THE Ember Alliance

2026



LIVERMORE FIRE PROTECTION DISTRICT

LARIMER COUNTY, COLORADO

Community Wildfire Protection Plan

Livermore
Fire Protection District
Community Wildfire Protection Plan
2026

PREPARED FOR LIVERMORE FIRE PROTECTION DISTRICT

311 W COUNTY ROAD 74E, LIVERMORE, COLORADO 80536

Livermore Fire Protection District
Serving Livermore, CO since 1997

PREPARED BY THE EMBER ALLIANCE

1631 E LINCOLN AVE, FORT COLLINS, CO 80524

THE Ember Alliance

Table of Contents

Acronyms 5

1. Introduction 7

1.a. Purpose and Need for a CWPP 7

1.b. Community and Partner Engagement 12

1.c. Recent Accomplishments in and around LFPD 15

2. Livermore Fire Protection District: Background 17

2.a. General Description 17

2.b. District and Community Capacity 23

2.c. Wildland-Urban Interface 26

2.d. Firefighting in the WUI 28

2.e. Fire History Along the Colorado Front Range 29

2.f. Potential for Extreme Fire Behavior and Exposure in LFPD 35

3. Becoming a Fire Adapted Community 48

3.a. Recommendations for Residents 49

3.b. Plan Unit Relative Risk 81

Bonner Peak 84

Cherokee Meadows 87

Granite Canyon – Little Ponderosa 90

Livermore 93

Mill Creek 96

Moen Ranch – Virginia Dale 99

Phantom Canyon 102

Poudre River Ranch 105

Prairie Divide – 82E – Boxer Ranch 109

Red Mountain – Buffalo Horn 112

Weaver Ranch 115

3.c. Recommendations for the District and Partner Organizations 118

3.d. Social Vulnerability/Access and Functional Needs 135

3.e. Funding Opportunities 137

4. Implementation Recommendations for Fuel Treatments and Ecological Resilience 140

4.a. Fuel Treatments and Ecological Resilience 140

4.b. Fuel Treatment History in and Around LFPD 145

4.c. Roadside Fuel Treatments 148

4.d. Priority Project Areas 150

4.e. Logistics of Fuel Treatments 167

5. Implementation Plan and the Future of the CWPP 173

5.a. Implementation Phases 173

5.b. Implementation Recommendations 174

5.c. CWPP as a Living Document 183

6. Glossary 185

7. References 192
Appendix A. Introduction to Wildfire Behavior and Terminology 201
Fire Behavior Triangle *201*
Categories of Fire Behavior *203*
Wildfire Threats to Homes *204*
Resources for More Information on Fire Behavior *204*
Appendix B. Community Risk Assessment and Modeling Methodology 205
Fire Behavior Analysis *205*
Expected Net Value Change *217*
Predicted Radiant Heat and Ember Cast Exposure *219*
Exposure of Highly Valued Resources and Assets *223*
Critical Values at Risk *226*
Roadway Survivability *231*
Wildland Urban Interface (WUI) Delineation *233*
Local Ecological Considerations *233*
Plan Unit Relative Risk Assessment *235*
Climate Change Assessment *238*
Prioritizing CWPP Project Areas *241*

APPROVAL AND SIGNATURES

This Community Wildfire Protection Plan (CWPP) was developed in response to the Healthy Forest Restoration Act of 2003 and complies with CWPP standards set forth by the 2022 Colorado State Forest Service Minimum Standards for Developing CWPPs. The CWPP is a collaborative effort to guide our wildfire protection. Where possible, we intend to apply the recommended practices to improve our community and increase public safety.

The following individuals and organizations were engaged in developing the Livermore Fire Protection District CWPP and approve the 2026 update:

Joel Meeter, Fire Chief
Livermore Fire Protection District

Signature: Joel Meeter box SIGN 1VJZ7X7X-19X2WLYL

Date: Sep 17, 2026

Max Erickson, Supervisory Forester
Colorado State Forest Service

Signature: Max Erickson box SIGN 4L75W3WL-19X2WLYL

Date: Sep 17, 2026

Derek Rosenquist, Battalion Chief
Larimer County Sheriff's Office Emergency Services Unit

Signature: Derek Rosenquist box SIGN 4QZQ8W8P-19X2WLYL

Date: Sep 17, 2026

Dave Herder, Captain
Livermore Fire Protection District

Signature: box SIGN 1X27PZLL-4ZLV699L

Date: Sep 4, 2026

How to use this CWPP Document

This document is designed for everyone that lives, works, and manages land within and around LFPD. Different sections will be most helpful to different people; please use this guide to direct you to the resources most relevant to you.

I want to learn the basics about wildfire, my community, and CWPPs.	• Section 1.a to learn about CWPPs. • Section 2.f to learn about wildfire threats in the district. • Appendix A for an introduction to fire behavior.
I want to learn about protecting my home and family.	• Section 3.a to learn about the actions you can take, including detailed recommendations and research-backed guidance, for protecting your home and family. • Section 3.b to find detailed risk ratings and recommendations for your neighborhood.
I want to learn about community-led action.	• Sections 3.a, 3.b, and 4.e to learn about the actions communities can take together to better protect everyone. • Section 5.b to find all specific recommended actions for the community.
I want to learn about landscape-scale wildfire mitigation.	• Sections 2.e, 2.f, and 4.b to learn about fire history and treatment history in the district. • Section 4.d to learn about priority projects for the district. • Sections 4.a and 4.c for recommendations for stand-scale and roadside fuel treatments.
I want to learn about the science behind these recommendations.	• Appendix B to learn about modeling methodology for fire behavior and evacuation modeling, on-the-ground hazard assessments, and treatment prioritization. • Section 7 to see all referenced research and information.

Acronyms

AFN	Access and Functional Needs
BLM	Bureau of Land Management
BMP	Best Management Practices
EMS	Emergency Medical Staff
FPD	Fire Protection District
FRWRM	Forest Restoration & Wildfire Risk Mitigation Grant Program
CDOT	Colorado Department of Transportation
CFRI	Colorado Forest Restoration Institute
CNHP	Colorado Natural Heritage Program
COCO	Coalitions & Collaboratives
COAL	Colorado All-Lands assessment by the U.S. Forest Service
COSWAP	Colorado Strategic Wildfire Action Program
CO-WRA	Colorado Wildfire Risk Assessment by the Colorado State Forest Service
CPW	Colorado Parks & Wildlife
CPRW	Coalition for the Poudre River Watershed
CSFS	Colorado State Forest Service
CSU	Colorado State University
CWDG	Community Wildfire Defense Grant
CWPP	Community Wildfire Protection Plan
CWRC	Colorado Wildfire Resiliency Code
CVAR	Critical Values at Risk
DFPC	Division of Fire Prevention and Control
DOLA	Department of Local Affairs
EDA	Economic Development Administration
FAC	Fire Adapted Community
FACO	Fire Adapted Colorado
FEMA	Federal Emergency Management Agency
GIS	Geographic Information Systems
HVRAs	Highly Valued Resources & Assets
HIFLD	Homeland Infrastructure Foundation-Level Data
HIZ	Home Ignition Zone

IIBHS	Insurance Institute for Business & Home Safety
IRPG	Incident Response Pocket Guide
LFPD	Livermore Fire Protection District
LCD	Larimer Conservation District
LCDNR	Larimer County Department of Natural Resources
LCOEM	Larimer County Office of Emergency Management
LCSO	Larimer County Sheriff's Office
LTPBR	Low-Tech, Process-Based Restoration
NASA	National Aeronautics and Space Administration
NCFC	Northern Colorado Fireshed Collaborative
NFF	National Forest Foundation
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NRCS	Natural Resources Conservation Service
NWCG	National Wildfire Coordinating Group
PBC	Pile Burn Cooperatives
PODs	Potential Operational Delineations
PSD	Poudre School District
PVREA	Poudre Valley Rural Electric Association
SCT	Site Conservation Team
SLB	State Land Board
SWA	State Wildlife Area
TEA	The Ember Alliance
TNC	The Nature Conservancy
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
WPP	Wildfire Partner Program by Larimer County Seriff's Office
WRAP	Wildfire Ready Action Plan
WRV	Wildlands Restoration Volunteers
WUI	Wildland-Urban Interface

Refer to the **Glossary** on page 185 for definitions of the words and phrases used throughout this document

1. Introduction

1.a. Purpose and Need for a CWPP

Community Wildfire Protection Plans (CWPPs) help communities assess local hazards, identify strategic investments to reduce wildfire risk, and promote preparedness at both the individual and community levels (**Figure 1.a.1**). The planning process also supports fire operations during wildfire events and helps residents prioritize mitigation actions. In addition, many grant programs require an approved CWPP, making the plan an essential tool for securing funding for fuel reduction and other projects.

> *"These are conditions that we have created, all of us, and the only way out of that is the same way we got into it—and that's together." – Josh Roberts, Larimer County Office of Emergency Management*

The Livermore Fire Protection District (LFPD) is an all-volunteer, taxpayer-funded Special Fire District that oversees 309 square miles of the Livermore community in unincorporated Larimer County. LFPD serves one of the largest areas in northern Colorado's Front Range along Highway 287 (**Figure 1.a.2**). Spanning the area approximately 30 minutes north of Fort Collins to the Wyoming border, LFPD encompasses ancestral lands of the Ute, Arapaho, and Cheyenne First Nations.

The 2026 CWPP is the first district-wide plan for LFPD. It addresses a changing landscape by considering wildfire risk, home construction, and other community characteristics. The plan includes a wildfire risk analysis, prioritization of mitigation activities, and recommendations for implementation. For the purpose of this CWPP, LFPD was divided into 11 plan units for comparing relative risk across LFPD and making specific recommendations to address wildfire risk and increase emergency preparedness (**Figure 1.a.3**).



Figure 1.a.1. *Elements of a holistic and actionable CWPP.*

This document will serve as a resource for LFPD, land managers, agency partners, community associations (including homeowners associations, landowners associations, property owners associations, and road associations), and residents to prioritize projects that make LFPD safer and more resilient to wildfire. The objectives of the CWPP are to:

- Produce a living, actionable CWPP informed by science-based analysis and community values across LFPD.
- Share information on wildfire history, risk, available services and programs, and actions that can reduce wildfire impacts.
- Provide tailored recommendations to reduce fire hazards, address risk, and improve evacuation safety at the individual, community, and district levels.
- Support holistic vegetation management best practices that restore ecosystem function, thereby creating ecologically and socially resilient landscapes.
- Enable coordinated planning and implementation by LFPD, land managers, agency partners, community associations, and residents.
- Identify clear, strategic, and prioritized projects to guide implementation over time.

Wildfire behavior is shaped by the interactions of fuels, weather, and topography. While wildfires are complex, much of their behavior can be predicted through established scientific research and fire behavior modeling. The CWPP draws on this science and modeling to guide recommendations. A basic understanding of fire behavior aids in interpreting the findings and recommendations reported herein. See **Appendix A Introduction to Wildfire Behavior and Terminology** and the **Glossary** for key terms.



Photo credit: LFPD.

Why is the CWPP relevant to me?

Becoming a fire adapted community that can safely coexist with wildland fire takes a concerted, ongoing effort by everyone who lives, owns property, protects, or manages land in and around this community. Conditions in LFPD share some risk factors common to past catastrophic wildfires across the country. This CWPP provides recommendations for how to prepare your family to safely evacuate during a wildfire, how to mitigate your home ignition zone to give your house a chance to stand strong during wildfires, and how to protect the lives of firefighters engaged in protecting your community.

Even if you do not have a permanent home on your property, you can take steps to protect your assets, including the value of your property; areas that are heavily burned have less aesthetic and monetary value. More importantly, work you do to reduce fire risk on your property can amplify the work that your neighbors do on theirs, resulting in greater risk reduction for everyone. Removing trees from along roadways can increase the visibility of your property to firefighters, increase the accessibility of your property for fire engines, and reduce the chance that conditions could develop that entrap residents and first responders during wildfires.

This CWPP is a call to action to do your part to continue making the district a beautiful and safe community. Land managers, agency partners, and LFPD are here to support your individual efforts, and they are committed to taking action to reduce wildfire risk, increase emergency preparedness, and enhance native ecosystems and wildlife habitat for the benefit of this amazing community.

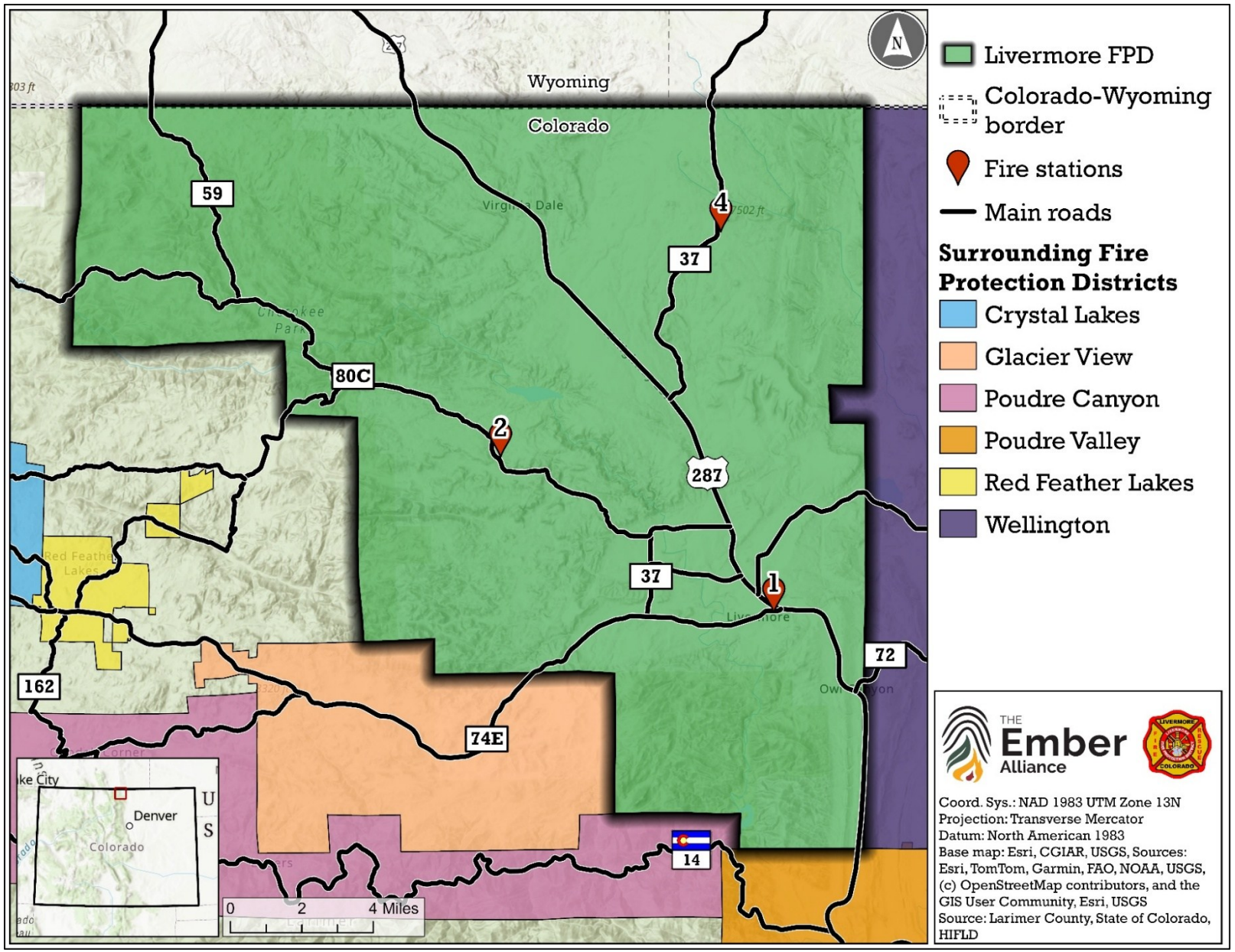


Figure 1.a.2. *Boundaries of LFPD and surrounding fire protection districts, and locations of LFPD stations indicated. Sources: Homeland Infrastructure Foundation-Level Data (HIFLD), Colorado Department of Transportation (CDOT), TIGER/Line from census.gov, and Larimer County Geographic Information System (GIS).*

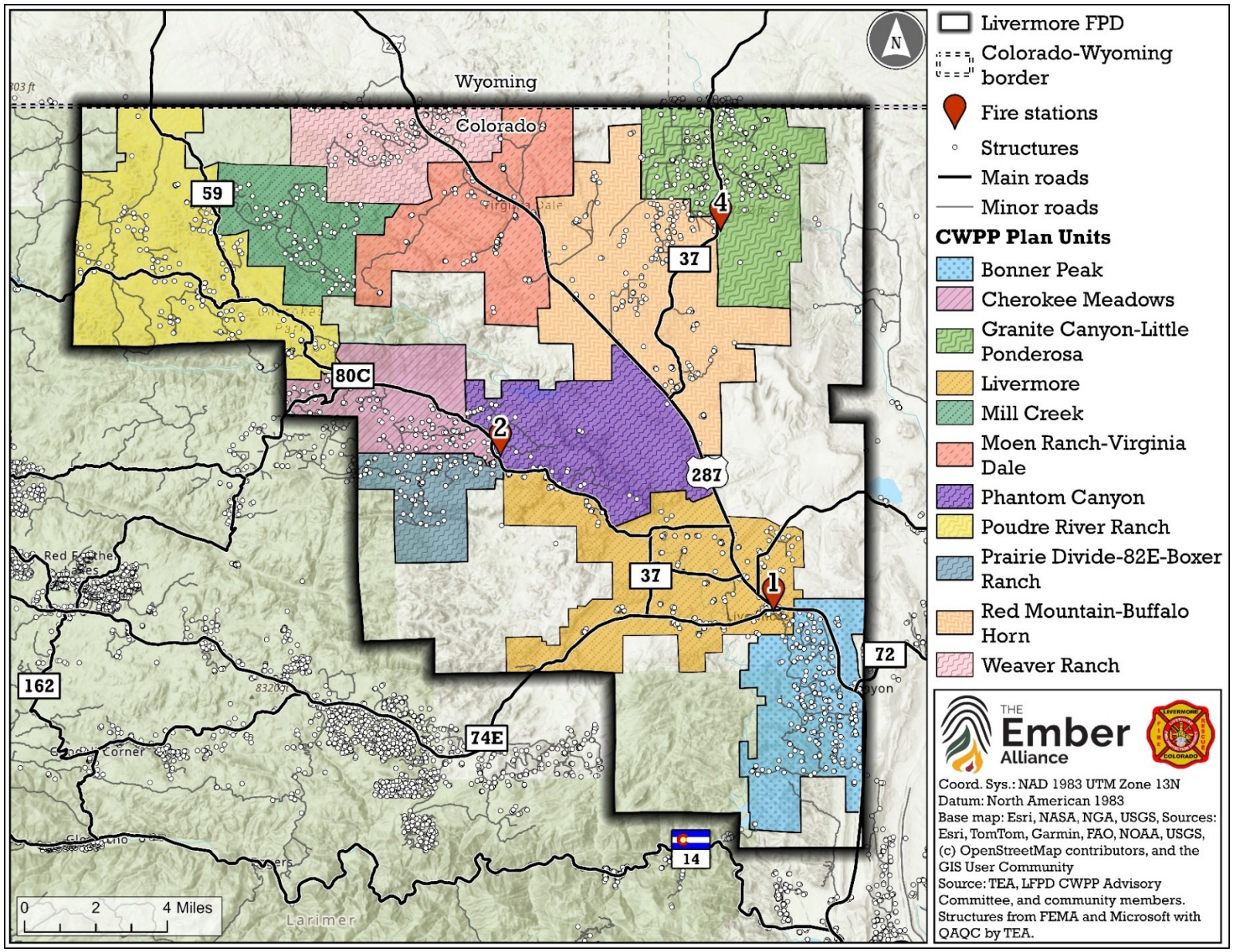


Figure 1.a.3. *LFPD was divided into 11 plan units for the CWPP to compare relative risk across the district and make specific recommendations to address wildfire risk and increase emergency preparedness. Sources: The Ember Alliance (TEA) with feedback from the LFPD CWPP Advisory Committee and Livermore community members.*

1.b. Community and Partner Engagement

Collaboration is an essential part of CWPPs. Community engagement, partner commitment, and follow-through are what make a CWPP successful and effective. The Ember Alliance (TEA)—a Colorado nonprofit dedicated to fire management and community engagement—worked with LFPD to write this CWPP. TEA and representatives from LFPD engaged partners from across the district and neighboring districts to develop the recommendations set forth in this CWPP. They incorporated lessons learned from recent, challenging wildfire seasons in Colorado and considered valuable insights shared by community members and other partners.

Recommendations in this CWPP also consider related plans and activities in the area:

- 2025-2029 Red Feather Lakes Area Wildfire Defense Project
- 2026 Red Feather Lakes CWPP Update
- 2025 Larimer County CWPP Update (draft)
- 2024 Upper Poudre Watershed Resilience Plan
- 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project
- 2023 Poudre Canyon Fire Protection District CWPP
- 2022 Crystal Lakes CWPP
- 2022 Glacier View Fire Protection District CWPP
- 2022 Cherokee Meadows Road Association CWPP
- 2021 Larimer County Hazard Mitigation Plan
- 2015 Cherokee Park Project Environmental Assessment
- 2011 Upper Cherokee Park CWPP
- 2026 Peaks to People Watershed Investment Tool

TEA and LFPD would like to thank the following partners for their time and effort in developing content, providing data and feedback, and contributing to planning implementation for this CWPP:

- Arapaho-Roosevelt National Forest
- City of Fort Collins
- City of Greeley
- Coalition for the Poudre River Watershed
- Colorado Forest Restoration Institute
- Colorado Division of Fire Prevention and Control
- Colorado Natural Heritage Program
- Colorado Parks and Wildlife
- Colorado State Forest Service
- Larimer Conservation District
- Larimer County Department of Natural Resources
- Larimer County Office of Emergency Management
- Larimer County Planning Division
- Larimer County Sheriff's Office Emergency Services
- Livermore Community Club
- Livermore Woman's Club
- Natural Resources Conservation Service
- North Fork Poudre Site Conservation Team
- Poudre Valley Rural Electric Association
- United States Forest Service
- Xcel Energy

Community and partner engagement included:

- Hosting a 2026 LFPD CWPP page on The Ember Alliance website.
- Attending the North Fork Poudre Site Conservation Team "Healthy Watershed Tour & Open House" in September 2025 to observe and learn about community-based conservation networks, projects, and methods in LFPD.
- Identifying and engaging with liaisons from neighborhoods within LFPD to ensure community representation across the district.

- Posting informational flyers at gate entrances and community gathering places across LFPD for CWPP awareness and engagement.
- Co-hosting a community kickoff meeting at LFPD Station 1 in October 2025 to introduce the CWPP process, encourage community participation, and gain an understanding of critical values of importance within the community.
- Conducting an evacuation meeting with LFPD and partners in January 2026 to discuss roadway hazards and priorities, evacuation concerns, and special considerations within the district.
- Attending and sharing information about the CWPP process at an April 2026 Livermore "Town Hall" hosted by the Larimer County Community Planning, Infrastructure, and Resources Department and County Commissioner Jody Shadduck-McNally.
- Collaborating closely with CFRI to pilot the Critical Values at Risk (CVAR) identification process within the CWPP process (see **Critical Values at Risk** in Appendix B for more details).
- Collecting feedback on the CWPP document during a public comment period in July - August 2026.
- Hosting a table at the North Fork Poudre Site Conservation Team "Healthy Watershed Tour & Open House" in September 2026 to release the signed and adopted CWPP document to the public and share findings and recommendations from the CWPP update process.



A community kickoff meeting was held at LFPD Fire Station 1 in October 2025 where attendees participated in activities designed to collect community input on Critical Values at Risk (CVAR) and provide feedback on initial maps and analyses, including plan unit boundaries. Attendance was comprised of residents from across the district, LFPD CWPP Advisory Committee members, and County Commissioner Jody Shadduck-McNally (bottom left). Photo credit: Cary Gooding, TEA.

1.c. Recent Accomplishments in and around LFPD

Cherokee Meadows Road Association

- In 2023, completed a CWPP specific to the road association.

Coalition for the Poudre River Watershed

- Awarded a $9.7 million Community Wildfire Defense Grant (CWDG) in 2024 for the 5-year Red Feather Lakes Area Wildfire Defense Project, with work being done in Cherokee Meadows (co-led with Larimer County Office of Emergency Management). The Advisory Committee for this effort received an Environmental Stewardship Award in June 2026, recognizing exemplary work in Larimer County.

Colorado Parks and Wildlife

- In 2024, 300 acres of cheatgrass were treated by aerial application on the Lower Unit of the Cherokee State Wildlife Area (SWA).
- Planned work for 2026 includes 150 acres of timber thinning/mastication on the Upper Unit of the Cherokee SWA and arial treatment of 600 acres of cheatgrass on the Lower Unit of the Cherokee SWA. Additionally, the Arapaho-Roosevelt National Forest plans to burn 400 acres on the Upper Cherokee Unit.

Colorado State Forest Service

- In 2024, completed 67 acres mastication project with Colorado Parks & Wildlife (CPW) on Cherokee SWA Upper Units.
- Ongoing implementation of the Cherokee Park Project with the US Forest Service (USFS) Canyon Lakes Ranger District using the Good Neighbor Authority program. Since 2024, 531 acres of fuels reduction complete and additional units in planning for future implementation.
- Ongoing technical and financial support for wildfire mitigation and forest management through Colorado State Forest Service (CSFS) landowner and grant programs.

Livermore Fire Protection District

- Broke ground on Fire Station 4 (Red Mountain) in September 2025 with an expected completion date of August 2026.
- Completed 35 Home Ignition Zone Assessments as ambassadors for the Larimer County Sheriff's Office (LCSO) Wildfire Partners Program (WPP).

Larimer Conservation District

- Larimer Conservation District (LCD) has completed landscape-scale forest restoration projects in conjunction with road associations in the areas of Diamond Peak (260 acres), Poudre River Ranch (220 acres), and Diamond Creek (140 acres). Additional projects include ranches along Prairie Divide (200 acres) and Highway 287 (200 acres).
- Planned work includes 675 acres of landscape-scale forest restoration on properties in Diamond Creek, Poudre River Ranch, Aspen Meadows, Two Bears, Elk Meadows, and along 74E. All projects are funded using federal Farm Bill money and a combination of local grants.

Larimer County Department of Natural Resources

- In 2023, Larimer County Department of Natural Resources (LCDNR), in partnership with CPW, aerially treated ~3,000 acres of invasive annual grasses (primarily cheatgrass) across Eagle's Nest Open Space and Cherokee SWA to enhance ecological health and reduce flashy fuels.

- In 2025, LCDNR completed efforts to conserve six ranches totaling 6,331 acres in Livermore—the ranches are being conserved in partnership with the landowners via conservation easements to permanently protect their high-quality wildlife habitats, water resources, scenic views, and agricultural values.

Larimer County Office of Emergency Management

- Since 2022, 59 Community Mitigation Grant Program projects have been completed in four annual grant cycles, with a total of over $343,000 in grant funds awarded to 47 different recipients—residents in Mill Creek and Cherokee Meadows have taken advantage of this grant.
- Over 2025 and 2026, the county updated its multi-jurisdictional Hazard Mitigation Plan, which includes LFPD as one of the jurisdictions.

Larimer County Sheriff's Office

- Established the Wildfire Partner Program (WPP) in 2023, as a part of the Emergency Services Section of the Larimer County Sheriff's Office, to provide tools, training, and support for local fire districts and departments to offer comprehensive wildfire Home Ignition Zone assessments to residents free of charge.



The Red Feather Lakes Area Wildfire Defense Project Advisory Committee received an Environmental Stewardship Award from Larimer County in June 2026. This effort is jointly administered by the Coalition for the Poudre River Watershed (CPRW) and Larimer County Office of Emergency Management (LCOEM) with funding from the U.S. Department of Agriculture (USDA) Community Wildfire Defense Grant (CWDG) program. Photo credit: LCOEM.

2. Livermore Fire Protection District: Background

2.a. General Description

In the foothills of the Front Range of the Rocky Mountains north of Fort Collins, LFPD covers 309 square miles of Larimer County with elevations ranging from approximately 5,400 feet to over 9,000 feet above sea level. LFPD is home to approximately 2,000 residents.

LFPD is surrounded by Red Feather Lakes Fire Protection District (FPD), Crystal Lakes FPD, Glacier View FPD, Poudre Canyon FPD, Poudre Fire Authority District, Wellington FPD, and Laramie County Fire District #10. The Colorado-Wyoming border is the northern boundary of LFPD and the Arapaho-Roosevelt National Forest lays to the west. LFPD often coordinates with surrounding FPDs to provide mutual aid and respond to calls near the borders of the district, including into Wyoming. LFPD is part of the South Platte River Basin and sits within the Cache la Poudre River Watershed.

The community of Livermore is unincorporated but municipal services such as planning, roads, and emergency management are handled by Larimer County. Larimer County Road & Bridge has a shop in Livermore for road and trail maintenance and coordination. The area is served by Poudre School District (PSD) and the Livermore Community Hall is a hub for community organization and events. LFPD is an all-volunteer, taxpayer-funded Special Fire District that maintains two fire stations in the district, with a third station planned in 2026.

LFPD contains numerous Highly Valued Resources and Assets (HVRAs) that should be considered in relation to wildfire and planning efforts (**Figure 2.a.1**). There are many historical structures in LFPD including the Livermore Community Hall, Virginia Dale Stage Station, and Virginia Dale Community Church. The district also includes critical infrastructure such as cisterns, substations, communication towers, fire stations, and a post office. Private ranches scattered across the district are also an important economic driver in the area. Additionally, there are several trailheads and campgrounds in and around LFPD that attract many visitors during the summer.

During the CWPP process, a subset of HVRAs were identified as Critical Values at Risk (CVARs) based on expert knowledge from the CWPP Advisory Committee, local fire and emergency response partners, community members, and other interested and affected entities. CVARs are values across a landscape that Agency Administrator or other fire response decision-maker might elevate to a higher level of protection during a wildfire due to their relative vulnerability and importance to a local community[1]. Protection can include altering tactics to reduce the potential of CVARs experiencing high-severity fire behavior or adverse impacts from fire suppression activities, such as heavy equipment or aerial resource use.

During an active wildfire incident, fire responders and key decision-makers must identify CVAR across a landscape to build a response strategy (Buettner et al., 2025). Proactively identifying CVARs in the pre-season can help first responders and decision-makers save time, reduce unnecessary risks to first responders, and better represent community interests as they develop fire management strategies (Aldworth & Beeton, 2025). The CWPP process provides an excellent opportunity to proactively identify CVARs due to a CWPP's collaborative nature and cadre of participants (T. Beeton et al., 2026). Detailed methodology and a description of CVARs in LFPD can be found in **Appendix B.**

Approximately 77,800 acres of land (39%) in LFPD is publicly managed land. These lands are overseen by a variety of agencies, including the U.S. Forest Service (USFS), the State Land Board (SLB), and Colorado Parks and Wildlife (CPW). Larimer County Department of Natural Resources (LCDNR) operates open spaces, and The Nature Conservancy (TNC) maintains a preserve in LFPD as well (**Table 2.a.1**; **Figure 2.a.2**).

[1] The process of identifying CVARs ***does not*** exclude other values from being considered or protected during fire response operations. Rather, identifying CVARs helps focus strategic discussions around the values most critical to a local community's safety, character, and continued functionality.

While a large portion of land in LFPD is public, there are also large parcels of privately owned land in the form of conservation easements. One exception is the third largest area in Livermore, Maxwell Ranch, which is an economically sustainable working cattle ranch that is owned by a private, non-profit corporation called CSU STRATA (a legally distinct entity from Colorado State University). The mission of Maxwell Ranch is to, "provide CSU, industry, and society with an economically sustainable working cattle ranch as a living laboratory for teaching, research, and demonstration, with special emphasis on beef cattle production and rangeland research".

The landscape of LFPD is dominated by grassland and shrubland in the east and ponderosa pine stands, with smaller patches of mixed conifer and lodgepole pine scattered throughout, in the west. Riparian zones and some hardwood forests including aspen follow streams and rivers. (**Table 2.a.2**; **Figure 2.a.3**). Mule deer, elk, moose, black bears, bobcats, and mountain lions are among the large wildlife found in LFPD. Notable birds in the area include bald eagles, blue heron, American dippers, and belted kingfishers.

Table 2.a.1. *Publicly owned land across LFPD. Source: COMaP managed by the Colorado Natural Heritage Program and last updated July 2, 2024.*

Land manager/agency (property names)	% of LFPD land area
U.S. Forest Service (Roosevelt National Forest)	15%
Colorado Parks & Wildlife (Brackenbury, Cherokee, and Seaman State Wildlife Areas)	10%
State Land Board (Meadow Creek, N. Rabbit Creek, Poudre River, Steinhoff Hill, and Pinyon Grove)	5%
Colorado State University (Maxwell Ranch and other CSU Research Foundation properties)	5%
Larimer County (Eagle's Nest and Red Mountain Open Spaces)	4%
Bureau of Land Management	<1%
City of Fort Collins and City of Greeley	<1%
Poudre R-1 School District	<1%

Table 2.a.2. *Vegetation type and land cover across LFPD. Source: 2022 CO-WRA.*

Vegetation type/land cover	% of LFPD land area
Grassland	46%
Ponderosa pine	24%
Shrubland	17%
Riparian vegetation	4%
Mixed conifer	3%
Lodgepole pine	2%
Developed	2%
Agriculture	1%
Conifer	1%
Hardwood	<1%
Open water	<1%
Sparsely vegetated	<1%
Spruce-fir	<1%
Conifer-hardwood	<1%

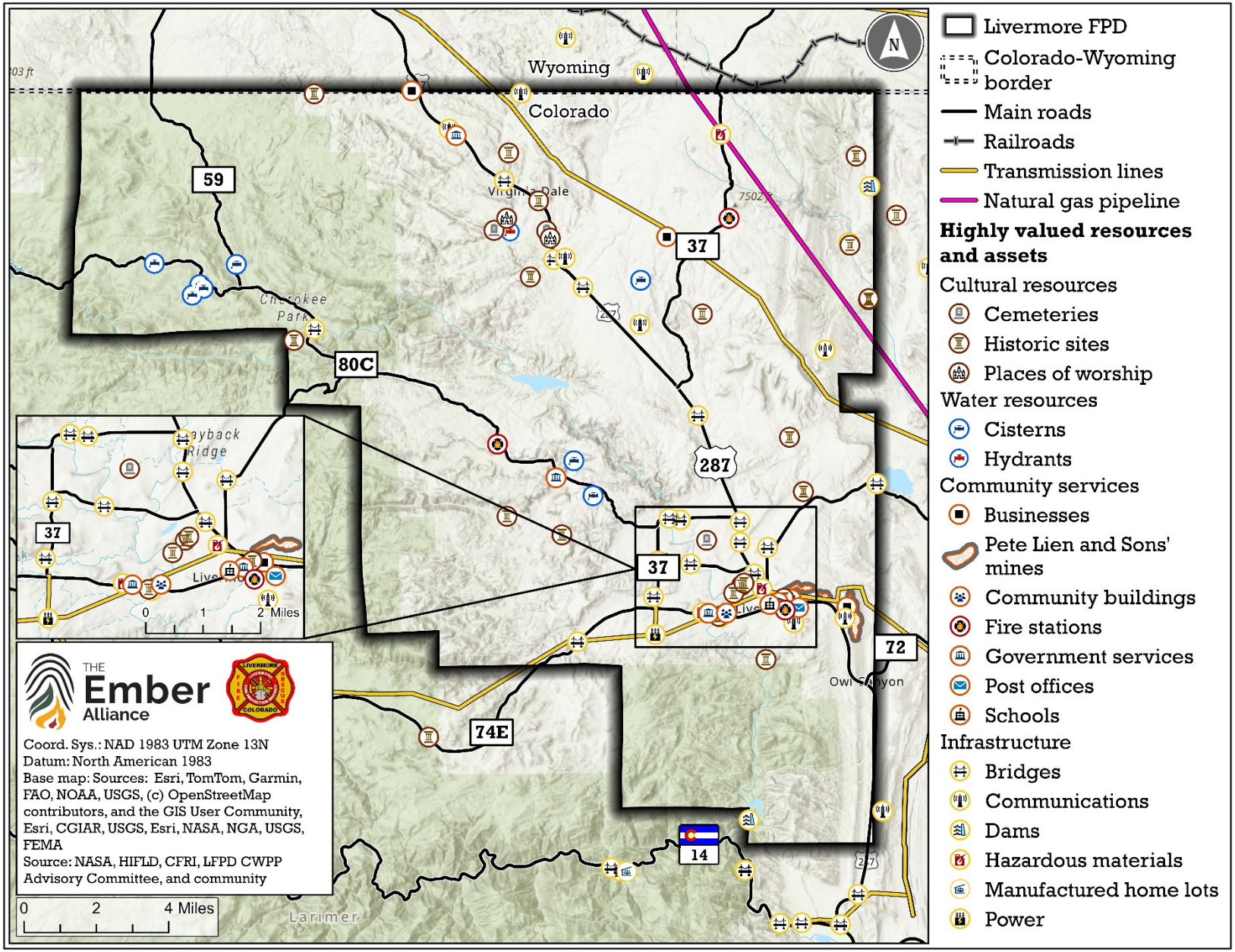


Figure 2.a.1. *Highly valued resources and assets within and around LFPD. Sources: National Aeronautics and Space Administration (NASA), HIFLD, CFRI, LFPD CWPP Advisory Committee, and Livermore community members.*

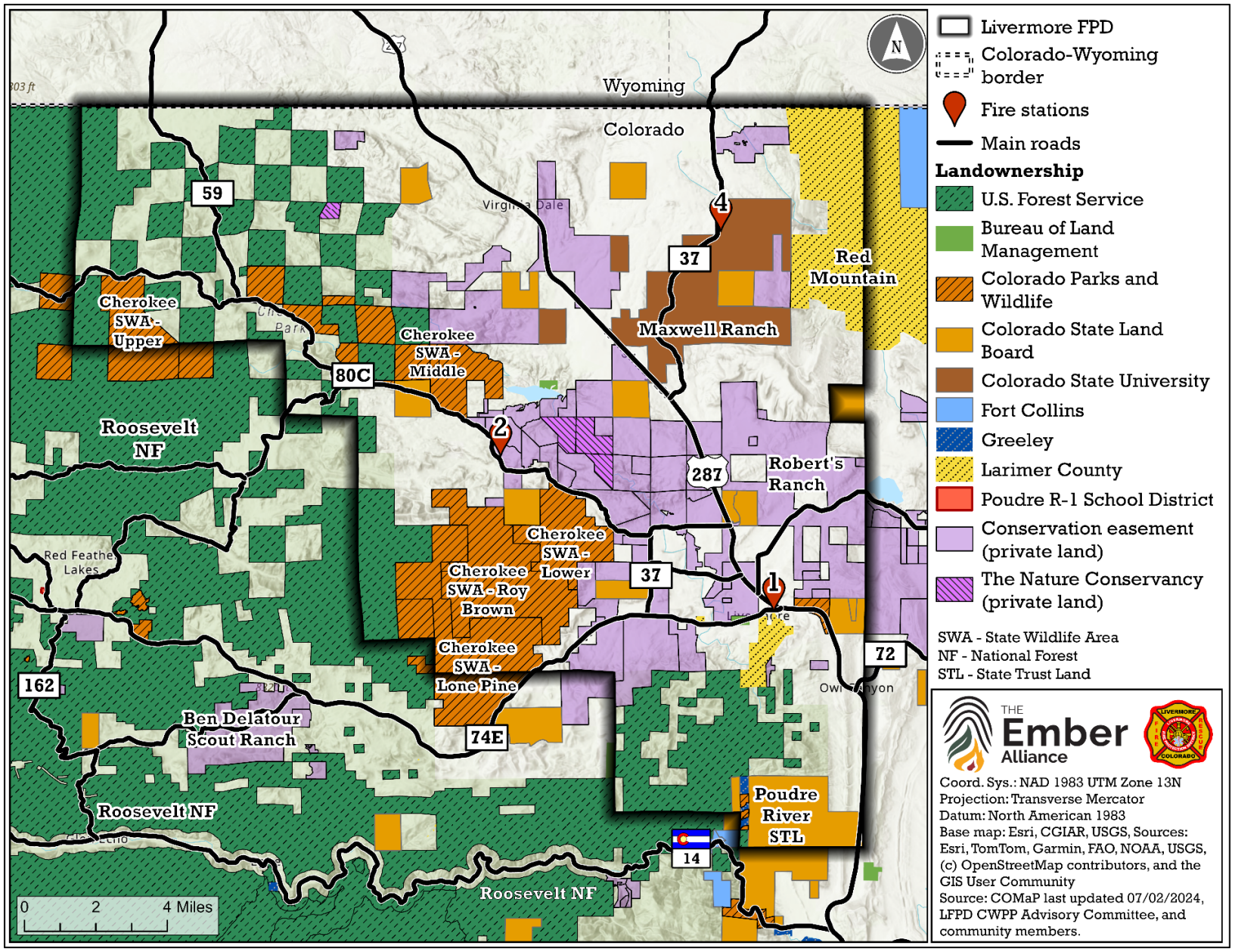


Figure 2.a.2. *Publicly owned land across LFPD. Source: COMaP managed by the Colorado Natural Heritage Program and feedback from the LFPD Advisory Committee and community members.*

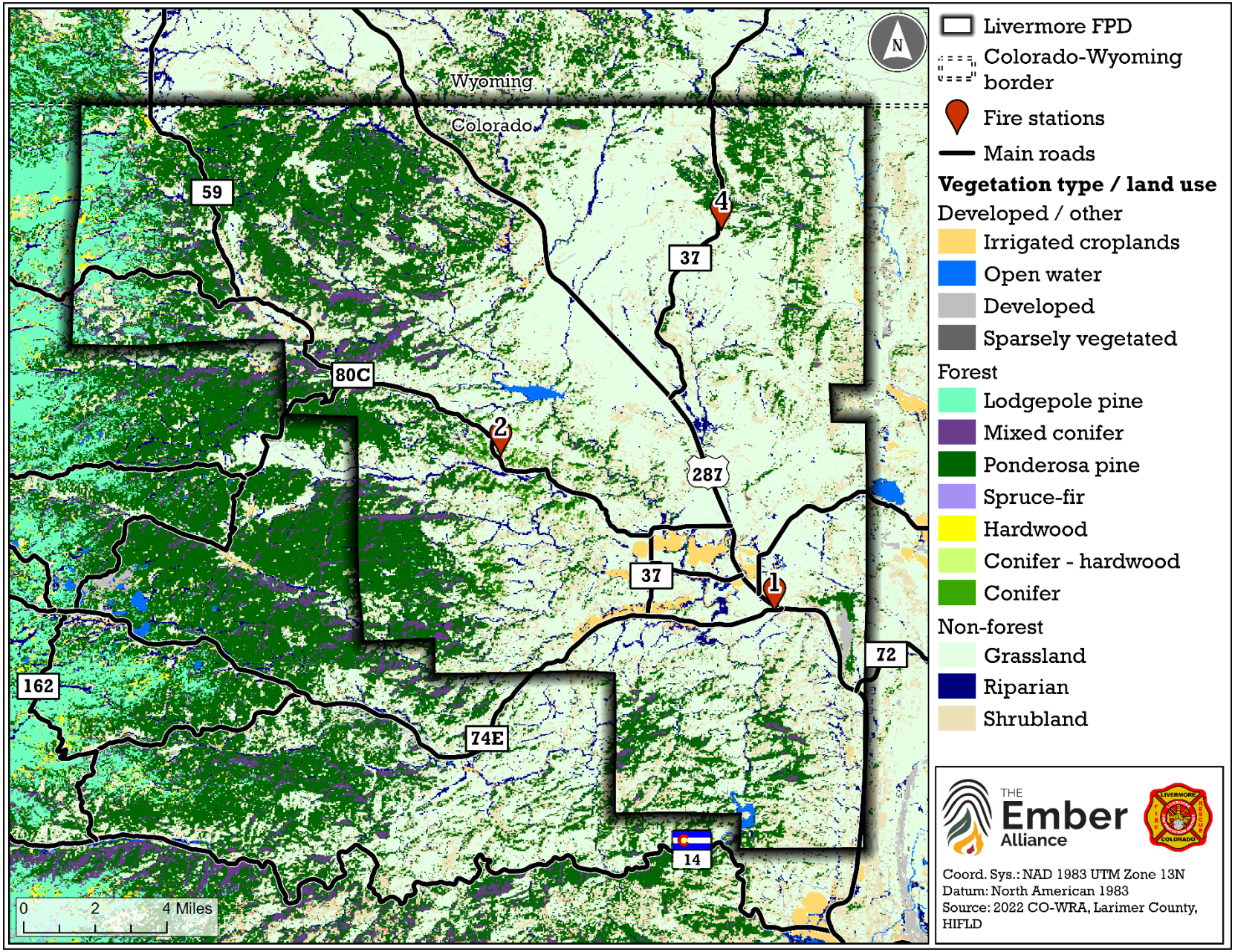


Figure 2.a.3. *Map of vegetation across LFPD. Major vegetation types include grasslands, shrublands, irrigated cropland, ponderosa pine, and mixed conifer forests. Source: 2022 CO-WRA.*

2.*b.* District and Community Capacity

LFPD is an all-volunteer, taxpayer-funded Special Fire District, consisting of 26 operations staff, 6 logistics staff, 7 board members, and 1 part-time office manager. LFPD serves one of the largest areas in northern Colorado's Front Range, covering approximately 309 square miles, including 24 miles of Highway 287 and over 250 miles of paved and unpaved roads according to data from Larimer Emergency Telephone Authority (this excludes private drives and driveways). LFPD currently operates two active stations, with a third station in the Red Mountain area, Station 4, breaking ground during the preparation of this plan and expected to be operational in 2026.

LFPD is staffed by volunteer firefighters and Emergency Medical Services (EMS) personnel who not only respond to 911 calls but also maintain stations, apparatus, and equipment. Volunteers provide 24/7 coverage for emergencies including wildland and structural fires, vehicle accidents, medical calls, and smoke reports.

Beyond district boundaries, LFPD maintains a robust mutual aid network with neighboring fire districts, covering an additional 300 square miles. This network is strengthened by coordinating with the Larimer County Sheriff's Office (LCSO) Emergency Services Initial Attack Module, which can rapidly deploy trained personnel for wildland firefighting and early suppression efforts across the region. LFPD also collaborates with local mitigation crews to support fuels reduction projects.

Through this combination of volunteer staffing, mutual aid partnerships, specialized county resources, and local mitigation teams, LFPD provides both comprehensive emergency response and proactive wildfire management, enhancing safety and resilience across Livermore and surrounding communities.



Photo credit: LFPD.

Station 1 – Livermore

311 County Road 74E

Apparatus:

- Engine 131 (Type 1, 750-gallon tank, 1,000 gallons per minute pump)
- Engine 431 (Type 4, 4wd Wildland Engine, 800-gallon tank, 500 gallons per minute pump)
- Tender 1 (3,000-gallon water tender)
- Med 1 (4wd ambulance)
- Command Squad 1
- Support 1



Photo credit: LFPD.

Station 2 – Cherokee Park

Country Road 80W (near Country Road 82E)



Photo credit: TEA.

Apparatus:

- Engine 132 (Type 1, 750-gallon tank, 1,500 gallons per minute pump)
- Engine 432 (Type 4, 800-gallon tank, 500 gallons per minute pump)
- Engine 632 (Type 6 Wildland Engine, 300-gallon tank, 60 gallons per minute pump)
- Rescue 2 (4wd rescue squad)
- Squad 2 (4wd personnel squad

1 additional type 6 engine (E633) and another rescue (R1) are located at the homes of responders.

Station 4 – Red Mountain Road

6382 Red Mountain Road

LFPD and Colorado State University Research Foundation have entered into a 100-year lease for a one-acre plot on Red Mountain Road. At the time of the writing of this document, LFPD obtained a well permit, completed architectural plans, and broke ground on construction. Station 4 will have a training/community room and five bays for apparatus. Station 4 will house E134 (1,000-gallon tank, 1,500 gallons per minute pump), Tender 4 (1,800-gallon tank, 500 gallons per minute pump), and E634 (300-gallon tank, 60 gallons per minute pump), Squad 4, and Support Trailer



Photo rendering of the Red Mountain Road Station (Photo credit: LFPD)

LFPD is looking for volunteers for the Red Mountain Road Station!

Visit their website to learn more.

Community Capacity and Opportunities

The Livermore community demonstrates strong and growing capacity for wildfire mitigation, land stewardship, and collaborative project implementation. This capacity is rooted in a mix of formal organizations, volunteer networks, and place-based conservation groups that collectively strengthen the area's resilience to wildfire.

The Colorado State Forest Service (CSFS), Larimer Conservation District (LCD), and Coalition for the Poudre River Watershed (CPRW) provide technical guidance, grant support, and coordination for fuels reduction and watershed restoration projects across LFPD. These organizations have an established record of assisting landowners with implementation of cross-boundary mitigation work. The Larimer County Wildfire Partner Program (WPP) further augments this support by offering professional home assessments and connecting residents with mitigation funding opportunities.

Local companies such as Rocky Mountain Log & Saw contribute operational capacity through specialized forest management and tree service operations, including custom logging for beetle-killed or burned tree removal, right-of-way clearing, tree thinning, log hauling with truck-mounted loaders and log trucks, firewood processing, and hand-peeling of logs.

Volunteer organizations also play a significant role. The Livermore Woman's Club, one of the oldest continuously active community groups in the region, serves as a social and communications hub, helping distribute wildfire preparedness information and mobilize volunteers for education and service initiatives. The N. Fork Poudre Site Conservation Team (SCT), working in coordination with land trusts and conservation partners and Wildlands Restoration Volunteers (WRV), brings ecological expertise to habitat restoration, fuels management, and post-fire recovery projects.

Much of the Livermore landscape is protected under private and organizational conservation easements, managed in partnership with USDA Natural Resources Conservation Service (NRCS). These conserved properties provide valuable open-space buffers that support landscape-scale wildfire mitigation, ecological restoration, and fuel-break maintenance, while creating opportunities for coordinated, cross-jurisdictional projects that integrate habitat conservation with fire resilience.

Homeowners associations, landowners associations, property owners associations, and road associations (collectively referred to as community associations), including those in Cherokee Meadows and Upper Cherokee Park, have demonstrated leadership by developing their own CWPPs in 2022 and 2009, respectively. Because the Cherokee Meadows CWPP was completed within the last five years and remains current by CSFS standards, the community was included in a $9.7 million USDA-funded Red Feather Lakes Area Community Wildfire Defense Grant (CWDG) project—mitigation work from this project began in Cherokee Meadows in 2025. Resident organizations, such as community associations, serve as vital social and organizational networks capable of mobilizing neighbors for coordinated mitigation projects and maintenance of shared access routes. These associations also provide vehicles for pooled financial contributions, grant cost-share matches, and group organization for things like chipping or slash removal services.

Community associations, organizations, and partners in the Livermore area have demonstrated increasing administrative and logistical capacity to support mitigation projects. Several residents and organization staff have experience with grant writing and project management through partnerships with Larimer County, CSFS, and CPRW. The community also has access to shared spaces suitable for staging and equipment storage, including LFPD stations, which can accommodate mitigation crews and temporary deployment of equipment such as chippers or air curtain burners.

Together, these networks—spanning community organizations, conservation groups, volunteer crews, and agency partners—form a capable and adaptive framework for advancing wildfire mitigation, ecological restoration, and community preparedness across LFPD.

2.c. Wildland-Urban Interface

Every year, wildfires result in billions of dollars in fire suppression costs and destroy thousands of homes across the United States (Bayham et al., 2022; Higuera et al., 2023). Some of the most destructive, deadly, and expensive wildfires occurred in the past several years, partly due to construction of additional homes in the wildland-urban interface (WUI). Wildfire risk in the WUI is further exacerbated by severe fire weather perpetuated by climate change (Caton et al., 2016). Some nearby examples include the 2020 Cameron Peak Fire, which destroyed 469 structures; the 2020 East Troublesome Fire, which destroyed at least 366 structures; and the 2021 Marshall Fire, which destroyed over 1,000 structures. See **Appendix A** for a discussion about how wildfires can threaten and destroy homes.

The WUI is any area where the built environment meets wildfire-prone areas—places where wildland fire can move between natural vegetation and the built environment and result in negative impacts on the community (Mowry & Johnston, 2018). The built environment includes homes, businesses, infrastructure, services such as utilities, roadways, and geographic features that aid in wildfire suppression, such as roads or ridgetops (Healthy Forest Restoration Act, 2003). WUI exists along a continuum of wildland to urban densities (**Figure 2.c.1**) and people that live and work in the WUI must be aware of the effect that wildland fires have on their lives.

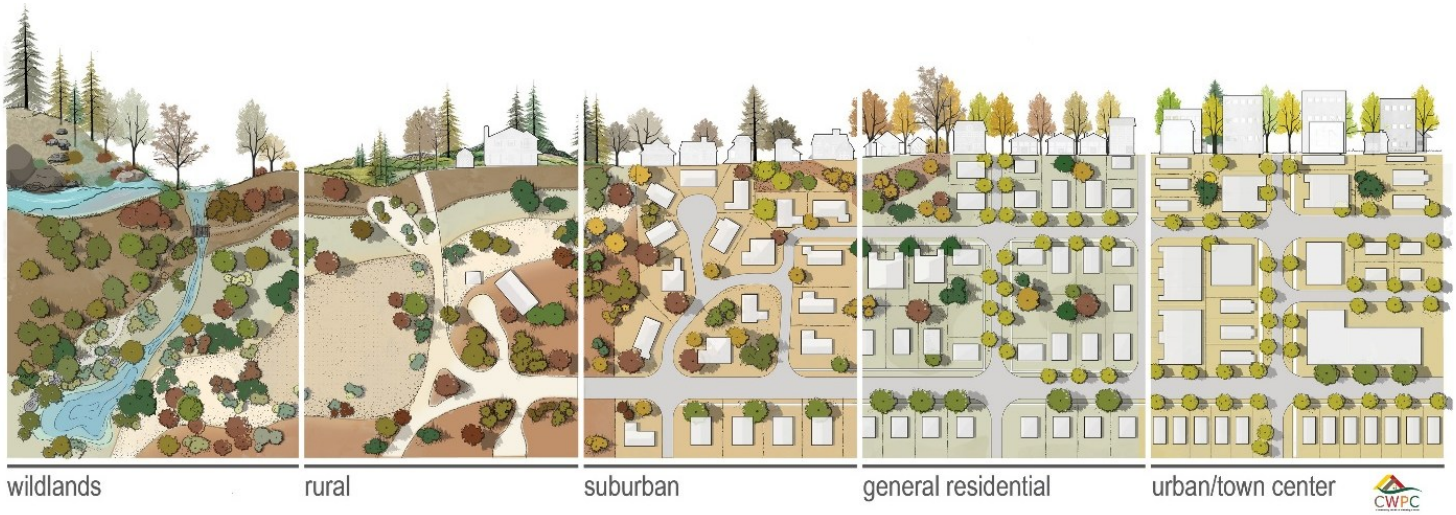


Figure 2.c.1. *The WUI exists along a continuum of wildland to urban. Source: Community Wildfire Planning Center.*

According to the 2025 Wildfire Risk to Communities analysis by the USFS, homes in LFPD and the surrounding area have a higher risk of wildfire than over 95% of the communities in the state of United States (USFS, 2021b). Over the past 50 years, immigration to the Front Range of the Rocky Mountains has increased the number of occupied structures within this historically forested landscape. This population change increased not only the density and size of the WUI but also increased the risk of structure loss from wildfire and the likelihood of fire ignitions.

All residents in LFPD live in the WUI (**Figure 2.c.2**). The WUI boundary for this CWPP includes potential operational delineations (PODs) that cover most of LFPD, important evacuation routes, and portions of the surrounding landscape that could transmit wildland fire into the district. The WUI for this CWPP captures not just populated areas but also portions of the landscape where fires could originate and spread into the community. PODs are topographic areas bounded by features suitable for fire control, other tactical operations during wildfires, proactive ecological resilience, and wildfire risk mitigation (e.g., ridgetops and roads) (T. A. Beeton et al., 2023; M. Thompson, 2023; M. P. Thompson et al., 2022). Proactive and strategic management along POD boundaries and within PODs can protect lives and property in LFPD, including protecting primary evacuation routes.

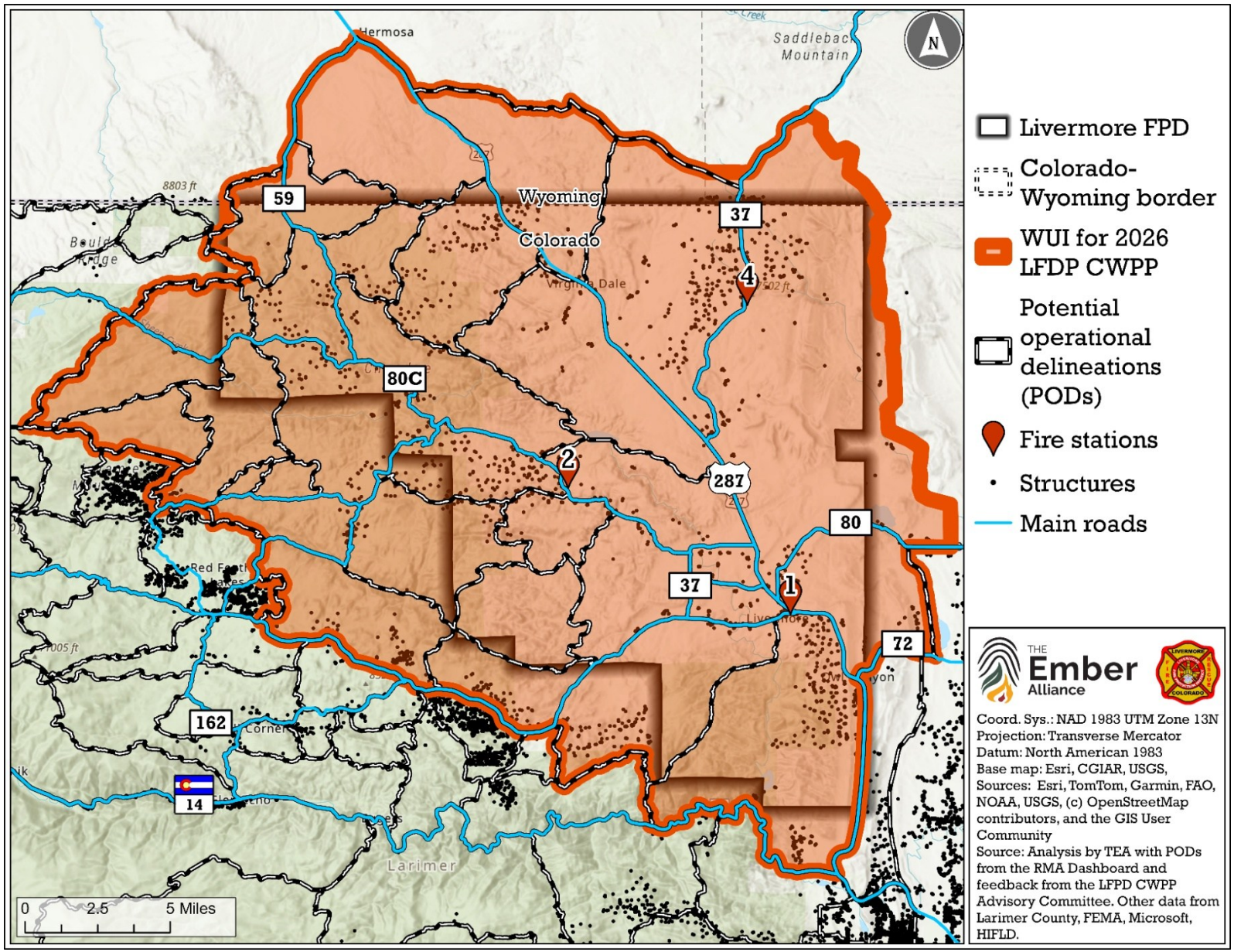


Figure 2.c.2. *All residents of LFPD live in the WUI and are exposed to elevated wildfire risk. The WUI boundary for this CWPP includes PODs that cover most of LFPD, important evacuation routes, and portions of the surrounding landscape that could transmit wildland fire into the district (see methodology in* ***Appendix B****). Sources: Analysis by TEA with POD data from the USFS and feedback from the LFPD CWPP Advisory Committee.*

2.d. Firefighting in the WUI

One of the standard firefighter orders from the National Wildfire Coordinating Group (NWCG) is to "fight fires aggressively, having provided for safety first" (NWCG, 2018a). Firefighters are committed to protecting lives and property, but firefighting is particularly perilous in the WUI. The firefighting community is committed to wildland firefighter safety, which can require them to cease structure protection when conditions are exceedingly dangerous, particularly around homes with inadequate defensible space, safety zones, and egress routes.

High-intensity, fast-moving wildfires in the WUI can quickly overwhelm firefighting resources when homes begin igniting each other (Caton and others 2016). Additionally, wildfires threaten public safety and evacuation, compounding the importance of taking actions that contribute to the safety of everyone in the community. Firefighters are often forced to perform structure triage to effectively allocate limited resources during an incident, and more importantly, to protect the lives of firefighters. The Incident Response Pocket Guide (IRPG), which is carried by all firefighters certified under the NWCG, explicitly states, "**Do not** commit to stay and protect a structure unless a safety zone for firefighters and equipment has been identified at the structure during size-up and triage" (NWCG, 2018a). The IRPG outlines four categories of structure triage:

1. Defensible – prep and hold.
2. Defensible – stand alone.
3. Non-defensible – prep and leave.
4. Non-defensible – rescue drive-by.

Do not count on firefighters staying to defend your home—your home should be able to stand strong on its own during a wildfire. There are never enough firefighters to stay and defend every single home during large incidents. The **Mitigate the Home Ignition Zone Section** of this CWPP provides recommendations for how residents can increase the chance of their homes standing strong during wildfires and enhance the safety of wildland firefighters.



Defensible space allowed firefighters to protect this home during the 2016 Cold Springs Fire near Nederland, CO. Photo credit: Wildfire Partners.

2.e. Fire History Along the Colorado Front Range

Wildfires burning heavily influenced Colorado's Front Range before the era of fire suppression. Whether started by Indigenous peoples or naturally, frequent, low-severity fires were common in grasslands, shrublands, and ponderosa pine and dry mixed-conifer forests before European settlement in the 1850's. Other forest types, particularly lodgepole and subalpine forests at higher elevations, experienced infrequent but high-severity wildfires (**Figure 2.e.1**). Some plant species evolved adaptations to wildfire; for example, the heat from wildfires opening the cones of lodgepole pine or mortality from wildfire triggering resprouting in Gambel oak and aspen. Some wildlife benefit from recently burned ecosystems with lower tree densities and a greater abundance of understory plants (Kalies et al., 2012; Pilliod et al., 2006).

Ponderosa pine forests with mixtures of Douglas-fir, Gamble oak, Rocky Mountain juniper, and aspen were fire-adapted ecosystems and very resilient to wildfires. Low- to mixed-severity fires occurred every 7 to 50 years, creating a mosaic of widely spaced trees and small tree clumps interwoven with grasslands and shrublands, particularly on drier south-facing slopes. North-facing slopes often supported denser forest stands (Addington et al., 2018). Frequent fires killed many tree seedlings and saplings, thereby preventing the accumulation of ladder fuels and reducing the potential for surface fires to transition into crown fires. Fire spread was more rapid through understory grasses but released far less heat, so many larger trees survived unscathed. Occasionally, dense clumps of trees experienced mortality from passive crown fires or active crown fires over several hundred acres, further increasing the diversity of habitat in these ecosystems. Ponderosa pine ecosystems with fewer trees support more abundant and species-diverse understories of grasses, wildflowers, and shrubs and provide habitat for a variety of wildlife that prefer more open forest structure (Kalies et al., 2012; Matonis & Binkley, 2018; Pilliod et al., 2006).

Lodgepole pine forests are part of fire-adapted ecosystems that are resilient after infrequent, stand-replacing wildfires. Research on historical conditions in lodgepole pine forests suggest they experienced high-severity wildfires every couple of centuries in northern Colorado and southern Wyoming (Higuera et al., 2021). Lodgepoles grow dense and tall, which leaves little light that reaches the understory. They have relatively high canopy base height because they drop their lower branches as they grow and few ladder fuels exist in the understory, meaning they typically burn with high-severity crown fires. They have serotinous cones that open after the heat of a wildfire, creating a dense seedbed that will grow into a new even-aged stand and replace the burned previous stand. Young stands that are in recovery and regeneration stages after wildfires do not have the resources to regenerate after a second wildfire event, so frequent stand-replacing fires are detrimental to this ecosystem (Dennis et al., 2009; Turner et al., 2019). Fires are becoming more common in high elevation lodgepole pine and wet mixed-conifer forests due to climate change (Higuera et al., 2021).

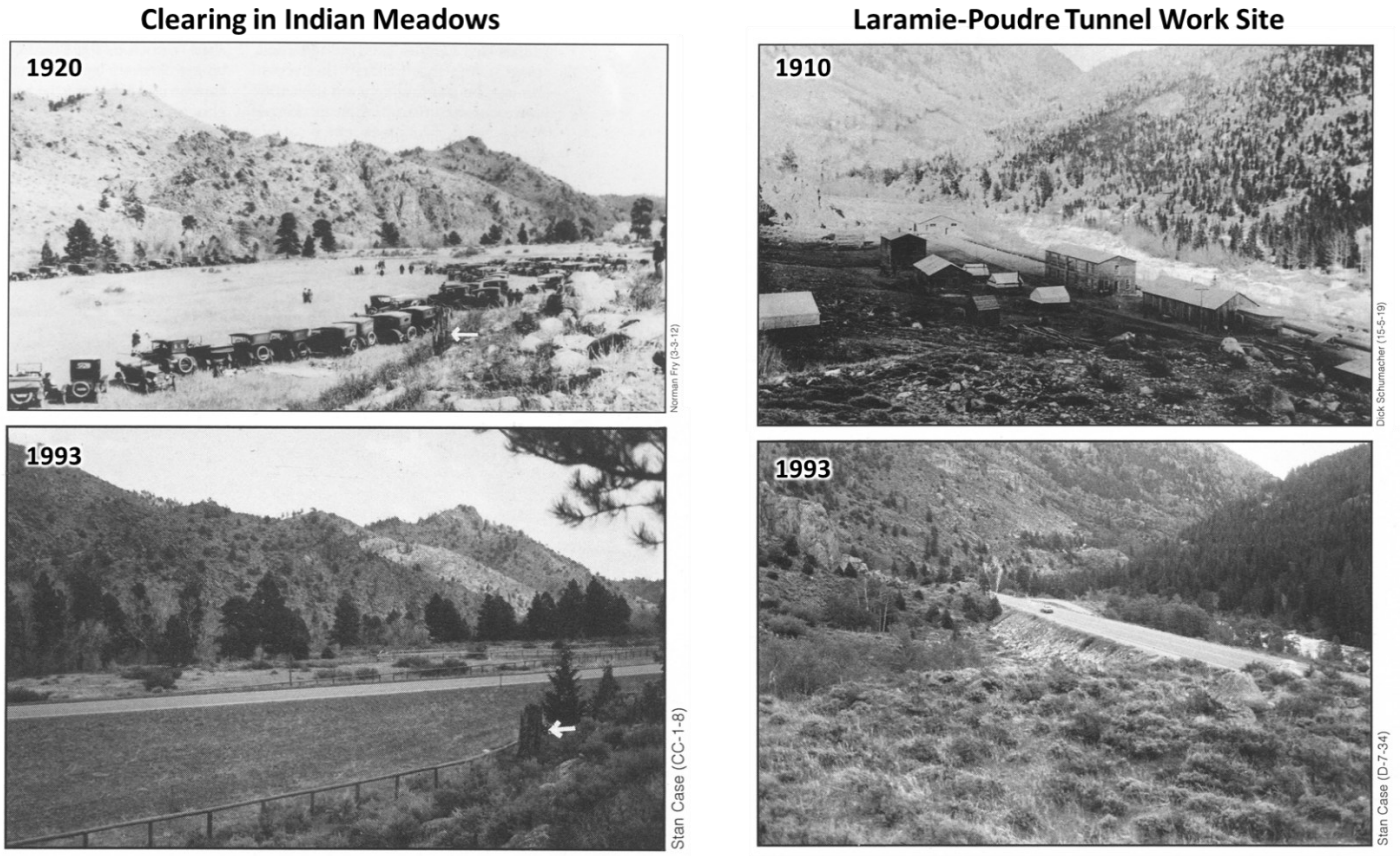
Wildfire behavior is vastly different today than it was over a century ago in many ecosystems along the Colorado Front Range. As the initial farming, ranching, and logging activities of Euro-American settlers subsided in the region and government-mandated fire suppression began in the late 1800's, forests filled in with trees (Addington et al., 2018). Tree densities in lower-elevation forests along the Colorado Front Range average 4.5 times higher today than they were in the mid-1800s, and tree densities in mid-elevation forests average 2.3 times higher today (Battaglia et al., 2018). **Although some consider dense forest as "natural," these conditions are vastly different from the fire-adapted and fire-resilient ecosystems that existed before.**

A combination of dense wildland vegetation, extreme heat and high winds, unplanned ignitions, and housing development in the WUI can create catastrophic wildfire scenarios (Haas et al., 2015). Climate change is making high-severity wildfires more frequent, intense, and larger in extent (Parks, Miller, Abatzoglou, et al., 2016). Many catastrophic wildfires in Colorado's history have occurred on dry and windy days, resulting in rapidly spreading fires that outpace the ability of firefighters to respond. On the Front Range, wind can gust over 60 miles/hour, which makes wildfire suppression nearly impossible (Haas et al., 2015).

The three largest wildfires in Colorado's history all burned during a period of extreme drought in 2020. The 2020 Cameron Peak Fire grew to the largest wildfire in Colorado's history at almost 209,000 acres and destroyed 461 structures, 224 of which were homes. The fire did not spread into LFPD, in part because its northward spread was slowed by reduced fuels in the boundary of the 87,280-acre High Park Fire, which burned into the district in

2012. Other larger fires in and around the southern portion of LFPD are the 46-acre Lien Fire in 2020, 560-acre McNey Fire in 2019, 230-acre Seaman Fire in 2018, 7,700-acre Hewlett Fire in 2012, and 8,900-acre Picnic Rock Fire in 2004 (**Figure 2.e.2)**. Other notable fires in LFPD include the 160-acre Halligan 1 Fire in 2022 and the 66-acre Roberts Ranch Fire, 49-acre acre Lone Pine Fire, and 300-acre Starwood Fire all in 2016.

Smaller fires break out across the district almost every year, but volunteer firefighters with LFPD and cooperating partners with other VFDs, LCSO, and the USFS often keep these fires to less than a couple of acres. The Stateline Fire started on March 21, 2026, in northern LFPD off Highway 287 and grew to about 2 acres. The fire was contained quickly by LCSO, LFPD, and Vedauwoo and Tie Siding Volunteer Fire Departments in Wyoming. The Sisters of Abbey of St. Walburga played a critical role in preventing the fire from growing out of control by providing firefighters with access to water sources on their property. The fire could have rapidly spread through grass into neighboring communities if not for the rapid response of firefighters in the area.



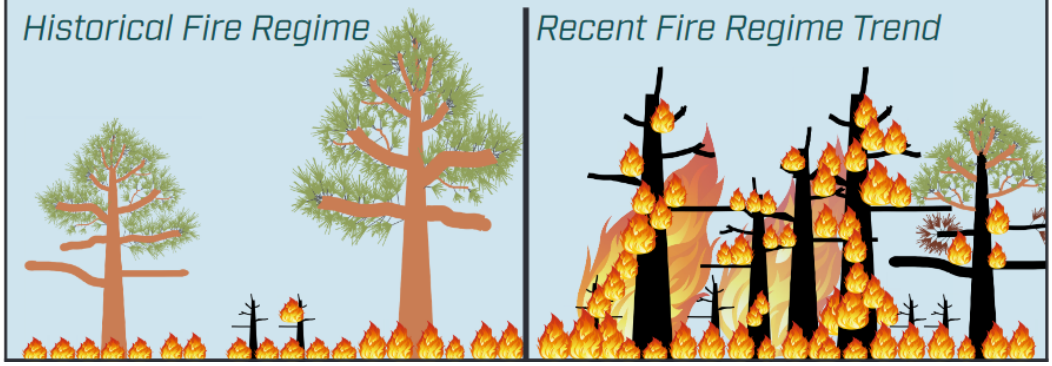
Tree densities have remained low in some ponderosa pine savannas areas (photos on left), but in other ponderosa pine and mixed-conifer forests, particularly north-facing slopes, tree densities are substantially higher today than they were historically in part due to fire suppression (photos on right). Photo credits: Norman Fry, Stan Case, and Dick Schumacher; source: Case 1995.

Ponderosa Pine Mixed Conifer (6,300-9,500 ft)

Fire Return Interval: 7-50 years (frequent)
Fire Severity: Low- to moderate severity, with some smaller patches of stand-replacing fire (where most or all trees die)

Species: Ponderosa pine, Douglas-fir, aspen, juniper, white fir, gamble oak

Ponderosa pine mixed conifer forests are fire dependent. Historically, fire burned across the forest floor, controlling tree regeneration, hardening mature trees, and leaving open spaces between trees. Human management activities (grazing, logging, fire suppression) have resulted in unnaturally dense forests. During extreme weather, high winds can easily spread fire between tree crowns, resulting in very large high-severity wildfires where most trees are killed. This is not always the case but is a trend that has occurred more frequently in this forest type in the last few decades.



Douglas-fir Mixed Conifer (6,000-9,500 ft)

Fire Return Interval: 20 to >100 years (semi-frequent)
Fire Severity: Moderate-severity with patches of stand-replacing fire
Species: Douglas-fir, ponderosa pine, lodgepole, aspen, white fir, occasional spruce, limber pine, gamble oak

Douglas-fir mixed conifer forests contain a diversity of tree species, many of which are not as fire tolerant as species in ponderosa pine mixed conifer forests. These forests also tend to be cooler and wetter than lower elevation ponderosa pine forests, and as a result do not burn as frequently. These forests are naturally denser than lower elevation forests, and when fire burns in these areas, patches of stand-replacing fire can be common.



Figure 2.e.1. *Fire behavior has changed for many ecosystems along the Front Range of Colorado, partially due to the suppression of wildfires for over a century. Source: Colorado Forest Restoration Institute (CFRI).*

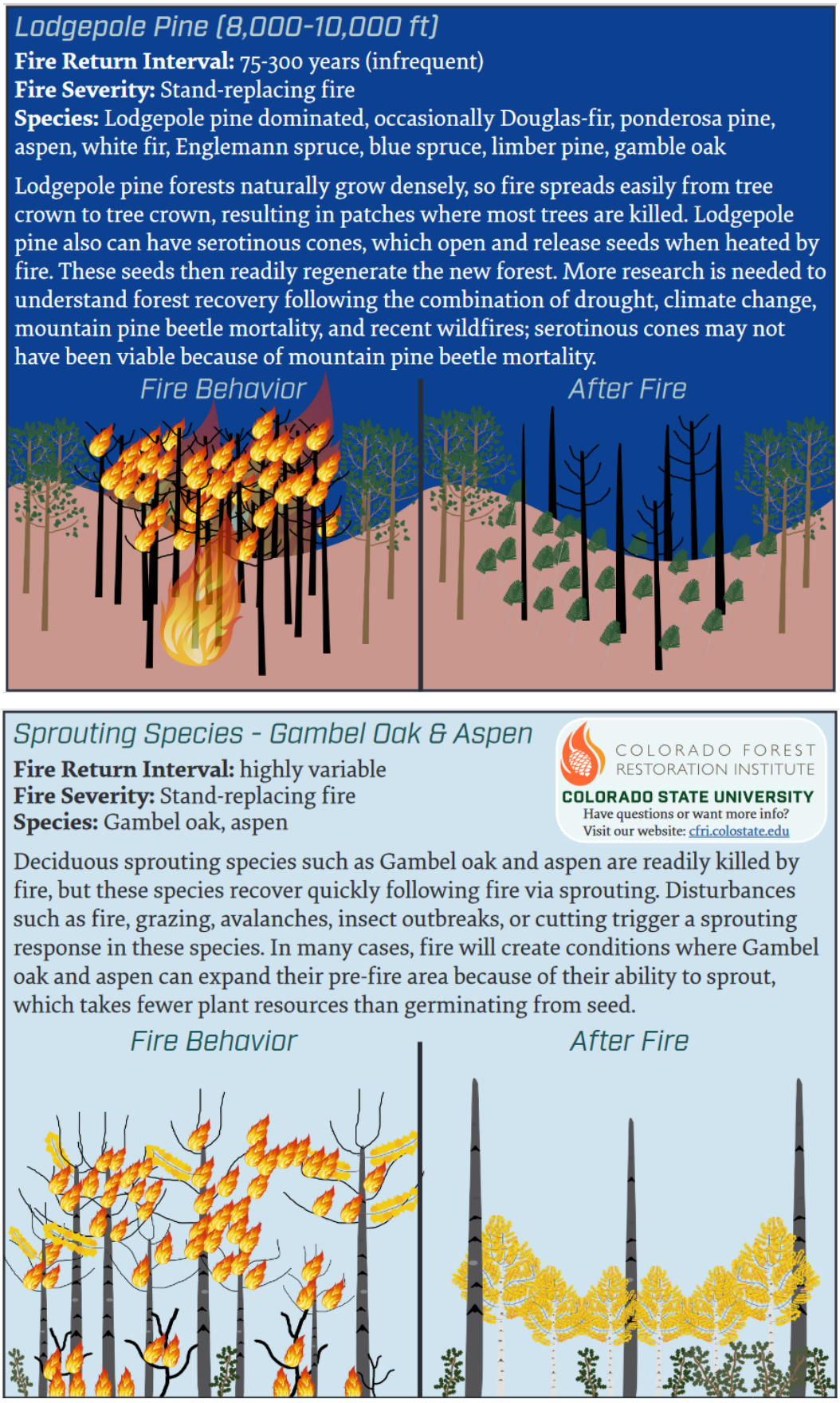


Figure 2.e.1. *(Continued). Other forests experienced more infrequent but high-severity wildfires in the past, and this fire behavior persists today. Source: CFRI.*

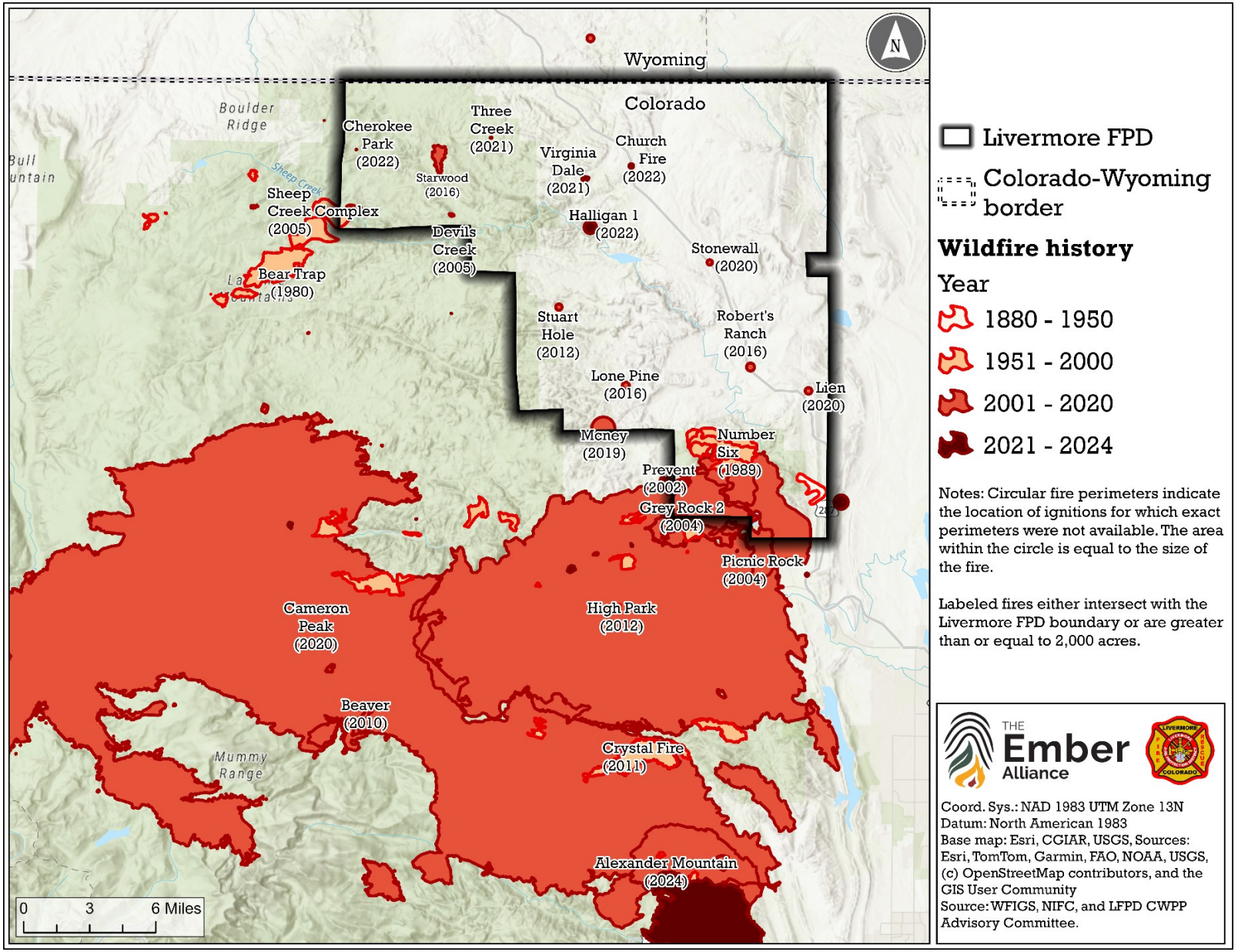


Figure 2.e.2. *Many significant wildfires have burned around the LFPD. While fires within LFPD have been small to date, there is a significant potential for large fire growth under hot, dry, and windy conditions. Sources: Wildland Fire Interagency Geospatial Services (WFIGS), National Interagency Fire Center (NIFC), and LFPD CWPP Advisory Committee.*

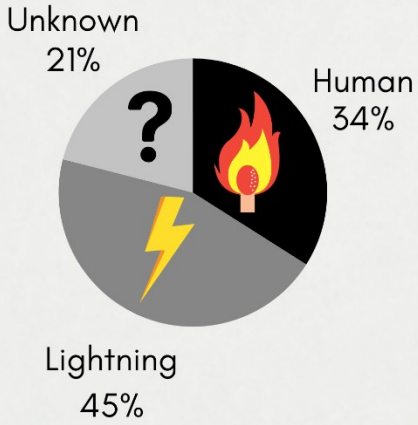
WILDFIRE IGNITIONS IN LFPD

FIRE IGNITIONS

Fire management agencies reported 188 ignitions within LFPD between 1992-2024 (average of 6/year). Some smaller fires are not reported to national datasets, so the actual number of ignitions each year is higher than this.

