

SEPTEMBER 2023



MESA COUNTY

COMMUNITY WILDFIRE PROTECTION PLAN

Working together to build
fire adapted communities,
resilient to wildfire



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ENVIRONMENTAL CONSULTANTS



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

For additional information, questions, or concerns regarding this project, please contact Project Manager Arianna Porter at arianna.porter@swca.com or Mesa County Emergency Manager Andrew Martsolf at andrew.martsolf@mesacounty.us

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



DISCLAIMER

The purpose of the risk assessment contained in this Plan is solely to provide a community- and landscape-level overview of general wildfire risks within the assessment area as of the date hereof, and to provide a potential resource for community pre-fire planning. This risk assessment is premised on various assumptions and models, which include and are based on data, software tools, and other information provided by third parties (collectively, "Third-Party Information and Tools"). SWCA, Incorporated, doing business as SWCA Environmental Consultants ("SWCA"), relied upon various Third-Party Information and Tools in the preparation of this risk assessment, and SWCA shall have no liability to any party in connection with this risk assessment including, without limitation, as a result of incomplete or inaccurate Third-Party Information and Tools used in the preparation hereof. SWCA hereby expressly disclaims any responsibility for the accuracy or reliability of the Third-Party Information and Tools relied upon by SWCA in preparing this risk assessment. SWCA shall have no liability for any damage, loss (including loss of life), injury, property damage, or other damages whatsoever arising from or in connection with this risk assessment. Any reproduction or dissemination of this risk assessment or any portion hereof shall include the entirety of this plan disclaimer.

The entities listed below participated in the development of and/or reviewed the Mesa County Community Wildfire Protection Plan and agree that the CWPP is viable, complete, and realistic in terms of risk reduction and implementation.

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EXECUTIVE SUMMARY

WHAT IS THE PURPOSE OF THIS COMMUNITY WILDFIRE PROTECTION PLAN?

For millennia, fire has been an integral process in the maintenance of western ecosystems, but with the growth of communities into the wildland urban interface (WUI), fire is increasingly seen as a threat to life and property. In recent years a number of large fires have destroyed homes throughout the West, raising public awareness for the need to mitigate fire effects and plan for improving a community's wildfire resilience.

This document has been developed to provide information and guidance regarding wildfire and the risks to communities in Mesa County, Colorado. Recommendations to abate catastrophic wildfire and minimize its impacts to communities are also included. A group of multi-jurisdictional agencies (federal, state, and local), organizations, and residents have joined together to develop the Mesa County Community Wildfire Protection Plan (CWPP). The CWPP will update the existing 2012 Mesa County CWPP with current data, recommendations, and resources regarding wildfire risk.

The planning process has served to identify many physical hazards throughout Mesa County that could increase the threat of wildfire to communities. The public also has helped to identify community values that it would most like to see protected. By incorporating public and Core Team input into the recommendations, treatments are tailored specifically for Mesa County. The Mesa County CWPP emphasizes the importance of collaboration among multi-jurisdictional agencies in order to develop fuels mitigation treatment programs to address wildfire hazards.

Mesa County has a committed team of career and volunteer firefighters, who work to protect the life and property of Mesa County citizens. However, without homeowners taking on the responsibility of reducing fire hazards in and around their own homes, these resources are being severely stretched. A combination of homeowner and community awareness, public education, and agency collaboration and treatments are necessary to comprehensively reduce wildfire risk.

It is important to stress that this document is an initial step and tool in educating the public and addressing areas of concern. The Mesa County CWPP should be treated as a live document to be updated approximately every five years. The plan should be revised to reflect changes, modifications, or new information that may contribute to an updated Mesa County CWPP.

WHAT ARE THE KEY ISSUES ADDRESSED?

Issues addressed in this CWPP include:

- Fuel treatment recommendations for land management agencies and homeowners to mitigate hazard and risk
- Prioritizing hazardous fuels reduction in the WUI
- Raising awareness about the natural role that fire plays in the ecosystem and maintaining resilient landscapes
- Public education and outreach to homeowners to enable individuals to reduce the risk of fire to their properties

- Investing and supporting fire response at all levels, including resources for local fire departments, to increase capacity to serve the community
- Increasing public understanding of the fire response process
- Continuing to address wildfire issues at the landscape level, across multiple jurisdictions
- Managing fire to protect values and accomplish resource management goals, including protection and enhancement of wildlife habitat, water supply and quality, and forest health
- Recent climate patterns and associated changes to the wildland fire environment

ACCOMPLISHMENTS SINCE THE 2012 CWPP

The previous Mesa County CWPP, completed in 2012, included project recommendations aimed at reducing wildfire risk and improving community and forest resilience. Recommendations included fuel reduction through forest thinning, mowing, and invasive management; increased community outreach and education; and enhanced defensible space and home hardening. Recommended projects were to be implemented by a variety of stakeholders including the Bureau of Land Management (BLM), National Park Service (NPS), U.S. Forest Service (USFS), Mesa County, homeowners associations (HOAs), and individual homeowners.

Tables ES.1 and ES.2 highlight the reported land management accomplishments that have been completed in the county between 2012 and 2023. This is not an exhaustive list of accomplishments in the county.

Tables ES.1 and ES.2 include information about land management and do not include public engagement and outreach accomplishments. Since the completion of the 2012 CWPP, the county has updated its building code as it relates to structural ignitability to include amendments that require new construction to use more fire-resistant building materials in areas rated as moderate to high wildfire risk. The county has also increased the number of resources available online for homeowners to reference. This includes family preparedness and evacuation guides, home hardening and defensible space guides, and emergency notification and wildfire operations information.

Table ES.1. Acres Treated by Each Agency by Treatment Type in Mesa County since 2012

Treatment Type	Acres Treated by Each Agency			
	BLM	NPS	USFS	Private/County/ HOAs/Other
Prescribed burn	3,084.95	0	1,927.37	3,960
Pile and burn	38.79	0	84	22.55
Mechanical treatment	1,521.73	2.17	688	299
Seeding and planting	127.57	0	335.9	8
Chemical treatment	145.7	0	418.75	109
Invasive removal	0	0	429.33	0

Table ES.2. Number of Acres Treated Each Year (2012–2023) by Agency

Year	Acres Treated by Agency			
	BLM	NPS	USFS	Private/County/ HOAs/ Other
2012	75.5	0	255.5	90.06
2013	146.7	1.87	173.88	157.95
2014	119.9	0.17	170.2	78.98
2015	243.3	0.14	306.2	124.28
2016	454.9	0	236.7	142.5
2017	604.95	0	1617.5	273.8
2018	364.76	0	316.87	401.27
2019	1,236.5	0	672	8.87
2020	85.14	0	181.9	3.2
2021	0	0	0	3,757.96
2022	0	0	0	720.35
Unknown Year	0	0	0	198

HOW IS THE PLAN ORGANIZED?

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

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

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

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

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

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

Appendix B contains additional resources for community members.

Appendix C provides summary information on hazard and risk for each WUI community.

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

Appendix E houses all project recommendations.

Appendix F details fuel treatment types and methods for application.

Appendix G provides resources for homeowners on preparing their properties for wildfire.

Appendix H contains information on wildfire recovery and restoration.

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

Appendix J hosts additional mapping.

Appendix K presents a sample form of the National Fire Protection Association (NFPA) Wildfire Fire Risk and Hazard Severity Form 1144.

Appendix L details funding opportunities.

Appendix M lists individuals who contributed to preparation of the CWPP and outlines stakeholder collaboration during the CWPP planning process.

WHAT IS THE GOAL OF A CWPP?

The goal of a CWPP is to enable local communities to improve their wildfire resilience and capacity to adapt to changing wildfire conditions, while developing actions that mitigate risks to human health and safety. This CWPP update aims to provide opportunities for accessing grants and other funding, while enhancing public and stakeholder participation by incorporating their input and support. The minimum requirements for a CWPP, as stated in the Healthy Forests Restoration Act (HFRA), are the following (Society of American Foresters [SAF] 2004):

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

HOW WAS THE 2023 MESA COUNTY CWPP UPDATE DEVELOPED?

A group of multijurisdictional agencies (federal, state, and local), organizations, and residents joined together as a Core Team to develop an update to the existing 2012 Mesa County CWPP. Several Core Team members with many years of experience working on CWPPs, as well as in-depth knowledge of fire management in the community and surrounding areas, have contributed to the development of this CWPP update.

The purposes of the CWPP planning process were to model and map wildfire risk, to identify and map the physical hazards in the planning area that could increase the threat of wildfire to communities, to prioritize treatments tailored specifically for the community to reduce fire risk, and to bring together wildfire responders and land managers into a Core Team, providing opportunities to build lasting, working relationships and encourage collaboration between agencies and municipalities.

WHERE IS THE PLANNING AREA?

The planning area includes Mesa County as delineated by its geographic and political boundaries.

WHO PARTICIPATED IN DEVELOPING THE PLAN?

Land managers across Mesa County and southwestern Colorado participated in this CWPP. Agencies such as the Mesa County Government, Mesa County Sheriff's Office, USFS, Grand Mesa, Uncompahgre, and Gunnison (GMUG) National Forest, Colorado State Forest Service (CSFS), Colorado Division of Fire Prevention and Control (DFPC), Upper Colorado River Interagency Fire Management Unit (UCR), Two-Rivers Wildfire Coalition, the BLM, and several local fire protection districts (FPDs) and fire departments, along with other additional community or organization representatives, served as the Core Team for this CWPP and drove the decision-making process.

WHAT WAS PUBLIC INVOLVEMENT?

The development of the 2023 CWPP also included advertisement of the CWPP and opportunities for the public to be involved, which resulted in community members who were highly engaged in providing input. See Appendix I for details on public outreach and engagement. Various types of public outreach including a public survey and informational flyer were provided to increase awareness and collect local input. Additionally, social media and online forums supported CWPP advertisement and furthered public engagement. The public was invited to provide comments on a draft of the CWPP update from August 14 to August 27, 2023. By incorporating public and Core Team input into the CWPP and associated recommendations, treatments are tailored specifically for Mesa County.

WHAT IS THE CURRENT WILDFIRE ECOLOGY OF MESA COUNTY?

Mesa County contains a large amount of wildfire-prone land. The county is home to vast swaths of pinyon-juniper–dominated forests that generally overlap the WUI and are understood to exhibit infrequent stand-replacing fires (Goodwin et al. 2021). Additionally, wildfire risk on the Grand Mesa has increased in recent years. This is likely due to fuel loading from mountain pine beetle-killed trees and climate-driven ecosystem changes such as increasingly ephemeral snowpacks and hotter annual temperatures (Goodwin et al. 2021; Higuera et al. 2021). Forest use practices, human development, and fire suppression policies have also potentially pointed the county toward a hazardous and less predictable wildfire situation. In the last 5 years, Mesa County has experienced large and severe wildfire events such as the Bull Draw and Pine Gulch Fires; see Chapter 2, Fire Environment, for more details.

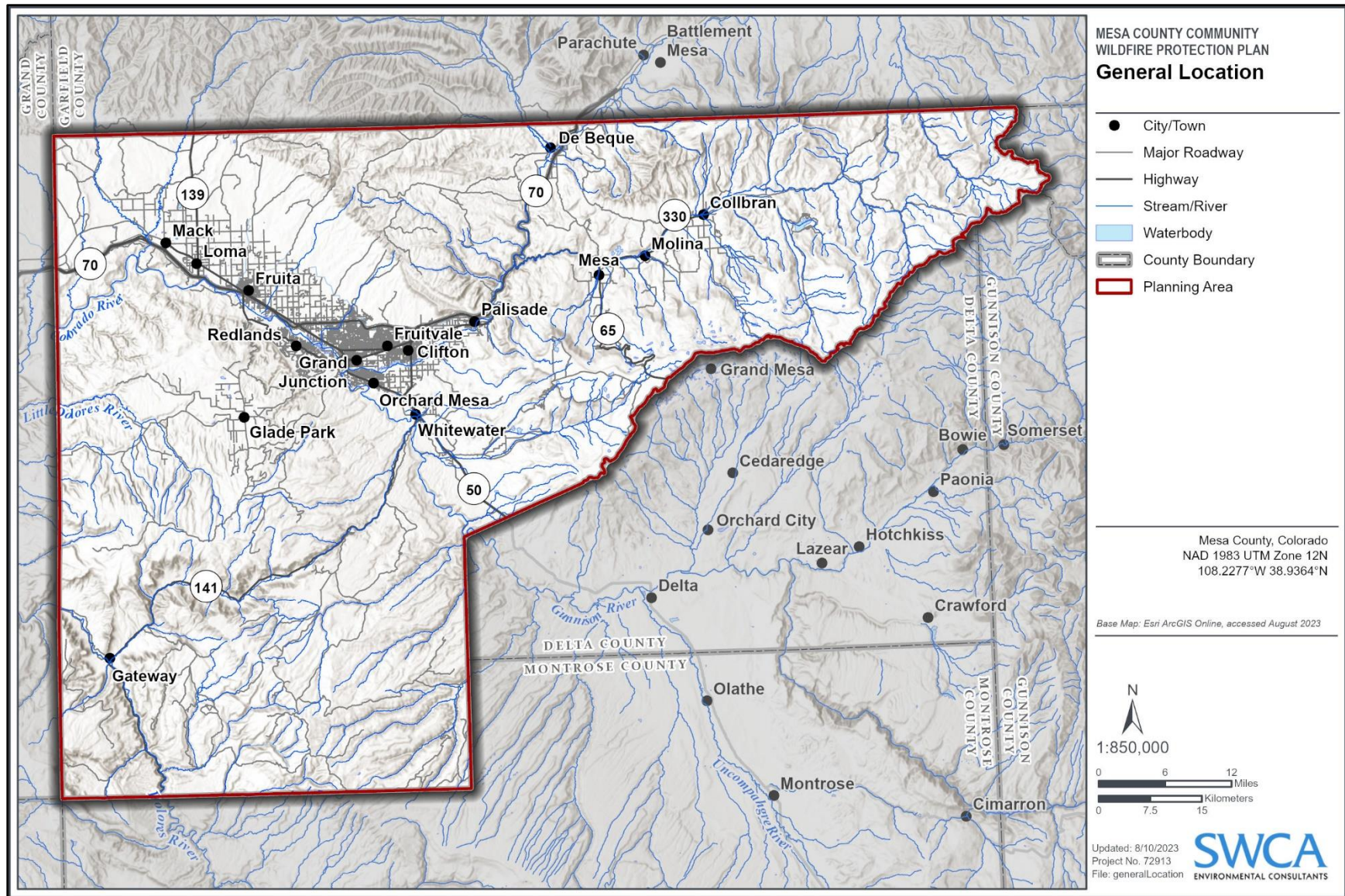


Figure ES.1. Mesa County CWPP planning area.

