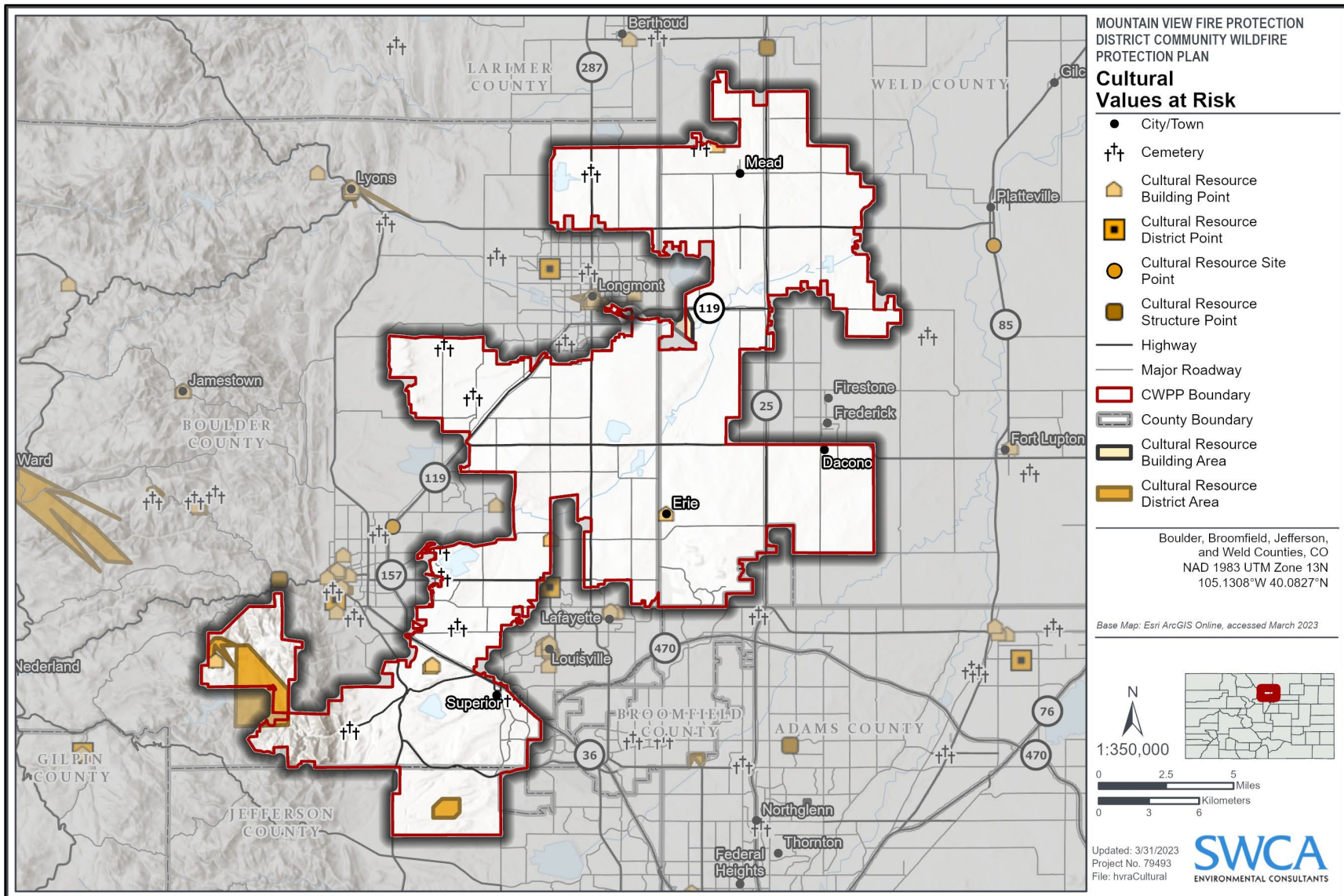
Map H.3. Quantitative Risk Assessment inputs: rate of spread. Rate of spread is simulated using a variety of inputs including fuel models, weather, and topography. Rate of spread is shown in meters per minute for each 30-meter grid square in the planning area.



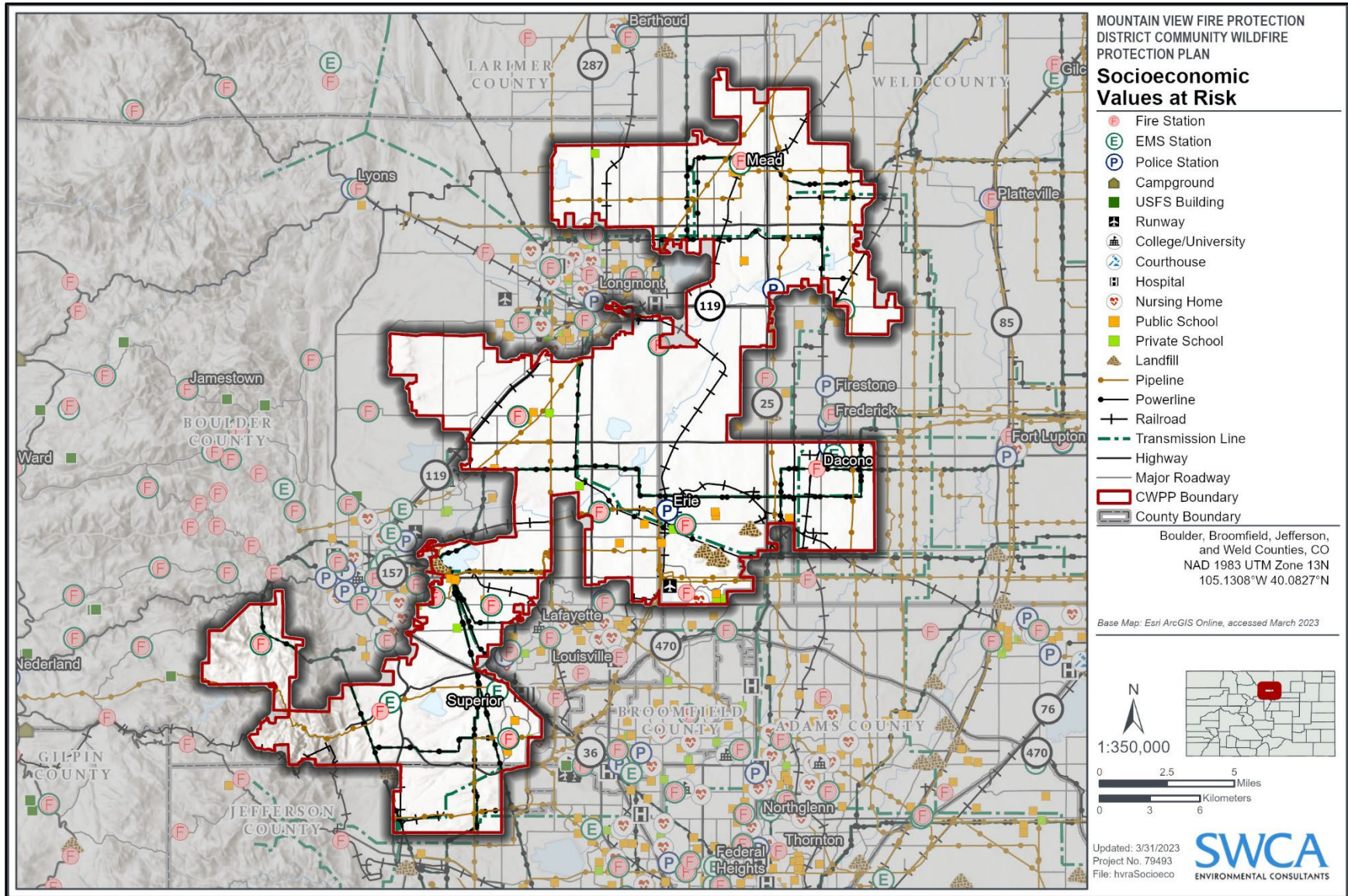
Map H.4. Quantitative Risk Assessment inputs: crown fire activity. Crown fire is a function of canopy characteristics such as height and bulk density but is also influenced by wind, topography, and vegetation type. The primary fuel source in active crown fires is tree canopies. Passive crown fires are characterized by group torching and occasional runs in the canopy as heat and/or wind periodically increases intensity. Surface fires consume shrubs, ladder fuels, and ground fuels without burning tree canopies.