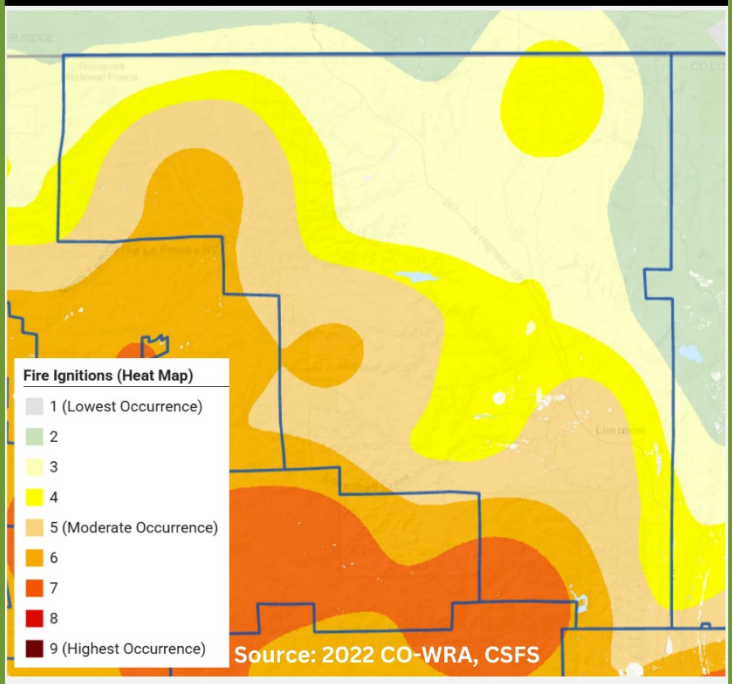
70% of ignitions were quickly extinguished at less than 2 acres

IGNITION CAUSES

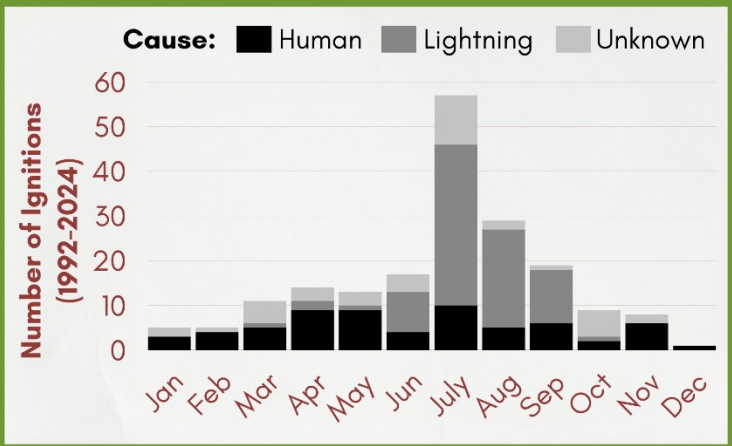


Lightning strikes were the most common known cause of fires. Human activities, such as accidental ignitions from vehicles, equipment, and campfires, caused at least a third of ignitions from 1992-2024.

IGNITION HOT SPOTS



Most ignitions occur to the west and south of LFPD. Within the district, the Poudre River Ranch and Cherokee Meadows Plan Units experience a moderate density of ignitions.



Sources: Ignition locations from the Fire Program Analysis fire-occurrence database, 6th edition (Short, 2022) and from NIFC. Ignition map from 2022 CO-WRA.

THE Ember Alliance

Most ignitions in the district occur July through September and at least a third of ignitions are human caused.

2.f. Potential for Extreme Fire Behavior and Exposure in LFPD

Many neighborhoods in the LFPD could experience extreme fire behavior that could put the lives of residents, visitors, and firefighters at risk. Steep slopes, dense forests, limited road access in and out of neighborhoods, and flammable building material contribute to this dangerous situation. **There is an immediate need for this community to undertake proactive measures to mitigate wildfire risk to protect lives and property. Implementing recommendations in this CWPP will go a long way towards helping LFPD become a fire adapted community.**

Potential Fire Behavior

Under extreme fire weather conditions—hot, dry, and windy conditions typical of red flag days—78% percent of LFPD could experience high to extreme fire behavior (**Figure 2.f.2**). High to extreme fire behavior includes ember production that ignites additional fires away from the main fire and the movement of high-intensity fire from treetop to treetop. Such fires are extremely challenging if not impossible to control until winds die down and fuel moistures increase. Fire growth could be extensive across LFPD if wildland firefighters cannot engage due to dangerous conditions from extreme fire behavior and if wildland fire moves rapidly through shrublands and grasslands.

Potential fire growth and spread are strongly affected by the initial location of a fire ignition, wind speed and direction, topography, alignment of wind patterns and topography, and fuels in the pathway of the fire. If wind is pushing wildfire up a steep slope, it can result in more extreme fire behavior than if a fire is backing down the leeward side of a slope.

Topography and fuel conditions are highly variable across LFPD (**Figure 2.f.1**), leading to high variation in potential fire behavior. The greatest potential for extreme fire behavior within LFPD is concentrated in the western portions of the district, where there are dense forests on steep slopes with lots of ladder fuels. The southeastern portion of the district is expected to have more moderate fire behavior, such as running surface fire with lower flame lengths, due to lower fuel densities and flatter terrain. Large, uninterrupted grasslands and rangelands across the northeastern part of LFPD could experience running surface fires with high flame lengths, particularly during high-wind events. The 2026 Morrill Fire in Nebraska demonstrated how quickly wildfires can spread across dry grasslands, pastures, and croplands, growing to 330,000 acres within the first day of the fire and reaching a total of 642,029 acres across 13 days of burning.

Important Considerations about Fire Behavior Predictions

Fire behavior models can provide reasonable estimates of relative wildfire behavior across a landscape. However, wildfire behavior is complex, and models are a simplification of reality. Models also struggle to capture impacts of structures on wildfire spread and home-to-home ignitions. It is recommended to use fire behavior analyses at a landscape scale to assess relative risk across the entire district.

Exceptionally hot, dry, and windy conditions are increasingly common due to climate change and could result in even more extreme fire behavior across LFPD than predicted by this analysis.

See Appendix B for details on fire behavior modeling used for this CWPP.



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Figure 2.f.1. *Fuel loads are variable across LFPD, ranging from dense forests with abundant ladder fuels (top) to open grasslands and rangelands with scattered shrubs (bottom). Fuel type and fuel loads greatly influence fire behavior, intensity, and rate of spread. Photo credits: TEA.*

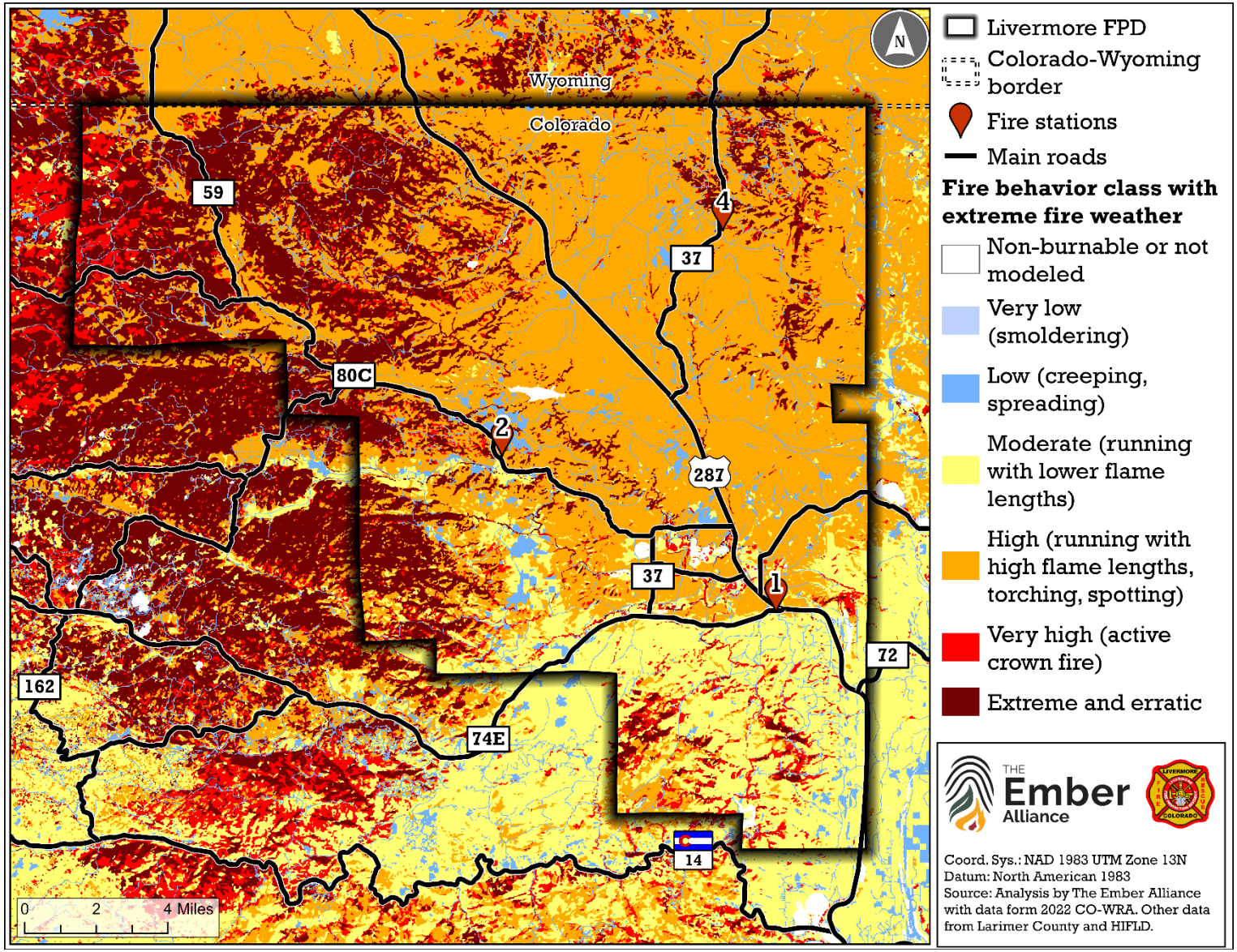


Figure 2.f.2. *Under extreme fire weather conditions, 78% percent of the district could experience high to extreme fire behavior that could produce embers that ignite additional fires away from the main fire and ignite homes. Such fires are extremely challenging if not impossible to control until winds die down and fuel moistures increase. Source: 2022 CO-WRA, Larimer County GIS, CDOT, TIGER/Line, HIFLD, and Analysis by TEA. See* ***Appendix B*** *for a description of fire behavior modeling for this CWPP.*

Likelihood of Wildfire

Wildfire risk is composed of hazard (potential intensity of wildfire and likelihood of wildfire) and vulnerability (exposure of highly valued resources and their susceptibility to damage). Burn probability is the annual probability of any location burning due to a wildfire. According to the 2022 Colorado Wildfire Risk Assessment (CO-WRA) from the CSFS, much of LFPD has high burn probability relative to the state of Colorado.

High burn probabilities occur in much of LFPD due to the potential for very high to extreme rates of fire spread across steep, complex terrain covered in dense coniferous forests with abundant ladder fuels in the west, and very high rates of spread in open, grassy areas to the east and north. Winds in LFPD are higher than many parts of Colorado, leading to the potential for large fire growth (**Figure 2.f.3**). Lower burn probabilities are predicted east of Highway 287 due to the potential for major roads to serve as fuel breaks under moderate fire weather conditions.

Another metric of the likelihood of wildfires is the frequency of days with weather conducive to large-scale fire growth, and LFPD frequently experiences days with weather conducive to this type of fire behavior. Factors such as low humidity, high temperatures, steep terrain, and strong winds contribute to this risk. Days with red flag warnings indicate severe fire weather and require extra vigilance by fire districts and residents. The occurrence of red flag warnings is highly variable from year to year due to regional weather patterns and weather anomalies such as El Niño and La Niña. On average, LFPD experiences 14 days per year of weather conditions that qualify as red flag warnings, with as many as 32 days of red flag warnings in 2012. Climate change could result in about 8 to 13 more days of very high fire danger by 2050, depending on emissions and future conditions (**Figure 2.f.4**).

Take Away Message

Parts of the district are at high risk for large, high-severity wildfires due to dense forest conditions, dry and hot weather, and strong, gusty winds. Increasing drought and warming temperatures exacerbate wildfire risk in the area. **Proactive work by LFPD, partners, and residents is imperative to protect lives and property.**



A large air tanker drops retardant during the 2020 Cameron Peak Fire on August 27, 2020. Photo credit: NWCG InciWeb.

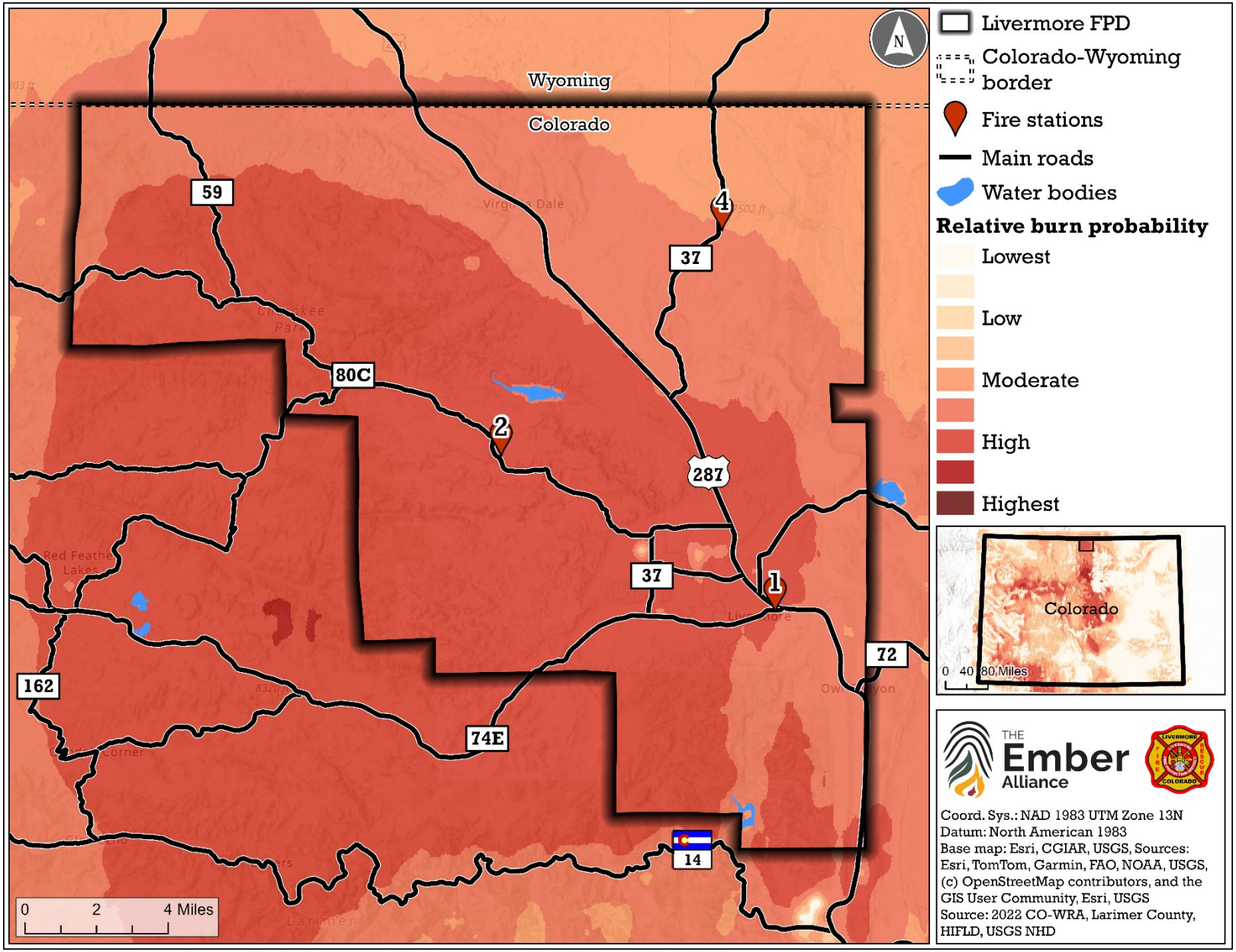


Figure 2.f.3. *Most of LFPD falls into the high burn probability category relative to the state of Colorado. Source: 2022 CO-WRA from CSFS. See* ***Appendix B*** *for a description of fire behavior modeling for this CWPP.*

FIRE WEATHER DANGER IN LFPD

During Red Flag Warnings, all residents need to follow fire restrictions and be prepared to evacuate in the case of a wildfire.

RED FLAG CRITERIA

Red Flag Warnings issued by the National Weather Service indicate that warm temperatures, very low humidity, and stronger winds are expected to result in elevated fire danger in the next 24-48 hours.

LFPD falls within the Denver/Boulder Forecast Office, which has two options for Red Flag criteria:

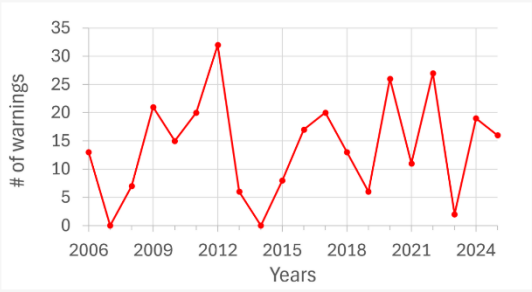
Option 1	Option 2
Relative humidity <= 15% Wind gusts >= 25 mph Dry fuels	Widely scattered dry thunderstorms Dry fuels

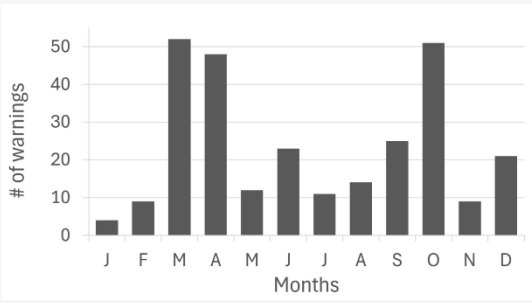
Large wildfires (> 2000 acres) around LFPD that occurred during Red Flag Warnings:

2020 Cameron Peak
2012 High Park
2011 Crystal Fire

WARNINGS FROM 2006-2025

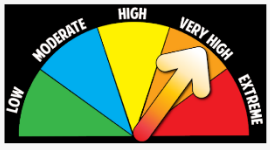
The National Weather Service issued on average 14 Red Flag Warnings/year for LFPD, with as many as 32 in 2012. Red Flag conditions most often occurred in March, April, and October.





CLIMATE CHANGE MEANS MORE FIRE DANGER AHEAD

Hotter and dryer conditions due to climate change could result in 8-13 more days/year with very high fire weather danger in LFPD by 2050.



National Fire Danger Ratings are separate from Red Flag Warnings but use similar indicators of severe fire weather.

BE INFORMED ABOUT COUNTY FIRE RESTRICTIONS

Permissible activities are limited during fire restrictions to protect the community.
USFS: https://www.fs.usda.gov/r02/arp/alerts/fire-restrictions
Larimer County: https://larimercounty.gov/safety/fire/fire-restrictions/

THE Ember Alliance

Sources: Historic Red Flag Warnings from Iowa Environmental Mesonet at Iowa State University. Future fire danger from https://climatetoolbox.org.

Figure 2.f.4. *LFPD experiences on average 14 red flag warnings per year, and climate change could further increase the number of days with high fire weather danger. Sources: Historic Red Flag Warnings from Iowa Environmental Mesonet at ISU, The Climate Toolbox, National Interagency Fire Center (NIFC). Infographic by TEA.*

Potential Consequences to the Community

There is a high potential for wildfire to negatively impact life safety, homes, businesses, and other highly valued resources and assets (HVRAs) in LFPD. On days with extreme fire weather conditions, 80% of structures in LFPD could experience damaging radiant heat from burning vegetation, and 56% of structures could be exposed to embers from burning vegetation, regardless of vegetation in the immediate vicinity of the home[2] (**Figure 2.f.6**). Many structures in LFPD are surrounded by grasslands and rangelands, and these vegetation types can support fast moving wildfires with high flame lengths during days with extreme weather conditions. In fact, wildfires in grasslands and shrublands destroy more homes in the WUI than wildfires in forests across the United States (Radeloff et al., 2023).

Homes and other structures can act as additional fuel sources, intensifying fire behavior and contributing to ember cast and potential structure-to-structure ignition. However, homes across much of LFPD are widely spaced, so the potential for structure-to-structure ignition is lower than densely developed parts of the Colorado Front Range. This CWPP outlines home hardening practices that residents and business owners can complete to reduce the risk of embers penetrating their homes.

Several non-residential HVRAs and CVARs could be exposed to damaging wildfire, including Livermore Fire Stations #2 and #4, Livermore Post Office, Livermore Elementary School, Abbey of Saint Walburga, Virginia Dale Church, numerous historic sites, and many important communication towers (**Figure 2.f.7**). See **Appendix B** for a description of methodology and details on exposure for each HVRA. Fuel treatments and other recommendations in this CWPP seek to reduce this exposure and protect critical resources in the district.

Relationship Between CWPPs and Insurance Decisions

Insurance companies do **not** use CWPPs or the analyses within this document—including wildfire modeling, evacuation mapping, or roadway survivability analysis—to determine insurance eligibility, pricing, or coverage. Insurers rely on their own proprietary risk models and data systems, which do not incorporate local plans or community-specific analyses.

In 2025, Colorado passed legislation (HB25-1182) requiring insurance companies to be more transparent about how they assess wildfire risk, improving understanding of insurance decision-making.

The information in this CWPP is intended to support local planning, preparedness, and wildfire mitigation efforts, not insurance determinations.

While it is always a good idea to invest in defensible space and home hardening for residents in the WUI, it is equally important to understand the limitations these steps have in certain environments. Relying on those actions or expecting the fire district to be able to protect your home and family is naïve in these extreme danger scenarios. Major coordinated action across the community is needed to make conditions safer for everyone.

Evacuation preparedness is of the utmost importance for residents in neighborhoods with hazardous conditions along roadways (see **Section Evacuation Preparedness**). Roads lined closely with dense, tall vegetation can create conditions that are dangerous to evacuees during extreme fire weather and may be unpassable during a wildfire event—roads such as these are referred to as potentially non-survivable in this CWPP. High to extreme fire behavior can create these non-survivable conditions along roadways, which is of particular concern in LFPD where there are few points of egress for evacuations. Under extreme fire weather conditions, 15% of roadways in LFPD could experience potentially non-survivable conditions (**Figure 2.f.5**).

Impacts of wildfires do not end once the flames are extinguished. Intense rainfall events can result in flash floods, erosion, sediment delivery and debris flows the first few years following a wildfire (Neary et al., 2005). It is very

[2] **Note:** This analysis looks at exposure of structure, meaning if they could be exposed to radiant heat and/or embers, but it does NOT look at vulnerability, meaning the likelihood a structure would be damaged if exposed to radiant heat and/or embers. We do not have data on the construction material of each structure and the vegetation within each structure's HIZ—data that would be necessary to predict structure vulnerability. See Appendix B for more details on methodology.

possible that a large storm in the years following a high-intensity wildfire in the district could result in high to extreme sedimentation.

Erosion and sedimentation are natural processes that shape streams, transport soil and nutrients across a landscape, and create diversity in streams and riparian habitats (Prettyman, 2018). However, extreme post-fire sediment delivery and debris flows can damage and destroy homes, community assets, infrastructure, fisheries, and riparian vegetation. For example, changes to soil and vegetation brought about by the 2012 High Park Fire exacerbated the degree of flooding experienced in the Poudre Canyon which resulted in the destruction of roads and bridges as well as significant amounts of ash, sediment, and debris deposited in the Cache la Poudre River threatening water quality for the greater Fort Collins area.

The potential for post-fire sediment delivery and damage to values at risk can be mitigated through activities to improve stream health and resilience, strategic fuel treatments to reduce fire hazards, and pre-planning for emergency response. A study in the upper portions of the Cache la Poudre and Big Thompson Watersheds found that strategic fuel treatments, including prescribed burning, can reduce wildfire risk to water supplies. Treatments should be targeted in dense, fire-prone forests on steep slopes that drain to water supply infrastructure such as reservoirs. This study found that benefits of treatments outweight the cost of treatments – it is usually more expensive to address damages from post-fire sedimentation to water quality and water supply infrastructure than to proactively reduce potential fire occurrence, spread, and severity (B. M. Gannon et al., 2019). These considerations were incorporated into the **Implementation Recommendations for Fuel Treatments and Ecological Resilience Section**.

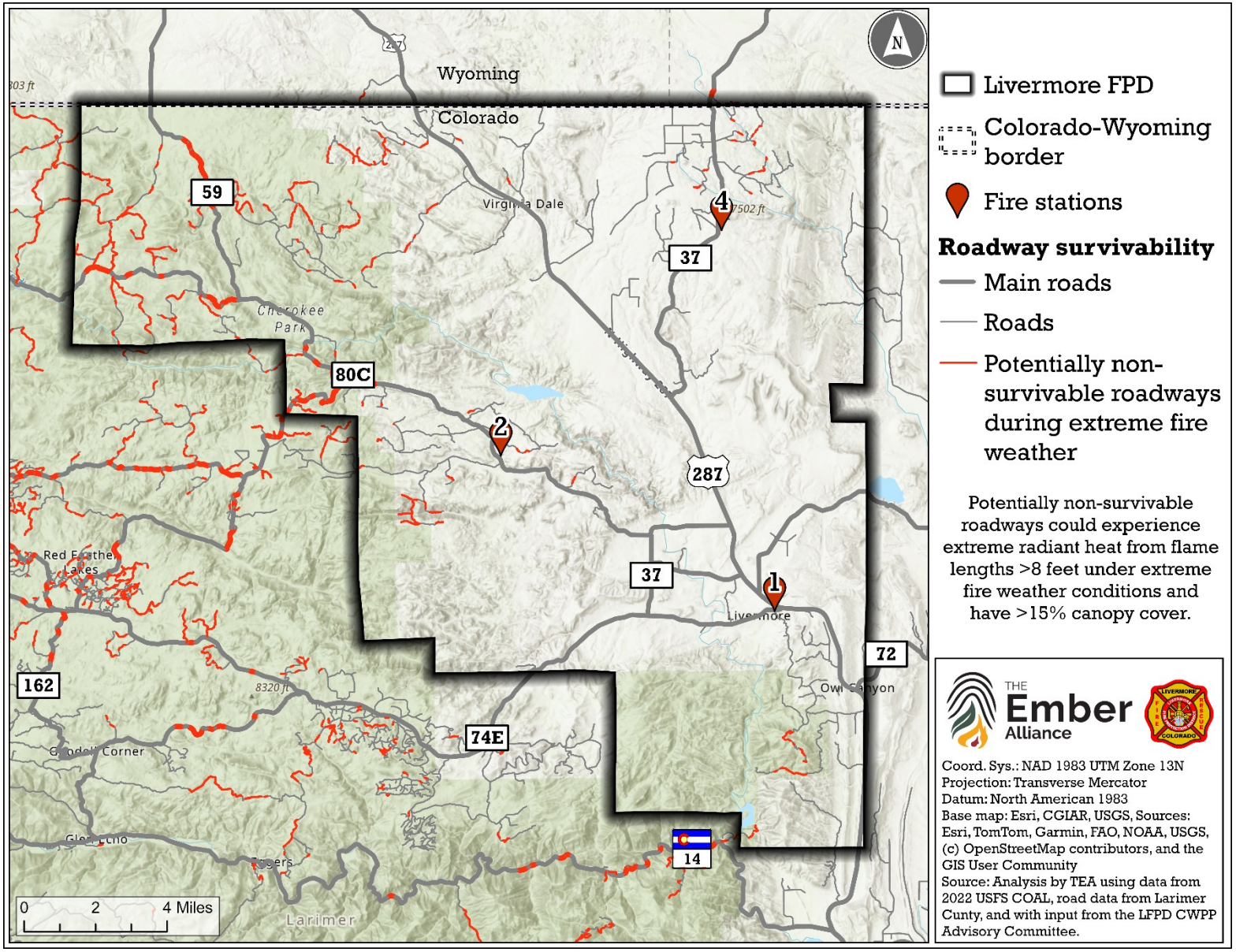


Figure 2.f.5. Under extreme fire weather conditions, 15% of roadways in LFPD could experience potentially non-survivable conditions during wildfires burning under extreme conditions. Non-survivable roadways could experience extreme radiant heat from >8-foot flame lengths and have >15% canopy cover. Source: Analysis by TEA using the 2022 COAL for the USFS and with feedback from the LFPD CWPP Advisory Committee. See Appendix B for methodology.

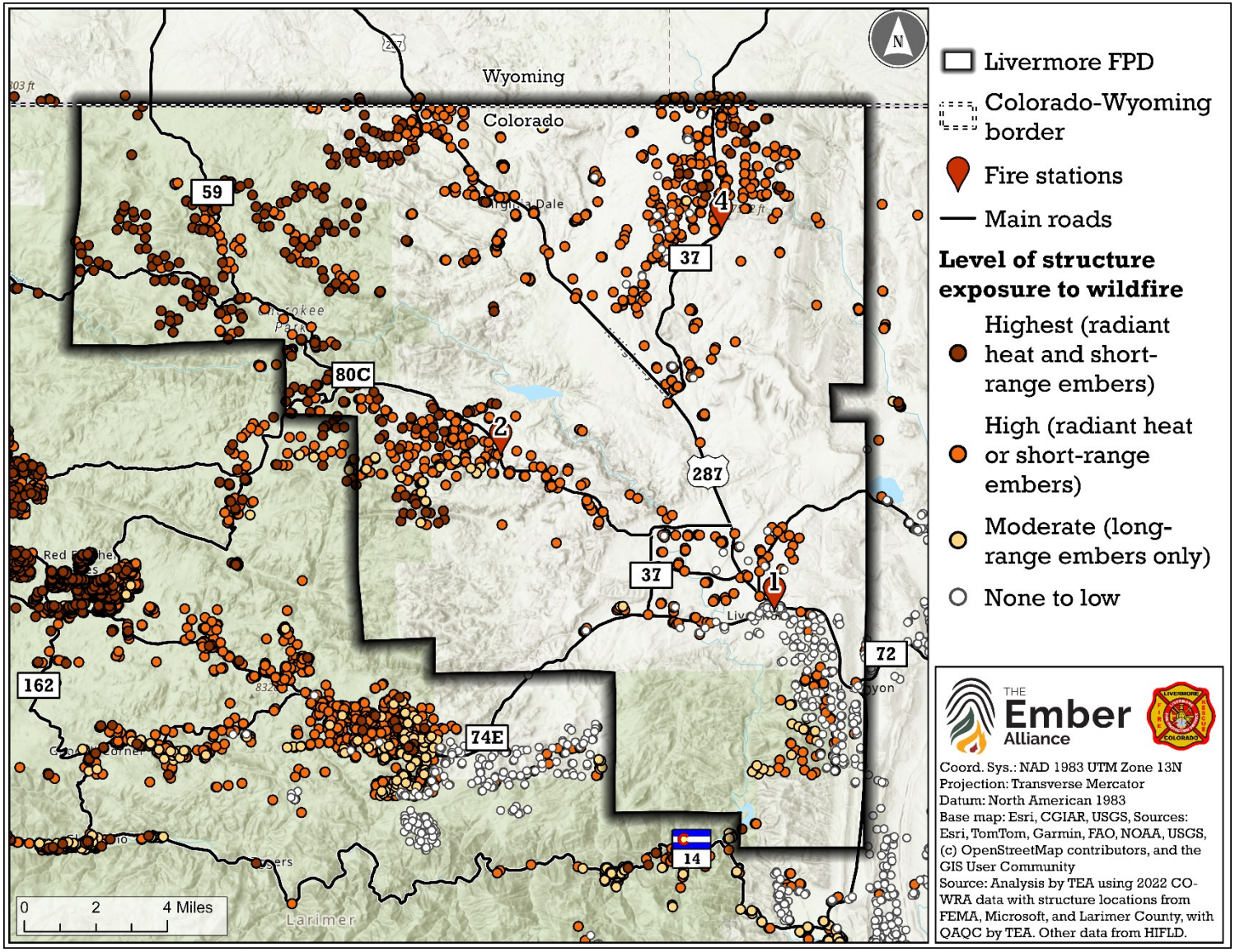


Figure 2.f.6. *Under extreme fire weather conditions, 80% of structures in LFPD could experience damaging radiant heat from burning vegetation, and 56% of structures could be exposed to embers from burning vegetation. This analysis does not consider the vulnerability of structures to ignition because data on construction materials and vegetation in the HIZ are not available for all structures. Source: Analysis by TEA using the 2022 CO-WRA dataset from CSFS, structure locations from FEMA, Microsoft, and Larimer County GIS. See* ***Appendix B*** *for methodology.*

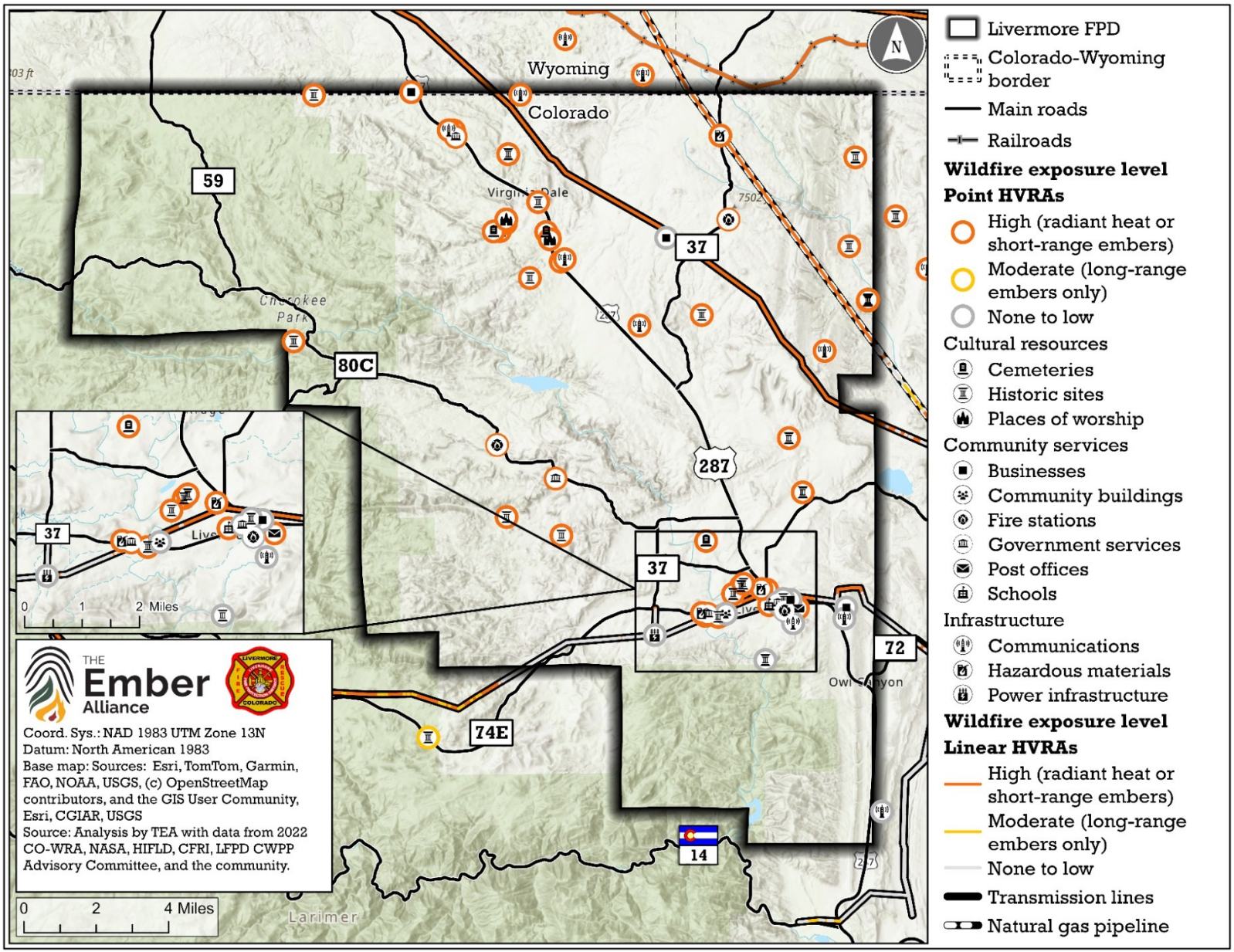


Figure 2.f.7. *Predicted exposure of highly valued resources in and around LFPD. This analysis looks at exposure to wildfire, not the vulnerability of HVRAs to ignition. Source: Analysis by TEA using output from the 2022 CO-WRA. HVRA data from NASA, HIFLD, CFRI, LFPD CWPP Advisory Committee, and community members. See* ***Appendix B*** *for a description of methodology and details on exposure for each HVRA.*

Potential Benefits of Wildfire

Keep in mind that not all wildfire is damaging and destructive. Many ecosystems along the Colorado Front Range have been shaped by wildfire for centuries and some ecosystems are dependent upon frequent, low-intensity fires. Wildfire creates important habitat for wildlife by killing trees, which are often used by cavity-nesting animals, and promoting the growth of native grasses and wildflowers. Areas burned by wildfires can serve as fuel breaks for decades afterwards and reduce the potential for damaging wildfire both in the burned area and surrounding landscape (Parks, Miller, Holsinger, et al., 2016).

According to an analysis by the Northern Colorado Fireshed (NCFC), wildfire and/or broadcast prescribed burning could benefit portions of LFPD by restoring ecological conditions and reducing fuel loads (Rhea et al., 2022). Beneficial fire (positive expected net value change) is more likely in areas without homes, where expected fire behavior is low to moderate, and where ecosystems are more likely to benefit from wildfire (**Figure 2.f.8**). Ponderosa pine ecosystems are very likely to benefit from lower-severity fire but could experience negative impacts from wildfires with higher-severity conditions. Higher severity wildfires in other parts of LFPD can threaten homes, damage habitat for some sensitive species of wildlife, such as the Preble's meadow jumping mouse, and reduce water quality if post-fire flooding and sedimentation occurs.

Fuel treatments are prioritized as part of this CWPP in the **Implementation Recommendations for Fuel Treatments and Ecological Resilience Section** and are intended to reduce potential negative consequences to ecosystems and wildlife while also creating forest conditions that are more resilient to wildfire. Forests with lower tree densities and more open grassy areas can benefit from low- to moderate-severity wildfire and broadcast prescribed burning. Proactive management, including prescribed burning, can support LFPD's journey towards fire adaptation and coexisting with wildfire.

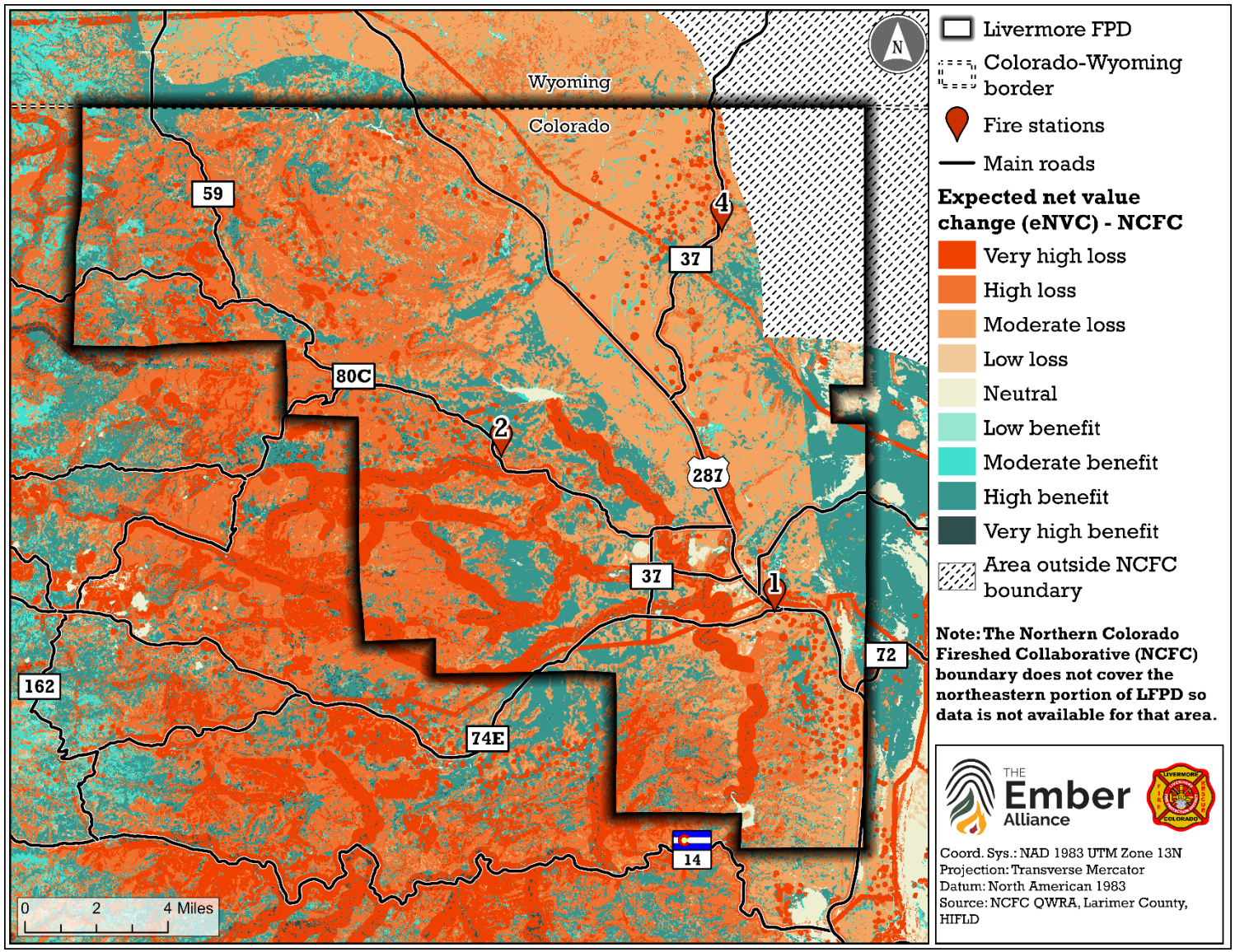


Figure 2.f.8. According to an analysis for the 2022 NCFC QWRA, beneficial fire is more likely in areas without homes or critical infrastructure, where there is less importance for surface drinking water, ecosystems are more adapted to wildfire, and expected fire behavior is moderate. The analysis considered potential fire behavior, likelihood of wildfire, exposure of values at risk, relative importance of values, and sensitivity of values to different types of fire behavior. The footprint of the Northern Colorado Fireshed does not encompass all LFPD, so predictions were not available for the northeastern corner of the district. Source: 2022 Northern Colorado Fireshed QWRA (Rhea et al., 2022). See ***Appendix B*** *for methodology.*

3. Becoming a Fire Adapted Community

It is recommended that residents and community associations within LFPD embrace the concept of Fire Adapted Communities (FAC), which is defined by NWCG as "a human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire." This concept can guide residents, fire practitioners, and communities through a holistic approach to become more resilient to fire (**Figure 3.1**).

Your community's CWPP sets the stage for fire adaptation, and the next step is on-the-ground action and an ongoing commitment to risk mitigation at all levels of the community, from individuals to neighborhoods and community associations, to LFPD, land managers, agencies, and other partners. This section of the CWPP includes recommendations and resources for mitigating wildfire risk and enhancing emergency preparedness. LFPD and public land managers have an important role to play in implementing the recommendations in this CWPP, and they have made commitments to take on-the-ground action as outlined in the **Implementation Recommendations for Fuel Treatments and Ecological Resilience Section.**

Individual homeowners, neighborhoods, and community associations also have a vital role to play in addressing shared wildfire risk. Action and community-building centered around mitigation have reduced wildfire risk and increased community resilience across the mountain west. Mitigation work by residents can spur mitigation by their neighbors (Brenkert-Smith et al., 2013). The cumulative impact of **Linked Defensible Space** across private properties can improve the likelihood of home survival and protect firefighters during wildfire events (Jolley, 2018; Knapp et al., 2021).

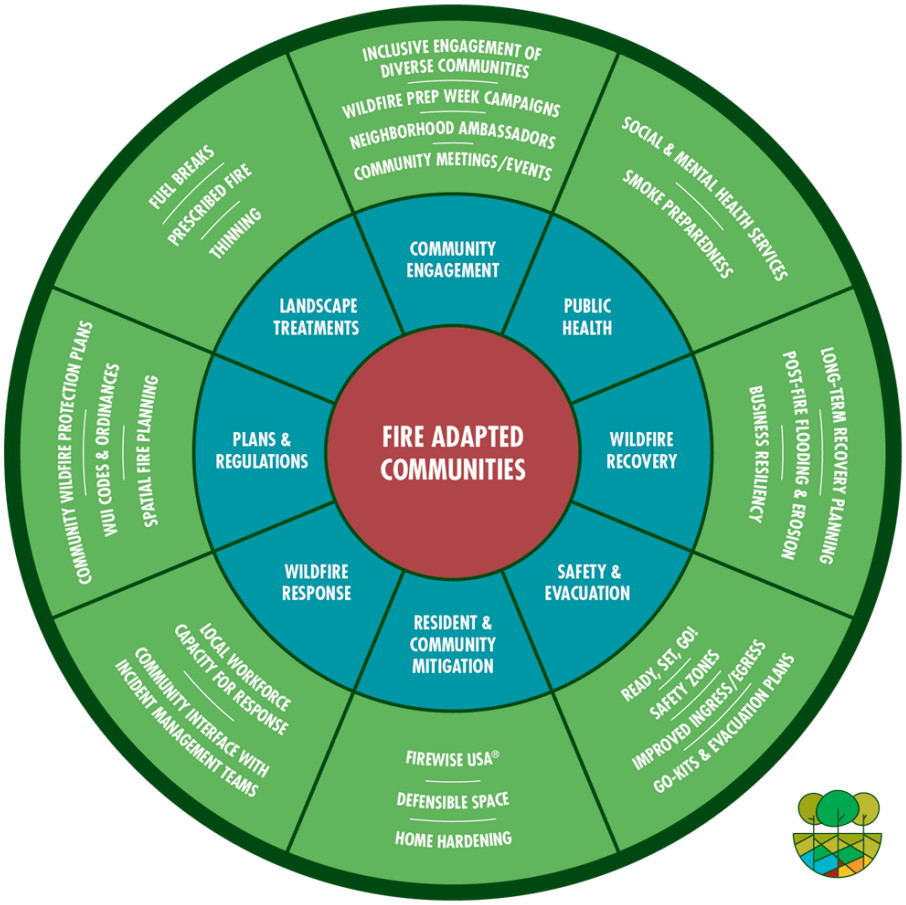


Figure 3.1. *The Fire Adapted Communities graphic provides specific programs and activities that communities can take to reduce their wildfire risk and increase their resilience Source: Fire Adapted Community Learning Network.*

3.a. Recommendations for Residents

Mitigate the Home Ignition Zone

During catastrophic wildfires, property loss happens mostly due to conditions in the home ignition zone (HIZ). The HIZ includes your home and other structures (e.g., sheds and garages) and the area within 100 feet of each structure. Firefighter intervention, adequate defensible space, and home hardening are common factors for homes that stand strong during major wildfires (IIBHS, 2019; Knapp et al., 2021; Maranghides et al., 2022).



You can increase the likelihood that your home will stand strong during a wildfire and help protect the safety of firefighters by creating defensible space, replacing or altering building materials to harden your home, and increasing firefighter access along your driveway.

It is important for residents to work together as a community to mitigate shared wildfire risk in the HIZ. Structure-to-structure ignition is a major concern in WUI neighborhoods and can cause substantial property loss. For example, 99% of the 848 structures that were exposed to direct flame contact during the 2021 Marshall Fire were within 100 feet of another structure, and 78% were within 30 feet (Holstrom et al., 2023). Neighbors can increase their homes' chances of survival during a wildfire if they work together to reduce hazards in their overlapping defensible space. The wildfire resiliency code approved by Larimer County deemed all of unincorporated Larimer County as WUI due to the history of and potential for large, destructive wildland fires.

Home hardening is the practice of making a home less likely to ignite from the heat or direct contact with flames or embers. It is important to remember that embers can ignite homes even when the flaming front of a wildfire is far away. Home hardening involves reducing structural ignitability by changing building materials, installation techniques, and structural characteristics of a home. Home hardening measures are particularly important for WUI homes; 50 to 90% of homes ignite due to embers rather than radiant heat during wildfires (Gropp, 2019; Holstrom et al., 2023; Johnston, 2018).

Defensible space is the area around a building where vegetation, debris, and other types of combustible fuels have been treated, cleared, or reduced to slow the spread of fire and reduce exposure to radiant heat and direct flame. It is encouraged that residents develop defensible space so their homes can stand strong during a wildfire without relying upon limited firefighter resources.

Defensible space and home hardening are important for all residents across LFPD whether the vegetation around their homes are dominated by forests, shrublands, or grasslands. Many homes are surrounded by grasslands and ungrazed rangelands, and tall grass can support fast moving wildfires with high flame lengths during days with extreme weather conditions. In fact, wildfires in grasslands and shrublands destroy more homes in the WUI than wildfires in forests across the United States (Radeloff et al., 2023).

Wildfire Risk Reduction Requirements in Larimer County

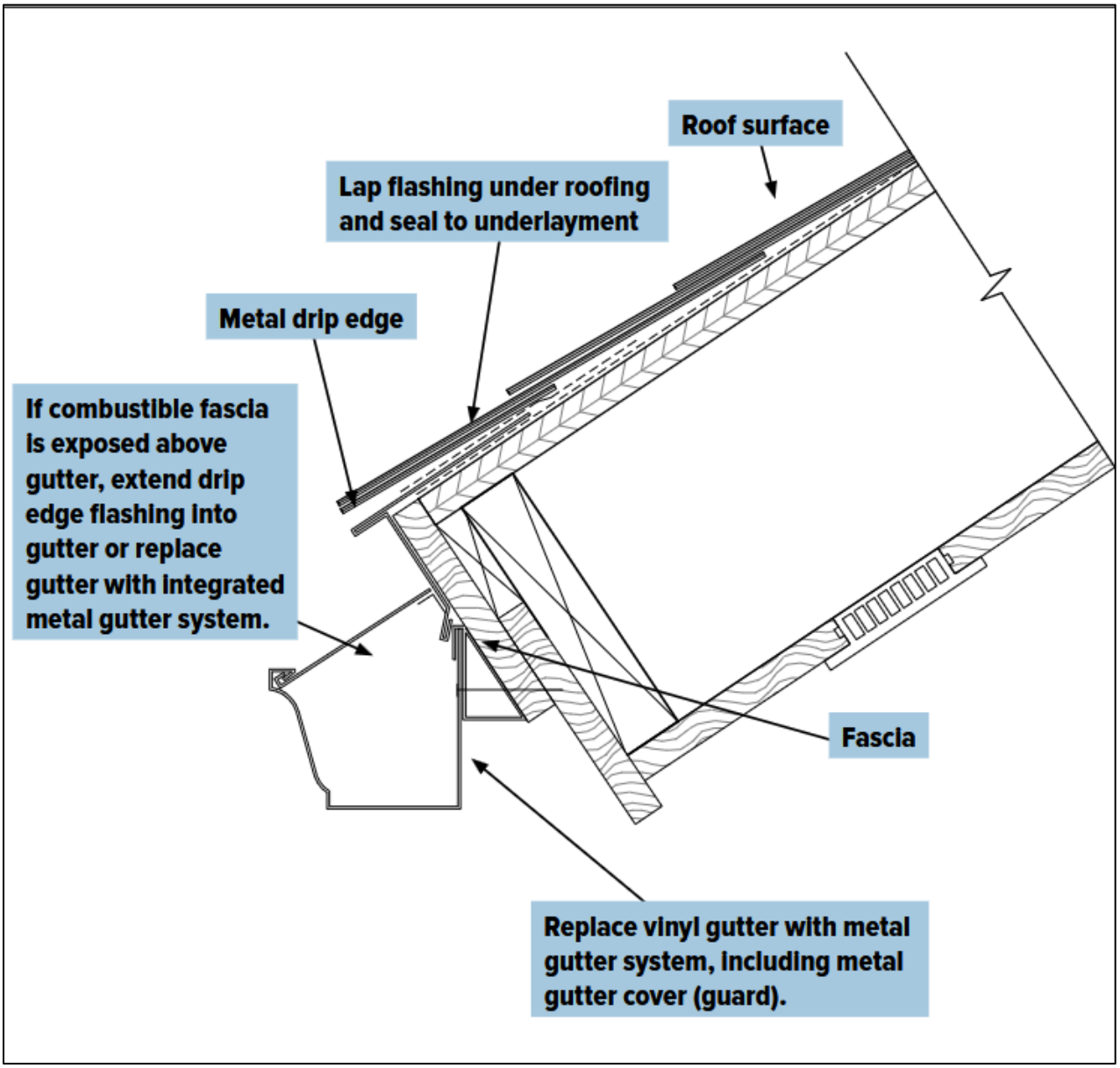
Effective January 2026, Larimer County approved a wildfire resiliency code which establishes minimum regulations to protect life and property from wildfire exposure in WUI areas of Larimer County. This code supplements existing building and fires codes, and applies to construction, alteration, movement, repair, maintenance, and use of any building or structure with occupiable/habitable space within designated wildfire hazard areas.

Components of the code include structure hardening and defensible space requirements, as well as permitting and enforcement. The Larimer County code adopts and amends the 2025 Colorado Wildfire Resiliency Code (CWRC), formalizing wildfire risk mitigation as part of the development and permitting process.

Home Hardening

Buildings cannot be made fireproof, but the chance of your home standing strong during wildfires increases when you create and maintain defensible space and reduce structural ignitability of your home through home hardening. Research from the Insurance Institute for Business & Home Safety (IIBHS) clearly illustrates the benefits of home hardening for reducing the chance of home ignition from embers. During the Marshall Fire, embers were responsible for 70% of recorded structure damage – the other 30% of structures were damaged from direct flame contact (Holstrom et al., 2023). Home hardening is the only defense against embers.

Within LFPD, 56% of the homes are at risk of long-range embers, and 80% are at risk of radiant heat from burning vegetation under severe fire weather conditions. Building density is generally low across LFPD, but there are some densely populated areas with a greater risk of structure-to-structure ignition. Reducing the ability of embers to penetrate and ignite your home is recommended for everyone in the district.



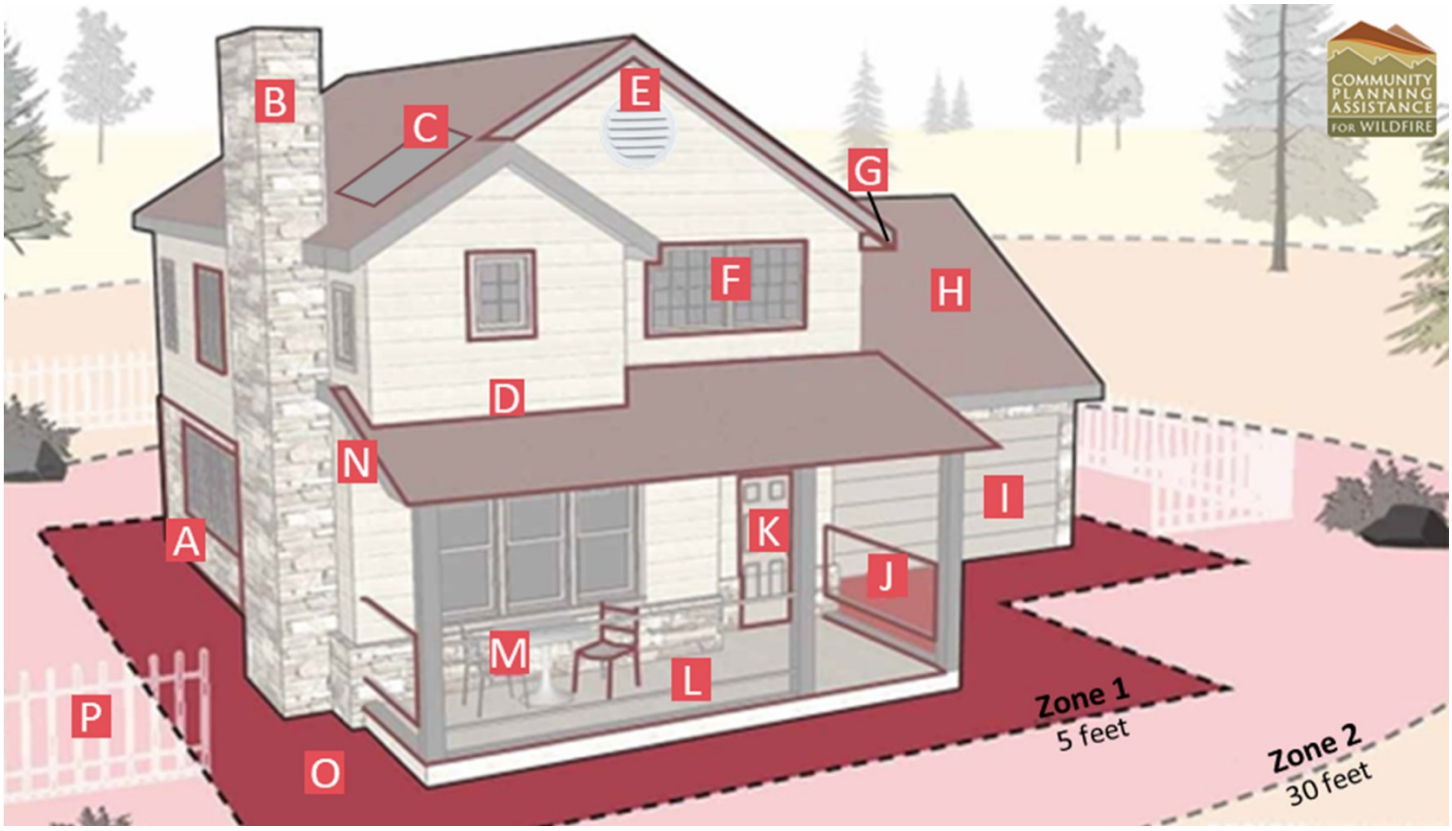
Residents can increase their homes' chance of survival by making it harder for embers to enter and ignite their homes (image from Headwaters Economics).

Roofs, siding, decks, windows, vents, and gutters are particularly vulnerable to embers from wildfire, and actions that prevent embers from penetrating your home can offer additional benefits such as reduced maintenance costs, greater durability, and increased energy efficiency:

- **Roofs** should be made of noncombustible materials[3] such as composite, metal, or tile, which tend to be more durable against wind, snow, and hail as well as wildfire.
- **Siding and decking** should be made of ignition-resistant or noncombustible materials, which is particularly effective when homes also have a 5-foot noncombustible border of dirt, stone, or gravel around them. Non-wood siding and decking are often more durable and require less routine maintenance than traditional wood.
- **Multi-pane windows** have greater resistance to radiant heat and provide better insulation and energy efficiency for your home. Windows often fail before a home ignites, providing a direct path for flames and airborne embers to enter a home (CSFS, 2021).
- **Enclosed eaves and vent screens** reduce the penetration of wind-born embers into structures, and can deter pests and critters from nesting in your home's vents and eaves (Hakes et al., 2017; Syphard & Keeley, 2019).
- **Fences** should be made of noncombustible materials and kept at least 8 feet away from the home (at least 20 feet away for double combustible fences). Fences can serve as pathways for wildfire to travel between vegetation and structures and from structure to structure (Maranghides et al., 2022). Wooden fences attached to homes served as one of the leading causes of home loss during the Marshall Fire (Holstrom et al., 2023). Ignition-resistant and noncombustible fences are more durable and require less maintenance than wood fences.

There are many low-cost actions you can start with to harden your home (**Figure 3.a.1**). Keep home-hardening practices in mind and use ignition-resistant materials if you replace a hail-damaged roof or remodel your home.

[3] See the **Glossary** for the definition of terms used the describe the performance of building materials when exposed to fire (e.g., wildfire-resistant, ignition-resistant, and noncombustible).



Low-cost actions:

B. Cover chimneys and stovepipe outlets with 3/8 to 1/2 inch corrosion-resistant metal mesh.

C. Minimize debris accumulation under and next to solar panels.

E. Cover vent openings with 1/16 to 1/8 inch corrosion-resistant metal mesh. Install dryer vents with metal flappers and keep closed when not in use.

G. Clear debris from roof and gutters regularly.

I. Install metal flashing around and under garage doors that goes up at least 6 inches inside and outside the door.

J. Use noncombustible lattice, trellis, or other decorative features.

K. Install weather stripping around and under doors.

L. Remove combustible materials from underneath, on top of, or within 5 feet of deck.

M. Use noncombustible patio future.

N. Cover all eaves with screened vents (as appropriate).

O. Establish and maintain a 5-foot noncombustible buffer around the home.

Actions to plan and save for:

A. Use noncombustible or ignition-resistant siding and trim (e.g., stucco, fiber cement, fire-retardant treated wood) at least 2 feet up around the base of your home.

C. Use multipaned glass for skylights, not materials that can melt (e.g., plexiglass), and use metal flashing.

D. Install a 6-inch vertical noncombustible surface on all gables above roofs.

F. Install multi-pane windows with at least one tempered-glass pane and metal mesh screens. Use noncombustible materials for window frames.

G. Install noncombustible gutters, gutter covers, and downspouts.

H. Install ignition-resistant or noncombustible roofs.

I. Install 1-hour fire rated garage doors.

K. Install 1-hour fire rated front and back doors.

L. Use ignition-resistant or noncombustible decking. Enclose crawl spaces.

N. Use noncombustible eaves.

P. Replace wooden fences with noncombustible materials and keep at least 8 feet away from the home (at least 20 feet away for double combustible fences—a pair of fences placed side-by-side with a gap between them).

Figure 3.a.1. *A home can never be made fireproof, but home hardening practices decrease risk. Letters on different components of the home correspond with low-cost actions and actions to plan and save for. Infographic by Community Planning Assistance for Wildfire with modifications from TEA to include information from CALFIRE 2019 and Maranghides et al. 2022.*

Effectiveness and Cost of HIZ Mitigation

HIZ mitigation is critical to reduce the risk of structures to wildfire. Risk from wildfire cannot be eliminated, but actions by residents, land managers, and other partners can reduce risk and increase the chance that homes stand strong to wildfire. Homeowners are encouraged to contact LFPD to discuss specific ways they can reduce risk on their property.

> *"Maintaining a near-home noncombustible zone, installing metal flashing at vulnerable junctions like the deck-to-wall intersections, and installing flame- and ember-resistant vents can increase chances of home survival. The cost can range from $2,000 to $15,000 depending on the design, complexity, topography, and size of the home" (Barrett & Quarles, 2024).*

Building new homes with wildfire-resistant construction materials can be about 15 to 26% more expensive than traditional construction, based on a recent study in California from IIBHS and Headwaters Economics (Barrett & Hawks, 2025). Costs of building materials change significantly year to year, so the cost difference between wildfire-resistant construction and traditional construction varies; previous research in 2018 found that new construction with wildfire-resistant materials was slightly lower than traditional construction (Quarles & Pohl, 2018).

Fully retrofitting existing structures with wildfire-resistant material can be expensive, over $100,000 based on a recent study in California, but there are meaningful lower-cost actions that can increase the chances of home surviving wildfire for $2,000 to $15,000 (Barrett & Quarles, 2024). Costs of retrofitting can be significantly reduced if flammable material in HIZ 1 is eliminated and vegetation in HIZ 2 is managed because this can reduce the need to replace flammable siding (Porter et al., 2021).

Costs of new construction and retrofitting with wildfire-resistant materials can be high, but these upfront costs can result in incredible cost savings by reducing rebuilding and repair costs, loss of content within the home, indirect business interruption, deaths and non-fatal injuries, and instances of PTSD. A study in Canada found that the benefit-cost ratio of compliance with WUI code is 4:1 when accounting for costs to homeowners, municipalities, and utilities. In other words, they estimated approximately $4 saved per $1 spent (Porter et al., 2021). In addition, there are co-benefits of many HIZ mitigation strategies, including lower maintenance costs for wildfire-resistant roofing, siding, and decking (**Figure 3.a.2**).

Homeowners and businessowners often wonder what HIZ mitigation they should prioritize. Multiple interacting factors influence risk, and there is not a one-size-fits-all optimal approach to risk reduction. Research on structure loss during wildfire and construction costs can provide general guidelines regarding high-priority actions for new construction or retrofitting existing structures (**Table 3.a.1**). Barrett & Quarles (2024) provide helpful decision trees to help evaluate costs and benefits of different retrofitting activities.

The following generalizations emerge from research on HIZ mitigation:

- Fire-resistant roofing is one of the most important characteristics of homes that survive wildfire.
- Double-paned, tempered-glass windows with fire-resistant frames are very important to prevent internal structure ignition from radiant heat and/or embers, especially when structures are spaced less than 30 feet apart.
- Non-flammable siding is particularly important when structures are spaced less than 30 feet apart and when vegetation in defensible space zones 1 and 2 are not mitigated. Removing vegetation can reduce the chance of flames and radiant heat igniting siding.
- Having no deck or non-flammable decking can increase the chance of homes surviving wildfire.
- The most cost-effective actions (i.e., beneficial but less expensive) are removing fencing or replacing fencing with fire-resistant material, installing fine wire mesh over vents, and mitigating vegetation in defensible space zones 1 and 2. However, the impact of these actions individually is lower in magnitude than some of the more expensive actions, such as non-flammable roofing and double-paned windows.
- No individual action can guarantee your home will stand strong during a wildfire, so it is important to reassess your structure and your ability to pay for mitigation work and make continuous improvements.

- HIZ mitigation requires a regular commitment to maintenance—debris fills gutters, cracks form in siding, and vegetation regrows. Take time every year to walk around your home and identify steps you can take to continue reducing your risk—this can help make your home, your family, your neighborhood, and firefighters safer in the case of an emergency.

Co-benefits of HIZ Mitigation

Using or replacing landscaping with low flammability plants.	Many low flammability plants require less water during the summer.
Material like pea gravel has a longer lifespan and less maintenance.	Replace wood mulch with pea gravel, flagstone, or other ignition-resistant material.
Replacing wooden fencing or decking with ignition-resistant material.	Material like plastic composite deck boards is often more durable and has lower upkeep.
Enclosing decks prevents buildup of leaves in hard-to-access areas, and it can prevent animals from building dens or nests under the deck.	Completely enclose or install fine mesh around ground-level raised decks to prevent embers from igniting material beneath the deck.
Replace ridge and soffit vents with fire-resistant vents with finer-grade mesh and other ember- and flame-resistant features.	Well-insulated and ventilated roofs can improve heating and/or cooling efficiency of the home.
Class A roofs have long life spans and lower maintenance costs than cedar shake.	Replace cedar shake shingles with asphalt or other class A roofing material.
Replace single-pane windows with well-insulated double-pane and tempered glass windows.	Double-pane windows improve heating and/or cooling efficiency of the home. Tempered glass is also safer because it does not form sharp shards if broken.
Fiber cement costs less than cedar siding, can have a longer lifespan, and requires less maintenance.	Use fiber cement instead of cedar siding for new builds or replace old cedar siding with fiber cement.

Figure 3.a.2. *HIZ mitigation actions often have additional co-benefits. Source: (Carter et al., 2023; Quarles & Pohl, 2018).*

Table 3.a.1. *Relative importance of HIZ mitigation actions based on research by Headwater Economics in 2018 and a study in Canada that utilized findings of structure loss and HIZ characteristics during the 2018 Camp Fire in California (Porter et al., 2021; Quarles & Pohl, 2018). Relative costs for retrofitting are classified as low (<$1,00), moderate ($1,000-5,000), high (>$5,000-10,000), and very high (>$10,000) based on cost estimates provided in Porter et al. (2021) and Quarles and Pohl (2018).*

HIZ mitigation action	Relative importance for risk reduction	Relative cost for retrofit
Replacing roof with fire-resistant material	Very high	Very high
Covering vents to reduce ember penetration	Moderate to high	Low
Replacing vinyl gutters with metal gutters and installing gutter cover devices and metal drip edge	High	Moderate
Enclosing soffits with fire-resistant material	Moderate to high	Moderate to high
Replacing flammable siding with fire-resistant exterior siding, sheathing, and vapor barriers	High, especially when home spacing is <30 feet and vegetation is not mitigated in defensible space zone 1 and 2	Very high
Replacing single-pane windows with vinyl frames with double-paned, tempered-glass windows with fire-resistant frames	Very high, especially when home spacing is <30 feet	Very high
Replacing flammable doors with fire-resistant doors and weather stripping	Moderate	Moderate to high
Replacing flammable decking with fire-resistant decking surface, frame, and fascia	High	Very high
Removing fences or replacing flammable fences with fire-resistant material	High	Low (removing fence) to high (replacing fence)
Removing all flammable material and creating non-combustible barrier in defensible space zone 1	Very high	Moderate
Reducing vegetation in defensible space zone 2	Very high	Moderate

Defensible Space Zones 1-3

Completely eliminating fuels immediately adjacent to the home and reducing fuels beyond creates a buffer between your home and vegetation that could ignite during a wildland fire. Mitigation of defensible space can slow the spread of wildfire, prevent direct flame contact, and reduce the chance that embers will ignite material on or near your home (Hakes et al., 2017). Substantially reducing vegetation within a structure's defensible space and removing vegetation that hangs over decks and roofs can reduce structure loss, especially for homes on slopes (Syphard et al., 2014).

The CSFS defines the HIZ as a structure AND the space surrounding it, or structural ignitability and defensible space. Home hardening addresses structural ignitability while targeted mitigation practices address defensible space and fall into three zones (**Figure 3.a.3**):

> **Do not count on firefighters staying to defend your home—your home should be able to stand strong on its own during a wildfire. There are never enough firefighters to stay and defend every single home during large incidents.** Properties that are not defensible will often not receive firefighter resources due to unsafe conditions and the higher likelihood of home loss regardless of firefighter intervention.

- **Zone 1 (0–5 feet):** The immediate or "ember-resistant" zone, where eliminating combustible materials is essential to prevent ignition.
- **Zone 2 (5–30 feet):** The intermediate or "lean, clean, and green" zone, where vegetation should be strategically spaced, limbed, and maintained.
- **Zone 3 (30–100 feet):** The extended or "fuel reduction" zone, aimed at modifying vegetation to reduce fire intensity before it reaches the home.

Property owners should apply HIZ practices to every structure and surrounding space on their property—not just the primary residence. Campers/RVs, sheds, detached garages, workshops, storage units, and other outbuildings are all potential ignition sources and should be maintained accordingly. Where possible, outbuildings should be placed at least 50 feet from the home to prevent structure-to-structure fire spread (Maranghides et al., 2022). HIZ mitigation not only reduces wildfire risk, but also delivers everyday co-benefits such as lower water use, reduced maintenance and replacement costs, improved energy efficiency, increased durability of homes and landscapes, and enhanced safety and comfort for residents (**Figure 3.a.2**). Larimer County wildfire resiliency code requirements are not voluntary and apply to construction, alteration, movement, repair, maintenance, and use of any building or structure with occupiable/habitable space within LFPD.

A 2021 study from the University of Colorado-Boulder showed that homeowners living in the WUI in Bailey, CO typically underestimated the level of risk their home faces due to wildfire, and tended to overestimate the amount of work done to protect their property (Simpkins, 2021). Make sure you are informed about best practices for protecting your home. See

Table 3.a.2 and the CSFS publication The Home Ignition Zone for recommendations. The **Defensible Space Zone 3 Recommendations by Vegetation Type Section** includes specific recommendations by forest type for zone 3.

Reviewing safety protocols, creating defensible space, and hardening your home are not one-time actions, but part of *annual* home maintenance when living in the WUI. During a wildland fire, homes that have clear defensible space are identified as sites for wildland firefighters to engage in structure protection, and homes that are not safely defensible will not usually receive firefighter resources. See Home Ignition Zone checklists from the CSFS and the Live Wildfire Ready checklist for annual safety and maintenance activities.

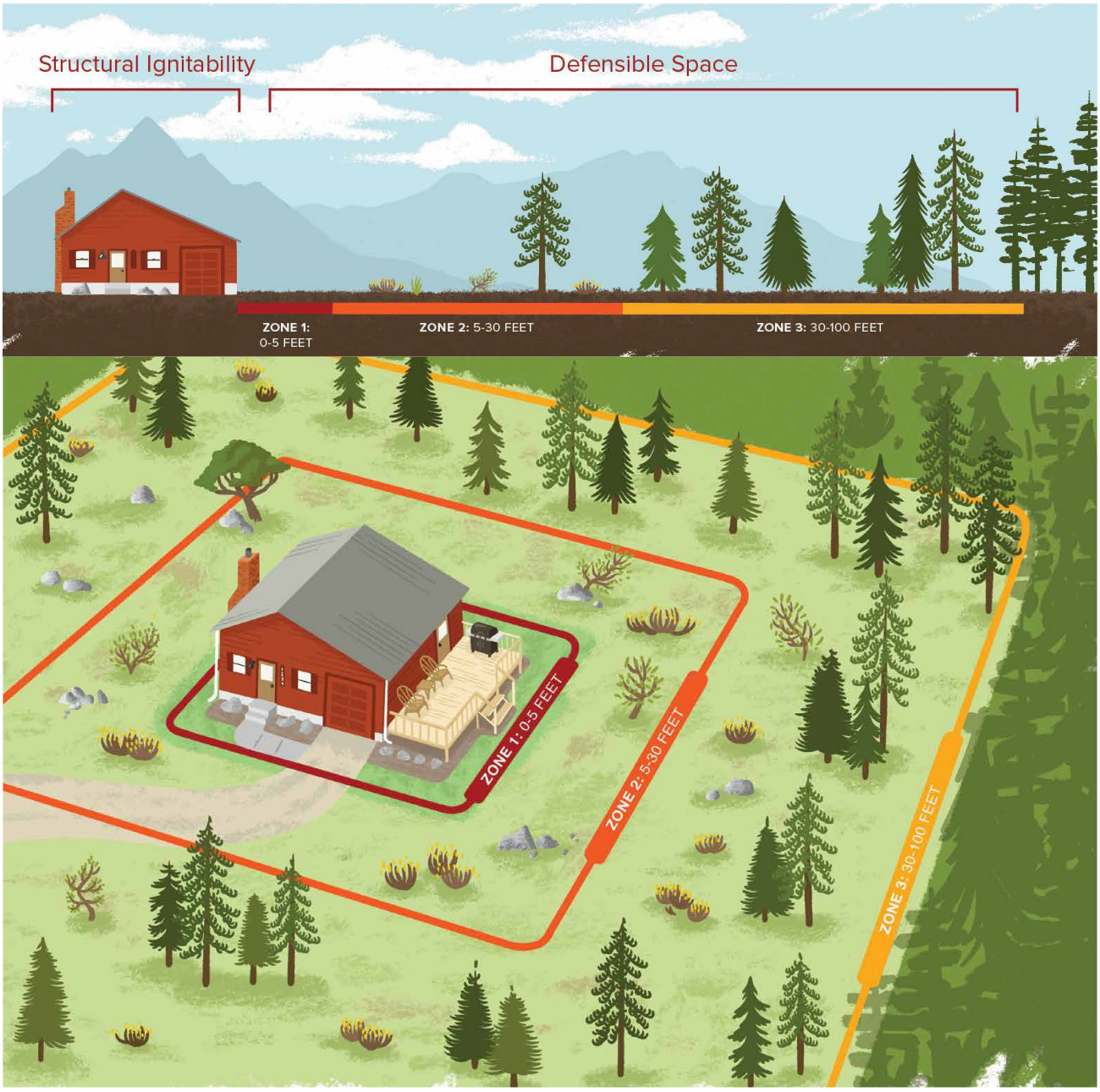


Figure 3.a.3. *Defensible space zones recommended by CSFS. Using ignition-resistant building materials and removing burnable fuel around primary structures, outbuildings such as sheds, and campers/RVs is crucial for increasing your home's chance of standing strong during a wildfire and creating safer conditions for wildland firefighters. Source: Colorado State Forest Service 2021, The Home Ignition Zone.*

Table 3.a.2. Defensible space zone recommendations based on the CSFS publication The Home Ignition Zone. Specific measures will depend on the placement and condition of your property.