WHAT IS THE PURPOSE OF THE RISK-HAZARD ASSESSMENT?

The purpose of the risk assessment is to evaluate and provide information pertaining to the risk of wildland fires within the WUI of Mesa County. The Risk-Hazard Assessment utilizes a geographic information system (GIS) model of hazard based on fire behavior and fuels modeling technology. The Core Team reviewed the results of the previous 2012 on-the-ground assessments and provided updates, as well as identifying changes to community hazards and values at risk (VARs) documented during the 2012 Mesa County CWPP planning effort.

The risk assessment considers fire behavior modeling, which includes the following:

- Fire history
- Probability of fire occurring
- Intensity of a fire if one occurs
- Exposure and susceptibility of the WUI and VARs to wildfire based on their locations

The purpose of the Risk-Hazard Assessment is to provide information about wildfire hazard and risk to highly valued resources and assets (HVRAs). High risk areas are delineated in Chapter 3 and detailed in Appendix C, Community Risk-Hazard Assessments.

HOW IS MY COMMUNITY RATED?

Community hazard-risk assessments were completed based on various parameters calculated from the wildfire modeling and risk assessment process. Community risk-hazard descriptions and accompanying ratings (low, moderate, high, extreme) are available in Appendix C.

WHAT ARE THE STRATEGIES TO ADDRESS WILDFIRE HAZARDS?

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

Recommendations for hazardous fuels treatments include the following:

- Road and vegetation maintenance
- WUI mitigation actions and maintenance
- Management of invasive vegetation
- Establishing fuel breaks

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

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

- Developing and promoting wildfire education
- Interagency collaboration on fuel treatments, prescribed fire, and public outreach
- Defensible space and structural hardening improvements
- Hosting community awareness events

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

Recommendations for improving fire response capabilities include the following:

- Wildland fire training to local firefighters
- Provide wildland firefighting equipment to FPDs
- Develop a countywide forum for fire training
- Water supply improvements

HOW WILL THE PLAN BE IMPLEMENTED?

The CWPP does not require implementation of any of the recommendations, but the message throughout this document is that the greatest fire mitigation could be achieved through the joint actions of individual homeowners, and local, state, and federal governments.

The recommendations for fuels reduction projects are general in nature; site-specific planning that addresses location, access, land ownership, topography, soils, and fuels would need to be employed upon implementation.

To streamline project implementation, this CWPP has identified the pertinent land management/ownership agencies associated with each recommendation. On-the-ground implementation of the recommendations in the CWPP planning area will require development of an action plan and assessment strategy for completing each project.

WHEN DOES THE CWPP NEED TO BE UPDATED?

The HFRA allows for maximum flexibility in the CWPP planning process, permitting the Core Team to determine the time frame for updating the CWPP. However, it is suggested that a formal revision be made on the fifth anniversary of signing and every 5 years following. Furthermore, due to the dynamic nature of wildfire litigation and the natural landscape, there are several triggers that may warrant a Plan update before the 5-year mark. CWPPs greater than 10 years old are outdated and will not be prioritized when considered for competitive funding opportunities. The best practice is to treat the CWPP as a living document to be updated annually or immediately following a significant fire event.

CORE TEAM

Name	Organization	Title
Andy Martsof	Mesa County Sheriff's Office	Emergency Services Director
Sean Norris	Mesa County Planning Division	Planning Manager
Matthew Schiltz	CSFS Northwest Area, Rifle Field Office	Supervisory Forester Communications and Communities
Jesse Moreng	DFPC	Colorado River Region Battalion Chief
Ron Cousineau	CSFS Grand Junction	Northwest Area Forest Manager
Pete Firmin	CPW	Two Rivers Wildfire Coalition Co-chair
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Jeremy Spetter	BLM Grand Junction	Upper Colorado River Interagency Fire Management Unit (UCR) Fuels Program Manager
Mike Jones	BLM Grand Junction	Fire Management Specialist (Mitigation and Fire Trespass)
Ben Sanders	USFS Grand Mesa, Uncompahgre, and Gunnison National Forests	Grand Valley Ranger District FMO
Bill Edwards	USFS Grand Mesa, Uncompahgre, and Gunnison National Forests	Grand Valley Ranger District District Ranger
Frank Hayde	NPS	Ranger
Rusty Lloyd	RiversEdge West	Executive Director
Christine Prins	NRCS/RiversEdge West	Private Lands Biologist
Ellis Thompson-Ellis	City of Grand Junction	Community Outreach Specialist
Melonie Montarozzo	Town of Collbran	Town Manager
Care McInnis	Town of De Beque	Municipal Judge
Chuck Balke	Town of Palisade	Fire Chief
Kimberly Bullen	City of Fruita	Public Works Director

For additional information on this project, please contact Project Manager Arianna Porter at Arianna.porter@swca.com or Mesa County Emergency Manager Andrew Martsof at andrew.martsof@mesacounty.us

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

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

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

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

In addition, this document, the 2023 Mesa County CWPP, reviews, verifies, and/or identifies potential new priority areas where mitigation measures are needed to protect from wildfire the irreplaceable life, property, and critical infrastructure in the county. However, this CWPP does not attempt to mandate the

type and priority for treatment projects that will be carried out by the land management agencies and private landowners. The responsibility for implementing wildfire mitigation treatments lies at the discretion of the landowner.

GOAL OF A COMMUNITY WILDFIRE PROTECTION PLAN

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

Collaboration: Local and state government representatives, in consultation with federal agencies or other interested groups, must collaboratively develop a CWPP (SAF 2004).

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

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

It is the intent of this 2023 CWPP to provide a countywide scale of wildfire risk and protection needs and bring together all responsible wildfire management and suppression entities in Mesa County to address the identified needs, and to support these entities in planning and implementing the necessary mitigation measures. Additional information on the planning process is available in Appendix A.

ALIGNMENT WITH COHESIVE STRATEGY

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

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

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

For more information on the Cohesive Strategy, please visit:

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

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

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



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

ALIGNMENT WITH PLANS AND AGREEMENTS

This CWPP is an update of the 2012 CWPP and is aligned with multiple local, state, and federal planning documents. These documents or agreements are summarized in Appendix A. In addition, fire policy and legislative direction are also summarized in Appendix A.

PLANNING AND REGULATORY BACKGROUND

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

CORE TEAM

The first step in the CWPP update process was to bring together a broad group of stakeholders representing both agency and private interests to form a Core Team. The Mesa County Office of Emergency Management invited engagement from adjacent government agencies in the development of this 2023 Mesa County CWPP, forming the “Core Team.” Many of these stakeholders also participated in the 2012 Mesa County CWPP planning effort. The Core Team drives the planning process through decision making, data sharing, experience, and communication with community members. The project was kicked off on December 6, 2022, and the Core Team convened again on March 22, 2023, and August 10, 2023. Additional information about Core Team meeting accomplishments, attendees, and schedule are available in Appendix M.

The Core Team has outlined the following goals and objectives for this CWPP update:

- Improve community resiliency and adaptation to wildfire.
- Develop actions to mitigate risks to human health and safety.
- Incorporate broad public and stakeholder input and support.
- Develop a CWPP update that will serve as a source and guide for accessing grant opportunities and funding.

PLANNING AREA

This CWPP is a countywide plan; therefore, the planning area boundary coincides with the geographic and political boundary of Mesa County (Figure 1.2).

Mesa County encompasses 3,341 square miles and a population of approximately 157,335 people (U.S. Census Bureau 2021). Mesa County has many recreational areas including the Dominguez–Escalante National Conservation Area, the Colorado National Monument, national forests, several BLM wilderness areas, lakes, and other amenities. Mesa County has roughly 61,977 housing units, with the majority of people in the county living in the developed Grand Valley region that houses the county’s most populous cities (U.S. Census Bureau 2021). The Core Team has identified the following communities as having the highest risk to wildfire: Glade Park, the Colorado River corridor, Redlands, Grand Junction, Collbran Plateau/Valley, and Grand Mesa.

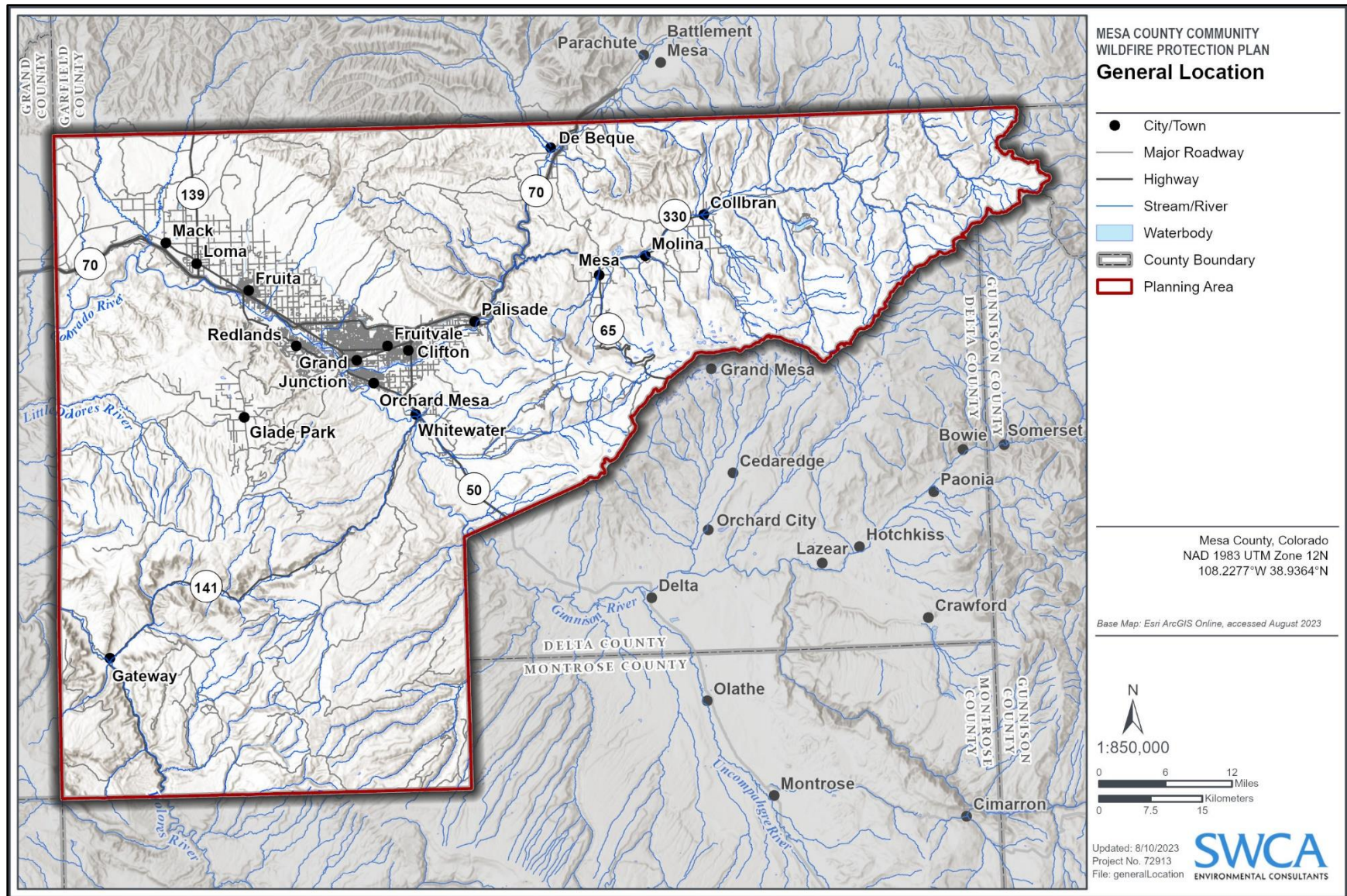


Figure 1.2. Mesa County general location.

Additional information on the county is provided in Appendix B, Community Background and Resources.

LAND OWNERSHIP

Large portions of Mesa County (over 70%) are owned and managed by the federal government (Figure 1.3). Of these federal lands, approximately 45.86% of the county is managed by the BLM's Grand Junction Field Office; 26.7% is managed by the U.S. Forest Service's (USFS's) Grand Mesa, Gunnison and Uncompahgre National Forests; 0.9% is managed by the National Park Service's (NPS's) Colorado National Monument, and less than 1% (0.35%) is managed by the U.S. Bureau of Reclamation. An additional 4.2% of Mesa County is owned and managed by the State of Colorado. Finally, approximately 26.7% of the land in the county is privately owned.

Additional details regarding land in Mesa County, such as topography and land management direction, are summarized in Appendix B.

PUBLIC INVOLVEMENT

Engaging interested parties is critical in the CWPP process. During this CWPP update process, a public survey was created and distributed to community members to collect their feedback.

The draft CWPP was made available for public review from August 14, 2023, through August 27, 2023. Comments were collected and incorporated into the plan as appropriate before the final plan was created.

Additional information regarding public involvement and outreach can be found in Appendix I.