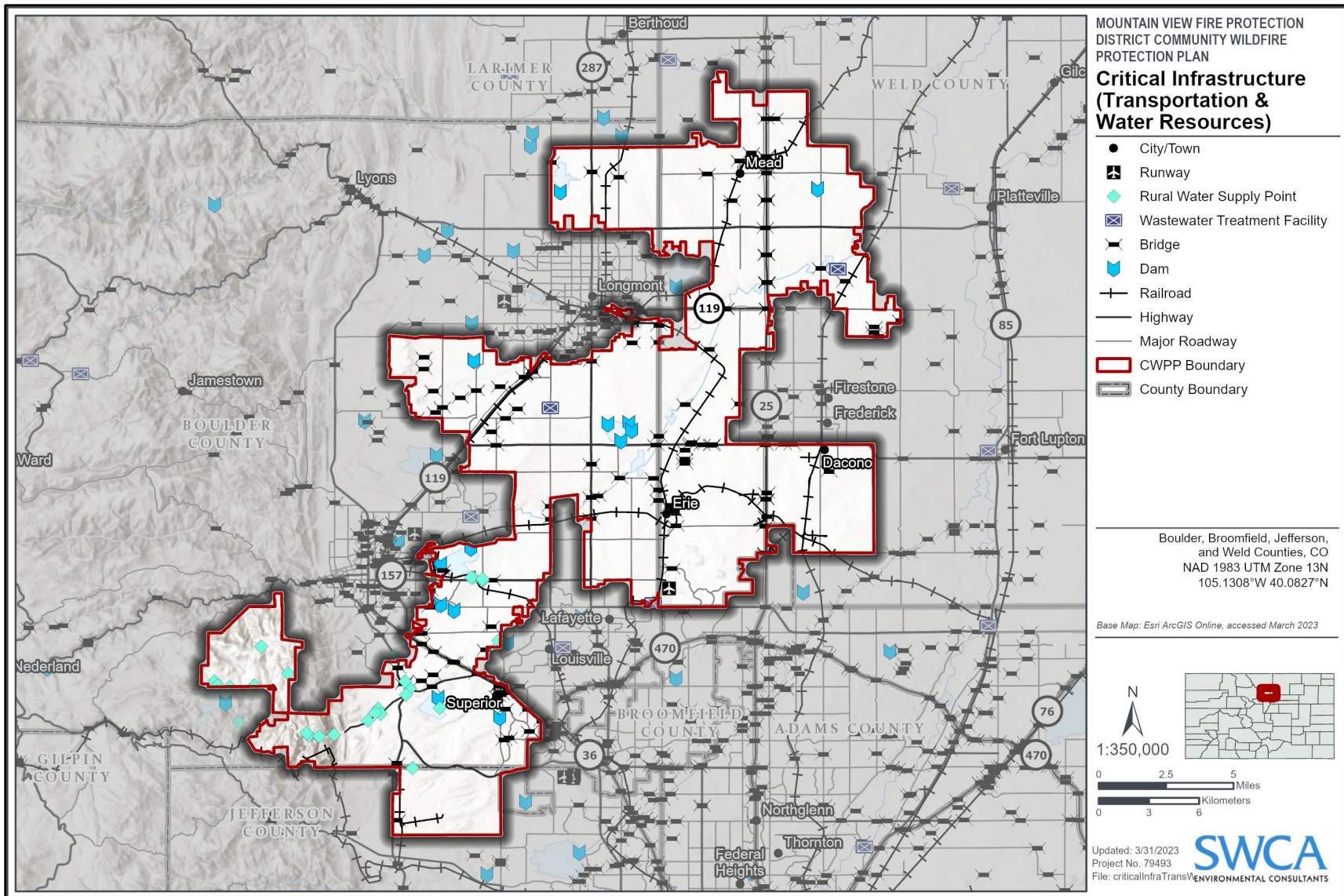
Map H.5. Highly valued natural resources at risk. Natural values include scenic trail systems, viewsheds, critical habitat, and water sources. Natural resources are often susceptible to short-term negative effects due to wildfire.



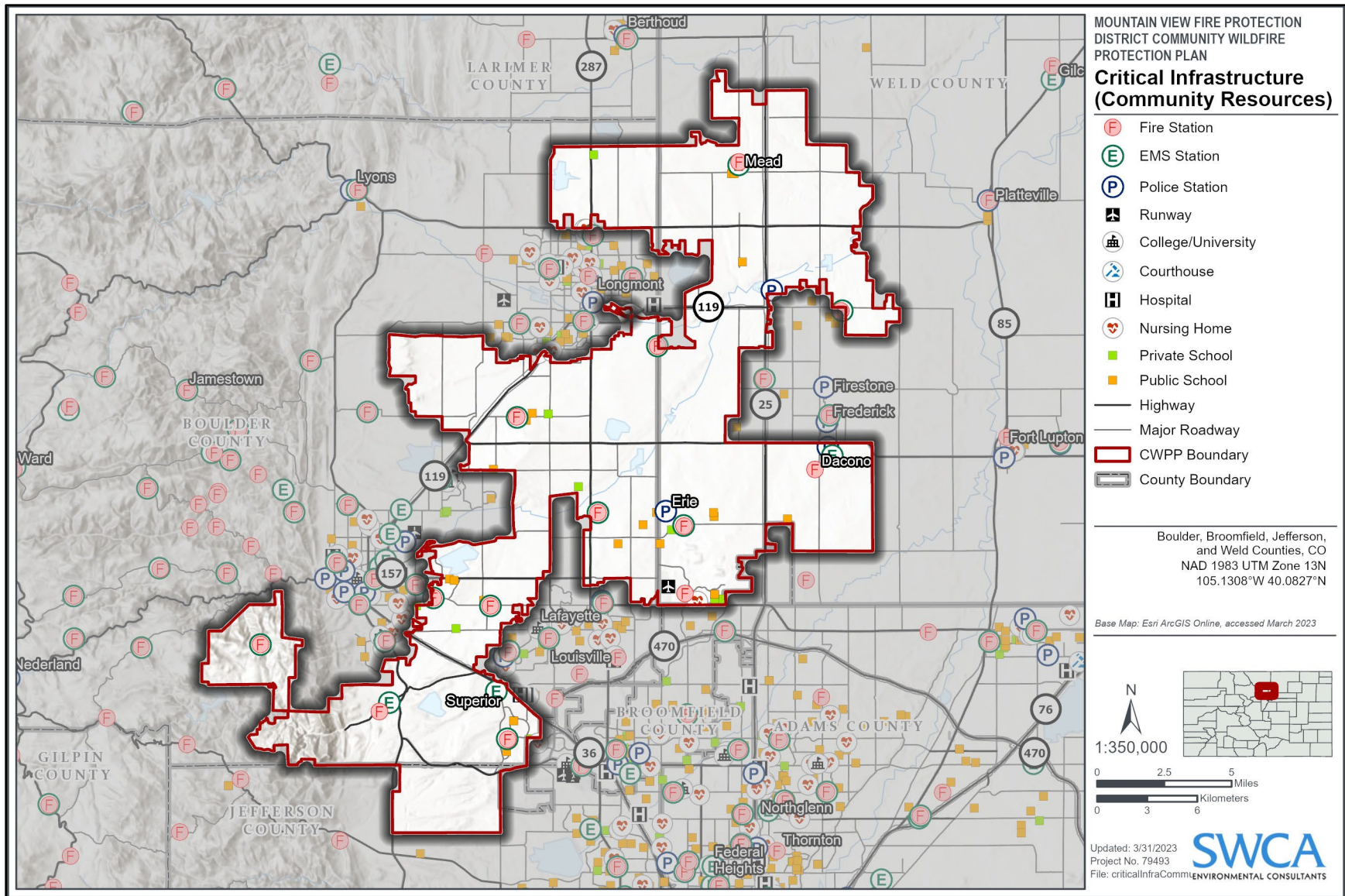
Map H.6. Highly valued cultural resources at risk. Cultural values are modern or historical human-made creations that are culturally significant to people in the area. Cultural resource district areas are often valuable zones of cultural significance and should be protected from natural disasters such as wildfire.