Zone 1: 0 to 5 feet from your home – "ember-resistant" zone.
Goal: Prevent flames from coming into direct contact with your home.
• Create a noncombustible border 5 feet around your home. Remove all vegetation and replace flammable wood chips or mulch with alternatives like dirt, stone, flagstone, concrete, or gravel. Research shows that the worst materials to use in zone 1 are shredded rubber, pine needles, and shredded western red cedar due to their high flammability **(Quarles & Smith, 2011)**.
• Remove branches that drop needles onto your roof and remove all fuels within 10 feet of the chimney.
• Remove combustible materials (dry vegetation, wooden picnic tables, juniper shrubs, etc.) from underneath, on top of, or within 5 feet of decks, overhangs, windows, and doors.
• Annually remove dead or dry leaves, pine needles, and dead plants within 5 feet of your home and off your deck, roof, and gutters. Raking material farther than 5 feet from structures will not significantly reduce the likelihood of ignition.
• Move firewood or other combustible materials to zone 3.
• Do not use space under decks for storage.

Zone 2: 5 to 30 feet from your home – the "lean, clean, and green" zone.
Goal: Slow the movement of flames approaching your home and lower the fire intensity.
• Maintain and mow grasses to 4 inches tall or less. If you are unable to irrigate, replace dry grasses with low-flammability plants that are more drought tolerant and less flammable.
• Remove any accumulated surface fuels such as logs, branches, slash, and mulch.
• Remove all common junipers because they are highly flammable and tend to hold a layer of flammable material beneath them. Landscape with plants that have more fire-resistant attributes, like short-statures, deciduous leaves, and higher moisture content. See low-flammability plants from Colorado State University Cooperative Extension for suggestions.
• 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. Create even more space between trees if your home is on a slope (**Table 3.a.3**). See **Figure 3.a.4** for how to measure crown spacing.
• Favor the retention of aspen trees because this species naturally has high fuel moisture, no low branches, and smooth bark, making them less likely to ignite than conifer trees.
• Remove ladder fuels under remaining trees. This is any vegetation that can bring fire from the ground up into taller fuels.
• Remove limbs so branches do not hang below 6 feet above the ground, ideally not below 10 feet above the ground. See **Figure 3.a.4** for a depiction of how to measure limb height.
• Keep spacing between shrubs at least 2-3 times their height.
• Relocate wood piles and propane tanks to zone 3.
• Remove stressed, diseased, dead, or dying trees and shrubs. This reduces the amount of vegetation available to burn and improves forest health.
• Keep shrubs at least 10 feet* away from the edge of tree branches.

Zone 3: 30 to 100 feet from your home – the "fuel reduction" zone. If you live on a slope, this zone should be larger due to the greater potential for extreme fire behavior.
Goal: Slow movement of flames, move fire to the ground, and reduce ember production.
• Store firewood and propane tanks at least 30 feet away and uphill from your home and away from flammable vegetation. Store even farther away if your home is on a slope. • Move campers/RVs, boats, detached garages, storage buildings, barns, and other large structures at least 50 feet away from your home. • Mow or trim grasses to a maximum height of 6 inches. Grasses can be taller in zone 3 than zone 2 because of the greater distance from your home, but shorter grass is always better for reducing potential flame lengths and therefore radiant heat exposure. • Remove enough trees to create at least 6- to 10-foot spacing* between the outermost branches of remaining trees. Create even more space between trees if your home is on a slope (**Table 3.a.3**). See **Figure 3.a.4** for a depiction of how to measure crown spacing. • Favor the retention of aspen trees because this species naturally has high fuel moisture, no low branches, and smooth bark, making them less likely to ignite than conifer trees. • Remove limbs so branches do not hang below 6 feet above the ground, ideally not below 10 feet above the ground. See **Figure 3.a.4** for a depiction of how to measure limb height. • Remove shrubs and saplings that can serve as ladder fuels. • Remove heavy accumulations of dead trees, branches, and piles of fallen leaves, needles, twigs, pinecones, and small branches. Thin trees to increase spacing and remove ladder fuels to reduce the likelihood of torching, crown fires, and ember production. • Consult with a qualified forester to develop a plan to manage your property to achieve fuel reduction and other goals, such as creating wildlife habitat. The Colorado State Forest Service's Fort Collins Field Office provides a list of forestry contractors on their website to help homeowners find local, reliable private contractors for mitigation work they cannot complete themselves.

*Spacing recommendations are a general guideline and should be increased for properties on steeper slopes. Reach out to LFPD, CSFS, LCD, or other forestry professionals to develop a plan for mitigating wildfire risk on your property.



Aspen trees naturally have high fuel moisture, no low branches, and smooth bark, making them less likely to ignite than conifer trees. Retaining small groups of aspen trees is acceptable in zone 2—just remember to rake up dry leaves that fall onto your roof or on the ground within 5 feet of your home. Photo credit: Fire Adapted Colorado.

Table 3.a.3. *Minimum recommended spacing between tree crowns and shrubs is greater for properties on steeper slopes due to the exacerbating impact of slope on fire behavior (Dennis, 2003).*

Percent slope	Min. spacing between tree crowns	Min. spacing between shrubs
0 to 10 %	10 feet	2.5 x shrub height
11 to 20%	15 feet	3 x shrub height
21 to 40%	20 feet	4 x shrub height
>40%	30 feet	6 x shrub height

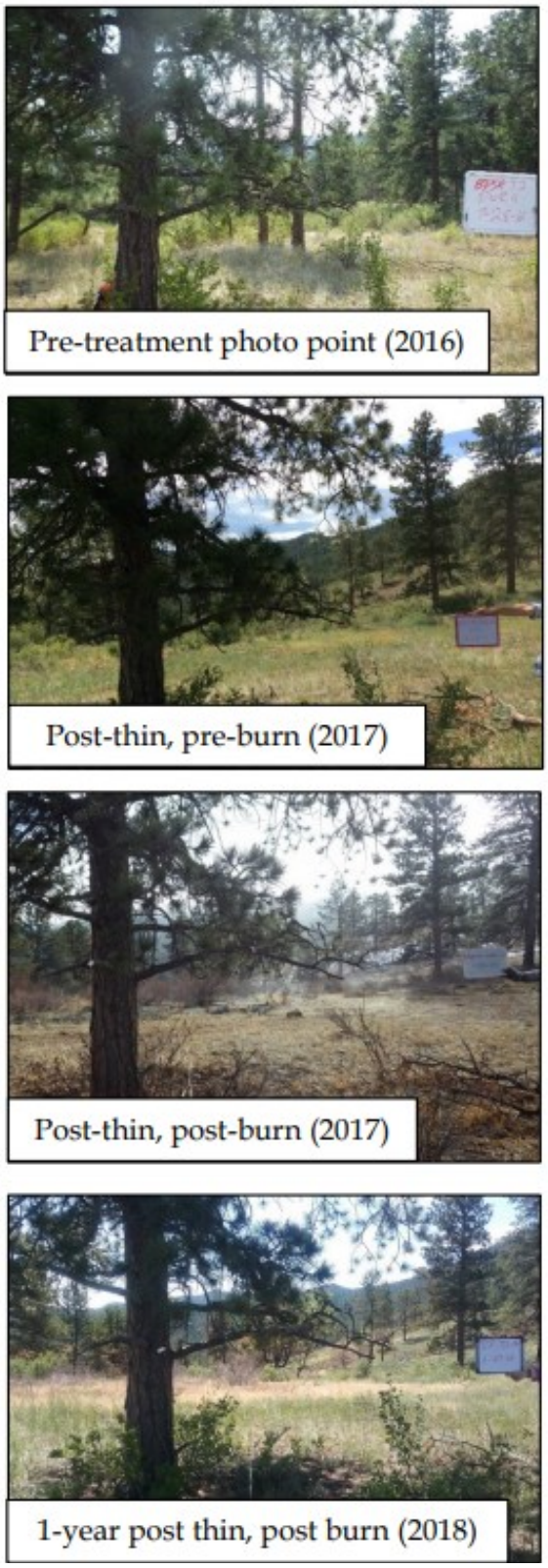


Figure 3.a.4. *Spacing between tree crowns is measured from the edge of tree crown to tree crown, NOT from tree stem to tree stem (left). Height of limbs above the ground is measured from the ground to the lowest point of the limb, NOT from where the limb attaches to the tree (right).*





Figure 3.a.5*. Grasses, shrubs, and wildflowers recovered quickly after tree removal in this ponderosa pine forest at the Shambhala Mountain Center near Red Feather Lakes. This beautiful and restored ecosystem is less susceptible to high-severity crown fire and can help reduce risk of wildfire damage to surrounding communities. The bottom image shows the diverse understory ecosystem that can recover within 1-3 years of removing trees and increasing light availability in ponderosa pine ecosystems. Photo credit: Larimer Conservation District (https://www.fortcollinscd.org/before-and-after.html).*



A restored ponderosa pine ecosystem treated with thinning and burning at the Ben Delatour Scout Ranch. Photo Credits: Colorado Forest Restoration Institute.

Some homeowners in the WUI are concerned that removing trees will destroy the forest and reduce the aesthetic and monetary value of their property. In fact, many dense ponderosa pine forests are unhealthy and greatly diverged from historical conditions that were maintained by frequent wildfires (**Figure 2.e.1**). The reality is that nothing will decrease the aesthetic and monetary value of your home as much as a high-severity wildfire burning all the vegetation in the community, even if your home survives the fire. Forest management can look messy and destructive in the first years following treatment; however, grasses, shrubs, and wildflowers will respond to increased light availability after tree removal and create beautiful ecosystems with lower fire risk (**Figure 3.a.4**).

Many property owners enjoy their land even more after conducting effective fuel treatments. Removing trees can open incredible views of mountains, rivers, and rock formations, and wildlife are often attracted to forests with lower tree densities and a greater abundance of understory plants. Reducing fuel loads and increasing the spacing between trees increases the chance that your home and your neighbors' homes will stand strong during a wildfire, and most importantly, it increases the safety of wildland firefighters working to protect your community**.**

Linked Defensible Space

The HIZ of individual homes can overlap that of their neighbors, so wildfire hazards on one property can threaten adjacent properties. Structures that are on fire can emit significant radiant heat and embers and endanger homes and structures near them. A little over half of structures in the district share a HIZ with at least one neighboring structure (**Figure 3.a.6**). When structures are closely spaced and have overlapping HIZs, there is a greater potential for structure-to-structure ignitions, especially if structures are not mitigated or hardened (Syphard et al., 2012). Mitigating HIZs for all structures, not just primary homes but also secondary structures such as garages and sheds, is critical for reducing the potential for wildfires to become urban conflagrations with structure-to-structure fire spread that can quickly outpace the ability of wildland and structural firefighters to respond (Maranghides et al., 2022).

Neighbors can increase their homes' chances of survival during a wildfire if they work together to create linked defensible space. According to James White, the former Rocky Mountain Region Cooperative Fire Specialist, "Broadcast burning, mechanical thinning, and other treatments are proven to mitigate wildfire risk, but they are even more effective when we work together to integrate treatments across the landscape, across borders and ownerships" (Avitt, 2021). Defensible space projects that span ownership boundaries are better candidates for grant funding due to their strategic value.

How can you help inspire your neighbors to act? Start by creating defensible space and hardening your own home. Then try the ideas below:

- ✓ Get a home assessment from LFPD and discuss the learnings with your neighbors.
- ✓ Invite your neighbors over for a friendly conversation about the risk assessment in this CWPP. Review resources about defensible space together, discuss each other's concerns and values, and develop joint solutions to address shared risk.
- ✓ Follow and share guidance from CSFS Live Wildfire Ready to help educate your community about the benefits of defensible space and home hardening.
- ✓ Help organize walking tours in your neighborhood to visit the property of residents with exemplary defensible space. Witnessing the type of work that can be done, and seeing that a mitigated property can still be aesthetically pleasing, can encourage others to follow suit.
- ✓ Apply for grants that support fuels mitigation for multi-homeowner projects (see **Funding Opportunities Section**).

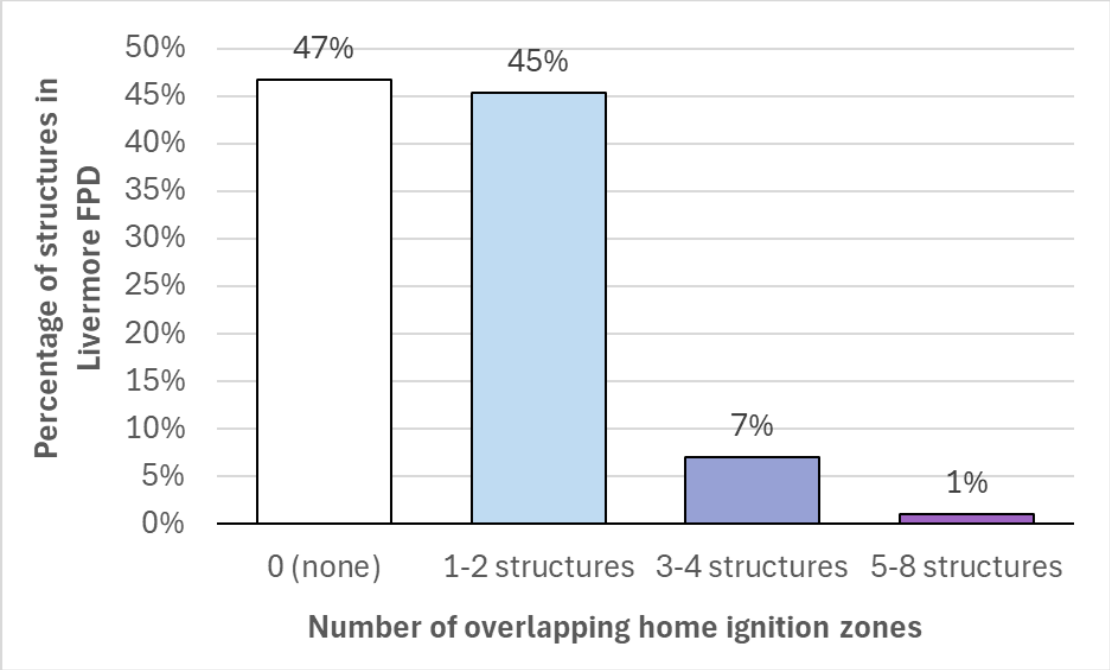
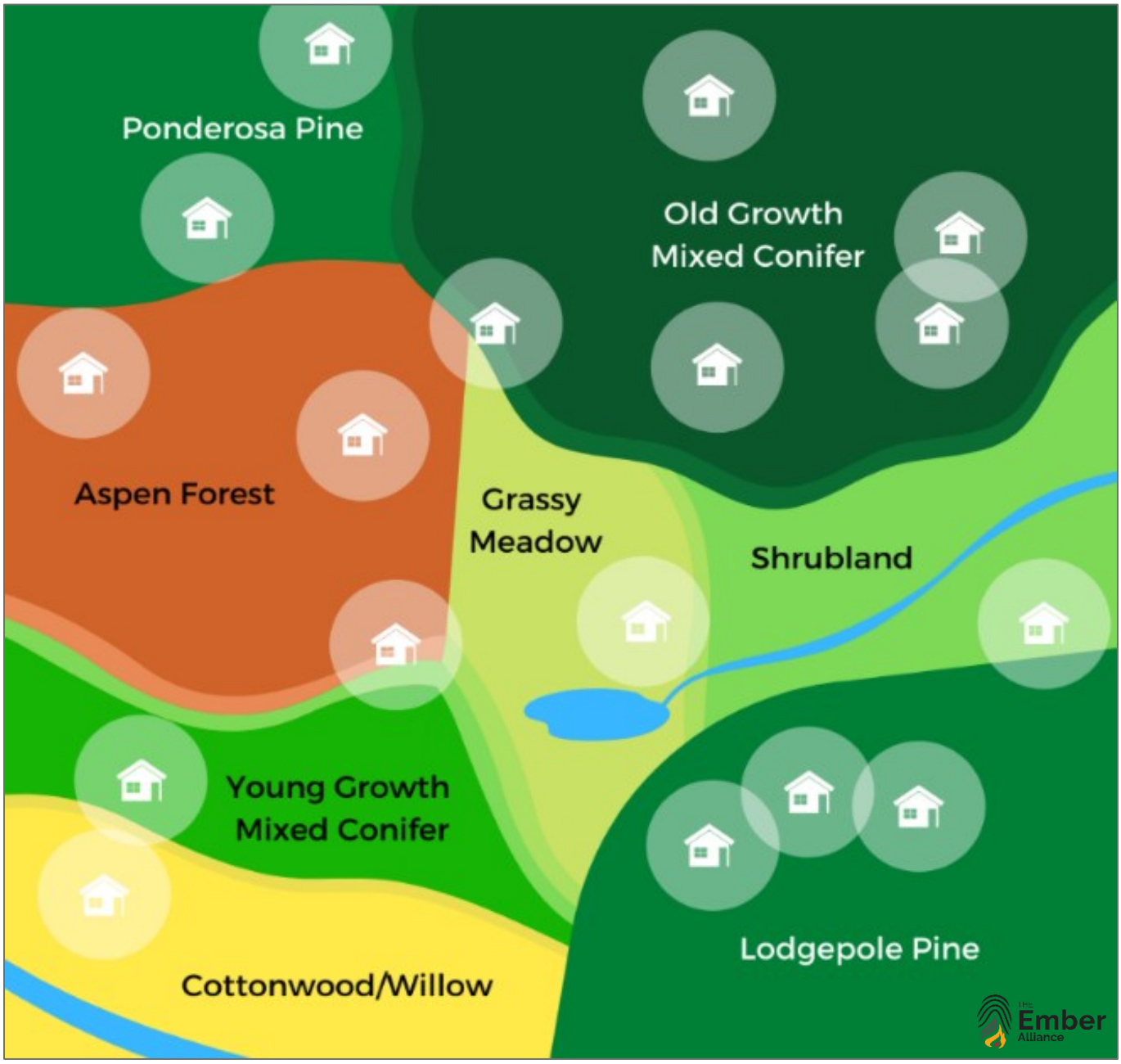


Figure 3.a.6 *Over little over half of structures within LFPD share an overlapping HIZ with at least one structure, opening them up to a higher risk of igniting from radiant heat or short-range embers from nearby structures.*

Mosaic Landscapes

Varied fuel types are known to slow the spread of fire, and heterogeneous landscapes (landscapes with multiple fuel types and trees of different sizes and ages) are more typical of historical forest conditions (Duncan et al., 2015). Creating a mosaic landscape in neighborhoods can help slow fire spread by changing the fuel types as it moves across a hill or valley. A mosaic landscape can be created in many ways. For example, a neighborhood could have a few acres of old-growth conifer trees next to a couple of acres of aspen stands, and a few acres of young, regenerating conifer trees by a large grassy meadow. This can be arranged in many ways for aesthetic and tactical purposes and will resemble a patchwork quilt or mosaic art.

The homes in each of these patches still need to have adequate defensible space, but these conditions would create a more diverse landscape where fire may move slower as it transitions between forest types and unforested locations like shrublands or meadows. Slower fire movement means firefighters have time to defend more homes in the neighborhood. It also creates a diversity of biomes that both residents and wildlife enjoy.



Example of a mosaic landscape in a neighborhood. Each home has defensible space around it, and the landscape is varied throughout, providing tactical opportunities for firefighters working to defend homes. Source: TEA.

Defensible Space Zone 3 Recommendations by Vegetation Type

Local knowledge and professional expertise are needed to design effective, site-specific fuel treatments based on the best available science. Specific fuel treatment recommendations are dependent on forest type, tree density, fuel loads, terrain, land use, and management objectives. The location and purpose of treatments also matter. Treatments in large, forested areas can include the retention of individual trees and groups of trees. Evenly and widely spacing trees might be reasonable in defensible space zone 3, but this tree arrangement would not be appropriate for resilience-style fuel treatments.

Treatments in defensible space zone 3 (30-100 feet away from the home) can promote forest resilience, but it is most important to focus on reducing wildfire risk to the home, creating safer conditions for firefighters, and increasing the visibility of your home from the road for firefighters. Homeowners often enjoy the more open forest around their home because it lets in more light which encourages understory grasses and shrubs to grow and, in turn, can increase wildlife sightings near their home. Defensible space zone 3 sometimes overlaps neighboring properties and requires residents to work together to address shared wildfire risk.

For all fuel treatments, it is important to address surface fuels. Forest management operations often increase surface fuel loads and can fail to achieve fire mitigation objectives if fuels created by the harvest activities (also known as slash) are not addressed (Agee & Skinner, 2005). Slash can include small trees, limbs, bark, and treetops. See the **Approaches to Slash Management Section** for pros and cons of different slash management options.

Mitigating the impacts of tree removal on soil compaction and erosion is also important when treatments occur near streams and riparian ecosystems. CSFS recommends streamside management zones of at least 50 feet (CSFS, 2023). Treatments should be monitored for colonization of invasive, weedy plants that might require control through integrated weed management. It is always a good idea to take pictures of treatments before and after to help evaluate effectiveness and monitor changes over time.

Here we provide general recommendations for treatments in defensible space zone 3 and stand-scale fuel treatments and ecological resilience by vegetation types. Guidance for defensible space is summarized from the CSFS publication The Home Ignition Zone. It is important to work with a forester that has experience creating defensible space so they can help you design an effective treatment specific to vegetation type, slope, and other conditions around your home. The CSFS Fort Collins Field Office provides a list of forestry contractors to help homeowners find local, reliable private contractors for mitigation work they cannot complete themselves.

Overall Goals of Mitigation Work in Defensible Space Zone 3:

- Reduce surface fuels, reduce tree density, and increase the distance between surface and canopy fuels.
- Moderate fire behavior near structures and increase their chance of standing strong during a wildfire.
- Increase safety and access for wildland firefighters.
- Increase the visibility of structures from roadways to assist wildland firefighters with locating and accessing your home.
- Coordinate with partners when defensible space zone 3 overlaps neighboring properties to address shared wildfire risk. Linked defensible space creates safer conditions and better tactical opportunities for wildland firefighters. Defensible space that span ownership boundaries are better candidates for grant funding due to their strategic value.

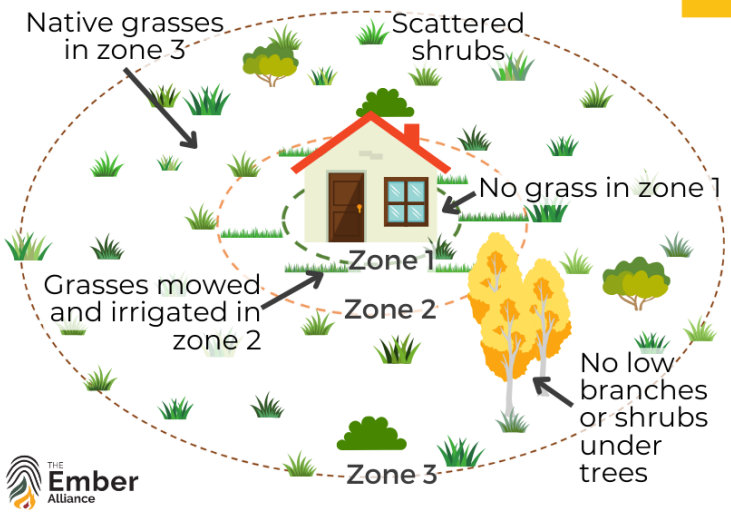
Grasslands

Species: Blue grama, little bluestem, prairie dropseed, buffalograss, sideoats grama, others

Typical elevation: 4,000-6,500 ft

Fire return interval: 2 to 20 years (frequent)

Fire severity: Low severity



Sources: CSFS Home Ignition Zone; Grassland Management in Boulder

Wildfires can spread rapidly across grasslands, and the management of grasslands is important for both fire resilience and ecological restoration.

Management in Defensible Space Zone 3

- Homeowners adjacent to grasslands should focus their efforts in zones 1 and 2
- Mowing grass is not required in zone 3.
- Remove cheatgrass and smooth brome with herbicide, grazing, or prescribed burns, and seed with native species.
- Replace wooden fences with non-flammable materials to reduce the chance of fire spreading from grasses to fences to homes.
- Use goats, cows, or other livestock to manage grasses and/or woody plants.
- Where appropriate, conserve prairie dogs. Their activity creates bare ground that can slow the spread of fire.

Shrublands

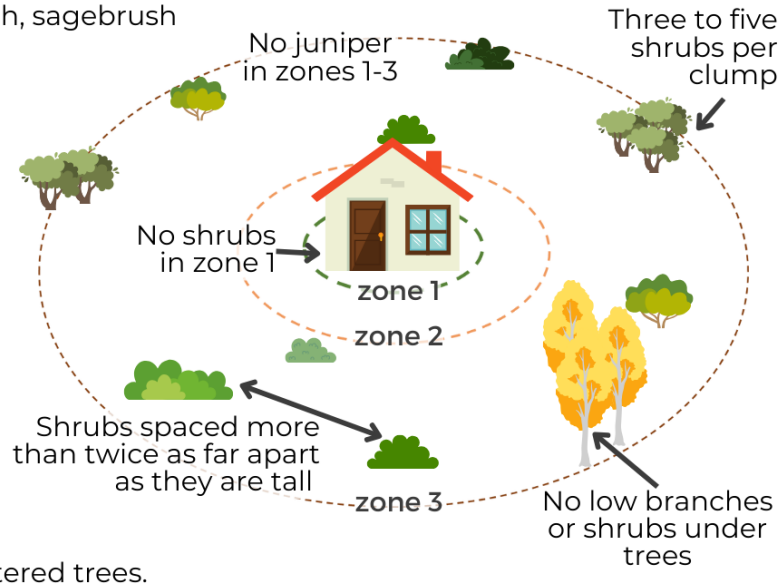
Species: Rocky mountain juniper, common juniper, Gambel oak, mountain mahogany, antelope bitterbrush, sagebrush

Typical elevation: 4,000-9,000 ft

Fire return interval: 2-30 years (frequent)

Fire severity: Low to moderate severity, depending on fuel continuity.

Shrubs that are close together and adjacent to homes are hazardous. In dry climates like Colorado, they can burn very hot and emit embers.



Management in Defensible Space Zone 3

- Remove shrubs under tree canopies.
- Remove limbs below 6-10 feet on scattered trees.
- Remove common junipers, which are highly flammable.
- Thin clumps of shrubs down to three to five shrubs/clump. Favor leaving large, old, Gambel oaks for biodiversity.
- Use mastication, mowing, herbicide, and prescribed fire for shrub removal, depending on the species and appropriate use of these management tools.
- Use goats, cows, or other livestock to manage grasses and/or woody plants.

Source: CSFS Home Ignition Zone

Ponderosa pine mixed conifer

Species: Ponderosa pine, Douglas-fir, aspen, juniper, white fir, gamble oak

Typical elevation: 6,300-9,500 ft



Fire return interval: 7-50 years (frequent)

Fire severity: Low- to moderate-severity, with some smaller patches of stand-replacing fire where most or all trees die

Ponderosa pine mixed conifer forests are fire dependent. Historically, fire burned across the forest floor, controlling tree regeneration, removing lower limbs on mature trees, and creating large, open spaces between trees.

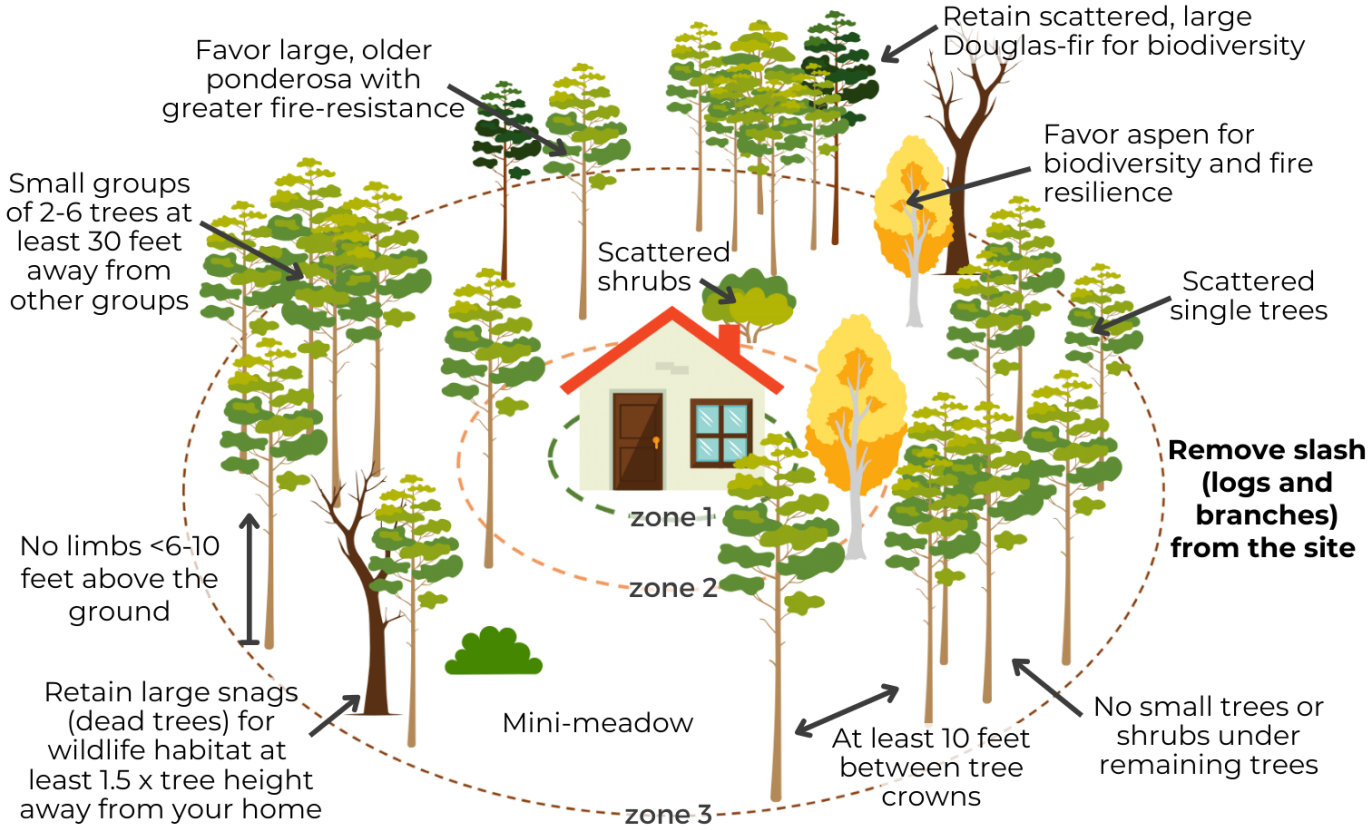


Human management activities (grazing, logging, fire suppression) have resulted in unnaturally dense forests. During extreme weather, high winds can easily spread fire between tree crowns, resulting in very large high-severity wildfires where most trees are killed. This is not always the case but is a trend that has occurred more frequently in this forest type in the last few decades.

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Management in Defensible Space Zone 3

To restore ecological conditions, increase fire resilience, and increase your home's ability to stand against wildfire, leave only 25-60 trees/acre in zone 3 (15-40 trees within 30 to 100 feet of your home) and create mini-meadows for grasses, wildflowers, and scattered shrubs.



THE Ember Alliance

Sources: CSFS Home Ignition Zone; Battaglia et al. 2018. Forest Ecology & Management 422:147-160; Rocky Mountain Research Station GTR-310.

Douglas-fir mixed conifer

Species: Douglas-fir, ponderosa pine, lodgepole, aspen, white fir, occasional spruce, limber pine, gamble oak

Typical elevation: 6,000-9,500 ft

Fire return interval: 20 to >100 years (semi-frequent)

Fire severity: Moderate-severity with patches of stand-replacing fire where most or all trees die

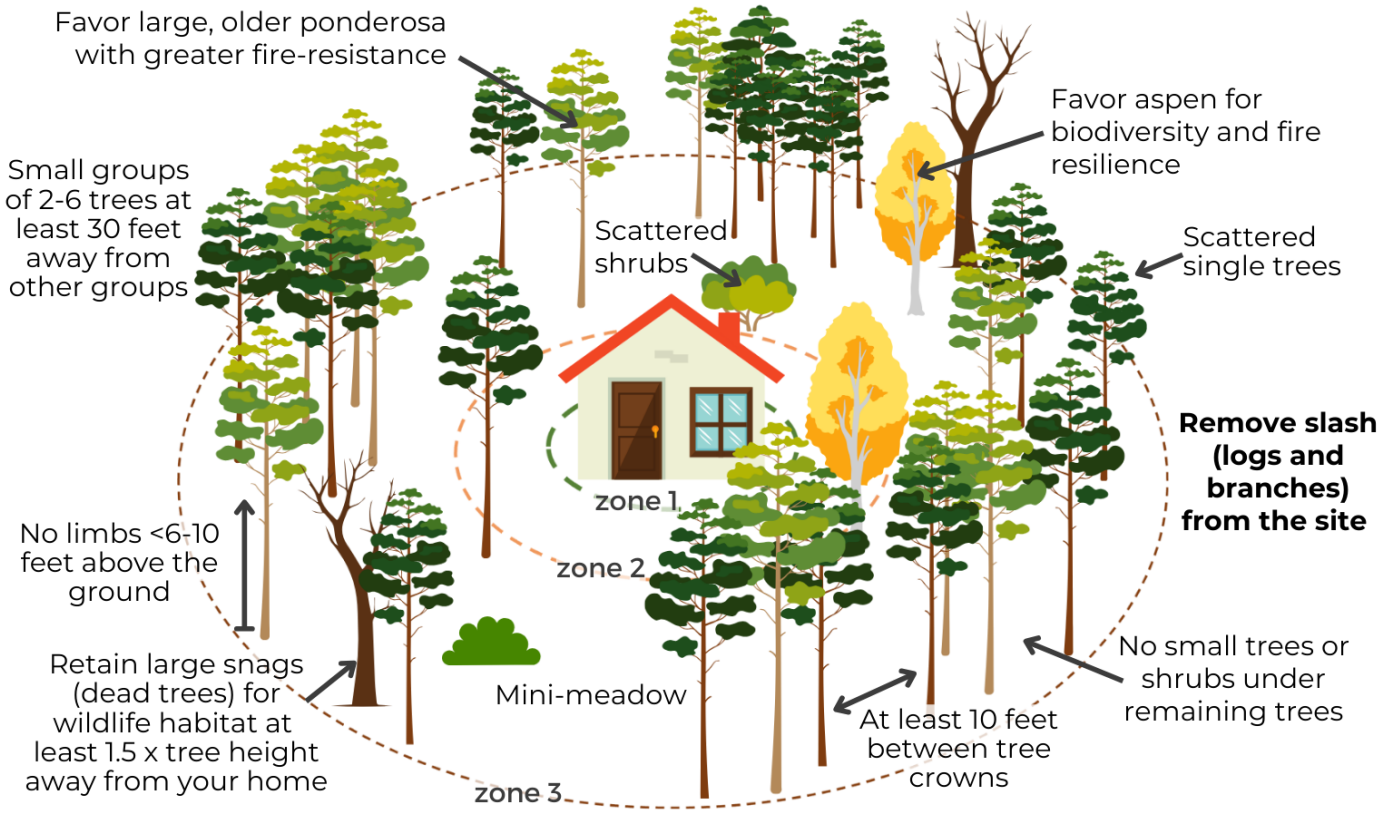


Douglas-fir mixed conifer forests contain a diversity of tree species, many of which are not as fire tolerant as ponderosa pine. These forests also tend to be cooler and wetter, and as a result do not burn as frequently. When fire burns in these areas, patches of stand-replacing fire can be common. These forests are naturally denser than lower elevation forests, but human management activities (grazing, logging, fire suppression) have resulted in unnaturally dense forests that can fuel larger, more extreme wildfires.

COLORADO FOREST RESTORATION INSTITUTE

Management in Defensible Space Zone 3

To restore ecological conditions, increase fire resilience, and increase your home's ability to stand against wildfire, leave only 25-60 trees/acre in zone 3 (15-40 trees within 30 to 100 feet of your home) and create mini-meadows for grasses, wildflowers, and scattered shrubs.



THE Ember Alliance

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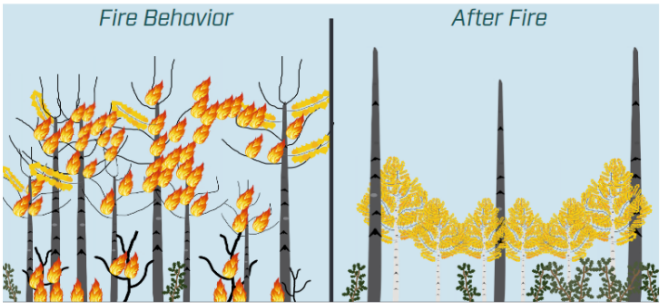
Aspen forests

Species: Aspen, occasional ponderosa pine, lodgepole pine, blue spruce, or other conifers

Typical elevation: Highly variable

Fire return interval: Highly variable

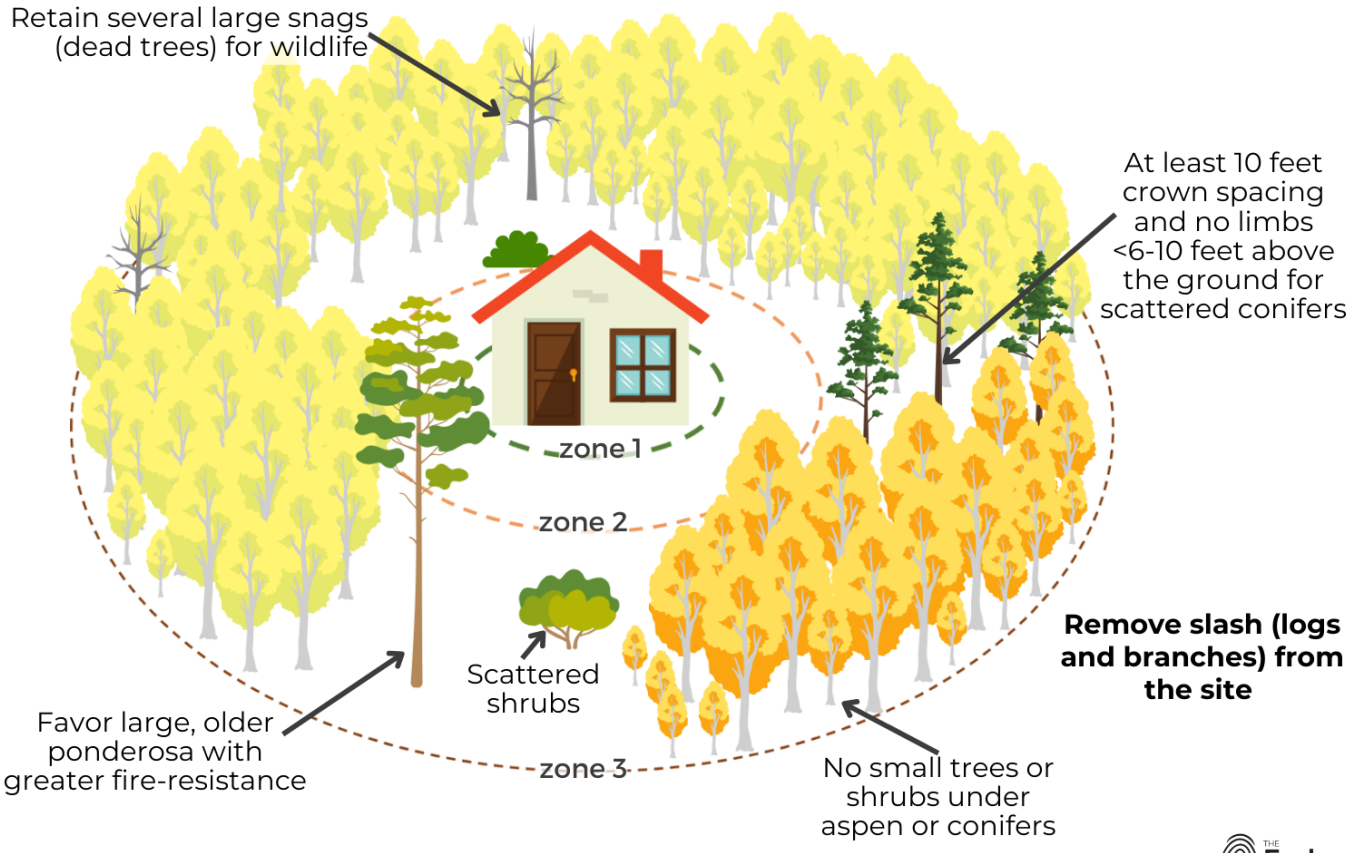
Fire severity: Slow and creeping or, during drought, stand-replacing fire where most or all trees die



Aspen trees are fairly fire resistant and fire resilient. These deciduous trees have high fuel moisture, no low branches, and smooth bark, making them less likely to ignite than conifer trees. Aspens are readily killed by fire, but they recover quickly via sprouting. Fires can create conditions where aspen stands expand because of the species' ability to sprout rather than needing to germinate from seed, and because this sun-loving species experiences reduced competition from conifer trees killed by fire.

Management in Defensible Space Zone 3

Aspen trees do not need to be removed from zone 3 due to their fire-resistant and fire-resilient nature. Instead, focus on removing limbs from conifer trees, shrubs growing under aspen and conifers, and slash (logs, branches, and other woody material).



Source: CSFS Home Ignition Zone.

Resident Assistance for Land Management Planning

Reducing wildfire risk requires a coordinated effort across individual properties and neighborhoods. Landowners are encouraged to use a holistic land management approach and to consult the following resources as a guide for creating and implementing a property plan using best ecological practices. Doing so allows landowners to meaningfully and collaboratively develop resilient, fire-adapted communities that can better respond and recover from disturbances such as wildfire.

Why Does Holistic Planning Matter?

Holistic land management is a decision-making process that considers the entire ecological system to reduce unintentional impacts while accomplishing management goals. Management goals for landowners can include creating a fire-resistant landscape, introducing a mosaic landscape, limiting noxious weeds, introducing native, fire-adapted species, and reducing fuel loads to prevent fire spreading to structures, amongst many others.

The most comprehensive way to reduce wildfire risk is to combine multiple practices in the proper order of application. Without considering land-specific ecology and timing, management practices can have unintended consequences. For example, using prescribed fire alone will not eliminate invasive species like cheatgrass, but coupling prescribed fire with another management strategy like herbicide application can be extremely effective. Otherwise, cheatgrass can reestablish, increase in prevalence, and continue to increase fire intensity and decrease intervals between fires (Bradley et al., 2018). Likewise, grazing is an efficient tool for reducing fuel loads, however there can be unintended consequences such as weed spread, erosion, and soil compaction without a specific plan (Larson & Gorman, 2019). In some cases, mechanical thinning before grazing will streamline fuel reduction by clearing the area so that livestock can access the intended fuels. Please consult LCD for more information on how to structure your management plan.

Having a comprehensive plan and timeline is important due to the treatment "lifespan". Depending on fuel type, topography, precipitation, rate of regeneration, and many other factors, most land requires more than one treatment to reduce fuels or requires a combination of treatment strategies to achieve management goals.

Common Land Management Strategies

Livestock Grazing

Grazing is an efficient and natural fuel reduction strategy, however there are many factors that can influence the outcome of animal use on property. If landowners are interested in grazing management, it is imperative to have a property plan in place. Please consult CSU Extension Small Acreage Management, a partnership between CSU and NRCS, for more information.

While soil erosion can be a concern, certain hooved animals can also provide helpful aeration and tilling through intentional soil disturbance (Cook, 2017). Historic grazing patterns of megafauna like bison and pronghorn helped reduce overall plant biomass and created heterogeneity in fuel loads and fuel heights (Geremia & Hamilton, 2022). Managed grazing by livestock can approximate historic grazing patterns (Davidson, 2025). Targeted grazing can help create fuel breaks, as well as other benefits (Clark, 2024). Grazing also limits the amount of fuel left on the ground surface after treatment, unlike mowing.

However, it is imperative to mitigate potential ecological impacts, and to consider safe and effective locations for grazing. Consult the USGS soil map to inform you of which hooved animal and tools are ideal to use. Additionally, it is important to identify the type of vegetation on your

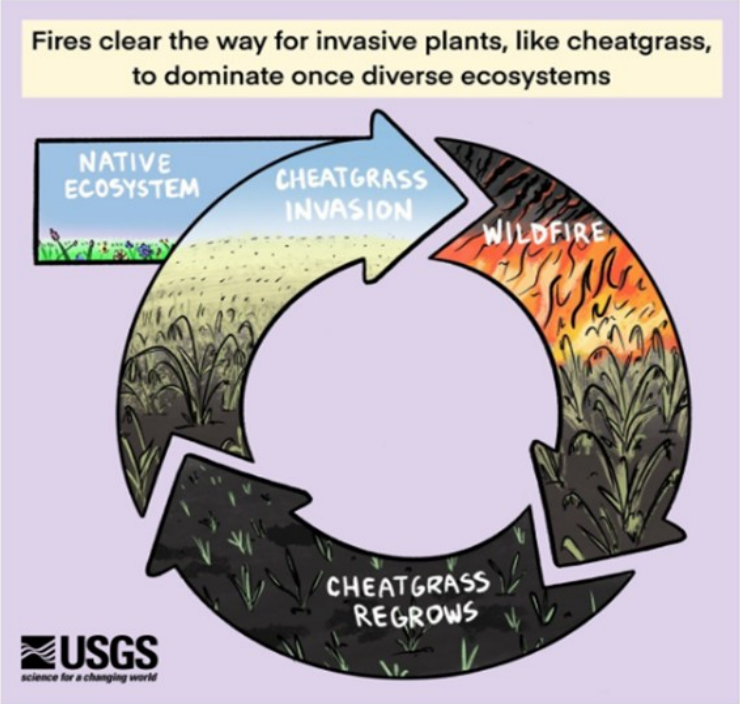
Grazing Considerations:

- Choose a strategic location, prioritizing areas that have a high likelihood of experiencing wildfire and protecting resources.
- Identify forage and grass species to select the proper grazing animal.
- Consider slope and soil type.
- Research proper seasonal and annual timing, plot rotation, and stocking rate.
- Consider the cost and accessibility of grazing compared to other management options. Make sure you have the proper tools for safe and effective grazing.
- Monitor soil before and after grazing for negative impacts. Monitor vegetation regrowth and species diversity, especially native species.
- Use practices such as reseeding to complement grazing efforts.
- Consider recurring grazing efforts over multiple years.

property—whether it is native or nonnative, and whether it is sod-forming or bunchgrass—to determine the appropriate level of grazing. To learn more about how to integrate grazing amongst other management strategies, please refer to the **Methods Used to Conduct Fuel Treatments and Promote Resilient Ecosystems Section** of this CWPP**.**

Noxious Weed Management

Integrated pest management involves a variety of methods to prevent, control, and monitor invasive species that often disrupt native ecosystems and species. Noxious weeds are common following disturbances such as wildfires, roadway construction, infrastructure development, or forest thinning practices. Some noxious weeds can exacerbate wildfire risk. Common invasive species in Colorado, specifically Larimer County, include cheatgrass (aka, downy brome), Japanese brome, smooth brome, kochia, Russian thistle, mullein, knapweed, and Russian olive (Larimer County Weed District, n.d.).



Fire clears the way for invasive annual grasses, like cheatgrass, to dominate once diverse ecosystems in Northwest rangelands. Credit: Ben Slyngstad, USGS

The spread of invasive annual grasses and weeds are some of the main contributors to increased fire size and frequency in the Western United States. Annual grasses such as cheatgrass (*Bromus tectorum*) and smooth brome, grow rapidly in the spring, accumulating a lot of fuel that dries out earlier in the summer than many native grasses and covering rangelands in dry vegetation and a continuous fuel-bed which can easily ignite and spread wildfire rapidly (Davidson, 2025; Paterson, 2024). Areas with invasive annual grasses burn 2 to 4 times more frequently than areas that are not dominated by annual grasses (Bradley et al., 2018; Smith et al., 2022).

The 2025 amendment to the Colorado Noxious Weed Act authorizes local governments to fine private landowners who are in violation of state and local noxious weed regulations. Larimer County has a cost share program within the "Weed District boundary" for seed, spraying, and mowing reimbursement. Residents can access the Larimer County Noxious Weed Management Plan and Larimer County's Weed Services for weed identification, compliance requirements, removal strategies, and potential funding opportunities to help with weed management costs.

Herbicide use is a common management practice to mitigate noxious weeds. Boulder County has seen significant success in eradicating cheatgrass using Indaziflam (Rejuvra), a pre-emergent herbicide. The applications controlled up to 98% of cheatgrass while doubling the richness of desirable (native) species (Sebastian et al., 2025). LCDNR and CPW have had success with aerial application of herbicide to manage cheatgrass at Eagle's Nest Open Space and Cherokee Park State Wildlife Area, and there is currently a proposed treatment for the Calloway Rim area. Please see the **Priority Project Areas Section** for more information.

Chemical Control Considerations:

- Take care to avoid waterways, trees, and vegetation that aren't intended for treatment. Inventory animals living on property or nearby and research potential reactions.
- Consider seasonal and annual timing for applications and reseeding.
- Research proper application methods and sprayers.
- Monitor for reestablishment and consider reseeding with native vegetation to avoid recurrence.
- Consider multi-year management strategies.

Landowners can consult page 114 of Larimer County's Weed Management Reference Guide for more information on purchasing herbicide, proper timing, and application (Clements et al., n.d.).

Cultural Control involves displacing or replacing weeds and invasive species. Methods for cultural control include mulching, mowing, irrigation, planting, and installing landscape fabrics. Where and when this replacement can be incorporated will require additional research, so landowners should consult the CSU Extension Weed Management page for more information, as well as the Firewise plant guide and low water plants guide.

Mowing, Digging, Tilling, Hand Pulling, Plowing and other forms of mechanical treatments can be effective solutions to mitigating fuel, weeds, and fire risk. They differ significantly in their application and effects, so residents can access more information through CSU Extension Weed Management as well as NRCS and Larimer County.

Establishing Native Species

Reseeding can help reestablish native and/or more wildfire resilient species. Reseeding may be necessary after fuel reduction strategies such as thinning, grazing, fire, or herbicide treatments. Typically, the ideal seeding window will be in late fall or early spring. Target smooth brome removal early in their seeding cycle, followed by native plant introduction. Consult USGS' soil map, which will inform the type of tools you can use and what will grow. Consider fuel continuity and vary the heights and spacing, especially between blanket and bunch grass, to disrupt fuel continuity.

For more information on seeding protocols and guidelines, appropriate seasonal timing and species lists, residents should consult Larimer County.

Reseeding Considerations:

- Consider soil, slope, and sun exposure.
- Look for local seed sources.
- Consider selecting native plants with low flammability.
- Consider the continuity of fuels.
- Consider seasonal and annual timing. Including senescing period.
- Monitor the establishment of seeds.

Mechanical and Hand Thinning

Thinning a forest can reduce the potential fire to spread from treetop to treetop, but it can also increase the potential for trees to blow down during high windstorms because they are not sheltered by neighboring trees. For more information on the benefits of thinning stands on their property, residents should consult the **Methods Used to Conduct Fuel Treatments and Promote Resilient Ecosystems Section.** Consult CSFS and LCD for help creating a treatment plan. Tree cutting with a chainsaw and other forestry equipment should be done by experienced and certified individuals. The CSFS provides guidance for how to select a contractor for forest management, and they provide a list of local contractors.

Prescribed Burning

Broadcast burning can be a beneficial treatment option, especially when combined with other methods, like thinning (before or after), or reseeding following a burn. Many landscapes require fire to maintain their ecosystem and promote growth. Landowners will need to follow permitting guidelines and regulations. For more information, please consult the **Broadcast Prescribed Burning Section**.

Pile burning can help reduce fuel loading and stimulate growth in some native vegetation. Burning should be done in collaboration with other mitigation strategies. Residents interested in burning piles on their property should consult LFPD. Pile burning is allowed in unincorporated Larimer County and on private property in LFPD, but **burning requires a permit and adherence to Larimer County regulations.** Permits are normally for woody slash under 6 inches in diameter and limited to 50 piles per year, no larger than 8'x8'x8', respectively. For more information, please consult the Pile Burning **Section** of this CWPP.

Pile Burning Considerations:

- Seek professional guidance to determine where to build piles, when to burn them, and how to burn them.
- Take a pile burning workshop.
- Build piles ahead of time and allow for ample time to dry out.
- Consult weather and fuel forecasts, snowpack, as well as county and adjacent county fire bans.
- Follow permitting procedures and regulations.

Other Slash Management

Piling and pile burning is one method of slash management. Other methods include removing fuels by chipping or taking to proper disposal facilities. Land management plans should always include plans for how to manage slash before projects begin.

Residents who want to cut trees to reduce fuel on their property need to develop a plan to manage the resulting slash. When building slash piles, branches or boles that are smaller than six inches in diameter can be burned. Any timber larger than six inches should either be cut and used as firewood that is stored at least 30 feet from the house (zone 2 or 3), hauled off the property in a timely manner to remove surface fuel, or "lopped and scattered", which is placing larger timber farther than 30 feet from the house (preferably 100 or more feet away), and not piled. Landowners should place logs away from root systems, live tree trunks, other cut logs, or the drip line of trees (directly under the branches). This allows heavy timber to properly decompose without creating jackpots, which are areas of dense fuel that could ignite and burn for an extended period with increased intensity. While "lop and scatter" doesn't remove those fuels from the property, it does help reduce fuel loading in the canopy by rearranging that fuel strategically onto the ground, which can help reduce fire intensity and spread. To develop a plan to haul timber off property, landowners should consult LCD and consider working with their neighbors. See **Approaches to Slash Management** for more information.

Ecological Best Practices and Implementation

Managing vegetation and forests can help reduce erosion and post-fire sedimentation by reducing the potential for high-severity wildfire. Additionally, fuel treatments and other disturbances can affect drainage patterns, downstream water resources, and riparian corridors if not taken into consideration. Landowners should consult with local watershed groups like CPRW to minimize impacts.

Residents interested in conducting land management activities should follow Best Management Practices (BMPs) to minimize erosion, soil disturbance, and impacts to water quality. Key practices include limiting soil compaction, protecting drainages, stabilizing disturbed areas, and proper planning to maintain healthy watersheds and reduce wildfire risk. More information on best management practices can be found through this CSFS publication.

Forest health management is the treatment of forested lands to reduce hazardous fuels, and increase resilience to wildfire, disease, and insects. Residents should consider consulting CSFS on best practices for specific species and proper methods of removal and management. CSFS can provide forest stewardship plans and fuel reduction guidance.

Recommendations for Land Management Planning

Before taking action to implement mitigation measures, there are a few steps landowners should take.

1. Identify your primary goal.
    a. Reducing forest fuels and improving forest health
    b. Grazing or small acre management
    c. Noxious weed/invasive species management
    d. Neighborhood planning

2. Develop a holistic management property plan and timeline. LCD offers tours for properties and projects that are in different stages of mitigation efforts, so that landowners can see the benefits of mitigation, the importance of proper timing for different treatments, and a realistic view of what the process looks like.
3. Account for all fuel types on property, especially invasive species.
4. Utilize best management practices to protect riparian ecosystems, including the creation of streamside management zones, when conducting fuel treatments near streams and rivers. Best management practices are provided by CSFS.
5. Identify potential funding sources and grant opportunities (see **Funding Opportunities Section**).
6. Monitor and plan for continuous prevention methods against fuel loading and invasive species.
7. Consult environmental professionals to develop specific plans and treatments on your property based on existing fuel types and ecosystems.
8. Coordinate vegetation treatments with adjacent public land management agencies and neighbors. Cross-boundary treatments can reduce treatment costs and magnify the impact of individual work to reduce wildfire risk and create more fire-resilient landscapes.

Assistance and Planning Resources for Landowners

While this list is not exhaustive, there are many resources available to landowners that can provide science-based guidance, cost-share and grant opportunities, and planning support.

- CSFS can provide fuel reduction guidance and forest health planning through the **Colorado Forest Resilience Guide** and **Cheat grass and wildfire (Fact Sheet 6.310)**.
- **Larimer County and CSU Extension** provide help with **small acreage management**.
- **Larimer County Climate Smart Future Ready** supports workforce development opportunities and land stewardship.
- **Larimer County Environmental Stewardship Award** is an annual award for landowners and stewardship by residents.
- **LCD** has restoration, education and outreach, and community resources available to help landowners with land management planning.
    - **LCD** offers tours for properties and projects that are in different stages of mitigation efforts, so that landowners can see the benefits of mitigation, the importance of proper timing for different treatments, and a realistic view of what the process looks like.
- **NRCS** provides resources through **Environmental Quality Incentives Program (EQIP)** and **Conservation Stewardship Program (CSP)**.
- **Peaks to People** connects donors with land stewards interested in instituting best management practices for water safety and forest health.
- **CPRW** supports watershed restoration and forest resilience.

Evacuation Preparedness

Evacuation can weigh heavily on the minds of residents in the district. The death of 29 people in Los Angeles, California during the 2025 Palisades and Eaton Fires underscores the importance of evacuation preparedness and fuel mitigation along evacuation routes. Of those who tragically perished in these fires, some did not receive evacuation alerts, others could not leave their home due to limitations from animals or family members, and many were simply overwhelmed by the 'perfect storm' of extreme fire weather conditions. Roads lined closely with dense, tall vegetation can create conditions that are dangerous to evacuees during extreme fire weather. During extreme weather, 15% of roadways in LFPD could experience extreme fire behavior and potentially non-survivable roads (**Figure 2.f.5**). LCSO may call evacuations early to get residents out of danger before roads become potentially non-survivable or to avoid future congestion. If any resident has concerns, such as knowing it may take additional time to evacuate, no one needs to wait for an evacuation order to act. **Evacuation preparedness is the responsibility of each resident in the district. The best way to get out quickly and safely during an evacuation is to be prepared.**

Visit Live Wildfire Ready and learn about go-bags and evacuation planning—simple and crucial actions that can save lives. Prepare a go-bag and have a family, pet, and livestock emergency plan **before** the threat of wildfire is in your area. Some residents have family members or neighbors with physical limitations who might struggle to evacuate in a timely manner. Develop specific emergency plans that address these unique needs and vulnerabilities. Parents should work with their neighbors to develop a plan for how to evacuate children.

Residents with livestock trailers or large camper vehicles should plan to leave during voluntary evacuation notices to allow time for their preparations and create more space on the roads for other residents during a mandatory evacuation. It is important to have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster. Part of this planning and preparation should include maintenance on equipment used to transport livestock.

Signing up for local emergency notifications can also help you leave quickly. Residents should register their cell phones and email addresses through NOCO Alert, the official emergency notification system for LFPD[4]. All residents are encouraged to self-identify access or functional needs when they sign up for emergency alerts (see the **Social Vulnerability/Access and Functional Needs Section**).

[4] NOCO Alert is the official emergency notification system for the district as of the writing of this CWPP in 2026.

Follow evacuation etiquette to increase the chance of everyone exiting the district in a safe and timely manner during a wildfire incident:

- Register for emergency notifications through NOCO Alert for timely information about evacuations.
- Leave as quickly as possible after receiving an evacuation notice.
- Have a go-bag packed and ready during the wildfire season, especially on days with red flag warnings.
- Leave with as few vehicles as possible to reduce congestion and evacuation times across the community.
- Drive safely and with headlights on. Maintain a safe and steady pace. Do not stop to take pictures.
- Yield to emergency vehicles.
- Follow directions of law enforcement officers and emergency responders.



Livestock is one of many evacuation considerations for residents across the district. Photo credit: TEA.

Accessibility and Navigability for Emergency Personnel

Address signs

Installing reflective address numbers can save lives by making it easier for firefighters to find your home at night and under smokey conditions. Mount reflective address signs on noncombustible posts, not on stumps, trees, wooden posts, or chains across driveways. Chains across driveways might be removed during wildfire suppression to permit access to your property. Make sure the numbers are clearly visible from both directions on the roadway.

Driveways

It is important to ensure emergency responders can locate and access your home. Narrow driveways without turnarounds, tree limbs hanging over the road, and lots of dead and down trees by the road may make firefighters choose to not defend your home during a wildfire event (Brown, 1994).

Some roads in the district have accessibility and navigability issues, such as narrow widths, inadequate vertical clearance for engines, and heavy fuel loading on the sides of the road. These unsafe road and driveway conditions could turn firefighters away from attempting to defend homes. According to the National Fire Protection Association (NFPA), driveways and roads should have a minimum of 20 feet of horizontal clearance and 13.5 feet of vertical clearance to allow engines to safely access the roads (O'Connor, 2021). Residents should remove trees and low-hanging limbs along driveways to facilitate firefighter access, as well as removing all dead trees that could fall across the driveway and block access.

Where possible, residents should improve roadway access, and where this is not feasible, it is vital that homeowners take measures to harden their home and create defensible space. Some actions to increase access to your home are simple, such as installing reflective address numbers, and others take time and investment, such as widening driveways to accommodate fire engines.



Many driveways within the district do not meet current access requirements and pose safety issues that are difficult to mitigate. Long, narrow, steep driveways lacking turnarounds, and dense trees on the sides of the road can create challenges for emergency response vehicles during wildfires. Photo credit: TEA.

LFPD keeps an updated list of gate codes to permit emergency access. **Ensure that your gate codes are known to LFPD so that emergency personnel can use them.** Contact LFPD to learn more.

If you or your neighborhood has a private bridge, post the bridge weight limits. Not all firefighting equipment will cross unmarked bridges, so knowing and posting weight limits may help firefighters access and defend your home.

Private Water Resources

Water resources to fight fires can be scarce, especially during the fire season in late summer and fall. Firefighters are skilled at determining the most beneficial ways to use water to protect structures from an approaching fire. Providing clear access to suitable water resources around your home or neighborhood can help them defend your home.

Do not turn sprinklers on around your home as you evacuate. This is counterproductive to protecting your home because continuous use of water far in advance of the fire can drain local wells and cisterns long before the fire reaches your neighborhood. This leaves firefighters with less resources to defend your home, putting their lives and your property at higher risk. Leave sprinklers visible but **turned off** so firefighters can determine whether they will be useful or not. Read this post by Fire Safe Marin about why it is unwise to leave water running when you evacuate during a wildfire.

Before you evacuate, prepare personal water resources by making them easily accessible and clearly labelling how to access them. Unlock pump house doors and remove vegetation or other obstructions. If you have a generator, leave it in an accessible location in case the power is turned off. Notify LFPD of community cisterns or tanks so they can be identified prior to an emergency. Contact LFPD when planning a new cistern to ensure it is compatible with their fire equipment.

Most importantly, create defensible space around your home and buildings so that water resources can be used effectively. Water is not a reliable resource along the Colorado Front Range. Maintaining a property that requires less water and resources to defend is more likely to stand strong during and be more resilient to wildfire.

Support Your Local Fire Protection District

Education and outreach are incredibly important to the district–connecting with their constituents is a vital part of building relationships and providing the highest quality services. Your support for LFPD can improve the safety of this community:

- Consider volunteering with LFPD.
- Provide financial support in the form of monetary donations.
- Support funding measures, such as a mill levy, that strengthen LFPD's capacity to provide wildfire mitigation, emergency response, and community education services, recognizing that sustained funding directly supports firefighter safety and community resilience.
- Attend events hosted or supported by LFPD about wildfire mitigation, emergency preparedness, and evacuation. Protecting your home from wildfire can also protect your local firefighters. Share information you learn with neighbors to build community resilience and magnify the impact of individual actions.



Support your community—sign up to volunteer with LFPD. Photo credit: livermorefireco.gov

Steps to enhance firefighter safety and access BEFORE a fire:

- Install reflective address numbers on the street to make it easier for firefighters to navigate to your home under smoky conditions and at night. **Installing reflective address numbers can save lives and is inexpensive and easy to accomplish.**
    - Make sure the numbers are clearly visible from both directions on the roadway.
    - Use noncombustible materials for your address sign and sign supports.
- Improve roadway accessibility for fire engines. Long, narrow, steep, and curving private drives and driveways without turnarounds significantly decrease firefighter access to your property, depending on fire behavior.
    - Fill potholes and eroded surfaces on private drives and driveways.
    - Remove trees along narrow private drives and driveways so the horizontal clearance is 20 feet wide and prune low-hanging branches of remaining trees so the unobstructed vertical clearance is at least 13.5 feet per NFPA recommendations.
- Post the load limit at any private bridges or culverts on your property.

Steps to enhance firefighter safety and access DURING a fire:

- Park cars in your driveway or garage, not along narrow roads, to make it easier for fire engines to access your home and your neighbors' homes.
- Clearly mark septic systems with signs or fences. Heavy fire equipment can damage septic systems.
- Clearly mark wells and water systems. Leave hoses accessible for firefighters to use when defending your home, but **DO NOT** leave the water running. This can reduce water pressure to hydrants across the community and reduce the ability of firefighters to defend your home.

3.b. Plan Unit Relative Risk

This CWPP is a useful planning document, but it will only affect real change if residents, neighbors, LFPD, community associations, land managers, and agency partners come together to address shared risk and implement strategic projects. **Individual, property-level actions—particularly home hardening and maintaining defensible space—are among the most effective ways to reduce structure vulnerability and, when implemented collectively, can significantly lower wildfire risk at the neighborhood and plan unit scale**. This section of the CWPP provides relative risk ratings for CWPP plan units in the district.

CWPP plan units are areas with shared fire risk where residents can organize and support each other to effectively reduce wildfire risk and enhance emergency preparedness. We delineated 11 plan units in the district by considering clusters of addresses, connectivity of roads, topographic features, land parcels, and local knowledge of community organization (**Figure 1.a.3**).

The 2026 LFPD CWPP includes a comparison of overall relative risk that is comprised of relative risk related to potential fire behavior, fire suppression challenges (e.g., limited hydrant availability and engine access), evacuation challenges, and HIZ hazards. This assessment was based on on-the-ground assessments of HIZ and roadway conditions, predictions of fire behavior, radiant heat and ember cast exposure, roadway survivability, and local knowledge from the LFPD CWPP Advisory Committee and other partners in the district. See **Appendix B** for a description of hazard rating methodology. Plan unit risk ratings are specific to the district and are not intended or suitable for comparing this fire protection district to other communities in Colorado or the United States.

The potential for wildfires to pose a threat to lives and property is high across the district, but risk is relatively higher in some parts of the district than others (**Figure 3.b.1**). Plan units with the highest overall relative risk are in the northwestern portion of LFPD where forests are denser, topography is steeper, hazards along roadways are more abundant, and many neighborhoods have limited egress routes. Plan units with higher relative risk for suppression challenges and evacuation challenges are scattered across the district. Plan units with extreme relative risk are strong candidates for immediate action to mitigate hazardous conditions. However, plan units with high relative risk still possess conditions that could threaten life and/or property in the case of wildfire. Specific conditions that contribute to relative risk are provided for each plan unit below.

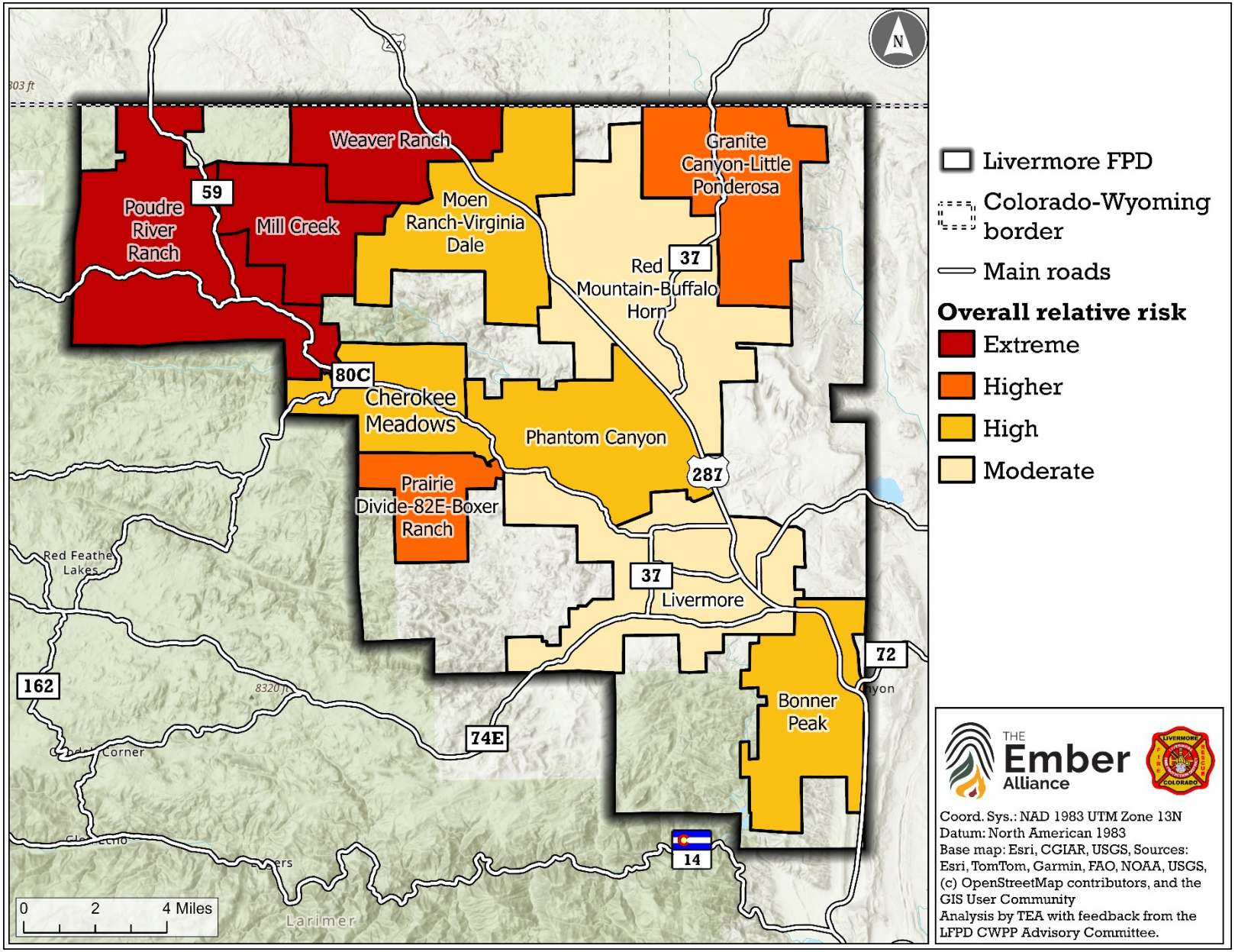


Figure 3.b.1. *Relative risk rating for plan units across the district. All residents within the district are exposed to elevated fire danger due to topography and fuels in this part of Colorado and should take recommended actions in this CWPP seriously, but some plan units have especially elevated risk. Source: Analysis by TEA with feedback from the LFPD CWPP Advisory Committee.*

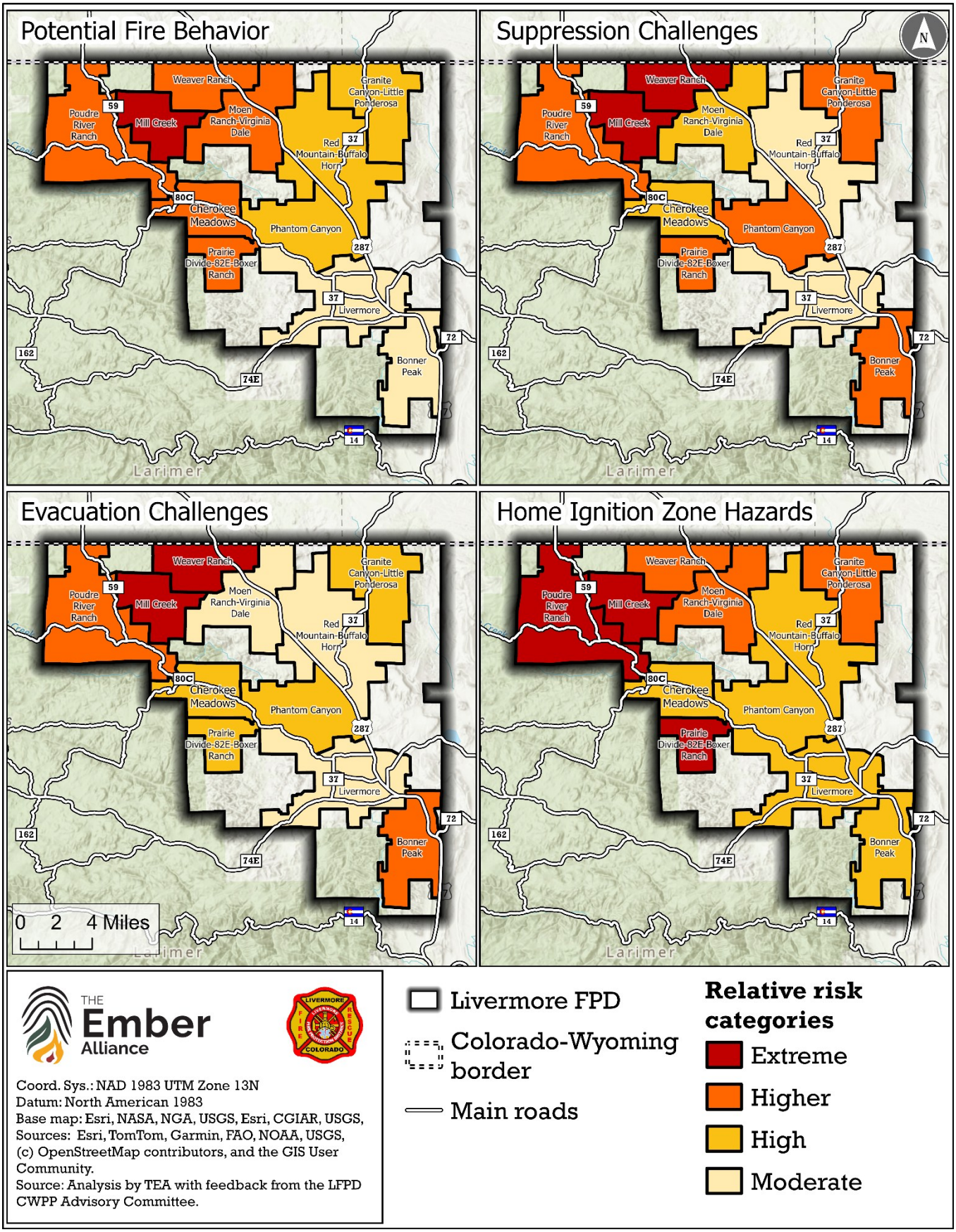


Figure 3.b.2. *Plan unit relative risk for each component used to determine overall risk ratings in the district. Source: Analysis by TEA with feedback from the LFPD CWPP Advisory Committee.*

Bonner Peak

High relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
High	Moderate	Higher	Higher	High

During a fire burning under extreme fire weather conditions:

- **11%** of the area could experience very high to extreme fire behavior.
- **7%** of roadways could experience potentially non-survivable conditions.
- **24%** of structures could be exposed to radiant heat from burning vegetation.
- **15%** of structures could be exposed to embers from burning vegetation.

General description: The Bonner Peak Plan Unit is in the southeastern portion of the LFPD and typifies the transitional zone between plains, hogbacks, and foothills along the Colorado Front Range. Much of the area is grassland, farmland, and ranchland. Almost 40% of this plan unit is public land. Public lands include the Owl Canyon Pinyon Grove, Eagle's Nest Open Space, Brackenbury State Wildlife Area, Poudre River State Trust Land, and a small section of the Arapaho-Roosevelt National Forest.

Highly valued resources & assets: Based on best available data, there are about 240 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Bonner Peak Plan Unit, which is the highest among all plan units in LFPD. This plan unit contains Pete Lien & Sons, a cell tower, and a historic homestead at Eagle's Nest Open Space (**Figure 2.a.1**). Bonner Peak is home to the northern-most pinyon pine grove in the United States, as well as golden eagle nests and important habitat for Preble's meadow jumping mouse and prairie dogs (**Figure B.13**). This plan units contains high- and highest-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan and is within high- and highest-priority watersheds for the 2026 Peaks to People Watershed Investment Tool.

Fire history and potential fire behavior: This plan unit is within the burned area of the 7,700-acre Hewlett Fire in 2012 and 8,900-acre Picnic Rock Fire in 2004, and it is close to the boundary of the 46-acre Lien Fire in 2020, 230-acre Seaman Fire in 2018, and 87,280-acre High Park Fire in 2012. The potential for extreme fire behavior is

moderate compared to other parts of LFPD due to the domination of grasslands. However, grasslands can experience rapid rates of fire spread during high wind events that can outpace the ability of firefighters to quickly suppress. Pockets of dense forest scattered across this plan unit, primarily on north-facing slopes, could experience passive and/or active crown fire. Burning trees and shrubs can emit prolific embers that ignite fuels and structures ahead of the main fire.

Previous and ongoing fuels mitigation: LCDNR performed extensive invasive annual grass treatments on the entirety of Eagle's Nest Open Space, to restore ecological conditions, improve wildlife habitat, and reduce wildfire risk from cheatgrass.