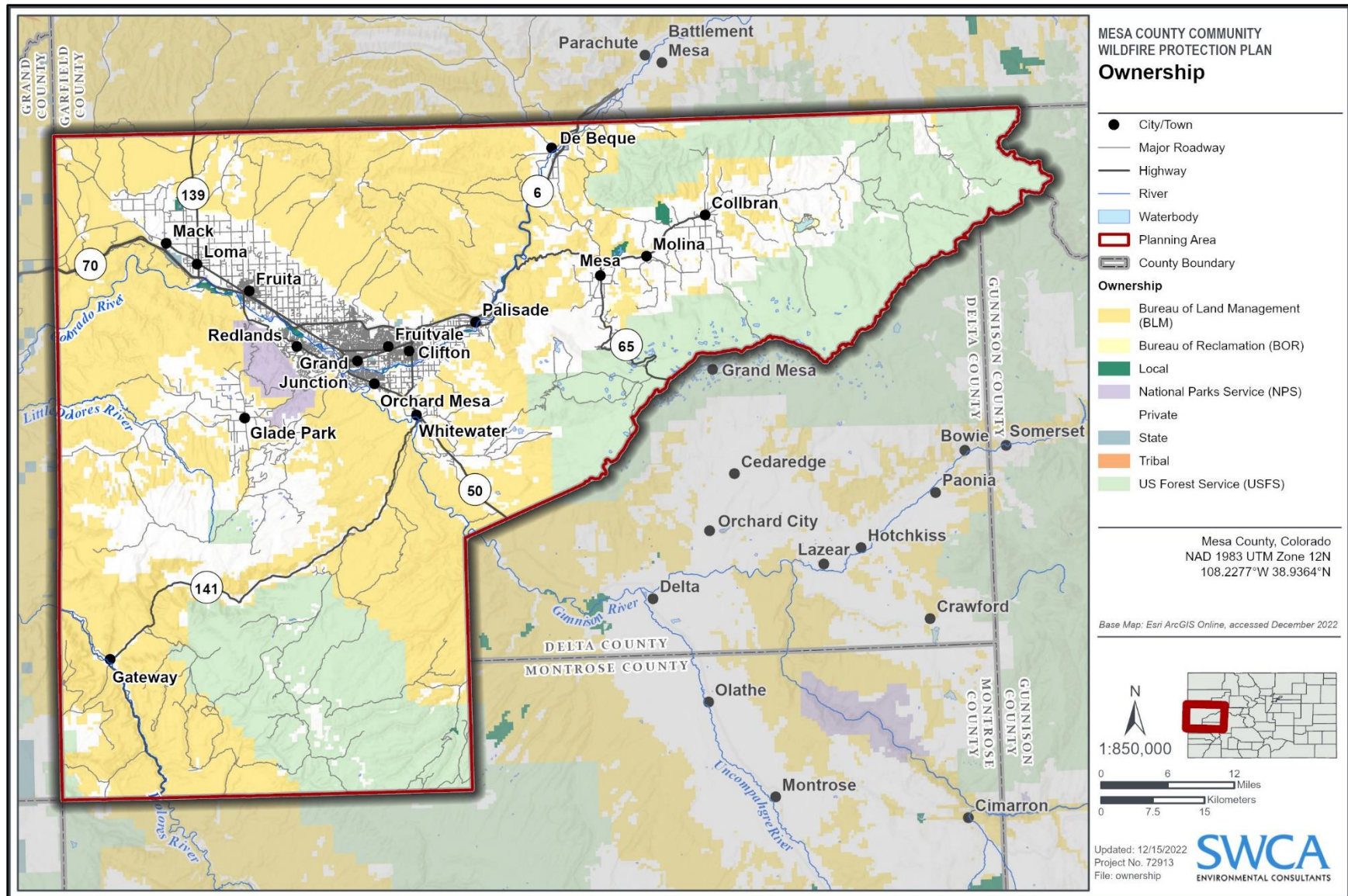


Figure 1.3. Mesa County land ownership.

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WILDLAND URBAN INTERFACE

The wildland urban interface (WUI) is composed of both interface and intermix communities and is defined as areas where human habitation and development meet or intermix with wildland fuels (U.S. Department of the Interior and U.S. Department of Agriculture [USDA] 2001:752–753). Interface areas include housing developments that meet or are in the vicinity of continuous vegetation. Intermix areas are those areas where structures are scattered throughout a wildland area where the cover of continuous vegetation and fuels is often greater than cover by human habitation.

The WUI creates an environment in which fire can move readily between structural and vegetative fuels, increasing the potential for wildland fire ignitions and the corresponding potential loss of life and property. Human encroachment upon wildland ecosystems within recent decades is increasing the extent of the WUI throughout the county (Figures 2.1 and 2.2), which is having a significant influence on wildland fire management practices. The expansion of the WUI into areas with high fire risk, combined with the collective effects of aggressive suppression policies, resource management practices, land use patterns, climate change, and insect and disease infestations, has created an urgent need to modify fire management practices and policies and to understand and manage fire risk effectively in the WUI (Pyne 2001; Stephens et al. 2005). Mitigation techniques for fuels and fire management can be strategically planned and implemented in WUI areas (e.g., with the development of defensible space around homes and structures).

A CWPP offers the opportunity for collaboration of land managers to establish a definition and a boundary for the local WUI; to better understand the unique resources, fuels, topography, and climatic and structural characteristics of the area; and to prioritize and plan fuels treatments to mitigate for fire risks. At least 50% of all funds appropriated for projects under the HFRA must be used within the WUI. The HFRA has given power to the Core Team to define the WUI in Mesa County differently than the Colorado State designation for WUI.

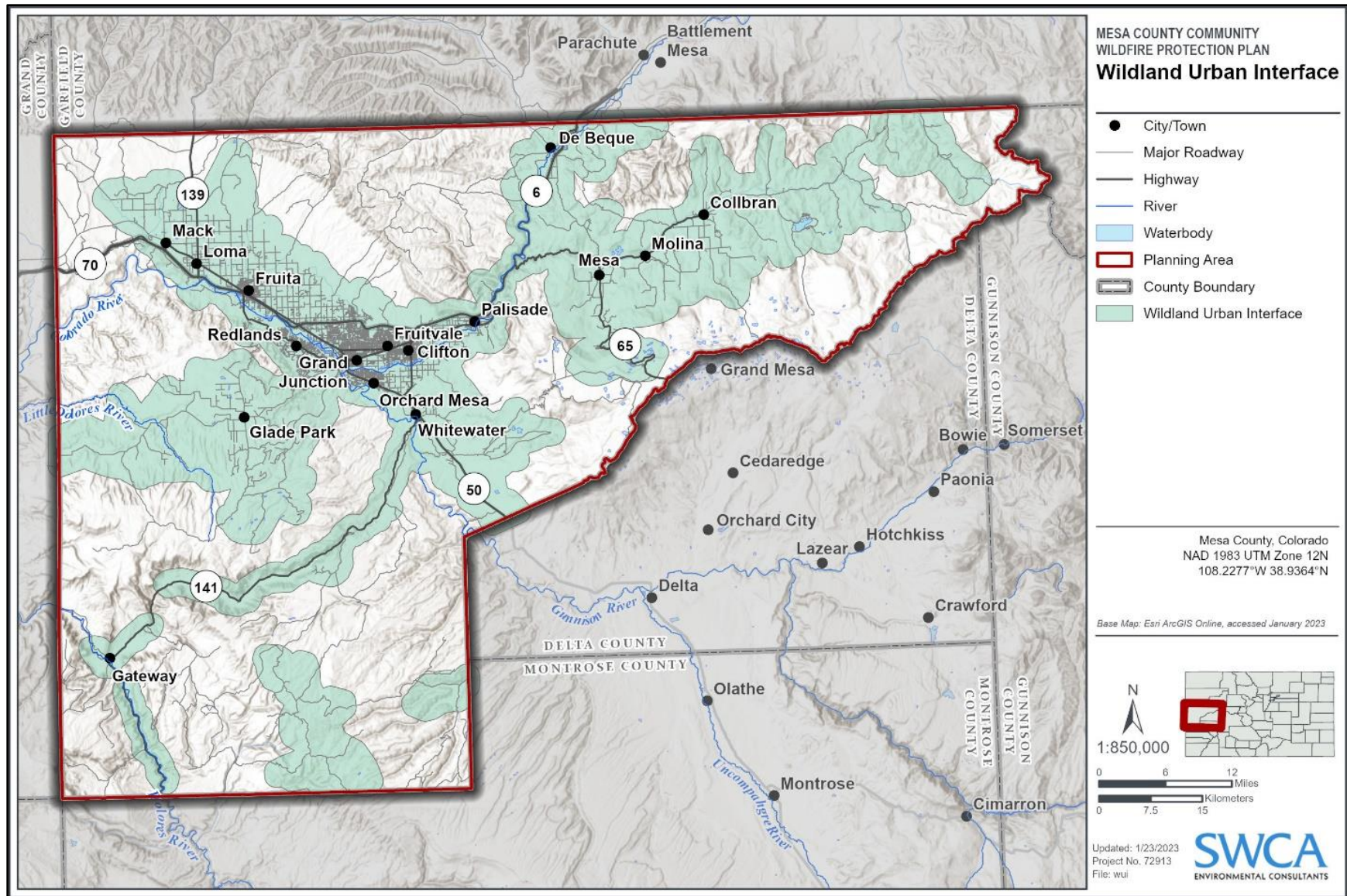


Figure 2.1. Mesa County WUI map.

The Core Team has decided to delineate the WUI as an area 1 mile from the edge of an at-risk community (Figure 2.1). Because of the rural nature of the county, at-risk communities are in turn defined as all communities on the edge of urban areas. Much of this land encompasses agricultural lands with scattered and remote homes in unincorporated areas. For each community in the county classified as high or extreme risk, a detailed map of the WUI area is presented in Appendix C.

WILDLAND URBAN INTERFACE LAND USE

Cities and counties are continuously challenged to accommodate both current and future residents in need of safe and affordable housing. Between 2010 and 2020, Colorado's population increased by nearly 745,000 people, but the development of new housing did not increase to meet this demand (U.S. Census Bureau 2020). Over the past few decades, jurisdictions across the state have approved many new housing units. These are often placed within or near wildland areas, creating WUI conditions (Figure 2.2). Today, more than 46 million residences in 70,000 communities across the United States are at risk for WUI fires (U.S. Fire Administration [USFA] 2021 a). When it comes to wildfire, this trend is of special concern since WUI conditions are linked with an increased risk of loss of human life, property, natural resources, and economic assets.



Figure 2.2. Example of the WUI in Mesa County (Source: Mesa County).

Appendix C houses the 2012 Mesa County CWPP community descriptions and hazard ratings accompanied by a WUI delineation map for each community evaluated within Mesa County that received a high or extreme risk rating (see an example in Figure 2.3). The WUI and associated buffer is an area where fuel treatments should be prioritized in order to provide additional protection to the community from potential wildfire spread.

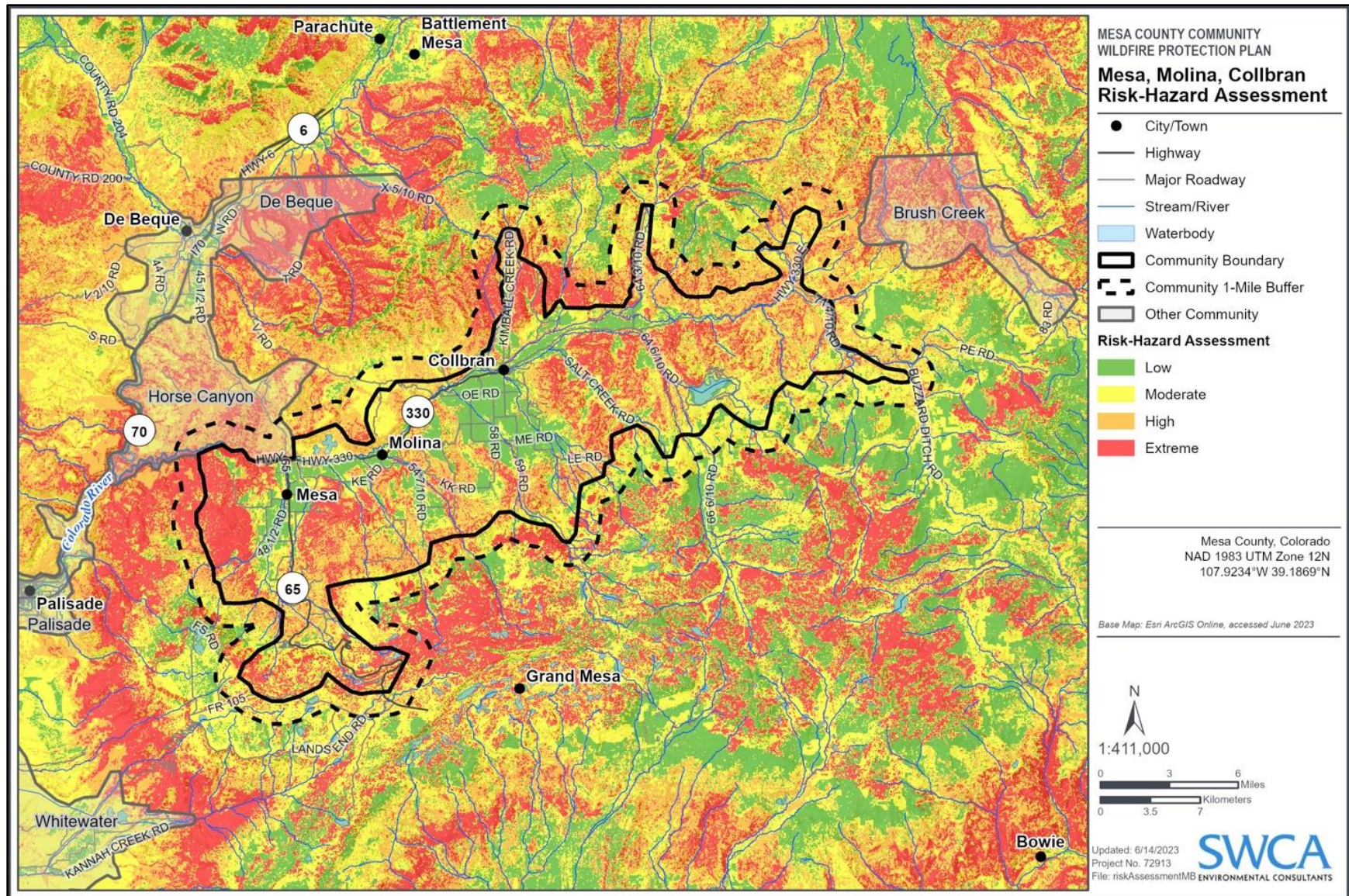


Figure 2.3. Communities of Mesa, Molina, and Collbran and 1-mile WUI buffer.

VEGETATION AND LAND COVER

Vegetation zones within the county are primarily a function of elevation, slope, aspect, substrate, and associated climatic regimes. Since a broad range in elevation and topography exists across the focus areas, characteristics in vegetative communities are quite variable across the county (Figures 2.4 and 2.5).