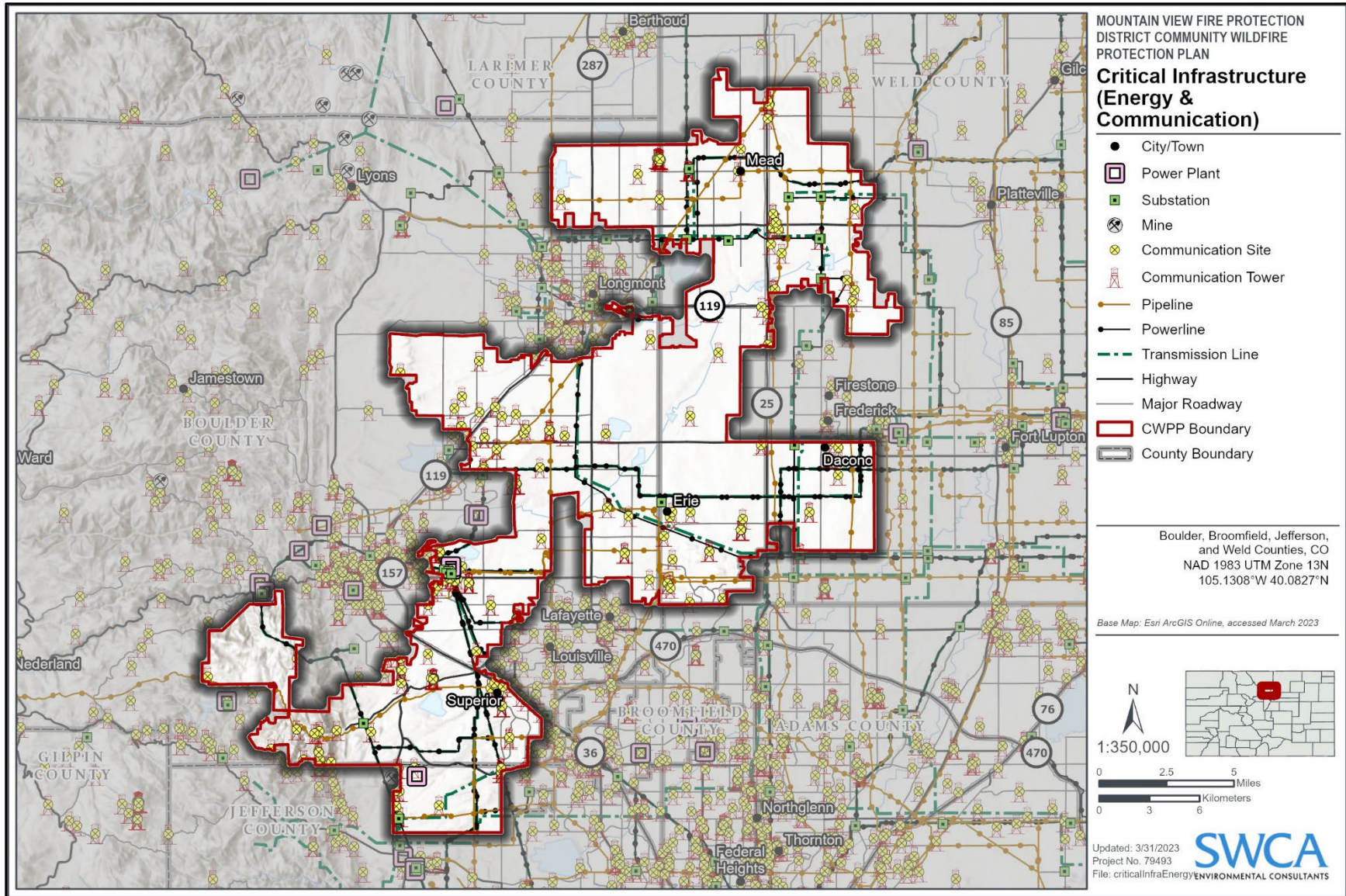
Map H.7. Highly valued socioeconomic resources at risk. Socioeconomic values at risk can be represented by utilities, infrastructure, and other human-made creations that are crucial to the economic and social well-being of citizens in the area.



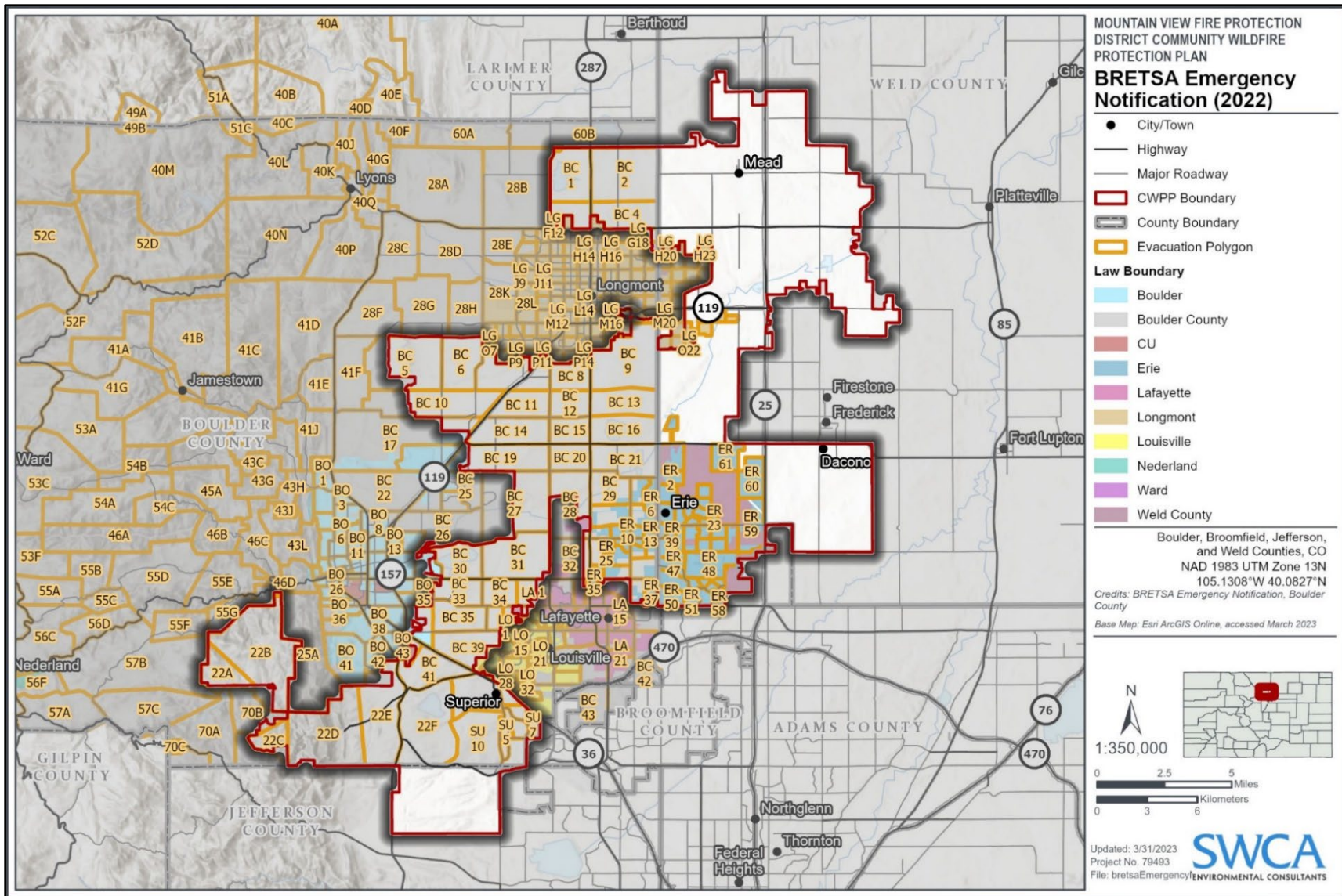
Map H.8. Critical infrastructure (water and transportation resources). This map specifically calls out critical water and transportation resources that could be impacted by a wildfire event. These resources are often vital to the function of local municipalities and communities.