Specific challenges and recommendations:

- All residents should undertake best practices to increase the chance of their home standing strong during wildfire (see the **Mitigate the Home Ignition Zone Section**). Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns.
- Grass fires can support rapid rates of spread during strong wind events. Residents need to be prepared for rapid evacuations, especially on days with red flag warnings. Evacuation preparedness is paramount in plan units like Bonner Peak where some neighborhoods have only one primary egress route. Following recommendations in the **Evacuation Preparedness Section** can help residents be ready to leave at a moment's notice and decrease the chance that they become trapped.
- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Some driveways in the plan unit are long and narrow, which can reduce the ability of firefighters and other first responders to access these properties. Residents should increase the accessibility of their driveways following recommendations in the **Accessibility and Navigability for Emergency Personnel Section**. This includes installing visible, legible, and reflective address numbers and roads signs.
- Potentially non-survivable conditions could develop along portions of Obenchain Road and Bonner Spring Ranch Road during wildfire burning under extreme fire weather conditions. Coordinate with Bonner Peak Landowner Association, neighbors, and the USFS to remove fuels along Bonner Springs Ranch Road and Obenchain Road to make these roads safer for evacuees, firefighters, and other first responders (see CWPP priority projects #16 and #17 in **Figure 4.d.1** and **Table 4.d.2**).
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.

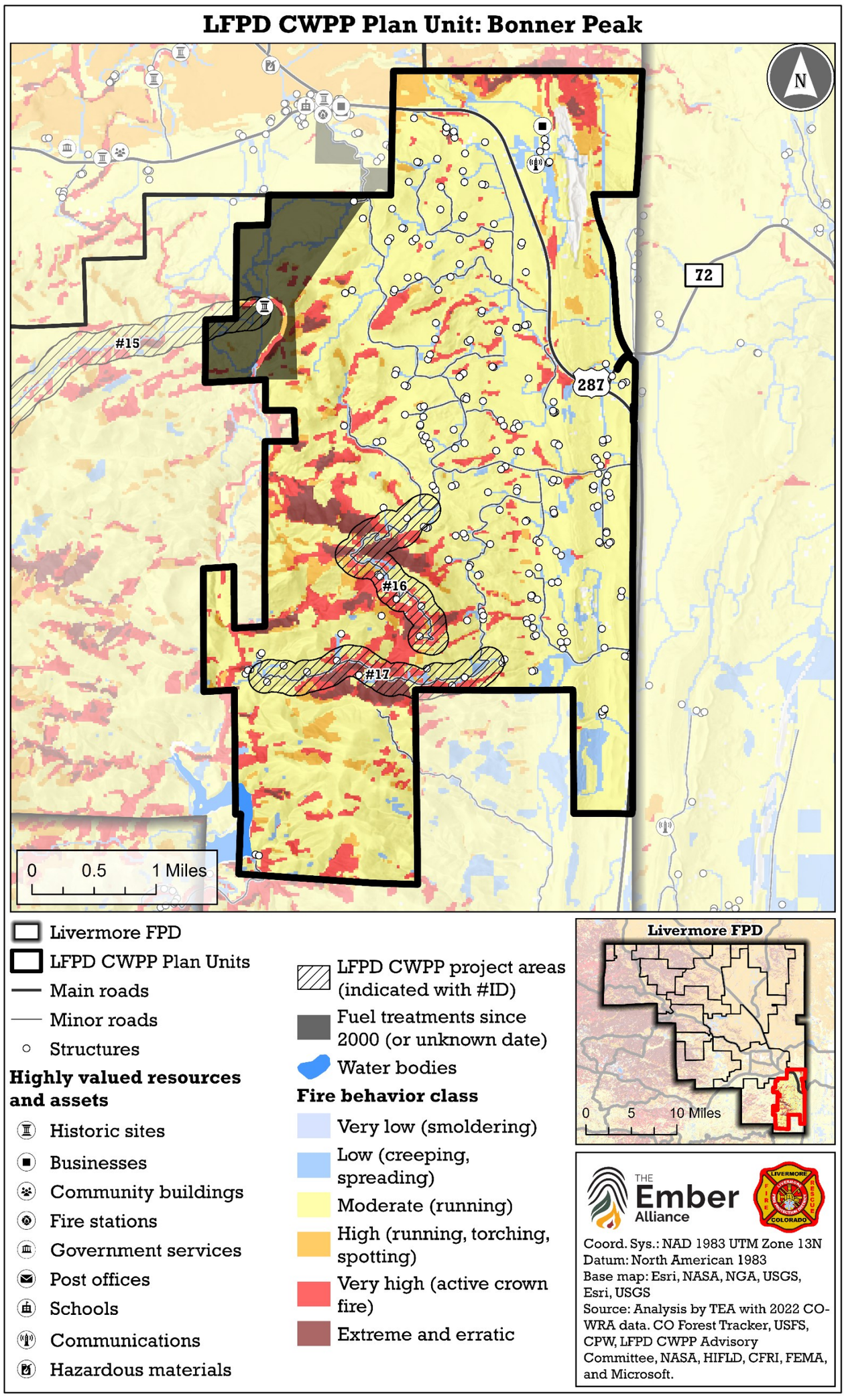


Figure 3.b.3. *Potential fire behavior in and around the Bonner Peak Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Cherokee Meadows

High relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
High	Higher	High	High	High

During a fire burning under extreme fire weather conditions:

- **48%** of the area could experience very high to extreme fire behavior.
- **16%** of roadways could experience potentially non-survivable conditions.
- **100%** of homes could be exposed to radiant heat from burning vegetation.
- **96%** of homes could be exposed to embers from burning vegetation.

General description: The Cherokee Meadows Plan Unit is in the western portion of the LFPD and is split down the middle by Meadow Creek. Homes are scattered across the southern half of the plan unit and intermixed with forest vegetation. This plan unit is nearly a 50-50 split of public land and private property. Public lands include the Middle Unit of the Cherokee State Wildlife Area, several sections of the Arapaho-Roosevelt National Forest, and the Meadow Creek State Land Board property. The western part of plan unit is within the 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project.

Highly valued resources & assets: Based on best available data, there are about 115 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Cherokee Meadows Plan Unit. LFPD Fire Station #2 is located at the border of Cherokee Meadows and Phantom Canyon Plan Units (**Figure 2.a.1**).

This plan unit contains important habitat for Preble's meadow jumping mouse and various rare plant species (**Figure B.13**). The area falls within the Halligan Reservoir action area and high- and highest-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan. There are a couple culverts along Meadow Creek identified by CPRW as critical road-stream crossing locations. The plan unit is also within moderate- to high-priority watersheds for composite goals from the 2020 CSFS Forest Action Plan.

Fire history and potential fire behavior: The 160-acre Halligan 1 Fire in 2022 and 30-acre Halligan Fire in 2006 occurred northeast of the plan unit. Several small wildfires have also ignited in the area over the past couple of

decades and were mostly kept to less than one acre. The Cherokee Meadows Plan Unit has a higher potential to experience extreme fire behavior, particularly in dense ponderosa pine and mixed-conifer forests on steep north-facing slopes. The area north of Meadow Creek supports grasslands and shrublands that can experience high flame lengths and rapid rates of spread during wildfires pushed by strong winds. Burning trees and shrubs can emit prolific embers that ignite fuels and structures ahead of the main fire.

Previous and ongoing fuels mitigation: Cherokee Meadows is covered by the 2022 Cherokee Meadows CWPP, and residents in the area are taking significant steps to address their wildfire risk. In 2025, grant funding from the Red Feather Lakes Area Colorado Wildfire Defense Grant (CWDG) supported mitigation work along Brown Bear Way, this plan unit's main evacuation route, reducing wildfire risk and evacuation challenges. Cherokee Meadows Road Association worked with a private contractor to reduce fuel load along Cherokee Meadows Road several years ago. Private landowners have worked with LCD to restore fire-resilient conditions on their properties, and the USFS has undertaken fuel treatment projects in the western part of this plan unit.

Portions of the Cherokee Meadows Plan Unit is a focus of targeted outreach and education by LCD and CPRW to encourage landowners to mitigate risk and restore forest conditions as part of the 2024 Landscape Resilience Investment Award from the Colorado Strategic Wildfire Action Program (see CWPP priority project #26 in **Figure 4.d.1** and **Table 4.d.2**).

Specific challenges and recommendations:

- Structures in this plan unit have an elevated exposure to radiant heat and embers from wildfire due to interspersing of homes in dense forests. Fortunately, many residents have begun hardening their homes and removing fuel in their HIZ, and this work should continue so homes have a greater chance of standing strong during wildfire. Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns. The **Mitigate the Home Ignition Zone Section** outlines many of the best practices for HIZ mitigation.
- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Some driveways in the plan unit are long and narrow, which can reduce the ability of firefighters and other first responders to access these properties. Residents should increase the accessibility of their driveways following recommendations in the **Accessibility and Navigability for Emergency Personnel Section**. This includes installing visible, legible, and reflective address numbers and roads signs.
- Potentially non-survivable conditions could develop along portions of County Road 67J during wildfire burning under extreme fire weather conditions. Larimer County Road & Bridge, Cherokee Meadows Road Association, private landowners, and other partners should work together to mitigate risk along this important evacuation route to make it safer for evacuees, firefighters, and other first responders (see CWPP priority project #12 in **Figure 4.d.1** and **Table 4.d.2**).
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.

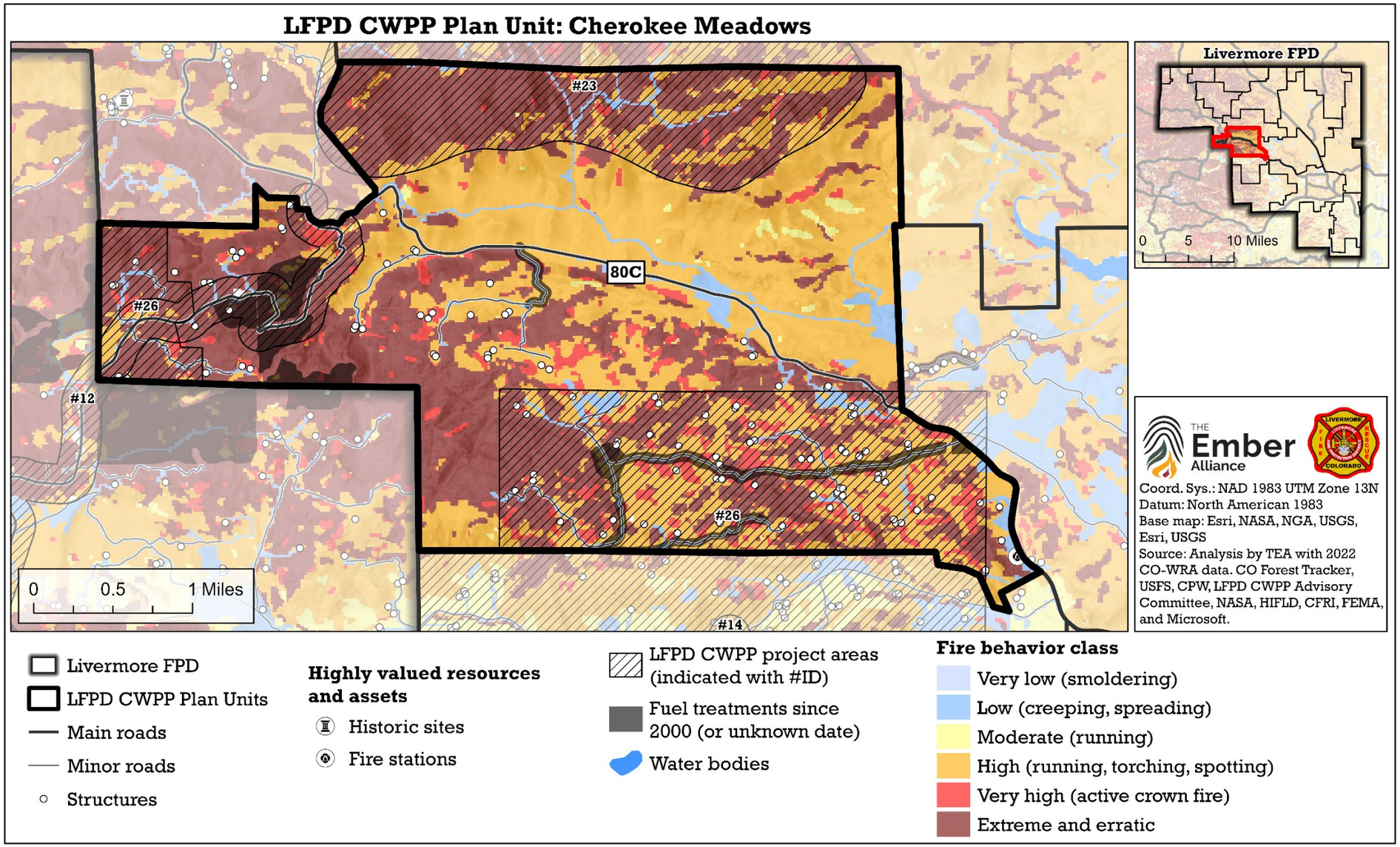


Figure 3.b.4. *Potential fire behavior in and around the Cherokee Meadows Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Granite Canyon – Little Ponderosa

Higher relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
Higher	High	Higher	High	Higher

During a fire burning under extreme fire weather conditions:

- **19%** of the area could experience very high to extreme fire behavior.
- **6%** of roadways could experience potentially non-survivable conditions.
- **96%** of homes could be exposed to radiant heat from burning vegetation.
- **81%** of homes could be exposed to embers from burning vegetation.

General description: The Granite Canyon – Little Ponderosa Plan Unit is in the northeastern portion of LFPD and supports farmland, grassland, and rangelands that abut rolling hills and drainages covered in ponderosa pine forest. One-third of the plan unit is public land, including a section of land owned by the Colorado State Land Board, a portion of the Maxwell Ranch managed by the CSU Research Foundation, and small portions of Red Mountain Open Space, which is managed by LCDRN. There are also several large conservation easements in this plan unit, which translates to no or limited additional development.

Highly valued resources & assets: Based on best available data, there are about 200 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Granite Canyon – Little Ponderosa Plan Unit. LFPD Fire Station #4 is currently under construction in this plan unit (**Figure 2.a.1**). The area also contains abundant habitat for various rare plant species (**Figure B.13**).

Fire history and potential fire behavior: No large fires have occurred in and around this plan unit in the past several decades, but there have been several small wildfires that were kept to less than two acres. The Granite Canyon – Little Ponderosa Plan Unit can experience a range of potential fire behavior. Grasslands and shrublands across much of the area could experience rapid rates of fire spread during high wind events and can outpace the ability of firefighters to quickly suppress the fire. Dense ponderosa pine forests on rolling hills and drainages

could experience passive and/or active crown fire. Burning trees and shrubs can emit prolific embers that ignite fuels and structures ahead of the main fire.

Previous and ongoing fuels mitigation: LCD has completed some fuel mitigation work on private land in the area, and they are planning future treatments with a landowner to restore fire-resilient ecosystems and reduce wildfire risk around their structures (see CWPP priority project #24 in **Figure 4.d.1** and **Table 4.d.2**).

Specific challenges and recommendations:

- Structures in this plan unit have an elevated exposure to radiant heat and embers from wildfire due to varied topography and abutting of grasslands with dense forests. Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns. The **Mitigate the Home Ignition Zone Section** outlines many of the best practices for HIZ mitigation.
- Grass fires can support rapid rates of spread during strong wind events. Residents need to be prepared for rapid evacuations, especially on days with red flag warnings. See the **Evacuation Preparedness Section** for specific suggestions.
- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Some driveways in the plan unit are long and narrow, which can reduce the ability of firefighters and other first responders to access these properties. Residents should increase the accessibility of their driveways following recommendations in the **Accessibility and Navigability for Emergency Personnel Section**. This includes installing visible, legible, and reflective address numbers and roads signs.
- Potentially non-survivable conditions could develop along switchbacks on Red Mountain Road during extreme fire behavior. Larimer County Road & Bridge, CSU Research Foundation, private landowners, and other partners should work together to mitigate risk along this important evacuation route to make it safer for evacuees, firefighters, and other first responders (see CWPP priority project #13 in **Figure 4.d.1** and **Table 4.d.2**).
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.

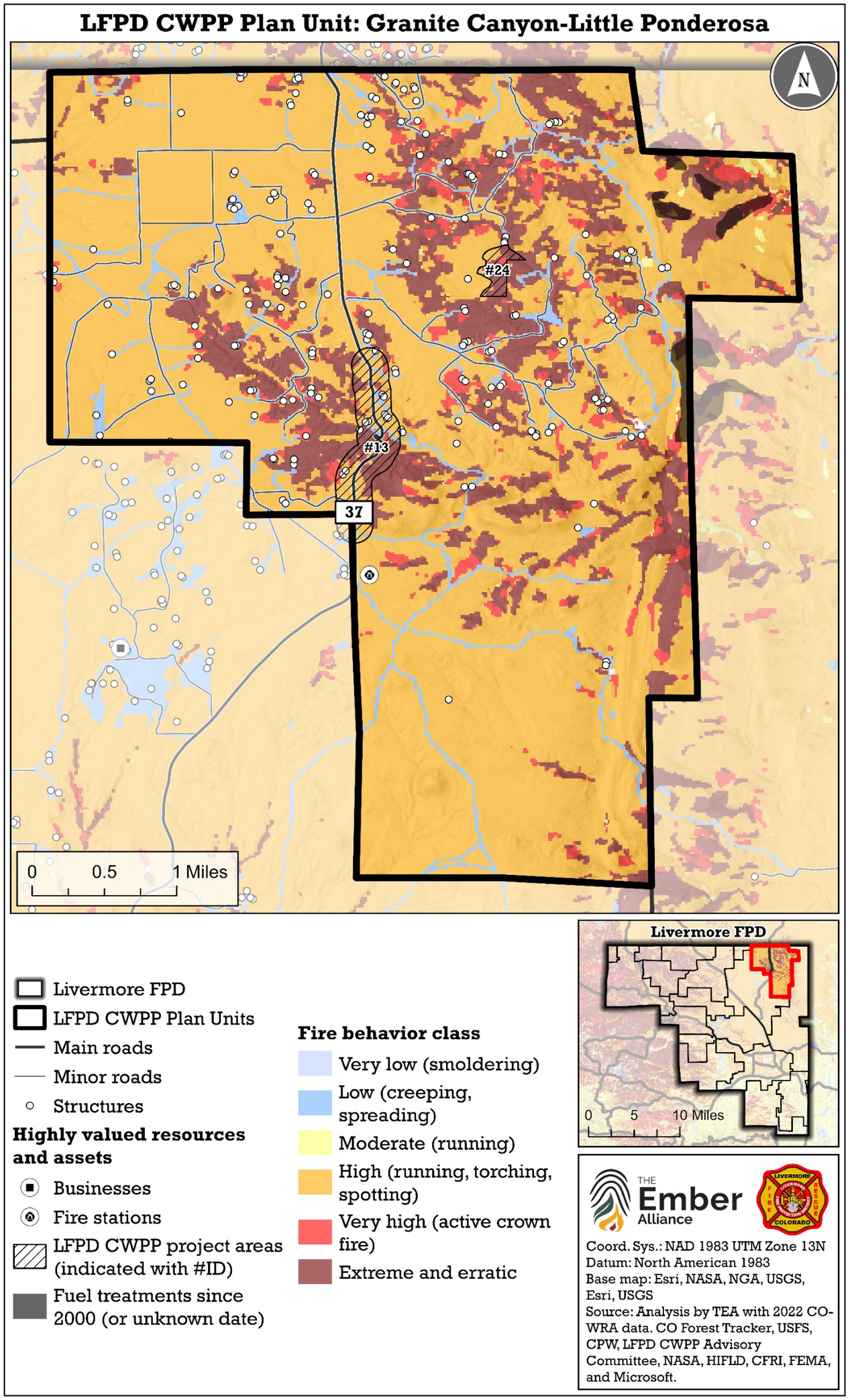


Figure 3.b.5. *Potential fire behavior in and around the Granite Canyon – Little Ponderosa Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Livermore

Moderate relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
Moderate	Moderate	Moderate	Moderate	High

During a fire burning under extreme fire weather conditions:

- **8%** of the area could experience very high to extreme fire behavior.
- **0%** of roadways could experience potentially non-survivable conditions.
- **70%** of homes could be exposed to radiant heat from burning vegetation.
- **10%** of homes could be exposed to embers from burning vegetation.

General description: Livermore is the social and economic hub of LFPD. Much of this plan unit is a mix of irrigated cropland, rangeland, grassland, and shrubland, with ponderosa pine and mixed conifer forests in the northwest. Riparian vegetation with willows and cottonwoods occurs along the many creeks and rivers in the area, including the North Fork of the Cache la Poudre River, Lone Pine Creek, Rabbit Creek, and Stonewall Creek. About 80% of this plan unit is private property including multiple large private conservation easements. Small sections of public land scattered across the plan unit include a portion of Eagle's Nest Open Space managed by LCDNR, the Steinhoff Hill State Trust Land owned by the Colorado State Land Board, a portion of the Lone Pine Unit of the Cherokee State Wildlife Area, and a small property managed by the Bureau of Land Management.

Highly valued resources & assets: Based on best available data, there are about 235 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Livermore Plan Unit, which is the second highest in LFPD (second to Bonner Peak Plan Unit). There are numerous HVRAs in this plan unit, including the LFPD Fire Station #1, Livermore Elementary School, Livermore Community Hall, Livermore Post Office, and Livermore Cemetery. CDOT and Larimer County Road & Bridge have maintenance shops in this area, and CPW has operational buildings at the Cherokee SWA - Lower Unit. Historic structures in this area include the Old Livermore Post Office, Livermore Hotel / General Store, a historic church, and Roberts Ranch, Dutch George, and French Pete historic structures. The Forks restaurant and gas station at the intersection of US-287 and Red Feather Lakes Road brings considerable economic activity to the area (**Figure 2.a.1**).

Important habitat for Preble's meadow jumping mouse occurs in riparian corridors along the Cache La Poudre River, Rabbit Creek, and Lone Pine Creek. The plan unit also contains important shrubland dominated by mountain mahogany (**Figure B.13**). The area falls within high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan.

Fire history and potential fire behavior: Recent fires in and around this plan unit include the 560-acre McNey Fire in 2019, 66-acre Roberts Ranch Fire in 2016, and 49-acre acre Lone Pine Fire in 2016. Several small wildfires have also ignited over the past couple of decades and were mostly kept to less than one acre.

The potential for extreme fire behavior is moderate compared to some plan units to the west due to the prevalence of irrigated croplands and grasslands. However, grasslands and shrublands can experience rapid rates of fire spread during high wind events that can outpace the ability of firefighters to quickly suppress. Shrublands can fuel wildfires with long flame lengths and emit prolific embers that ignite fuels and structures ahead of the main fire. Dense forest on north-facing slopes in the northwestern portion of the plan unit could experience passive and/or active crown fire.

Previous and ongoing fuels mitigation: CPW and LCDNR have previous, ongoing, and future planned treatments on Cherokee State Wildlife Area and Eagle's Nest Open Space to reduce noxious weeds, reduce wildfire risk, and improve wildlife habitat. Private landowners, CSFS, LCDNR, and North Fork Poudre Site Conservation Team are also mitigating cheatgrass, improving wildlife habitat, and restoring health to riparian ecosystems in the area (see CWPP priority project #25 in **Figure 4.d.1** and **Table 4.d.2**). Some of this work is funded by the City of Fort Collins through the Halligan Water Supply Project Fish & Wildlife Mitigation and Enhancement Plan.

Specific challenges and recommendations:

- The risk of home-to-home ignition during wildfire is elevated in the Livermore Plan Unit compared to other parts of LFPD because of higher housing densities and less distance between structures. Of particular concern in this plan unit is the abundance of fuel within home ignition zone 1 (0-5 feet from structures). All residents should undertake best practices to increase the chance of their home standing strong during wildfire (see **Mitigate the Home Ignition Zone Section** for best practices). Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns.
- Grass fires can support rapid rates of spread during strong wind events. Residents need to be prepared for rapid evacuations, especially on days with red flag warnings. See the **Evacuation Preparedness Section** for specific suggestions.
- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Firefighters might struggle to find homes during wildfires in the absence of visible, legible, and reflective address numbers and roads signs in this plan unit. Residents should follow recommendations in the **Accessibility and Navigability for Emergency Personnel Section**, which include installing reflective address numbers.
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.

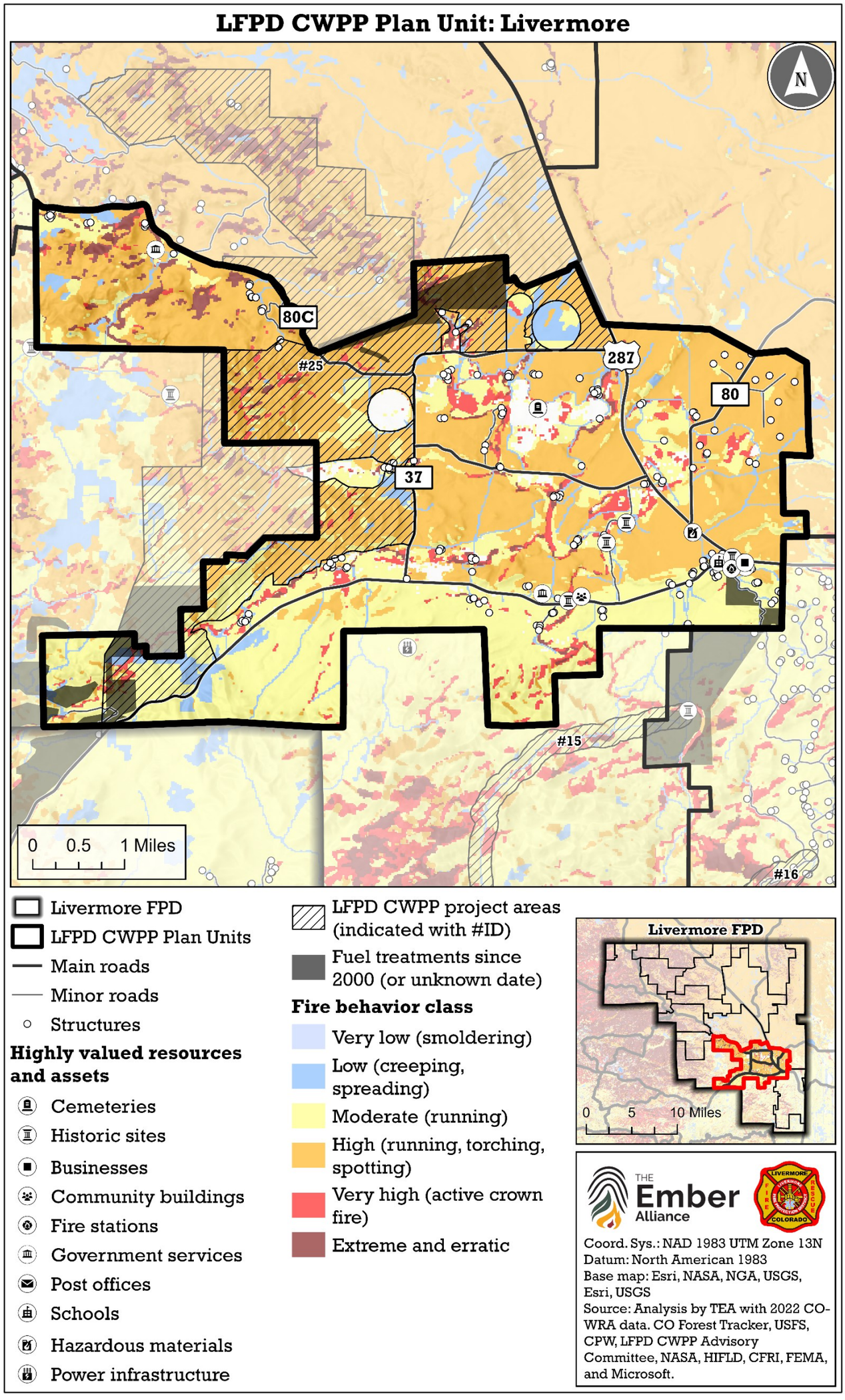


Figure 3.b.6. *Potential fire behavior in and around the Livermore Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Mill Creek

Extreme relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
Extreme	Extreme	Extreme	Extreme	Extreme

During a fire burning under extreme fire weather conditions:

- **65%** of the area could experience very high to extreme fire behavior.
- **32%** of roadways could experience potentially non-survivable conditions.
- **100%** of homes could be exposed to radiant heat from burning vegetation.
- **100%** of homes could be exposed to embers from burning vegetation.

General description: The Mill Creek Plan Unit is characterized by rock outcroppings, complex topography, and ponderosa pine and mixed-conifer forests. Grasslands, shrublands, and riparian vegetation occur along Mill Creek. This plan unit is nearly a 50-50 split of public land and private property in a checkerboard pattern of private property and the Arapaho-Roosevelt National Forest. The plan unit includes a 140-acre land trust called Cap Rock Preserve that is managed by TNC. The plan unit falls within the 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project.

Highly valued resources & assets: Based on best available data, there are about 70 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Mill Creek Plan Unit. The area contains important habitat for the Preble's meadow jumping mouse and various rare plants (**Figure B.13**), and it falls within the Halligan Reservoir action area and high- and highest-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan. There are several culverts along Mill Creek and North CR 59 that were identified by CPRW as critical road stream crossing locations. The plan unit is also within moderate- to high-priority watersheds for composite goals from the 2020 CSFS Forest Action Plan.

Fire history and potential fire behavior: Recent fires in and around this plan unit include the 300-acre Starwood Fire in 2016, 6-acre Wells Spring Fire in 2019, and 7-acre Starwood 2 Fire in 2017. Several small wildfires have also ignited over the past couple of decades and were mostly kept to less than one acre.

The Mill Creek Plan Unit has the most extreme potential for high-intensity wildfire in LFPD. Continuous and dense patches of forest on steep slopes can support passive and active crown fire and emit abundant embers that can ignite additional fires. Dead trees, large logs, and unburned slash piles are common in the plan unit and can burn for a long time with high intensity when they are dry at the end of a summer, especially during drought. If fires burning in these forests were to escape the initial ability of firefighters to suppress, they can quickly become challenging if not impossible to control until winds die down and fuel moistures increase.

Previous and ongoing fuels mitigation: CSFS has previous, ongoing, and future planned projects with homeowners under the 2015 USFS Cherokee Park Environmental Assessment to restore fire-resilient ecosystems and reduce wildfire risk around their structures (see CWPP priority project #21 in **Figure 4.d.1** and **Table 4.d.2**).. Portions of Mill Creek Plan Unit is a focus of targeted outreach and education by LCD and CPRW to encourage landowners to mitigate risk and restore forest conditions as part of the 2024 Landscape Resilience Investment Award from the Colorado Strategic Wildfire Action Program (see CWPP priority project #26 in **Figure 4.d.1** and **Table 4.d.2**).

Specific challenges and recommendations:

- Structures in this plan unit have an elevated exposure to radiant heat and embers from wildfire due to the interspersing of homes in continuous and dense patches of forest on steep slopes. Of particular concern in this plan unit is the abundance of fuel within home ignition zone 1 (0-5 feet from structures) and home ignition zone 2 (5-30 feet from structures). All residents should undertake best practices to increase the chance of their home standing strong during wildfire (see **Mitigate the Home Ignition Zone Section** for best practices). Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns.
- Unburned slash piles on public and private land can hamper fire suppression. Burning piles is a valuable means of disposing of slash, and sometimes the only good option, so it is important for residents to be supportive of judicious pile burning so they are eliminated in a timely fashion.
- Evacuation preparedness is paramount in plan units like Mill Creek where some neighborhoods have only one primary egress route. Following recommendations in the **Evacuation Preparedness Section** can help residents be ready to leave at a moment's notice and decrease the chance that they become trapped. Mill Creek Community Association could also pursue establishing a secondary evacuation route along Moen Road in coordination with the USFS and other partners (see CWPP priority project #11 in **Figure 4.d.1** and **Table 4.d.2**).
- Many driveways in the plan unit are long and narrow, which can reduce the ability of firefighters and other first responders to access these properties. Residents should increase the accessibility of their driveways following recommendations in the **Accessibility and Navigability for Emergency Personnel Section**. This includes installing visible, legible, and reflective address numbers and roads signs.
- Potentially non-survivable conditions could develop along portions of most roads in Mill Creek Plan Unit during wildfire burning under extreme fire weather conditions. County Road 59, Mill Creek Road, Willow Creek Trail, Three Creek Trail, and Haystack Rock Circle are primary evacuation routes for residents in this area. CSFS, USFS, LCD, Diamond Creek, Poudre River Ranch, and Mill Creek Landowner Associations, and private landowners should work together to mitigate risk along these roads to make them safer for evacuees, firefighters, and other first responders (see CWPP priority projects #8 and #21 in **Figure 4.d.1** and **Table 4.d.2**).
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.

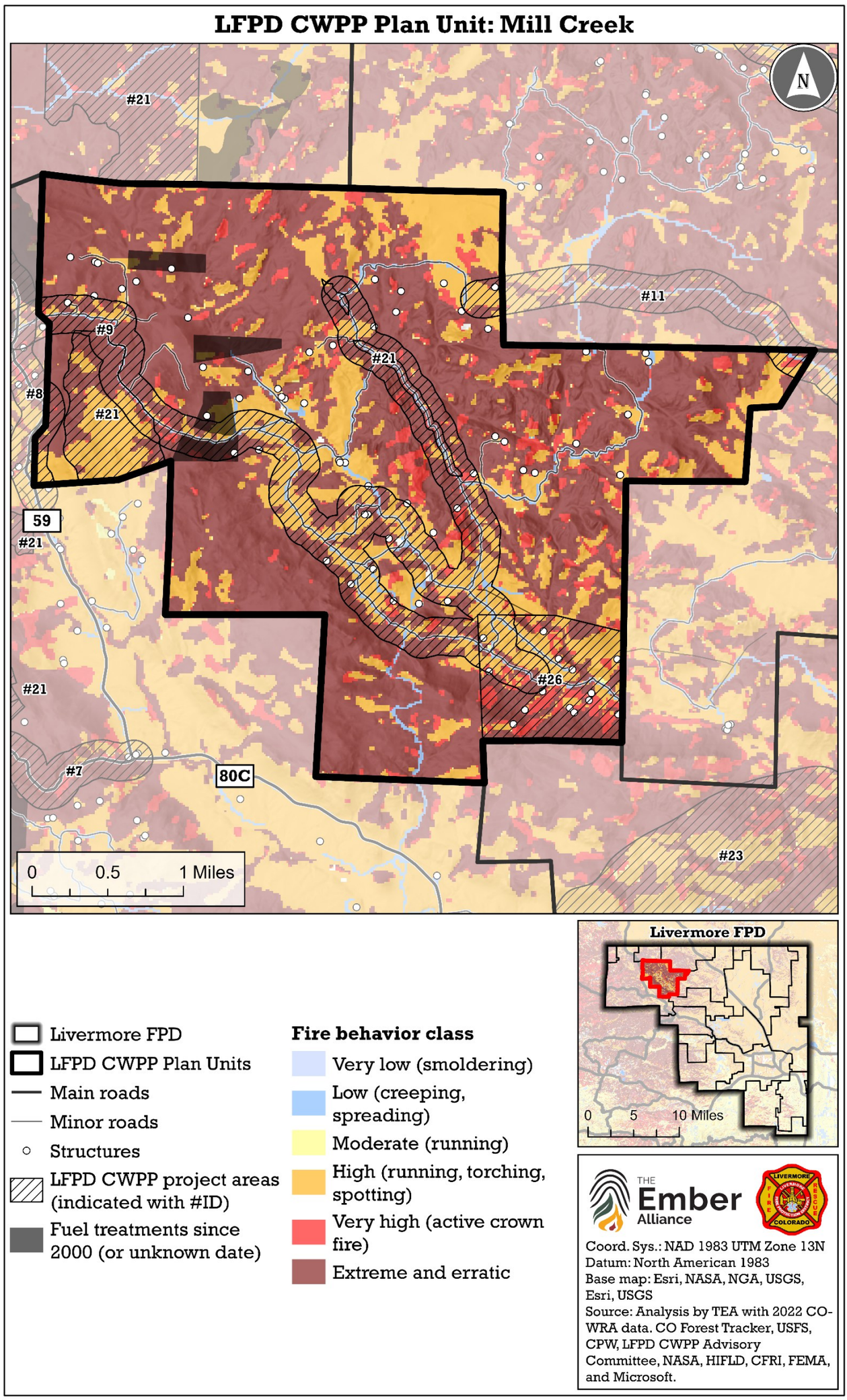


Figure 3.b.7. *Potential fire behavior in and around the Mill Creek Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Moen Ranch – Virginia Dale

High relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
High	Higher	High	Moderate	Higher

During a fire burning under extreme fire weather conditions:

- **34%** of the area could experience very high to extreme fire behavior.
- **8%** of roadways could experience potentially non-survivable conditions.
- **97%** of homes could be exposed to radiant heat from burning vegetation.
- **96%** of homes could be exposed to embers from burning vegetation.

General description: The Moen Ranch – Virginia Dale Plan Unit is in north-central LFPD, and the area supports farmland, grassland, and rangelands that abut steep slopes, gulches, and drainages covered in ponderosa pine and mixed-conifer forest. Almost all this plan unit is private property (92%), and subject to conservation easement. Several sections of the Arapaho-Roosevelt National Forest occur in this plan unit, along with a section of land owned by the Colorado State Land Board. The western portion of the plan unit is within the 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project.

Highly valued resources & assets: Based on best available data, there are about 110 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Moen Ranch – Virginia Dale Plan Unit. This area contains several important, historic buildings, such as the Virginia Dale Community Hall with the Virginia Dale Overland Stage Station and Hurzeler House, the old Virginia Dale Post Office, and a historic homestead at Flying S Ranch. The plan unit also contains the Abbey of Saint Walburga and Virginia Dale Church and their associated cemeteries (**Figure 2.a.1**).

Riparian areas along Fish Creek, Mud Creek, and Dale Creek serve as critical habitat for the Preble's meadow jumping mouse. The plan unit also contains habitat for various rare plant species (**Figure B.13**). The area falls within high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan and moderate- to high-priority watersheds for composite goals from the 2020 CSFS Forest Action Plan.

Fire history and potential fire behavior: Recent fires in and around this plan unit include the 160-acre Halligan 1 Fire in 2022, 22-acre Church Fire in 2022, and 32-acre Virginia Dale Fire in 2021. The Stateline Fire started on March 21, 2026, in northern LFPD off Highway 287 and grew to about 2 acres. The fire was contained quickly by LCSO, LFPD, and Vedauwoo and Tie Siding Volunteer Fire Departments in Wyoming. The Sisters of Abbey of St. Walburga played a critical role in preventing the fire from growing out of control by providing firefighters with access to water sources on their property. Several small wildfires have also ignited in the area over the past couple of decades and were mostly kept to less than one acre.

The Moen Ranch – Virginia Dalek Plan Unit can experience a range of potential fire behavior. Grasslands and shrublands could experience rapid rates of fire spread during high wind events and can outpace the ability of firefighters to quickly suppress the fire. Dense ponderosa pine forests on rolling hills and drainages could experience passive and/or active crown fire. Burning trees and shrubs can emit prolific embers that ignite fuels and structures ahead of the main fire.

Previous and ongoing fuels mitigation: LCD has previous, ongoing, and future planned projects with homeowners in this plan area to restore fire-resilient ecosystems and reduce wildfire risk around their structures.

Specific challenges and recommendations:

- Structures in this plan unit have an elevated exposure to radiant heat and embers from wildfire due to varied topography and abutting of grasslands with dense forests. Of particular concern in this plan unit is the abundance of fuel within home ignition zone 1 (0-5 feet from structures) and home ignition zone 2 (5-30 feet from structures). The many wooden fences in this plan unit can serve as fire pathways between structures. All residents should undertake best practices to increase the chance of their home standing strong during wildfire (see the **Mitigate the Home Ignition Zone Section** for best practices). Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns.
- The Virginia Dale Community Club, Overland Stage Station, and Hurzeler House could be exposed to radiant heat from fast-moving wildfires with high flame lengths. Virginia Dale Community Club should work with LFPD and other partners to ensure these important and historic structures have the best chance of their home standing strong during wildfire (see CWPP priority project #27 in **Figure 4.d.1** and **Table 4.d.2**).
- Grass fires can support rapid rates of spread during strong wind events. Residents need to be prepared for rapid evacuations, especially on days with red flag warnings. See the **Evacuation Preparedness Section** for specific suggestions.
- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Firefighters might struggle to find homes during wildfires in the absence of visible, legible, and reflective address numbers and roads signs in this plan unit. Residents should follow recommendations in the **Accessibility and Navigability for Emergency Personnel Section**, which include installing reflective address numbers.
- Potentially non-survivable conditions could develop along portions of Moen Ranch Road during wildfire burning under extreme fire weather conditions. The USFS, private landowners, and other partners should work together to mitigate risk along this important evacuation route to make it safer for evacuees, firefighters, and other first responders (see CWPP priority project #11 in **Figure 4.d.1** and **Table 4.d.2**).
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.

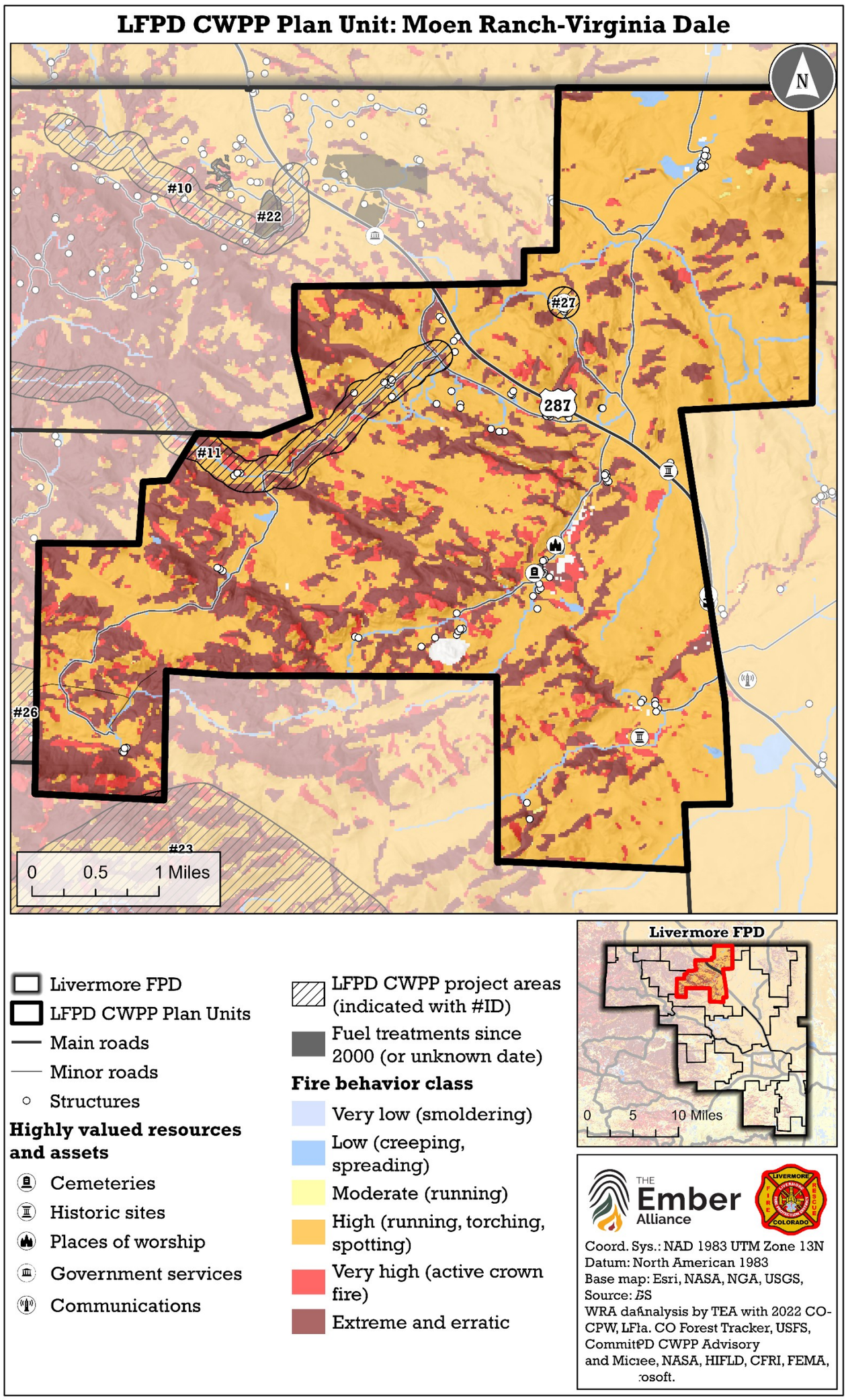


Figure 3.b.8. *Potential fire behavior in and around the Moen Ranch – Virginia Dale Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Phantom Canyon

High relative risk



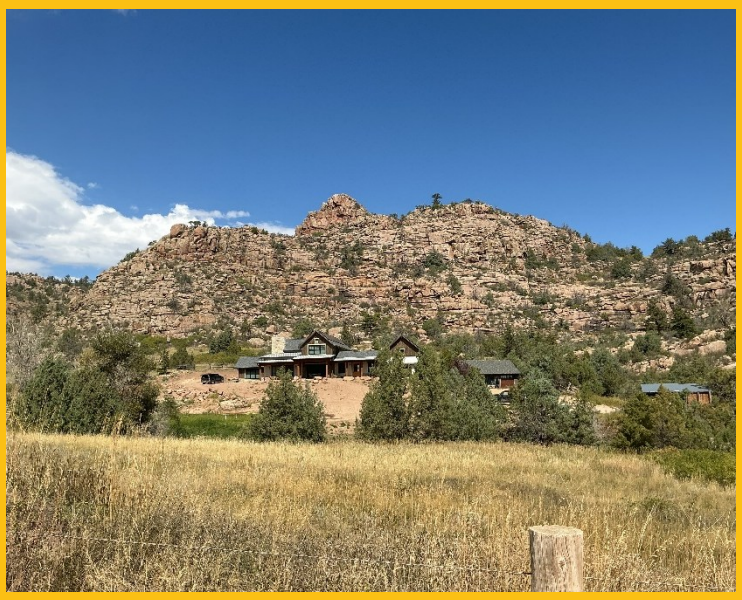


Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
High	High	Higher	High	High

During a fire burning under extreme fire weather conditions:

- **10%** of the area could experience very high to extreme fire behavior.
- **3%** of roadways could experience potentially non-survivable conditions.
- **100%** of homes could be exposed to radiant heat from burning vegetation.
- **76%** of homes could be exposed to embers from burning vegetation.

General description: The North Fork Cache La Poudre River runs through the middle of the Phantom Canyon Plan Unit, making it an ecologically significant area that provides diverse habitat for wildlife. Much of the plan unit is a mix of grasslands, rangelands, and shrublands, but dense patches of forest are scattered across rocky hills and steep north-facing slopes. Nearly all this plan unit is private property (94%), most of which is subject to conservation easement. Phantom Canyon Ranch Preserve managed by TNC is located here and consists of about 1,700 acres of protected habitat along the North Fork of the Cache la Poudre River. The plan unit also contains one section of land owned by the Colorado State Land Board.

Highly valued resources & assets: Based on best available data, there are about 35 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Phantom Canyon Plan Unit. LFPD Fire Station #2 is located on the border of Phantom Canyon and Cherokee Meadows Plan Units (**Figure 2.a.1**).

Riparian areas along the North Fork Cache La Poudre provide important habitat for the Preble's meadow jumping mouse, and rock formations in the area are critical habitat for the pale lumped-nosed bat (**Figure B.13**). The northwestern part of this plan unit is within the Halligan Reservoir action area, and several parts of the plan unit are in high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan. There are several culverts along Meadow Creek that were identified by CPRW as critical road stream crossing locations.

Fire history and potential fire behavior: Recent fires in and around this plan unit include the 160-acre Halligan 1 Fire in 2022, 30-acre Stonewall Fire in 2020, and 8-acre Halligan Fire in 2021. Several small wildfires have also ignited in the area over the past couple of decades and were mostly kept to less than one acre.

The Phantom Canyon Plan Unit can experience a range of potential fire behavior. Grasslands and shrublands across much of the area could experience rapid rates of fire spread during high wind events and can outpace the ability of firefighters to quickly suppress the fire. Dense ponderosa pine forests on steep slopes could experience passive and/or active crown fire. Burning trees and shrubs can emit prolific embers that ignite fuels and structures ahead of the main fire.

Previous and ongoing fuels mitigation: In early 2026, grant funding from the Red Feather Lakes Area Colorado Wildfire Defense Grant (CWDG) supported mitigation work along Brewster Lane to reduce wildfire risk and evacuation challenges. CPW has complete, ongoing, and planned projects to mitigate cheatgrass in and around the Cherokee State Wildlife Area to restore ecological conditions, improve wildlife habitat, and reduce fire risk. Private landowners, CSFS, LCDNR, and North Fork Poudre Site Conservation Team are also mitigating cheatgrass, improving wildlife habitat, and restoring health to riparian ecosystems in the area (see CWPP priority project #25 in **Figure 4.d.1** and **Table 4.d.2**). Some of this work is funded by the City of Fort Collins through the Halligan Water Supply Project Fish & Wildlife Mitigation and Enhancement Plan**.** TNC also undertakes projects across their Phantom Canyon property to improve wildlife habitat and restore fire-resilient ecosystems.

Specific challenges and recommendations:

- Structures in this plan unit have an elevated exposure to radiant heat from wildfire due to varied topography and abutment of grasslands with dense forests. Of particular concern in this plan unit is the abundance of fuel within home ignition zone 1 (0-5 feet from structures). All residents should undertake best practices to increase the chance of their home standing strong during wildfire (see the **Mitigate the Home Ignition Zone Section** for best practices). Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns.
- Grass fires can support rapid rates of spread during strong wind events. Residents need to be prepared for rapid evacuations, especially on days with red flag warnings. See the **Evacuation Preparedness Section** for specific suggestions.
- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Some driveways in the plan unit are long and narrow, which can reduce the ability of firefighters and other first responders to access these properties. Residents should increase the accessibility of their driveways following recommendations in the **Accessibility and Navigability for Emergency Personnel Section**. This includes installing visible, legible, and reflective address numbers and roads signs.
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.
- This area has high ecological value for rare and sensitive plants and wildlife species. Habitat considerations should be factored into fuel mitigation projects, with a focus on ecological restoration of meadows, forests, and riparian habitat.

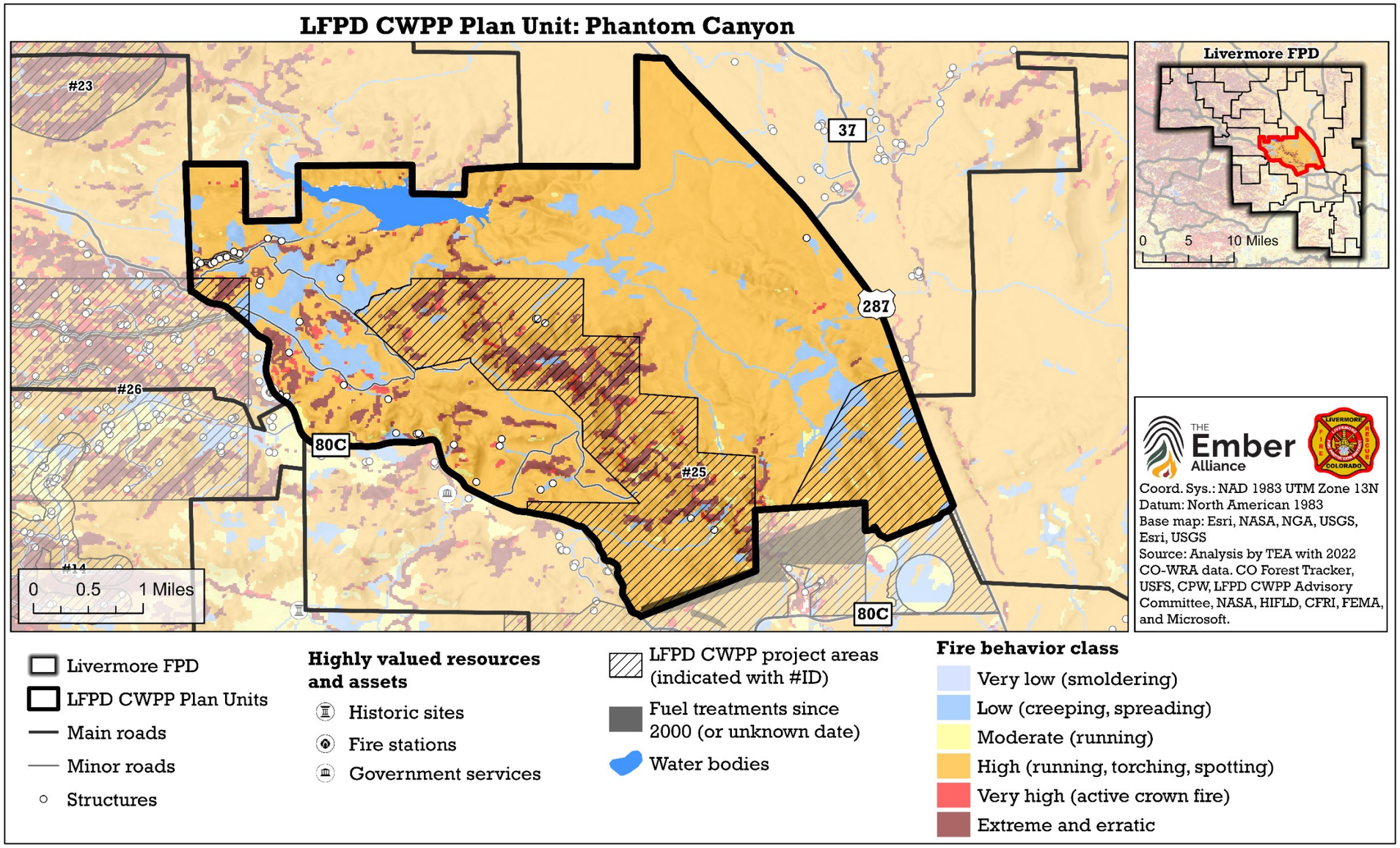


Figure 3.b.9. *Potential fire behavior in and around the Phantom Canyon Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Poudre River Ranch

Extreme relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
Extreme	Higher	Higher	Higher	Extreme

During a fire burning under extreme fire weather conditions:

- **70%** of the area could experience very high to extreme fire behavior.
- **41%** of roadways could experience potentially non-survivable conditions.
- **99%** of homes could be exposed to radiant heat from burning vegetation.
- **100%** of homes could be exposed to embers from burning vegetation.

General description: The Poudre River Ranch Plan Unit is the western-most and highest elevation portion of LFPD. Dense forests of ponderosa pine and mixed conifer species cover much of the area, interspersed with aspen and rocky outcroppings. Lodgepole pine forests dominate at higher elevations. Grasslands, shrublands, and riparian vegetation occur along Trail Creek and various other drainages. This plan unit is nearly a 50-50 split of public land and private property in a checkerboard pattern of private land, the Arapaho-Roosevelt National Forest, and the Upper and Middle Units of the Cheroke State Wildlife Area managed by CPW. The area falls within the 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project. The plan unit is also covered by the 2010 Diamond Creek / Upper Cherokee Park CWPP.

Highly valued resources & assets: Based on best available data, there are about 155 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Poudre River Ranch Plan Unit. Cherokee Park Dude Ranch in this plan unit contains several historic buildings and brings considerable economic activity to the area (**Figure 2.a.1**).

Riparian corridors provide habitat for the Preble's meadow jumping mouse, and the northern portion of the plan unit is used by elk as a migration route. There is also habitat for various rare plants (**Figure B.13**). There are many culverts along Bull Creek, Devil's Creek, Pratt Creek, Trail Creek, and the North Fork Cache la Poudre River that were identified by CPRW critical road stream crossing locations. The plan unit falls within the Halligan

Reservoir action area and high- and highest-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan. It is also within moderate- to high-priority watersheds for composite goals from the 2020 CSFS Forest Action Plan.

Fire history and potential fire behavior: Recent fires in and around this plan unit include the 300-acre Starwood Fire in 2016, 8-acre Prickly Pear Fire in 2022, 7-acre Starwood 2 Fire in 2017, 30-acre Sheep Complex Fire in 2005, and 11-acre Devil's Creek Fire in 2005. Numerous small wildfires have also ignited in the area over the past couple of decades and were mostly kept to less than one acre.

The Poudre River Ranch Plan Unit has a higher potential for extreme fire behavior than much of LFPD. Continuous and dense patches of forest on steep slopes can support passive and active crown fire and emit abundant embers that can ignite additional fires. Dead trees, large logs, and unburned slash piles are common in the plan unit and can burn for a long time with high intensity when they are dry at the end of a summer, especially during drought. If fires burning in these forests were to escape the initial ability of firefighters to suppress, they can quickly become challenging if not impossible to control until winds die down and fuel moistures increase.

Previous and ongoing fuels mitigation: The 2011 Diamond Creek / Upper Cherokee Park CWPP inspired many homeowners in the area to address their wildfire risk. There are several completed, ongoing, and planned projects by LCD and CSFS with homeowners to restore fire-resilient ecosystems and reduce wildfire risk around their structures as part of the 2015 USFS Cherokee Park Environmental Assessment (CWPP priority project #21 in **Figure 4.d.1** and **Table 4.d.2**). The USFS has completed extensive fuel treatment projects across the western part of the plan unit, including broadcast burning. USFS also has several planned projects in the area, particularly along roads, as part of the 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project (CWPP priority project #2 in **Figure 4.d.1** and **Table 4.d.2**).

Portions of the Poudre River Ranch Plan Unit is a focus of targeted outreach and education by LCD and CPRW to encourage landowners to mitigate risk and restore forest conditions as part of the 2024 Landscape Resilience Investment Award from the Colorado Strategic Wildfire Action Program (CWPP priority project #26 in **Figure 4.d.1** and **Table 4.d.2**).

Specific challenges and recommendations:

- Structures in this plan unit have an elevated exposure to radiant heat and embers from wildfire due to the interspersing of homes in continuous and dense patches of forest on steep slopes. Of particular concern in this plan unit is the abundance of fuel within home ignition zone 1 (0-5 feet from structures) and home ignition zone 2 (5-30 feet from structures). Historic structures at Cherokee Park Dude Ranch are also vulnerable due to their wooden construction, which makes fuel reduction in the home ignition zone even more critical. All residents should undertake best practices to increase the chance of their home standing strong during wildfire (see the **Mitigate the Home Ignition Zone Section** for best practices). Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns.
- Private landowners should work with the USFS, CSFS, CPW, and other partners in the area to create linked defensible space and a fuel break that protects the community (CWPP priority projects #19 and #20 in **Figure 4.d.1** and **Table 4.d.2**).
- Unburned slash piles on public and private land can hamper fire suppression. Burning piles is a valuable slash management strategy, especially when there are limited, if any, other means of slash disposal, so it is important for residents to be supportive of judicious pile burning so they are eliminated in a timely fashion.
- Many driveways in the plan unit are long and narrow, which can reduce the ability of firefighters and other first responders to access these properties. Residents should increase the accessibility of their driveways following recommendations in the **Accessibility and Navigability for Emergency Personnel Section**. This includes installing visible, legible, and reflective address numbers and roads signs.

- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Recreators visiting the U.S. Forest Service, Cherokee SWA – Upper Unit, and Cherokee Park Dude Ranch can create an additional challenge for evacuations by increasing the number of people in the area, adding more campers and trailers on the roads, and being less familiar with the area. The USFS and CPW should consider alternate means of communicating fire risk and evacuation orders to recreators, such as electronic sign boards. Cherokee Park Dude Ranch should develop an evacuation plan in coordination with LCSO Emergency Services so they could safely evacuate guests in the case of wildfire.
- Potentially non-survivable conditions could develop along portions of most roads in Poudre River Ranch Plan Unit during wildfire burning under extreme fire weather conditions. Of particular concern are conditions along sections of Cherokee Ranch Road (CR 80C), Pratt Creek Road (FS 182), and CR 59 because these are primary evacuation routes for residents in this area. Conditions along CR 65E could also become non-survivable and inaccessible, creating issues for recreators at the Cherokee SWA – Upper Unit and firefighters trying to access the area. The USFS, CPW, CPW, Larimer County Road & Bridge, Diamond Creek and Poudre River Ranch Landowner Associations, and private landowners should work together to mitigate risk along these roads to make them safer for evacuees, firefighters, and other first responders (CWPP priority projects #3, #4, #5, #6, #7, and #8 in **Figure 4.d.1** and **Table 4.d.2**).
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.

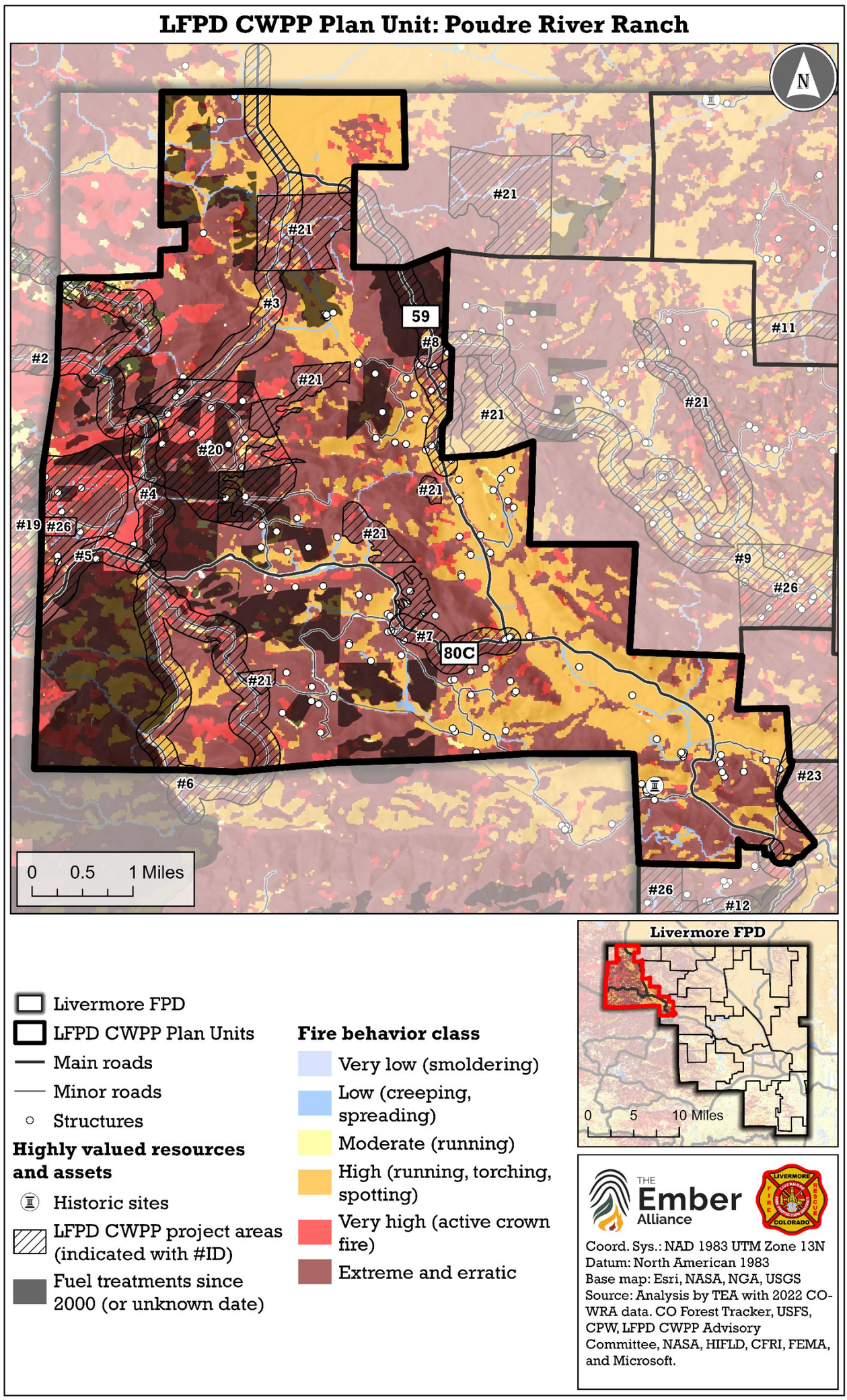


Figure 3.b.10. *Potential fire behavior in and around the Poudre River Ranch Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Prairie Divide – 82E – Boxer Ranch

Higher relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
Higher	Higher	Higher	High	Extreme

During a fire burning under extreme fire weather conditions:

- **44%** of the area could experience very high to extreme fire behavior.
- **29%** of roadways could experience potentially non-survivable conditions.
- **82%** of homes could be exposed to radiant heat from burning vegetation.
- **86%** of homes could be exposed to embers from burning vegetation.

General description: The North Fork Rabbit Creek and Middle Fork Rabbit Creek traverse the Prairie Divide – 82E – Boxer Ranch Plan Unit and are lined with riparian vegetation. Flat areas along these creeks are covered in grasslands, rangelands, and shrublands. Dense ponderosa pine and mixed-conifer forests occur across the plan unit, particularly on steep north-facing slopes. The upper two-thirds of this plan unit is private property. Public land in the plan unit is a section of the Arapaho-Roosevelt National Forest and portions of the Lone Pine and Roy Brown Units of the Cherokee State Wildlife Area. The western portions of the plan unit are within the 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project.

Highly valued resources & assets: Based on best available data, there are about 110 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Prairie Divide – 82E – Boxer Ranch Plan Unit. Riparian corridors provide important habitat for the Preble's meadow jumping mouse, and various rare plants are found here (**Figure B.13**). The plan unit falls within high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan, and the western portion within high and highest-priority watersheds for the 2026 Peaks to People Watershed Investment Tool.

Fire history and potential fire behavior: The 227-acre Stuart Hole Fire occurred in this plan unit in 2012. Several small wildfires have also ignited over the past couple of decades and were mostly kept to less than one acre.

The Prairie Divide – 82E – Boxer Ranch Plan Unit can experience a range of potential fire behavior. Grasslands and shrublands could experience rapid rates of fire spread during high wind events and can outpace the ability of firefighters to quickly suppress the fire. Dense forests could experience passive and/or active crown fire, particularly on steep north-facing slopes. Burning trees and shrubs can emit prolific embers that ignite fuels and structures ahead of the main fire.

Previous and ongoing fuels mitigation: At least one landowner in the Prairie Divide – 82E – Boxer Ranch Plan Unit has worked with CSFS on forest management projects to restore fire-resilient ecosystems and reduce wildfire risk around their structures. Portions of the Prairie Divide – 82E – Boxer Ranch Plan Unit is a focus of targeted outreach and education by LCD and CPRW to encourage landowners to mitigate risk and restore forest conditions as part of the 2024 Landscape Resilience Investment Award from the Colorado Strategic Wildfire Action Program (CWPP priority project #26 in **Figure 4.d.1** and **Table 4.d.2**).

Specific challenges and recommendations:

- Structures in this plan unit have an elevated exposure to radiant heat and embers from wildfire due to the interspersing of homes in continuous and dense patches of forest on steep slopes. Of particular concern in this plan unit is the abundance of fuel within home ignition zone 1 (0-5 feet from structures) and home ignition zone 2 (5-30 feet from structures) and prevalence of homes with flammable roofs, siding, and decking. The many wooden fences in this plan unit can serve as fire pathways between structures. All residents should undertake best practices to increase the chance of their home standing strong during wildfire (see the **Mitigate the Home Ignition Zone Section** for best practices). Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns.
- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Firefighters might struggle to find homes during wildfires in the absence of visible, legible, and reflective address numbers and roads signs in this plan unit. Residents should follow recommendations in the **Accessibility and Navigability for Emergency Personnel Section**, which include installing reflective address numbers.
- During wildfire burning under extreme fire weather conditions, potentially non-survivable conditions could develop along the only egress route for residents in the southern part of this plan unit along Boxer Ranch Road, Kestrel Lane, Spirit Ranch Road, Nuthatch Lane, Thiem Drive, Jackelope Lane, and Calliope Lane. Castlebrook Road Association, private landowners, and other partners should work together to mitigate risk along these roads to make them safer for evacuees, firefighters, and other first responders (CWPP priority project #14 in **Figure 4.d.1** and **Table 4.d.2**).
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.

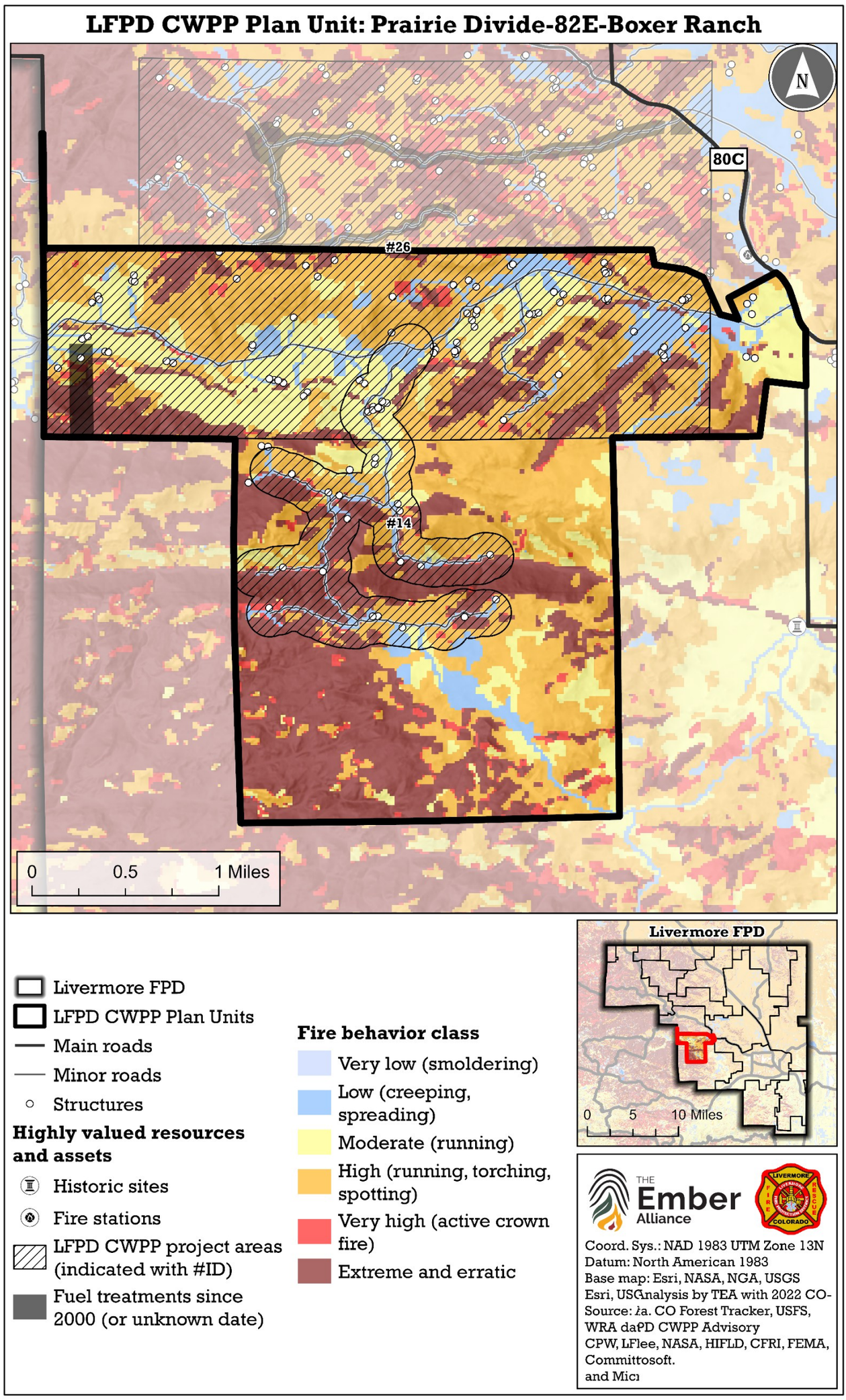


Figure 3.b.11. *Potential fire behavior in and around the Prairie Divide – 82 E – Boxer Ranch Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Red Mountain – Buffalo Horn

Moderate relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
Moderate	High	Moderate	Moderate	High

During a fire burning under extreme fire weather conditions:

- **6%** of the area could experience very high to extreme fire behavior.
- **0%** of roadways could experience potentially non-survivable conditions.
- **88%** of homes could be exposed to radiant heat from burning vegetation.
- **4%** of homes could be exposed to embers from burning vegetation.

General description: The Red Mountain – Buffalo Horn Plan Unit is characterized by extensive grasslands, rangelands, and shrublands. Riparian vegetation occurs along several creeks in the area, including Stonewall Creek, Tenmile Creek, and Deadman Creek. A little over one-third of the area is public land, primarily the Maxwell Ranch property managed by the CSU Research Foundation in the southeastern part of the plan unit and sections of land managed by the Colorado State Land Board in the north and south. There is a large private conservation easement in the western portion of the plan unit.

Highly valued resources & assets: Based on best available data, there are about 185 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Red Mountain – Buffalo Horn Plan Unit. Red Granite Ranch and Maxwell Ranch, which houses numerous historic structures, and an important Verizon cell tower occur in this area (**Figure 2.a.1**). Riparian corridors provide important habitat for the Preble's meadow jumping mouse, and various rare plants are found here (**Figure B.13**). A small portion of the plan unit falls within the Halligan Reservoir action area, and several parts of the plan unit are in high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan.

Fire history and potential fire behavior: Recent fires in this plan unit were the 22-acre Church Fire in 2022 and 30-acre Stonewall Fire in 2020. Several small wildfires have also ignited over the past couple of decades and were mostly kept to less than one acre. The potential for extreme fire behavior is lower than other parts of LFPD

due to the domination of grasslands. However, grasslands can experience rapid rates of fire spread during high wind events that can outpace the ability of firefighters to quickly suppress. Burning shrublands can support extreme flame lengths and emit prolific embers that ignite fuels and structures ahead of the main fire.

Previous and ongoing fuels mitigation: No widespread action has occurred yet, but hopefully this CWPP can inspire future work by residents. At the time this CWPP was written, LCD was actively engaging with landowners to support fuels reduction projects and provide education on ecosystem health and wildfire mitigation.

Specific challenges and recommendations:

- Structures in this plan unit have an elevated exposure to radiant heat from wildfire due to the potential for fast moving wildfires with high flame lengths. Of particular concern is the abundance of fuel within home ignition zone 1 (0-5 feet from structures) and homes with flammable siding. The many wooden fences in this plan unit can serve as fire pathways between structures. All residents should undertake best practices to increase the chance of their home standing strong during wildfire (see the **Mitigate the Home Ignition Zone Section** for best practices). Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns.
- Grass fires can support rapid rates of spread during strong wind events. Residents need to be prepared for rapid evacuations, especially on days with red flag warnings. See the **Evacuation Preparedness Section** for specific suggestions.
- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Firefighters might struggle to find homes during wildfires in the absence of visible, legible, and reflective address numbers and roads signs in this plan unit. Residents should follow recommendations in the **Accessibility and Navigability for Emergency Personnel Section**, which include installing reflective address numbers.
- Grazing can be a useful tool for mitigating wildfire in grassland ecosystems. Landowners in this plan unit should explore options for managed grazing on their properties. See the section **Recommendations for Land Management Planning** for guidance on land management planning.

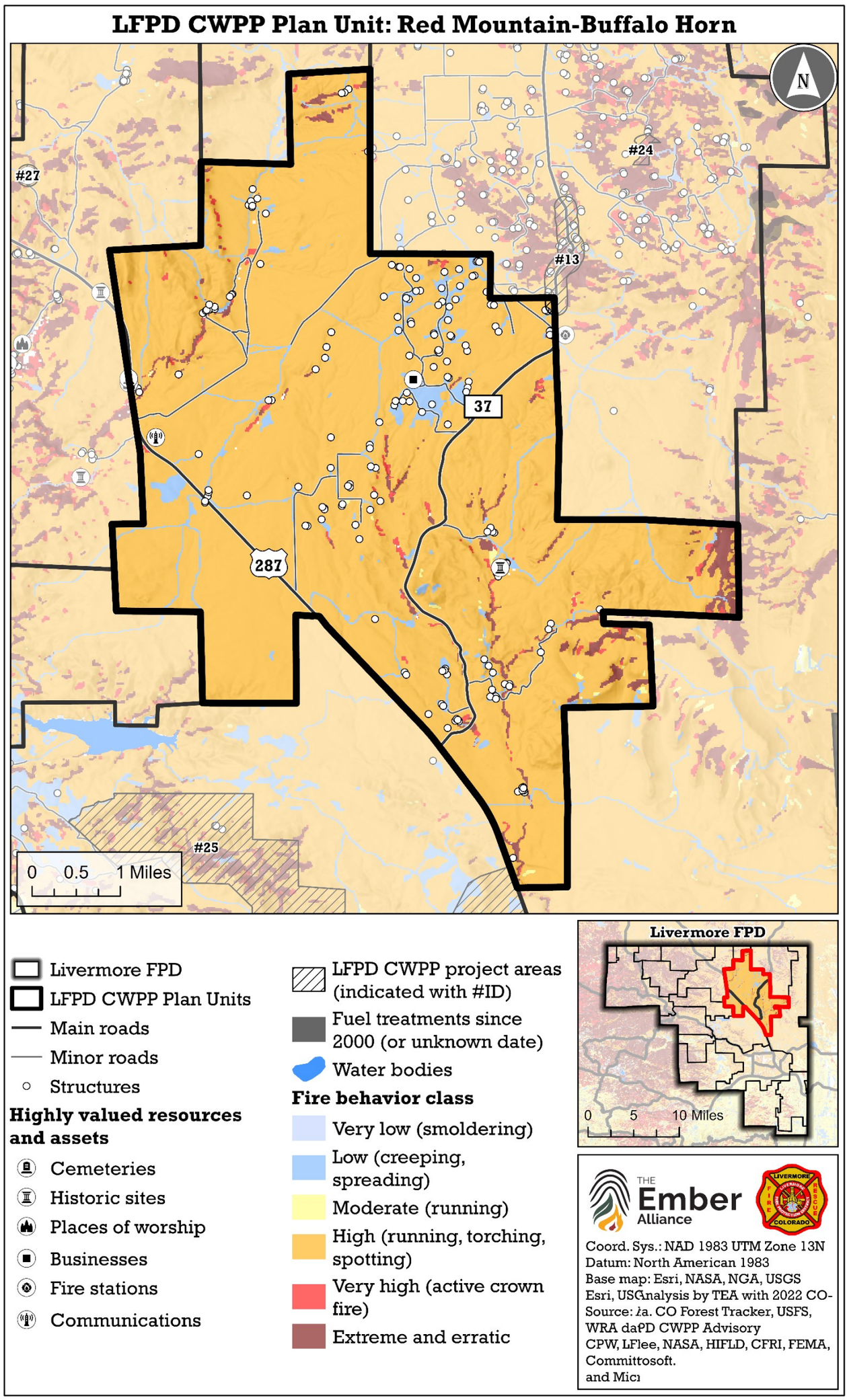


Figure 3.b.12. *Potential fire behavior in and around the Red Mountain – Buffalo Horn Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

Weaver Ranch

Extreme relative risk





Photo credit: TEA.