Dominant vegetation types within the county are described based on a large spatial scale and represent the overall community structure that will play a general role in fire occurrence and behavior. Although the vegetation types are outlined for the county, site-specific evaluations of the vegetative composition and structure in each area of focus should be taken into consideration when planning fuels treatments. Various fuel types and methods are specified in Appendix F.

According to the Southwest Regional Gap Analysis Project (SWReGAP) (2022) the dominant vegetation types in Mesa County are Colorado Plateau Pinyon-Juniper Woodland, Rocky Mountain Gambel Oak-Mixed Montane Shrubland, Rocky Mountain Aspen Forest and Woodland, Inter-Mountain Basins Big Sagebrush Shrubland, Inter-Mountain Basins Mixed Salt Desert Scrub, and Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland. Other types of land cover (e.g., agricultural areas and water bodies) also exist in the county and are not described in more detail as they do not play a significant role in fire behavior.

Wetland and riparian vegetation are the most threatened vegetation in Mesa County (Colorado Natural Heritage Program [CNHP] 2002). Riparian areas are found throughout the county at all elevations. At the lowest elevations, Rio Grande cottonwood (*Populus deltoides* ssp. *wislizeni*) make up the overstories with thick shrub-dominated understories of willow (*Salix* sp.) and invasive tamarisk (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*). Above about 5,500 feet, Rio Grande cottonwood is replaced by narrowleaf cottonwood (*Populus angustifolia*). Common understory species at these elevations are various willows, red-osier dogwood (*Cornus sericea*), chokecherry (*Prunus virginiana*), and wild rose (*Rosa woodsii*) (CNHP 2002). Key fuel reduction treatments should include the removal of tamarisk, Siberian elm (*Ulmus pumila*), and Russian olive invasive plants throughout Mesa County. These species should be a focus of fuel treatments because of their ability to proliferate in densely vegetated Southwest Riparian Woodland and Shrubland (Figures 2.4 and 2.5), which increases fuel loads and, in turn, can increase wildfire risk in nearby WUI areas. Live or dead vegetation that allow for flames to be carried from the lower vegetation on the forest floor to the tree canopy, or “fuel ladders”, should also be prioritized for treatment.

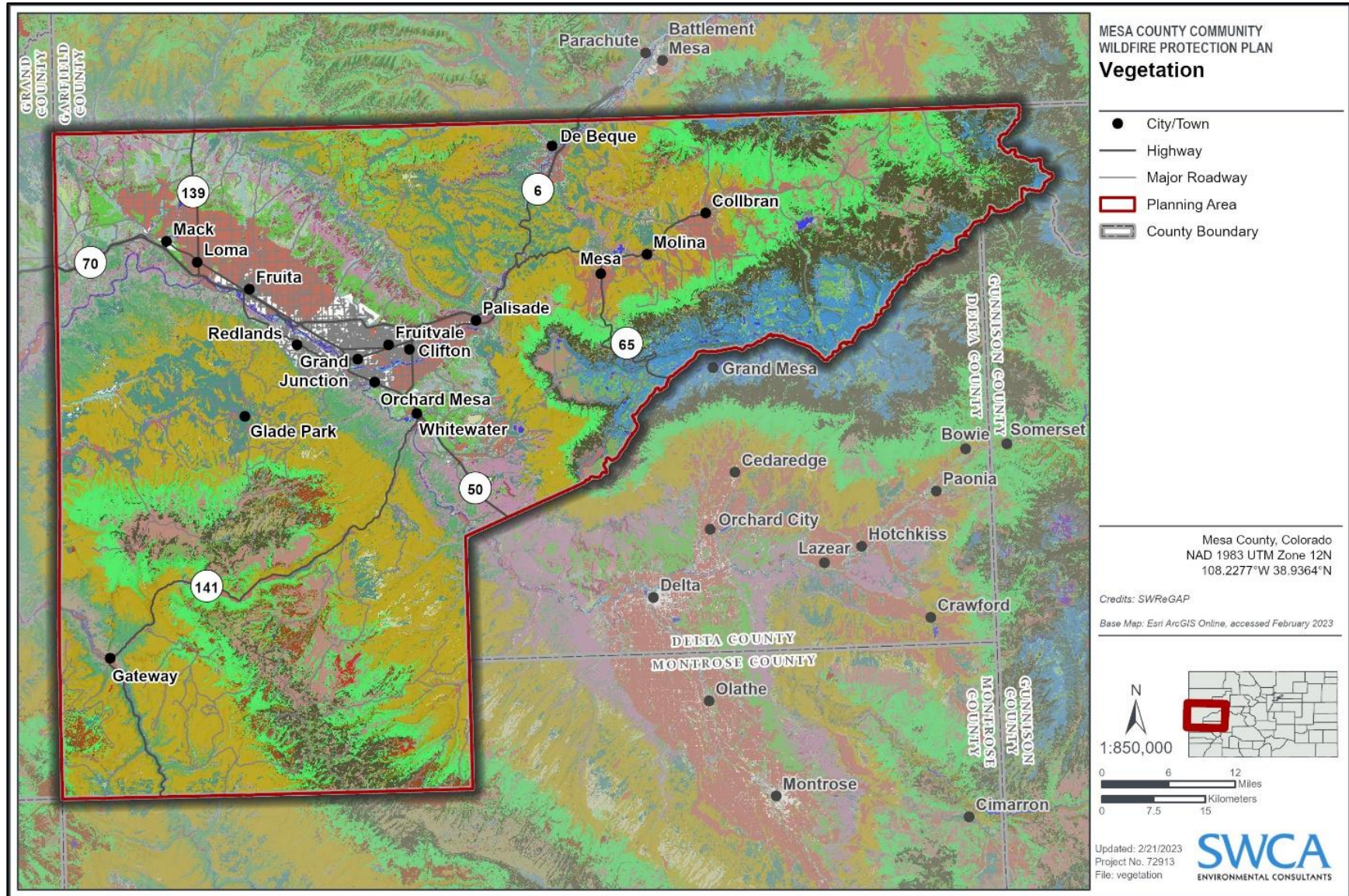


Figure 2.4. Vegetation types (recent to 2016) in Mesa County.

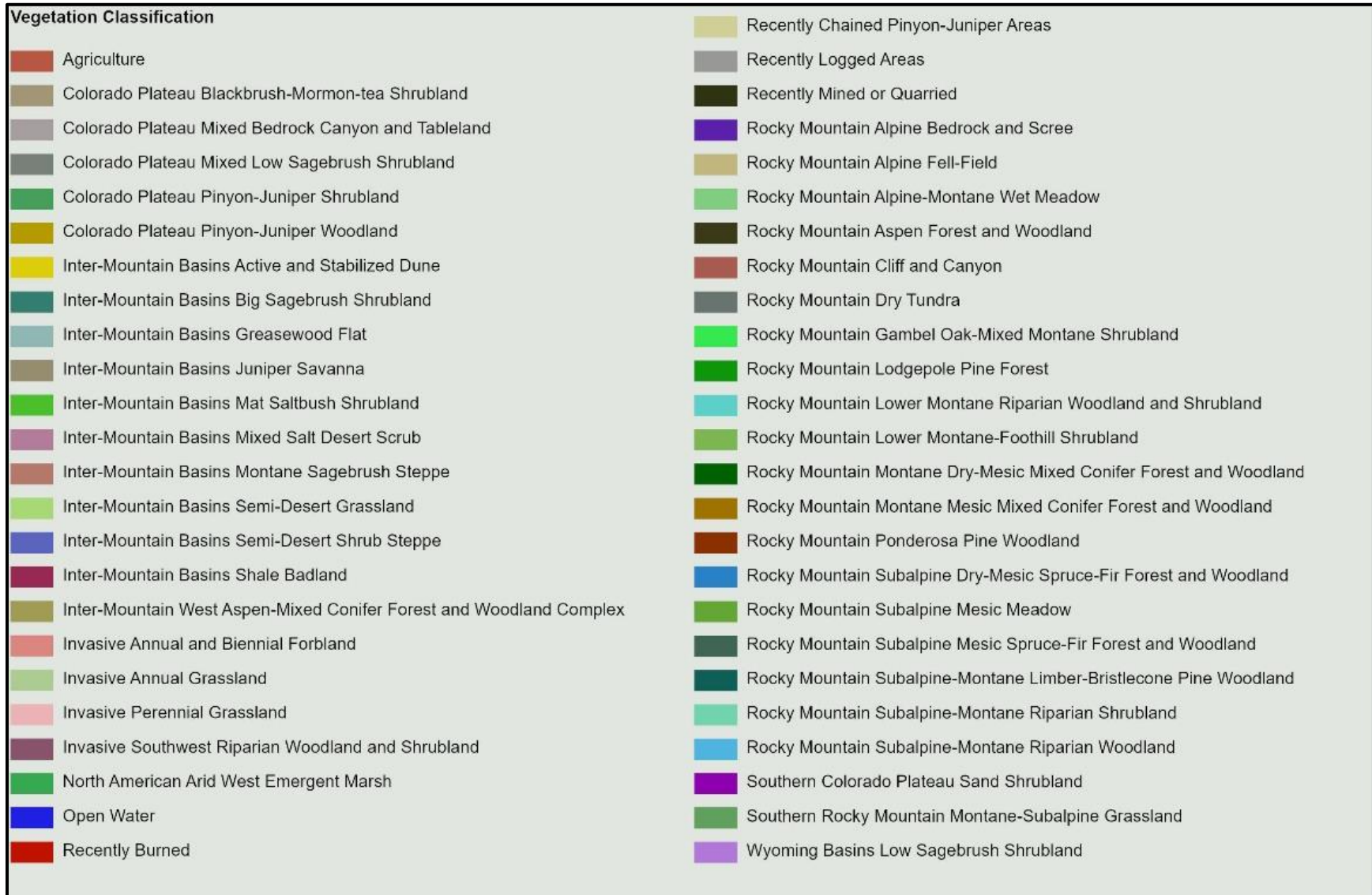


Figure 2.5. Legend for the vegetation types in Mesa County.

FUELS AND TOPOGRAPHY

Fuels in Mesa County were classified using the updated Scott and Burgan (2005) 40 fuels model. Fuels in this region are typically dependent on elevation. Generally, lower-elevation areas around Grand Junction, De Beque, Glade Park, and Gateway are dominated by grass (GR1 and GR2) and grass shrub (GS2 and GS1) fuel types. GR1 fuels typically occupy sites that are either arid and have low fuel loading or have experienced recent wildfire (e.g., the Pine Gulch burn scar). GS1 fuels typically represent low elevation grass-shrublands, where there is an intermix of grass species and shrubs, typically sagebrush (*Artemisia tridentata*).

GS2 and SH1 fuels typically represent Mesa County's pinyon-juniper (*Pinus edulis*–*Juniperus osteosperma*) woodlands. These commonly occur on the mesa tops at low to mid-elevations. At mid-elevations, many of the lower slopes of the county's mesas are characterized by SH5, SH7, and TL3 fuels, which typically correspond to Gambel oak (*Quercus gambelii*) shrublands and woodlands. These fuels typically have higher fuel loading. While not easily visible on the fuel map (Figure J.1), it is important to note that at lower elevations many canyon and drainage bottoms with perennial and ephemeral streams can also have a high degree of shrub and woodland fuel loading due to the wetter and cooler conditions. These fuels, combined with their confinement in canyons and drainages, can result in hazardous rates of spread and greater fireline intensity during a wildfire.

As elevation increases many forest fuel types become more common. For instance, Gambel oak–dominated fuels transition into TU1 fuels, which typically correspond to aspen (*Populus tremuloides*) stands. Fuelbeds in TU1 fuels are low and are comprised of grasses and shrubs. The highest elevations are typically dominated TU5 fuels, which usually correspond with Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*) forests. TU5 typically have high fuel loads derived from conifer litter and down-woody debris. The non-burnable areas in the county are typically associated with developed areas, exposed ridges, and non-vegetated desert; while these areas are considered non-burnable, wildfires have been known to “jump” these areas of sparse vegetation (e.g., Pine Gulch Fire) and cause spot ignitions in areas with suitable fuels. Additional information on fuels within Mesa County is in Appendix D, Fire Behavior Modeling/GIS Background and Methodology.

Table 2.1. Most Common Fuel Types in Mesa County

Existing Fuel Type	Acres	Percent
GS2	543,849	25.42
TU1	220,829	10.32
SH5	192,068	8.98
TL3	185,299	8.66
GR1	156,782	7.33
SH1	125,490	5.87
GS1	123,780	5.79
SH7	116,792	5.46
GR2	100,583	4.70
TU5	79,079	3.70
SH2	76,017	3.55
NB3	65,771	3.07

Existing Fuel Type	Acres	Percent
NB1	50,801	2.37
TL8	43,653	2.04
NB9	30,377	1.42
Other – various fuel types	28,050	1.31

Source: Scott and Burgan (2005)

Figure J.1 in Appendix J shows fuels within Mesa County. Please see Appendix D for detailed descriptions of each fuel type.

EMBER IGNITION HAZARDS

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

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

For more detailed information and explanations on ember ignition hazards, see Appendix B.

FIRE REGIMES

Fire regimes are defined by wildfire characteristics such as intensity, frequency, seasonality, and spatial pattern when measured across time. These characteristics are directly correlated with vegetation communities and are the basis for fire regime delineation. Understanding of fire regimes helps prioritize and plan for fuels treatments across a fire management region.

The fire regimes in Mesa County play an important role in shaping the ecology of the area. The complex topography and biophysical nature of Mesa County have resulted in a diverse array of vegetation types with their unique fire ecology (Figures 2.4 and 2.5). The lowest elevations are characterized by desert grassland, with fire return intervals (FRIs) ranging from 10 to 100 years. At slightly higher elevations the grasslands transition into sagebrush shrublands, where FRIs ranging from 40 to 250 years (USFS 2012). Mid-elevations are characterized by pinyon-juniper woodlands that have highly variable FRIs ranging from 40 to 400 years. Rocky Mountain Gambel Oak Mixed Montane Shrublands typically occupy the lower portions of the county’s montane regions (e.g., Grand Mesa and the Uncompahgre Plateau), with FRIs ranging from 1 to 100 years. Transitioning out of the oak shrublands, the higher-elevation montane

areas are dominated by aspen forests and spruce-fir forests, where fire regimes can range from 100 to 500 years (USFS 2021c).