Map H.9. Critical infrastructure (community resources). Community resources such as fire stations, police stations, and hospitals are critical resources that should be identified and well-known during disaster situations.

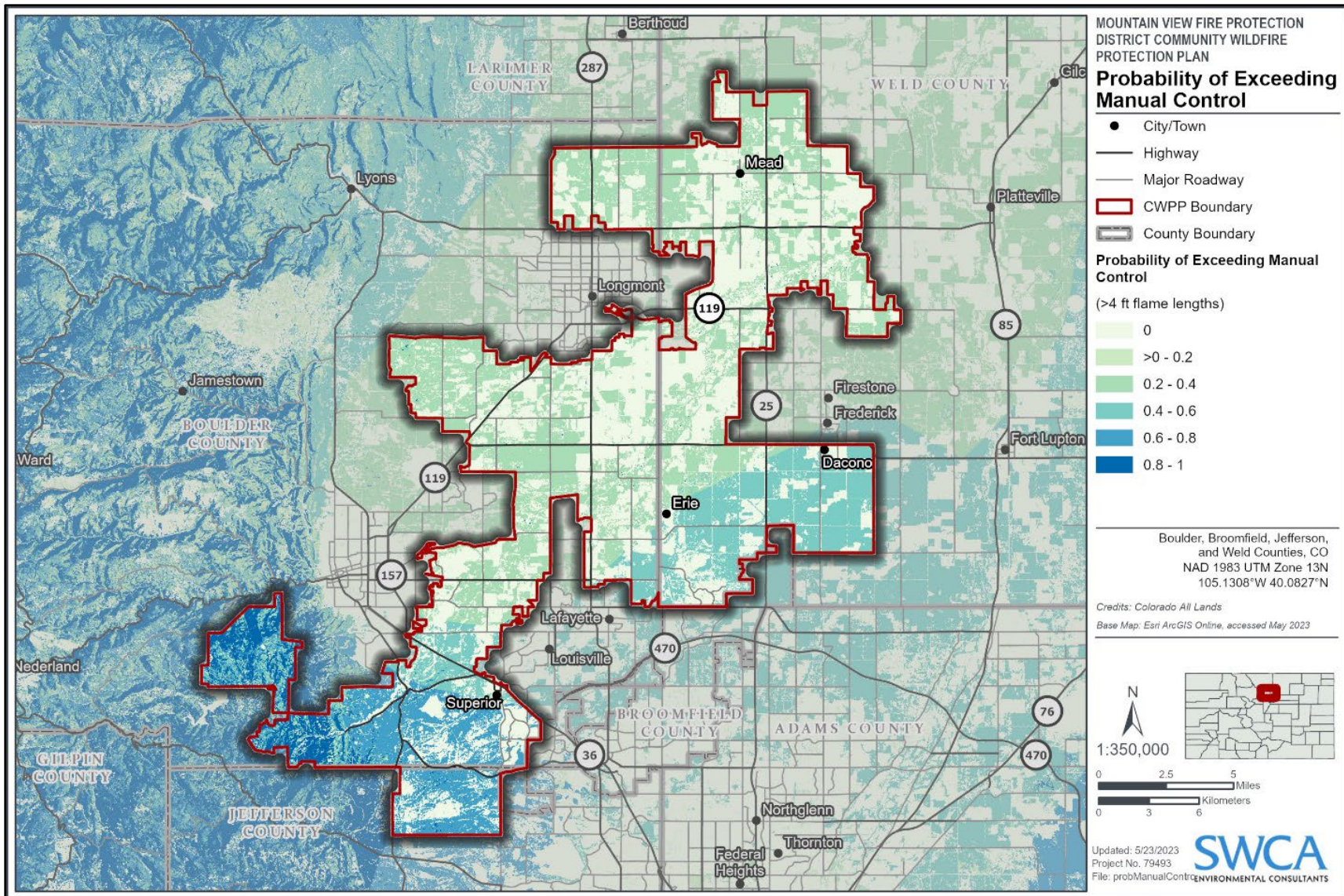


Map H.10. Critical infrastructure (energy and communication). Energy infrastructure is often responsible for wildfire ignitions and are also key resources to protect in the event of a wildfire.

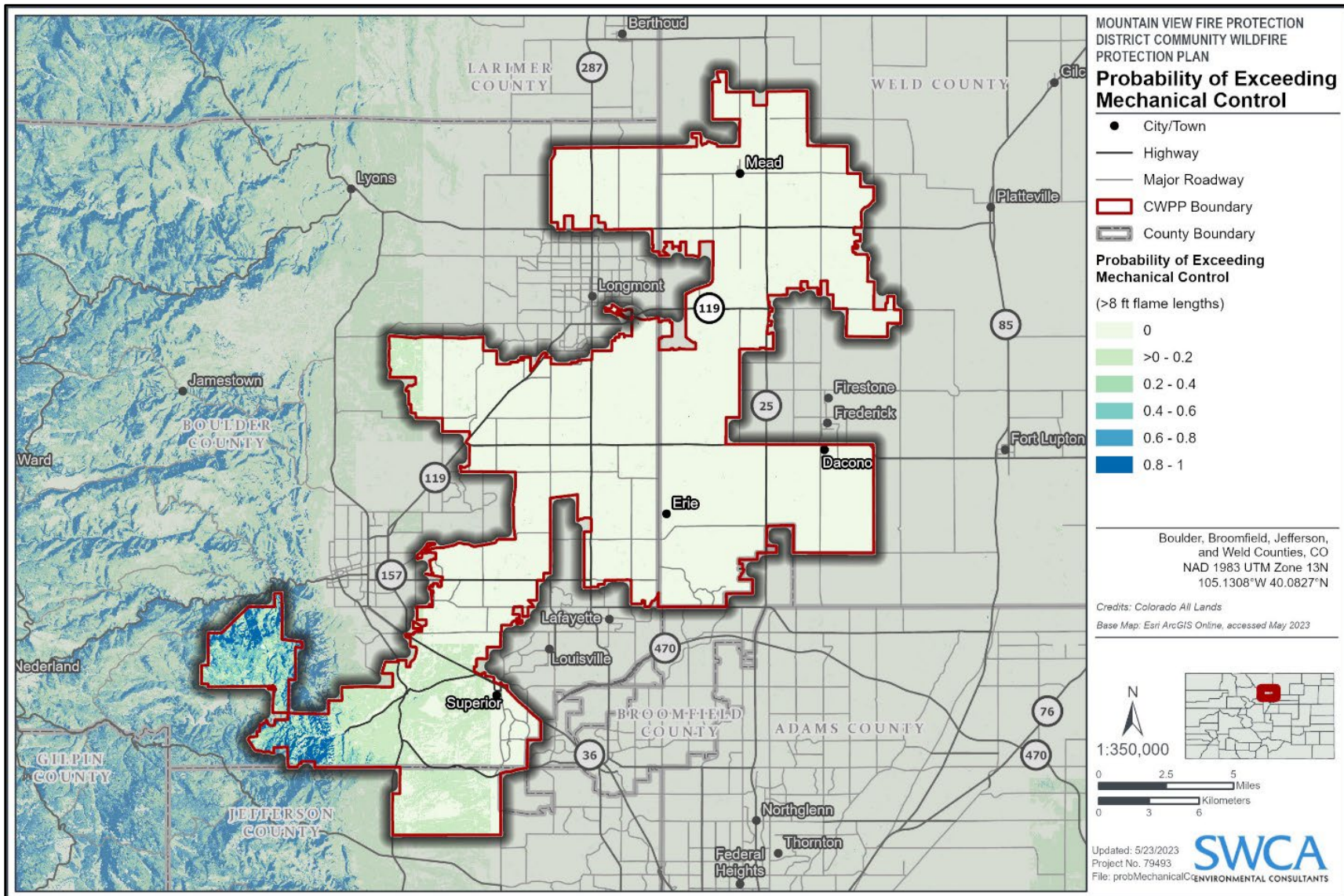


Map H.11. Boulder Regional Emergency Telephone Authority (BRETSA) Emergency Notification Zones.