Overall relative risk	Potential fire behavior	Wildland fire suppression challenges	Evacuation challenges	Home Ignition Zone Hazards
Extreme	Higher	Extreme	Extreme	Higher

During a fire burning under extreme fire weather conditions:

- **46%** of the area could experience very high to extreme fire behavior.
- **23%** of roadways could experience potentially non-survivable conditions.
- **100%** of homes could be exposed to radiant heat from burning vegetation.
- **97%** of homes could be exposed to embers from burning vegetation.

General description: The eastern portion of Weaver Ranch Plan Unit is a patchwork of grasslands, shrublands, and forests, interspersed with riparian vegetation along creeks. The western portion is covered in dense ponderosa pine and mixed-conifer forests interspersed with rocky outcroppings. Around three-fourths of the plan unit is private property, with public land in the southern and western part of the plan unit being sections of the Arapaho-Roosevelt National Forest and a section owned by the Colorado State Land Board. The western portion of the plan unit is within the 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project.

Highly valued resources & assets: Based on best available data, there are about 90 structures (i.e., homes, barns, sheds, and other large auxiliary structures) in the Weaver Ranch Plan Unit. Historic structures on Ranch 2-7 and the Virginia Dale rest area maintained by CDOT are in this area (**Figure 2.a.1**). The plan unit falls within high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan and within moderate- to high-priority watersheds for composite goals from the 2020 CSFS Forest Action Plan.

Fire history and potential fire behavior: No large fires have occurred in Weaver Ranch in the past several decades, but there have been several small wildfires that were kept to less than one acre. The Weaver Ranch Plan Unit can experience a range of potential fire behavior. Grasslands and shrublands in the east could experience rapid rates of fire spread during high wind events that can outpace the ability of firefighters to quickly suppress the fire. Dense forests on steep slopes in the west could experience passive and/or active crown fire. Dead trees

and large logs are common in the plan unit and can burn for a long time with high intensity when they are dry at the end of a summer, especially during drought. Burning trees and shrubs can emit prolific embers that ignite fuels and structures ahead of the main fire. If fires burning in these forests were to escape the initial ability of firefighters to suppress, they can quickly become challenging if not impossible to control until winds die down and fuel moistures increase.

Previous and ongoing fuels mitigation: Some homeowners have completed and ongoing projects with LCD to restore fire-resilient ecosystems and reduce wildfire risk around their structures (CWPP priority project #22 in **Figure 4.d.1** and **Table 4.d.2**).

Specific challenges and recommendations:

- Structures in this plan unit have an elevated exposure to radiant heat and embers from wildfire due to varied topography and abutting of grasslands with dense forests. Of particular concern in this plan unit is the abundance of fuel within home ignition zone 1 (0-5 feet from structures) and home ignition zone 2 (5-30 feet from structures). Residents can reach out to LFPD and LCSO Wildfire Parters Program for home assessments to identify specific hazards on their property and tangible steps to address these concerns. The **Mitigate the Home Ignition Zone Section** outlines many of the best practices for HIZ mitigation.
- Evacuation preparedness is paramount in plan units like Weaver Ranch where some neighborhoods have only one primary egress route. Following recommendations in the **Evacuation Preparedness Section** can help residents be ready to leave at a moment's notice and decrease the chance that they become trapped.
- Many properties have livestock that would require trailers and potentially multiple trips to evacuate. Livestock owners should have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations. FEMA provides tips for protecting livestock during a disaster.
- Many driveways in the plan unit are long and narrow, which can reduce the ability of firefighters and other first responders to access these properties. Residents should increase the accessibility of their driveways following recommendations in the **Accessibility and Navigability for Emergency Personnel Section**. This includes installing visible, legible, and reflective address numbers and roads signs.
- During wildfire burning under extreme fire weather conditions, potentially non-survivable conditions could develop along Weaver Ranch Road and Cap Rock Road in the western part of the plan unit. Weaver Ranch Road Association, private landowners, and other partners should work together to mitigate risk along this road to make it safer for evacuees, firefighters, and other first responders (CWPP priority project #10 in **Figure 4.d.1** and **Table 4.d.2**).
- Overhead powerlines can pose a risk for fire ignitions. Residents should mitigate fuel along electrical feeder lines on their property, and LFPD should continue encouraging power companies to remove vegetation along powerline corridors. Residents also need to be prepared for public safety power shutoffs.

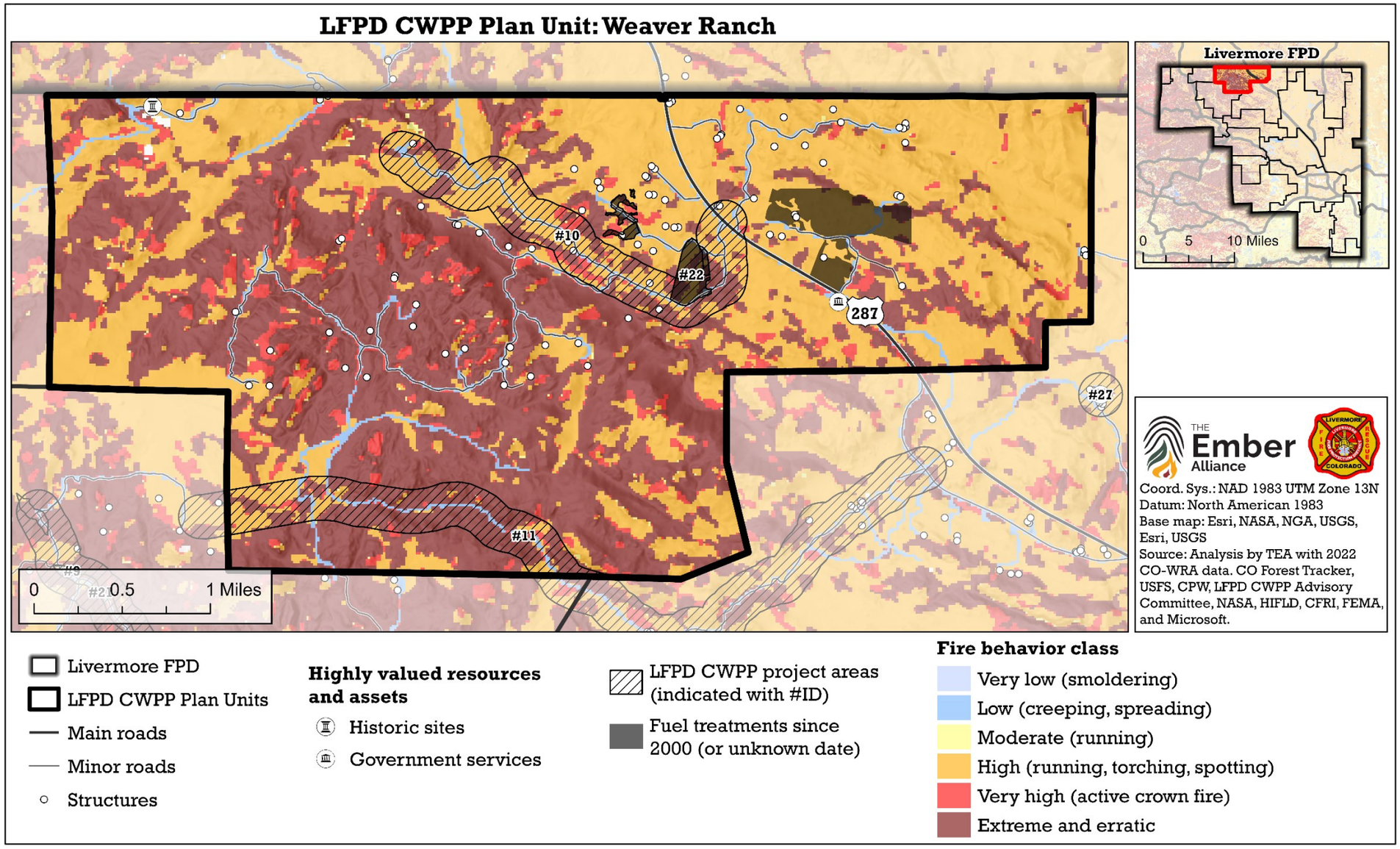


Figure 3.b.13. *Potential fire behavior in and around the Weaver Ranch Plan Unit based on data from the 2022 CO-WRA, and the location of structures, highly valued resources and assets, previous fuel treatments, and CWPP priority projects (see project details in* ***Table 4.d.2****).*

3.c. Recommendations for the District and Partner Organizations

Fire Protection District Capacity

Responsible Parties: LFPD, LCSO Emergency Services, Larimer County Office of Emergency Management (LCOEM), Colorado Division of Fire Prevention and Control (DFPC), mutual aid fire districts, neighboring FPDs, and CWPP Implementation Committee.

LFPD carries responsibility for critical services around the fire protection district. LFPD is an all-volunteer department that serves 322 square miles and contributes mutual aid support for an additional 300 square miles of surrounding districts. Not only do they respond to wildland fires, structure fires, vehicle accidents, and medical emergencies, but they also provide mitigation support for landowners in the district. These volunteers are on call 24/7, and increasing LFPD's capacity allows these volunteers to safely and effectively serve the district in wildfire mitigation and emergency response. Increasing their response capability involves increasing funding, staffing, training, and continued mutual aid support.

Recommendation	LFPD	Neighboring FPDs	LCOEM	DFPC	Mutual Aid Fire Districts	LCSO Emergency Services	CWPP Implementation Committee
Increase staffing to account for longer fire seasons, mitigation projects, and community outreach. This includes emergency response personnel, logistics and planning, and board members. • Increase the number of LFPD volunteers. • Increase advertising for non-operational volunteer opportunities. • Explore a dedicated wildfire mitigation and safety coordinator position for education, code enforcement coordination, HIZ assessments, and fuel reduction efforts, in consultation with Larimer County's Wildfire Partner Program coordinator. • Collaborate with neighboring fire protection districts to fund and share staff positions that increase regional capacity for mitigation implementation, outreach, and slash management.	✓	✓					
Identify and secure funding to gain more up-to-date equipment for LFPD, including LFPD's list of needs.	✓		✓				
Work together to enhance mutual aid and increase overall capacity. Potential methods include increasing cross-training, strengthening mutual aid agreements, and having an updated annual operating picture.	✓			✓	✓		
Make Standard Operating Guidelines (SOGs) procedural.	✓						
Equip vehicles with Starlink.	✓						
Increase training for new volunteers.	✓						
Offer additional training opportunities and funding for firefighters to take NWCG courses and complete task books, as well as other training opportunities, such as DFPC's certified burner program, COCO's Community Wildfire Mitigation Best Practices Training, and NFPA's Wildfire Mitigation Specialist certification.	✓						

Recommendation	LFPD	Neighboring FPDs	LCOEM	DFPC	Mutual Aid Fire Districts	LCSO Emergency Services	CWPP Implementation Committee
Coordinate use of available fire crews (Phantom Canyon Crew) to support fuels reduction projects on county and community lands when not assigned to active incidents.	✓					✓	
Implement CWPP recommendations by identifying staffing, funding, and partnership opportunities to begin on-the-ground implementation.							✓

Evacuation Planning and Accessibility of Emergency Personnel

Responsible Parties: LFPD, LFPD Logistics, LCSO Emergency Services, LCOEM, Larimer County Road & Bridge, Colorado Department of Transportation (CDOT), USFS, community associations, and landowners.

There is potential for several factors to inhibit evacuation and emergency access across the district. Plan units with higher to extreme levels of evacuation challenges are Poudre River Ranch, Mill Creek, Weaver Ranch, and Bonner Peak plan units (**Figure 3.b.2**). Many neighborhoods only have one ingress/egress route. Congestion, especially when emergency vehicles need to pass evacuating community members or when residents are evacuating livestock, can slow down evacuation and response times. Moreso, plan units across the district have roads that are inaccessible to fire engines. Multiple roads in the district are steep, narrow, or winding, which can cause potential navigation issues for emergency personnel to access homes efficiently. It is also an ongoing issue that roads and houses do not have proper reflective signage, and gate access across the district continues to be a challenge for LFPD with changing lock combinations.

Many roads have heavy vegetation that can cause blind corners and potential extreme fire behavior that can make roads dangerous for evacuation (**Figure 2.f.5**). Fuel removal on high-priority sections of road can reduce the potential for extreme fire behavior and therefore increase the safety of residents and firefighters. See **the Priority Project Areas Section** for roadways where fuels treatments are particularly important in the coming years.

These factors, when combined with potential heavy smoke during a wildfire, can increase navigation concerns and reduce neighborhood access for emergency personnel. For more information on accessibility of emergency personnel and vehicles, please see the **Accessibility and Navigability for Emergency Personnel Section.** The following section outlines recommendations that can ameliorate emergency personnel access, safety, and evacuation.

Emergency preparedness is also vital for safe and efficient evacuations, and this planning should occur at all levels: county, fire protection district, community, and individual. The **Recommendations for Residents Section** outlines steps that all residents, renters, business owners, recreators, and other visitors to the district should follow to promote their own safety**.**

Recommendation	LFPD	Community Associations	Landowners	LCSO Emergency Services	Larimer County Road & Bridge	CDOT	USFS	LCOEM
Improve roads by grading and filling in potholes. Ensure that private roads and driveways include adequate turnarounds to allow emergency vehicles to safely enter and exit and to make it easier for vehicles to pull over in the case of an accident.	✓	✓	✓		✓	✓		
Continually maintain and improve road surfaces for evacuation safety and emergency vehicle access. Improve roadway access by widening roads, creating pullovers, and creating turnarounds for two-way traffic and fire engine navigability.	✓	✓		✓	✓	✓		
Improve, install, and maintain road and address reflective signage in accordance with county code to improve visibility and help emergency personnel navigate during heavy smoke or at night.	✓	✓	✓		✓	✓		
Maintain up-to-date gate access information, including providing gate codes to LFPD and dispatch to ensure timely emergency response. Conduct annual	✓	✓	✓					

Recommendation	LFPD	Community Associations	Landowners	LCSO Emergency Services	Larimer County Road & Bridge	CDOT	USFS	LCOEM
gate access checks by sending reminders to residents and/or coordinating with LFPD personnel to verify accessibility.								
Conduct tree removal, limb trees, and mitigate hazardous fuel along roadways to reduce the chance of extreme fire behavior that can endanger residents and firefighters. Roads with the most traffic and congestion should be prioritized. See the **Roadside Fuel Treatments Section** for roadways where fuels treatments are particularly important in the coming years.	✓	✓	✓	✓	✓	✓	✓	
Remove trees along driveways and prune low-hanging branches to increase horizontal and vertical clearance. According to NFPA, driveways and roads should have a minimum of 20 feet of horizontal clearance and 13.5 feet of vertical clearance to allow engines to safely access the roads **(O'Connor, 2021)**.		✓	✓					
Apply for grants to fund both roadway improvements and roadside fuel treatments.	✓	✓	✓					
Plan and execute evacuation drills across the district. Promote evacuation safety and awareness by encouraging residents to participate in evacuation drills and practice exercises.	✓	✓		✓				✓
Work together to enhance mutual aid and increase capacity for evacuation-related needs. Potential methods include cross-training, mutual aid agreements, updated annual operating plans, and availability of Larimer County Road and Bridge dozers/graders for fire response on red flag days.	✓			✓	✓		✓	✓
Increase participation in the NOCO Alert emergency notification system through outreach and education efforts. More information can be found in the **Evacuation Preparedness Section**. Educate residents on how to register mobile devices and email, and make sure residents know the limitations of the notification system and what steps they can take to be informed in a timely manner. • Incorporate considerations for socially vulnerable populations into evacuation planning, including identifying residents who may require additional assistance. • Consider implementing an additional alert system to aid in evacuation notification.	✓	✓		✓				
Educate residents about warning systems, protocols for evacuation orders, and evacuation etiquette prior to the need to evacuate. Communicate the importance of following evacuation orders, as **failing to leave the community in a timely manner during a wildfire emergency can put first responders at risk.** • Encourage residents to leave with only one vehicle per household to reduce congestion.	✓	✓		✓				

Recommendation	LFPD	Community Associations	Landowners	LCSO Emergency Services	Larimer County Road & Bridge	CDOT	USFS	LCOEM
• Encourage all households to develop family evacuation plans and pack go-bags. • Encourage residents to work with neighbors to develop a plan for helping each other with evacuation, especially where school-aged children, pets, or mobility impairments require special assistance. • Encourage residents to evacuate whenever they feel unsafe, even before receiving mandatory evacuation orders, and to leave promptly once a mandatory order is issued. • Coordinate and disseminate additional information about evacuation preparedness such as animal evacuation, evacuation pre-planning and practice, situational awareness, and personal responsibility.								

Survivable Roadways	***Potentially Non-Survivable Roadways***
	

Some roads in the district have been well mitigated by removing tall trees and saplings, removing limbs on the remaining trees, and keeping grass mowed (left image). Other roads could experience potentially non-survivable conditions because they are lined by thick forests (right image). Photo credit: TEA.

Slash Management

Responsible Parties: LFPD, neighboring FPDs, Larimer County, DFPC, LCD, CSFS, Poudre Valley Rural Electric Association (PVREA), community associations, community contractors, and landowners.

Slash removal in this part of Colorado is quite difficult due to limited biomass and timber industries, and the sheer quantity of slash that needs to be removed from stand-scale fuel treatments and in the HIZ. Methods for managing slash come with different benefits and challenges (see a detailed description of slash management techniques in the **Logistics of Fuel Treatments Section**). For example, lop-and-scatter and mastication do not remove surface fuels from the site, they only rearrange them. It can take a decade or more for slash to decompose to a point where it no longer poses a significant fire hazard. Broadcast prescribed burning and pile burning are more effective at removing surface fuels, but they require extensive planning and expertise to conduct properly. Pile burning is permitted in the district within certain parameters. Ensuring safe protocols are followed and communicating plans to residents can minimize risk and assuage fears about pile burning. While there is no single solution, there are multiple options to address the slash removal challenges in LFPD.

Recommendation	LFPD	Larimer County	Community Associations	CSFS	LCD	Landowners	DFPC	Neighboring FPDs	PVREA	Contractors	Other Partners
Decide on proper entity(ies) to begin and maintain responsibility for slash removal coordination efforts.	✓	✓	✓			✓					✓
Increase accessibility of slash disposal by identifying potential slash collection sites throughout the district. Identify and mitigate risks associated with the accumulation of slash piles over longer periods of time, including strategies to reduce backlog of piles on the district.	✓	✓	✓	✓	✓						
Develop and implement community slash removal services such as chipping programs, helping residents haul material off-site, and creating smaller and more scattered sites for slash disposal as an alternative to large community slash piles. Consider seasonal staff to help implement and execute the program.	✓	✓		✓	✓			✓			
Identify, create, and maintain sustainable funding sources for slash removal and disposal to meet ongoing and increasing demand. This can include applying for grants to increase the community's ability to dispose of woody debris.	✓	✓	✓		✓				✓		
Explore the use of bio-burning, air curtain burners, and other potential removal methods to dispose of slash on the district. Support the potential use of air curtain burners by ensuring access to qualified personnel and contractors and providing regular trainings to promote safe and effective operations.	✓						✓				

Recommendation	LFPD	Larimer County	Community Associations	CSFS	LCD	Landowners	DFPC	Neighboring FPDs	PVREA	Contractors	Other Partners
Make homeowners aware of CSFS Fort Collins Field Office's website for a list of reliable private contractors for mitigation work. Update and maintain this list as contractors change.	✓			✓						✓	
Promote and expand participation in DFPC's Certified Burner Program to increase local capacity for safe and effective pile burning.	✓						✓				
Encourage home and landowners to collaborate with neighbors to dispose of woody slash. Establish Pile Burn Cooperatives (PBCs), which are groups of neighbors that get together to help burn slash piles, often with support from their local fire protection district. The Ember Alliance hosts workshops on pile building and burning to assist communities who are interested in forming PBC. Visit The Ember Alliance's website to learn more about PBCs in Colorado.	✓		✓			✓					
Consider reducing or eliminating fees for slash disposal sites to increase participation in mitigation activities.	✓	✓									
Encourage residents to use multiple slash management options, including chipping, hauling, and pile burning where appropriate.	✓	✓	✓	✓	✓						
Maintain the wildland fire safety program to help residents with adopted building and land-use codes, provide wildfire hazard assessments, facilitate slash disposal, and promote public education on wildfire risk and preparedness.		✓									



A pile build workshop that The Ember Alliance hosted in Coal Creek Canyon, Boulder County (left) and near Red Feather Lakes, Larimer County (right). Photo credit: TEA (left), Evan Barrientos Photography (right).

Preparing for Post-Fire Impacts and Long-Term Recovery

Responsible Parties: LFPD, LCD, Larimer County, LCOEM, LCSO Emergency Services, Larimer Recovery Collaborative, USFS, CSFS, CPRW, CDOT, water providers, community associations, and landowners.

Long-term recovery from wildfire is a continuous effort, and many resources are available to guide proactive and reactive response. Effective, responsive action requires coordinating landowners, community organizations, and governments and navigating local and federal requirements. The Colorado Post-Fire Recovery Playbook was created for counties, tribes, municipalities, water providers, etc. to provide actionable steps to take and contacts to make before, during, and within the first 30 days of a fire.

CSFS provides Forest Management Restoration & Rehabilitation guidance for land managers and agencies, and Coalitions & Collaboratives (COCO) provides resources on multiple scales from individuals to government entities as part of their Post Fire Resources. It is advisable for homeowners and residents, small businesses, local governments, and land managers to review these resources prior to devastating wildfire.

CPRW and partners are currently developing a Wildfire Ready Action Plan (WRAP) to equip agencies and communities with a shared roadmap for reducing wildfire risks and safeguarding critical resources from post-fire effects. The WRAP is expected to be finalized in September 2026 and will have more detailed recommendations for post-fire impacts and long-term recovery in the area.

Recommendation	CPRW	LFPD	LCDNR	Road & Bridge	LCD	USFS	Landowners	LCOEM	LCSO Emergency Services	Water Providers	Community Associations	Larimer Recovery Collab.	Larimer County	CSFS	CDOT
Participate in pre-planning, such as completing the Colorado Post-Fire Recovery Playbook for the district to plan for post-fire recovery and community resilience. This involves identifying points of contact for organizations that need to be involved in post-fire recovery efforts. Plans include evaluating tradeoffs and the suitability of different mitigation approaches prior to a wildfire and outlining steps to rapidly deploy appropriate mitigation measures.	✓	✓	✓	✓	✓	✓		✓	✓			✓			
Identify social and economic impacts of fire and educate the public on how communities, residents, businesses, and FPD services may be affected. Educating the public on the multi-faceted impacts of fire and long-term recovery can increase understanding and spur action.	✓							✓		✓					
Ensure pre-planning around what rebuilding after a fire looks like is included and updated in relevant master plans and documents, and that all impacted agencies and partners are aware of this pre-planning.													✓		

Recommendation	CPRW	LFPD	LCDNR	Road & Bridge	LCD	USFS	Landowners	LCOEM	LCSO Emergency Services	Water Providers	Community Associations	Larimer Recovery Collab.	Larimer County	CSFS	CDOT
Identify funding opportunities, including grants, to support both pre-fire mitigation and post-fire recovery efforts.		✓									✓				
Conduct fuels treatments in strategic locations to reduce wildfire severity and extent, decrease the likelihood that hydrophobic soils (soil that repels water) form, and reduce the loss of roots, vegetation, and plant litter that hold soil in place (B. M. Gannon et al., 2019; Jones et al., 2017).	✓				✓	✓	✓		✓		✓			✓	
Track locations where flooding and sedimentation occurred after rainstorms in the past and use that information in planning, prioritizing, and implementation efforts to restore streams and riparian ecosystems and reduce the potential for future post-fire flooding and debris flows.	✓	✓	✓	✓						✓					
Undertake low-tech, process-based restoration (LTPBR) to improve stream health. Rivers and stream channels that can dissipate flood waters and store sediment have high floodplain connectivity, contain features that can slow the velocity of water and sediment, and are lined with abundant riparian vegetation. See this blog post from the National Forest Foundation for more information on LTPBR.	✓				✓		✓								
Conserve, restore, and steward healthy intact stream-side vegetation, like willows and cottonwoods, to reduce soil erosion, moderate floods, and potentially slow down the spread of wildfire due to elevated fuel moisture in healthy riparian corridors.	✓		✓			✓	✓								
Maintain and improve culverts, drainage features, and roadways in areas with elevated risk of post-fire sedimentation and debris flows. Proactive measures to improve infrastructure can reduce the potential for severe road damage in the future.				✓											✓



According to the Environmental protection Agency (EPA), "A mitigation bank is a wetland, stream, or other aquatic resource area that has been restored, established, enhanced, or (in certain circumstances) preserved for the purpose of providing compensation for unavoidable impacts to aquatic resources". This conservation bank in LFPD similarly provides habitat improvement through a collaboration between local ranchers and the U.S. Fish & Wildlife Service (USFWS). Photo credit: Cary Gooding, TEA.

Outreach and Education

Responsible Parties: LFPD, LCSO Wildfire Parters Program (WPP) coordinator, USFS, CSFS, PVREA, and community associations.

LFPD should continue to engage with community members using a variety of methods, including workshops, social media, and education materials.

Social Media

Social media is a powerful tool when used properly to connect with different audiences. The FEMA Wildfire Safety Social Media Toolkit is a great starting place for fire protection districts to engage with their constituents and share important fire safety information. Put Fire to Work highlights programs and organizations that successfully engage audiences around wildland fire and prescribed burning. CalFire's Ready for Wildfire campaign is active and collaboratively created to engage and encourage people to act on wildfire preparedness.

Community Associations

Community associations, including homeowners associations, landowners associations, property owners associations, and road associations, play a crucial role in leadership, organization, education, and communication within their neighborhood. LFPD should continue fostering close relationships with community associations, and encourage coordination among associations, to encourage residents to take individual and collective action. Community associations themselves are encouraged to revisit and revise documents that set standards for their associations, such as architectural covenants. There may be rules and regulations that do not match states or county regulations on building codes for home hardening measures or defensible space on individual properties. Certain rules can directly or indirectly inhibit residents' ability to take certain steps to mitigate the risk of wildfire on their property. Additionally, community associations should consider what services they can provide for their residents (like chipping), or how they can reduce risk in common areas around the association.

Firewise USA® Community

Associations should also consider becoming Firewise USA® communities to help organize the community to reduce risk together. Encouraging communities to meet a voluntary set of criteria to be qualified as a Firewise USA® community from the NFPA can help neighborhoods organize, find direction, and take action to reduce risk and increase emergency preparedness. Being recognized as a Firewise USA® site increases community resilience and capacity and can qualify residents for grant funding.

Recommendation	LFPD	Community Associations	LCSO Emergency Services	CSFS	LCOEM	USFS	Local Partners	WPP Coordinator	LCD	Larimer County	Contractors	Landowners	PVREA
Continuously update public education materials for fire safety, prevention, wildfire mitigation, and emergency preparedness through digital platforms, outreach events, and programs such as Larimer Connects.	✓	✓	✓	✓	✓	✓							
Provide accessible information to the public on wildfire mitigation, evacuation, and preparedness recommendations to improve community-wide awareness and engagement. Host public events to engage residents, like Firewise education days, defensible space workshops, and wildfire awareness tabling. Recruit and teach community ambassadors at these events.	✓	✓	✓	✓									

Recommendation	LFPD	Community Associations	LCSO Emergency Services	CSFS	LCOEM	USFS	Local Partners	WPP Coordinator	LCD	Larimer County	Contractors	Landowners	PVREA
Expand outreach efforts to recruit volunteer firefighters and community volunteers to support wildfire preparedness and response initiatives. Promote nonoperational volunteer roles such as logistics support to expand the variety of potential volunteers.	✓												
Reinforce evacuation preparedness education, including promoting Ready, Set, Go! Initiatives and encouraging residents to prepare and maintain go-bags. Distribute or offer go-bags to current and new residents.	✓	✓											
Establish homeowner and partner committees dedicated to identifying funding sources and pursuing grant opportunities for mitigation and resilience projects. Promote and encourage communities to become Firewise USA® communities for neighborhood collaboration in wildfire risk reduction.	✓	✓					✓						
Maintain and expand the wildland fire safety program to provide wildfire hazard assessments, facilitate slash disposal, ensure compliance with adopted building and land-use codes, promote public education on wildfire risk and preparedness, and coordinate fuel reduction efforts.			✓										
Continue to expand and fund LCSO's Wildfire Partner Program and LFPD's Wildfire Ambassadors to help residents better understand wildfire risks and pursue coordinated action in the district. See **Table 3.c.1** from the *Fire adapted communities neighborhood ambassador approach: Increasing preparedness through volunteers* guide for effective activities that ambassadors can undertake **(Wildfire Adapated Partnership, 2018)**. Increased capacity and funding will help standardize HIZ assessments, increase participation, promote voluntary mitigation on private property, and strengthen coordination with local mitigation groups and nonprofit partners.	✓	✓	✓					✓					
Increase the number of home assessments, strengthen connections between homeowners, and provide clear pathways for residents to act on recommendations.	✓		✓										
Encourage residents to pursue landscape-scale management on their property. Encourage those	✓	✓		✓					✓	✓	✓	✓	

Recommendation	LFPD	Community Associations	LCSO Emergency Services	CSFS	LCOEM	USFS	Local Partners	WPP Coordinator	LCD	Larimer County	Contractors	Landowners	PVREA
interested to seek professional consultation and to contact LCD to tour properties and projects that are in the beginning, middle, and end stages of mitigation efforts. Educate landowners on the benefits, as well as the potential consequences, of certain fuel treatments, in addition to the importance of proper timing for different treatments. Please see the **Resident Assistance for Land Management Planning Section** for more information.													
LFPD should continue to foster close relationships with community associations, and encourage coordination among associations, to encourage residents to take individual and collective action.	✓	✓											
Revisit and revise documents that set standards for their associations, such as architectural covenants.		✓											
Encourage coordination between neighboring landowners to support landscape-scale mitigation efforts. See the **Resident Assistance for Land Management Planning Section** for more information and resources.	✓	✓											
Develop programs to support socially vulnerable populations, including residents who are unable to physically complete mitigation work, by connecting them with assistance resources or volunteer support.	✓		✓										
Maintain open communication, shared goals, and mutual support to ensure successful implementation of CWPP recommendations across the district.	✓												
Clearly communicate needs, timing, and duration of public safety power shutoffs.													✓
Encourage residents to acquire backup generators and create plans for public safety power shutoffs.	✓	✓											

Table 3.c.1. *Example activities for the community wildfire ambassador program. Table adapted from (Wildfire Adapted Partnership, 2018).*

Example activity	Ambassador responsibility	Ambassador team responsibility
Educational programs about defensible space and home hardening	Gauge interest of neighbors and select topics. Find meeting location. Encourage neighbors to attend.	Arrange for specialists to make presentations. Advertise programs through community association newsletters, social media, etc.
Emergency planning	Organize an event for people to ask firefighters and law enforcement personnel about emergency planning and evacuation. Encourage residents to work with their neighbors to develop a plan for evacuation if a resident is not at home, school-aged children or pets might be home alone, or residents have mobility impairments and need special assistance.	Provide information to residents about emergency planning and go-bags. Arrange for specialists to make presentations. Advertise programs through community association newsletters, social media, etc.
Pile Burn Cooperative involvement	Work with LFPD to determine if slash pile burning is an appropriate method of slash management in your neighborhood or community. Gauge interest level among residents around pile burning.	Work with LFPD and partner organizations to plan pile build and burn workshops. Facilitate pile burn days among residents within your neighborhood or community.
Community chipping day	Secure community association buy-in and request financial support. Select a date and organize event logistics. Encourage neighbors to attend.	Secure fuels module availability and grants or other financial support. Address liability and safety concerns. Advertise programs through community association newsletters, social media, etc.
Defensible-space walking tour	Identify homeowners with exemplary defensible space. Select a date and organize event logistics.	Arrange for fuel treatment specialists to attend and make presentations. Provide handouts and other educational material about defensible space.

	Encourage neighbors to attend.	Advertise programs through community association newsletters, social media, etc.
Defensible space projects	Work with neighbors to identify high-priority project locations using insights from this CWPP. Secure community association buy-in and request financial support. Select contractors and solicit bids. Oversee project completion.	Work with a certified forester for insights about effective treatment location and prescriptions, following guidelines in this CWPP. Identify potential contractors. Write scope of work for contract. Inspect project upon completion. Celebrate success through social media posts and newspaper articles.
Roadside fuel treatment projects	Work with neighbors to identify roads and driveways with potentially non-survivable conditions using insights from this CWPP. Secure community association buy-in and request financial support. Select contractors and solicit bids. Oversee project completion.	Work with a certified forester for insights about effective treatment location and prescriptions, following guidelines in this CWPP. Identify potential contractors. Write scope of work for contract. Inspect project upon completion. Celebrate success through social media posts and newspaper articles.
Firewise designation	Plan volunteer mitigation events. Account for money, time, and resources spent on mitigation in the neighborhood.	Guide ambassadors in updating 3-year action plans. Support annual community-wide education program.

Collaboration

Collaboration among local, state, and federal agencies, non-profit organizations, community groups, private citizens, and other interested parties is the best way to ensure recommendations from the CWPP translate to on-the-ground action. Some organizations may be able to offer incentives to homeowners, others have expertise and capacity to mitigate wildfire risk, and others have authority to enforce changes. A holistic approach to fire adaptation is only possible through compromise, mutual respect, and collaboration around shared goals.

As part of the **Implementation Plan and the Future of the CWPP**, it is recommended that a CWPP Implementation Committee is formed to continue the collaborative momentum fostered throughout the CWPP process. Numerous partners were engaged in the development of this CWPP and offered input on the recommendations and priorities for the district. The CWPP Implementation Committee should continue coordinating with these partners and coordinate with neighboring FPDs and Larimer County as they implement their CWPPs as well.

3.d. Social Vulnerability/Access and Functional Needs

Social factors influence how individuals and communities experience and respond to wildfire. Access and Functional Needs (AFN) reflect differences in access to resources, services, and support systems that can affect a person's ability to prepare for, respond to, and recover from wildfire. These resources may include transportation, infrastructure, health care, social support networks, communication access, physical mobility, and financial means (Cutter et al., 2003). While the district as a whole may be well positioned to improve wildfire preparedness through this CWPP process, some individuals or groups may face barriers that limit their ability to engage in mitigation, preparedness, or evacuation efforts—placing them at increased risk during a wildfire event.

Factors commonly associated with social vulnerability and AFN include income constraints, age, physical or cognitive disabilities, health conditions, language barriers, and experiences of social or economic marginalization. AFN includes conditions that may limit an individual's ability to access information, complete mitigation actions, prepare for wildfire, respond during an incident, or recover afterward. These needs may be temporary or permanent and can be related to mobility, communication, health, transportation, power dependence, financial capacity, or social support systems. Although Census Blocks within the district rate relatively low for wildfire-related social vulnerability, vulnerable individuals and households are still present. Recognizing and addressing these needs is essential to ensure that wildfire preparedness, mitigation, and evacuation planning are inclusive and accessible to all community members.

In addition to addressing broader measures related to social vulnerability, this CWPP incorporates AFN considerations consistent with FEMA's Whole Community approach and FAC principles available in the Access and Functional Needs Library. A fire adapted community recognizes that wildfire preparedness and mitigation must be inclusive and accessible to all residents. Proactively identifying and addressing AFN supports safer outcomes for the entire community and strengthens collective resilience.

Considerations in LFPD

Seniors and Residents with Access or Functional Needs

Older adults and residents with mobility, medical, cognitive, or functional limitations may face challenges completing defensible space work, hardening structures, accessing information, or maintaining preparedness over time. FEMA guidance emphasizes the importance of voluntary self-identification and community-based support to ensure inclusive preparedness.

To support this approach, all residents are encouraged to register with NOCO Alert, which allows individuals to self-identify access or functional needs. This information supports inclusive planning, targeted outreach, and coordination among emergency management partners and the LFPD.

In addition to information-sharing, this CWPP recognizes that some residents may be unable to complete mitigation work independently due to physical, financial, or logistical barriers. To help address these gaps, LFPD and community partners can play a critical role by:

- Supporting or coordinating volunteer-based mitigation assistance, such as neighborhood work days, community fuel-reduction events, or partnerships with service organizations
- Connecting residents to existing programs and resources that provide technical guidance, financial assistance, or labor support for defensible space and home hardening
- Working with community groups and leaders to identify residents who may benefit from shared or collective mitigation approaches
- Promoting education and outreach efforts tailored to seniors and residents with AFN, using clear, accessible messaging and trusted communication channels

By combining voluntary self-identification, targeted outreach, and community-supported mitigation efforts, LFPD and its partners can help ensure that wildfire preparedness and mitigation actions outlined in this CWPP

are accessible to all residents, reducing risk for individuals while strengthening resilience across the broader community.

Livestock and Large Animal Owners

Residents who keep livestock or large animals have additional preparedness and mitigation considerations, including reducing fuels around animal enclosures, planning for animal movement or sheltering, and coordinating with neighbors and partners in the event of evacuation. While human safety remains the highest priority during wildfire events, proactive mitigation and preparedness actions can reduce risk to animals and support safer community outcomes. Livestock owners should plan ahead and integrate animal-related considerations into household and neighborhood wildfire preparedness efforts.

Off-grid Residents and Power-dependent Households

Households that rely on solar power, generators, or other off-grid systems may face additional challenges related to communications, power continuity, and access to real-time information during wildfire events. FEMA AFN guidance emphasizes redundancy and advance planning for these households. Wildfire preparedness for off-grid residents includes maintaining defensible space around energy systems, planning for extended outages, and ensuring multiple communication pathways.

3.e. Funding Opportunities

There are many funding opportunities from federal, state, and local agencies as well as non-profits to assist in forest health and wildfire mitigation projects. These funds can increase capacity but cannot cover all the costs of fire mitigation needed across the district. Residents and partners must put forth funds and time to complete this work. This is not an exhaustive list but provides a starting point for finding funding that may fit your needs.

Opportunities from Local and State Agencies in Colorado

- The LCOEM **Community Mitigation Grant Program** was created to help cover upfront costs of hazard mitigation.
- CSFS regularly updates their **Natural Resources Grants & Assistance Database** to help residents, agencies, and other partners find funding for natural resource projects.
- CSFS has multiple grant programs available to community members to help reduce wildfire risk.
    - **Forest Restoration and Wildfire Risk Mitigation** (FRWRM) is a competitive grant program designed to assist with funding community-level actions across the entire state to: reduce the risk to people, property and infrastructure from wildfire in the wildland-urban interface; promote forest health and the utilization of woody material including for traditional forest products and biomass energy; and encourage forest resilience projects. Eligible applicants include local community groups, local government entities such as fire protection districts, public and private utilities, state agencies, and non-profit groups.
    - The **Wildfire Mitigation Outreach Grant Program** allows local governments, counties, and nonprofits to conduct outreach to landowners.
    - The **Colorado IRA Urban & Community Forestry Grant Program** funds projects such as tree planting, removal, and urban forest management plans for growing the tree canopy in disadvantaged areas of Colorado.
    - The **Rural Grant Navigator** aids non-government organizations who provide support for rural Colorado communities applying for federal or state grants for wildfire mitigation.
    - **Timber, Forest Health & Wildfire Mitigation Industries Workforce Development** allows for the hiring and training of employees in timber, forest health, and wildfire mitigation.
- The State of Colorado developed the **Colorado Strategic Wildfire Action Program (COSWAP)** grant program in 2021 to distribute funds for fuels reduction, mitigation, education, and capacity building across the state. COSWAP offers multiple grants:
    - Landscape Resilience Investment through COSWAP offers wildfire risk reduction support with landscape resilience investments.
    - Workforce development grants that offer either crew time or cash grants with SWIFT crews or CYCA (Colorado Youth Corps Association) conservation corps for wildfire mitigation projects.
- **Colorado Water Plan Grants** from the Colorado Water Conservation Board includes a category for watershed health & recreation that can support planning and action to protect critical drinking water, infrastructure, and overall watershed health from post-fire impacts.
- CSFS administers programs for landowner and community assistance, including the **Colorado Forest Ag Program** and **Colorado Tree Farm Program**.
- The Colorado Department of Revenue provides a **State income tax credit for wildfire mitigation (HB22-1007)** whereby individuals, estates, and trusts may claim a subtraction on their Colorado income tax return or receive a state income tax credit for certain costs incurred in performing wildfire mitigation measures on property in the WUI.
- **LCD** helps landowners navigate forestry projects to promote forest health and complete wildfire mitigation projects.

- **CPRW** works with landowners, agencies, and partners to support watershed health, forest restoration, and post-fire recovery efforts that improve ecosystem resilience and reduce wildfire impacts.
- The **Community Mitigation Grant** is offered through the LCOEM to help with upfront costs for hazard mitigation for community-led mitigation projects.
- **RESTORE Colorado**, through the National Fish and Wildlife Foundation and other agencies, helps fund at-scale habitat restoration and stewardship projects on public and private conservation lands that benefit local communities by focusing on priorities like watershed resilience and grasslands/rangelands and urban areas.
- **Restoring Colorado's Forest Fund** provides no-cost seedlings to landowners whose properties have been impacted by wildfires and other natural disasters for restoration through CSU/CSFS.
- **Wildfire Resilient Home Grant** through DFPC helps homeowners improve their home or structures on property with home hardening strategies.
- **Disaster Resilience Rebuilding Program** through Colorado Department of Local Affairs (DOLA) helps communities impacted by environmental disasters, especially suffering from property loss, and helps homeowners, businesses, and local governments and communities to rebuild after natural disasters.
- **Habitat Partnership Program** through CPW can help assist private land conservation efforts.
- LCDNR and other land conservation groups work with private landowners to place conservation easements on their land to ensure perpetual protection of conservation values (wildlife habitat, scenic, buffers, wetlands, agriculture, etc.) which are compensated financially and have tax benefits.

Funding from Federal Agencies

- **Community Wildfire Defense Grants** (CWDG) are funded annually through the USFS and help communities take action on implementation projects from their local CWPP.
- **Hazard Mitigation Assistance Grants Program** provides funding to state, local, Tribal, and territorial governments so they can rebuild in a way that reduces, or mitigates, future disaster losses in their communities. This grant funding is available after a presidentially declared disaster.
- The **Forest Landowner Support** through the USFS provides grant opportunities to deliver technical and financial assistance to private forest landowners.
- The **WUI Grant Program** through the Council of Western State Foresters is a grant program for fuels treatment, education, and mitigation planning to help reduce hazardous fuels.
- The **Community Catalyst Fund** through Coalitions & Collaboratives (COCO) helps community focused organizations find federal funding for climate resilience through the USFS.
- **Collaborative Capacity Program for Forests & Communities** through the National Forest Foundation (NFF) helps fund land and watershed restoration as well as wildfire resilience for local governments, nonprofits, and tribal organizations.
- FEMA's **Hazard Mitigation Grant Program** provides funding to state, local, and tribal territories for hazard mitigation plans and rebuilding to help with future disaster loss.
- The **Firewood Bank Assistance Program** through the Alliance for Green Heat provides financial and educational resources to programs to access wood heat for low- to moderate-income families who struggle paying for home heating especially during emergencies like power outages.
- **Landscape Scale Restoration** funded through the USFS is a grant program that promotes collaborative, science-based restoration of forest landscapes, leverage public and private resources, and advance State Forest Action Plan priorities.
- **Disaster Supplemental** through the Economic Development Administration (EDA) gives funds to regions struggling with economic harm from wildfires or other natural disasters.
- The **Emergency Forest Restoration Program** through the USDA Farm Service Agency helps owners of nonindustrial private forests restore forest health damaged by natural disasters.

- NRCS helps farmers, ranchers, foresters, and other land managers with conservation efforts.
    - The **Environmental Quality Incentives Program** (EQIP) provides farmers, ranchers, and private forest landowners financial, cost-share assistance to implement conservation practices like forest management, prescribed burning, or prescribed grazing to reduce fire risk.
    - The **Emergency Watershed Protection** helps local communities after natural disasters.

Opportunities from Non-Governmental Organizations

- COCO manages the **Action, Implementation, and Mitigation Program** to increase local capacity and support wildfire risk reduction activities in high-risk communities. AIM provides direct support to place-based wildfire mitigation organizations with pass-through grant funding, on-site engagement, technical expertise, mentoring, and training on mitigation practices to help high-risk communities achieve their wildfire adaptation goals.
- **Community Impact program** from Great Outdoors Colorado funds cities, towns, counties, special districts, and land conservation organizations that manage or acquire open space and natural areas.
- **Conservation Service Corps Grants** from Great Outdoors Colorado fund chainsaw crews to support local agencies, tax districts, political subdivisions, and non-profit with fuel mitigation projects.
- FACO manages the **FACO Opportunity Fund**, which is a matching mini-grant program to support projects, build capacity, and address local needs with funding from the National Fire Adapted Communities Learning Network.
- **Northern Colorado Fireshed Collaborative Fund** awards grants to community partners to add capacity, enhance readiness, and increase the pace and scale of forest treatments.
- **Project Advisory Community Grant Program** is a program through the Rocky Mountain Elk Foundation that supports organizations that are treating elk habitat across the US, including prescribed burning, forest thinning, and noxious weed treatments.

Capacity for Fire Protection Districts

- **Staffing for Adequate Fire and Emergency Response Grants** from FEMA directly fund fire departments and volunteer firefighter organizations to help increase their capacity.
- **Assistance to Firefighters Grants** from FEMA help firefighters and other first responders obtain critical resources necessary for protecting the public and emergency personnel from fire and related hazards.
- **Fire Prevention & Safety Grants** from FEMA support projects that enhance the safety of the public and firefighters from fire and related hazards, such as carrying out fire prevention education and training, fire code enforcement, fire/arson investigation, firefighter safety and health programming, strategic national projects, prevention efforts, and research and development.

4. Implementation Recommendations for Fuel Treatments and Ecological Resilience

4.a. Fuel Treatments and Ecological Resilience

Objectives and Benefits

Fuel treatments are a land management tool for reducing wildfire hazards by decreasing the amount and altering the distribution of wildland fuels. Common goals of stand-scale fuel treatments are to reduce the risk of active or passive crown fires and to reduce fire intensity. This is achieved by removing trees, increasing the distance between tree crowns, removing small trees, shrubs, and low branches to increase the distance between surface fuels and tree crowns, and removing downed trees and other dead vegetation (Agee & Skinner, 2005). Fuel treatment methods include grazing, tree thinning, pruning, pile burning, broadcast prescribed burning, and fuel mastication.

> "Given the right conditions, wildlands will inevitably burn. It is a misconception to think that treating fuels can 'fire-proof' important areas... Fuel treatments in wildlands should focus on creating conditions in which fire can occur without devastating consequences, rather than on creating conditions conducive to fire suppression" (Reinhardt et al. 2008).

The goal of promoting ecological resilience is to both improve the ability of an ecosystem to withstand disturbance and increase its ability to recover after disturbance (Dakos & Kéfi, 2022). Many ecosystems evolved with disturbances like insect outbreaks, wildfire, and post-fire erosion, and these disturbances have important impacts that can even improve ecological conditions, such as habitat for some wildlife species. However, many forests in the western United States have been damaged, degraded, or destroyed because of changes to their historical fire regimes following Euro-American colonization, which reduces their ability to withstand disturbance and recover afterwards. In some frequent-fire forests, creating stands with lower tree densities and larger, healthier trees might make forests more resilient in the face of drought, bark beetles, and high-severity wildfire (North et al., 2022).

In some cases, fuel treatments can achieve both ecological objectives and wildfire risk reduction. For example, grazing, prescribed broadcast burning, and reseeding with native plants can restore grassland conditions, reduce the cover of invasive weeds, and lower the risk for rapid fire growth. Low-tech stream restoration can increase the ability of riparian areas to capture sediment after a wildfire, increase fuel moisture, and create natural fuel breaks that slow the spread of wildfire. Restoration treatments in dry-mixed conifer and ponderosa pine forests that create mosaic conditions of tree groups and open meadows tend to achieve both fuel treatment and ecological restoration objectives.

However, fuel treatments and ecological restoration are not synonymous. A treatment that creates a forest with widely, evenly spaced trees could serve as an effective fuel treatment but would not achieve ecological objectives in other forest types. Similarly, mowing grasslands to reduce fuel load might reduce potential flame lengths but will not restore grassland ecosystems without also conducting regular prescribed burns and seeding with native species.

Strategically located, high-quality fuel treatments can create tactical options for fire suppression (Jolley, 2018; Plucinski, 2019; Reinhardt et al., 2008). Fuel treatments along POD boundaries can allow firefighters opportunities to use direct or indirect suppression techniques to contain fire spread. POD boundaries were an important consideration for defining and prioritizing roadside and stand-scale projects for this CWPP. Using POD boundaries in the district aligns with the NCFC approach to mitigate risk and promote ecological resilience.

There are numerous examples of the tactical use of POD boundaries. Firefighters used fuel treatments in the Red Feather Lakes area as tactical features during the Cameron Peak Fire (Avitt, 2021). In 1980, fuel treatments helped firefighters protect the Crystal Lakes area during the Bear Trap Fire (Dennis, 2005). Firefighters used fuel treatments north and west of Loveland Fire Rescue Authority as tactical features when fighting the Cameron Peak

fire in 2020. The most useful treatments were previous wildfires (namely the High Park fire burn area and the Bobcat Fire burn area), fuels treatments from the previous five years, and fuels treatments along roadways (Greiner et al., 2023). See more about PODs in the section **2.c. Wildland-Urban Interface**.

Strategic fuel treatments, in tandem with work by individual residents to mitigate hazards in their HIZ, can help protect life and property. Land management agencies in and around the district are actively reducing wildland fuels (see **Figure 4.b.1** for a map of previous fuel treatments). Addressing shared risk requires shared responsibility and action. Residents are encouraged to reference the **Resident Assistance for Land Management Planning Section** for more information on how to initiate mitigation actions on their own acreage.

Methods Used to Conduct Fuel Treatments and Promote Resilient Ecosystems

Mechanical Treatments

Trees can be removed manually or mechanically, with the most suitable method depending on slope, road access, cost, and potential damage to soil. Use of mechanical equipment is often infeasible on slopes greater than 35% (Hunter et al., 2007). Handcrews or contractors with chainsaws can operate on steeper slopes but can be less efficient than mechanical thinning. Sometimes the only option for tree removal on steep, inaccessible slopes is expensive helicopter logging.

Thinning operations alone can increase surface fuel loads and can fail to achieve fire mitigation objectives if fuels created by the harvest activities (also known as slash) are not addressed with management methods such as removal or pile burning (Agee & Skinner, 2005). See the **Approaches to Slash Management Section** for options to mitigate surface fuel loads created by fuel management.



A feller-buncher is a common piece of equipment used for mechanical treatments. Photo credit: Oregon Department of Forestry.



Before and after aerial imaging of thinning efforts at Poudre River Ranch Road Association. Removal of trees in large patches mimics the results of fire and reduces ladder and canopy fuel loading to prevent fire from spreading through the canopy. Photo credit: Justin Yow, LCD.

Prescribed Grazing

Prescribed grazing for wildfire uses livestock (usually cattle or goats) to eat large strips of flammable vegetation down to stubble-height to reduce fine fuels, fuel loads, and fuel bed continuity. An effective grazing regime can

decrease the probability, rate of spread, and severity of wildfires. When used in the right place, at the right intensity, for the right amount of time, grazing can be a sustainable and feasible alternative to mowing or prescribed burning.

Well-planned and flexible grazing strategies can help to meet a variety of rangeland and fire-management goals. While other options for creating fuel breaks can be cost prohibitive or difficult to maintain over time, researchers with the USDA Agricultural Research Service found that, "cattle can create and maintain protective fuel breaks with lower financial costs than mechanical methods. Additionally, a targeted grazing program has the potential to mutually benefit rangeland resources and ranching operations by presenting the rancher with the opportunity to reduce or eliminate the need to feed hay or stored forages in the early spring" (Clark, 2024).

By using livestock to create fuel breaks in these swaths of invasive annual grasses, rangeland managers could help to prevent more wildfires from turning into megafires (Clark, 2024).

When considering grazing as a method of wildfire fuel reduction, the following site-specific factors should be considered to determine if grazing is the best option for a specific location:

- Strategic location with potential to protect resources like infrastructure or fragile habitat.
- Safe and effective location for grazing, consider species-specific livestock needs (forage needs, water availability, fencing, access, toxic plant sensitivities, etc.).
- Grazing regime (timing, frequency, intensity) must be tailored to avoid negative effects on desirable plants and other sensitive ecological features and mitigate for potential ecological impacts. Adequate residue must be retained after grazing rotation to protect natural resources, prevent soil erosion, improve water quality, and maintain wildlife habitat.
- Targeted grazing should be located an area that has a high likelihood of experiencing wildfire.
- Feasibility considerations of grazing as a management tool. Analyze costs entailed in improving and maintaining infrastructure to support grazing (fencing, water, transport, etc.).
- Part of an integrated management system with other conservation practices such as: noxious weed management, WUI fuel reduction treatments, rangeland seeding, sage-steppe habitat restoration, climate-smart agriculture, soil enhancements, riparian restoration, and replanting with less flammable vegetation.

Broadcast Prescribed Burning

Broadcast prescribed burning is often the most effective method to mitigate wildfire risk and create healthy conditions in a variety of grassland, shrubland, and forest ecosystems (Paysen et al., 2000; Stephens et al., 2009). This method has unique impacts on vegetation, soils, and wildlife habitat that cannot be replicated by mechanical treatments alone (McIver et al., 2013). Prescribed burning mimics naturally occurring wildfire, can treat hundreds of acres at a time, removes surface fuel, and is relatively cost-effective (Hartsough et al., 2008; Hunter et al., 2007). Prescribed burns can reduce property damage during wildfires because they are so effective at reducing fuel loads (Loomis et al., 2019).



There are many resources that are needed for a successful prescribed burn. Photo taken during the 2023 Magic Feather prescribed burn. Photo credit: USDA Forest Service.

Often, due to decades of fuel accumulation, mechanical treatments are necessary before broadcast burning can safely and effectively be

implemented. Broadcast prescribed burning or pile burning can be used following mechanical treatments to magnify treatment impacts by consuming surface fuels that could burn in a wildfire (Fulé et al., 2012; Prichard et al., 2020). Regular spring burning can also help repair grassland ecosystems by recycling nutrients, replicating natural fire processes, and controlling non-native grasses such as smooth brome (Willson & Stubbendieck, 1997). Many native grass species stay green into the summer, unlike cheatgrass and smooth brome, making them less receptive to wildfire (Miller, 2006).

Broadcast prescribed burning is challenging in the WUI due to diverse fuel types, proximity to homes, risk of visibility impairments on roads from smoke, health impacts of smoke, and political and social concerns. However, with proper planning and implementation, qualified firefighters can safely conduct prescribed burns, even in the WUI (Hunter et al., 2007). Continuous thinning projects and broadcast prescribed burning are safely and effectively conducted in Magic Feather, east of Red Feather Lakes, from 2023-2026. Life safety is always a top consideration when developing and conducting prescribed burns.



Drones can be used during prescribed burns to determine consumption and effectiveness of interior burning and maintain firefighter safety. Photo from 2023 Magic Feather prescribed burn. Photo credit: USDA Forest Service.

Broadcast burning is carefully regulated in Colorado by DFPC, the Colorado Department of Public Health and Environment, local sheriff's offices, and fire departments as outlined in the *Colorado Prescribed Burning Standards of 2024* and *2019 Colorado Prescribed Fire Planning and Implementation Policy Guide*. Firefighters who plan and conduct prescribed burns are highly qualified under national standards set forth by the NWCG.

There is always risk involved in the application of prescribed fire but, when mitigated, the benefits outweigh the risks of not using prescribed fire. Less than 1% of prescribed burns escape containment lines, and most of these are rapidly suppressed (Weir et al., 2019). Unfortunately, one example is the escape of the Elkhorn Prescribed Burn. This experience has understandably created fear amongst some members of the public. The prescribed burn community has taken lessons away from the Elk Fire which will reduce the likelihood of future escapes (CO Department of Public Safety, 2020).



Prescribed burning can remove surface and ladder fuels and repair ecological processes in frequent-fire ecosystems. This photo is from the Magic Feather prescribed burn in Red Feather. Photo Credit: NCFC.

Fuel Treatment Effectiveness

The effectiveness of fuel treatments is influenced by a variety of factors, including the intensity, quality, and extent of treatment, location of treatments, maintenance of treatments, weather conditions and fire behavior, and actions of firefighters (**Figure 4.a.1**). The percentage of fuel breaks that have effectively stopped actual wildfires is between 22-47% in forests (B. Gannon et al., 2023; Syphard et al., 2011) and 46-71% in sagebrush ecosystems (Weise et al., 2023). A review of fuel treatment effectiveness found that, "A fuel treatment can only be as effective as the suppression that goes along with it"—less than 1% of wildfires are stopped by a fire break alone and in insolation of suppression activities (McDaniel, 2023; page 3).

Fuel treatments are more effective under moderate fire weather conditions than extreme weather conditions, and most effective when firefighters are present to use the fuel treatment as a control feature (B. Gannon et al., 2023; T. B. Jain et al., 2021; Reinhardt et al., 2008; Syphard et al., 2011; Weise et al., 2023). Uncontrollable factors will always play a role in home loss during extreme wildfires. Minute-to-minute shifts in wind directions, unexpected wind gusts, and extreme fire behavior and growth that overwhelm suppression efforts can result in home loss not explained by mitigation efforts prior to the fire.

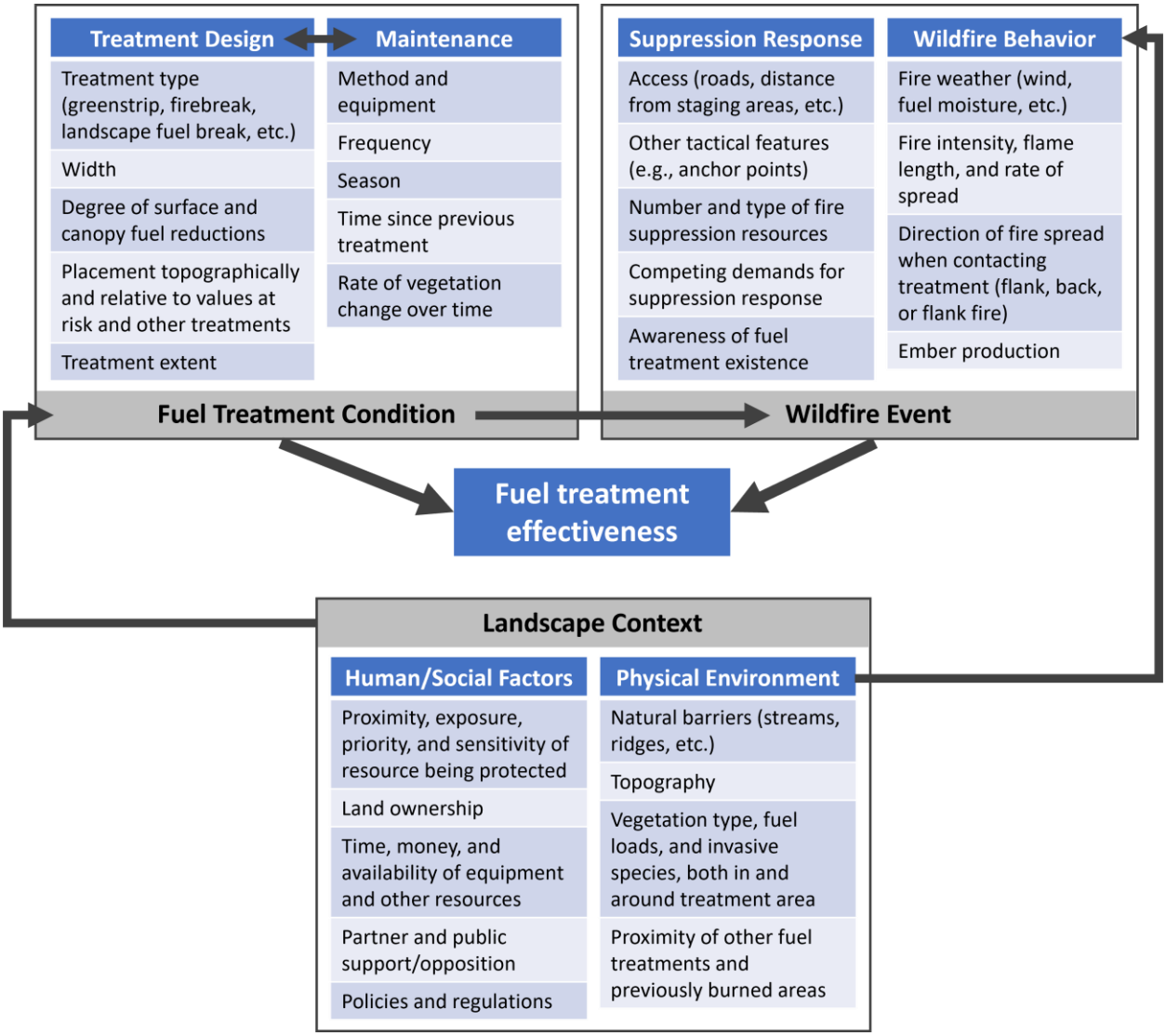


Figure 4.a.1. *The effectiveness of fuel treatments at altering wildfire behavior is influenced by numerous factors related to landscape context, fuel treatment specifications, and conditions during a wildfire event. Figure modified by TEA based on (T. B. Jain et al., 2021; Trauernicht & Kunz, 2019).*

4.b. Fuel Treatment History in and Around LFPD

Public land managers and private residents in and around LFPD have conducted fuel treatments on thousands of acres since 2000 to reduce wildfire risk and create healthy ecosystems (**Figure 4.b.1**). Fuel treatments include thinning, pile burning, broadcast burning, and treatments to remove flammable noxious weeds like cheatgrass. Within LFPD, about 7,630 acres were treated since 2000, and within the Colorado-side of the LFPD WUI boundary, about 22,100 acres were treated. Some of these acres have been treated more than once, for example, some areas were thinned and then experienced a prescribed burn. Between 2000-2024, the USFS, CSFS, CPW, and partners safely conducted broadcast prescribed burns on about 9,550 acres and pile burns on about 3,500 acres within the Colorado-side of the LFPD WUI. With proper planning and implementation, qualified firefighters can safely conduct appropriate broadcast prescribed burning in the WUI (Hunter et al., 2007).

Fuel treatments in LFPD are often collaborative efforts undertaken by multiple landowners and agencies. Under the Red Feather Lakes Area Wildfire Defense Project, roadside fuels were removed along Brown Bear Way and Brewster Lane in LFPD in 2025 and 2026. These projects were led by CPRW, Larimer County ES, Larimer County OEM, LFPD, and Meadow Creek Association. CSFS works on private land and adjacent USFS land under the Cherokee Park Environmental Assessment and through the Good Neighbor Authority. LCD works with private landowners to develop management plans and undertake work to restore ecosystems and mitigate wildfire risk. CPRW, CPW, TNC, and the North Fork Poudre Site Conservation Team undertake projects to improve wildlife habitat, mitigate wildfire risk, and reduce the potential for post-fire flooding and erosion.

An essential component of this CWPP was identifying locations for additional fuel treatments to protect the community. The **Priority Project Areas Section** outlines these priority locations and the land management agency leading these efforts in the coming years.



In 2025, roadway treatments were completed in Cherokee Meadows as part of the [LCOEM Community Mitigation Grant Program](). Photo credit: Dave Herder, LFPD.

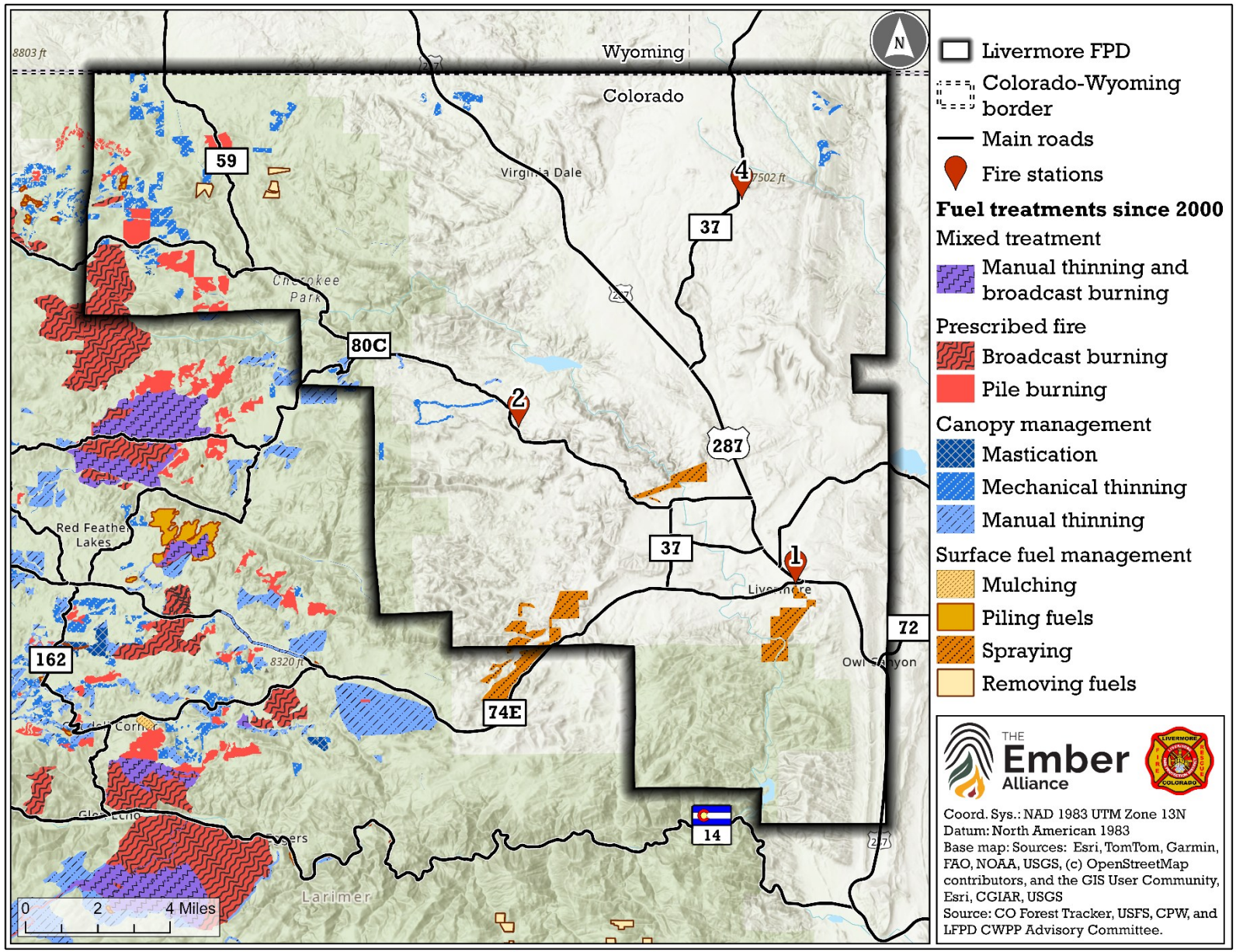


Figure 4.b.1. *Locations of forest management treatments and wildfires in and around LFPD. Many treatments involving canopy management also involved surface fuel management. Some data from the CSFS only indicates what private parcels were treated, not the actual treatment boundary. Treatments rarely occur across the entire property. Source: Colorado Forest Tracker, CSFS, CFRI, USFS, and LFPD CWPP Advisory Committee.*

4.c. Roadside Fuel Treatments

Treatments along roadways require a dramatic reduction of fuels to create safer and survivable conditions. This includes removing most trees adjacent to the roadway, limbing remaining trees, and regularly mitigating hazardous fuel with high ignition potential (**Figure 4.a.1**). Treatments along roadways are often described as shaded fuelbreaks (Dennis, 2005). Roadside fuel treatments are already ongoing in LFPD to make the community safer, and this CWPP prioritized additional work along roadsides (see **Priority Project Areas Section**).

The width of an effective roadside fuel treatment (distance to the left and right of a road) depends on slope. CSFS recommends that treatments extend 150 to 240 feet off the downhill side of the road and 100 to 150 feet off the uphill side. Wider treatments are necessary on the downhill side on steeper slopes due to the exacerbating effect of slope on fire intensity when fires travel uphill (**Table 4.c.1**) (Dennis, 2005). Important aspects of all roadside fuel treatments include:

- Removing limbs overhanging the road to create at least 13.5-feet of vertical clearance. See **Figure 3.a.4** for a depiction of how to measure limb height.
- Removing trees alongside the road to create at least 20-feet of horizontal clearance.
- Removing trees to create at least 10-feet crown spacing between remaining trees within the roadside treatment zone. See **Figure 3.a.4** for a depiction of how to measure crown spacing.
- Removing all dead trees that could fall across the road and block traffic.
- Removing shrubs and regeneration that can serve as ladder fuels.
- Mitigating hazardous fuel with high ignition potential along the road.

Along important evacuation routes that could experience extreme congestion, roadside treatments should be more aggressive and consist of near removal of all trees within at least 30 feet of roadways. Clearcutting along roads when surrounding forests remain dense can cause problems with snow drifting, so shaded fuelbreaks might be more appropriate in areas where drifting is more likely, or snow fences might need to be installed.

Some residents find roadside fuel treatments aesthetically displeasing because of the removal of so many trees, but these treatments are vital for increasing the safety of residents and firefighters in this community. Roadside treatments must dramatically reduce fuel loads to effectively reduce the risk of non-survivable conditions developing during wildfires.

Overall Goals of Roadside Fuel Treatments:

- Dramatically reduce or eliminate surface and canopy fuels.
- Reduce the likelihood of non-survivable conditions along roadways during wildfires.
- Create tactical opportunities for fire suppression.
- Increase the visibility of structures from roadways to assist wildland firefighters.
- Create conditions that enable safe and effective prescribed burning within potential operational delineations.

Table 4.c.1. *Minimum fuel treatment width uphill and downhill from roads depends on the slope along the roadway[1]. Recommendations from the Colorado State Forest Service (Dennis, 2005).*

Percent slope (%)	Downhill distance (feet)	Uphill distance (feet)	Total fuel treatment width (feet)
0	150	150	300
10	165	140	305
20	180	130	310
30	195	120	315
40	210	110	320
50	225	100	325
60	240	100	340

[1]Measurements are from the toe of the fill for downhill distances and above the road cut for uphill distances. Distances are measured parallel to flat ground, not along the slope.



Figure 4.c.1. *Before and after aerial imaging of thinning efforts at Poudre River Ranch Road Association. Effective roadway fuel treatments remove enough trees to result in widely space crowns, remove ladder fuels (seedlings, saplings, shrubs, and low limbs), and reduce surface fuels. Removal of trees in large patches mimics the results of fire and reduces ladder and canopy fuel loading to prevent fire from spreading through the canopy. Photo credit: Justin Yow, LCD.*

4.d. Priority Project Areas

A critical component of CWPPs is prioritizing strategic projects to reduce the impact of wildfire in the district, create strategic opportunities for wildland firefighters, create safer conditions for evacuations, and promote ecological resilience. The LFPD Advisory Committee worked with land management agencies, community members, and other partners to identify high-priority locations to plan and implement work over the next 5 years. Types of projects include POD boundary[5] / roadside treatments, stand-scale fuel mitigation and restoration, riparian and stream restoration, cheatgrass mitigation, and HIZ mitigation / point projection (**Table 4.d.1**). Priority projects are depicted in **Figure 4.d.1** and described in **Table 4.d.2**. Some of these projects are already in motion, and others will require years of work to build relationships and find funding before work can begin. These project areas cross ownership boundaries and require community-wide commitment, coordination, and collaboration among private landowners, public land managers, and forestry professionals to create successful outcomes.

Project areas were identified by the LFPD CWPP Advisory Committee and partners at an in-person meeting on April 27th, 2026. Partners involved in the prioritization meeting were LFPD, USFS, CSFS, CPW, DFPC, Larimer County Natural Resources, Larimer Conservation District, Larimer County Sheriff's Office Emergency Services, Larimer County Planning Division, CPRW, Mighty Arrow Foundation, and resident representatives. Project area locations and priorities were refined by the LFPD CWPP Advisory Committee and through follow-up conversations with partners. The Advisory Committee and partners identified and prioritized project areas based on the following factors:

- Potential fire behavior under extreme fire weather conditions (**Figure B.6**).
- Potential exposure of homes and high valued resources & assets to radiant heat and embers (**Figure B.9**;
- **Figure B.11**).
- Roadway survivability (**Figure B.12**) and priority locations for roadside treatments (**Figure B.17**).
- Location of PODs prioritized by the NCFC to create a "ribbon" of fuel treatments to protect vulnerable communities along the Front Range (**Figure B.18**).
- Priorities for watershed health identified by the 2024 Upper Poudre Watershed Resilience Plan, 2026 Peaks to People Watershed Investment Tool, and 2020 CSFS Forest Action Plan (**Figure B.18**).
- Completed, ongoing, and planned projects identified in nearby CWPPs (2026 Red Feather Lakes FPD CWPP [in preparation], 2022 Glacier View FPD CWPP, 2022 Cherokee Meadows CWPP, and 2011 Diamond Creek/Upper Cherokee Park CWPP), Red Father Lakes Area CWDG, 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project, 2015 USFS Cherokee Park Environmental Assessment, and other partners (**Figure B.19**).
- Land ownership (**Figure 2.a.2**).
- Important habitat for wildlife and plant species (**Figure B.13**).

The CWPP priority projects focus on high-priority locations to address in the next five years, but this prioritization does not discourage ecological resilience work and fuel mitigation in other areas. If multiple neighbors work together to mitigate fire risk across ownership boundaries, it could attract funding and increase the priority and effectiveness of treating those areas. Land managers, county administrators, and residents should reevaluate fire risks and reprioritize projects as conditions change over time.

[5] Potential operational delineations (PODs) are topographic areas bounded by features suitable for fire control, other tactical operations during wildfires, proactive ecological resilience, and wildfire risk mitigation (e.g., ridgetops and roads) (T. A. Beeton et al., 2023; M. Thompson, 2023; M. P. Thompson et al., 2022). Proactive and strategic management along POD boundaries and within PODs can protect lives and property in LFPD, including protecting primary evacuation routes. See the infographic in **Section 2.c** for more information on PODs.

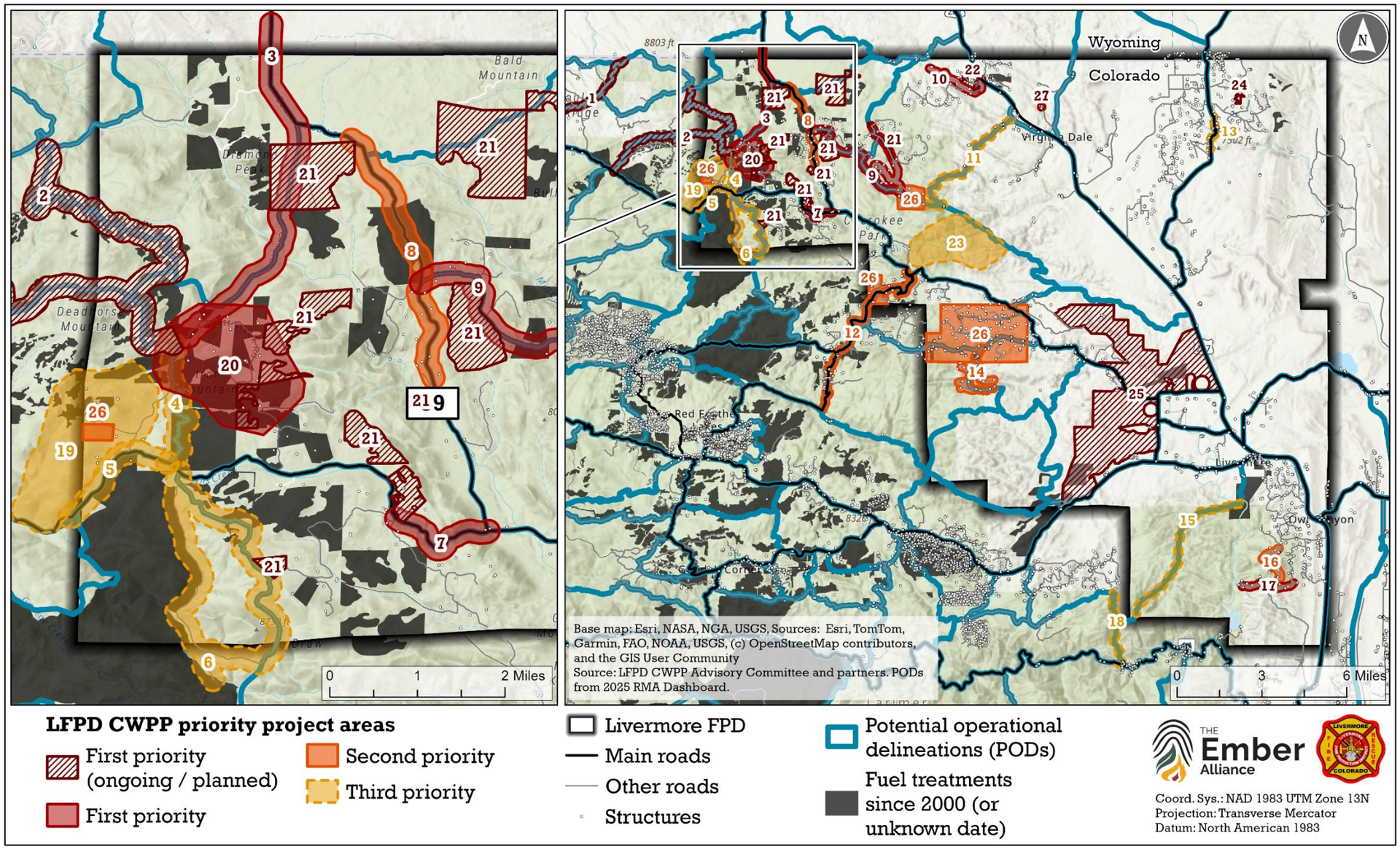


Figure 4.d.1. *Priority project areas in LFPD to reduce the impact of wildfire in the district, create strategic opportunities for wildland firefighters, create safer conditions for evacuations, and promote ecological resilience. See* ***Table 4.d.1*** *for description of project types and* ***Table 4.d.2*** *for details on each project.*

Table 4.d.1. *Types of projects recommended and prioritized in this CWPP and a description of general methods and recommendations for implementation.*

Project type	Methods/recommendations for implementation
POD boundary/roadside treatment	Reduce fuels by thinning, pruning, prescribed burning, grazing, chipping, and/or masticating fuels. Remove hazard trees near roads. Mow grasses next to the road to reduce risk of fires starting from vehicles. Specific approaches and treatment specifications should be tailored to each project based on vegetation type, fuel loads, topography, landownership, width of right-of-way easements, etc. Treatments along key evacuation routes and POD boundaries need to be more intensive in terms of fuel reduction to maximize community safety benefits. Strategically tie projects into previous fuel treatments if they have been completed in the area. Include plans for slash disposal and maintenance treatments, including post-treatment windthrow and weed monitoring, when designing projects and applying for funding. Where appropriate and feasible, improve road conditions (e.g., widening the road, road grading, creating pullovers) and install visible and reflective street and address signs. For POD treatments that fall along trails or two-tracks and not roadways, improve firefighter access by widening trails or two-tracks. Seek cooperation from private, city, county, state, and federal partners who own or manage land within or adjacent to project areas to maximize treatment outcomes, realize cost-saving measures from larger cross-boundary projects, and make projects more competitive for grant funding.
Stand-scale fuel mitigation and restoration	Apply integrated management techniques which increase the ecosystem health and wildfire resilience of individual properties and the entire watershed. Methods can include thinning, pruning, prescribed burning, grazing, chipping, and/or masticating fuels. Specific approaches and treatment specifications should be tailored to each project based on forest type, fuel loads, topography, landownership, etc. Support working lands and rural communities with strategically targeted investments, technical assistance, and conservation incentives. Include plans for slash disposal and maintenance treatments, including post-treatment windthrow and weed monitoring, when designing projects and applying for funding. Strategically tie projects into previous fuel treatments and restoration projects if they have been completed in the area. Seek cooperation from private, city, county, state, and federal partners who own or manage land within or adjacent to project areas to maximize treatment outcomes, realize cost-saving measures from larger cross-boundary projects, and make projects more competitive for grant funding.