Similar to other areas in Colorado, fire suppression, changing land use, and changing land management have resulted in more hazardous wildfire conditions in Mesa County (Colorado Department of Public Safety 2018). However, there is misconception that all fire-prone landscapes in Mesa County have historically exhibited low-intensity frequent surface fire regimes. Evidence suggests that forests and woodland areas in southwestern forests with longer fire intervals may not have been significantly impacted by fire suppression efforts during the twentieth century. In Mesa Verde National Park, pinyon-juniper woodlands had fire turnovers every 400 years. Given the timing of fire suppression policies in relation to the park's fire history, it is unlikely that the park's fire ecology significantly deviated from its historic conditions (Floyd et al. 2000). Similar findings have also been found in Colorado's spruce-fir forests (Higuera et al. 2021).

Fire regimes in the more common vegetation types of the Mesa County region are discussed below.

SAGEBRUSH SHRUBLANDS

Sagebrush shrublands are common in Mesa County and occur from low to high elevations; however, they are typically found in desert scrub and pinyon-juniper woodlands. This vegetation type can vary in species composition and distribution based on site characteristics such as aspect, elevation, precipitation, temperature, and soil type. Fire return intervals in sagebrush shrublands depend on fuel loading and continuity. In arid sites with less continuous fuels, FRIs are longer due to less wildfire spread. Conversely, sites with shorter intervals have more continuous fuel cover from finer fuels like grasses. These FRIs can range from 40 to 250 years (USFS 2012, 2021c). Fire in this vegetation type can spread into adjacent vegetation types. Additionally, invasives, such as cheatgrass, can heighten burn probability and wildfire spread (BLM 2015). Effective fuel management, especially within the WUI, can mitigate wildfire risk to local towns/communities and prevent the spread of fires into woodlands with higher fuel loads that are susceptible to high severity fires.

PINYON-JUNIPER WOODLANDS

Fire disturbance in pinyon-juniper woodlands was relatively infrequent but played a greater role where pinyon-juniper woodlands transition to savannah, ponderosa pine, and scrub oak (*Quercus gambelii*). Many pinyon-juniper ecotones are experiencing expansion or contraction (Betancourt 1987; Gottfried 2004). The historical assessment of woodlands is closely linked to the issue of encroachment into grasslands, with evidence suggesting long-term trends rather than solely land use changes. Factors, such as disturbance recovery, natural range expansion, livestock grazing, fire exclusion, and CO₂ fertilization contribute to the complex nature of pinyon-juniper expansion (Romer et al. 2009). However, some regions, like Mesa County, are experiencing impacts from a combination of factors, such as drought, disease, invasive plants and changing fire regimes, potentially leading to the reduction of pinyon-juniper woodland cover (CSFS 2021; Zouhar 2003).

Pinyon-juniper savannas, typically located in lower-elevation sites, consist of scattered trees in a grass matrix (Dick-Peddie 1993). These savannas have experienced decreased range as tree density increased. There is significant scientific debate regarding the natural FRI for savannas, but it is generally agreed that fire was more frequent in savannas than in persistent woodlands due to the higher density of ground fuels in the savannah zones. Persistent pinyon-juniper woodlands tend to have older and denser trees, where herbaceous understory vegetation is typically sparse, even in the absence of heavy livestock grazing. Evidence suggests that FRIs in persistent woodlands may have been on the order of 400 years

or longer (Baker and Shinneman 2004; Romme et al. 2007). Fire exclusion in persistent pinyon-juniper woodlands has likely had little to no impact, unlike pinyon-juniper savannahs (Romme et al. 2007). As such, any fire work in pinyon-juniper ecotones should consider local fire ecology, land use, invasive plants, and most importantly, departure (or lack thereof) from historical conditions (Romme et al. 2007).

GAMBEL OAK WOODLANDS

Gambel oak woodlands are typically dominated by high-frequency, high-severity fire regimes (USFS 2021c). In the Mesa County region these woodlands typically experience stand replacement events every 80 to 100 years (USFS 2021c). The seral stage (i.e., the primary succession stage) after a wildfire is usually a grass-forb vegetative community, but shrubs also prolifically resprout from underground roots. If there is frequent fire, the constant resprouting may deplete stored resources in the roots and increase the time frame for recovery of the oak woodland. After 60 years scrub oak naturally dies back, which can result in increased fuel accumulation and increase the severity of a wildfire (Simonin 2000). The fast recovery of Gambel oak (and other shrubs in these woodlands) has led to their encroachment into old-growth pinyon-juniper woodlands. Floyd (2000) found that Gambel oak can persist in low abundance in the understory of pinyon-juniper woodlands. After high severity wildfires, the oak can quickly resprouts and dominates the post-fire landscape, while pinyon-juniper is slow to recover. This is pronounced in edge habitats where pinyon-juniper woodlands transition to Gabel oak. In southwest Colorado, evidence suggests that more frequent high severity fires has caused Gambel oak woodlands to replace old-growth pinyon-juniper woodlands (Floyd 2000; Floyd et al. 2004).

ASPEN FORESTS

Aspen is a clonal fire adapted species and many of the large aspen stands in southwest Colorado are the result of the region's fire ecology. Generally, fire regimes in aspen stands can vary substantially. The wildfire severity in aspen dominated forests is typically a function of stand age, stand health, and presence of more fire prone conifers (Shinneman et al. 2013). Normally, fire will not spread in aspen forests due to their high fuel-moisture. However, under the right climate and fuel conditions, crown fires can spread throughout aspen forests. Crown fire potential also increases with increasing prevalence of conifers and dead fuels (e.g., down woody debris and standing dead trees). Since aspen has thin bark, even low intensity surface fires can cause significant mortality on aspen stands. Typically, younger aspen stands experience less severe fires, while older stands experience more severe fires (USFS 2021c, 2022g). In the Mesa County region, most aspen forests are likely to fit into two types of fire regime: fire-influenced, stable aspen and conifer-aspen mix; and fire-dependent (Shinneman et al. 2013).

SPRUCE-FIR FORESTS

In Mesa County, spruce-fir forests (Engelmann spruce and subalpine fir) comprise substantial portions of the forested Grand Mesa. These forests arise due to secondary forest secession following a high-severity fire event, where it may take spruce and fir over 100 years to establish in the post-disturbance forest and another 100 or more years to reach dominance in the overstory (Uchytel 1991a, 1991b). Due to the successional nature of spruce-fir forests and their cool, wet conditions, their stand and fuels densities are high and their FRIs are long. Lightning and downslope fires are primary causes of fire in spruce-fir forests. When fires occur, they are usually large, destructive stand replacement events (Sibold 2006; Uchytel 1991a, 1991b); follow periods of substantial tree mortality (e.g., disease and insects); and are strongly correlated with exceptionally hot and dry fire seasons (Higuera et al. 2021; Sibold 2006). In the Mesa County region, the estimated FRI in most spruce-fir forests usually ranges from 200 to 500 years (USFS

2021c). Climate change is expected to increase the probability of fire in spruce-fir forests (Higuera et al. 2021).

IMPACTS FROM CHEATGRASS

Invasive annual plants, such as cheatgrass (*Bromus tectorum*) and, to a lesser extent, jointed goatgrass (*Aegilops cylindrica*), Russian thistle (*Salsola tragus*), and European madwort (*Alyssum simplex*), have significantly impacted the natural fire regimes of Mesa County (BLM 2015, 2019). In invaded ecosystems, cheatgrass can promote unnatural fine fuel growth (BLM 2015) and, at times, dominate the post-fire landscape, which can increase the potential for and recurrence of future wildfire (Zouhar 2003). In areas dominated by cheatgrass, the average FRI is typically less than 10 years (Paysen et al. 2000). In Mesa County, the most impacted vegetation types are usually grasslands, shrub-steppe, and pinyon-juniper woodlands (BLM 2015 and 2019a).

Impacts of Cheatgrass to Pinyon-Juniper Woodlands. Cheatgrass (Figure 2.6) has been described as ubiquitous to many pinyon-juniper woodlands (Zouhar 2003). Mature pinyon-juniper woodlands with a sparse understory of native perennials that experience infrequent stand replacement events are most likely to experience cheatgrass invasion during the early post-wildfire successional stages (Goodrich 1999; Zouhar 2003), where cheatgrass can achieve 60% to 80% ground cover within 5 to 10 years. If allowed to persist, cheatgrass would transition from a very infrequent FRI (~400 years) to a recurring FRIs of less than 20 years and a loss of natural pinyon-juniper woodlands (Zouhar 2003).



Figure 2.6. Cheatgrass (*Bromus tectorum*) is identified by its spindle leaves and signature droopy-brome with hues that vary between dull red and tan.

IMPACTS FROM TAMARISK AND RUSSIAN OLIVE

Fire-tolerant, flammable, non-native species now exist within cottonwood (*Populus* sp.) and willow (*Salix* sp.) stands along the Colorado River corridor and other rivers and drainages throughout the county. One species that deserves special mention with regard to wildfire is the non-native phreatophyte tamarisk (*Tamarix* sp.). This species is common among nearly all riparian areas in Mesa County. Once established, tamarisk can obtain water at deeper groundwater levels and has higher water-use efficiency than native riparian trees in both mature and post-fire communities (Busch 1995; Busch and Smith 1993).

One of the major competitive advantages of tamarisk (Figure 2.7) is its ability to sprout from the root crown following fire or other disturbances (e.g., flood, herbicides) that kill or severely injure aboveground portions of the plant (Brotherson and Field 1987; Brotherson and Winkel 1986; Smith et al. 1998). Tamarisk flammability increases with the buildup of dead and senescent woody material within the dense bases of the plant (Busch 1995). Tamarisk can also contribute to increased canopy density, which creates volatile fuel ladders and increases the likelihood of wildfire. Other non-native species, such as Russian olive and Siberian elm, also exist along the river corridors and have created similar problems,

although not as extensive, to those created by tamarisk. These invasives can heighten hazardous wildfire conditions in canyons and drainage bottoms.

Programs to reduce tamarisk have already been implemented in the county and include collaborative activities from non-profit, county, state, and federal partners (Mesa County 2023a). In Grand Junction, the RiversEdge West organization has been working to actively restore native riparian vegetation by removing tamarisk and restoring native riparian plant communities throughout the county (RiversEdge West 2023). Tamarisk and Russian olive have been removed via various methods, including bulldozer land clearing, mechanical chipping or mulching, and cut-stump with herbicide application. All treated vegetation should be removed from open spaces, roads, and walking rights-of-way through a range of biomass mitigation practices, such as pile burning with proper county burn permits. Restoration efforts include secondary weed control (kochia, Russian knapweed, perennial pepper weed, and Russian thistle primarily), native riparian and upland grass seeding, upland and riparian shrub plantings, and woody riparian pole plantings. The goal for the project is to enhance ecological health, visitor experience, and wildlife habitat (RiversEdge West 2023).



Figure 2.7. A mature tamarisk (*Tamarix* sp.) tree-shrub that is characterized by its dense composition, blue-green leaves, and narrow cluster of small flowers differing between white and pink (photo credit: J. Oldenettel, 2008).

CLIMATE AND WEATHER PATTERNS

Table 2.2. Mean Annual Temperature and Precipitation by Station in Mesa County

Location	Period of Record	Mean Annual Precipitation (Inches)	Mean Annual Temperature (°F)		
			Max	Min	Mean Annual
Piñon Mesa	1991–2020	23.3	52.6	28.8	40.7
Grand Mesa	1991–2020	30.1	46.8	25.6	36.2
Grand Junction	1991–2020	9.1	66.6	39.8	53.2

Sources: NOAA (2023); PRISM (2023)

In Mesa County, July is usually the hottest month, with average maximum temperatures ranging from 69.8°F to 94.5°F. January is the coldest month, with average minimum temperatures ranging from 9.8°F to 17.3°F. Temperatures in the valleys and canyons show more variation between summer and winter than the montane areas. Grand Junction experiences hot summers but comparable winter temperatures to the Piñon and Grand Mesas.

Annual precipitation can vary greatly. Grand Junction receives only 9.1 inches of precipitation, while the western side of the Grand Mesa receives over 30.1 inches. Spring and fall are usually the wettest months, but the high-elevation mesas also receive significantly more winter precipitation. The North American Monsoon (NAM) effect is most evident in the Grand Junction and Piñon Mesa regions, with higher precipitation in late summer and early fall. June and July are typically the driest months, posing a high risk of wildfires. The NAM effect usually starts in late August, ending the fire season. However, years with little NAM impact can result in prolonged wildfire conditions in the fall. The NAM effect has become more erratic and unpredictable due to climate change. In 2020, the region experienced one of the driest monsoon seasons on record, leading to low precipitation levels in Mesa County. These conditions likely contributed to the Pine Gulch Fire, the third largest wildfire in Colorado history.

Monthly climate normals (30-year averages) for Mesa County are graphed by weather stations and modeled climate data below (Figures 2.8–2.10).

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

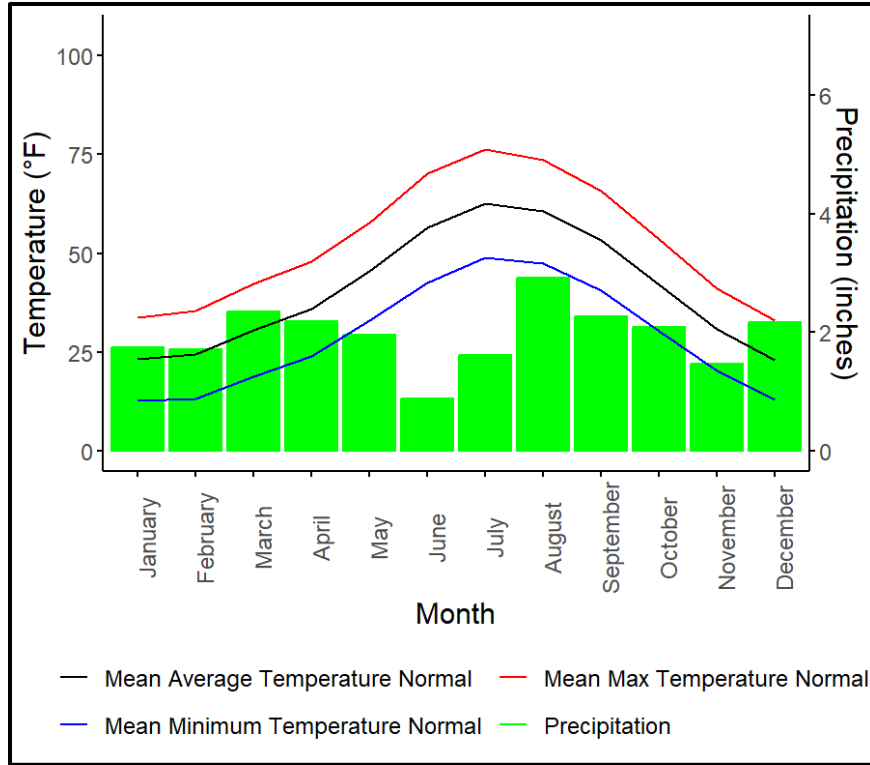


Figure 2.8. Monthly climate averages for the Piñon Mesa region, Colorado, 1991–2020 (source: PRISM 2023).