Note: These notification zones allow all emergency service agencies to efficiently alert and inform residents and individuals within specific geographic areas about potential emergencies or disasters, enabling residents to take necessary actions to ensure their safety and well-being.



Map H.12. Probability of exceeding manual control (>4-foot flame lengths). This map combines burn probability with flame lengths to produce a raster showing how likely fire will produce flame lengths over 4 feet. Direct attack with manual control methods such as fireline constructions is dangerous and difficult when flame lengths are over 4 feet.



Map H.13. Probability of exceeding mechanical control (>8-foot flame lengths). This map combines burn probability with flame lengths to produce a raster showing how likely fire will produce flame lengths over 8 feet. Direct attack with mechanical control methods such as dozer line construction is dangerous and difficult when flame lengths are over 8 feet.

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APPENDIX I: Funding Sources

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FUNDING SOURCES

The following section provides information on federal, state, and private funding opportunities for conducting wildfire mitigation projects. It should be noted that matched funding can be an excellent funding strategy, when possible.

FEDERAL FUNDING INFORMATION

Source: 2022 Infrastructure Investments and Jobs Act

Agency: Multiple

Website: <https://www.congress.gov/bill/117th-congress/house-bill/3684>

Description: The Infrastructure Investments and Jobs act allocated funding through various departments for infrastructure projects including, but not limited to roads, bridges, and major projects; passenger and freight rail; highway and pedestrian safety; public transit; broadband; ports and waterways; airports; water infrastructure; power and grid reliability and resiliency; resiliency, including funding for coastal resiliency, ecosystem restoration, and weatherization; clean school buses and ferries; electric vehicle charging; addressing legacy pollution by cleaning up Brownfield and Superfund sites and reclaiming abandoned mines; and Western Water Infrastructure.

Specifically, the Community Wildfire Defense Grant Program is a \$1 billion program where the Department of Agriculture will provide grants to communities at risk from wildfire to develop or revise their community wildfire protection plans and carry out projects described within those plans. It will include a mix of formula and competitive funds. Applications are expected to open early in 2023.

Section 40803 addresses wildfire risk reduction, section 40804 deals with ecosystem restoration, section 40806 handles the establishment of fuel breaks in forests and other wildland vegetation, and section 70302 addresses reforestation. To learn more about the Act, please see guidebook located here: <https://www.whitehouse.gov/wp-content/uploads/2022/05/BUILDING-A-BETTER-AMERICA-V2.pdf>

Source: Building Resilient Infrastructure and Communities (BRIC) Grant Program

Agency: Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA)

Website: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

Description: BRIC will support states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. You can find more information on the BRIC program here: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

Source: Hazard Mitigation Grant Program (HMGP)

Agency: FEMA

Website: <https://www.fema.gov/grants/mitigation/hazard-mitigation>

Description: The HMGP provides funding to state, local, tribal, or territorial governments (and individuals or businesses if the community applies on their behalf) to rebuild with the intentions to mitigate future losses due to potential disasters. This grant program is available after a presidentially declared disaster.

Source: Hazard Mitigation Grant Program (HMGP) – Post Fire

Agency: FEMA

Website: <https://www.fema.gov/grants/mitigation/post-fire>

Description: The HMGP Post Fire grant program provides assistance to communities for the purpose of implementing hazard mitigation measures following a wildfire. Mitigation measures may include:

- Soil stabilization
- Flood diversion
- Reforestation

Source: Flood Mitigation Assistance (FMA) Grant

Agency: FEMA

Website: <https://www.fema.gov/grants/mitigation/floods>

Description: The Flood Mitigation Assistance Program is a competitive grant program that provides funding to states, local communities, federally recognized tribes, and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA chooses recipients based on the applicant's ranking of the project and the eligibility and cost-effectiveness of the project.

Source: Emergency Management Performance Grant (EMPG)

Agency: FEMA

Website: <https://www.fema.gov/grants/preparedness/emergency-management-performance>

Description: The EMPG program provides funding to state, local, tribal, and territorial emergency management agencies with the overall goal of creating a safe and resilient nation. The two main objectives of the program are 1) closing capability gaps that are identified in the state or territory's most recent Stakeholder Preparedness Review (SPR); and 2) building or sustaining those capabilities that are identified as high priority through the Threat and Hazard Identification and Risk Assessment (THIRA)/SPR process and other relevant information sources. The grant recipient and Regional Administrator must come to an agreement on program priorities, which are crafted based on National, State, and regional priorities.

Source: Fire Management Assistance Grant (FMAG)

Agency: FEMA

Website: <https://www.fema.gov/assistance/public/fire-management-assistance>

Description: Fire Management Assistance is available to state, local, and tribal governments for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster. The Fire Management

Assistance declaration process is initiated when a state submits a request for assistance to the FEMA Regional Director at the time a "threat of major disaster" exists. The entire process is accomplished on an expedited basis and a FEMA decision is rendered in a matter of hours. Before a grant can be awarded, a state must demonstrate that total eligible costs for the declared fire meet or exceed either the individual fire cost threshold, which applies to single fires, or the cumulative fire cost threshold, which recognizes numerous smaller fires burning throughout a state.

Source: **Regional Catastrophic Preparedness (RCP) Grants**

Agency: FEMA

Website: <https://www.fema.gov/grants/preparedness/regional-catastrophic>

Description: The Regional Catastrophic Preparedness Grant program provides funding to increase collaboration and capacity in regard to catastrophic incident response and preparation.

Source: **America the Beautiful Challenge**

Agency: National Fish and Wildlife Foundation

Website: <https://www.nfwf.org/programs/america-beautiful-challenge>

Description: The America the Beautiful Challenge is an annual initiative to streamline funding for conservation and restoration work to build watershed and forest resilience. The program emphasizes restoration of rivers, coasts, wetlands, grasslands, and forests to protect from drought, flooding, and wildfire. ATBC encourages public-private partnerships to benefit landscape scale conservation and resilience efforts.

Source: **Emergency Forest Restoration Program (EFRP)**

Agency: USDA Farm Service Agency (FSA)

Website: <https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/emergency-forest-restoration/index>

Description: The Emergency Forest Restoration Program (EFRP) helps the owners of non-industrial private forests restore forest health damaged by natural disasters. The EFRP does this by authorizing payments to owners of private forests to restore disaster damaged forests. The local FSA County Committee implements EFRP for all disasters with the exceptions of drought and insect infestations. Eligible practices may include debris removal, such as down or damaged trees; site preparation, planting materials, and labor to replant forest stand; restoration of forestland roads, fire lanes, fuel breaks, or erosion-control structures; fencing, tree shelters; wildlife enhancement.

To be eligible for EFRP, the land must have existing tree cover; and be owned by any nonindustrial private individual, group, association, corporation, or other private legal entity.