Project type	Methods/recommendations for implementation
Riparian and stream restoration	Maintain/expand/build upon/initiate riparian restoration, enhancement, and preservation programs increase streamside vegetation and riparian cover, restore natural stream processes and floodplain interaction, increase the fuel-moisture content, improve water quality, slow water velocity, increase sediment retention, improve in-stream flow-conditions, and restore critical wildlife habitat. Projects could include in-stream habitat restoration, riparian planting and enhancement, and upland vegetation planting. Increased wildfire resilience of watershed will reduce potential for post-fire sedimentation and improve habitat for sensitive species. Specific approaches and treatment specifications should be tailored to each project based on vegetation and stream conditions, wildlife habitat, topography, landownership, etc. Include plans for maintenance treatments when designing projects and applying for funding. Strategically tie projects into previous and ongoing restoration projects if present in the area. Seek cooperation from private, city, county, state, and federal partners who own or manage land within or adjacent to project areas to maximize treatment outcomes, realize cost-saving measures from larger cross-boundary projects, and make projects more competitive for grant funding.
Cheatgrass mitigation	Increase funding and capacity to monitor invasive and implement rangeland restoration programs that include integrated weed management (aerial and hand-application of herbicides) and targeted/prescribed grazing programs to reduce fuels. Seed with native, wildfire resistant and resilient species to restore ecosystem health, reduce future wildfire risks, and reduce post-fire soil-erosion. Specific approaches and treatment specifications should be tailored to each project based on vegetation conditions, degree of invasion by cheatgrass and other invasive plants, wildlife habitat, topography, landownership, etc. Include plans for slash disposal and maintenance treatments when designing projects and applying for funding. Include weed monitoring in grant applications so LCDNR can be contracted to support work. Strategically tie project into previous cheatgrass mitigation conducted in the area. Strategically tie projects into previous and ongoing restoration projects if present in the area. Seek cooperation from private, city, county, state, and federal partners who own or manage land within or adjacent to project areas to maximize treatment outcomes, realize cost-saving measures from larger cross-boundary projects, and make projects more competitive for grant funding.
HIZ mitigation/point protection	Follow HIZ guidance from the CSFS. Specific approaches and treatment specifications should be tailored to each project based on vegetation conditions, conditions of structures on the property, topography, landowner goals, etc. A home assessment is the first step for identify exactly what work needs to be done on a property to reduce wildfire risk. Include plans for slash disposal and maintenance treatments, including post-treatment windthrow and weed monitoring, when designing projects and applying for funding. Strategically tie projects into previous and ongoing restoration projects if present in the area. Seek cooperation from private, city, county, state, and federal partners who own or manage land within or adjacent to project areas to maximize treatment outcomes, realize cost-saving measures from larger cross-boundary projects, and make projects more competitive for grant funding.

*Table 4.d.2. Descriptions of priority project areas. Project IDs correspond to numbers in **Figure 4.d.1**.*

Project ID: 1		**Priority:** First (planned)	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundary along Sand Creek Road (Forest Road 336)	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, private landowners	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along Sand Creek Road (Forest Road 336), which runs through private land and the Arapaho-Roosevelt National Forest. Strength the ability of this road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. The road is well-mitigated in Wyoming but not on the Colorado side. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Boundary PODs for the Arapaho-Roosevelt National Forest (Green Mountain, Trail Creek, and Boulder Ridge POD). Within high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan (Trout Creek, Upper Trail Creek, and UT1 to Trail Creek watersheds). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project and includes planned and funded/projects on the Arapaho-Roosevelt National Forest.

Project ID: 2		**Priority:** First (ongoing/planned)	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundaries along Pratt Creek and Green Mountain Roads	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, CPW		Create safer conditions for firefighters and evacuees along Pratt Creek and Green Mountain Roads, which run through the Arapaho-Roosevelt National Forest and Dead Tree SWA. Strength the ability of these roads to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Boundaries of high-priority PODs for the NCFC (Iron Mountain and Diamond Peak PODs) and other PODs for the and Arapaho-Roosevelt National Forest (Dead Horse and Green Mountain PODs). Within the Halligan Reservoir action area and high-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (UT4 to Trail Creek watershed). Includes culverts identified by CPRW as critical road stream crossing locations (several locations along Pratt Creek and Trail Creek). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project and includes planned and funded/projects on the Arapaho-Roosevelt National Forest. Ties into adjacent fuel treatments completed by the USFS and LCD.

Project ID: 3		**Priority:** First	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundaries along Diamond Peak Road	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, private landowners, Diamond Creek and Poudre River Ranch community associations	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along Diamond Peak Road. which runs through private land and the Arapaho-Roosevelt National Forest. Strength the ability of this road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Contains priority projects from the 2011 Diamond Creek/Upper Cherokee Park CWPP. Boundaries of high-priority PODs for the NCFC and Arapaho-Roosevelt National Forest (Iron Mountain and Diamond Peak PODs). Within the Halligan Reservoir action area for the 2024 Upper Poudre Watershed Resilience Plan. Includes culverts identified by CPRW as critical road stream crossing locations (Diamond Peak Road crossing Trail Creek). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Ties into adjacent fuel treatments completed and ongoing by the LCD and CSFS.

Project ID: 4		**Priority:** Third	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundary along Pratt Creek Road (Forest Service Road 182)	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, private landowners	LCD, CSFS, LCSO	Continue creating safer conditions for firefighters and evacuees along Pratt Creek (Forest Service Road 182), which runs through the Arapaho-Roosevelt National Forest. Continue strengthening the ability of this road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. Focus on completing ongoing treatments and maintaining previous treatments on USFS and explore ways to expand treatments onto adjacent private land. Previous and ongoing treatments by USFS and LCD have made this road safer over the past few years. LCD plans to grade Pratt Creek Road / Forest Service Road 182 after completing their Diamond Creek project.	Boundary of high-priority PODs for the NCFC (Iron Mountain POD) and a POD for the Arapaho-Roosevelt National Forest (Dead Horse POD). Within the Halligan Reservoir action area and high- and highest-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan (UT5 to Trail Creek and Devils Creek watersheds). Includes two culverts identified by CPRW as critical road stream crossing locations. Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project, and includes completed, planned, and funded/projects on the Arapaho-Roosevelt National Forest. A portion of the area is also in the 2015 USFS Cherokee Park Environmental Assessment. Ties into adjacent fuel treatments completed by the USFS, LCD, and CSFS.

Project ID: 5		**Priority:** Third	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundary along Cherokee Park Road (County Road 80C) west of Pratt Creek Road	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, CPW, Larimer County Road & Bridge, private landowners	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along County Road 80C, which runs through private land, the Arapaho-Roosevelt National Forest, and Cherokee SWA – Upper Unit. Strength the ability of this road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Boundary of high-priority PODs for the NCFC (Creedmore Lakes POD) and a POD for the Arapaho-Roosevelt National Forest (Dead Horse POD). Within the Halligan Reservoir action area and highest-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (Devils Creek watershed). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Ties into adjacent fuel treatments completed by the USFS and LCD.

Project ID: 6		**Priority:** Third	**Project type:** POD boundary/roadside treatment
Project name/location:		Roads and POD boundary in the Cherokee SWA – Upper Unit	
Leads	**Partners**	**Objectives**	**Strategic alignment**
CPW, Larimer County Road & Bridge		Create safer conditions for firefighters and evacuees along County Road 65E and other roads in the Cherokee SWA – Upper Unit, which are used by campers, hikers, hunters, and other recreators. Strength the ability of this road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Boundary of high-priority PODs for the NCFC and Arapaho-Roosevelt National Forest (Goat Mountain and Creedmore Lakes PODs). Within the Halligan Reservoir action area and high- and highest-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (UT to North Fork-Bull Creek, Upper North Fork-Bull Creek, and Devils Creek watershed). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Ties into adjacent fuel treatments completed, ongoing, and planned by the USFS and LCD.

Project ID: 7		**Priority:** First	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundary along Cherokee Park Road (County Road 80C) west of County Road 59	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, LCD, Larimer County Road & Bridge, Poudre River Ranch community associations, private landowners	CSFS, LCSO	Create safer conditions for firefighters and evacuees along County Road 80C which runs through private land and the Arapaho-Roosevelt National Forest. Strength the ability of this road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Boundary of high-priority PODs for the NCFC and Arapaho-Roosevelt National Forest (Goat Mountain and Iron Mountain PODs). Within the Halligan Reservoir action area and highest-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (Devils Creek watershed). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Ties into adjacent fuel treatments ongoing and planned by the LCD

Project ID: 8		**Priority:** Second	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundary along County Road 59	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, Larimer County Road & Bridge, private landowners	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along County Road 59, which runs through private land and the Arapaho-Roosevelt National Forest. Strength the ability of this road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Boundary of high-priority PODs for the NCFC and Arapaho-Roosevelt National Forest (Iron Mountain, Bull Rock, and Turkey Roost PODs). Within the Halligan Reservoir action area for the 2024 Upper Poudre Watershed Resilience Plan. Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Ties into adjacent fuel treatments completed by the CSFS as part of the 2015 USFS Cherokee Park Environmental Assessment.

Project ID: 9		**Priority:** First	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundaries along Mill Creek Road, Three Creek Trail, Willow Creek Trail, and Haystack Rock Circle	
Leads	**Partners**	**Objectives**	**Strategic alignment**
Private landowners, Mill Creek Community Association, USFS	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along Mill Creek, Three Creek Trail, Willow Creek Trail, and Haystack Rock Circle, which run through a checkerboard of private land and the Arapaho-Roosevelt National Forest. Strength the ability of these roads to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. Improve road conditions (e.g., widening the road, road grading, creating pullovers), and install visible and reflective street and address signs.	Boundary of high-priority POD for the NCFC and Arapaho-Roosevelt National Forest (Bull Rock, Cap Rock, and Turkey Roost PODs). Within the Halligan Reservoir action area and a high-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (Middle Mill Creek watershed). Includes culverts identified by CPRW as critical road stream crossing locations (several locations along Mill Creek). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Ties into adjacent fuel treatments completed and ongoing by the LCD and by CSFS as part of the 2015 USFS Cherokee Park Environmental Assessment.

Project ID: 10		**Priority:** First	**Project type:** Roadside treatment
Project name/location:		Weaver Ranch Road	
Leads	**Partners**	**Objectives**	**Strategic alignment**
Private landowners, Weaver Ranch Road Association	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along Weaver Ranch Road, which is the only egress route for homes in the area. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Within high-priority POD for the NCFC and Arapaho-Roosevelt National Forest (Cap Rock POD). Within high-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (Lower Fish Creek watershed). Includes culverts identified by CPRW as critical road stream crossing locations (several locations along Devils Creek). Ties into adjacent, ongoing work by LCD with private landowners.

Project ID: 11		**Priority:** Third	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundary and alternate evacuation route along Moen Road	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, private landowners, Mill Creek Community Association	LCD, CSFS, LCSO	Create an alternate evacuation route and point of access for firefighters in the Mill Creek area, which currently has only one primary evacuation route. Strength the ability of Moen Road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. Improve road conditions (e.g., widening the road, road grading, creating pullovers). The current two-track runs through the Arapaho-Roosevelt National Forest and private land and is not passable by smaller vehicles or vehicles pulling trailers.	Boundary of high-priority POD for the NCFC (Cap Rock POD) and another POD for the Arapaho-Roosevelt National Forest (Halligan Reservoir PODs). Within high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan (UT4 to Lower Dale Creek, Upper Georges Gulch, and Lower Fish Creek watersheds). Partially within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Within high-priority area for composite goals for the 2020 CSFS Forest Action Plan.

Project ID: 12		**Priority:** Second	**Project type:** POD boundary/roadside treatment
Project name/location:		POD boundaries along County Road 67J	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, Larimer County Road & Bridge, Elk Meadows HOA, private landowners	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along County Road 67J, which runs through private land and the Arapaho-Roosevelt National Forest. Strength the ability of this road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Priority project area for the 2026 Red Feather Lakes FPD CWPP [in preparation]. Boundaries of high-priority PODs for the NCFC and Arapaho-Roosevelt National Forest (Goat Mountain, Many Thunders, South Divide, and Black Tail Point PODs). Within the Halligan Reservoir action area and high- and highest-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan (Middle North Fork-Bull Creek, Lower Bull Creek, and UT to North Fork Lone Pine Creek watersheds). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Within high-priority area for composite goals for the 2020 CSFS Forest Action Plan. Ties into adjacent fuel treatments ongoing and completed by the USFS and LCD.

Project ID: 13		**Priority:** Third	**Project type:** POD boundary/roadside treatment
Project name/location:		Switchbacks on Red Mountain Road (County Road 37)	
Leads	**Partners**	**Objectives**	**Strategic alignment**
Larimer County Road & Bridge, CSU Research Foundation, private landowners	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along switchbacks on the Red Mountain Road (County Road 37), which runs through private land and the CSU Maxwell Ranch. Strength the ability of this road to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Boundaries of PODs for the Arapaho-Roosevelt National Forest (Park Creek Reservoir and Little Twins PODs).

Project ID: 14		**Priority:** Second	**Project type:** POD boundary/roadside treatment
Project name/location:		Roads in the Prairie Divide-82E-Boxer Ranch Plan Unit	
Leads	**Partners**	**Objectives**	**Strategic alignment**
Castlebrook Road Association, private landowners	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along Boxer Ranch Road, Kestrel Lane, Spirit Ranch Road, Nuthatch Lane, Thiem Driver, Jackelope Lane, and Calliope Lane, which are private roads maintained by the Castlebrook Road Association. Strength the ability of Boxer Ranch Road, Kestrel Lane, and Nuthatch Lane to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers). Factor in stream restoration and habitat improvements where the road enters riparian areas.	Boundary of high-priority POD (South Divide POD) and other PODs for the NCFC and Arapaho-Roosevelt National Forest (Rabbit Creek PODs). Within high-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (Upper Middle Fork Rabbit Creek watershed). Includes priority habitat for the Preble's meadow jumping mouse based on analyses by the North Fork Poudre SCT.

Project ID: 15		**Priority:** Third	**Project type:** POD boundary treatment
Project name/location:		POD boundaries within Eagle's Nest Open Space and Arapaho-Roosevelt National Forest	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, Larimer County Open Space, private landowners	LCD, CSFS, LCSO	Strength the ability of two-tracks, ridges, and rivers in Eagle's Nest Open Space and on the Arapaho-Roosevelt National Forest to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. Improve firefighter access by widening two-tracks.	Boundaries of PODs for the Arapaho-Roosevelt National Forest (Seamon Reservoir and Livermore Mountain PODs). Within high- and highest-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (UT1 to Middle Lower CLP River and Greyrock Mountain Creek watersheds). Within highest-priority watersheds for the 2026 Peaks to People Watershed Investment Tool. Ties into adjacent fuel treatments completed by Larimer County Open Space.

Project ID: 16		**Priority:** Second	**Project type:** Roadside treatment
Project name/location:		Bonner Springs Ranch Road	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, private landowners, Bonner Peak LOA	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along Bonner Springs Ranch Road, which is the only evacuation route for homes in the area. This road runs through private land and the Arapaho-Roosevelt National Forest. As appropriate, improve road conditions (e.g., widening the road, road grading, creating pullovers).	Within high- and highest-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (Obenchain Draw-Seaman Reservoir, UT6 to North Fork-Seaman Reservoir, and Outlet North Fork-Seaman Reservoir watersheds). Within high- and highest-priority watersheds for the 2026 Peaks to People Watershed Investment Tool.

Project ID: 17		**Priority:** First	**Project type:** Roadside treatment
Project name/location:		Obenchain Road	
Leads	**Partners**	**Objectives**	**Strategic alignment**
Private landowners, Bonner Peak LOA	LCD, CSFS, LCSO	Create safer conditions for firefighters and evacuees along Obenchain Road, which is the only evacuation route for homes in the area. Improve road conditions (e.g., widening the road, road grading, creating pullovers).	Within highest-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (Obenchain Draw-Seaman Reservoir watershed). Within high- and highest-priority watersheds for the 2026 Peaks to People Watershed Investment Tool.

Project ID: 18		**Priority:** Third	**Project type:** POD boundary treatment
Project name/location:		POD boundary along Hewlett Gulch Trail	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS		Strength the ability of the Hewlett Gulch Trail on the Arapaho-Roosevelt National Forest to serve as potential control lines that support effective fire suppression and proactive landscape-scale management. Improve firefighter access by widening and maintaining trail.	Boundary of high-priority POD (Cedar Gulch POD) and other PODs for the NCFC and Arapaho-Roosevelt National Forest (Seaman Reservoir and Livermore Mountain PODs). Within highest-priority watersheds for the 2026 Peaks to People Watershed Investment Tool.

Project ID: 19		**Priority:** Third	**Project type:** Stand-scale fuel mitigation/restoration
Project name/location:		Treatments on USFS and private land along and west of Aspen Springs Road	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, CSFS, CPW, private landowners	CPRW, LCD	Fuel reduction projects on the Arapaho-Roosevelt National Forest, Cherokee SWA-Upper Unit, and private land to create a fuel break, reduce the potential for wildfires to ignite and spread into developed areas, and mitigate fuels around structures. The project could potentially fall under Good Neighbor Authority (GNA) work between CSFS and USFS.	Within the Halligan Reservoir action area and high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan (UT2 to Sheep Creek-North Fork and UT5 to Trail Creek watersheds). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Ties into adjacent fuel treatments completed by the USFS, and projects completed by LCD under the 2024 Landscape Resilience Investment Award from COSWAP for North Cherokee Park/Cedar Park.

Project ID: 20		**Priority:** First	**Project type:** Stand-scale fuel mitigation/restoration
Project name/location:		Diamond Creek/Upper Cherokee Park	
Leads	**Partners**	**Objectives**	**Strategic alignment**
Private landowners, Diamond Creek and Poudre River Ranch community associations, USFS	LCD, CSFS	Fuel mitigation on private land and the Arapaho-Roosevelt National Forest to create defensible space, restore wildfire resilient ecosystems, reduce wildfire risk, protect/enhance water quality in high-priority watersheds, and improve habitat for wildlife.	Contains priority projects from the 2011 Diamond Creek/Upper Cherokee Park CWPP. Within high-priority POD for the NCFC and Arapaho-Roosevelt National Forest (Iron Mountain POD). Within the Halligan Reservoir action area and high-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (UT5 to Trail Creek watershed). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. A portion of the area is also in the 2015 USFS Cherokee Park Environmental Assessment. Ties into adjacent fuel treatments completed by the LCD, CSFS, and USFS.

Project ID: 21		**Priority:** First (ongoing/planned)	**Project type:** Stand-scale fuel mitigation/restoration
Project name/location:		Northwestern LFPD and the Cherokee Park Environmental Assessment	
Leads	**Partners**	**Objectives**	**Strategic alignment**
CSFS, USFS, LCD, private landowners, Diamond Creek and Poudre River Ranch community associations		Fuel mitigation on private land and the Arapaho-Roosevelt National Forest to create defensible space, restore wildfire resilient ecosystems, reduce wildfire risk, protect/enhance water quality in high-priority watersheds, and improve habitat for wildlife. This work is already ongoing and/or planned by LCD and the CSFS in coordination with the USFS under the Good Neighbor Authority and the USFS Cherokee Park Environmental Assessment.	Within the Halligan Reservoir action area and high- and highest-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan (UT to North Fork-Bull Creek, UT2 to Fish Creek, UT5 to Trail Creek, Devils Creek, and Hamxe Creek watersheds). Within high-priority POD for the NCFC and Arapaho-Roosevelt National Forest (Turkey Roost POD). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project and the 2015 USFS Cherokee Park Environmental Assessment. Within high-priority area for composite goals for the 2020 CSFS Forest Action Plan. Ties into adjacent fuel treatments completed by the LCD, CSFS, and USFS.

Project ID: 22		**Priority:** First (ongoing)	**Project type:** Stand-scale fuel mitigation/restoration
Project name/location:		Ecological restoration of private land along Weaver Ranch Road	
Leads	**Partners**	**Objectives**	**Strategic alignment**
CSFS, USFS, LCD, private landowners, Diamond Creek LOA, Poudre River Ranch LOA		Fuel mitigation on private land to create defensible space, restore wildfire resilient ecosystems, reduce wildfire risk, protect/enhance water quality in high-priority watersheds, and improve habitat for wildlife. This work is already ongoing by LCD.	Within the Halligan Reservoir action area and a high-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (Lower Fish Creek watershed) Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Within high-priority area for composite goals for the 2020 CSFS Forest Action Plan.

Project ID: 23		**Priority:** Third	**Project type:** Stand-scale fuel mitigation/restoration
Project name/location:		Cherokee SWA – Middle Unit and Arapaho-Roosevelt National Forest checkerboard	
Leads	**Partners**	**Objectives**	**Strategic alignment**
USFS, CPW	USFS, CSFS, LCD	Cross-boundary fuel mitigation on Cherokee SWA – Middle Unit and the Arapaho-Roosevelt National Forest to restore wildfire resilient ecosystems, reduce wildfire risk, protect/enhance water quality in high-priority watersheds, and improve habitat for wildlife. General area of potential work identified in the CWPP, not specific treatment boundaries.	Within high-priority POD for the NCFC and Arapaho-Roosevelt National Forest (Turkey Roost POD). Within the Halligan Reservoir action area and high- and highest-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan (Middle North Fork-Bull Creek and Lower North Fork-Bull Creek watersheds). Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Within high-priority area for composite goals for the 2020 CSFS Forest Action Plan.

Project ID: 24		**Priority:** First (planned)	**Project type:** Stand-scale fuel mitigation/restoration
Project name/location:		Restoration on conservation easement in northeastern LFPD	
Leads	**Partners**	**Objectives**	**Strategic alignment**
Private landowners, USFS, CSFS	LCD	Fuel mitigation on private land to create defensible space, restore wildfire resilient ecosystems, reduce wildfire risk, protect/enhance water quality in high-priority watersheds, and improve habitat for wildlife. This work is already planned by LCD.	

Project ID: 25		**Priority:** First (planned)	**Project type:** Cheatgrass mitigation & riparian restoration
Project name/location:		Calloway Rim and Cherokee SWA Cheatgrass Projects	
Leads	**Partners**	**Objectives**	**Strategic alignment**
CPW, private landowners (many in area with existing conservation easements)	CSFS, LCWB, North Fork Poudre SCT	Intensive effort to mitigate cheatgrass to reduce wildfire risk, restore ecological conditions, and improve wildlife habitat, particularly for bighorn sheep, and to restore health to riparian ecosystems in the Calloway Rim and Cherokee SWA – Lower and Roy Brown Units. Planned work on private and public land also includes fence removal and fence modification for wildlife. Work is ongoing and planned through 2027 and expands upon previous cheatgrass treatments by CPW on the Cherokee SWA – Lone Pine Unit.	Within a priority area for the 2022 Glacier View FPD CWPP. Expands upon previous cheatgrass treatments on the Cherokee SWA. Partially a high-priority watershed for the 2024 Upper Poudre Watershed Resilience Plan (Upper North Fork-Seaman Reservoir watershed). Includes priority habitat for the Preble's meadow jumping mouse based on analyses by the North Fork Poudre SCT. Funding for this project comes in part from the City of Fort Collins through the Halligan Water Supply Project Fish & Wildlife Mitigation and Enhancement Plan

Project ID: 26		**Priority:** Second	**Project type:** Other (targeted outreach)
Project name/location:		LCD/CPRW outreach for 2024 COSWAP award in western LFPD	
Leads	**Partners**	**Objectives**	**Strategic alignment**
LCD, CPRW, private landowners, Cherokee Meadows Road Association, Mill Creek Community Association	USFS, CSFS, CPW	Targeted outreach and education by LCD and CPRW to educate, interest, and prepare landowners for the possibility of future treatments as part of the 2024 Landscape Resilience Investment (LRI) Award from the Colorado Strategic Wildfire Action Program (COSWAP) for the North Cherokee Park/Cedar Park project. Future work in this area could include cross-boundary fuel mitigation on private land, the Arapaho-Roosevelt National Forest, Meadow Creek State Trust Land, and Cherokee State Wildlife Area – Middle Unit to create defensible space, restore wildfire resilient ecosystems, reduce wildfire risk, protect/enhance water quality in high-priority watersheds, and improve habitat for wildlife.	Contains priority projects from the 2022 Cherokee Meadows CWPP. Within high-priority PODs for the NCFC and Arapaho-Roosevelt National Forest (Goat Mountain, Turkey Roost, Black Tail Point, and Cap Rock PODs). Within the Halligan Reservoir action area and high- and highest-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan (UT5 to Trail Creek, Middle Mill Creek, Upper Meadow Creek, and UT to Meadow Creek). Includes a culvert along Mill Creek identified by CPRW as a critical road stream crossing location. Within USFS Black Diamond Landscape Resiliency & Risk Reduction Project. Ties into adjacent fuel treatments completed by LCD and private contractors.

Project ID: 27		**Priority:** First	**Project type:** Other (point protection)
Project name/location:		Virginia Dale Community Club, Overland Stage Station, and Hurzeler House	
Leads	**Partners**	**Objectives**	**Strategic alignment**
Virginia Dale Community Club	LFPD, community volunteers	Mitigate fuels around the historic Overland Stage Station, Hurzeler House, and Virginia Dale Community Club to give these structures the best chance of standing strong against wildfire. The Virginia Dale Community Club completed restoration of the Stage Station in 2019 and has plans for restoring Hurzeler House, and since these structures are wooden for historical purposes, ensuring they have defensible space is critical.	Within a high-priority watersheds for the 2024 Upper Poudre Watershed Resilience Plan (Middle Lower Dale Creek watershed).

4.e. Logistics of Fuel Treatments

Roles and Responsibilities

Landowners are responsible for fuel mitigation on their own lands, including along their private driveways. Residents must initiate and follow through on this work, but that does not mean they must do it alone. For assistance in planning and implementing fuel treatments, please refer to the **Resident Assistance for Land Management Planning Section** for information and links to contact LCD, CSFS, or other wildfire mitigation specialists. LFPD can also reach out to local mitigation crews for support implementing hazardous fuel reduction, such as LCSO's Phantom Canyon Wildlife Fire Crew, or apply for help from national volunteer organizations like Team Rubicon. Tree cutting with a chainsaw and other forestry equipment should be done by experienced and certified individuals. The CSFS provides guidance for how to select a contractor for forest management, and they provide a list of local contractors.

Many land management agencies, homeowners, and other partners in LFPD are already engaged in fuel mitigation and ecological restoration. LCSO's Phantom Canyon Wildland Fire crew completed projects along Brewster Lane and Brown Bear Way in LFPD and along North Rom Road in Glacier View FPD as part of the Red Feather Lakes Area CWDG project. The USFS has complete fuel treatments along Green Mountain Road, Pratt Creek Road / Forest Service Road 182, and other roads in western LFPD. Cherokee Meadows Road Association worked with a private contractor to reduce fuel load along Cherokee Meadows Road several years ago. LFPD and CSFS continue to work with landowners across the district to develop forest management plans and implement projects that make neighborhoods safer and more ecologically resilient.

The responsibility for conducting roadside fuel treatments depends on the location of the road. Landowners are responsible for treatments along their private driveways. Some private roads are the responsibility of road associations in LFPD. Treatments along country roads need to be coordinated with the County's Road and Bridge Department. Treatments along Forest Service roads are the responsibility of that agency to complete and maintain. Cooperation from private property owners is necessary for effective roadside fuel treatments; roadside easements are rarely wide enough to satisfy the minimum of 150 feet treatment depth on each side of roads.

Treatment Costs

The cost of fuel treatment depends on management objectives, treatment specifications, slope, accessibility, and treatment method (e.g., mechanical thinning, hand thinning, or prescribed burning). Costs of $2,500 to $10,000 per acre are not uncommon along the Colorado Front Range where there is little biomass or timber industry to provide financial return (B. M. Gannon et al., 2019). Follow-up treatments are generally less expensive than the initial entry and help maintain the efficacy of the original treatment investment. Since fuel treatments are expensive, it is important to conduct strategic, well-designed, landscape-scale treatments to increase the likelihood that fuel treatments modify fire behavior, save lives, and promote resilient ecosystems. Fuel treatments can reduce property damages by making wildfires less damaging and easier to control; this is especially true for prescribed burning which is often cheaper and more effective at altering forest fuel loads than mechanical thinning alone (Fulé et al., 2012; Loomis et al., 2019; Prichard et al., 2020). Proactive management of forests can also reduce the cost of rehabilitating water sources when wildfires are followed by large storms and result in massive erosion (Jones et al., 2017). Fuel treatments can also reduce suppression costs due to the increased efficiency of firefighting (Loomis et al., 2019).

Longevity of Fuel Treatment Benefits

Benefits of fuel treatments are not permanent and decrease overtime, with treatment "lifespan" depending on forest type, topography, rates of seedling regeneration (which is often influenced by precipitation), and the number of trees and understory brush removed during treatments. Many forests require more than one treatment to reduce fuels and promote resilient ecosystem structure. Some areas might require mechanical tree removal followed by prescribed burning, and then a maintenance treatment with tree removal and/or prescribed burning 10 to 20 years later. With a single pulse of tree regeneration, the risk of torching returns to near pre-treatment levels within 10 to 35 years in ponderosa pine forests in Colorado (Tinkham et al., 2016). Gambel oak shrublands can require retreatment every 3-5 years due to vigorous sprouting after treatment (CSFS, 2021).

Approaches to Slash Management



Crews observe the fire effects during the 2023 Magic Feather prescribed burn. Photo Credit: USDA Forest Service.

Thinning operations can increase surface fuel loads and can fail to achieve fire mitigation objectives if fuels created by the harvest activities (also known as slash) are not addressed with management methods such as removal or pile burning (Agee & Skinner, 2005). Slash can include small trees, limbs, bark, and treetops. Slash management is a critical step in the forest management process. It is unwise, ineffective, and even dangerous to conduct poor-quality fuel treatments that fail to reduce canopy fuels, result in increased surface fuel loads, and do not receive maintenance treatments. Such treatments can lead to a false sense of security among residents and fire suppression personnel (Dennis, 2005), and they divert limited funds away from more effective, strategic projects.

Chips and masticated fuels are a type of slash that rearrange fuels on a site but do not remove fuels. However, in some instances, chipping and mastication can reduce fire intensity and rates of spread by increasing the distance between surface and canopy fuels and suppressing the regrowth of grasses (Kreye et al., 2014). See below for more information on pros and cons of chipping and masticating fuels.

Leaving untreated slash within roadside fuel treatments is particularly counterproductive. The risk of active crown fire might be lower after a thinning operation, but untreated slash in fuel treatments can burn at high intensities and endanger the lives of residents stuck on roadways during a wildfire. Slash is easier and cheaper to manage along roadways due to access, and roads can serve as highly effective holding features for controlled burning of grass in the spring and fall and pile burning in the winter.

Methods for managing slash come with different benefits and challenges (**Table 4.e.1**). For example, lop-and-scatter and mastication do not remove surface fuels from the site, they only rearrange them. It can take a decade or more for slash to decompose to a point where it no longer poses a significant fire hazard. Broadcast prescribed burning and pile burning are more effective at removing surface fuels, but they require extensive planning and expertise to conduct properly.



Prescribed burning is a common tool used to restore ecosystem processes and reduce fuel loads. Photo from 2023 Magic Feather prescribed burn. Photo credit: USDA Forest Service.

Slash removal in this part of Colorado is quite difficult due to limited biomass and timber industries. LFPD, Larimer County, and partners should work together to develop a slash management strategy and program for the area and its residents. This can and should include a combination of the following slash management techniques.

Broadcast Prescribed Burning

Broadcast prescribed burning is often the most effective method to reduce surface, ladder, and canopy fuel loads. Broadcast burning can be safely and successfully conducted with proper planning and implementation by qualified firefighters. Broadcast burning is regulated in Colorado by the DFPC, Department of Public Health and Environment, local sheriff's offices, and fire departments as outlined in the *2019 Colorado Prescribed Fire Planning and Implementation Policy Guide.*

Barriers/Challenges to Broadcast Burning:

- Public concerns about risk from flames, embers, and smoke.
- Limited opportunities to conduct pile burns because of requirements for snowpack and atmospheric ventilation.
- Limited staffing because firefighters are often on wildfire assignments and unavailable to conduct burns, especially as fire seasons have become almost year-round due to climate change.

Pile Burning

Pile burning can be the best and sometimes only option for slash removal in steep, inaccessible areas, and incomplete slash management can leave an area just as at risk as an unmitigated area. Pile burning is different from broadcast burning; the overall complexity of pile burn operations is lower because fire activity is limited to discrete piles, and piles can be burned when snow covers the ground. Pile burning is often a required treatment before a stand is in a condition and ready to accept broadcast burning.



Pile burning can be a safe and effective method to consume slash created by thinning operations Photo credit: TEA.

Burning piles can produce embers, but the risk of these embers igniting spot fires or structures is low. Piles are typically burned on days with snowpack, high fuel moisture, and low to moderate wind speeds. Embers from burn piles travel shorter distances than embers from passive and active crown fires because the burning material is closer to the ground (Evans & Wright, 2017).

It is critical to properly construct piles either by hand or with machines and to burn them as soon as conditions allow (see the 2015 *Colorado pile construction guide* from the DFPC and CSFS for guidance). Unburnt slash piles can become a hazard during wildfires, especially if loose logs catch fire and roll down slopes. Burning older piles is less effective and does not consume as much material because piles become compact and lose fine fuels over time (Wright et al., 2019).

Individuals must apply for open burn permits from the Larimer County Department of Health and Environment (LCDHE) burn fewer than 50 piles. Burning more than 50 piles requires a smoke management permit from the Colorado Department of Public Health and Environment. Larimer County Sheriff's Office does NOT allow open burning during fire restrictions and fire bans. Contact LFPD for specific requirements to burn piles in the district. Pursuant to Colorado House Bill 22-1132 (Darcy's Last Call Act), individuals must contact their local fire department before burning.

DFPC administers a certified burner program that provides civil liability protection to individuals planning and leading burns if smoke or flames cause damage. The burn must have been properly planned, approved, and executed to receive liability protection. The rigorous certification program requires individuals to complete 32 hours of training, pass an exam, lead at least three pile burns, complete a task book, and comply with all legal requirements for pile burning in Colorado.

Barriers/Challenges to Pile Burning:

- Public concerns about risk from flames, embers, and smoke. There are thousands of piles within and around the district that are ready to be burned, but the agency needs more public support before conducting the pile burns.
- Limited opportunities to conduct pile burns because of requirements for snowpack and atmospheric ventilation.
- Impacts to soil and vegetation. Intense heat from pile burning can sterilize soils and result in slow recovery of plants. Mitigation measures, such as raking the burnt soil and seeding with native plants, are sometimes warranted after pile burning if the soil was completely sterilized by extreme heat or if invasive species are prevalent in the area (Miller, 2015).

Air Curtain Burners and Burn Boxes

Air curtain burners and burn boxes are machines that burn woody material cleanly in contained space. They typically consist of a box or trench into which slash is loaded and ignited. A strong fan blows a curtain of air down and over the burning material in a way that keeps oxygen flowing through the fire and keeps smoke from escaping from the top. Carbon from the smoke is filtered out of the air and kept inside the box.

Air curtain burners can be an acceptable form of slash removal where there is no social license for pile or broadcast burning. They produce significantly less smoke than open burns and can be placed in accessible locations in the WUI.



Air curtain burner owned and operated by Loveland Fire Rescue Authority. Photo: TEA

Air curtain burners can be used under a much wider range of conditions and locations than pile burning or broadcast burning. Air curtain burners can burn more kinds of slash than pile burning, including green wood, lumber, and general yard waste. Burning material is contained and can be extinguished with relative ease.

Barriers/Challenges to Air Curtain Burners and Burn Boxes:

- State regulations to get a permit to operate an air curtain burner are cumbersome and take a lot of time.
- Substantial upfront cost, and ongoing cost to pay for professional operators, such as firefighters staffing engines.
- Need for a large, fuel-free area to operate the burner.
- Need for equipment to haul slash from treatment areas to the site of the burner.
- Impacts to soil since nutrients are permanently removed from the treatment site, unlike broadcast prescribed burns. Some nutrients can be returned to the ground if ash is removed from the burner and spread out, and it is rarely feasible to return ash to the original treatment site.

Community Slash Piles

Community slash piles allow residents to immediately reduce fuel loads on their property, and they eliminate the need for residents to burn or chip their own material. However, it can be challenging for residents to haul material from their properties to the slash pile. Providing a program that will pick up the slash material and bring it to the slash disposal site will also reduce barriers for residents to complete mitigation work thoroughly.

The success of community slash piles is dependent on consistent management of the pile. If large slash piles are left in the community, they can pose a fire risk if they were to burn during a wildfire. Community slash piles also come with a cost for management and maintenance, but the cost is spread across all residents and therefore lower than if individual residents were to create and burn their own slash piles.

Lop-and-Scatter

Lopping involves cutting limbs, branches, treetops, smaller-diameter trees, or other woody plant residue into shorter lengths. Scattering involves spreading slash, so it lies evenly and close to the ground. The lop-and-scatter approach reduces the height of slash relative to untreated slash, therefore increasing the distance between surface and canopy fuels (but not as effectively as broadcast prescribed burning or pile burning).

Lop-and-scatter can contribute to more intense fire behavior by not addressing increased surface fuel loads created by thinning (Agee & Skinner, 2005; Hunter et al., 2007). **Lop-and-scatter should not be utilized in defensible space zones 1-3 or along roadways** because this method does not remove surface fuels from the site, it just rearranges them. Lop-and-scatter is better suited to areas with low slash accumulations and for stand-scale fuel treatment areas far away from homes.

Mastication or Chipping

Mastication involves using specialized machines like a tow-behind chipper or a hydro-ax to grind up standing saplings and shrubs and cut slash into medium-sized chips. Chipping involves processing slash through a mechanical chipper to break material into small chips or shreds. Mastication and chipping can reduce fire intensity and rates of spread by increasing the distance between surface and canopy fuels and suppressing the regrowth of grasses (Kreye et al., 2014).

Neighborhood chipping programs are cost-effective ways for communities to gain access to chippers without individuals paying for the unit and service each time they need it. Many communities create chipping programs where a chipper can be brought to anyone's property and chip the material there for them to spread across their land again. The district could host a chipping program for residents as another cost-effective slash management option. For detailed information on chipping and mastication, refer to CFRI's Mulching Knowledge Summary.

Barriers/Challenges to Mastication or Chipping:

- Unless material is hauled away after treatment, fuels are just rearranged, not reduced
- Smoldering fires in masticated and chipped fuels can be difficult to suppress, produce abundant smoke, kill tree roots, and lead to spot fires if high winds reignite masticated fuels and blow them across containment lines (Kreye et al., 2014).
- LFPD and community associations do not have the capacity to keep up with chipping needs of the community given the significant amount of fuel that needs to be removed to reduce risk around homes.
- Fuels left behind in mastication and chipping treatments are deeper and more compact than natural fuels and can impede plant regeneration, particularly when the depth of masticated and chipped fuels exceeds 4 inches (Jain et al., 2018).

Table 4.e.1. *Many methods are available to remove slash created by forest thinning, each with their own benefits and challenges.*

Method	Removes surface fuel from site	Repairs ecosystem functions	Retains nutrients on the site	Expertise required to conduct	Effort to conduct	Relative cost/acre	Total time to plan and conduct
Broadcast prescribed burning	✓	✓	✓	Very high	Very high	$$$	Months to years
Pile burning on site	✓		✓	Moderate	Moderate to high	$$	Weeks to months
Air curtain burner	✓			High	Moderate	$$$$ (upfront)	Weeks to months
Community slash pile	✓			Low to moderate	Moderate	$$	Ongoing
Lop-and-scatter			✓	Low to moderate	Moderate	$ - $$	Weeks to months
Mastication or chipping	(✓)		✓	High	Moderate to high	$$$	Weeks to months

Note: Mastication and chipping only remove surface fuel from the site if material is hauled away after treatment. Utilizing material for firewood can relocate surface fuels from one site to another but increase fuel loads near a home until burned.

5. Implementation Plan and the Future of the CWPP

Below are strategic actions for residents, LFPD, and partners to implement in the immediate, short-, and mid-term (see definitions below). Some actions have minimal financial costs but require a shift in attitudes, behaviors, and priorities to reduce catastrophic wildfire risk. Others are more complex and will require sustained commitment, collaboration, and investment to secure funding, leverage resources, and achieve meaningful progress over time.

Many of these recommendations are aspirational and will require additional capacity, funding, partnerships, and community engagement to fully implement. Achieving long-term wildfire resilience will depend on the collective efforts of residents, community organizations, local leaders, and partner agencies working together toward shared goals.

The priority level and implementation phase assigned to each recommendation were developed collaboratively and reflect planning priorities at the time this CWPP was prepared. These designations are intended to guide decision-making and resource allocation but should not be interpreted as requiring a specific sequence or timeline for implementation. Likewise, they do not preclude actions that are not explicitly identified in this CWPP. As wildfire risk, community needs, available resources, and environmental conditions evolve, land managers, local governments, partner organizations, and residents should periodically reassess priorities and adapt implementation efforts accordingly.

5.a. Implementation Phases

Immediate	• Actions that should be initiated as soon as practical following CWPP adoption. • Have the highest potential for near-term wildfire risk reduction or return on investment. • Can be implemented within the existing capacity of landowners, LFPD, and partner organizations, with limited supplemental funding. • Require little to no expansion of existing staffing, programs, or organizational capacity. • Can leverage existing partnerships, programs, and community relationships. • Typically involves planning, education, outreach, or relatively straightforward implementation activities.
Short-term	• Actions that should be initiated once higher-priority immediate actions are underway or completed. • Require moderate expansion of financial, staffing, or implementation capacity. • May require securing grant funding or other external resources. • Require increased coordination among landowners, partners, stakeholders, and community members. • May involve developing new partnerships, programs, or implementation mechanisms. • Often require additional community engagement, discussion, and decision-making before implementation.
Mid-term	• Actions that require substantial planning, coordination, and resource development before implementation. • Typically involve multi-year planning horizons and sustained funding commitments. • Require significant external funding, expanded organizational capacity, or dedicated staffing. • Depends on extensive coordination among landowners, agencies, partners, and community groups. • May require policy changes, new programs, major infrastructure investments, or landscape-scale implementation efforts. • Often involves substantial community engagement, consensus-building, and long-term commitment from multiple stakeholders.

5.b. Implementation Recommendations

Recommendation	Goals	Responsibility	Priority
Immediate Implementation Phase			
Form a CWPP Implementation Committee	Implement CWPP recommendations by identifying staffing, funding, and partnership opportunities to begin on-the-ground implementation. See **Recommendations for the District and Partner Organizations Section.**	CWPP Advisory Committee	First
Embrace the concept of Fire Adapted Communities	Defined by NWCG as "a human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire". This concept can guide residents, fire practitioners, and communities through a holistic approach to become more resilient to fire. See **Becoming a Fire Adapted Community Section**.	CWPP Implementation Committee, community associations, residents	First
Get involved with your community association(s)	Learn about the homeowner, landowner, property owner, or road association in your neighborhood and how you can stay informed or get more involved. See **Outreach and Education Section.**	Residents	First
Expand LFPD Wildfire Ambassador Program	Continue to expand LFPD's Wildfire Ambassador Program. See **Outreach and Education Section.**	LFPD, residents, community associations	First
Identify funding opportunities to support pre-fire mitigation and post-fire recovery efforts.	See **Funding Opportunities Section**.	LFPD, community associations	First
Complete home hardening	See **Recommendations for Residents Section.**	Residents	First
Mitigate defensible space zone 1	See **Recommendations for Residents Section.**	Residents	First
Mitigate defensible space zone 2	See **Recommendations for Residents Section.**	Residents	First
Follow specific recommendations in your plan unit Relative Risk	See **Plan Unit Relative Risk Section**.	Residents	First
Make homeowners aware of CSFS list of reliable private contractors	Make landowners aware of the contractor list available on the Fort Collins Field Office's website so homeowners can find local, reliable private contractors for mitigation work they cannot complete themselves. See **Mitigate the Home Ignition Zone Section.**	LFPD, CSFS, contractors	First

Recommendation	Goals	Responsibility	Priority
Encourage landowners to develop holistic land management plans	Before taking large-scale steps on their own property, encourage small acreage landowners to work with professionals at organizations such as CSFS and Larimer County to develop a land management plan. Encourage landowners to continue adaptive management like weed control over time. See **Resident Assistance for Land Management Planning Section**.	Community associations, LFPD, CSFS, Larimer County, contractors	First
Establish Pile Burn Cooperatives	PBCs are groups of neighbors that get together to help burn slash piles, often with support from their local FPD. See **Slash Management Section.**	Community associations, LFPD, landowners	First
Provide and continuously update accessible public education materials pertaining to wildfire mitigation, evacuation, and preparedness	Improve community-wide awareness and engagement. Update information on fire safety, prevention, wildfire mitigation, ecological enhancements/protections, and emergency preparedness through digital platforms, outreach events, and programs such as Larimer Connects. See **Outreach and Education Section.**	LFPD, LCSO Emergency Services, CSFS, LCEOM, USFS, community associations	First
Sign up for emergency notification through NOCO Alert	Visit the NOCO Alert website to sign up and learn more. NOCO Alert also allows individuals to self-identify access or functional needs, which is critical to supporting inclusive planning. See the **Evacuation Preparedness Section.**	Residents	First
Invest time and energy into proper evacuation preparedness	Evacuation preparedness is the responsibility of each resident in LFPD. The best way to get out quickly and safely during an evacuation is to be prepared. See the **Evacuation Preparedness Section.**	Residents	First
Consider animals and livestock in evacuation planning	Plan to leave during voluntary evacuation notices to allow time for preparations and create more space on the roads for other residents during a mandatory evacuation. See the **Evacuation Preparedness Section.**	Residents	First
Increase participation in the NOCO Alert emergency notification system through outreach and education efforts	Educate residents on how to register mobile devices and email. Make sure residents know the limitations of the notification system and what steps they can take to be informed in a timely manner. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	LFPD, LCSO Emergency Services, community associations	First
Educate residents about warning systems, protocols for evacuation orders, and evacuation etiquette	Ensure residents have appropriate information prior to evacuation. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	LCSO Emergency Services, LFPD, and community associations	First
Maintain up-to-date gate access information	Ensure timely emergency response, conduct annual gate access checks by sending reminders to residents and/or coordinating with LFPD personnel to verify accessibility. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	LFPD Logistics, community associations, and landowners	First
Make personal water resources accessible for firefighters	See **Support Your Local Fire Protection District Section.**	Residents	First

Recommendation	Goals	Responsibility	Priority
Maintain the wildland fire safety program	Help residents with adopted building and land use codes, provide wildfire hazard assessments, facilitate slash disposal, and promote public education on wildfire risk and preparedness. See **Fire Protection District Capacity Section.**	Larimer County	First
Coordinate use of available fire crews	Support fuels reduction projects on county and community lands when not assigned to active incidents. See **Fire Protection District Capacity Section.**	LFPD and LCSO Emergency Services	First
Post signs for any limitations to emergency personnel access	Post the load limit at any private bridges or culverts on private property. See **Accessibility and Navigability for Emergency Personnel Section.**	Residents, community associations	First
Remove trees along driveways and prune low-hanging branches	Increase horizontal and vertical clearance, driveways and roads should have a minimum of 20 feet of horizontal clearance and 13.5 feet of vertical clearance to allow engines to safely access the roads. S See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	Community associations and landowners	First
Apply for grants to fund roadway improvements and roadside fuel treatments	Widening roads and removing fuels along roadways can be time-consuming and expensive, but this work is vital for the safety of residents and first responders. Residents, community leaders, and LFPD can work together to share costs and apply for grants to facilitate this work. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	LFPD, community associations, landowners	First
Decide on proper entity(ies) to begin and maintain responsibility for slash removal coordination efforts.	Establish main responsible party to move efforts forward. See **Slash Management Section.**	Larimer County, LFPD, and other partners	First
Consider options that reduce barriers for slash disposal	Reduce barriers and increase participation in mitigation activities. See **Slash Management Section.**	LFPD, community associations, Larimer County	First
Enhance mutual aid and increase capacity for district needs	Work together to enhance mutual aid and increase capacity to respond to emergencies, assist with prevention, and provide education. Potential methods include increasing cross-training, strengthening mutual aid agreements, and having an updated annual operating picture. See **Fire Protection District Capacity Section.**	LFPD, DFPC, mutual aid fire districts	First
Increase staffing to account for longer fire seasons, mitigation projects, and community outreach.	This includes emergency response personnel, logistics and planning, and board members. See **Fire Protection District Capacity Section.**	LFPD, surrounding FPDs	First
Evaluate and begin first priority projects from this CWPP	See **Priority Project Areas Section.**	Varies by project	First

Recommendation	Goals	Responsibility	Priority
Continue meetings and collaboration with land management partners	Provide accountability on projects and continue to participate in cross-boundary mitigation programs such as the NCFC. See **Collaboration Section.**	CWPP Implementation Committee	Second
Revisit and revise documents that set standards for community associations	There may be rules and regulations that do not match states or county regulations on building codes for home hardening measures or defensible space on individual properties. Certain rules can directly or indirectly inhibit residents' ability to take certain steps to mitigate the risk of wildfire on their property. See **Outreach and Education Section.**	Community associations	Second
Encourage coordination between neighboring landowners to support landscape-scale mitigation	See **Resident Assistance for Land Management Planning Section.**	LFPD, community associations	Second
Increase the number of home assessments	Provide clear pathways for residents to act on recommendations. See **Outreach and Education Section.**	LFPD, LCSO Emergency Services	Second
Use social media for engagement and education	Social media is a powerful tool when used properly to connect with different audiences. See **Outreach and Education Section.**	LFPD	Second
Encourage residents to take individual and collective action	Foster close relationships with community associations and encourage coordination among associations. See **Outreach and Education Section.**	LFPD	Second
Promote education and outreach efforts tailored to social vulnerability and AFN	Use clear, accessible messaging and trusted communication channels. See **Outreach and Education Section.**	LFPD	Second
Understand social and access factors related to evacuation	Talk to your neighbors, community associations, and LFPD to better understand social vulnerability and AFN in your community and neighborhood. See **Social Vulnerability/Access and Functional Needs Section**.	Residents	Second
Increase accessibility of slash disposal	Identify potential slash collection sites throughout the district, identify and mitigate risks associated with the accumulation of slash piles over longer periods of time (including strategies to reduce backlog of piles on the district). See **Slash Management Section.**	Larimer County, LFPD, CSFS, LCD, community associations	Second
Encourage residents to use multiple slash management options	Examples including chipping, hauling, and pile burning where appropriate. See **Slash Management Section.**	LFPD, CSFS, LCD, Larimer County, and community associations	Second

Recommendation	Goals	Responsibility	Priority
Participate in post-fire pre-planning	Complete the Colorado Post-Fire Recovery Playbook for the district to plan for post-fire recovery and community resilience. See **Preparing for Post-Fire Impacts and Long-Term Recovery Section.**	LFPD, Larimer Recovery Collaborative, LCDNR, LCOEM, Larimer County Road & Bridge, LCSO Emergency Services, LCD, USFS, and CPRW	Second
Evaluate and begin second priority projects from this CWPP	See **Priority Project Areas Section.**	Varies by project	Second
Organize HIZ tours	Organize community-wide home hardening and defensible space tours to demonstrate exemplary HIZ work. See **Mitigate the Home Ignition Zone Section.**	Residents, community associations	Third
Organize fuel treatment tours	Organize before/during/after treatment tours to demonstrate what fuel treatments involve and look like throughout the process. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	LCD, CSFS, community associations, landowners	Third
Improve, install, and maintain road and address reflective signage	Improve visibility and help emergency personnel navigate during heavy smoke or at night. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	LFPD, CDOT, Larimer County Road & Bridge, community associations, and landowners	Third
Develop and implement community slash removal services	Examples include chipping programs, helping residents haul material off-side, and creating smaller and more scattered sites for slash disposal as an alternative to large community slash piles. Also consider seasonal staff to help implement and execute the program. See **Slash Management Section.**	LFPD, neighboring FPDs, LCD, Larimer County, CSFS	Third
Identify residents who may benefit from shared or collective mitigation approaches	Understand AFN and social vulnerability in the district. See **Outreach and Education Section.**	LFPD	Third
Include planning for rebuilding after a fire in relevant plans	Ensure information is included and/or updated in relevant master plans and documents, and that all impacted agencies and partners are aware of this pre-planning. See **Preparing for Post-Fire Impacts and Long-Term Recovery Section.**	Larimer County	Third
Evaluate and begin third priority projects from this CWPP	See **Priority Project Areas Section.**	Varies by project	Third
Short-term Implementation Phase			
Understand wildfire risk reduction requirements in the district	See **Recommendations for Residents Section.**	Residents	First
Become Firewise USA® sites	Work within your neighborhood to meet a voluntary set of requirements that can help get you funding for mitigation action. See **Outreach and Education Section.**	Residents	First

Recommendation	Goals	Responsibility	Priority
Engage in annual maintenance of your HIZ	See **Recommendations for Residents Section.**	Residents	First
Mitigate defensible space zone 3	See **Recommendations for Residents Section.**	Residents	First
Create linked defensible space	Where applicable, work with neighbors with overlapping HIZ to create safer conditions and better tactical opportunities for wildland firefighters. See **Mitigate the Home Ignition Zone Section.**	Residents	First
Promote and expand participation in the DFPC Certified Burner Program	Increase local capacity for safe and effective pile burning. See **Mitigate the Home Ignition Zone Section.**	LFPD, DFPC	First
Clearly communicate needs, timing, and duration of public safety power shutoffs	Increase awareness and trust. See **Outreach and Education Section.**	PVREA	First
Reinforce evacuation preparedness education	Promote Ready, Set, Go! Initiatives and encouraging residents to prepare and maintain go-bags. Distribute or offer go-bags to current and new residents. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	LFPD and community associations	First
Conduct tree removal, limb trees, and mitigate hazardous fuel along roadways to reduce the chance of extreme fire behavior that can endanger residents and firefighters	See **Roadside Fuel Treatments Section**.	Varies by project	First
Maintain and improve roadways	Improve roads by grading and filling in potholes. Ensure that private roads and driveways include adequate turnarounds to allow emergency vehicles to safely enter and exit and to make it easier for vehicles to pull over in the case of an accident. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	LFPD, community associations, CDOT, LCSO, Larimer County Road & Bridge	First
Identify, create, and maintain sustainable funding sources for slash removal and disposal	Meet ongoing and increasing demand. This can include applying for grants to increase the community's ability to dispose of woody debris. See **Slash Management Section.**	LFPD, LCD, Larimer County, PVREA, community associations	First
Expand outreach efforts to recruit volunteer firefighters and community volunteers	Support wildfire preparedness and response initiatives. Promote nonoperational volunteer roles such as logistics support to expand the variety of potential volunteers. See **Fire Protection District Capacity Section.**	LFPD	First

Recommendation	Goals	Responsibility	Priority
Conduct fuels treatments in strategic locations to mitigate for post-fire impacts	Reduce wildfire severity and extent, decrease the likelihood that hydrophobic soils (soil that repels water) form, and reduce the loss of roots, vegetation, and plant litter that hold soil in place. See **Preparing for Post-Fire Impacts and Long-Term Recovery Section.**	LCSO Emergency Services, LCD, USFS, CSFS, CPRW, community associations, landowners:	First
Re-evaluate and begin additional first priority projects from this CWPP	See **Priority Project Areas Section.**	Varies by project	First
Establish homeowner and partner committees dedicated to identifying funding sources and pursuing grant opportunities	Decrease barriers and increase opportunity for mitigation and resilience projects. See **Outreach and Education Section.**	LFPD, community associations, local partners	Second
Conduct public outreach and education on alternative landscape recommendations	Encourage and educate residents on fire-resistant plants and landscaping to reduce wildfire hazards in the HIZ. See **Mitigate the Home Ignition Zone Section.**	LFPD, community associations	Second
Maintain and improve culverts, drainage features, and roadways	Proactive measures to improve infrastructure can reduce the potential for severe road damage in the future. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	CDOT and Larimer County Road & Bridge	Second
Continue to expand and fund LCSO's WPP	Help residents better understand wildfire risks and pursue coordinated action in the district. See **Fire Protection District Capacity Section.**	WPP coordinator, LCSO Emergency Services, LFPD, community associations	Second
Enhance mutual aid and increase capacity for evacuation-related needs	Potential methods include cross-training, mutual aid agreements, updated annual operating plans, and availability of Larimer County Road and Bridge dozers/graders for fire response on red flag days. See **Fire Protection District Capacity Section.**	LFPD, LCSO Emergency Services, LCOEM, USFS, Larimer County Road & Bridge	Second
Offer additional training opportunities and funding for firefighters to take NWCG courses and complete task books	Include other training opportunities, such as DFPC's certified burner program, COCO's Community Wildfire Mitigation Best Practices Training, and NFPA's Wildfire Mitigation Specialist certification. See **Fire Protection District Capacity Section.**	LFPD	Second
Equip LFPD vehicles with Starlink	Provide connectivity across emergency personnel and vehicles. See **Fire Protection District Capacity Section.**	LFPD	Second
Identify and secure funding to gain more up-to-date equipment for LFPD	Acquire items from LFPD's list of needs. See **Fire Protection District Capacity Section.**	LFPD, LCOEM	Second

Recommendation	Goals	Responsibility	Priority
Conserve, restore, and steward healthy intact stream-side vegetation	Reduce soil erosion, moderate floods, and potentially slow down the spread of wildfire due to elevated fuel moisture in healthy riparian corridors. See **Preparing for Post-Fire Impacts and Long-Term Recovery Section.**	LCDNR, USFS, CPRW, and landowners	Second
Track locations where flooding and sedimentation occur	Use information in planning, prioritizing, and implementation efforts to restore streams and riparian ecosystems and reduce the potential for future post-fire flooding and debris flows. See **Preparing for Post-Fire Impacts and Long-Term Recovery Section.**	LFPD, LCDNR, Larimer County Road & Bridge, CPRW, water providers	Second
Re-evaluate and begin additional second priority projects from this CWPP	See **Priority Project Areas Section.**	Varies by project	Second
Apply for grants for multi-homeowner projects	Apply for grants that support fuels mitigation for multi-homeowner projects. See **Recommendations for Residents Section.**	Community associations, residents	Third
Encourage residents to acquire backup generators and create plans for public safety power shutoffs	Increase preparedness. See **Recommendations for Residents Section.**	LFPD, community associations	Third
Connecting residents to existing programs and resources for AFN and social vulnerability	Examples include resources that provide technical guidance, financial assistance, or labor support for defensible space and home hardening. See **Social Vulnerability/Access and Functional Needs Section.**	LFPD, LCSO Emergency Services, LCOEM, community associations	Third
Maintain and improve road surfaces for evacuation safety and emergency vehicle access	Continually maintain and improve road surfaces for evacuation safety and emergency vehicle access. Improve roadway access by widening roads, creating pullovers, and creating turnarounds for two-way traffic and fire engine navigability. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	CDOT, Larimer County Road & Bridge, LCSO Emergency Services	Third
Explore burning options	Explore options for bio-burning, air-curtain burning, and box burning. Work with DFPC to utilize the agency's large air-curtain burner. See **Slash Management Section.**	LCSO Emergency Services, LFPD, DFPC, community associations	Third
Make SOGs procedural	Standardize and encourage compliance. See **Fire Protection District Capacity Section.**	LFPD	Third
Volunteer with LFPD	Sign up to become a volunteer today! See **Fire Protection District Capacity Section.**	Residents	Third
Educate the public on multi-faceted impacts of fire and long-term recovery	Identify social and economic impacts of fire and educate the public on how communities, individual residents, businesses, and FPD services may be affected. See **Preparing for Post-Fire Impacts and Long-Term Recovery Section.**	LCOEM, CPRW, and water providers	Third

Recommendation	Goals	Responsibility	Priority
Undertake low-tech LTPBR to improve stream health	Building artificial beaver dams, building rock erosion control structures (also known as Zeedyk structures), and encouraging beaver activity in strategic locations can decrease the velocity of downstream flows and trap sediment. See **Preparing for Post-Fire Impacts and Long-Term Recovery Section.**	LCD, CPRW, landowners	Third
Re-evaluate and begin additional third priority projects from this CWPP	See **Priority Project Areas Section.**	Varies by project	Third
Mid-term Implementation Phase			
Develop programs to support socially vulnerable populations	Increase awareness and access to resources. See **Outreach and Education Section**	LFPD and LCSO Emergency Services	First
Explore the use of bio-burning, air curtain burners, and other potential removal methods to dispose of slash	Support the potential use of air curtain burners by ensuring access to qualified personnel and contractors and providing regular trainings to promote safe and effective operations. See **Slash Management Section.**	LFPD, DFPC	First
Begin remaining first priority projects from this CWPP	See **Priority Project Areas Section.**	Varies by project	First
Plan and execute evacuation drills across the district	Promote evacuation safety and awareness by encouraging residents to participate in evacuation drills and practice exercises. See **Evacuation Planning and Accessibility of Emergency Personnel Section.**	LFPD, LCSO Emergency Services, LCOEM, community associations	Second
Begin remaining second priority projects from this CWPP	See **Priority Project Areas Section.**	Varies by project	Second
Coordinate volunteer-based mitigation assistance for AFN and social vulnerability	Examples include neighborhood work days, community fuel-reduction events, or partnerships with service organizations that help individuals unable to complete mitigation work individually. See **Social Vulnerability/Access and Functional Needs Section.**	LFPD, community associations, local service organizations	Third
Begin remaining third priority projects from this CWPP	See **Priority Project Areas Section.**	Varies by project	Third

5.c. CWPP as a Living Document

A CWPP is both a planning document and a guide for action. LFPD and the CWPP Implementation Committee should review this plan annually to track progress, evaluate priorities, and identify emerging needs. Completed projects, outreach efforts, partnerships, and other accomplishments should be documented and celebrated. Between formal updates, partners should maintain records of completed work, collect spatial data where available, take photographs, and document lessons learned to inform future planning efforts.

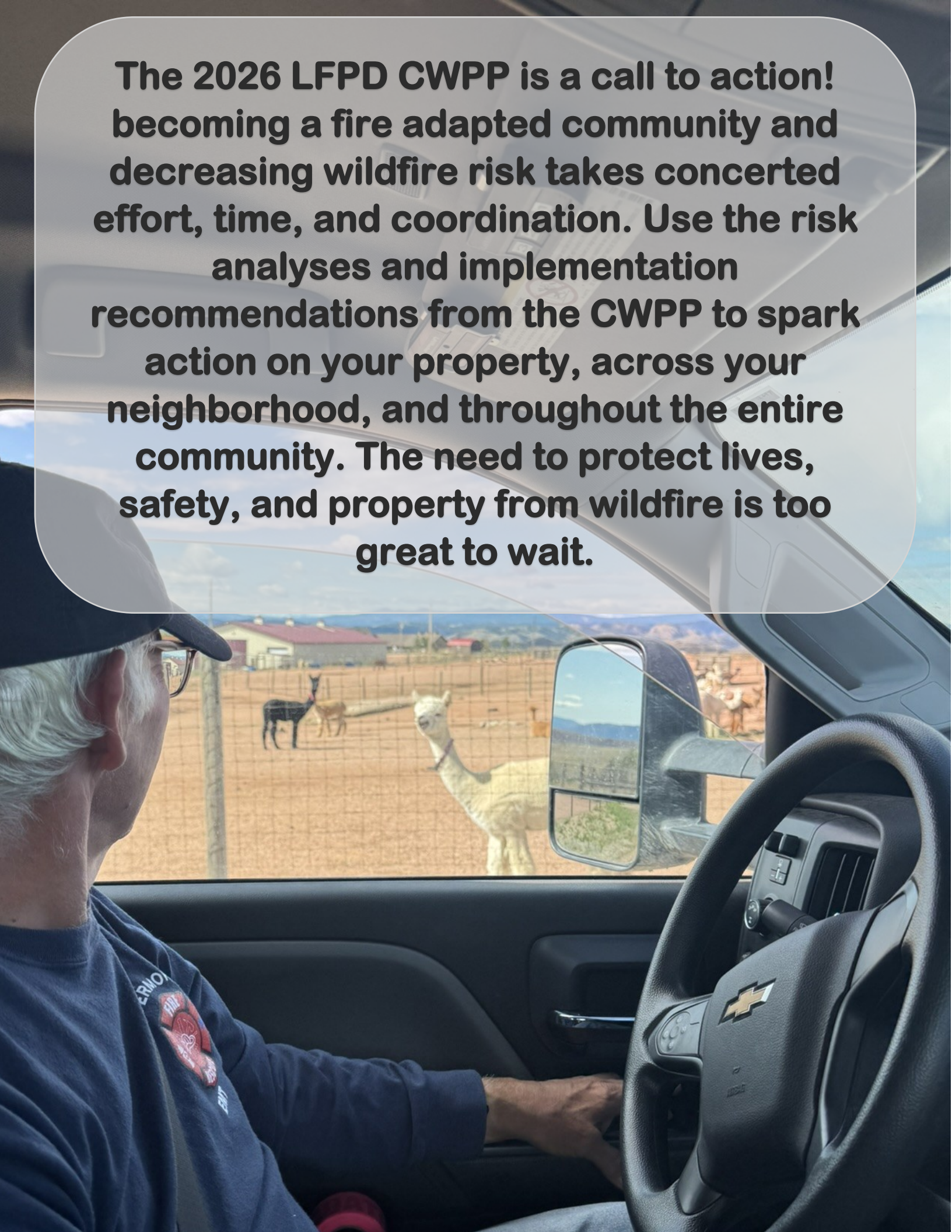
The CSFS recommends updating CWPPs at least every five years. CWPPs that are more than ten years old may no longer reflect current conditions and can reduce a community's competitiveness for certain funding opportunities.

Updates may be prepared as an addendum to this document or as a comprehensive revision. At a minimum, updates should include:

- A summary of progress made since the previous CWPP.
- Changes in community demographics, development patterns, infrastructure, and land use.
- Identification of new or emerging wildfire risks.
- Updated risk analyses, as appropriate.
- Revised and prioritized recommendations, projects, and implementation strategies.
- Updated maps and supporting data.

CSFS recommends the following update process:

- Review the existing CWPP and implementation progress.
- Re-engage partners and stakeholders with an interest in wildfire resilience.
- Conduct collaborative meetings to evaluate priorities and community needs.
- Document completed projects and significant changes to the community and landscape.
- Reassess wildfire risk and update mitigation priorities.
- Update maps, data, and supporting analyses.
- Distribute draft updates to partners for review and input.
- Finalize the updated CWPP, obtain required signatures, and submit it to the CSFS State Office.



The 2026 LFPD CWPP is a call to action! becoming a fire adapted community and decreasing wildfire risk takes concerted effort, time, and coordination. Use the risk analyses and implementation recommendations from the CWPP to spark action on your property, across your neighborhood, and throughout the entire community. The need to protect lives, safety, and property from wildfire is too great to wait.

6. Glossary

20-foot wind speed: The rate of sustained wind over a 10-minute period at 20 feet above the dominant vegetation. The wind adjustment factor to convert surface winds to 20-foot wind speeds depends on the type and density of surface fuels slowing down windspeeds closer to the ground (NWCG, 2021).

Active crown fire: Fire in which a solid flame develops in the crowns of trees and advances from tree crown to tree crown independently of surface fire spread (NWCG, 2018b).

ArcCASPER: An intelligent capacity-aware evacuation routing algorithm used in the geospatial information system mapping program ArcMap to model evacuation times and congestion based on roadway capacity, road speed, number of cars evacuating per address, and the relationship between roadways congestion and reduction in travel speed (Shahabi & Wilson, 2014).

Basal area: Cross sectional area of a tree measured at breast height (4.5 feet above the ground). Used as a method of measuring the density of a forest stand in units such as ft^2/acre (USFS, 2021a).

Broadcast prescribed burning (aka, prescribed burn, controlled burn): A wildland fire originating from a planned ignition in accordance with applicable laws, policies, and regulations to meet specific objectives (NWCG, 2018b).

Canopy cover: The ground area covered by the crowns of all trees in an area as delimited by the vertical projection of their outermost crown perimeters (NWCG, 2019).

Canopy fuels: The stratum of fuels containing the crowns of the tallest vegetation (living or dead), usually above 20 feet (NWCG, 2018b).

Canopy: The more or less continuous cover of branches and foliage formed collectively by adjacent tree crowns (USFS, 2021a).

Canyon: A long, deep, very steep-sided topographic feature primarily cut into bedrock and often with a perennial stream at the bottom (NRCS, 2017).

Chain: Chains are commonly used in forestry and fire management as a measure of distance. 1 chain is equivalent to 66 feet. Chains were used for measurements in the initial public land survey of the U.S. in the mid-1800s.

Chute: A steep V-shaped drainage that is not as deep as a canyon but is steeper than a draw. Normal upslope air flow is funneled through a chute and increases in speed, causing upslope preheating from convective heat, thereby exacerbating fire behavior (NWCG, 2008).

Community Wildfire Protection Plan (CWPP): A plan developed in the collaborative framework established by the Wildland Fire Leadership Council and agreed to by state, Tribal, and local governments, local fire departments, other partners, and federal land management agencies in the vicinity of the planning area. CWPPs identify and prioritize areas for hazardous fuel reduction treatments, recommend the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure, and recommend measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, and structure protection (NWCG, 2018b).

Convection: A type of heat transfer that occurs when a fluid, such as air or a liquid, is heated and travels away from the source, carrying heat along with it. Air around and above a wildfire expands as it is heated, causing it to become less dense and rise into a hot convection column. Cooler air flows in to replace the rising gases, and in some cases, this inflow of air creates local winds that further fan the flames. Hot convective gases move up slope and dry out fuels ahead of the flaming front, lowering their ignition temperature and increasing their susceptibility to ignition and fire spread. Homes located at the top of a slope can become preheated by convective heat transfer. Convection columns from wildfires carry sparks and embers aloft.

Crown (aka, tree crown): Upper part of a tree, including the branches and foliage (USFS, 2021a).

Defensible space: The area around a building where vegetation, debris, and other types of combustible fuels have been treated, cleared, or reduced to slow the spread of fire and reduce exposure to radiant heat and direct flame. It is encouraged that residents develop defensible space so that during a wildfire their home can stand alone without relying upon limited firefighter resources due to the great reduction in hazards they have undertaken. The Colorado State Forest Service defines three zones of defensible space: zone 1 (HIZ1) as 0 to 5 feet from the home, zone 2 (HIZ2) as 5 to 30 feet from the home, and zone 3 (HIZ3) as 30 to about 100 feet from the home (CSFS, 2021).

Direct attack: Any treatment applied directly to burning fuel such as wetting, smothering, or chemically quenching the fire or by physically separating the burning from unburned fuel (NWCG, 2018b).

Draws: Topographic features created by a small, natural watercourse cutting into unconsolidated materials. Draws generally have a broader floor and more gently sloping sides than a ravine or gulch (NRCS, 2017).

Ecological restoration: The process of assisting the recovery of an ecosystem that has been damaged, degraded, or destroyed (SER, 2004). In ponderosa pine and dry mixed-conifer forests of the Colorado Front Range, ecological restoration involves transforming dense forests into a mosaic of single trees, clumps of trees, and meadows similar to historic forests that were maintained by wildfires and very resilient to them (Addington et al., 2018).

Ember: Small, hot, and carbonaceous particles. The term "firebrand" is also used to connote a small, hot, and carbonaceous particle that is airborne and carried for some distance in an airstream (Johnston, 2018).

Ember cast: The process of embers/firebrands/flaming sparks being transported downwind beyond the main fire and starting new spot fires and/or igniting structures. Short-range ember cast is when embers are carried by surface winds and long-range ember cast is when embers are carried high into the convection column and fall out downwind beyond the main fire. The number of embers reaching an area decreases exponentially with distance traveled, and the likelihood of structure ignition increases with the number of embers landing on receptive fuels (Caton et al., 2016). The distance used to differentiate short-range and long-range ember cast varies among sources. NWCG (2018b) classifies short-range ember cast as embers that travel less than 0.25 miles and long-range ember cast as embers that travel more than 0.25 miles, whereas Beverly et al., (2010) use a threshold of 0.06 miles. We use the Beverly et al., (2010) definition in this CWPP.

Fire adapted community (FAC): A human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire (NWCG, 2018b). There is not a checklist or one silver bullet to become a FAC; there are many strategic actions and tools that should be used together to reduce shared risk. Risk mitigation is the responsibility of everyone who lives and works in the community—residents, community groups, fire protection districts, agency partners, non-governmental organizations, etc. Fire adaptation is an ongoing process of collaborative action to identify risk, mitigate it, and maintain the work overtime.

Fire behavior: The manner in which a fire reacts to the influences of fuel, weather, and topography. Characteristics of fire behavior include rate of spread, fire intensity, fire severity, and fire behavior category (NWCG, 2018b).

Fire history: A general term referring to the historic fire occurrence in a specific geographic area (NWCG, 2018b).

Fire intensity (aka, fireline intensity): (1) The product of the available heat of combustion per unit of ground and the rate of spread of the fire, interpreted as the heat released per unit of time for each unit length of fire edge, or (2) the rate of heat release per unit time per unit length of fire front (NWCG, 2018b).

Fire regime: Description of the patterns of fire occurrences, frequency, size, and severity in a specific geographic area or ecosystem. A fire regime is a generalization based on fire histories at individual sites. Fire regimes can often be described as cycles because some parts of the histories usually get repeated, and the repetitions can be counted and measured, such as fire return interval (NWCG, 2018b).

Fire severity. Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time (NWCG, 2018b). Fire severity is determined by visually inspecting or measuring the effects that wildfire has on soil, plants, fuel, and watersheds. Fire severity is often classified as low-severity (less than 20% of

overstory trees killed) and high severity (more than 70% of overstory trees kills). Moderate-severity or intermediate fire severity falls between these two extremes (Agee, 1996). Specific cutoffs for fire severity classifications differ among researchers. For example, Sheriff et al. (2014) define high-severity fires as those killing more than 80% of overstory trees.

Fire weather conditions: Weather conditions that influence fire ignition, behavior, and suppression, for example, wind speed, wind direction, temperature, relative humidity, and fuel moisture (NWCG, 2018b).

Firebreak: A natural or constructed barrier where all vegetation and organic matter have been removed down to bare mineral soil. Firebreaks are used to stop or slow wildfires or to provide a control line from which to work (Bennett et al., 2010; NWCG, 2018b).

Fireline: (1) The part of a containment or control line that is scraped or dug to mineral soil, or (2) the area within or adjacent to the perimeter of an uncontrolled wildfire of any size in which action is being taken to control fire (NWCG, 2018b).

Flame length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface). Flame length is measured on an angle when the flames are tilted due to effects of wind and slope. Flame length is an indicator of fire intensity (NWCG, 2018b).

FlamMap: A fire analysis desktop application that can simulate potential fire behavior and spread under constant environmental conditions (weather and fuel moisture) (Finney, 2006). FlamMap is one of the most common models used by land managers to assist with fuel treatment prioritization, and it is often used by fire behavior analysts during wildfire incidents.

Fuel model: A stylized set of fuel bed characteristics used as input for a variety of wildfire modeling applications to predict fire behavior (Scott & Burgan, 2005).

Fuel reduction: Manipulation, combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage from wildfires and resistance to control (NWCG, 2018b).

Fuelbreak: A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled. Fuelbreaks differ from firebreaks due to the continued presence of vegetation and organic soil. Trees in shaded fuelbreaks are thinned and pruned to reduce the fire potential but enough trees are retained to make a less favorable microclimate for surface fires (NWCG, 2018b).

Fuels mitigation/management: The act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire, in support of land management objectives (NWCG, 2018b).

Fuels: Any combustible material, most notably vegetation in the context of wildfires, but also including petroleum-based products, homes, and other man-made materials that might combust during a wildfire in the wildland-urban interface. Wildland fuels are described as 1-, 10-, 100-, and 1000-hour fuels. One-hour fuels are dead vegetation less than 0.25 inch in diameter (e.g., dead grass), ten-hour fuels are dead vegetation 0.25 inch to 1 inch in diameter (e.g., leaf litter and pine needles), one hundred-hour fuels are dead vegetation 1 inch to 3 inches in diameter (e.g., fine branches), and one thousand-hour fuels are dead vegetation 3 inches to 8 inches in diameter (e.g., large branches). Fuels with larger diameters have a smaller surface area to volume ratio and take more time to dry out or become wetter as relative humidity in the air changes (NWCG, 2018b).

Handcrews: A number of individuals that have been organized and trained and are supervised principally for operational assignments on an incident (NWCG, 2018b).

Handline: Fireline constructed with hand tools (NWCG, 2018b).

Hazards: Any real or potential condition that can cause injury, illness, or death of personnel, or damage to, or loss of equipment or property (NWCG, 2018b).

Home hardening: Steps taken to improve the chance of a home and other structures withstanding ignition by radiant and convective heat and direct contact with flames or embers. Home hardening involves reducing structure ignitability by changing building materials, installation techniques, and structural characteristics of a

home (California Fire Safe Council, 2020). A home can never be made fireproof, but home hardening practices in conjunction with creating defensible space increases the chance that a home will stand strong during a wildfire.

Home ignition zone (HIZ): The characteristics of a home and its immediate surroundings within 100 feet of structures. Conditions in the HIZ principally determine home ignition potential from radiant heat, convective heat, and ember cast (NWCG, 2018b).

Ignition-resistant building materials: Materials that resist ignition or sustained flaming combustion. Materials designated ignition-resistant have passed a standard test that evaluates flame spread on the material (Quarles, 2019; Quarles & Pohl, 2018).

Incident Response Pocket Guide (IRPG): Document that establishes standards for wildland fire incident response. The guide provides critical information on operational engagement, risk management, all hazard response, and aviation management. It provides a collection of best practices that have evolved over time within the wildland fire service (NWCG, 2018a).