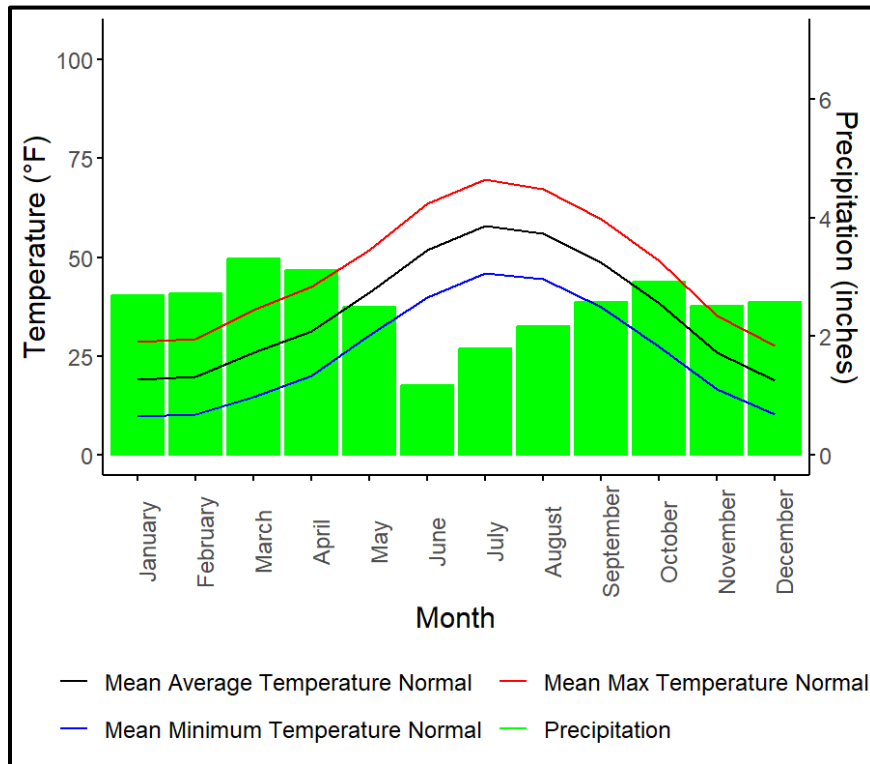


Figure 2.9. Monthly climate averages for the Grand Mesa region, Colorado, 1991–2020 (source: PRISM 2023).

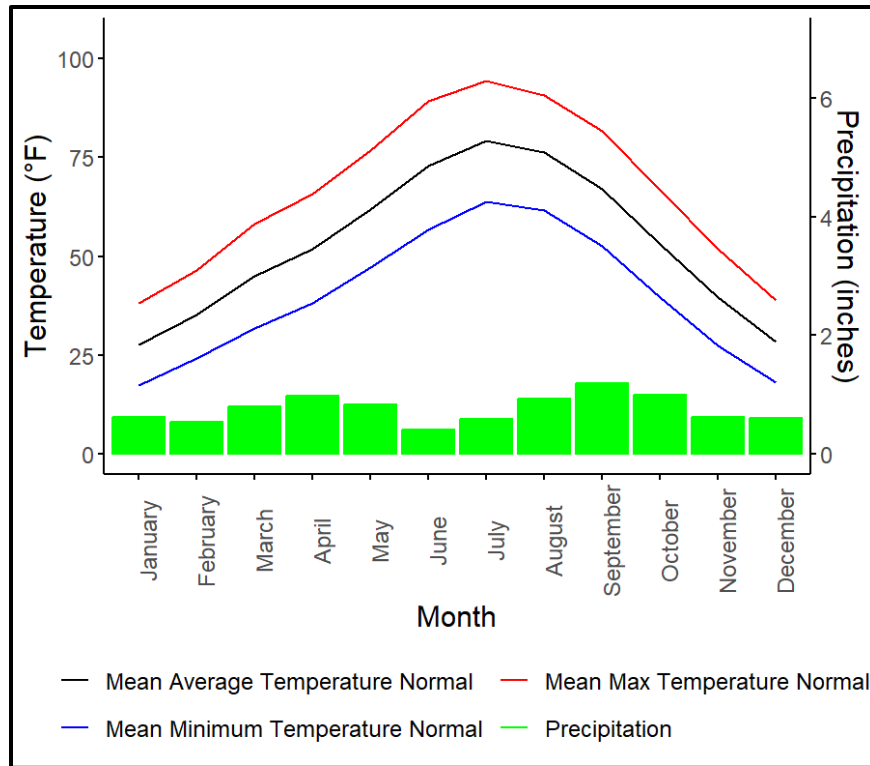


Figure 2.10. Monthly climate averages for Grand Junction, Colorado, 1991–2020 (source: NOAA 2023).

FIRE HISTORY

Fire is a natural part of Colorado’s diverse landscapes and is essential to many ecosystems across the state. Almost all of Colorado’s diverse ecosystems are fire-dependent or fire-adapted. For centuries, many Colorado Native American tribes recognized this interdependence between fire and the ecosystem and used prescribed burning to maintain and restore ecosystem health. However, in the 1800s, a shift in management actions—settlers began enforcing strict fire suppression regimes—led to challenges such as dense stand conditions, unhealthy rangelands, and increased ecosystem and community vulnerability to fire. These challenges hold true today in Mesa County, with many areas experiencing an increased fire threat from historic normal (Mesa County Sheriff’s Office 2015). Furthermore, other actions such as human expansion into wildlands, climate change, and forest health degradation have likely resulted in an imbalance between wildfire and ecosystem interactions (Higuera et al. 2021).

PAST FIRE MANAGEMENT POLICIES AND LAND MANAGEMENT ACTIONS

Fire management in Colorado and the western United States has adapted over time in response to changing knowledge of forest ecosystems. In 1910, just 5 years after the USFS was established, massive fires burned over 3 million acres of the agency’s land in northern Idaho and western Montana, prompting a federal fire suppression policy to protect ecosystem services and timber stands (USFS 2017). The NPS and BLM were established in 1916 and 1946, respectively, and adopted similar land management philosophies.

In the 1970s, forest management research began to reveal the natural role of wildfire in ecosystems (USFS 2017), and by the turn of the century, complete fire suppression tactics on publicly managed land were mostly replaced with a combination of suppression, containment, and mitigation measures such as fuel treatments and prescribed burning (Forests and Rangelands 2021). Although these practices now protect and restore public lands through more scientifically supported methods, some areas in Mesa County have excessive fuel buildups, dense and continuous vegetative cover, and invasive plant encroachment exacerbated by historic land management practices (Mesa County Sheriff's Office 2015).

RECENT FIRE OCCURRENCE

Colorado's fire season has been estimated to occur between mid-May and mid-October (Wei et al. 2017). Mesa County's recent fire history reflects this, as most fires occurred within the period of May through September, which is when high temperatures and drier conditions are more probable across the county (Figure 2.15). Natural causes have been the primary cause of wildfire ignitions (Figure 2.16); however, human ignitions are also common. Since 2014, humans have been responsible for 37.6% of the fires that have occurred within Mesa County and have a known ignition source, with many of these human-caused ignitions occurring near the county's towns and municipalities (Figures 2.17 and 2.18). Specific recent wildfire events are discussed in more detail below. An analysis of Mesa County's wildland fire history (1980–2022) (LANDFIRE 2022) shows that fires have mostly occurred in the county's forested areas (Figure 2.11). Specific recent wildfire events are discussed in more detail below.

Wildfire has become an increasing concern throughout the western United States. Since 2010, nationally, a record number of acres have burned, and numbers are continually increasing (NIFC 2020). In 2020, 58,950 fires were reported nationwide, burning 10.1 million acres (NIFC 2020). In 2020, wildfires burned 665,454 acres of land in Colorado, marking the largest and most destructive season recorded in the state's history (*Colorado Sun* 2020). It is estimated that wildfire suppression efforts in Colorado cost over \$266 million in 2020. Mesa County avoided the worst effects of the 2020 drought and fire season; however, it was impacted by the nearby Pine Gulch Fire. The worst fire in recent years occurred in 2018 when the Bull Draw Fire burned over 36,000 acres of land between Montrose and Mesa Counties. The wildfire seasons in 2018 and 2020 corresponded with a period extreme drought and warm growing season temperatures brought on by climate change (NOAA 2023).

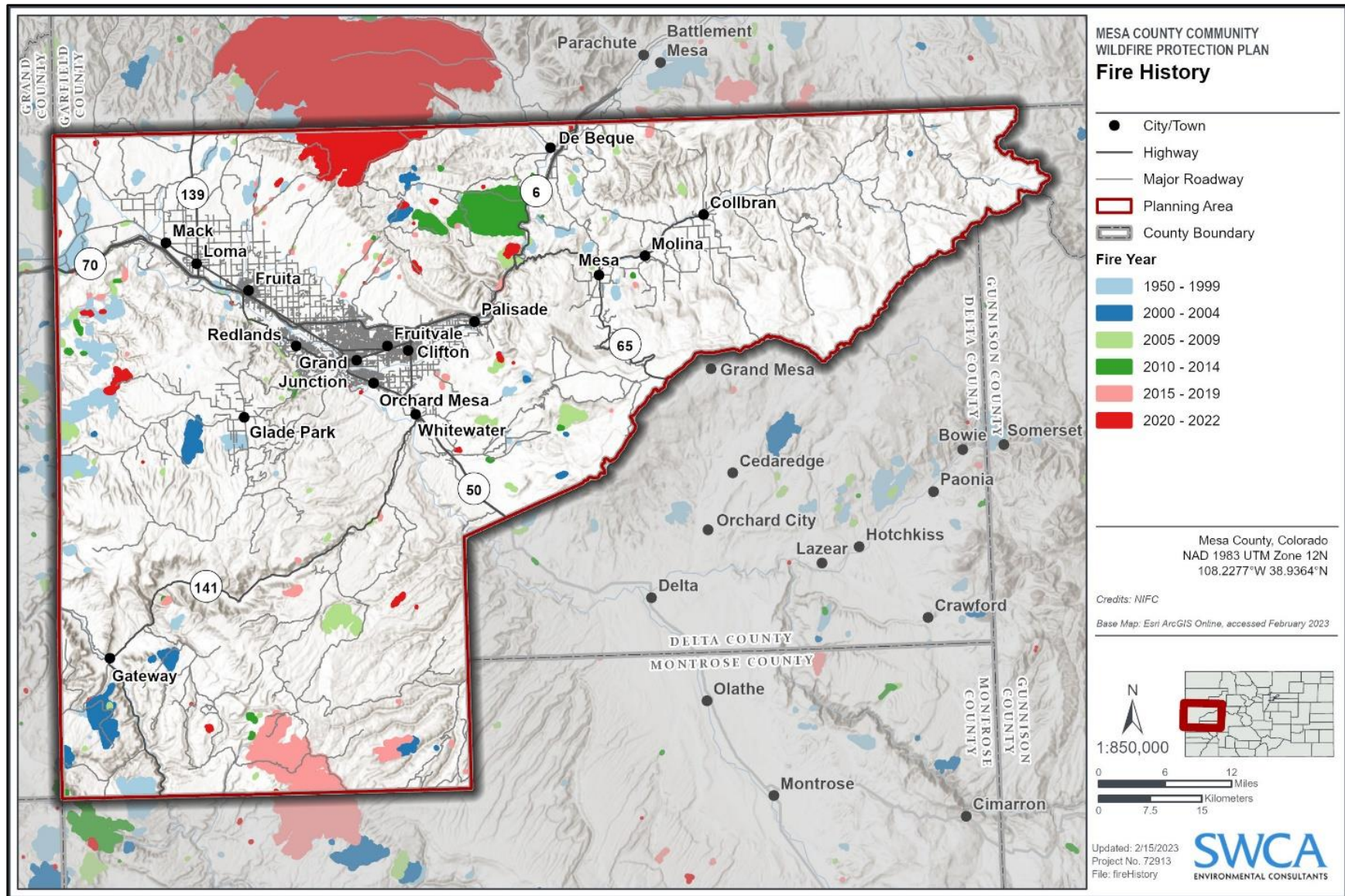


Figure 2.11. Recent wildfire history in Mesa County.