Source: **Emergency Conservation Program (ECP)**

Agency: USDA Farm Service Agency (FSA)

Website: <https://www.fsa.usda.gov/programs-and-services/conservation-programs/emergency-conservation/index>

Description: The Emergency Conservation Program (ECP) helps farmers and ranchers to repair damage to farmlands caused by natural disasters and to help put in place methods for water conservation during severe drought. The ECP does this by giving ranchers and farmers funding and

assistance to repair the damaged farmland or to install methods for water conservation. The grant could be used for restoring conservation structures (waterways, diversion ditches, buried irrigation mainlines, and permanently installed ditching system).

Source: Environmental Quality Incentives Program (EQIP)

Agency: National Resource Conservation Service (NRCS)

Website: <https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives>

Description: The Environmental Quality Incentives Program (EQIP) is a voluntary program authorized under the Agricultural Act of 2014 (2014 Farm Bill) that helps producers install measures to protect soil, water, plant, wildlife, and other natural resources while ensuring sustainable production on their farms, ranches, and working forest lands.

Source: Emergency Watershed Protection (EWP) Program

Agency: National Resource Conservation Service (NRCS)

Website: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/>

Description: The program offers technical and financial assistance to help local communities relieve imminent threats to life and property caused by floods, fires, windstorms, and other natural disasters that impair a watershed.

Eligible sponsors include cities, counties, towns, conservation districts, or any federally recognized Native American tribe or tribal organization. Interested public and private landowners can apply for EWP Program recovery assistance through one of those sponsors.

EWP Program covers the following activities.

- Debris removal from stream channels, road culverts, and bridges
- Reshape and protect eroded streambanks
- Correct damaged drainage facilities
- Establish vegetative cover on critically eroded lands
- Repair levees and structures
- Repair conservation practices

Source: Funding for Fire Departments and First Responders

Agency: DHS, U.S. Fire Administration

Website: <https://www.fema.gov/grants/preparedness/firefighters/assistance-grants>

Description: Includes grants and general information on financial assistance for fire departments and first responders. Programs include the Assistance to Firefighters Grant Program, Reimbursement for Firefighting on Federal Property, State Fire Training Systems Grants, and National Fire Academy Training Assistance.

Source: Specific EPA Grant Programs

Agency: Environmental Protection Agency (EPA)

Website: <https://www.epa.gov/grants/grants-your-region-information-specific-epa-region-8>

Description: Various grant programs are listed under this site. Listed below are examples of grants offered:

- Multipurpose Grants to States and Tribes: <https://www.epa.gov/grants/multipurpose-grants-states-and-tribes>
- Environmental Education Grants: <https://www.epa.gov/education/grants>
- Environmental Justice Grants: <https://www.epa.gov/environmentaljustice/environmental-justice-grants-funding-and-technical-assistance>

Source: Conservation Innovation Grants (CIG)

Agency: National Resource Conservation Service

Website: <https://www.nrcs.usda.gov/programs-initiatives/cig-conservation-innovation-grants>

Description: CIG State Component. CIG is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. Under CIG, Environmental Quality Incentives Program (EQIP) funds are used to award competitive grants to non-federal governmental or nongovernmental organizations, tribes, or individuals. CIG enables the Natural Resources Conservation Service (NRCS) to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with federal, state, and local regulations. The NRCS administers the CIG program. The CIG requires a 50/50 match between the agency and the applicant. The CIG has two funding components: national and state. Funding sources are available for water resources, soil resources, atmospheric resources, and grazing land and forest health.

Source: Urban and Community Forestry Program, National Urban and Community Forestry Challenge Cost Share Grant Program

Agency: U.S. Forest Service

Website: <https://www.fs.usda.gov/managing-land/urban-forests/ucf>

Description: U.S. Forest Service funding will provide for Urban and Community Forestry Programs that work with local communities to establish climate-resilient tree species to promote long-term forest health. The other initiative behind this program is to promote and carry out disaster risk mitigation activities, with priority given to environmental justice communities. For more information, contact a Forest Service Regional Program Manager.

Source: Community Wildfire Defense Grant

Agency: U.S. Forest Service

Website: <https://www.fs.usda.gov/managing-land/fire/grants>

Description: The Community Wildfire Defense Grant is intended to help communities with a high wildfire risk plan and implement the goals of the National Cohesive Wildland Fire Management Strategy. These goals include restoring and maintaining landscapes, creating fire adapted communities, and improving wildfire response. Funds are available to develop or update community wildfire protection plans and to implement projects listed in CWPPs that are less than 10 years old.

At-risk communities are those positioned in fire prone areas, low-income communities, and those that have been impacted by a severe disaster.

Source: Catalog of Federal Funding Sources; Land Resources

Agency: Multiple

Website: <https://ordspub.epa.gov/ords/wfc/f?p=165:512:16627993499812:::512::>

Description: The Land Finance Clearing House is a catalogue of federal funding sources for all things land related.

Examples of the types of grants found at this site are:

- Forest and Woodlands Resource Management Grant: https://sam.gov/fal/a798ad78cac749639b48270db3e86fdc/view?index=cfd&page=2&organization_id=100011100
- Environmental Education Grant: <https://www.epa.gov/education/grants>
- Public Assistance Grant Program: <https://www.fema.gov/assistance/public>
- Hazard Mitigation Grant: <https://www.fema.gov/grants/mitigation/hazard-mitigation>

Source: Catalog of Federal Funding Sources; Water Resources

Agency: Multiple

Website: <https://ordspub.epa.gov/ords/wfc/f?p=165:12:16627993499812:::12::>

Description: The Water Finance Clearing House is a catalogue of federal funding sources for all things water related.

Examples of the types of grants found at this site are:

- Water Conservation Field Services Program: <https://www.usbr.gov/waterconservation/>
- Colorado Community Development Block Grant: <https://oedit.colorado.gov/community-development-block-grant-planning-feasibility-studies-grant#:~:text=The%20Community%20Development%20Block%20Grant%20%28CDBG%29%20Planning%20and,least%20one%20full-time%20equivalent%20job%20per%20%2420%2C000%20funded.>
- Colorado State Water Quality Grants: <https://cdphe.colorado.gov/water-quality/funding-grants-and-loans/water-quality-grants>

Source: Firewise Communities

Agency: Multiple

Website: <https://www.nfpa.org/about-nfpa/awards>

Description: Many different Firewise Communities activities are available to help homes and whole neighborhoods become safer from wildfire without significant expense. Community cleanup days, awareness events, and other cooperative activities can often be successfully accomplished through partnerships among neighbors, local businesses, and local fire departments at little or no cost.

The kind of help you need will depend on who you are, where you are, and what you want to do. Among the different activities that individuals and neighborhoods can undertake, the following often benefit from seed funding or additional assistance from an outside source:

- Thinning/pruning/tree removal/clearing on private property—particularly on very large, densely wooded properties
- Retrofit of home roofing or siding to non-combustible materials
- Managing private forest
- Community slash pickup or chipping
- Creation or improvement of access/egress roads
- Improvement of water supply for firefighting
- Public education activities throughout the community or region

Source: The National Fire Plan (NFP)

Agency: DOI & USDA

Website: <http://www.forestsandrangelands.gov/>

Description: Many states are using funds from the NFP to provide funds through a cost-share with residents to help them reduce the wildfire risk to their private property. These actions are usually in the form of thinning or pruning trees, shrubs, and other vegetation and/or clearing the slash and debris from this kind of work. Opportunities are available for rural, state, and volunteer fire assistance.

Source: Staffing for Adequate Fire and Emergency Response (SAFER)

Agency: FEMA

Website: <https://www.fema.gov/grants/preparedness/firefighters/safer>

Description: The purpose of SAFER grants is to help fire departments increase the number of frontline firefighters. The goal is for fire departments to increase their staffing and deployment capabilities and ultimately attain 24-hour staffing, thus ensuring that their communities have adequate protection from fire and fire-related hazards. The SAFER grants support two specific activities: (1) hiring of firefighters and (2) recruitment and retention of volunteer firefighters. The hiring of firefighters activity provides grants to pay for part of the salaries of newly hired firefighters over the five-year program.