Indirect attack A method of suppression in which the control line is located some considerable distance away from the fire's active edge. Generally done in the case of a fast-spreading or high-intensity fire and to utilize natural or constructed firebreaks or fuelbreaks and favorable breaks in the topography. The intervening fuel is usually backfired; but occasionally the main fire is allowed to burn to the line, depending on conditions (NWCG, 2018b).

Insurance Services Office (ISO) rating: ISO ratings are provided to fire departments and insurance companies to reflect how prepared a community is for fires in terms of local fire department capacity, water supply, and other factors (see more information online at https://www.isomitigation.com/ppc/fsrs/).

Ladder fuels: Fuels that provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees with relative ease. Ladder fuels help initiate torching and crowning and assure the continuation of crowning. Ladder fuels can include small trees, brush, and lower limbs of large trees (NWCG, 2018b).

LANDFIRE: A national program spearheaded by the U.S. Department of the Interior and the U.S. Department of Agriculture to provide spatial products characterizing vegetation, fuels, fire regimes, and disturbances across the entire United States. LANDFIRE products serve as standardized inputs for fire behavior modeling. More information about the program is available online at https://www.landfire.gov/.

Lop-and-scatter: Cutting (lopping) branches, tops, and unwanted boles into shorter lengths and spreading that debris evenly over the ground such that resultant logging debris will lie close to the ground (NWCG, 2018b).

Mastication: A slash management technique that involves using a machine to grind, chop, or shred vegetation into small pieces that then become surface fuel (T. Jain et al., 2018).

Mitigation actions: Actions that are implemented to reduce or eliminate (mitigate) risks to persons, property, or natural resources. These actions can be undertaken before and during a wildfire. Actions before a fire include fuel treatments, vegetation modification in the home ignition zone, and structural changes to increase the chance a structure will stand strong during a wildfire (aka, home hardening). Mitigation actions during a wildfire include mechanical and physical tasks, specific fire applications, and limited suppression actions, such as constructing firelines and creating "black lines" through the use of controlled burnouts to limit fire spread and behavior (NWCG, 2018b).

Mosaic landscape: A heterogeneous area composed of different communities or a cluster of different ecosystems that are similar in function and origin in the landscape. It consists of 'patches' arranged in a 'matrix', where the patches are the different ecosystems and the matrix is how they are arranged over the land (Hansson et al., 1995).

National Wildfire Coordinating Group (NWCG): An operational group established in 1976 through a Memorandum of Understanding between the U.S. Department of Agriculture and Department of the Interior to coordinate programs of the participating agencies to avoid wasteful duplication and to provide a means of constructively working together. NWCG provides a formalized system and agreed upon standards of training, equipment, aircraft, suppression priorities, and other operational areas. More information about NWCG is available online at https://www.nwcg.gov/.

Noncombustible building materials: Material of which no part will ignite or burn when subjected to fire or heat, even after exposure to moisture or the effects of age. Materials designated noncombustible have passed a standard test (Quarles, 2019; Quarles & Pohl, 2018).

Non-survivable road: Portions of roads adjacent to areas with predicted flame lengths greater than 8 feet under severe fire weather conditions. Potentially non-survivable flame lengths start at 8 feet according to the Haul Chart, which is a standard tool used by firefighters to relate flame lengths to tactical decisions (NWCG, 2019). Drivers stopped or trapped on these roadways would have a lower chance of surviving radiant heat from fires of this intensity. Non-survivable conditions are more common along roads that are lined with thick forests, particularly with trees that have limbs all the way to the ground and/or abundant saplings and seedlings.

Overstory: Layer of foliage in a forest canopy, particularly tall mature trees that rise above the shorter immature understory trees (USFS, 2021a).

Passive crown fire: Fire that arises when surface fire ignites the crowns of trees or groups of trees (aka, torching). Torching trees reinforce the rate of spread, but passive crown fires travel along with surface fires (NWCG, 2018b).

Pile burning: Piling slash resulting from logging or fuel management activities into manageable piles that are subsequently burned during safe and approved burning conditions (NWCG, 2018b).

Potential operational delineations (PODs): PODs are topographic areas bounded by features suitable for fire control (e.g., ridgetops and roads) that can be used for proactive wildfire decision making and tactical operations during wildfire events. PODs can serve as management units for proactive ecological resilience and wildfire risk mitigation, as well as for cross-boundary and collaborative land and fire management planning (M. P. Thompson et al., 2022).

Radiation: A method of heat transfer by short-wavelength energy through air (aka, infrared radiation). Surfaces that absorb radiant heat warm up and radiate additional short-wavelength energy themselves. Radiant heat is what you feel when sitting in front of a fireplace. Radiant heat preheats and dries fuels adjacent to the fire, which initiates combustion by lowering the fuel's ignition temperature. The amount of radiant heat received by fuels increases as the fire front approaches. Radiant heat is a major concern for the safety of wildland firefighters and can ignite homes without direct flame contact.

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. Rate of spread is usually expressed in chains or acres per hour for a specific period in the fire's history (NWCG, 2018b).

Ravine: Topographic feature created by streams cutting into unconsolidated materials. They are narrow, steep-sided, and commonly V-shaped. Ravines are steeper than draws (NRCS, 2017).

Resilience: The two main definitions of resilience are (1) the ability of an ecosystem to recover to its original state after a disturbance (aka, "engineering resilience") and (2) the ability of an ecosystem to absorb disturbance before fundamentally changing its structure and/or function (aka, "ecological resilience") (Dakos & Kéfi, 2022).

Risk: (1) The chance of fires starting as determined by the presence and activity of causative agents (e.g., lightning), (2) a chance of suffering harm or loss, or (3) a causative agent (NWCG, 2018b).

Roadside fuel treatment: A natural or manmade change in fuel characteristics along a roadway which affects fire behavior so that fires burning into them can be more readily controlled, survivable conditions with shorter flame lengths are more likely during a wildfire, and firefighter access is enhanced (NWCG, 2018b).

Saddle: A low point on a ridge or interfluve, generally a divide or pass between the heads of streams flowing in opposite directions. The presence of a saddle funnels airflow and increases windspeed, thereby exacerbating fire behavior (NRCS, 2017).

Safety zones: An area cleared of flammable materials used by firefighters for escape in the event the line is outflanked or spot fires outside the control line render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand, allowing the fuels inside the control line to be consumed before going

ahead. Safety zones may also be constructed as integral parts of fuelbreaks; they are greatly enlarged areas which can be used with relative safety by firefighters without the use of a fire shelter (NWCG, 2018b).

Shaded fuelbreak: Fuel treatments in timbered areas where the trees on the break are thinned and pruned to reduce fire potential yet enough trees are retained to make a less favorable microclimate for surface fires (NWCG, 2018b).

Slash: Debris resulting from natural events such as wind, fire, or snow breakage or from human activities such as road construction, logging, pruning, thinning, or brush cutting. Slash includes logs, bark, branches, stumps, treetops, and broken understory trees or brush (NWCG, 2018b).

Smoldering combustion: The combined processes of dehydration, pyrolysis, solid oxidation, and scattered flaming combustion and glowing combustion, which occur after the flaming combustion phase of a fire; often characterized by large amounts of smoke consisting mainly of tars (NWCG, 2018b).

Spot fire: Fire ignited outside the perimeter of the main fire by an ember (NWCG, 2018b). Spot fires are particularly concerning because they can form a new flaming front, move in unanticipated directions, trap firefighters between two fires, and require additional firefighting resources to control.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire (NWCG, 2018b).

Stand: An area of forest that possesses sufficient uniformity in species composition, age, size, structural configuration, and spatial arrangement to be distinguishable from adjacent areas (USFS, 2021a).

Structure protection: The protection of homes or other structures from an active wildland fire (NWCG, 2018b).

Structure triage: The process of inspecting and classifying structures according to their defensibility or non-defensibility, based on fire behavior, location, construction, and adjacent fuels. Structure triage involves a rapid assessment of a dwelling and its immediate surroundings to determine its potential to escape damage by an approaching wildland fire. Triage factors include the fuels and vegetation in the yard and adjacent to the structure, roof environment, decking and siding materials, prevailing winds, topography, etc. (NWCG, 2018b). There are four categories used during structure triage: (1) defensible – prep and hold, (2) defensible – stand alone, (3) non-defensible – prep and leave, and (4) non-defensible – rescue drive-by. The most important feature differentiating defensible and non-defensible structures is the presence of an adequate safety zone for firefighters (NWCG 2018a). Firefighters conduct structure triage and identify defensible homes during wildfire incidents. Categorization of homes is not pre-determined; triage decisions depend on fire behavior and wind speed due to their influence on the size of safety zones needed to keep firefighters safer.

Suppression: The work and activity used to extinguish or limit wildland fire spread (NWCG, 2018b).

Surface fire: Fire that burns fuels on the ground, which include dead branches, leaves, and low vegetation (NWCG, 2018b).

Surface fuels: Fuels lying on or near the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low stature living plants (NWCG, 2018b).

Task book: A document listing the performance requirements (competencies and behaviors) for a position in a format that allows for the evaluation of individual (trainee) performance to determine if an individual is qualified in the position. Successful performance of tasks, as observed and recorded by a qualified evaluator, will result in a recommendation to the trainee's home unit that the individual be certified in the position (NWCG, 2018b).

Torching: The burning of the foliage of a single tree or a small group of trees from the bottom up. Torching is the type of fire behavior that occurs during passive crown fires and can initiate active crown fires if tree canopies are close to each other (NWCG, 2018b).

Values at risk: Aspects 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 include diverse characteristics such as homes, specific structures, water supply, power grids, natural and cultural resources, community infrastructure, and other economic, environmental, and social values (NWCG, 2018b).

Watershed (aka, drainage basin or catchment): An area of land where all precipitation falling in that area drains to the same location in a creek, stream, or river. Smaller watersheds come together to create basins that drain into bays and oceans (NOAA, 2021).

Wildfire-resistant building materials: A general term used to describe a material and design feature that can reduce the vulnerability of a building to ignition from wind-blown embers or other wildfire exposures (Quarles, 2019; Quarles & Pohl, 2018).

Wildland-urban interface (WUI): Any area where the built environment meets wildfire-prone areas—places where wildland fire can move between natural vegetation and the built environment and result in negative impacts on the community (Mowry & Johnston, 2018). For the purpose of this CWPP, the WUI was delineated using potential operational delineations (PODs) to capture not just populated areas but also portions of the landscape where fires could originate and spread into the community. Mount Evans Wilderness was excluded from the WUI because very little vegetation management will occur in a Wilderness Area, and there are POD boundaries between the Wilderness Area and the district that could be used to slow or suppression wildfire spread towards the community (**Figure 2.c.2**).

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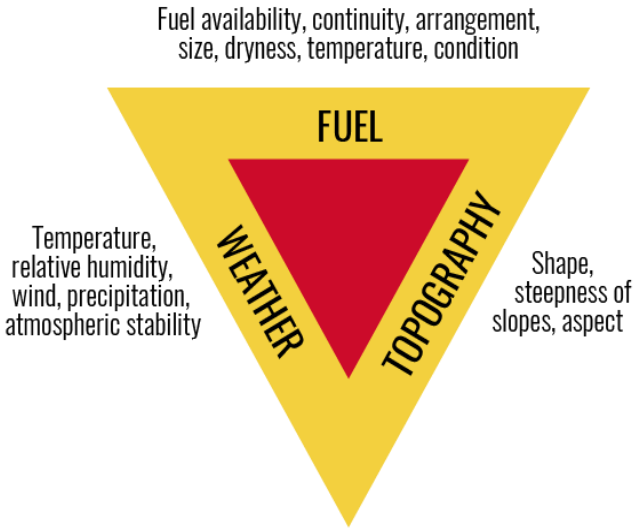
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Appendix A. Introduction to Wildfire Behavior and Terminology

Fire Behavior Triangle

Complex interactions among wildland fuels, weather, and topography determine how wildfires behave and spread. These three factors make up the sides of the fire behavior triangle, and they are the variables that wildland firefighters pay attention to when assessing potential wildfire behavior during an incident (NWCG, 2019).



Interactions between fuels, weather, and topography dictate fire behavior. Source: California State University.

Fuels

Fuels include live vegetation such as trees, shrubs, and grasses, and dead vegetation like pine needles, cured grass, and materials such as houses, sheds, fences, trash piles, and combustible chemicals.

Grasses and pine needles are known as "flashy" fuels because they easily combust and burn the fastest of all fuel types. If you think of a campfire, flashy fuels are the kindling that you use to start the fire. Flashy fuels dry out faster than other fuel types when relative humidity drops or when exposed to radiant and convective heat[6]. Fires in grassy fuel types can spread quickly across large areas, and fire behavior can change rapidly with changes in weather conditions.

Dead branches on the surface dry out slower than flashy fuels, release more radiant heat when they burn, and take longer to completely combust. The rate of spread is fast to moderate through shrublands depending on their moisture content, and long flame lengths can preclude direct attack by firefighters. Shrubs and small trees can also act as ladder fuels that carry fire from the ground up into the tree canopy.

Dead trees (aka, snags) and large downed logs are called "heavy fuels," and they take the longest to dry out when relative humidity drops and when exposed to radiant and convective heat. Heavy fuels release tremendous radiant heat when they burn, and they take longer to completely combust, just like a log on a campfire. Fire spread through a forest is slower than in a grassland or shrubland, but forest fires release more heat and can be extremely difficult and unsafe for firefighters to suppress. An abundance of dead trees killed by drought, insects, or disease can exacerbate fire behavior, particularly when dead trees still have dry, red needles (Moriarty et al., 2019; Parsons et al., 2014).

Topography

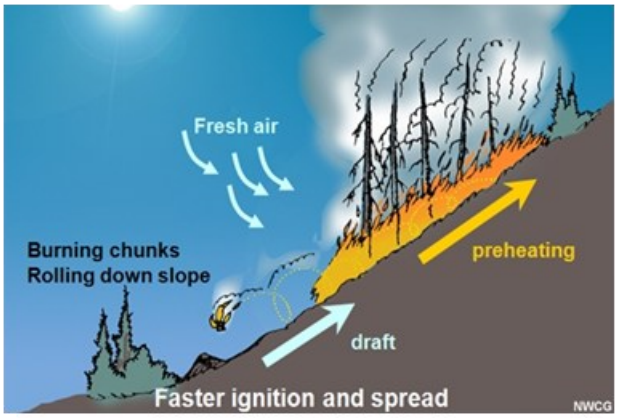
Topography (slope and aspect) influences fire intensity, speed, and spread. In the northern hemisphere, north-facing slopes experience less sun exposure during the day, resulting in higher fuel moistures. Tree density is often

[6] Radiant heat transfer occurs by short-wavelength energy traveling through air. Radiant heat is what you feel when sitting in front of a fire. Radiant heat preheats and dries fuels adjacent to a wildfire, which initiates combustion by lowering the fuel's ignition temperature. Convective heat transfer occurs when air is heated, travels away from the source, and carries heat along with it. Convective heat is what you would feel if you put your hand in the air above an open flame. Air around and above a wildfire expands as it is heated, causing it to become less dense and rise into a hot convection column. Cooler air flows in to replace the rising gases, and in some cases, this inflow of air creates local winds that further fan the flames. Hot convective gases move up slope and dry out fuels ahead of the flaming front, lowering their ignition temperature and increasing their susceptibility to ignition and fire spread.

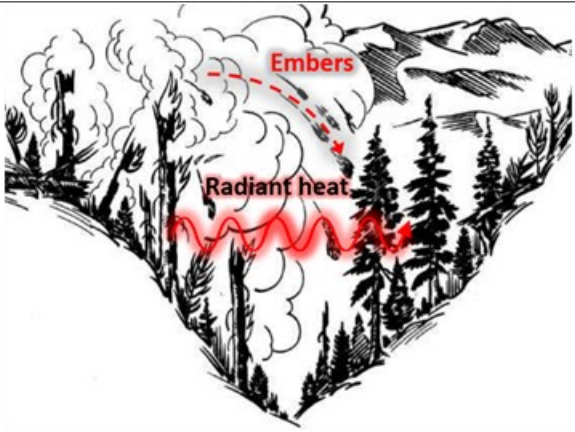
higher on north-facing slopes due to higher soil moisture. South-facing slopes experience more sun exposure and higher temperatures and are often covered in grasses and shrubs. The hotter and drier conditions on south-facing slopes mean fuels are drier and more susceptible to combustion, and the prevalence of flashy fuels results in fast rates of fire spread.

Fires burn more quickly up steep slopes due to radiant and convective heating. Fuels are brought into closer proximity with the progressing fire, causing them to dry out, preheat, and become more receptive to ignition, thereby increasing rates of spread. Steep slopes also increase the risk of burning material rolling and igniting unburnt fuels below.

Narrow canyons can experience increased combustion because radiant heat from a fire burning on one side of the canyon can heat fuel on the other side of the canyon. Embers can easily travel from one side of a canyon to the other. Topography also influences wind behavior and can make fire spread unpredictable. Wildfires burning through steep and rugged topography are harder to control due to reduced access for firefighters and more unpredictable and extreme fire behavior.



Slope increases fire spread through radiant and convective heating (source: NWCG).



Fires can easily cross narrow canyons (source: U.S. Forest Service).

Weather

Weather conditions impacting fire behavior include temperature, relative humidity, precipitation, wind speed, and wind direction. The National Weather Service uses a system called a red flag warning to indicate local weather conditions that can combine to produce increased risk of fire behavior and danger. Red flag warning days indicate an increased risk of extreme fire behavior due to a combination of hot temperatures, very low humidity, dry fuels, strong winds, and the presence of thunderstorms.

RED FLAG CRITERIA

Red flag days are warnings issued by the National Weather Service (NWS) to indicate that warm temperatures, very low humidity, and stronger winds are expected to result in elevated fire danger in the next 24-48 hours.

The NWS Denver/Boulder Forecast Office has two options for red flag criteria:

Option 1	Option 2
Relative humidity <= 15% Wind gusts >= 25 mph Dry fuels	Widely scattered dry thunderstorms Dry fuels

Direct sunlight and hot temperatures impact how ready fuels are to ignite. Warm air preheats fuels and brings them closer to their ignition point. When relative humidity is low, the dry air can absorb moisture from fuels, especially flashy fuels, making them more susceptible to ignition. Long periods of dry weather can dehydrate heavier fuels, including downed logs, increasing the risk of wildfires in areas with heavy fuel loads.

Wind influences fire behavior by drying out fuels, increasing the amount of oxygen feeding the fuel, preheating vegetation through convective heat, and carrying embers more than a mile ahead of an active fire. Complex

topography, such as chutes, saddles, and draws, can funnel winds in unpredictable directions, increasing wind speeds and resulting in erratic fire behavior.

Categories of Fire Behavior

Weather, topography, and fuels influence fire behavior, and fire behavior in turn influences the tactical options available for wildland firefighters and the risks posed to lives and property. Three general categories of fire behavior are described throughout this CWPP: surface fire, passive crown fire, and active crown fire.

- **Surface fire –** Fire that burns fuels on the ground, which include dead branches, leaves, and low vegetation. Surface fires can be addressed with direct attack using handcrews when flame lengths are less than four feet and with equipment when flame lengths are less than eight feet. Surface fires can emit significant radiant heat, which can ignite nearby vegetation and homes.
- **Passive crown fire –** Fire that arises when a surface fire ignites the crowns of trees or groups of trees (aka, torching). Torching trees reinforce the rate of spread, but passive crown fires travel along with surface fires. Firefighters can sometimes address passive crown fires with an indirect attack, such as dropping water or retardant out of aircraft or digging fireline at a safe distance from the flaming front. The likelihood of passive crown fire increases when trees have low limbs and when smaller trees and shrubs grow below tall trees and act as ladder fuels. Radiant heat and ember production from passive crown fires can threaten homes during wildfires.
- **Active crown fire –** Fire in which a solid flame develops in the crowns of trees and advances from tree crown to tree crown independently of surface fire spread. Crown fires are very difficult to contain, even with the use of aircraft dropping fire retardant, due to long flame lengths and the tremendous release of radiant energy. The likelihood of active crown fires increases when trees have interlocking canopies. Radiant heat and ember production from active crown fires can threaten homes during wildfires.

Passive and active crown fires can result in short- and long-range ember production that can create spot fires and ignite homes. Spot fires are particularly concerning because they can form a new flaming front, move in unanticipated directions, trap firefighters between two fires, and require additional firefighting resources to control. Crown fires are generally undesirable in the wildland-urban interface (WUI) because of the risk to life and property; however, passive and active crown fires are part of the natural fire regime for some forest types and result in habitat for plant and animal species that require recently disturbed conditions (Keane et al., 2008; Pausas & Parr, 2018). Historically, passive and active crown fires occurred in some lodgepole pine forests and higher-elevation ponderosa pine and mixed-conifer forests on north-facing slopes (Addington et al., 2018; Romme, 1982).



Wildfire Threats to Homes

Wildfires can ignite homes through several pathways: radiant heat, convective heat, and direct contact with flames or embers. The ability for radiant heat to ignite a home is based on the properties of the structure (i.e., wood, metal, or brick siding), the temperature of the flame, the ambient air temperature, and the distance from the flame (Caton et al., 2016). Ignition from convective heat is more likely for homes built along steep slopes and in ravines and draws. For flames to ignite a structure, they must directly contact the building long enough to cause ignition. Flames from a stack of firewood near a home could cause ignition to the home, but flames that quickly burn through grassy fuels are less likely to ignite the home (although the potential still exists). Fires can also travel between structures along fuel pathways such as a fence or row of shrubs connecting a shed and a home (Maranghides et al., 2022). Some housing materials can burn hotter than the surrounding vegetation, thereby exacerbating wildfire intensity and initiating home-to-home ignition (Mell et al., 2010).



Homes built mid-slope and at the top of steep slopes and within ravines and draws are at greater risk of convective heat from wildfires. A wildfire could rapidly spread up this steep slope and threaten the home above. Photo credit: TEA

Homes can be destroyed during wildfires even if surrounding vegetation has not burned. During many wildland fires, 50 to 90% of homes ignite due to embers rather than radiant heat or direct flame (Gropp, 2019; Johnston, 2018). Embers can ignite structures when they land on roofs, enter homes through exposed eaves, or get under wooden decks. Embers can also ignite nearby vegetation and other combustible fuels, which can subsequently ignite a home via radiant heat, or direct flame contact. Burning homes can release embers that land on and ignite nearby structures, causing destructive home-to-home ignitions, as evidenced by the destructive 2021 Marshall Fire in Boulder County. Structural characteristics of a home can increase its exposure to embers and risk of combustion, such as wood shingle roofs and unenclosed eaves and vents (Hakes et al., 2017; Syphard & Keeley, 2019). Embers can also penetrate homes if windows are destroyed by radiant or convective heat.

Resources for More Information on Fire Behavior

- Introduction to Fire Behavior from the National Wildfire Coordinating Group (9:57 minute video)
- The Fire Triangle from the National Wildfire Coordinating Group (7:26 minute video)
- Understanding Fire Behavior in the Wildland/Urban Interface from the National Fire Protection Association
- Understanding Fire from California State University
- S-190 Introduction to Wildland Fire Behavior Course Materials from the NWCG (PowerPoints, handouts, and videos)

Appendix B. Community Risk Assessment and Modeling Methodology

Fire Behavior Analysis

We leveraged three existing, high-quality wildfire risk analyses for the LFPD CWPP: (1) the 2022 Colorado Wildfire Risk Assessment (2022 CO-WRA) (CSFS & Technosylva 2023a, 2023b), (2) the 2022 Wildfire Risk for All Lands in Colorado (COAL) analyses led by Pyrologix, LLC for the U.S. Forest Service Rocky Mountain Region (Napoli, Gilbertson-Day, Brough, et al., 2022; Napoli, Gilbertson-Day, Vogler, et al., 2022; Vogler et al., 2022), and (3) the 2022 Northern Colorado Fireshed Quantitative Wildfire Risk Assessment (2022 NCFC QWRA) (Rhea et al., 2022). More details on these analyses are provided below.

Fire behavior models utilized for the 2022 CO-WRA, COAL, and NCFC QWRA require information on topography, surface fuel loads, canopy fuel loads, and fire weather conditions. Fuel models are a stylized set of fuel bed characteristics used to characterize surface fuel loads areas the area of interest. **Figure B.1** depicts the fire behavior fuel models present across LFPD according to data from the 2022 CO-WRA.

The LFPD CWPP relies primarily on fire behavior predictions from the 2022 CO-WRA, but we also utilized predictions of flame length predictions from the 2022 COAL and expected net value change from the 2022 NCFC QWRA. Predictions of flame length under extreme weather were less extreme in grassland ecosystems according to the 2022 COAL compared to the 2022 CO-WRA because of the fire weather inputs used. Flame length predictions from the 2022 COAL were more useful for quantifying roadside hazards than the 2022 CO-WRA for reasons described below in the section on **Roadway Survivability**.

Important Considerations about Fire Behavior Predictions

Fire behavior models can provide reasonable estimates of relative wildfire behavior across a landscape. However, wildfire behavior is complex, and models are a simplification of reality. Models also struggle to capture impacts of structures on wildfire spread and home-to-home ignitions. It is recommended to use these fire behavior analyses at a landscape scale to assess relative risk across the entire LFPD, not at the parcel-level.

Exceptional hot, dry, and windy conditions are increasingly common due to climate change and could result in even more extreme fire behavior across LFPD than predicted by the 2022 Colorado Wildfire Risk Assessment.

We utilized expected net value change from the 2022 NCFC QWRA because it incorporated expert opinion from local fire and fuel specialists with the Arapaho-Roosevelt National Forest and NFCF stakeholders whereas the 2022 COAL was developed for the entire state of Colorado and had less local involvement. The 2022 CO-WRA analysis does not account for potential benefits of wildfire for ecological conditions and other highly valued resources and assets. The 2022 NCFC QWRA provides a more holistic view of potential consequences of wildfire on the landscape.

2022 CO-WRA: The 2022 CO-WRA is the most recent and advanced version of the wildfire risk assessment available through the Colorado Forest Atlas. The Colorado State Forest Service (CSFS) and Technosylva made improvements in methodology for the 2022 update, notably greater ground-truthing of input data, novel approaches for predicting wildfire spread into suburban and urban areas, and a higher spatial resolution (20-meter resolution versus 30-meter that was used before).

The 2022 CO-WRA includes predictions of flame length, rate of spread, crown fire activity, fire intensity scale, burn probability, and spotting distance from Technosylva's Wildfire Analyst software, which is like the fire behavior model FlamMap. FlamMap is a fire analysis desktop application that simulates potential fire behavior and spread under constant weather and fuel moisture (Finney, 2006). FlamMap is one of the most common models used by land managers to assist with fuel treatment prioritization, and it is often used by fire behavior

analysts during wildfire incidents. Details on the 2022 CO-WRA are provided by (CSFS & Technosylva 2023a, 2023b).

Technosylva developed four weather scenarios (low, moderate, high, and extreme), with temperature, relative humidity, and wind speed and direction for each 10-m by 10-m pixels across Colorado based on 1970-2022 data from gridMET. Technosylva used these data to predict surface fuel moistures. Predictions of fire type from the 2022 CO-WRA utilize extreme weather conditions. The 2022 CO-WRA provides characteristic flame lengths and characteristic rates of spread that are a weighted average of the four weather scenarios as well as predicted flame lengths and rates of spread under extreme conditions. The LFPD CWPP utilizes flame length and rate of spread predictions for extreme weather conditions to evaluate wildfire risk under the most dangerous fire weather conditions, which are becoming more common across Colorado because of climate change.

To predict burn probability, Technosylva simulated over 3 million wildfires over the state of Colorado, with a mean ignition density of 10 fires/km^2. Ignition locations were spatially distributed based on historical fire occurrences. They then determined how many of those fires intersected each 20 m x 20 m portion of the landscape.

2022 COAL: The 2022 COAL uses state-of-the art fire behavior modeling conducted with the large-fire simulator (FSim) (Finney et al., 2011) and WildEST (Scott, 2020), which deploys a command-line version of FlamMap (Finney, 2006). Pyrologix, LLC mapped fuel conditions across Colorado representative of the 2020 fire season. They organized a fuel calibration workshop in February 2020 with wildland fire professionals to review and improve fuel data available from the 2016 LANDFIRE Remap. They modified fuel characteristics in areas that had experienced recent wildfires and fuel treatments to approximate post-disturbance conditions.

Pyrologix, LLC developed custom fuel models for high elevation-subalpine vegetation, burnable agriculture, burnable urban areas, and burnable roadsides. They utilized timber litter fuel models for low- and moderate-density developed areas to allow fire to propagate through developed areas. See additional details on development of fuel data for the 2022 COAL in (Napoli, Gilbertson-Day, Brough, et al., 2022).

Pyrologix, LLC modeled fire behavior under 50,000-100,000 simulated fire seasons and 216 deterministic weather conditions for each of 10 fire occurrence areas (FOAs) across Colorado. Fire occurrence areas were delineated based on historic occurrence of large fires, ecoregions, and local fire staff input. The LFPD falls in FOA 803, for which historic weather conditions were based on the Cheesman Remote Automated Weather Station. For each day of the 100,000 simulated fire seasons, FSim selects plausible weather scenarios based on historic fire weather between 1979 and 2017. Ignition locations for the simulations are guided by the occurrence of historic ignitions between 1992 and 2018.

Fire behavior predictions from WildEST are weighted averages based on the weather type probability for the weather scenarios—a probability that integrates the relative area burned for that weather scenario and the relative frequency of the weather scenario occurring. Fire behavior conditions were summarized for simulations with an energy release component (ERC) in the 70-80th percentile of historic ERC values, 80-90th percentile, 90-97th percentile, and ≥97th percentile and wind speeds of 5, 10, and 15 miles/hour. For the LFPD's CWPP, we utilized fire behavior predictions for the 90-97th percentile ERC under 15 miles/hour wind speeds, which represent potential fire behavior under extreme fire weather conditions. See additional details on fire weather conditions and methodology for the 2022 COAL in (Vogler et al., 2022).

2022 NCFC QWRA: The 2022 NCFC QWRA is a similar analysis to the 2022 COAL, but it provides more locally specific weather inputs and information on highly valued resources and assets. The 2022 NCFC QWRA was conducted by the Colorado Forest Restoration Institute (CFRI) with input from fire and fuel specialists with the Arapaho-Roosevelt National Forest and NCFC stakeholders. The 2022 NCFC QWRA utilizes FlamMap for predictions of flame length and crow fire activity and FSim for burn probability. CFRI developed four weather scenarios (low, moderate, high, and extreme) based on 2000-2019 weather data from eight remote automated weather stations distributed across the analysis area (Red Feather, Redstone, Estes Park, Sugarloaf, Harbison Meadow, Dumont, Pickle Creek, and Corral Creek).

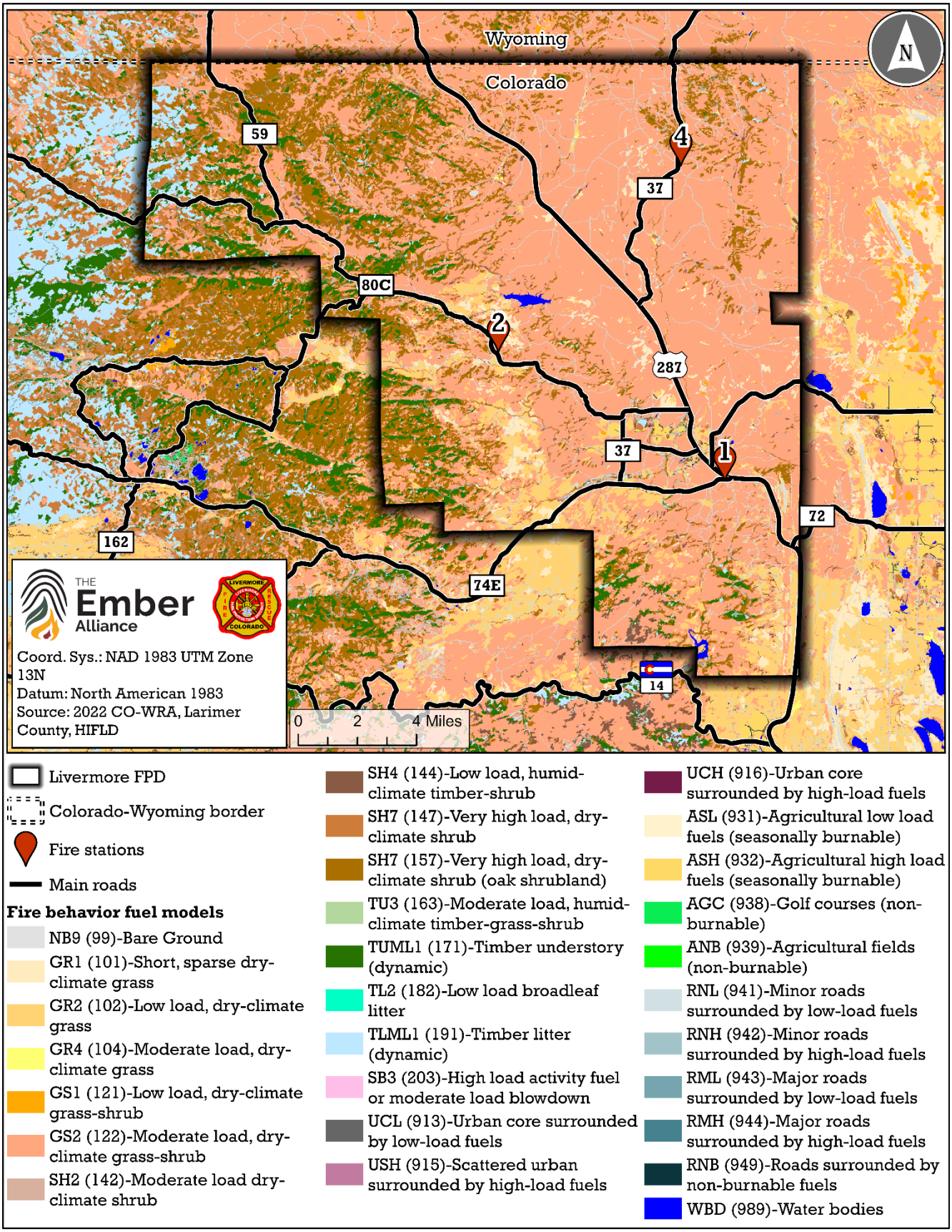


Figure B.1. *Fire behavior fuel models are an important input for modeling potential fire behavior. See (Scott & Burgan, 2005) for a description of each fuel model and (CSFS & Technosylva, 2023b) for methods used to map surface fuels for the 2022 CO-WRA.*

Model Interpretations and Limitations

Fire behavior models have been rigorously developed and tested based on over 40 years of experimental and observational research (Sullivan, 2009). Fire behavior models allow us to identify areas that could experience high-severity wildfires and pose a risk to lives, property, and other values at risk. **Fire behavior analyses are useful for assessing relative risk across the entire district and are not intended to assess specific fire behavior in the vicinity of individual homes.**

Wildfire behavior is complex, and models are a simplification of reality. It is not feasible to predict every combination of fire weather conditions, ignition locations, and suppression activities that might occur during a wildfire. Uncertainty regarding where a wildfire might ignite and how it will behave is inevitable until one occurs. Even then, fire behavior can be erratic and unpredictable.

Our maps of fire behavior predictions include areas indicated as "unburnable/not modeled"—parking lots, roadways, bodies of water, and barren areas are considered unburnable; areas dominated by homes and buildings were classified as "not modeled" because fire behavior models utilized for the 2022 CO-WRA, COAL, and NCFC QWRA do not adequately account for structures as a fuel type and cannot capture impacts of structures on wildfire spread and home-to-home ignitions. Data are not available on the building material used for every structure in an area or the vegetation in the HIZ, which are factors that significantly impact the vulnerability of a structure to ignition during wildfire.

In the absence of this data and a deeper quantitative understanding of interactions between structures and wildland vegetation during a wildfire, fire behavior cannot be modeled for areas dominated by homes in the same fashion as areas dominated by grassland, shrubland, or forest vegetation. To address structure exposure, TEA conducted a separate analysis to predict potential exposure of homes to radiant heat and ember cast, as described below in the section below on predicted radiant heat and ember cast exposure.

Predicted Fire Behavior

Wildland firefighters pay attention to current and expected fire behavior when making tactical decisions. The Haul Chart is a tool in the Incident Response Pocket Guide (IRPG) carried by all wildland firefighters that can help them interpret fire behavior based on observed flame length, rate of spread, and crown fire activity (**Table B.1**). We utilize cutoffs from the Haul Chart for classifying flame length, rate of spread, and producing a map of fire behavior class using outputs from the 2022 CO-WRA.

Flame Length

Flame length is the distance measured from the average flame tip to the middle of the flaming zone at the base of the fire. Flame length is measured at an angle when the flames are tilted due to effects of wind and slope (see image at right). Flame length is an indicator of fire intensity—the amount of energy released by a fire.



Predicted flame lengths under extreme conditions show similar overall patterns of higher flame lengths in areas of forest and shrubland, especially in the western part of LFPD for both the 2022 COAL (**Figure B.2**) and 2022 CO-WRA (**Figure B.3**). However, the overall magnitude of flame length predictions are higher in grasslands across the district according to the 2022 CO-WRA. The 2022 CO-WRA used wind speeds of about 30 mph because historical wind speeds in this area are some of the highest in the state of Colorado (CSFS & Technosylva, 2023a). The 2022 COAL used wind speeds of 15 mph across all of Colorado for their scenarios of extreme fire weather. The greater wind speeds used for the 2022 CO-WRA resulted in realistically extreme predictions of flame lengths and rates of spread in LFPD, but for our assessment of potential hazards along roadways, flame length predictions from the 2022 COAL were more useful

because they highlighted areas where there could be extreme flame lengths in forests rather than forests and grasslands. See more in the section on **Roadway Survivability** below.

Potential Fire Type

Figure B.4 shows the potential fire type that might occur across LFPD (see **Appendix A** for a description of different types of fire behavior). CO-WRA predictions of crown fire activity were made for extreme fire weather conditions. Torching (aka, passive crown fire) could occur over much of LFPD, and active crown fires are possible on steep slopes in densely forested areas in the northwestern portion of the district. Both passive and active crown fires pose a significant risk to the safety of firefighters and residents and can destroy homes through radiant and convective heating and ember production.

Rate of Spread

Rate of spread is the speed with which a fire moves in a horizontal direction across the landscape. The 2022 CO-WRA presents characteristic rate of spread, which is the weighted average speed with which a head-fire moves in a horizonal direction across the landscape under low, moderate, high, and extreme weather scenarios (**Figure B.5**). Rates of spread are faster on steep slopes, when wind speeds are greater and aligned with the direction of spread, and in fine, flashy fuels like continuous, dry grass. Although slopes are steep and forests dense in the northwestern part of LFPD, predicted rates of spread are low because under most fire weather conditions, fire moves slowly through timber litter in lodgepole pine forests.

Fire Behavior Class

The Ember Alliance combined estimates of flame length and potential fire type from the 2022 CO-WRA to produce a map of fire behavior class across the district (**Figure B.6**). Under hot, dry, and windy weather, 78% percent of the district could experience high to extreme fire behavior, including ember production that ignites additional fires away from the main fire and the movement of high-intensity fire from treetop to treetop. Such fires are extremely challenging if not impossible to control until winds die down and fuel moisture increases.

Relative Burn Probability

Relative burn probability indicates how likely an area is to burn during a wildfire compared to other areas. Areas with a greater potential for rapidly growing wildfires have higher relative burn probabilities because more fire perimeters are likely to overlap when fires are larger. Topography, non-burnable barriers such as wide rivers, interstates, and highways, and fuel loads also influence conditional burn probability by dictating how fire spreads across the landscape. Short-range transport of embers can cause spot fires to ignite even across unburnable barriers such as roads, and CO-WRA modelers account for the potential for spot fires when modeling fire spread to predict burn probability.

Most parts of LFPD have high burn probabilities relative to the rest of the state of Colorado (**Figure B.7**). Burn probabilities are lower in some of the dense lodgepole pine forests in the northwestern part of the district where fires could move slowly through timbe litter under most fire weather conditions. The pattern in burn probability mirrors historic fire behavior—grasslands tended to burn every couple of years whereas lodgepole pine forests burned every couple hundreds of years, but when lodgepole pine forests do burn under extreme conditions, the potential for extreme fire behavior is great.

Table B.1. *The Haul Chart and tactical interpretations. The Haul Chart is a tool used by firefighters for relating fire behavior to tactical decision-making (NWCG, 2019).*

Fire behavior class	Flame length (feet)	Rate of spread (chains/hr)*	Tactical interpretation
Very low, smoldering	<1	0-2	Fire is not spreading and has limited flames. Fire can be attacked at the head or flanks by persons using handtools. Handline will hold the fire.
Low, creeping, spreading	1-4	2-5	Fire can be attacked at the head or flanks by persons using handtools. Handline should hold the fire.
Moderate, running	4-8	5-20	Fires are too intense for direct attack at the head of the fire by persons using handtools. Handline cannot be relied on to hold the fire. Equipment such as dozers, engines, and retardant aircraft may be effective.
High, torching and spotting	8-11	20-50	Fires present serious control problems with torching, crowning, and spotting. Control efforts at the head of the fire are probably ineffective.
Very high, active crown fire	11-25	50-150	Crowning, spotting, and major fire runs are expected. Control efforts at the head of the fire are ineffective.
Extreme and erratic	>25	>150	Extreme intensity, turbulent fire, and chaotic spread. Escape to safety should be considered.

*__Note:__ 1 chain = 66 feet. Chains are commonly used in forestry and fire management as a measure of distance. 1 chain/hour = 1.1 feet/minute.

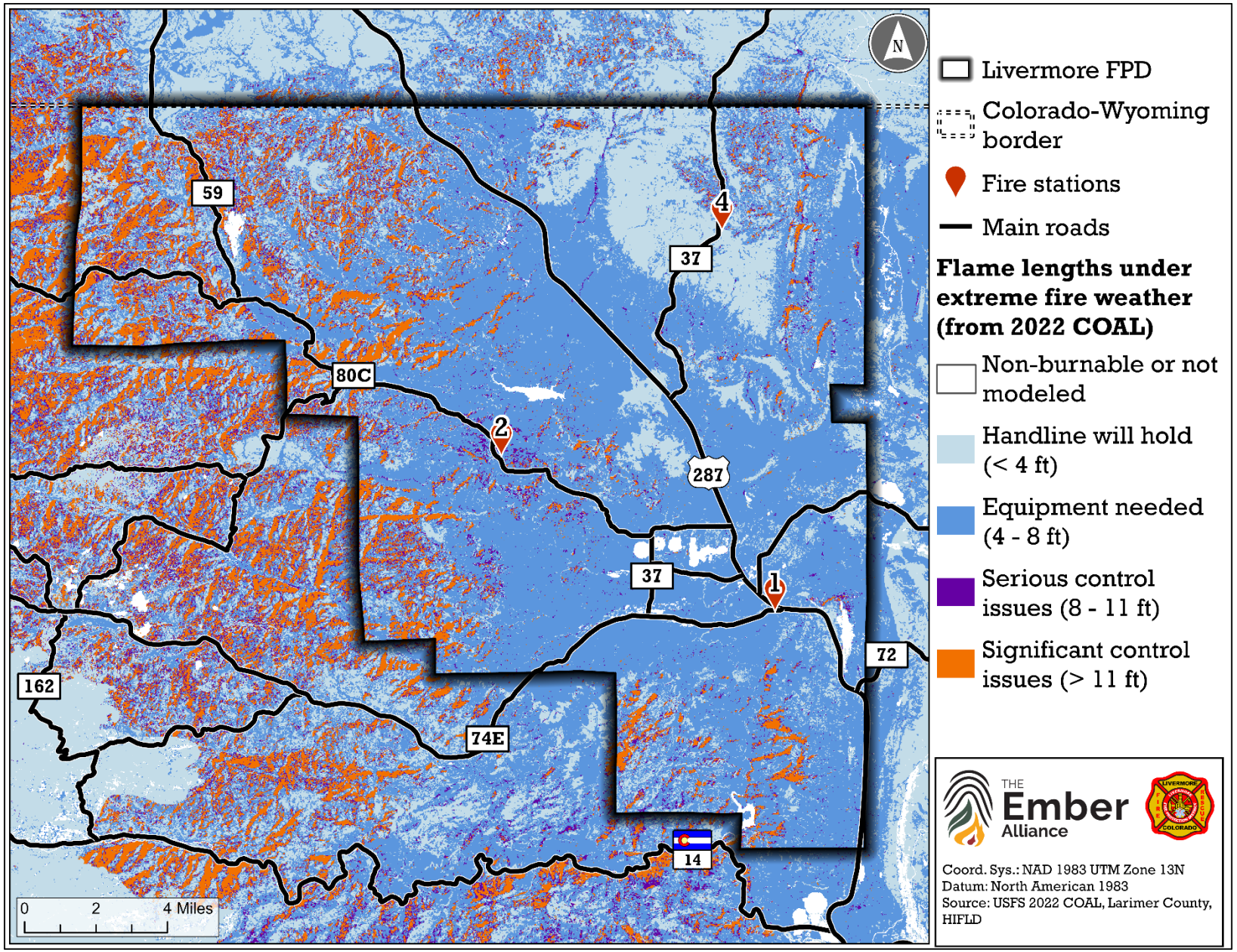


Figure B.2. *Flame lengths in the district under extreme fire weather conditions, categorized by the Haul Chart (**Table B.1**). Source: 2022 U.S. Forest Service COAL.*

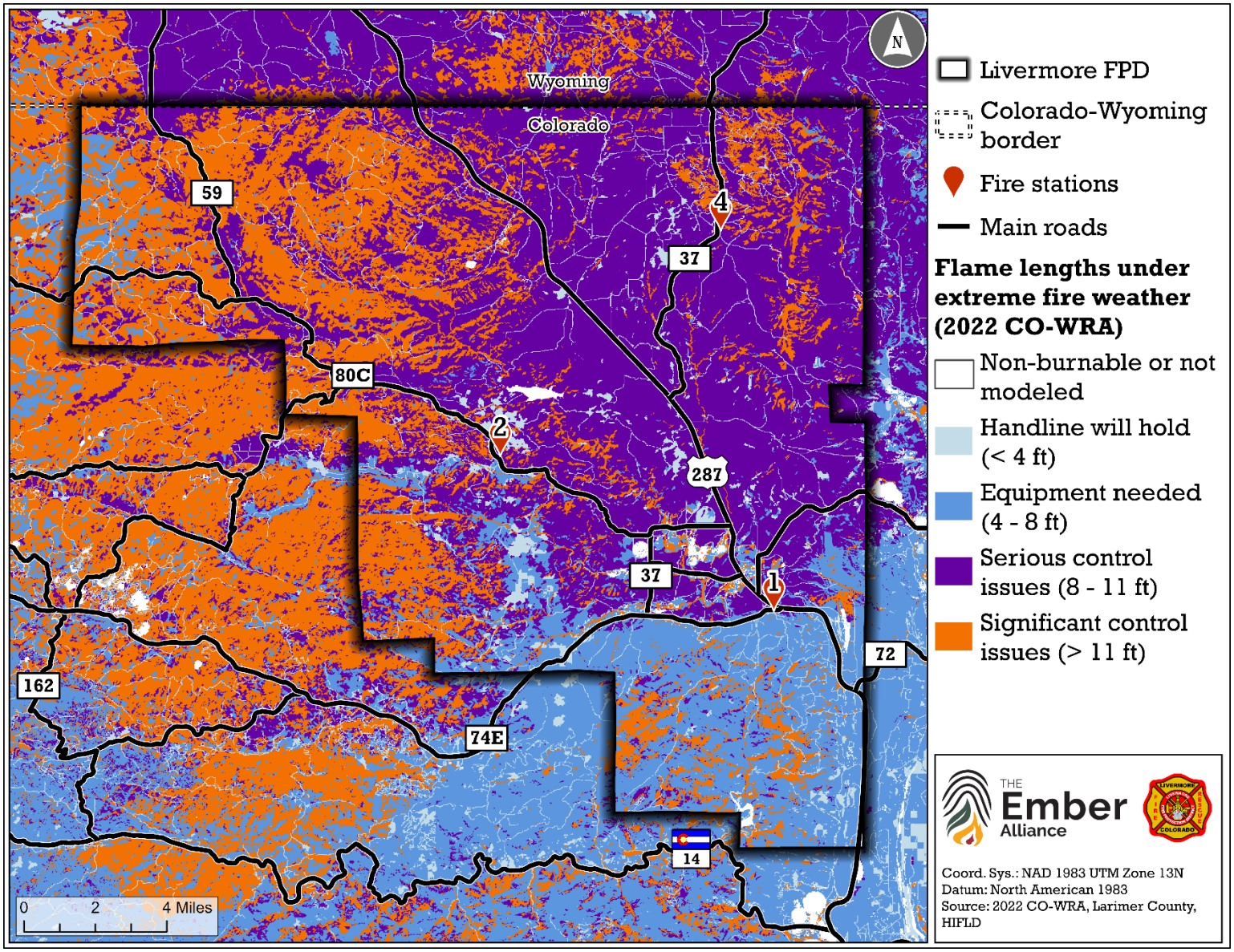


Figure B.3. *Flame lengths in the district under extreme fire weather conditions, categorized by the Haul Chart (**Table B.1**). Source: 2022 CO-WRA from CSFS.*

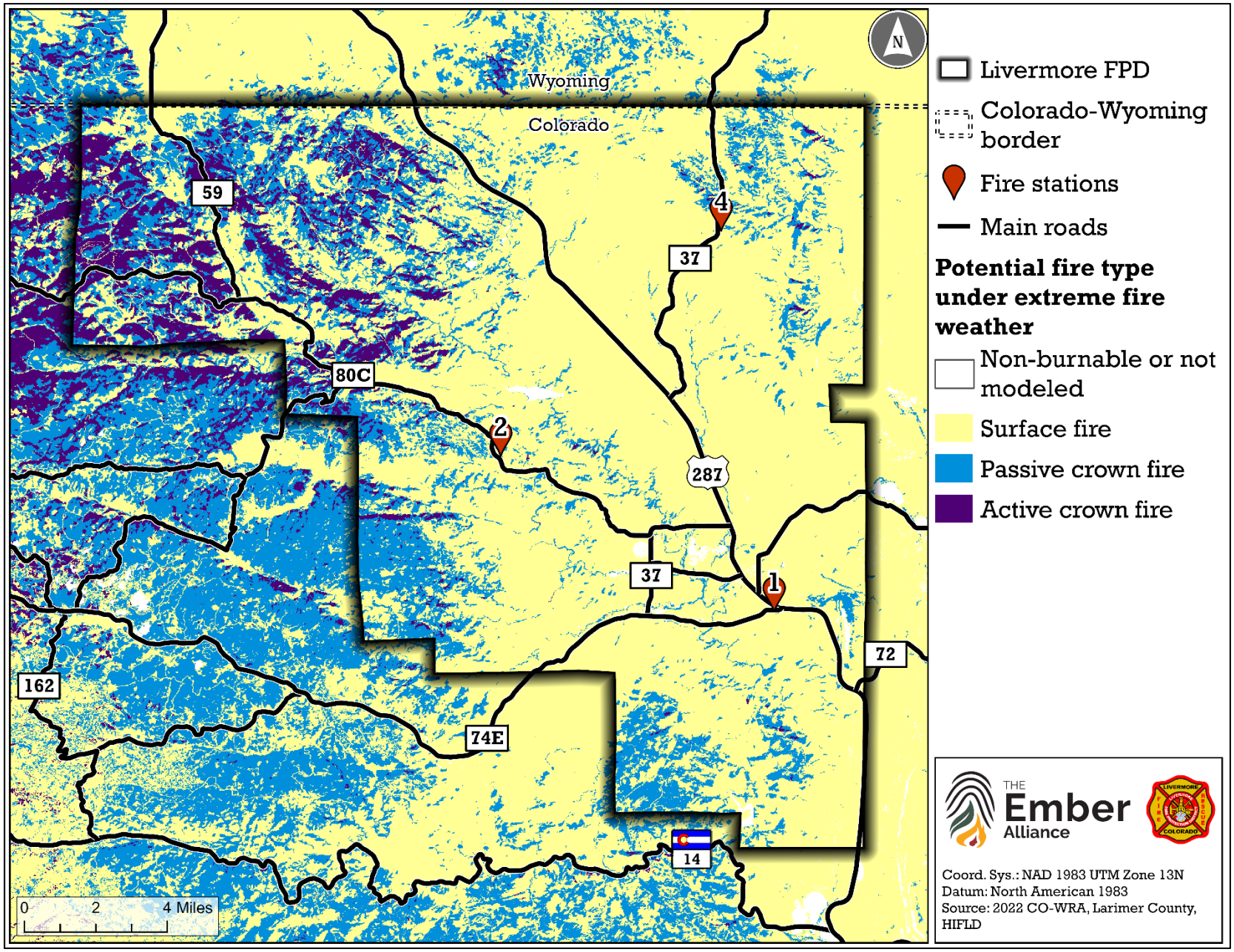


Figure B.4. *Potential fire type in the district under extreme fire weather conditions. Source: 2022 CO-WRA from CSFS.*

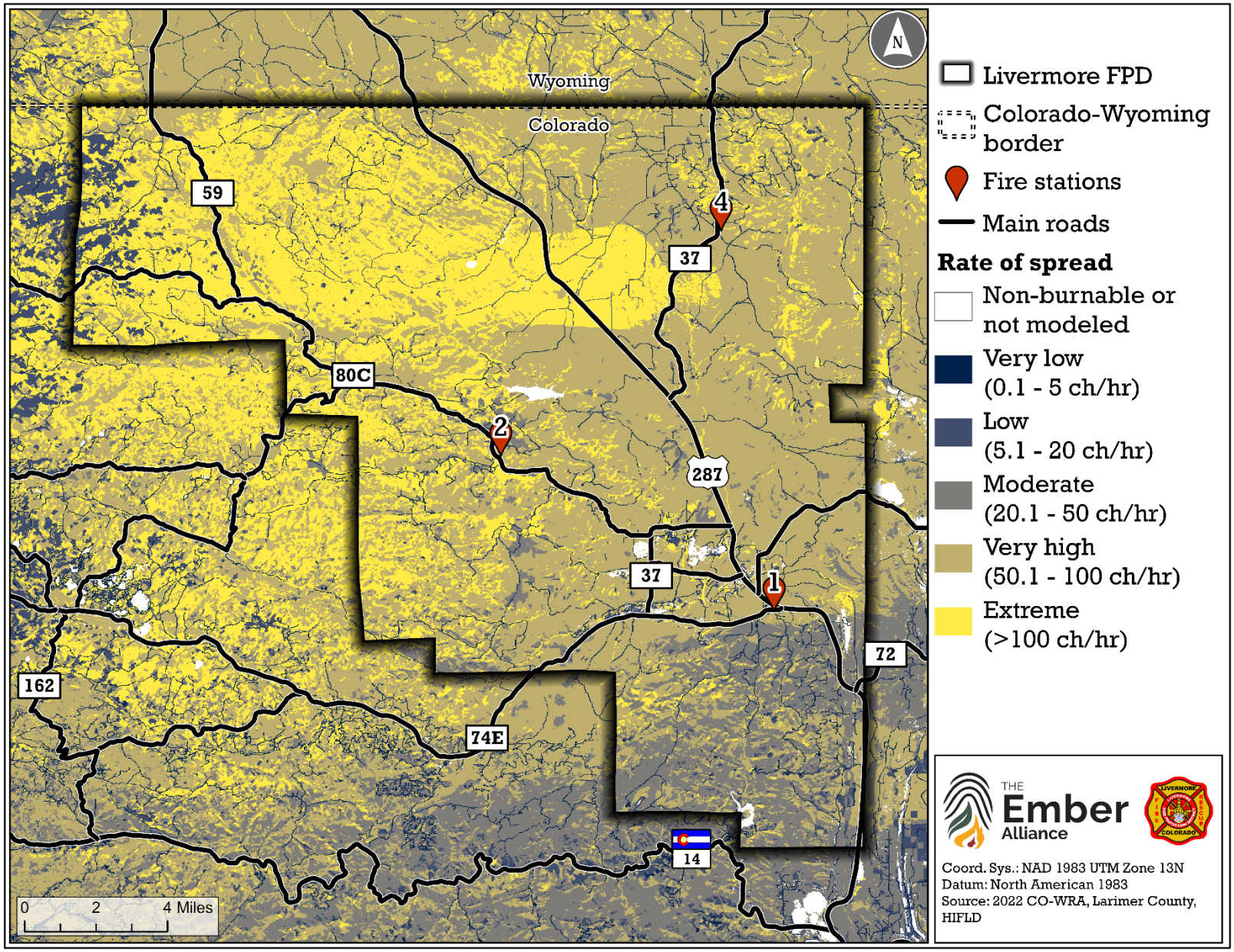


Figure B.5. *Rate of spread at the fire front (aka, head fire) in the district under various weather conditions. Chains are commonly used in forestry and fire management as a measure of distance. 1 chain = 66 feet. 1 chain/hour = 1.1 feet/minute. Source: 2022 CO-WRA from CSFS.*

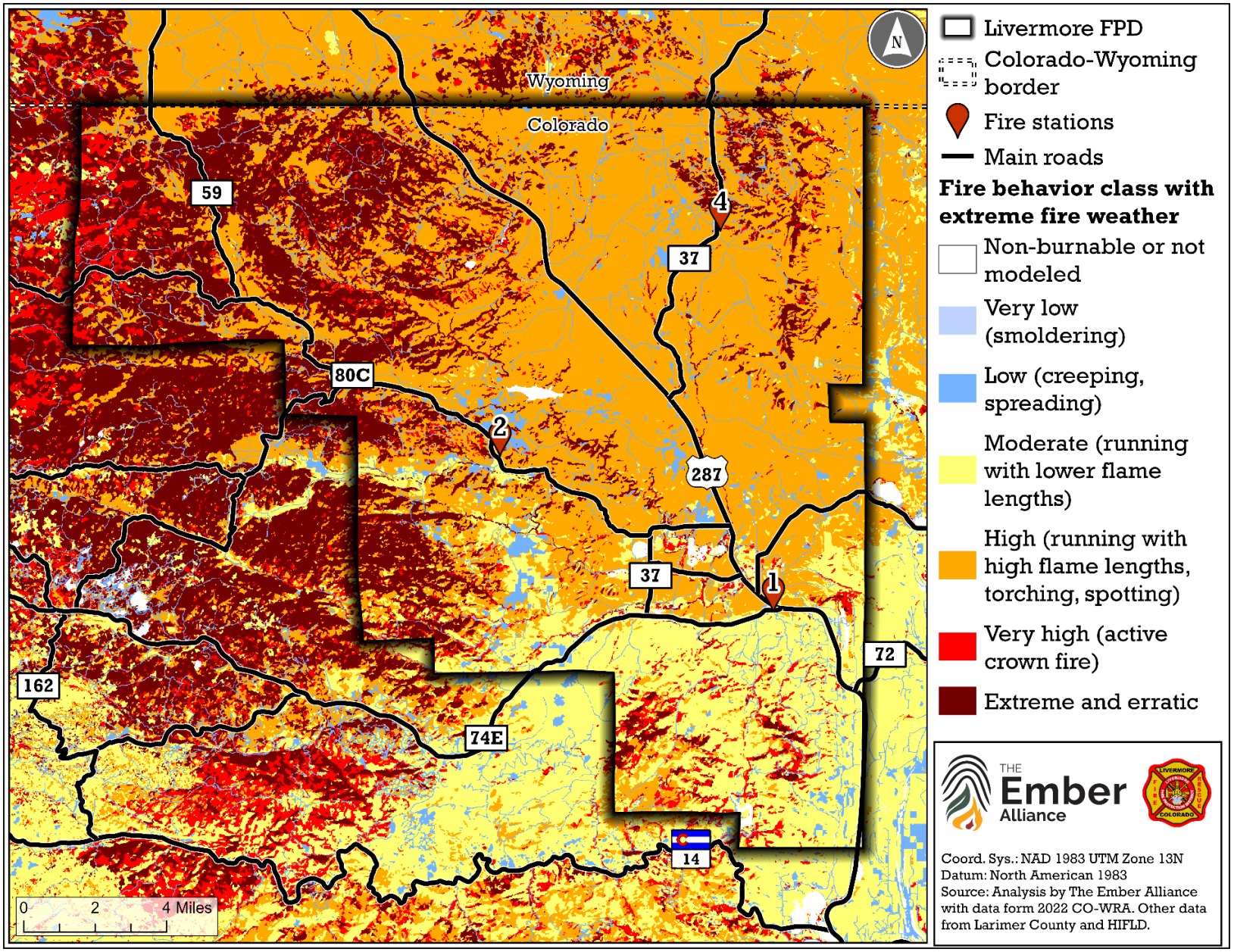


Figure B.6. *Under extreme fire weather conditions, 78% percent of the district could experience high to extreme fire behavior, which includes long flame lengths and active crown fires that are difficult for firefighters to suppress. Source: 2022 CO-WRA from CSFS.*

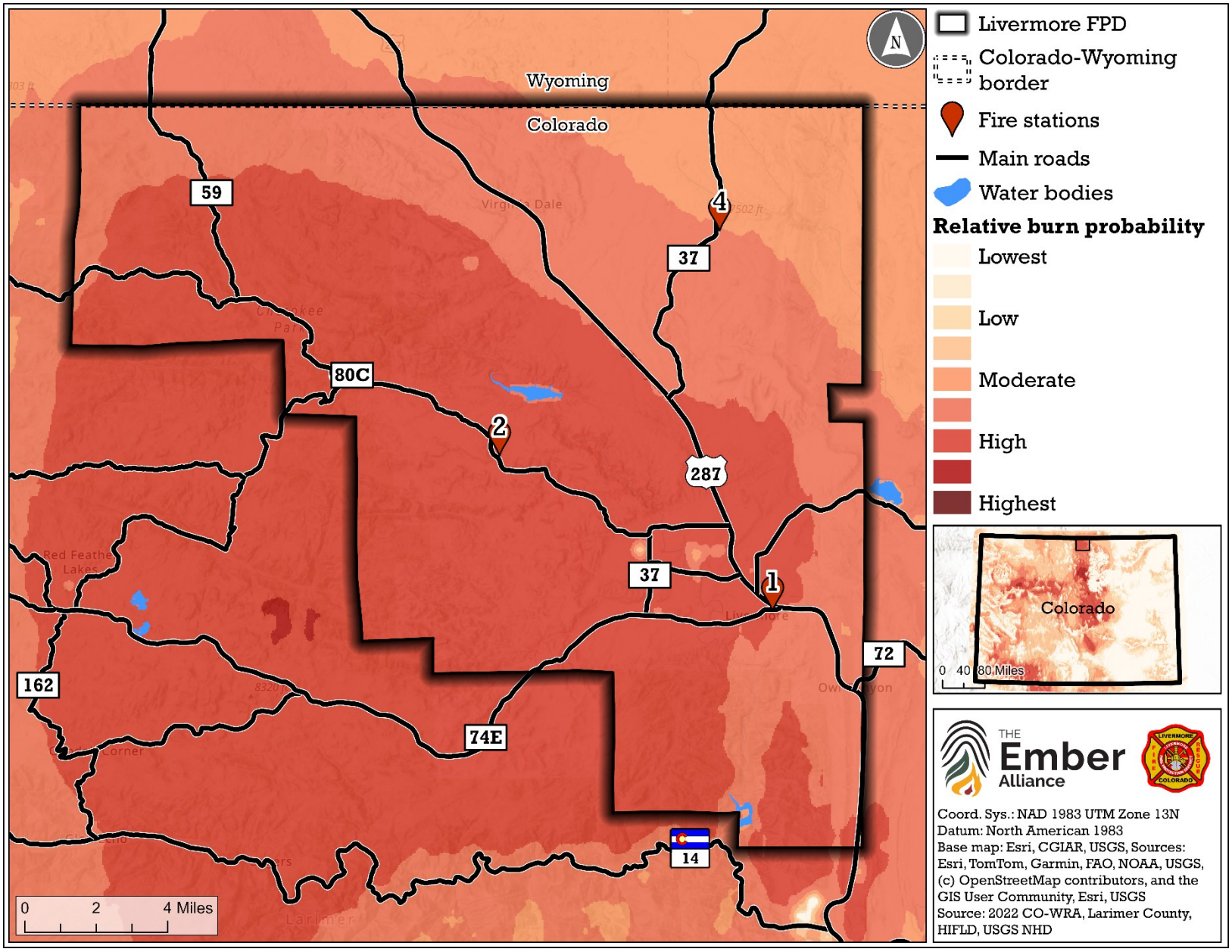


Figure B.7. *Most of LFPD falls into the high burn probability category relative to the state of Colorado. Source: 2022 CO-WRA from CSFS.*

Expected Net Value Change

Expected net value change (eNVC) from the 2022 NCFC QWRA provides a quantitative assessment of wildfire risk to highly valued resources and assets (HVRAs) based on potential fire intensity, likelihood of wildfire, and the exposure, relative importance, and sensitivity of values at risk to different types of fire behavior. Expected net value change is positive where the overall impact of wildfire is expected to benefit HVRAs present at a location, and eNVC is negative where the overall impact is expected to degrade HVRAs. Expected net value change is calculated by multiplying flame length probability for each flame length class by the potential impact of each flame length class on each HVRA (positive or negative impact) by the relative importance of each HVRA by the burn probability at each location.

We used predictions of eNVC from the 2022 NCFC QWRA because it provides locally specific predictions that account for potential benefits of wildfire as well as negative impacts. The 2022 CO-WRA analysis does not account for potential benefits of wildfire to ecological conditions and other HVRAs, and the 2022 COAL was developed for the entire state of Colorado and did not include all locally important HVRAs.

HVRAs included in the 2022 NCFC QWRA were water (critical water supply and designated waters), WUI (building density), infrastructure (monitoring stations, roads, electrical substations, transmission lines, mines, historic structures, and communication towers), recreation (trails, trailheads, camping, and other recreation assets), wildlife habitat (Preble's meadow jumping mouse, lynx, and greenback cutthroat trout), and different vegetation types. Relative weights of HVRA categories were 23% for water, 19% for WUI, 17% for infrastructure, 16% for recreation, 12% for wildlife, and 12% for vegetation. Maps and response functions for HVRAs are provided in (Rhea et al., 2022).

The eNVC analysis for the 2022 NCFC QWRA suggests that some portions of LFPD could benefit from wildfire, particularly areas without homes or critical infrastructure and where there is less importance for surface drinking water, ecosystems are more adapted to wildfire, and expected fire behavior is moderate (**Figure B.8**). However, wildfire could have negative impacts on HVRAs across much of LFPD because high-severity wildfire can threaten homes, critical infrastructure, surface drinking water, and habitat for sensitive wildlife. The footprint of the Northern Colorado Fireshed does not encompass all of LFPD, so predictions were not available for the northeastern corner of the district.

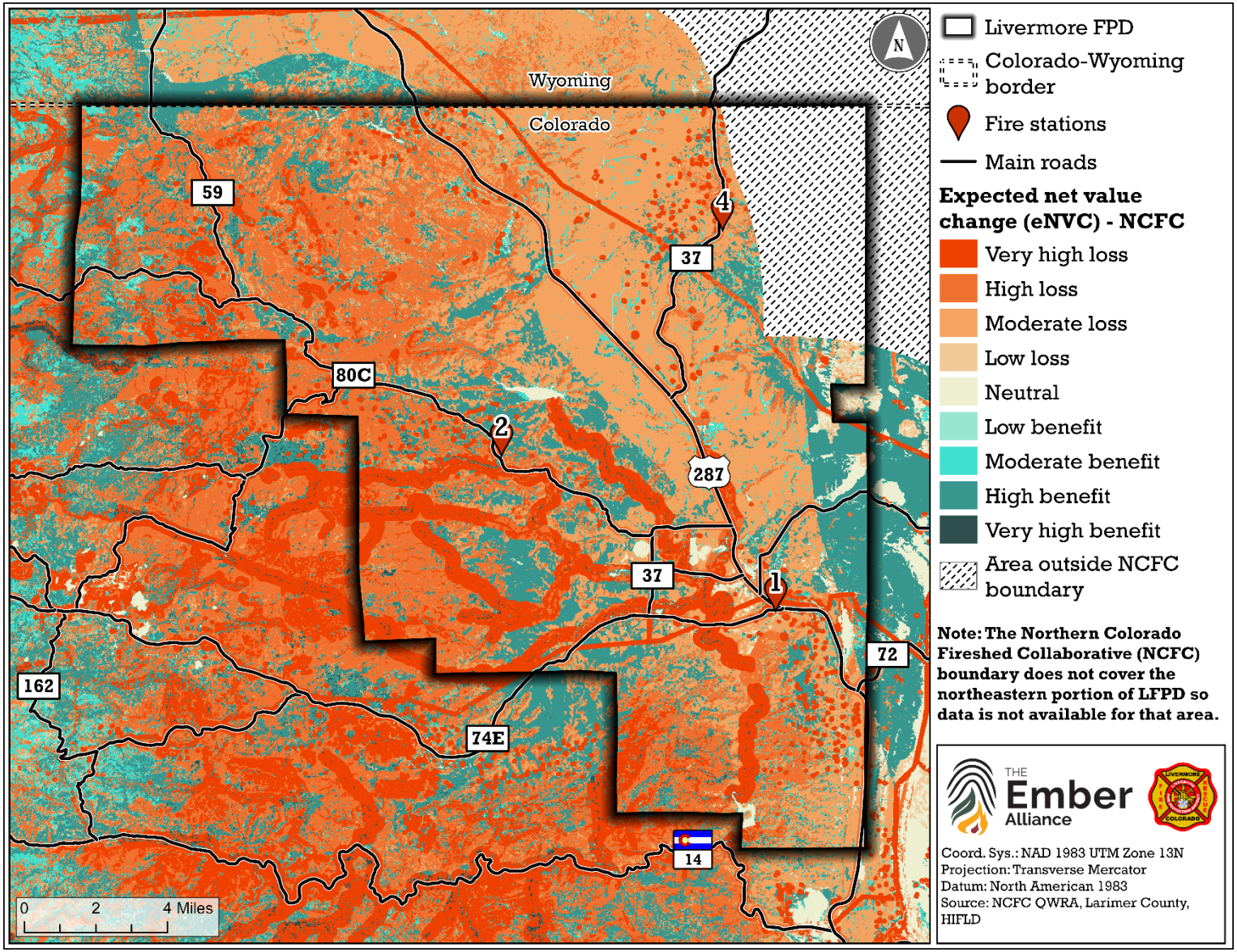


Figure B.8. *According to an analysis for the 2022 NCFC QWRA, beneficial fire is more likely in areas without homes or critical infrastructure, where there is less importance for surface drinking water, ecosystems are more adapted to wildfire, and expected fire behavior is moderate. The analysis considered potential fire behavior, likelihood of wildfire, exposure of values at risk, relative importance of values, and sensitivity of values to different types of fire behavior. The footprint of the Northern Colorado Fireshed does not encompass all of LFPD, so predictions were not available for the northeastern corner of the district. Source: 2022 Northern Colorado Fireshed QWRA (Rhea et al., 2022).*

Predicted Radiant Heat and Ember Cast Exposure

The Ember Alliance assessed the risk that radiant heat and long-range ember cast pose to structures using flame length and fire type predictions from the 2022 CO-WRA and best-available science on structure exposure. Radiant heat from burning vegetation can ignite nearby homes, and embers emitted from burning vegetation or other homes can travel long distances and ignite vegetation and homes away from the main fire. This analysis is useful for comparing relative exposure across the district and not for evaluating absolute risk to individual homes. Fire behavior outputs from the 2022 CO-WRA cannot account for defensible space, the fire resistance of materials used in home construction, and other fine-scale variation in fuel loads that contribute to the ignition potential of individual homes.

Embers can ignite homes even when the flaming front of a wildfire is far away. See the **Mitigate the Home Ignition Zone Section** for tangible and relatively simple steps you can take to harden your home against embers. Mitigation practices, such as removing pine needles from gutters and installing covers over vents, can make ignition less likely and make it easier for firefighters to defend your property.

Ember production and transport and their ability to ignite recipient fuels are guided by complex processes structure (Caton et al., 2016), so The Ember Alliance utilized research by Beverly et al., (2010) and Caggiano et al., (2020) for simplified predictions of exposure radiant heating, and long-range ember cast. Exposure is based on distance from long flame lengths and torching trees assuming:

- Radiant heat can ignite homes when extreme fire behavior (flame lengths > 8 feet) occurs within 33 yards (30 meters) of structures, following the approach of Beverly et al., (2010). Areas with flame lengths >8 feet (**Figure B.3**) were included in these predictions. Research summarized by (Abo El Ezz et al., 2022) suggest that 75% of structures are destroyed when exposed to >8-foot flame lengths during actual wildfires.
- Short-range embers can reach homes within about 110 yards (100 meters) of active crown fires, following the approach of Beverly et al., (2010).
- Long-range embers can reach homes within 930 yards (850 meters) of active crown fires (**Figure B.4**). (Caggiano et al., 2020) found that a vast majority (95%) of home losses during WUI fires occurred within 100 meters of wildland vegetation, but homes were lost as far as 850 meters from the flaming front. The density of long-range embers received by a location will be less than the density of short-range embers.

The risk to homes from short-range embers is greater than from long-range embers. Although embers can travel miles ahead of a wildfire, the number of embers reaching an area decreases exponentially with distance traveled, and the likelihood of structure ignition increases with the number of embers landing on the structure (Caton et al., 2016). **Note that this analysis looks at exposure of structure, meaning if they could be exposed to radiant heat and/or embers, but it does NOT look at vulnerability, meaning the likelihood a structure would be damaged if exposed to radiant heat and/or embers.** We do not have data on the construction material of each structure and the vegetation within each structure's HIZ—data that would be necessary to predict structure vulnerability.

On days with extreme fire weather conditions, 18% of homes in the district have extreme exposure to wildfire, meaning they could experience damaging radiant heat from burning vegetation and receive abundant short-range embers. 62% of homes have high exposure to wildfire, meaning they could be exposed to damaging radiant heat or short-range embers (**Figure B.9**).

Homes serve as an additional source of fuel that could produce high-intensity flames, emit embers, and initiate home-to-home ignitions. We located areas with an elevated risk of home-to-home ignition by determining the number of structures with overlapping HIZs (0-100 feet from structures). A little over half of structures in the district share a HIZ with at least one neighboring structure (0-100 feet from structures), and some structures share overlapping HIZ with up to 8 other structures (**Figure B.10**).

It is imperative that homeowners work with their neighbors to reduce shared risk when HIZs 2 and 3 overlap with adjacent properties. Structures with overlapping HIZs have a greater risk for home-to-home fire spread,

especially if homes are not mitigated or hardened (Syphard et al., 2012). All structures in the district should be built and upgraded with ignition-resistant materials and need mitigated HIZs to reduce the ability of embers to penetrate the building. This includes secondary structures (e.g., sheds, garages, barns) to reduce the likelihood of ignition and fire spread to primary structures (Maranghides et al., 2022). This CWPP outlines home hardening practices that residents and business owners can complete to reduce the risk of embers penetrating their homes.