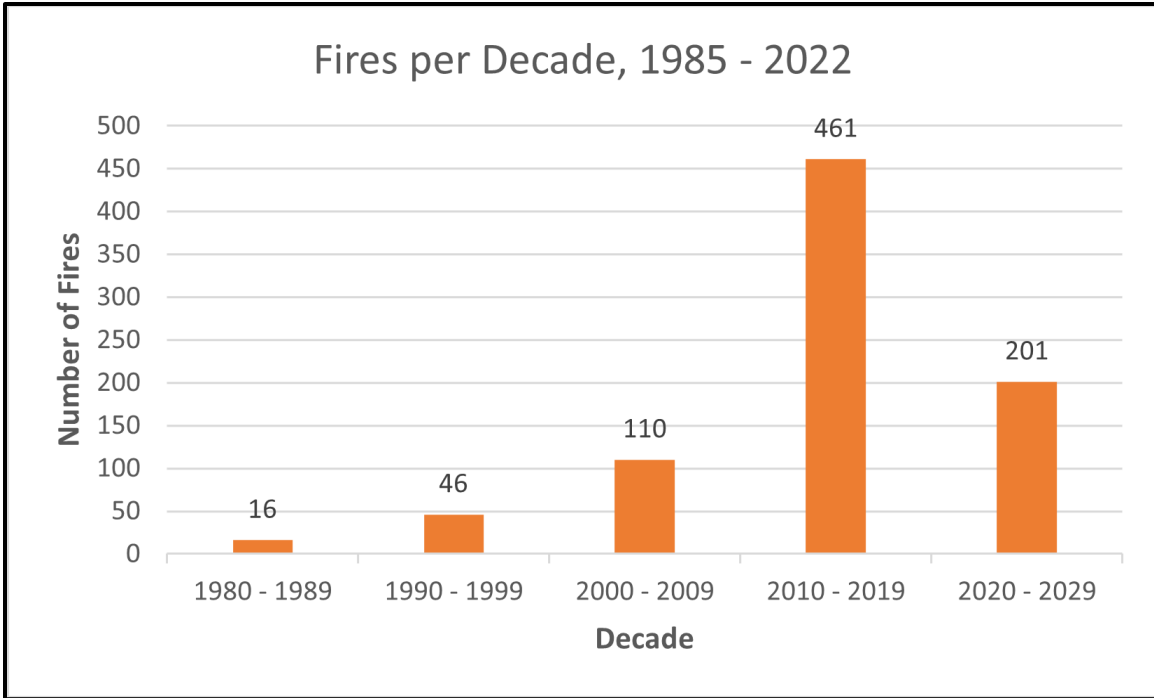


Figure 2.12. Decadal wildfire frequency for Mesa County based on available data from 1985 through 2022.

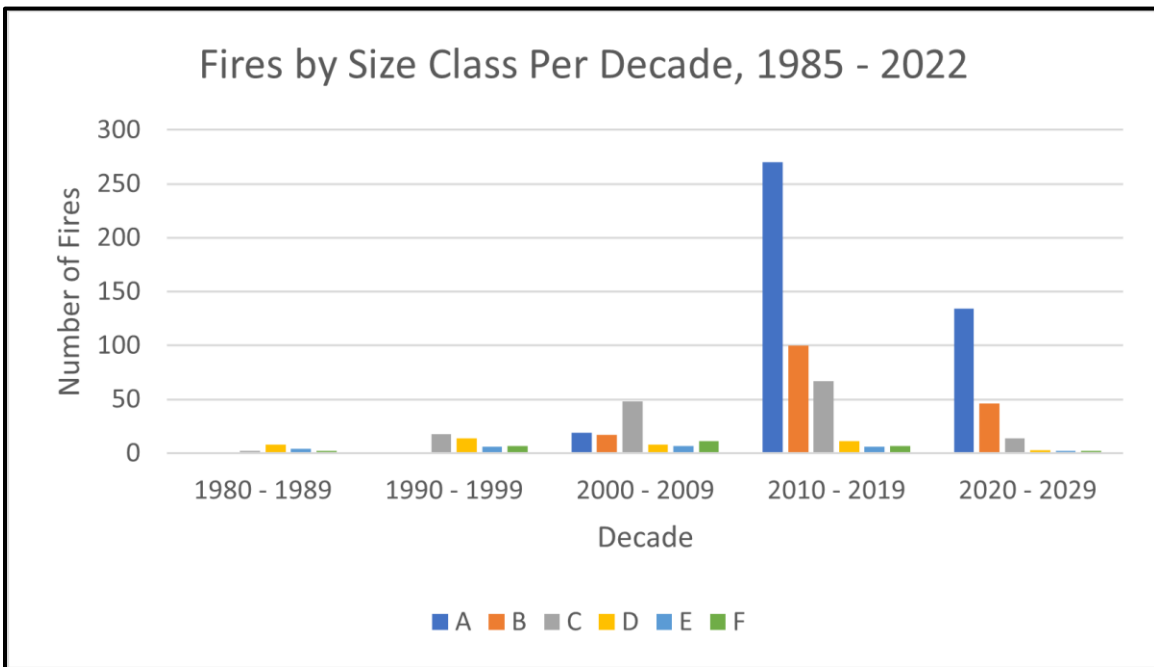


Figure 2.13. Fire size statistics for Mesa County are based on fire history data from 1985 through 2022. The size classifications are as follows: A = 0–0.25 acre, B = 0.25–10 acres, C = 10–100 acres, D = 100–300 acres, E = 300–1,000 acres, F = >1,000 acres.

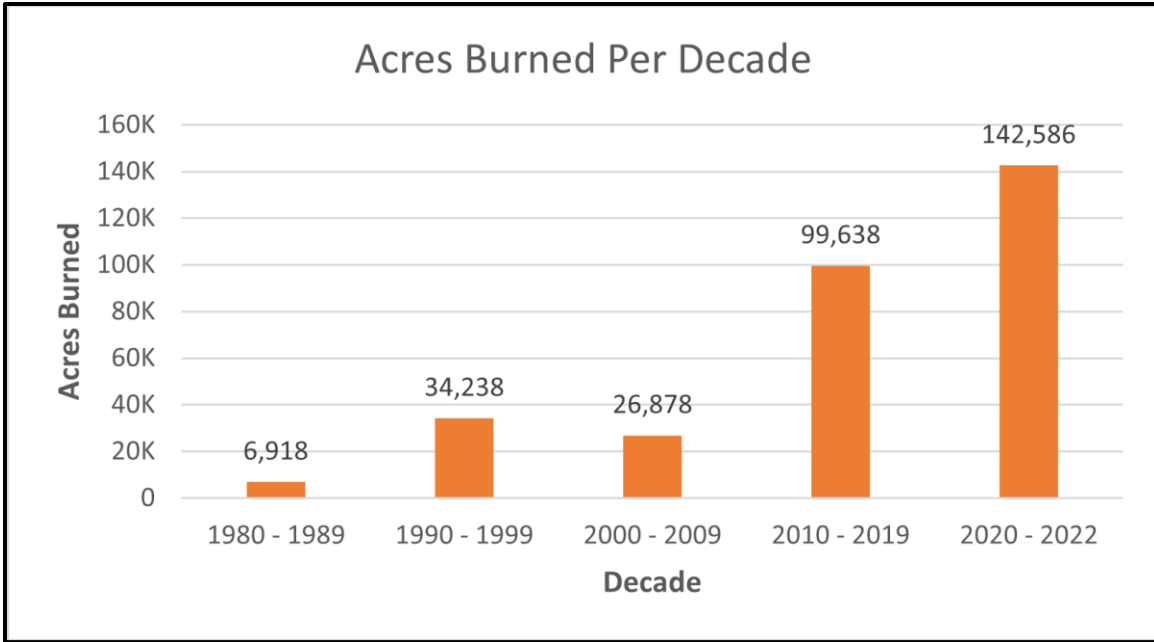


Figure 2.14. Acres burned per decade for Mesa County based on fire history data from 1985 through 2022.

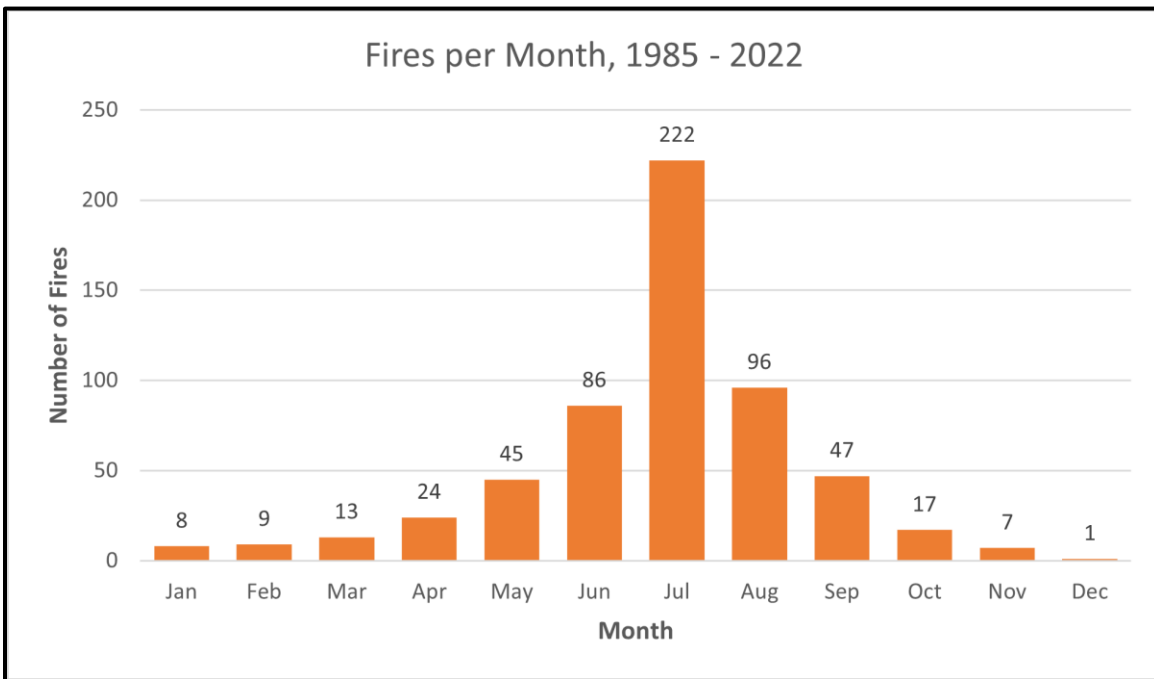


Figure 2.15. Number of recorded fires per month in Mesa County from 1985 through 2022.

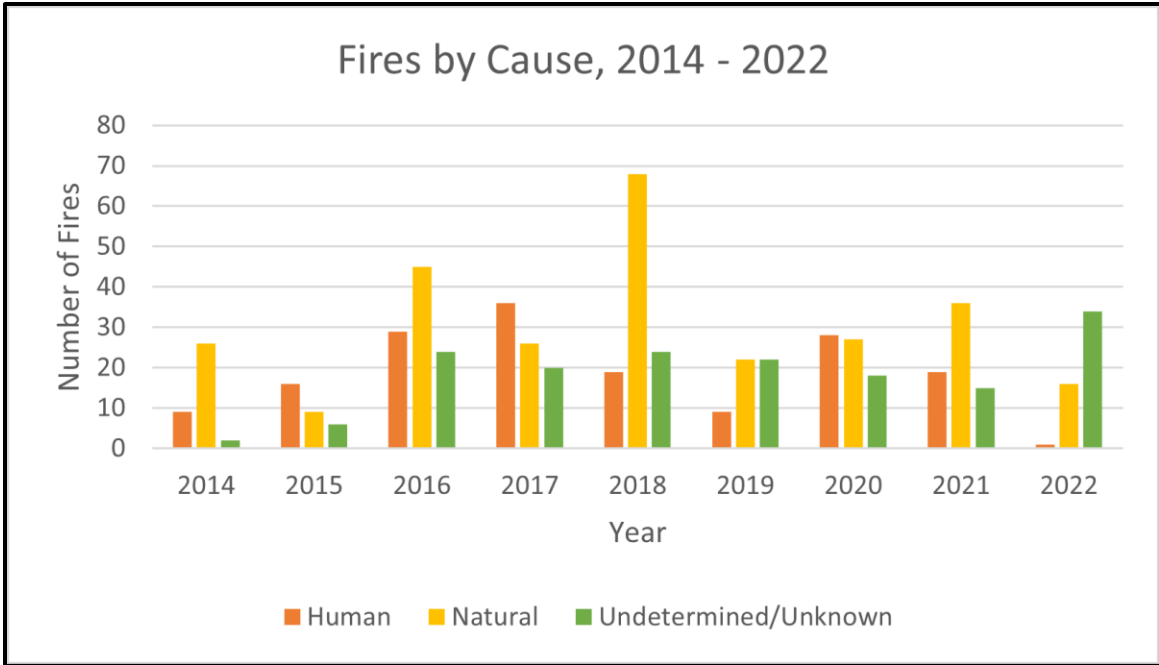


Figure 2.16. Cause of wildfire ignitions in Mesa County from 2014 through 2022.

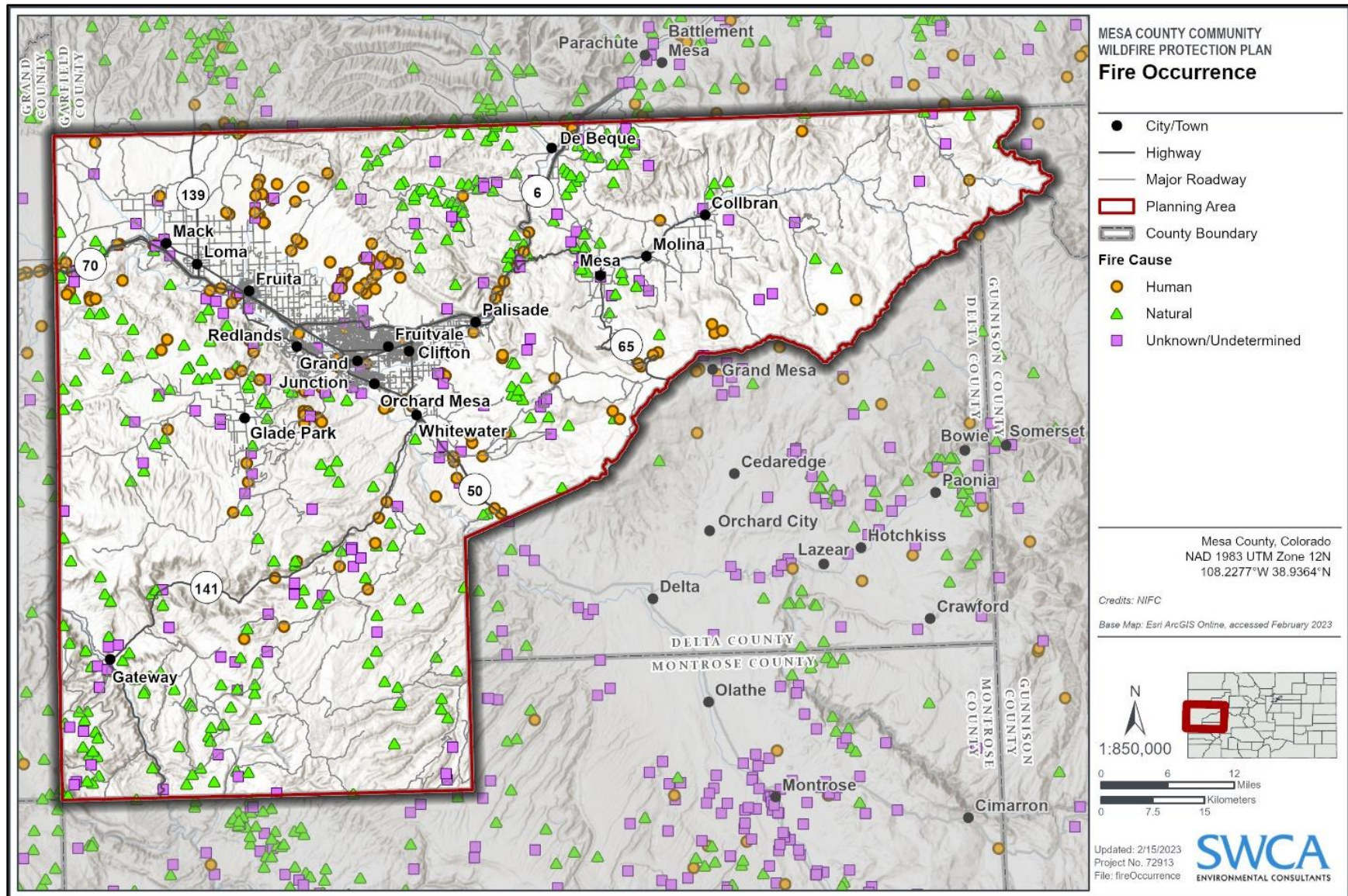


Figure 2.17. Location of wildfire occurrences in Mesa County.