Source: The Fire Prevention and Safety Grants (FP&S)

Agency: FEMA

Website: <https://www.fema.gov/grants/preparedness/firefighters/safety-awards#:~:text=Awards%20%20%20%20Organization%20%20%20,%20%20%241%2C499%2C957%20%2016%20more%20rows%20>

Description: FP&S offers support to projects that enhance the safety of the public and firefighters who may be exposed to fire and related hazards. The primary goal is to target high risk populations and mitigate high incidences of death and injury. Examples of the types of projects supported by FP&S include fire-prevention and public-safety education campaigns, juvenile fire-setter interventions, media campaigns, and arson prevention and awareness programs. In fiscal year 2005, Congress

reauthorized funding for FP&S and expanded the eligible uses of funds to include firefighter safety research and development.

Source: GSA-Federal Excess Personal Property

Agency: USFS

Website: <https://gsaccess.gov/>

Description: The Federal Excess Personal Property (FEPP) program refers to Forest Service-owned property that is on loan to State Foresters for the purpose of wildland and rural firefighting. Most of the property originally belonged to the Department of Defense (DoD). Once acquired by the Forest Service, it is loaned to State Cooperators for firefighting purposes. The property is then loaned to the State Forester, who may then place it with local departments to improve local fire programs. State Foresters and the USDA Forest Service have mutually participated in the FEPP program since 1956.

Source: Assistance to Firefighters Grants (AFG)

Agency: FEMA

Website: <https://www.fema.gov/grants/preparedness/firefighters>.

Description: The AFG program provides resources to assist fire departments in attaining critical resources such as training and equipment.

STATE FUNDING INFORMATION

Source: Colorado State Forest Service Grants & funding Assistance

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/grants/>

Description: The Colorado State Forest Service manages multiple funding programs to assist private and public landowners in managing forested lands to mitigate the risk of wildfire and steward forests for ecological, economic, and social value. A list of current programs is provided here with links to respective program sites:

Public Programs

- Forest Restoration & Wildfire Risk Mitigation: <https://csfs.colostate.edu/grants/forest-restoration-wildfire-risk-mitigation/>
- Wildfire Mitigation Incentives for Local Government: <https://csfs.colostate.edu/grants/wildfire-mitigation-incentives-for-local-government/>
- Wildfire Mitigation Resources & Best Practices Grant Program: <https://csfs.colostate.edu/grants/wildfire-mitigation-resources-best-practices-grant-program/>

Private Landowner Programs

- Forest Ag Program: <https://csfs.colostate.edu/forest-ag-program/>
- Forest Legacy Program: <https://csfs.colostate.edu/forest-legacy-program/>
- Forest Stewardship Program: <https://csfs.colostate.edu/forest-stewardship-program/>
- Tree Farm Program: <https://csfs.colostate.edu/tree-farm/>

Source: Various Funding Sources

Agency: Colorado Division of Fire Prevention and Control (DFPC)

Website: <https://dfpc.colorado.gov/sections/grants>

Description: The DFPC manages three funding programs: HB 22-1194 funding, Firefighter Safety Disease Prevention Grant, and the Volunteer Fire Assistance Grant. HB 22-1194 provides funds to structural and wildland crews to purchase personal protective equipment such as breathing apparatuses and line packs. The FFSDP grant similarly provides funding for any firefighter equipment that improves safety and prevents occupation-related diseases. The VFA Program supports rural fire stations with volunteer crews that serve communities with 10,000 people or fewer.

Source: Colorado Strategic Wildfire Action Program

Agency: Colorado Department of Natural Resources

Website: <https://dnr.colorado.gov/divisions/forestry/co-strategic-wildfire-action-program>

Description: In 2021, Senate Bill 21-258 was signed into law and established the Colorado Strategic Wildfire Action Program. This program is intended to bolster wildland firefighter capabilities by expanding workforce development, providing additional funds to hire more crew members, and helping state wildland inmate fire teams (SWIFT), find long term employment post-incarceration. This funding opportunity is intended to strategically address focal landscapes and concern areas through expanded mitigation and response capacity.

PRIVATE FUNDING INFORMATION

Source: State Farm Good Neighbor Citizenship (GNC) Grants

Agency: State Farm

Website: <https://www.statefarm.com/about-us/corporate-responsibility/community-grants/good-neighbor-citizenship-grants>

Description: State Farm funding is directed at:

- Auto and roadway safety
- Teen Driver Education
- Home safety and fire prevention
- Disaster preparedness
- Disaster recovery

Source: The Urban Land Institute (ULI)

Website: <http://www.uli.org>

Description: ULI is a 501(c)(3) nonprofit research and education organization supported by its members. The institute has more than 22,000 members worldwide, representing the entire spectrum of land use and real estate development disciplines, working in private enterprise and public service. The mission of the ULI is to provide responsible leadership in the use of land to enhance the total environment. ULI and the ULI Foundation have instituted Community Action Grants that could be used for Firewise Communities activities. Applicants must be ULI members or part of a ULI District

Council. Contact actiongrants@uli.org or review the web page to find your District Council and the application information.

Source: Environmental Systems Research Institute (ESRI)

Website: <http://www.esri.com/grants>

Description: ESRI is a privately held firm and the world's largest research and development organization dedicated to geographic information systems. ESRI provides free software, hardware, and training bundles under ESRI-sponsored Grants that include such activities as conservation, education, and sustainable development, and posts related non-ESRI grant opportunities under such categories as agriculture, education, environment, fire, public safety, and more. You can register on the website to receive updates on grant opportunities.

Source: National Forest Foundation; Innovative Finance for National Forests Grant Program

Website: <https://www.nationalforests.org/grant-programs/innovative-finance-for-national-forests-grant-program>

Description: The Innovative Finance for National Forests Grant Program aims to bring in non-USFS funds to increase forest resilience. There are three main topics for funding: wildfire resilience and recovery, sustainable recreation access and infrastructure, and watershed health. In addition, three types of projects are funded: pilot programs with on-the-ground implementation, scaling projects to deliver backlogs of unfunded work, and research and development to provide to new forest information.

Source: StEPP Foundation

Website: <https://stepfoundationga.org/>

Description: StEPP is a 501(c)(3) organization dedicated to helping organizations realize their vision of a clean and safe environment by matching projects with funders nationwide. The StEPP Foundation provides project oversight to enhance the success of projects, increasing the number of energy efficiency, clean energy, and pollution prevention projects implemented at the local, state, and national levels for the benefit of the public. The website includes an online project submittal system and a Request for Proposals page.

Source: Matching Awards Program

Agency: National Forest Foundation (NFF)

Website: <https://www.nationalforests.org/grant-programs/map>

Description: The NFF is soliciting proposals for its Matching Awards Program (MAP) to provide funds for direct on-the-ground projects benefitting America's National Forests and Grasslands. By pairing federal funds provided through a cooperative agreement with the U.S. Forest Service with non-federal dollars raised by award recipients, MAP measurably multiplies the resources available to implement stewardship projects that benefit the National Forest System.

Source: Patagonia Environmental Grants and Support

Agency: Patagonia

Website: <https://www.patagonia.com/how-we-fund/>

Description: Patagonia supports innovative work that addresses the root causes of the environmental crisis and seeks to protect both the environment and affected communities. Patagonia focuses on places where they have built connections through outdoor recreation and through their network of retail stores, nationally and internationally.

Source: Leonardo DiCaprio Foundation Grants

Agency: Leonardo DiCaprio Foundation

Website: <https://www.rewild.org/>

Description: The foundation supports projects around the world that build climate resiliency, protect vulnerable wildlife, and restore balance to threatened ecosystems and communities.