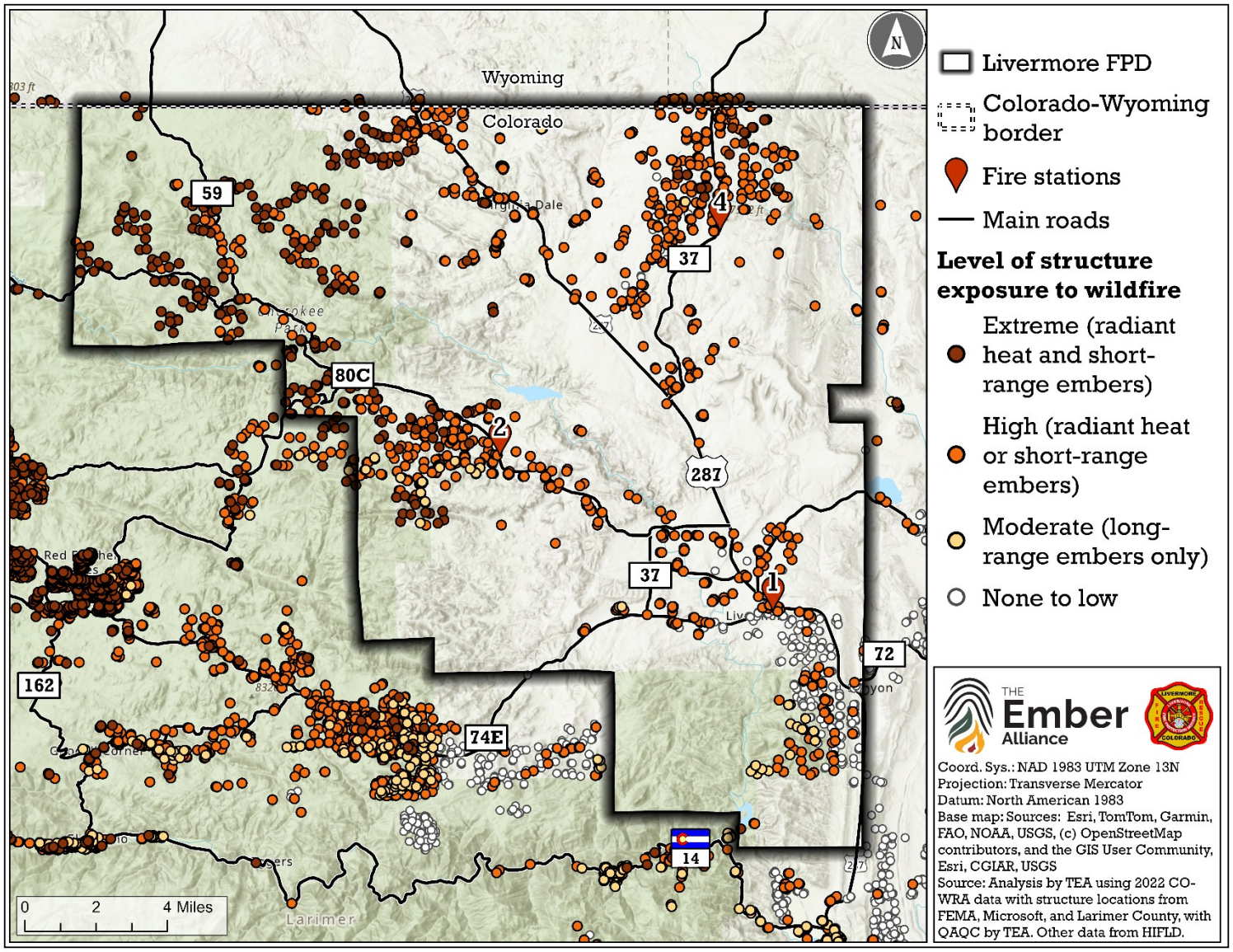


Figure B.9. *Under extreme fire weather conditions, 18% of homes in the district have extreme exposure to wildfire, meaning they could experience damaging radiant heat from burning vegetation and receive abundant short-range embers. 62% of homes have high exposure to wildfire, meaning they could be exposed to damaging radiant heat or short-range embers. This analysis does not consider the vulnerability of structures to ignition because data on construction materials and vegetation in the HIZ are not available for all structures. Source: Analysis by TEA using the 2022 CO-WRA dataset from CSFS, structure locations from FEMA, Microsoft, and Larimer County GIS.*

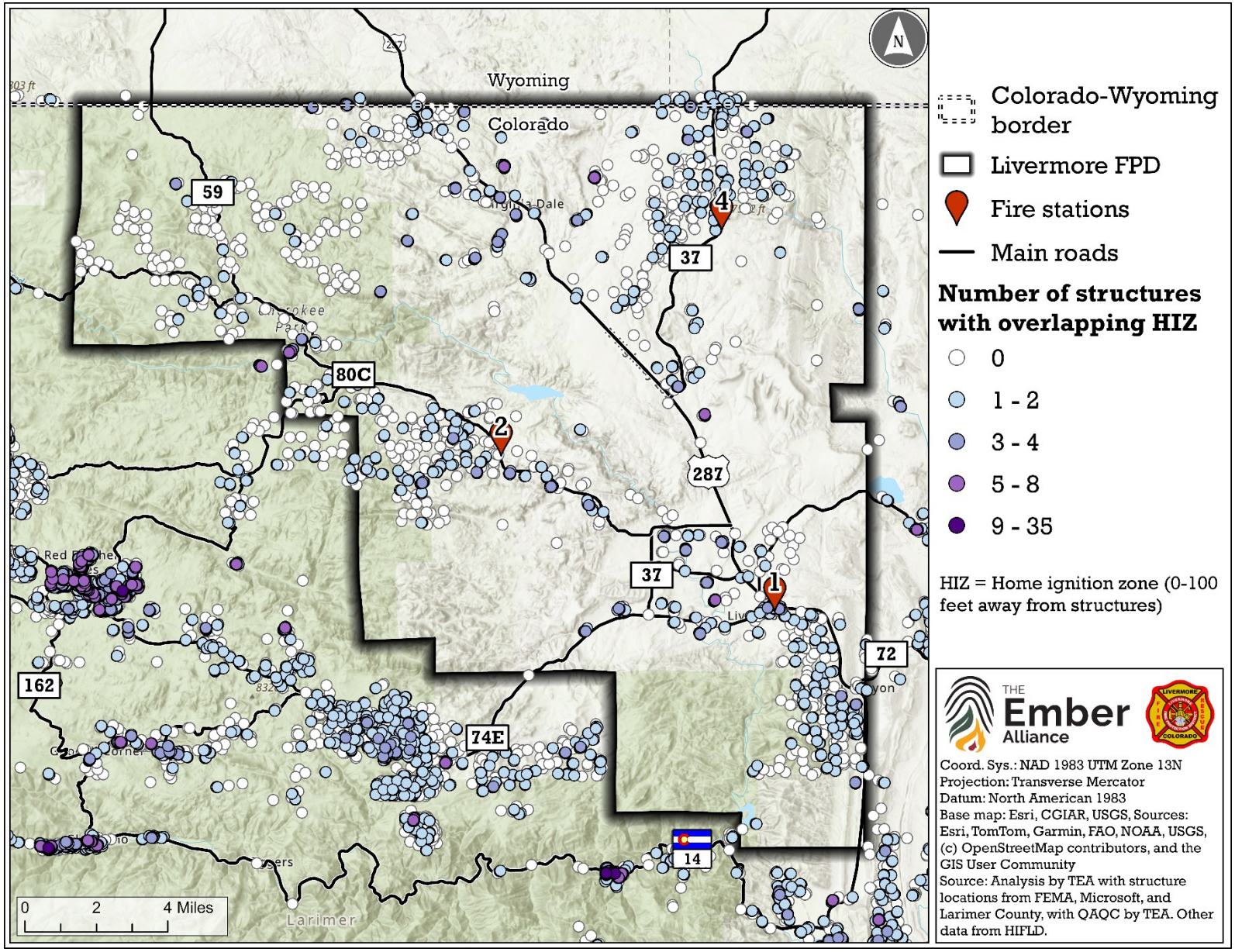


Figure B.10. *A little over half of structures in the district share a HIZ with at least one neighboring structure (0-100 feet from structures), and some structures share overlapping HIZ with up to 8 other structures. Structures with overlapping HIZs are at greater risk of structure-to-structure ignitions from radiant heat and ember cast (Syphard et al., 2012). Analysis by TEA using structure data from Microsoft building footprints (circa 2020).*

Exposure of Highly Valued Resources and Assets

We identified highly valued resources and assets (HVRAs) in areas that could experience damaging radiant heat, short-range ember cast, and/or long-range embers (**Table B.2**; **Figure B.11**). This analysis informed fuel treatment prioritization and plan unit recommendations. HVRAs that are exposed to radiant heat and/or short-range embers have greater potential risk from wildfire than those exposed to long-range embers. The concentration of embers received by an area decreases with distance from the flaming front of a fire.

Note that this analysis looks at exposure of HVRAs, meaning if they could be exposed to radiant heat and/or embers, but it does NOT look at vulnerability, meaning the likelihood an HVRA would be damaged if exposed to radiant heat and/or embers. Also keep in mind that the 2022 CO-WRA fire behavior analyses occurred at the scale of 0.1 acres (20 x 20 meters), and input fuel data is developed via extrapolation of aerial imagery and satellite data. Site-level assessments are vital to verify exposure of HVRAs and develop specific plans for mitigation.

Table B.2. *Potential exposure of HVRAs to radiant heat, short-range embers, and/or long-range embers under extreme fire weather conditions. Colors correspond with symbols displayed in* ***Figure B.11****. High exposure means potential exposure to radiant heat or short-range embers, and moderate exposure means potential exposure to long-range embers only. HVRAs indicated with an asterisk (*) were also identified as Critical Values at Risk (CVARs), which are described in the following section on Critical Values at Risk.*

HVRA Category	Sub-Category	Name	Potential Exposure to Wildfire
Community services	Fire station	Livermore Fire Station #2*	High
		Livermore Fire Station #4*	High
		Livermore Fire Station #1*	None to low
	Government service	CDOT Virginia Dale Rest Area	High
		CPW operations buildings at Cherokee SWA - Lower Unit	High
		Larimer County Road & Bridge Maintenance Shop*	High
		CDOT Maintenance Shop*	None to low
	Post office	Livermore Post Office*	High
	School	Livermore Elementary*	High
	Community building	Livermore Community Hall*	None to low
	Business	Two Chicks Paintball*	High
		Pete Lien & Sons*	None to low
		Red Granite Ranch	None to low
		The Forks*	None to low
Cultural resources	Cemetery	Abbey of Saint Walburga Cemetery*	High
		Livermore Cemetery*	High
		Virginia Dale Community Church Cemetery*	High
	Historic site	Archaeological site at Red Mountain Open Space*	High
		Cherokee Park Dude Ranch*	High
		Elliot Homestead	High
		Historic barn at Red Mountain Open Space*	High
		Historic building/sod house at Red Mountain Open Space*	High
		Historic homestead at Flying S Ranch	High
		Historic homestead at Red Mountain Open Space*	High

HVRA Category	Sub-Category	Name	Potential Exposure to Wildfire
Cultural resources	Historic site	Historic schoolhouse at Red Mountain Open Space*	High
		Historic trapper's cabin*	High
		Tepee Rings Site 1*	High
		Tepee Rings Site 2*	High
		Historic schoolhouse on Cherokee SWA - Lower Unit	High
		Maxwell Ranch	High
		Ranch 2-7 Historic Structures	High
		Roberts Ranch historic structures*	High
		Roberts Ranch, Dutch George, and French Pete historic structures*	High
		The Old Post Office and Livermore Hotel/General Store*	High
		Virginia Dale Old Post Office*	High
		Virginia Dale Overland Stage Station and Hurzeler House*	High
		Batterson Barn*	Moderate
		Homestead at Eagle's Nest Open Space	None to low
		Livermore Historic Church*	None to low
	Place of worship	Abbey of St. Walburga*	High
		Virginia Dale Church*	High
Infrastructure	Communication infrastructure	Microwave service tower near CO-WY border*	High
		Microwave service tower on Mound Mountain in Wyoming*	High
		Microwave service tower at end of Pack Saddle Road*	High
		Antenna structure off Lone Tree Creek*	High
		Antenna structure at the end of N. CR 23*	High
		Antenna structure at CDOT Virginia Dale Rest Area*	High
		Cell tower near Virginia Dale*	High
		Cell tower on hogback east of US 287*	None to low
		Cell tower near Pete Lien & Sons*	None to low
		Microwave service tower off Rattlesnake Road*	None to low
	Hazardous material	Large propane storage site*	High
		Sinclair natural gas pipeline - Munroe valve*	High
		Propane tanks at Larimer County Road & Bridge Maintenance Shop*	High
	Power infrastructure	Microgrid solar batteries at Livermore Elementary*	High
		Substation*	None to low

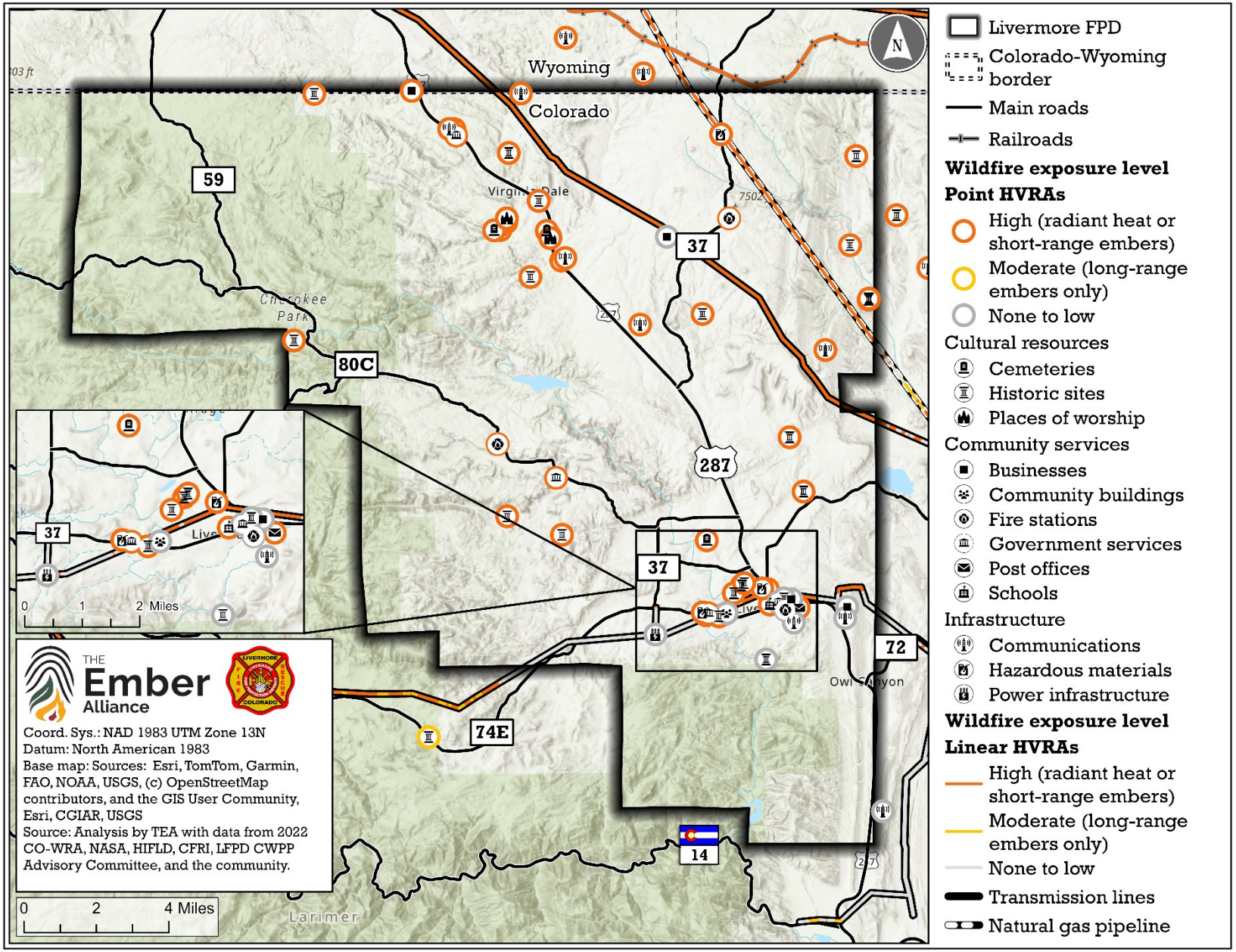


Figure B.11. *Predicted exposure of highly valued resources in and around LFPD. Source: Analysis by TEA using output from the 2022 CO-WRA. HVRA data from NASA, HIFLD, CFRI, LFPD CWPP Advisory Committee, and community members.*

Critical Values at Risk

Critical Values at Risk (CVAR) are the values across a landscape an Agency Administrator or other fire response decision-maker would ask firefighters to assume an elevated level of risk to protect during fire response. They are the highest priority values to be protected from 1) fire behavior and/or 2) fire suppression activities, such as heavy equipment or aerial resource use. There is some overlap between CVARs and the HVRAs (highly valued resources and assets) identified for this CWPP, but the set of CVARs is narrower and their intended audience, purpose, and use are different, as described here.

During an active wildfire incident, fire responders and key decision-makers must identify CVARs across a landscape to build a response strategy (Buettner et al., 2025). Crucially, the process of identifying CVARs ***does not*** exclude other values from being considered or protected during fire response operations. Rather, identifying CVARs helps focus strategic discussions around the values most critical to a local community's safety, character, and continued functionality.

Proactively identifying CVARs in the pre-season can help first responders and decision-makers save time, reduce unnecessary risks to first responders, and better represent community interests as they develop fire management strategies (Aldworth & Beeton, 2025). The CWPP process provides an excellent opportunity to proactively identify CVARs in the pre-season due to a CWPP's collaborative nature and cadre of participants (T. Beeton et al., 2026). Distinct benefits of identifying CVARs in the preseason as part of a CWPP include:

1. Building a common understanding of CVARs within a CWPP before a fire ignites can decrease the time pressure that fire responders and decision-makers face on an incident. CVAR identification during incidents often occurs in dynamic, uncertain, and time-sensitive environments.
2. Building a common understanding of CVARs within a CWPP can support safe and effective response by both identifying areas of high concern across a landscape, as well as areas with less overall concern. Identifying areas of high or low concern can help firefighters avoid unnecessary risk exposures by allowing them to more explicitly plan their strategies to focus on geographic areas that will benefit from their efforts.
3. Identifying CVARs within a CWPP can supplement HVRA prioritization efforts and help fire responders and the public assess opportunities for fuel treatments, prescribed fires, indirect fire suppression tactics, or alternative fire management strategies, while also supporting responders as they assess where more aggressive and direct response strategies should be employed.
4. Including community member input while identifying CVARs within a CWPP can help facilitate a sense of empowerment within a community. Knowing that local resident perspectives will be considered during emergency response is particularly important during a wildfire when communities may experience a sense of powerlessness and lack of access to information and decision-making authorities (Daurio, 2026).

Livermore CVAR Identification Methods

As part of the 2026 Livermore CWPP process, CFRI facilitated the identification of CVARs within the LFPD footprint. Expert knowledge from the CWPP Advisory Committee, local fire and emergency response partners, and other interested and affected entities were paired with community input to identify CVARs that reflect the unique makeup and needs of both communities and responders within the LFPD. CVAR for LFPD were identified within five thematic types: people and private property, infrastructure, cultural, economic, and ecological values.

Information gathered for each CVAR include:

- Geographic location and data type (point, polygon, or line features).
- Thematic type (people and private property, infrastructure, economic, cultural, and ecological values) and sub-type (e.g., communication sites, government services, power/substations, etc.).
- Rationale for including a CVAR (i.e., why it is considered critical by community members, local fire responders, and CWPP Advisory Committee members).

- Qualitative rating of vulnerability to fire behavior and fire suppression activities. Vulnerability includes considerations of both risk and severity of impact.
- Relevant contact information and additional contextual information.

To gather information for the CVAR process, CFRI and TEA conducted a focus group activity during the Livermore CWPP community kick-off meeting on October 25, 2025. The objectives of the meeting were to introduce key components of the CWPP process, introduce the concept of CVARs, and engage community members to improve the overall quality of the CWPP.

Meeting attendees were split into three focus groups, each with 8-12 participants, to identify places and things across LFPD of importance to them. Each focus group was led by a facilitator and supplemental notetaker consisting of CFRI research associates, a graduate student from CSU's Master of Conservation Leadership program, and a post-doctoral researcher from CSU's Human Dimensions of Natural Resources Department. The CWPP project lead and the project's primary GIS expert – both members of TEA – rotated between the different groups to answer questions about the overall CWPP process and provide additional support to facilitators.

Within each focus group, facilitators asked participants to identify places and things that 1) participants considered critically important, and 2) participants perceived could be impacted negatively by either fire behavior or fire suppression activities. To manage focus group conversations, facilitators segmented the discussion into five general categories: people and private property, infrastructure, cultural, economic, and ecological values. Each group addressed these topics one at a time in a random order. This allowed each group to develop a manageable list of values that could be combined across groups using an organized classification scheme that would be minimally biased toward any individual category.

At the end of the exercise, each group shared a general summary of their conversation with the entire meeting. The total activity lasted 1.5 hours. Geographically explicit values were added to the list of HVRAs in the LFPD CWPP. Notes from group discussions were combined and summarized for use by the CWPP Advisory Committee, LFPD, and other responders. The information from these focus groups was synthesized by CFRI and reviewed by the CWPP Advisory Committee, and a summary of community input is provided below.

CFRI also facilitated two virtual activities with the CWPP Advisory Committee to review CVARs for each of the five thematic types. CWPP Advisory Committee members considered which CVARs should be prioritized to drive fire response strategy by combining their local knowledge and community perspectives. CFRI also met virtually with CWPP Advisory Committee members and contributors – both in small groups and individually – to gather additional attributes for each CVAR. Terminology and definitions from the Incident Strategic Alignment Process (catastrophic, critical, moderate, and negligible) were leveraged to guide attribution. Once identified CVARs were attributed as completely as possible, CFRI presented the overall outcomes of this exercise during a CWPP Advisory Committee meeting and incorporated feedback as it arose.

After the process was complete, TEA verified that CVARs were incorporated into HVRAs for the CWPP where appropriate. HVRAs that are also CVARs are indicated in **Table B.2**. CFRI made all CVAR data for LFDP available to fire responders in the area.

Identified CVAR for the LFPD CWPP

People and Private Property Values

Structures were discussed by community members, local fire responders, and CWPP Advisory Committee members as critically important. To visualize areas with structures while protecting privacy, CFRI used Microsoft Building Footprint data to create a high-level map of structure locations across LFPD. This method prevented any individual structure, or specific group of structures, from being preferentially identified within the people and private property type.

Participants at the community meeting universally agreed they did not want structures to burn but emphasized they would always prioritize human life (firefighter and civilian) over structure loss. Many also indicated they are less concerned about outbuildings being lost during wildfire than homes and functioning barns. They emphasized that many small-parcel landowners had pets and livestock that would suffer if barns were destroyed. Throughout

the conversation, participants said they were less concerned with fire impacting private land if there were no structures or lives under threat.

Participants recommended that fire planners and responders work with homeowners' associations and road maintenance associations to better understand where there are denser levels of development and higher concentrations of primary homeowners, which may indicate areas with greater overall social vulnerability. Participants said working with these associations may help account for and support private landowners not engaged with the CWPP.

Participants shared that many private landowners utilize well water and septic systems, and many have shallow-buried power/phone lines, and they emphasized these utilities may be sensitive to fire behavior and could be threatened by haphazard heavy equipment use. Additionally, some properties have potentially hazardous solar infrastructure and propane tanks that could pose a danger to firefighters during response.

Infrastructure Values

CVARs in the infrastructure type included communication sites, government services, power/substations, transmission lines, highly vulnerable stream crossings/culverts, and hazardous materials sites.

- Communication sites were described as critical for managing response operations and evacuations. Contact information was not available for all communication sites, but an effort was made to provide as many attributes for each communication site as possible.
- Government services, including fire stations, schools, the operational Livermore post office, and highway/road infrastructure facilities we considered crucial for LFPD's post-incident functionality.
- Power/substation locations were considered key infrastructure for the electrical grid, and transmission lines were identified due to their overall importance for communities in LFPD and external communities such as Red Feather Lakes, CO, and Laramie, WY.
- Highly vulnerable stream crossing/culvert sites were identified as critical because they are undersized relative to the magnitude of post-fire flooding flows expected in high-severity fire scenarios. Participants expressed a hope that identifying these stream crossing/culverts would encourage pre-fire mitigation and fire response strategies that avoid high severity fire in high-risk drainages, thus decreasing risk to downstream infrastructure.
- Hazardous materials in LFPD include hydrocarbon (propane, natural gas, etc.) storage and transport infrastructure. The location for a buried liquid hydrocarbon pipeline that crosses the northeast corner of the LFPD area could only be roughly approximated.

Participants at the community meeting frequently discussed the importance of individual private roads for ingress and egress, indicating that many smaller parcels have only one route leading in/out. Many private roads feed onto county roads or Highway 287, which were described as key evacuation routes. Bridges and culverts were often mentioned as critically important in case of evacuations triggered by fire, flooding, or other severe weather, and that it is crucial these structures are not damaged by fire or suppression actions.

Participants also discussed the propane fill station in Livermore, transmission lines across the area, and cell towers as important infrastructure that may be susceptible to fire or suppression actions. Participants discussed Livermore's "microgrid" that serves as a backup to the Livermore church, elementary school, and the Forks Restaurant. Participants wanted firefighters to be aware of its existence so they could protect both the microgrid and themselves during fire response

Cultural Values

Community members and CWPP Advisory Committee members emphasized the importance of cultural values to the character and identity of the LFPD area. Two sub-types of cultural values were historic structures and archaeological sites. Historic structures included physical structures, such as cabins and historically significant buildings. Participants in the community meeting frequently discussed historic structures, including the historic Cherokee Ranch, historic schoolhouses, historic residential buildings, historic post offices, and stage stops. Participants hoped these historic structures would be protected when a fire ignites.

Participants also frequently discussed archaeological sites associated with indigenous peoples that may be sensitive to both suppression activities and fire behavior. These included the Lindemeier and Roberts Ranch archaeological sites, Livermore Pinon Pine grove, and numerous 'signal trees'. Participants shared that these are priceless testaments of historic indigenous stewardship.

Many historic structures and archaeological sites exist on private land. Due to privacy and resource concerns, these types of CVARs were identified and included based on the following criteria:

1) The value/site is located on public land, OR
2) The value is on private land but is easily locatable using publicly available online resources, OR
3) The value is on private land but well-known to the community and easily visible from a public road, OR
4) The value is on private land and not well known or visible, but CFRI contacted and received consent from the relevant landowner/manager to include the cultural value in the CWPP.

Community institutions were another sub-type of cultural values. Participants identified the Livermore and Virginia Dale community halls, active local churches, and the Forks Mercantile as important cultural values that might be susceptible to fire behavior.

Economic Values

The CWPP Advisory Committee identified known businesses that are highly frequented and/or have overnight guests. Economic values are important during emergency response due to evacuation considerations. CWPP Advisory Committee members (including fire responders) expressed that including businesses in the list of CVARs could help emergency managers and fire responders more effectively manage and plan for evacuations during an active incident.

Participants at the community meeting frequently discussed large ranching operations and the importance of ranching to the character of the local area. Many ranches have important structures critical to their business operations. Participants recommended that response organizations connect with ranch managers if they haven't already to build alignment on potential suppression strategies.

Participants also discussed smaller business operations, including the Abbey of St. Walburga, numerous guest ranches, and a local paintball operation. Participants indicated that these businesses are most likely threatened by potential fire behavior rather than suppression actions. The Pete Lien & Sons Mine was not brought up specifically by participants, though the mine does have a substantial operation within the Livermore Footprint.

Ecological Values

The CWPP Advisory Committee and participants at the community meeting frequently discussed the importance of natural areas and sensitive wildlife habitat. Participants strongly emphasized The Phantom Canyon preserve owned and managed by TNC, Meadowbrook Conservation Area, Cherokee Unit State Wildlife Areas, and Larimer County Open Spaces. Areas that allowed public access were noted as important for their recreational value and contribution to quality of life in the area. Participants indicated these special places are potentially sensitive to fire and suppression tactics.

Participants also discussed numerous sensitive species including the Prebble's meadow jumping mouse, black footed ferrets, golden eagles, and aquatic species. They expressed concern that the habitat of these species would be negatively impacted by suppression actions such as heavy equipment operation (Prebble's mouse/Black footed ferret), the use of aviation resources (Golden eagles), and retardant drops (aquatic species).

Sensitive habitats included primary riparian corridors with sensitive species, such as the North Fork of the Cache La Poudre River and associated reservoirs, and unique habitats such as the Livermore piñon pine grove. The CWPP Advisory Committee believes these areas could experience the greatest catastrophic ecological impacts from high severity fire and/or fire suppression activities.

Key Considerations for Livermore CVAR

CVAR identification ***did not*** create a detailed hierarchy of CVARs across the LFPD footprint (e.g., bridge 'x' is the most important value for fire response throughout Livermore; cultural values are more important than structures in specific locations). Additionally, identified CVARs were not necessarily or always the most vulnerable or susceptible values to fire behavior or fire suppression actions. Rather, they were the values that participants believed might be the most important to the community's safety, character, and continued functionality.

Community input used to inform CVAR identification and attribution came from a small subset of community members and may not fully represent the diversity of perspectives and preferences within the landscape. The CVAR identification process is intended to help inform fire management strategies, regardless of conditions, and it was ***not*** meant to replace thoughtful engagement between fire managers and the communities they serve. Like other components of a CWPP, the CVAR process serves as both a tool for emergency managers during wildfire response and a starting point for continued dialogues between fire managers, community members, and other interested and affected entities across LFPD.

Roadway Survivability

The Ember Alliance identified road segments that could potentially experience non-survivable conditions during a wildfire burning under extreme fire weather conditions (**Figure B.12**). "Non-survivable roadways" were defined as portions of roads adjacent to areas with flame lengths greater than 8 feet under extreme fire weather conditions. Drivers stopped or trapped on potentially non-survivable roadways could have a lower chance of survival due to radiant heat emitted from fires of this intensity. This assumption is based on the Haul Chart, which is a standard tool used by firefighters to relate flame lengths to tactical decisions (**Table B.1**). Direct attack of a flaming front is no longer feasible once flame lengths exceed about 8 feet due to the intensity of heat output (NWCG, 2019). Flames greater than 8 feet could also make roads impassable and cut residents off from egress routes. Non-survivable conditions are more common along roads lined by thick forests with abundant ladder fuels, such as trees with low limbs and saplings and tall shrubs beneath overstory trees.

This analysis relied on flame length predictions from the 2022 COAL (**Figure B.2**). Flame length predictions from the 2022 CO-WRA were not used because the high wind speeds used for the 2022 CO-WRA predicted extreme flame lengths for grassland vegetation, and while extreme flame lengths are possible for grassland vegetation, the rapid rate of spread in grassland vegetation means that the residence time of flame alongside roads would be less, and therefore the potential impact to humans would be far less significant than high flame lengths burning in forested vegetation. For this reason, we only classified roads as potentially non-survivable if canopy cover were >15% based on canopy cover estimates used for the 2022 COAL. The LFPD chief, Joel Meter, and the station number two captain, Dave Herder, also provided ground-truthing of roadway survivability predictions based on their local knowledge.

Under extreme fire weather conditions, 15% of roadways in the district could experience potentially non-survivable conditions during wildfires (**Figure B.17**). Some non-survivable road segments across the district occur on major roads, or roads that are the only primary egress for neighborhoods. These areas are a high priority for roadside fuel mitigation to create safer conditions for residents, visitors, fire fighters, and other first responders. See priority roadside project areas for the CWPP in **Figure 4.d.1.**

Mitigation actions along sections of road with high risk for non-survivable conditions during a wildfire can increase the chances of survival for residents stranded in their vehicles during a wildfire and decrease the chance that roadways become impassable due to flames. Evacuation preparedness is paramount for all residents of Asotin County.

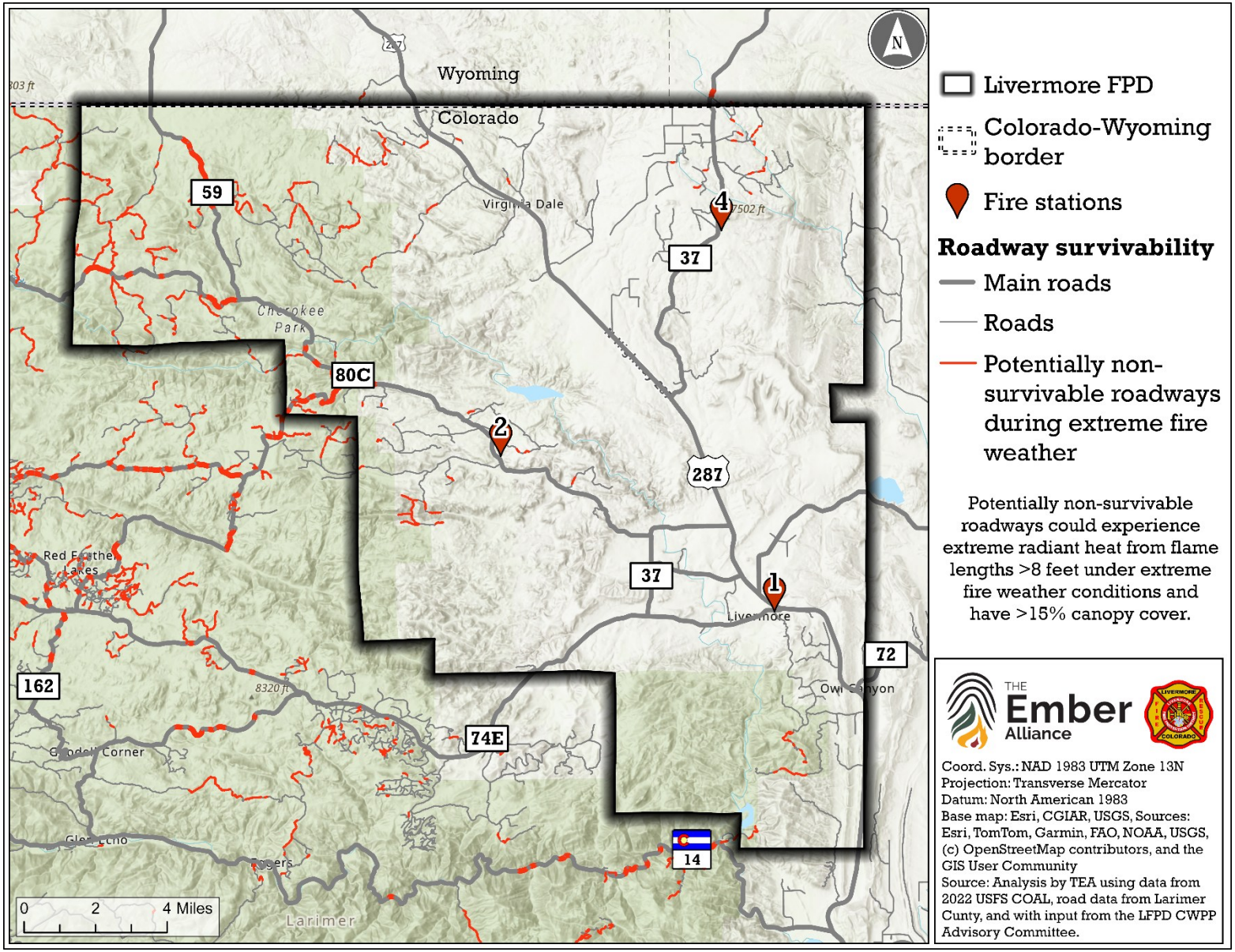


Figure B.12. *Under extreme fire weather conditions, 15% of roadways in LFPD could experience potentially non-survivable conditions during wildfires burning under extreme conditions. Non-survivable roadways could experience extreme radiant heat from >8-foot flame lengths and have >15% canopy cover. Source: Analysis by TEA using the 2022 COAL from the USFS and with feedback from the LFPD CWPP Advisory Committee.*

Wildland Urban Interface (WUI) Delineation

Delineating the wildland-urban interface is a critical component of CWPPs in compliance with the Healthy Forest Restoration Act (HFRA) of 2003. Communities can extend the WUI boundary into adjacent areas that pose a wildfire threat to their community, that can serve as a strategic location for wildland firefighting, and that are adjacent to evacuation routes for the community (HFRA 4 U.S.C. §101.16). Strategic wildfire mitigation across the WUI can increase the safety of residents and wildland firefighters and reduce the chances of home loss.

The approach we took for delineating the WUI of LFPD aligns with the WUI delineation in the Red Feather Lakes CWPP. The WUI for LFPD includes any area that could transmit wildland fire into a residential area and important evacuation routes. We used potential operational delineations (PODs) and water features to define our boundaries. POD boundaries represent areas where wildland firefighters have a greater potential to suppress wildfires, and they are areas that might be used as holding features for proactive fuel management with prescribed fire. Almost all of LFPD falls within the WUI similar to the WUI delineation for the Red Feather Lakes FPD CWPP (**Figure 2.c.2**).

Local Ecological Considerations

The Ember Alliance and CFRI conducted a community kickoff meeting where community members within LFPD shared highly valued resources and assets that are important to them. Many of these HVRAs were ecological and outside the scope of our normal HVRA map, which is infrastructure focused (**Figure 2.a.1**). The Ember Alliance utilized data from the Colorado Parks and Wildlife (CPW) and the Colorado Natural Heritage Program (CNHP) at Colorado State University to map areas of note for conservation of species and habitat valued by the community (**Figure B.13**). Some of these areas reflect species ranges and other areas reflect potential conservation areas (PCAs) from CNHP. PCAs are defined as the total area needed to support the long-term survival of critical or vulnerable species and often includes adjacent suitable habitat and buffers from disturbance that increase the likelihood of survival (Colorado Natural Heritage Program, 2026). Habitat for Preble's meadow jumping mouse from CNHP was updated to include streams identified by the North Fork Poudre Site Conservation Team as having populations of this important and threated species.

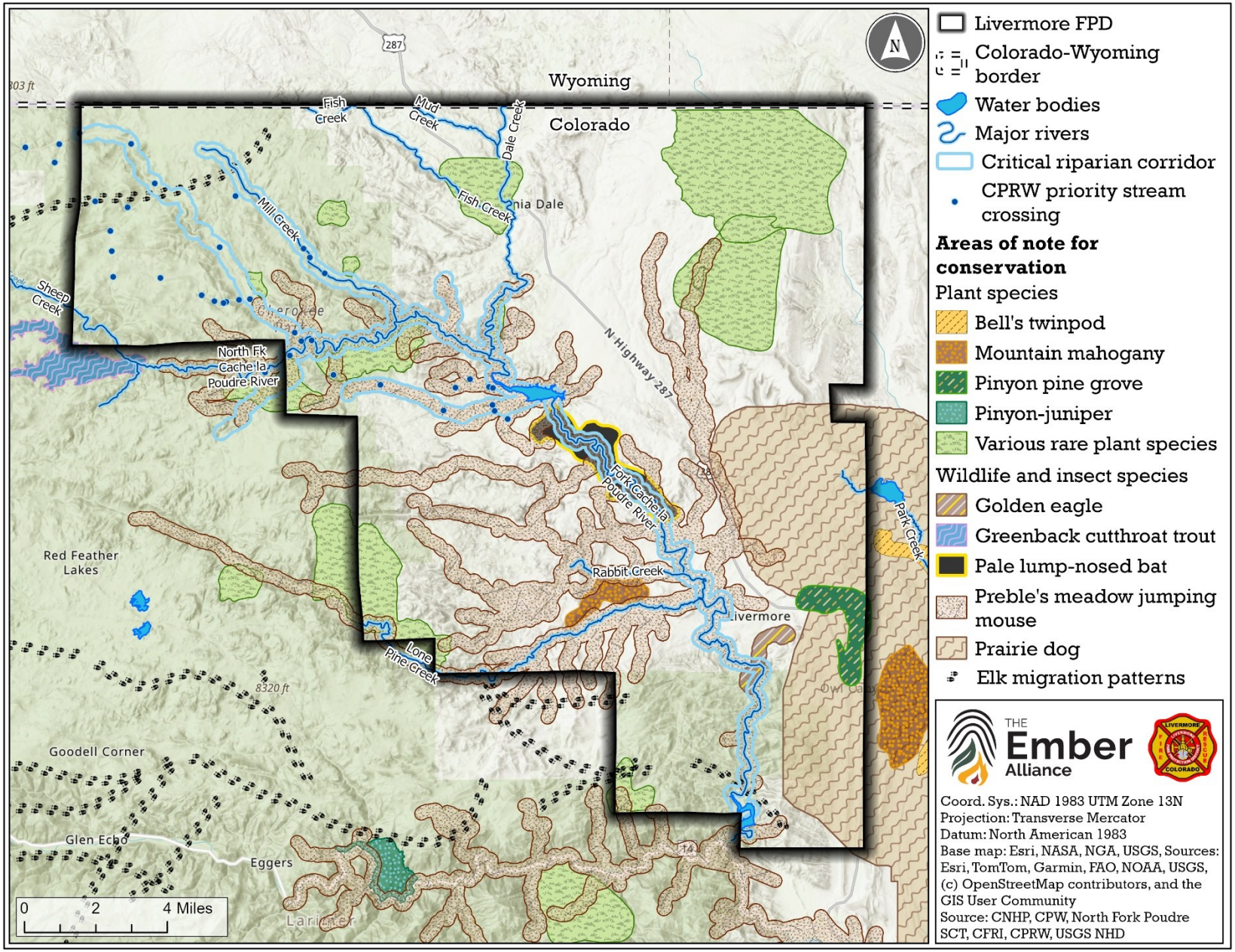


Figure B.13. *Areas of note for conservation of species and habitat valued by the community based on feedback at a community meeting for the LFPD CWPP. Sources: CNHP, CPW, North Fork Poudre Site Conservation Team, CFRI, CPRW, and USGS National Hydrography Dataset.*

Plan Unit Relative Risk Assessment

CWPP Plan Units

The Ember Alliance and LFPD CWPP Advisory Committee compared the relative risk that wildfire poses to life and property in plan units across the district (**Figure 1.a.3**). Plan units are areas with shared fire risk where residents can organize and support each other to effectively mitigate hazardous fuels across the plan unit. We delineated 11 plan units in the district by considering clusters of addresses, road connectivity, topographic features, land parcels, extreme fire weather behavior, and local knowledge from community organizations.

Risk Rating Approach

An important part of the 2026 CWPP for LFPD was assessing relative risk among plan units to help prioritize hazard mitigation and develop priority plan unit-specific recommendations. Plan units receiving a "high" relative rating have risk factors that are lower than risk factors in plan units with an "extreme" rating, but they are still areas with wildfire hazards. Relative risk was assessed in four categories: potential fire behavior, fire suppression challenges (e.g., limited hydrant availability and engine access), evacuation challenges, and HIZ hazards.

This assessment was based on predictions of fire behavior, radiant heat and ember cast exposure, roadway survivability, structure locations on slopes, and ground assessments. It also incorporates local knowledge from the LFPD CWPP Advisory Committee and other fire and fuel professionals in the district about evacuation hazards, suppression challenges, and hazards in the HIZ. The Ember Alliance and LFPD CWPP Advisory Committee developed a rating scale specifically for the district based on the range of values observed across the community (**Table B.3**). **This relative risk assessment is not intended or suitable for comparing this fire protection district to other areas in Colorado or the United States.**

Table B.3. *Relative risk rating values for the district.*

Hazard category	Max. points possible	Range of values in plan units	Moderate	High	Higher	Extreme
A. Potential fire behavior	59	7 – 46	5-15	16-30	31-45	46+
B. Fire suppression challenges	45	5 – 34	1-10	11-20	21-30	31+
C. Evacuation challenges	50	10 – 41	10-19	20-29	30-39	40+
D. HIZ hazards	83	34 – 54	0-20	21-40	41-49	50+
Overall risk	237	64 – 167	60-89	90-119	120-139	140+

Relative Risk Rating Form

A. Potential Fire Behavior	Points
1. Percent area with very high to extreme fire behavior class[1]	
<30% of area	0
31-<60% of area	6
≥60% of area	12
2. Percent area with >8 feet flame lengths[1]	
<20% of area	0
21-59% of area	4
60-89% of area	8
≥90% of area	12
3. Mean rate of spread[1]	
40-70 chains/hour	0
71-99 chains/hour	6
≥100 chains/hour	12
4. Average burn probability[1]	
0-0.6%	0
>0.6-1%	2
>1-1.5%	4
>1.5%	8
5. Powerline placement	
Range from 0 (all underground utilities) to 5 (numerous overhead powerlines)	5
6. Other ignition sources	
Range from 0 (absent) to 5 (campsites and railroads present	5
7. Lightning and human-caused ignition density[2]	
Lower (<15 ignitions)	0
Medium (15-30 ignitions)	3
Higher (≥31 ignitions)	5
A. Total points possible	**59**

[1]Predictions from CO-WRA under extreme fire weather conditions for plan unit and adjacent watersheds.

[2]Based on compiled ignition data from the National Interagency Fire Center IRWIN and the Fire Program Analysis fire-occurrence database for 1992-2024.

B. Fire Suppression Challenges	Points
1. Percent area with high to highest suppression difficulty index	
<10% of area	0
10-18% of area	5
>18% of area	10
2. Water sources (hydrants, cisterns, and draft sites)	
>5 water sources	0
2-5 water sources	5
0-1 water sources	10
3. Road width, length, turnarounds, grade, and surface	
Range from 0 (practically all roads accessible for Type 3 engine) to 15 (few roads accessible for Type 3 engines)	15
4. Presence of legible and reflective signs	
Range from 0 (present on practically all roads and homes) to 5 (present on few roads and homes)	5
5. Presence of HazMat (e.g., tires, propane, fuel tanks, commercial sites)	
Absent	0
Present	5
B. Total points possible	**45**

[2]Predictions from the 2022 COAL under extreme fire weather conditions

C. Evacuation Capacity	
1. Number of lanes in each direction	
Range from 0 (at least 1 lane on practically all roads) to 5 (less than 1 lane on most roads)	5
2. Potential for congestion or other evacuation challenges[3]	
No evacuation challenges reported	0
1 limited access point or priority road	10
2+ limited access points or priority roads	20
3. Percentage of roadways with potentially non-survivable conditions (>8 ft flame lengths and >15% canopy cover)	
<5% of roadways	0
5-<15% of roadways	5
15-<25% of roadways	10
≥25% of roadways	15
4. Presence of livestock that could require multiple trips to evacuate	
Range from 0 (few properties with livestock) to 10 (many properties with livestock)	10
C. Total points possible	**50**

[3] Based on feedback from the LFPD CWPP Advisory Committee and other local experts

D. Home Ignition Zone Hazards	Points
1. Roof construction material (Class A = metal or tile, Class B = composite, Class C = wood singles)	
Range from 0 (Class A or B present on most homes) to 15 (Class A or B are not present on most homes)	15
2. Siding	
Range from 0 (non-combustible siding) to 5 (untreated wood or vinyl deck on most homes)	5
3. Decking	
Range from 0 (non-combustible or ignition-resistant decking on practically all homes) to 5 (untreated wood or vinyl decking on most homes)	5
4. Defensible space zone 1 (0-5 feet from home)	
Range from 0 (practically all homes have adequate HIZ zone 1) to 10 (few homes have adequate HIZ zone 1)	10
5. Defensible space zone 2 (5-30 feet from home)	
Range from 0 (practically all homes have adequate HIZ zone 2) to 10 (few homes have adequate HIZ zone 2)	10
Other hazards within 30 feet of homes (e.g., wood piles, propane tanks, campers, wooden sheds, etc.)	
Range from 0 (practically no homes have additional hazards within 30 feet of home) to 5 (many homes have additional hazards within 30 feet of home)	5
6. Percent of homes mid-slope on slopes >10 degrees	
<10% of homes	0
10-<20% of homes	2
≥20% of homes	4
7. Percent of homes on ridgetops	
<10% of homes	0
10-<20% of homes	2
≥20% of homes	4
8. Percent of structures exposed to radiant heat and/or short-range embers	
≤25% of homes	0
>25-75% of homes	10
>75% of homes	15
8. Average number of structures within short-range spotting of other structures (primary and auxiliary structures included)	
<1 structure	0
1-2 structures	4
>3 structures	8
D. Total points possible	**83**

Climate Change Assessment

Climate change has a measurable impact on fire intensity, frequency, and size, and these impacts are likely to continue over the coming decades (Parks, Miller, Abatzoglou, et al., 2016). Fire behavior modeling for this CWPP utilizes historical weather data and does not include future weather predictions. To explore the potential for exacerbated fire weather conditions in the future, The Ember Alliance used the Climate Toolbox's future boxplots and future time series tools (Hegewisch et al., 2021). These tools model climate scenarios for the next 50-100 years using two representative concentration pathways (RCP) that assume different levels of global greenhouse gas emissions The RCP 4.5 scenario assumes that greenhouse gas emissions stabilize before the year 2100, peaking around 2040, and the RCP 8.5 scenario assumes that greenhouse gas emissions are not curtailed by 2100 (IPCC, 2014).

Three variables were selected for this assessment: maximum temperatures in the summer (June, July, and August), the number of days with very high fire danger, and vapor pressure deficit (VPD) in the summer. The Climate Toolbox defines very high fire danger as days with 100-hour fuel moisture below the 10th percentile fuel moisture from 1971-2000. VPD is a meaningful measurement of moisture stress experienced by plants, more so than relative humidity because VPD is independent of temperature. High values of VPD indicate that the air can draw more moisture out of leaves while they photosynthesize, resulting in drier fuels and increased fire risk.

The models predict that maximum summer temperatures in LFPD could increase by 3.1-4.3° Fahrenheit by 2050, going from 79.1°F in 2005 to 82.2-83.4°F in 2050 (**Figure B.14**). LFPD could experience about 8 to 13 more days per year with very high fire danger by 2050 (**Figure B.15**)**,** and average summer VPD could increase from 1.5 in 2005 to 1.7 kilopascal (kPa) by 2050 (**Figure B.16**). Drier fuels in the summer have a greater potential to carry large wildfires; an increase in summer VPD from 1.5 to 1.7 kPa is related to a 7-fold increase in annual area burned in forested parts of the western U.S. (Seager et al., 2015).

Fire behavior may be even more extreme, frequent, and extensive in the coming decades in the district. Mitigating actions in the coming years, including fuel treatments, defensible space around homes, and structure hardening, are critical to protecting life safety of residents and enhance community resiliency into the future.

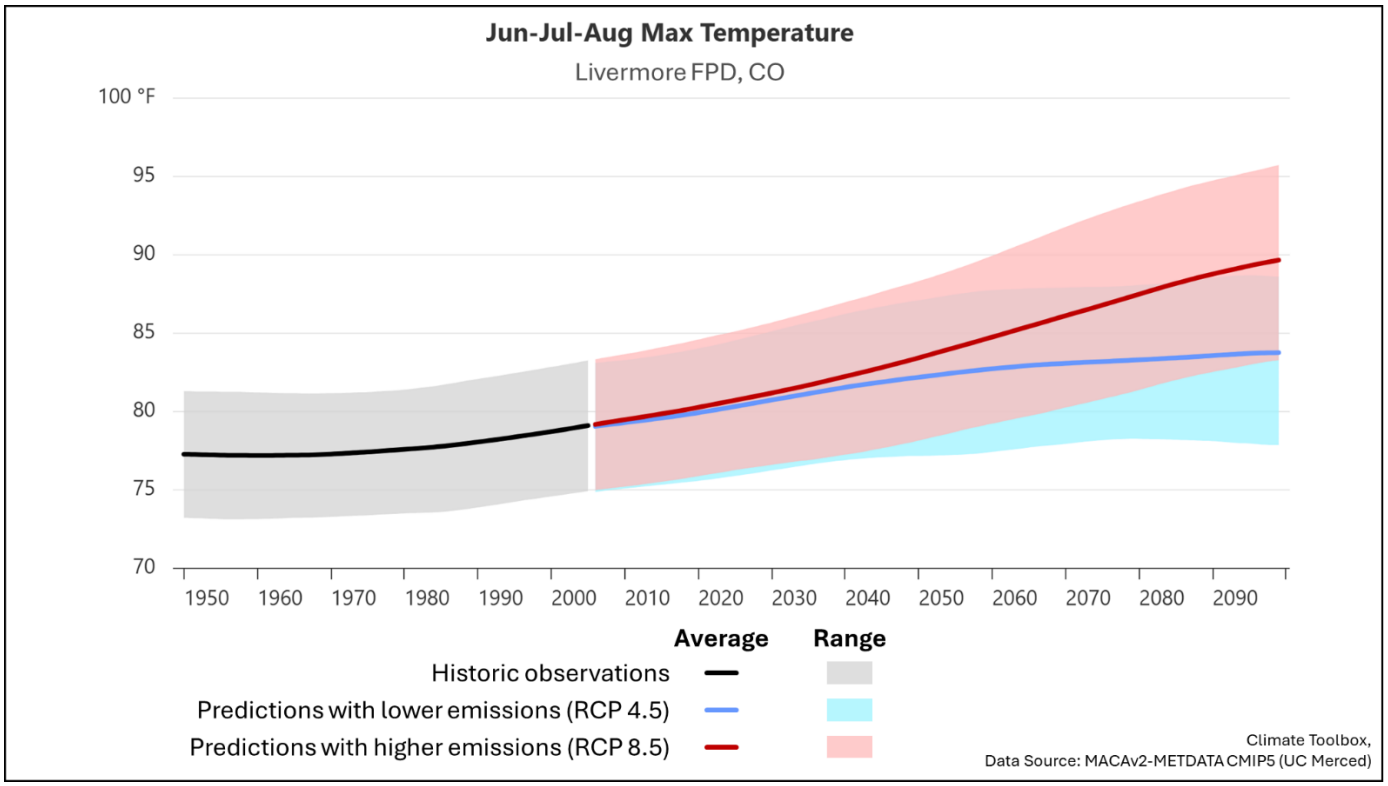


Figure B.14. *Predicted maximum summer temperature in LFPD under lower and higher greenhouse gas emission scenarios. Source: Climate Toolbox (Hegewisch et al., 2021).*

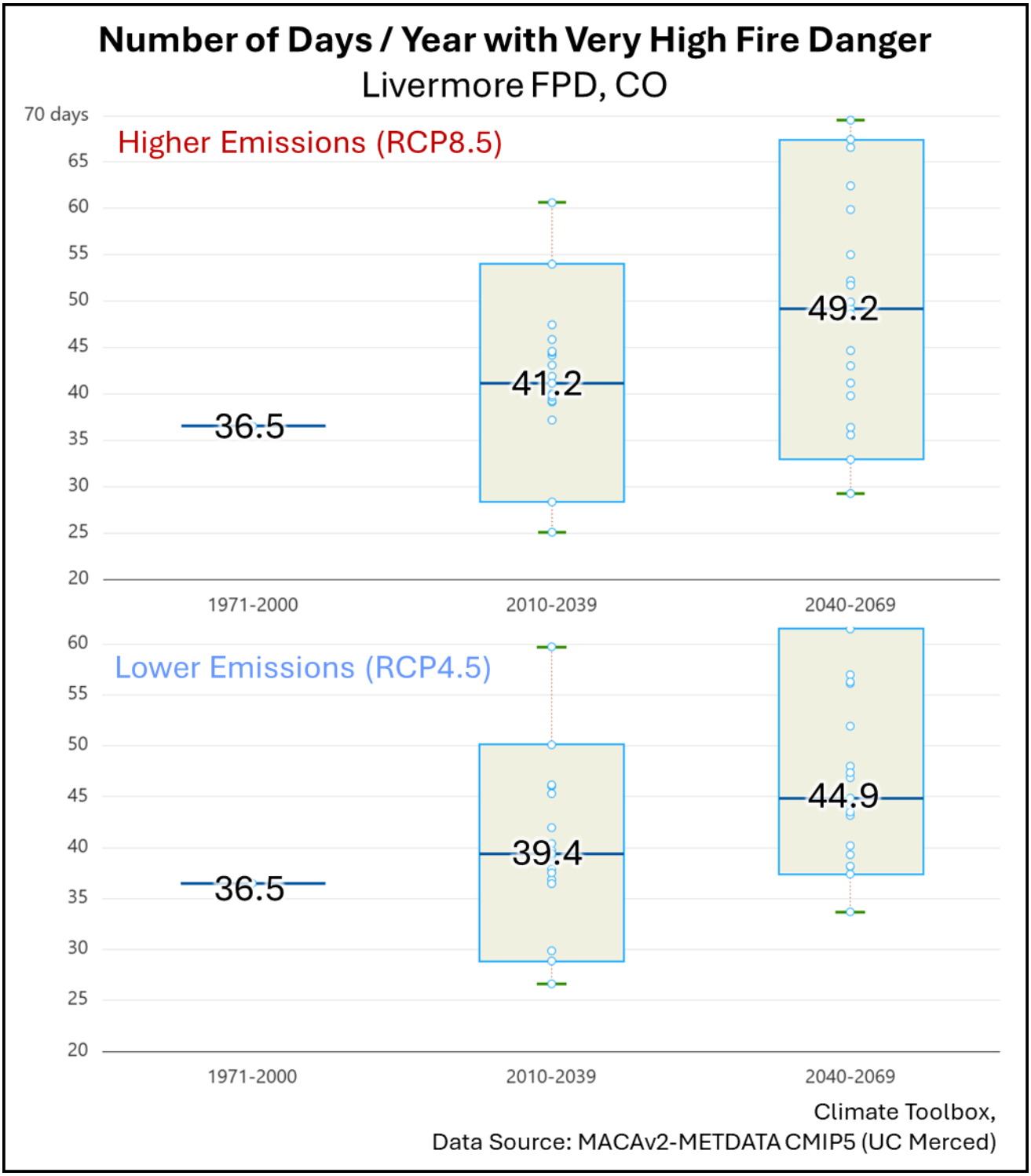


Figure B.15. *Predicted number of days with very high fire danger in Livermore under lower and higher greenhouse gas emission scenarios. Source: Climate Toolbox (Hegewisch et al., 2021). Boxplots show 5th percentile, median, and 97th percentile predictions. Numbers indicate median values. Whiskers show minimum and maximum predictions. Dots represent individual predictions from different climate models.*

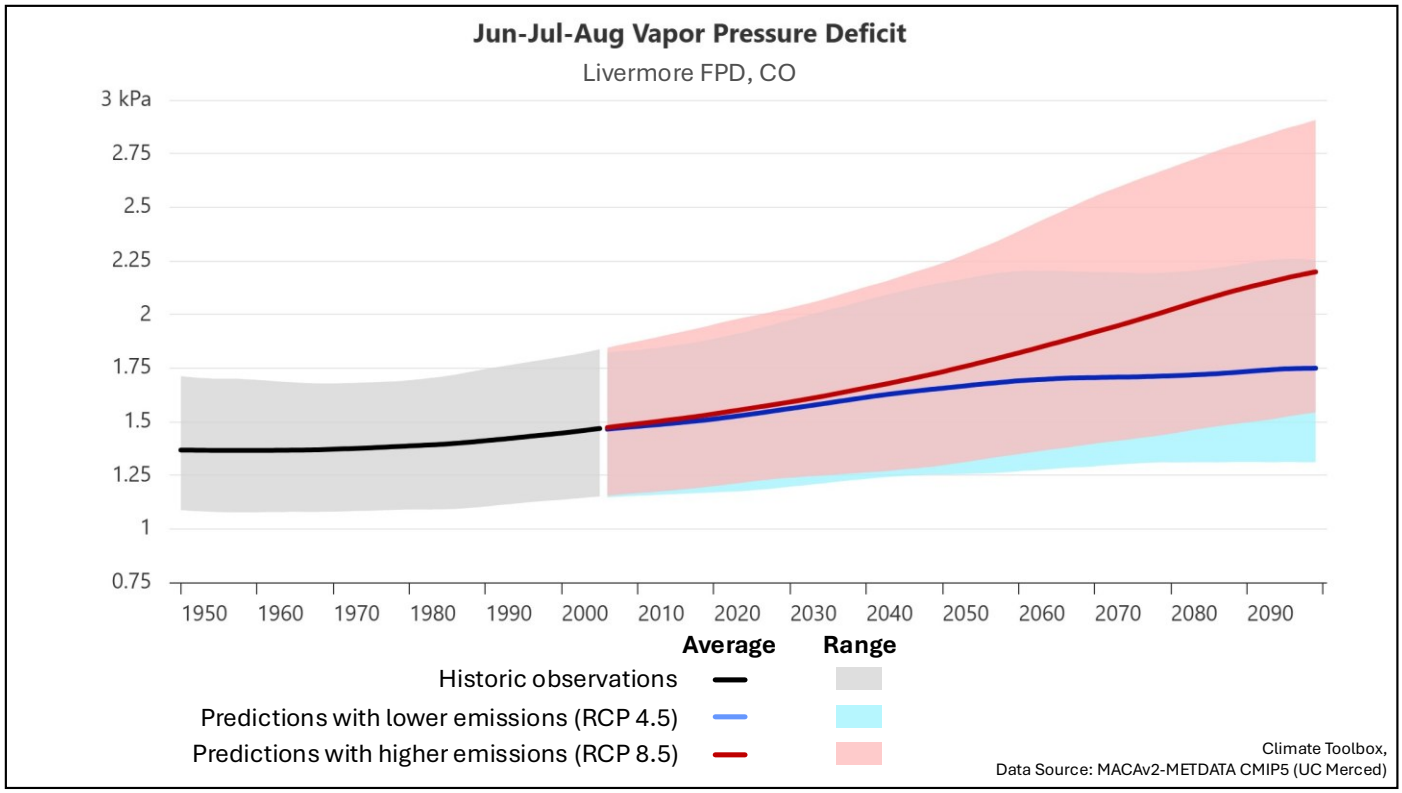


Figure B.16. *Predicted average summer vapor pressure deficit in Livermore, Colorado under lower and higher greenhouse gas emission scenarios. Higher vapor pressure deficits are associated with drier fuels and greater fire risk. Source: Climate Toolbox (Hegewisch et al., 2021).*

Prioritizing CWPP Project Areas

The LFPD Advisory Committee worked with land management agencies, community members, and other partners to identify high-priority locations to plan and implement work over the next 5 years. Types of projects include POD boundary / roadside treatments, stand-scale fuel mitigation and restoration, riparian and stream restoration, cheatgrass mitigation, and HIZ mitigation / point projection (**Table 4.d.1**).

TEA met with the LFPD CWPP Advisory Committee, resident representatives, and additional partners on January 26, 2026, to identify roads that are important evacuation routes, have potential access issues, and potentially dangerous roadside conditions (**Figure B.17**; Table B.4).

Locations that require special evacuation considerations were also identified. These are places where people might congregate, such as the Virginia Dale Community Club, and/or places that have potentially vulnerable populations, such as Livermore Elementary School. Additional priority roads were identified during the in-person meeting with partners on April 27th, 2026.

Factors that informed priority designations by the LFPD CWPP Advisory Committee and partners were if roadways (1) formed POD boundaries, (2) were the only primary evacuation route or one of two routes for a neighborhood, (3) could experience potentially non-survivable conditions during extreme wildfire behavior, or (4) treatments have already been completed or planned in the area.

Additional project areas were identified by the LFPD CWPP Advisory Committee and partners at an in-person meeting on April 27th, 2026. Partners involved in the prioritization meeting were LFPD, USFS, CSFS, DFPC, Larimer County Natural Resources, CPW, Larimer Conservation District, CPRW, Larimer County Sheriff's Office Emergency Services, Larimer County Planning Division, Mighty Arrow Foundation, and resident representatives.

We divided participants into three groups, and each group drew their own priority treatment locations (**Figure B.20**). Groups identified and prioritized project areas based on the following factors:

- Potential fire behavior under extreme fire weather conditions (**Figure B.6**).
- Potential exposure of homes and high valued resources & assets to radiant heat and embers (**Figure B.9**;
- **Figure B.11**).
- Roadway survivability (**Figure B.12**) and priority locations for roadside treatments (**Figure B.17**).
- Location of PODs prioritized by the NCFC to create a "ribbon" of fuel treatments to protect vulnerable communities along the Front Range (**Figure B.18**).
- Priorities for watershed health identified by the 2024 Upper Poudre Watershed Resilience Plan, 2026 Peaks to People Watershed Investment Tool, and 2020 CSFS Forest Action Plan (**Figure B.18**).
- Completed, ongoing, and planned projects identified in nearby CWPPs (2026 Red Feather Lakes FPD CWPP [in preparation], 2022 Glacier View FPD CWPP, 2022 Cherokee Meadows CWPP, and 2011 Diamond Creek/Upper Cherokee Park CWPP), Red Father Lakes Area CWDG, 2024 USFS Black Diamond Landscape Resiliency & Risk Reduction Project, 2015 USFS Cherokee Park Environmental Assessment, and other partners (**Figure B.19**).
- Land ownership (**Figure 2.a.2**).
- Important habitat for wildlife and plant species (**Figure B.13**).

After the meeting, project area locations and priorities were refined by the LFPD CWPP Advisory Committee and through follow-up conversations with partners (**Figure 4.d.1**; **Table 4.d.2**). The CWPP priority projects focus on high-priority locations to address in the next 5 years, but this prioritization does not discourage ecological resilience and fuel mitigation in other areas. If multiple neighbors work together to mitigate fire risk across ownership boundaries, it could attract funding and increase the priority and effectiveness of treating those areas. Land managers, county administrators, and residents should reevaluate fire risks and reprioritize projects as conditions change over time.

Table B.4. *Priority roads for fuel treatments to protect evacuees during an extreme fire weather event. Colors correspond to prioritization in* ***Figure B.17****.*

Name of roadway	CWPP priority project ID	Treatment priority	Potential operational delineation (POD) boundary*
Cherokee Ranch Road (CR 80C) west of CR 59	7	First	Yes*
Mill Creek Road	9	First	Yes
Three Creek Trail		First	Yes
Willow Creek Trail		First	No
Haystack Rock Circle		First	No
Weaver Ranch Road	10	First	No
Obenchain Road	18	First	No
CR 59	8	Second	Yes*
CR 67J	12	Second	Yes*
Boxer Ranch Road	14	Second	Yes
Kestrel Lane		Second	Yes
Spirit Ranch Road		Second	No
Nuthatch Lane		Second	Yes
Jackelope Lane		Second	No
Calliope Lane		Second	No
Bonner Springs Ranch Road	17	Second	No
Pratt Creek Road (FS 182)	4	Third	Yes*
Cherokee Ranch Road (CR 80C) west of Pratt Creek Road	5	Third	Yes*
CR 65E and other roads in the Cherokee SWA – Upper Unit	6	Third	Yes*
Moen Road	11	Third	Yes
Red Mountain Road	13	Third	Yes

*Indicates priority POD for the NCFC and Arapaho-Roosevelt National Forest

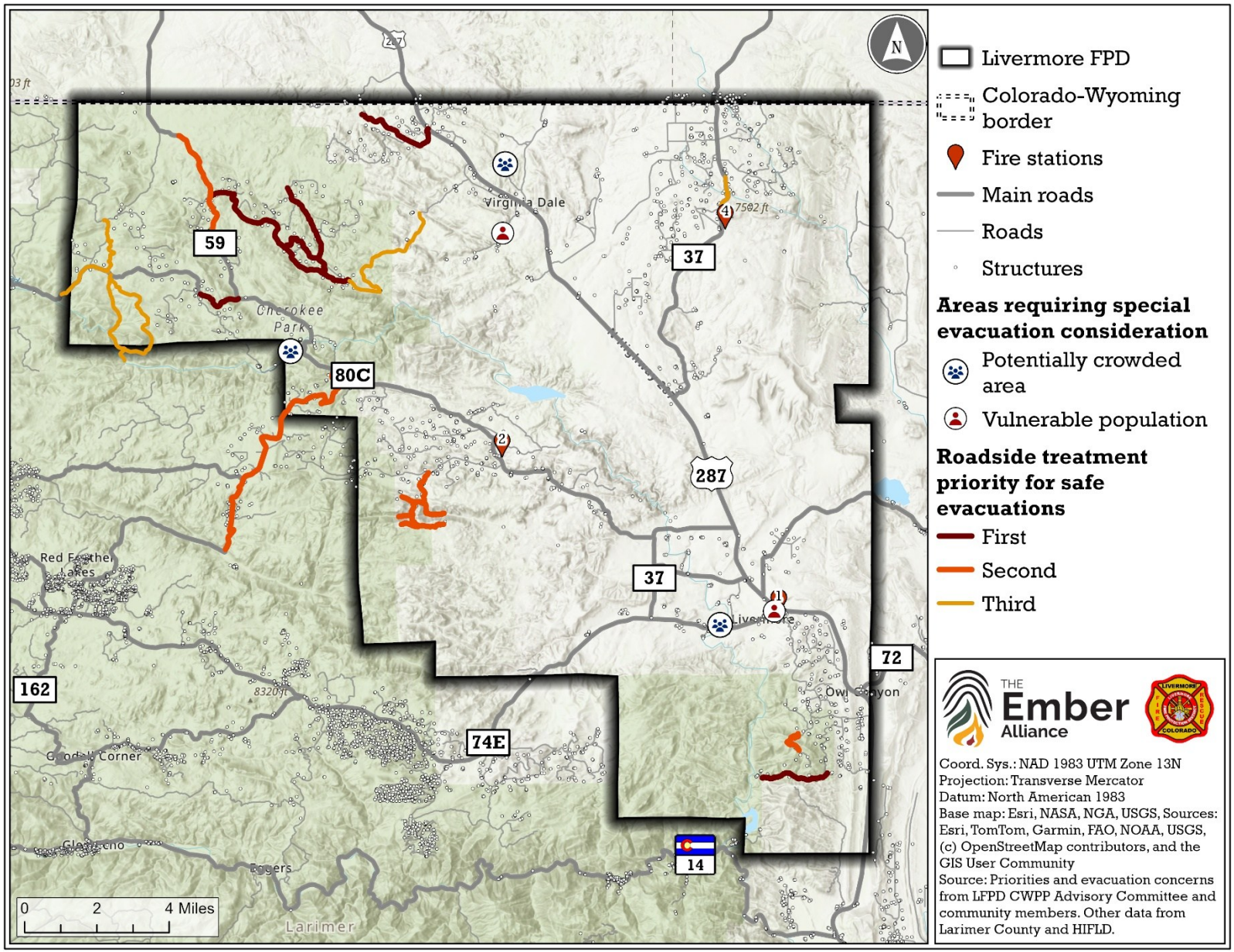


Figure B.17. *Priority locations for roadside fuel treatments in the LFPD to make them safer for evacuees during wildfires. The map also shows locations that require special evacuation considerations due to the number of people who congregate at those areas and/or potentially vulnerable populations. Sources: LFPD CWPP Advisory Committee and community members.*

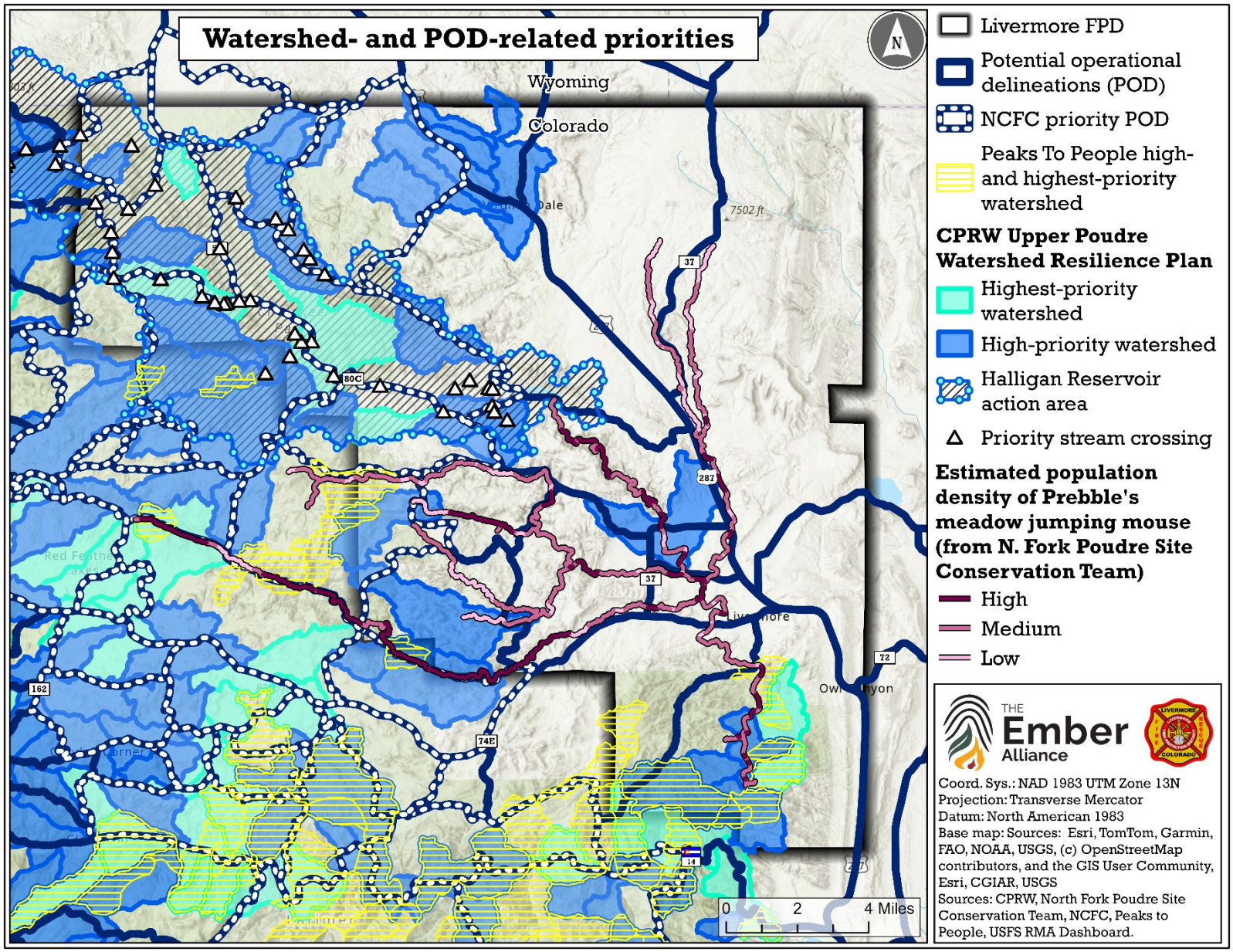


Figure B.18. *Priority locations for watershed- and POD-related work by partner organization in LFPD. Sources: CPRW, North Fork Poudre Site Conservation Team, NCFC, Peaks to People, USFS RMA Dashboard.*

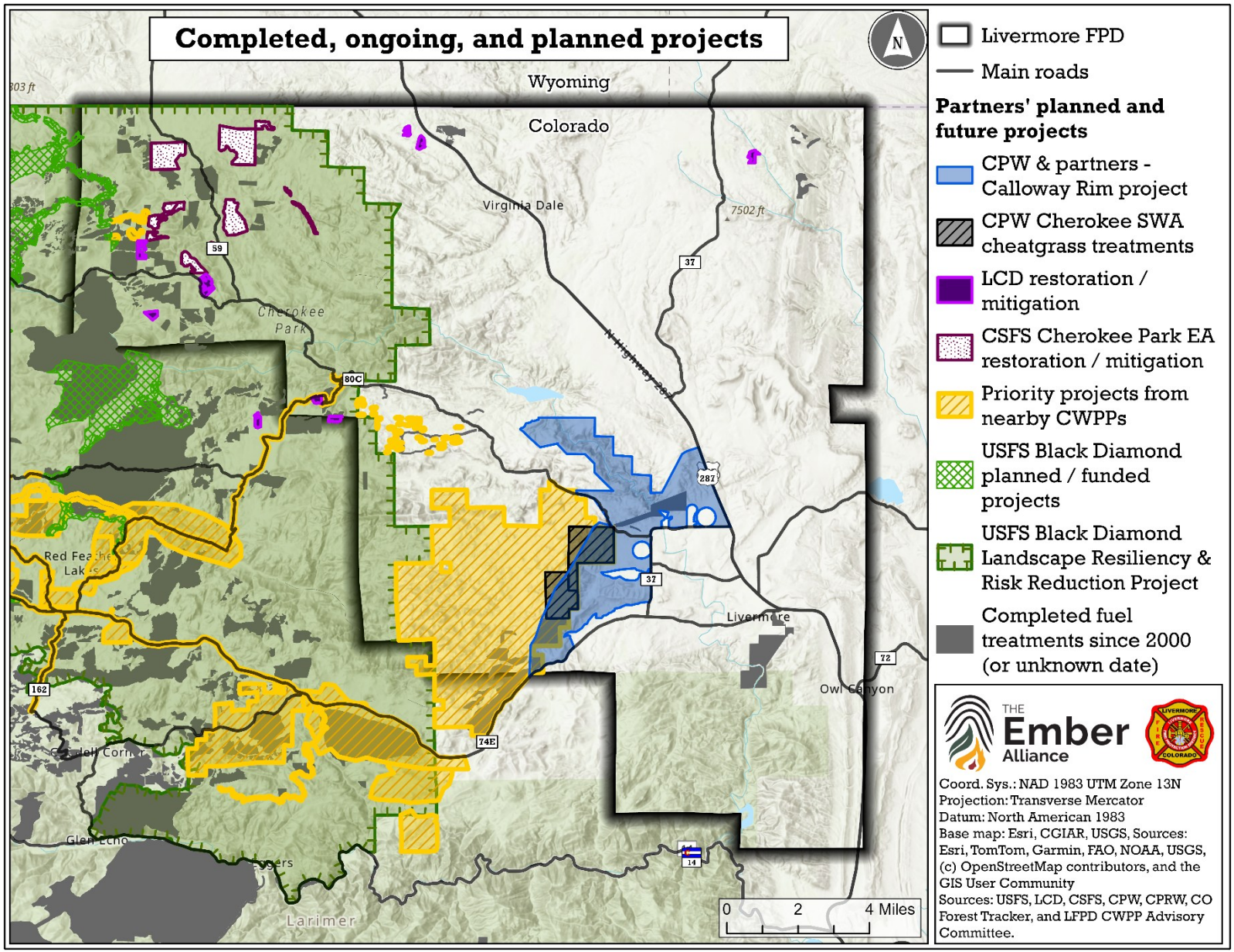


Figure B.19. *Completed, ongoing, and planned projects by partners in LFPD. Sources: USFS, LCD, CSFS, CPW, CPRW, CO Forest Tracker, and LFPD CWPP Advisory Committee.*

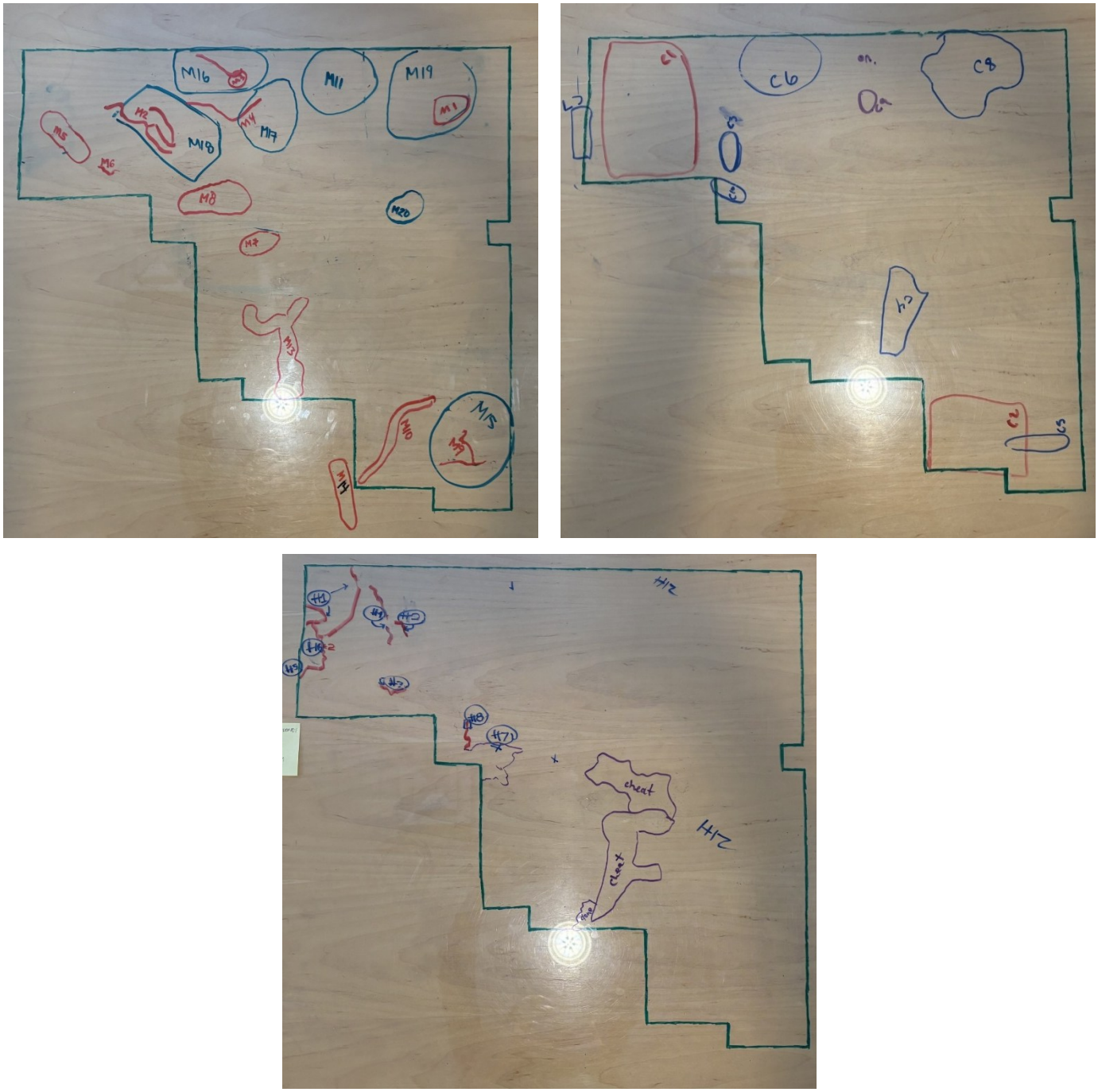


Figure B.20. *Roadside and stand-scale fuel treatments identified by each of the three groups of partners at the prioritization meeting on April 27th, 2026. After the meeting, project area locations and priorities were refined by the LFPD CWPP Advisory Committee and through follow-up conversations with partners (**Figure 4.d.1**).*