Source: U.S. Endowment for Forestry and Communities

Agency: U.S. Environmental Protection Agency, Natural Resources Conservation Service (NRCS), U.S. Forest Service, U.S. Department of Defense, U.S. Economic Development Agency

Website: <https://www.usendowment.org/>

Description: As the nation's largest public charity dedicated to keeping our working forests working and ensuring their bounty for current and future generations, the Endowment deploys the creativity and power of markets to advance their mission: The Endowment works collaboratively with partners in the public and private sectors to advance systemic, transformative and sustainable change for the health and vitality of the nation's working forests and forest-reliant communities.

OTHER FUNDING INFORMATION

The following resources may also provide helpful information for funding opportunities:

- Western Forestry Leadership Coalition: <https://www.thewflc.org/>
- USDA Information Center: <https://www.nal.usda.gov/main/information-centers>
- Forest Service Fire Management website: <http://www.fs.fed.us/fire/>
- Insurance Services Office Mitigation Online (town fire ratings): <http://www.isomitigation.com/>
- National Fire Protection Association: <http://www.nfpa.org>
- National Interagency Fire Center, Wildland Fire Prevention/Education: <https://www.nifc.gov/fire-information/fire-prevention-education-mitigation>
- Department of Homeland Security U.S. Fire Administration: <https://www.usfa.fema.gov/index.html>

FUNDING SOURCES FOR PROPERTY OWNERS

Source: Boulder County Wildfire Partners Mitigation Program

Agency: Boulder County

Website: <https://wildfirepartners.org/about/>

Description: Boulder County Wildfire Partners is a program in Boulder County that aids property owners in mitigating their properties and getting ready for wildfire incidents. It is funded by Boulder County, Colorado State Forest Service, and FEMA grants. The program is open to all property owners in the county's mountain and foothills areas, regardless of the age of their homes or previous mitigation efforts. The program offers property owners on-site assessments, customized fire hazard reports, access to advisors, and financial assistance to have forest work done on their property.

Source: **Boulder County Wildfire Fund**

Agency: Community Foundation Boulder County

Website: <https://www.commfound.org/grants/get-grant/Boulder-County-Wildfire-Fund>

Description: The Boulder County Wildfire Fund is supported by money raised through global donations totaling over \$43 million from 82,000 donations. The funds are managed in partnership with the County and the Community Foundation Boulder County to ensure that resources are effectively distributed. The Wildfire Fund prioritizes rebuilding affected households and targeting the needs of vulnerable populations. Mental health services and support navigating the recovery process are also supported.

Source: **Navigating Disaster for Boulder County**

Agency: Boulder County

Website: <https://bouldercountynavigatingdisaster.gov/>

Description: The Navigating Disaster offers support for Boulder County residents recovering from disasters. Providing support to both individuals and families, the program offers assistance and guidance in applying for grant funds, accessing financial planning resources, and being connected to state and federal programs. Additionally, the program will assist in developing personalized recovery plans and accessing recovery resources such as mental health services.

Source: **Forest Ag Program**

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/forest-ag-program/>

Description: The Forest Ag Program is a voluntary program available to landowners with 40 or more acres of forested land who manage their land for harvestable wood products. The program is intended to incentivize forest management and fire resilient forests through property tax reductions for land managers. Landowners are required to complete a Forest Management Plan with a professional forester to ensure management activities are in line with landscape objectives and best management practices.

Source: **Forest Legacy Program**

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/forest-legacy-program/>

Description: The Forest Legacy Program is a federally funded initiative to assist in the acquisition or designation of conservation easements on privately owned forest land. The program was established to permanently protect portions of Colorado's forests that contribute to the state's ecological and scenic value while maintaining sustainable uses of forest resources such as recreation. Funds are primarily provided by the federal government with matching funds required by state funders or

conservation organizations to purchase or secure forested lands. Conserved lands can be kept under private ownership or opened to public access through this easement program.

Source: Forest Stewardship Program

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/forest-stewardship-program/>

Description: The Forest Stewardship Program is a voluntary initiative intended to broaden resource availability and technical assistance for privately owned forest land. The program connects landowners with professional foresters to identify property goals and develop a Stewardship Management Plan to improve overall forest health and landowner knowledge. The program goal is to expand forest stewardship principles to ensure proper management and connectivity of private forestland. Financial assistance may be available for landowners with a Forest Stewardship Plan.

Source: Wildfire Mitigation Resources & Best Practices Grant Program

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/grants/wildfire-mitigation-resources-best-practices-grant-program/>

Description: The Colorado Legislature established the Wildfire Mitigation Resources & Best Practices Grant Program in 2022. This program provides state support to conduct outreach among landowners in high wildfire hazard areas. To be eligible, a recipient must be an agency of local government, a county, municipality, special district, a tribal agency or program, or a nonprofit organization. The Colorado State Forest Service has \$300,000 available for grant awards through this program.

Source: Homesite Assessments

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/homeowners-landowners/homesite-assessments/>

Description: CSFS foresters are available to assist property owners through homesite assessments. A forester will visit your land and examine your trees for disease, wildland fire defensible space, and overall health. They can make recommendations for disposing of diseased trees, safeguarding your trees, keeping your trees healthy and reducing their risk of disease, and mitigating the risk of catastrophic wildfire. For more information or to schedule a homesite assessment, contact a local CSFS Field Office.

Source: Colorado Tree Farm Program

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/tree-farm/>

Description: The Colorado Tree Farm Program is part of the American Tree Farm System (ATFS) and is a program of the American Forest Foundation. The ATFS is a privately funded, national tree-growing effort that encourages forest management on private lands. Other forest certification organizations exist, but the ATFS is the oldest and largest forest certification program in the United States.

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SWCA

APPENDIX J:

List of Preparers

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Name	Organization	Title	Project Role
Chief Keith Long	Mountain View FPD	Assistant Chief - Special Ops	Core Team Member
Allison James	Town of Superior	Disaster Preparedness Recovery Manager	Core Team Member
Leslie Clark	Town of Superior	Director of Parks, Rec. and Open Space	Core Team Member
Patrick Hammer	Town of Erie	Director of Parks and Recreation	Core Team Member
David Limbach	Niwot Community Association	President	Core Team Member
Denise Bradshaw	Weld County Emergency Management/Town of Mead	Coordinator	Core Team Member
Kathy Koehler	Niwot Community Association	Director at Large	Core Team Member
Merrie Garner	Carbon Valley Emergency Management/City of Dacono	Coordinator	Core Team Member
Madelene McDonald	Denver Water	Watershed Scientist	Core Team Member
Ashley Denault	Denver Water	Public Outreach	Core Team Member
Meg Halford	Boulder County	Senior Forest Health Planner/Special Projects Coordinator	Core Team Member
Nick Stremel	Boulder County	Parks and Open Space	Core Team Member
Mike Chard	Boulder Office of Disaster Management	Director	Core Team Member
Kerry Webster	Boulder Fire-Rescue	Fire Operations Specialist	Core Team Member
Maya MacHamer	Boulder Watershed Collective	Director	Core Team Member
Kirin Riddell	Boulder Watershed Collective	Fire Adaptive Communities Coordinator	Core Team Member
Megan Monroe	Marshall	Representative	Core Team Member
Eric Phillips	Xcel Energy	Sr. Manager High Pressure Gas Ops.	Core Team Member
Ben Pfohl	CSFS	Supervisory Forester	Core Team Member
Daniel Godwin	USFS	Sub-regional Fire Planner	Core Team Member
Victoria Amato	SWCA	Principal Fire Planner	Plan Preparer
Arianna Porter	SWCA	Project Manager	Plan Preparer
Mallory Phillips	SWCA	Assistant Project Manager	Plan Preparer
Liz Hitzfelder	SWCA	Lead Geospatial Analyst	Plan Preparer
Tim Clute	SWCA	Fire Planner	Plan Preparer
Sam Lashley	SWCA	Fire Planner	Plan Preparer
Ryan Saggese	SWCA	Fire Planner	Plan Preparer

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