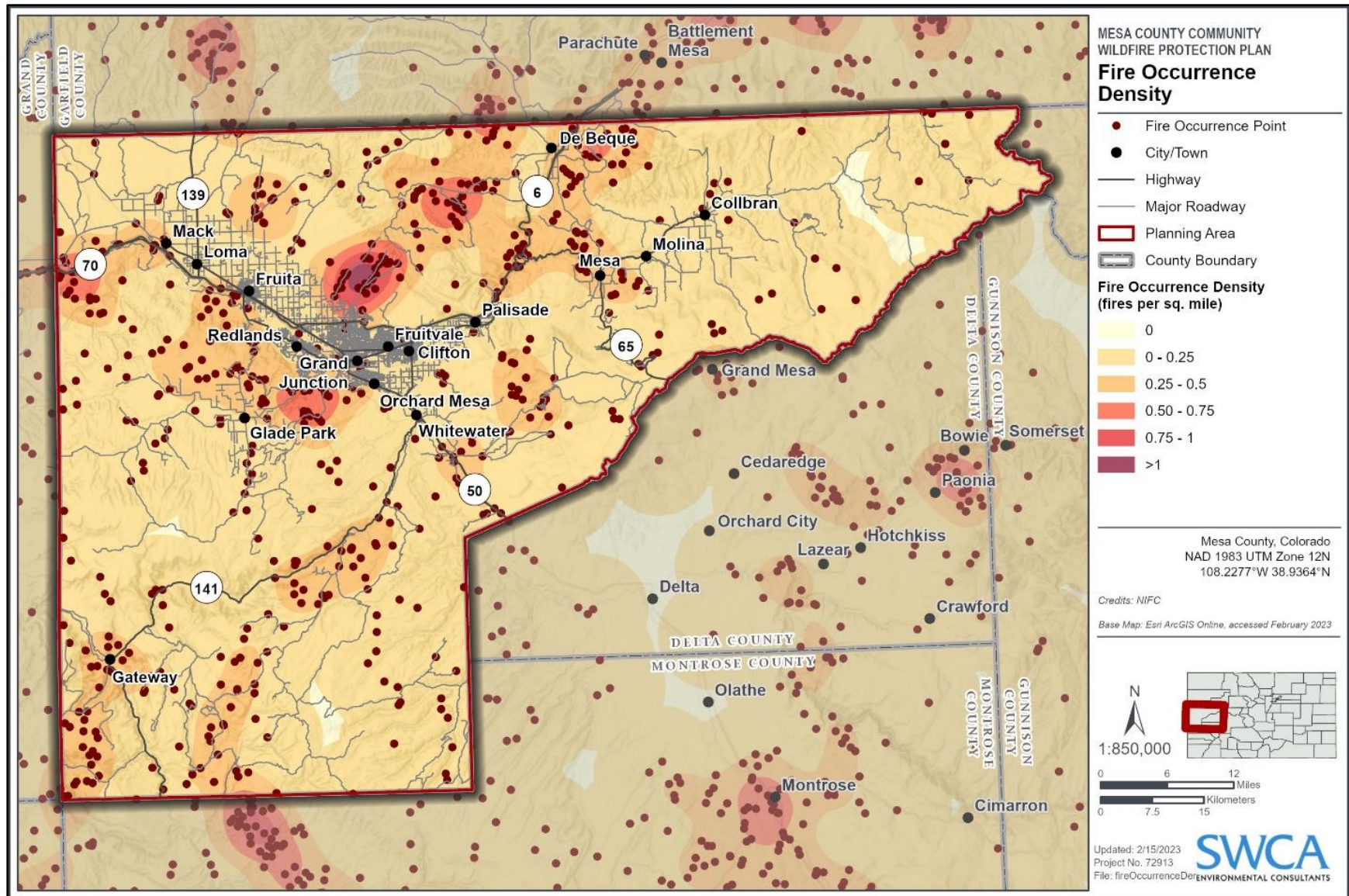


Figure 2.18. Fire occurrence densities in Mesa County.

The three largest and most destructive wildfires in Mesa County have occurred since 2012, with all three having been ignited by lightning. The more recent wildfires have occurred where wildfires had not previously, which has largely been attributed to impacts from drought and unnatural fuel accumulation due to fire suppression and the intrusion of non-native plants (Mesa County 2020).

Pine Ridge Fire: This fire was ignited by lightning strike and occurred northeast of Grand Junction and west of De Beque. Burning in the summer of 2012 from June 27 to July 4, the Pine Ridge Fire burned 13,920 acres of land. This led to long term closures of the land from public access to allow for rehabilitation of the ecosystem, which was greatly impacted by the high-intensity fire. Additionally, post-fire erosion threatened major water quality impacts to the Colorado River (USDA 2012).

Bull Draw Fire: This fire occurred on the Uncompahgre National Forest and adjacent land northwest of Nucla and was ignited by a lightning strike in July 2018. The summer was particularly hot and dry, with annual precipitation in much of the region hovering around 50% of historical averages (Montrose Dispatch 2018), leading to difficult firefighting conditions. The fire burned over 35,000 acres across Montrose and Mesa Counties throughout July, August, and September until cooler temperatures and 5 inches of snowfall helped crews achieve 100% containment in early October (Montrose County Sheriff's Office 2018). It is estimated that suppression costs for the Bull Draw Fire were over 10.7 million dollars (NIFC 2020).

Pine Gulch Fire: This fire was started by a lightning strike on July 31, 2020, approximately 18 miles north of Grand Junction, Colorado, in Mesa and Garfield Counties. The fire moved quickly through grass, sage, pinyon-juniper, and Douglas-fir during unseasonably hot weather. Drought stressed vegetation combined with steep terrain led to extreme fire behavior and weeks of active burning. On August 18, a thunderstorm produced 40-mph sustained winds for 3 to 4 hours, which resulted in the fire perimeter increasing by 30,000 acres in a single night. The Pine Gulch Fire is the third largest wildfire in Colorado state history, covering 139,007 acres before being fully contained on September 23 (Mesa County Sheriff's Office 2023).

FIRE RESPONSE CAPABILITIES

PLANNING DECISION AND SUPPORT

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

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

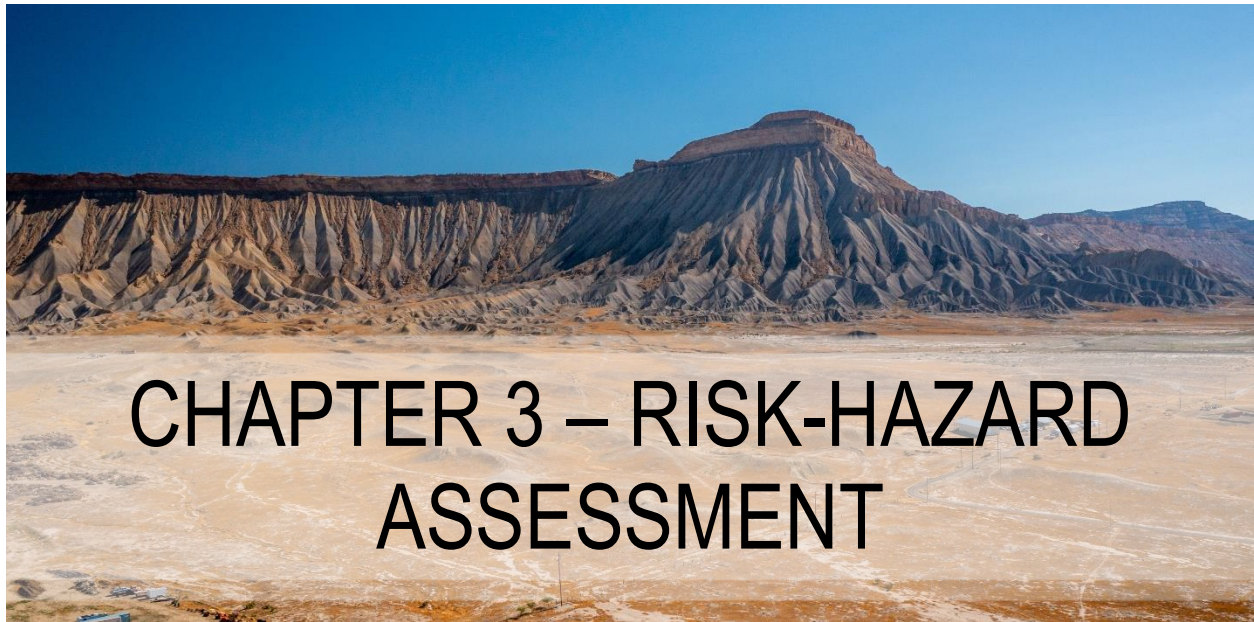
FIRE RESOURCES

Fire management in Colorado is accomplished through a cooperative interagency partnership among federal, state, and local entities. Wildland fire response is directed and managed by regional interagency

fire centers in Colorado. These dispatch centers are part of the larger Rocky Mountain Area Coordination Center. The dispatch centers in Colorado include the Fort Collins, Craig, Grand Junction, Montrose, Durango, and Pueblo Interagency Dispatch Centers. When a fire is reported in Mesa County, a 911 call is routed to the Grand Junction Regional Communications Center, which will dispatch the appropriate agency. Additional details regarding fire response resources can be found in Appendix B, and Map J.10 of Appendix J outlines local fire station service areas.

Individuals seeking fire resources can explore the Mesa County Wildfire Council (<https://sheriff.mesacounty.us/divisions/emergency-services/wildland-fire-management/>) and Two Rivers Wildfire Coalition (<https://www.tworiverswildfirecoalition.org/>) websites, both of which serve as excellent local resources for collaborative education and action on wildfire prevention, mitigation, and community preparedness.

In addition, community members can sign up for emergency alerts to be notified to their cell phone of any emergencies faced by the county. Additional resources for community and fire preparedness can be found in Appendix B.



CHAPTER 3 – RISK-HAZARD ASSESSMENT

PURPOSE

The purpose of developing the Risk-Hazard Assessment model described here is to create a unique tool for evaluating the risk of wildland fires to communities within the WUI areas of Mesa County. Although many definitions exist for hazard and risk, for the purpose of this document, these definitions follow those used by the firefighting community:

Risk is defined as the chance of a fire starting as determined by the presence and activity of causative agents (National Wildfire Coordinating Group [NWCG] 1998).

Hazard is a fuel complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition and resistance to control.

From the risk assessment, land use managers, fire officials, planners, and others can begin to prepare strategies and methods for reducing the threat of wildfire, as well as work with community members to educate them about methods for reducing the damaging consequences of fire. The fuels reduction treatments can be implemented on both private and public land, so community members have the opportunity to actively apply the treatments on their properties, as well as recommend treatments on public land that they use or care about.

Disclaimer

The purpose of this risk assessment is solely to provide a community- and landscape-level overview of general wildfire risks within the assessment area as of the date hereof, and to provide a potential resource for community pre-fire planning. This risk assessment is premised on various assumptions and models, which include and are based on data, software tools, and other information provided by third parties (collectively, "Third-Party Information and Tools"). SWCA, Incorporated, doing business as SWCA Environmental Consultants ("SWCA"), relied upon various Third-Party Information and Tools in the preparation of this risk assessment, and SWCA shall have no liability to any party in connection with this risk assessment including, without limitation, as a result of incomplete or inaccurate Third-Party Information and Tools used in the preparation hereof. This risk assessment may not be relied upon by any party without the express written consent of SWCA. SWCA hereby expressly disclaims any responsibility for the accuracy or reliability of the Third-Party Information and Tools relied upon by SWCA

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RISK-HAZARD ASSESSMENT INPUTS

The Risk-Hazard Assessment is created by layering several risk-hazard inputs, including fire behavior model outputs generated in the desktop analysis (flame length, rate of spread, crown fire potential, and burn probability, all of which are discussed in Appendix D, Fire Behavior Modeling/GIS Background and Methodology), highly valued resources and assets (HVRAs) (discussed in the Values at Risk section of Chapter 3), and the WUI (discussed in the Wildland Urban Interface section of Chapter 2), fire history, and fire response (both described in Appendix B, Community Background and Resources).

DESKTOP ANALYSIS

The desktop analysis analyzes risks and hazards, uses fuels properties, topography, and weather to generate fire behavior modeling outputs: burn probability (Map J.3 in Appendix J), crown fire activity (Map J.5), flame length (Map J.2), and rate of spread (Map J.4), which were used as inputs (along with fire history, fire response, VARs, and the WUI) in the Risk-Hazard Assessment.

Detailed information on fuels analysis and calibration, topography, and weather are provided in Appendix D.

Information regarding fire history and response resources are explained in Chapter 2 and Appendix B, respectively.

Fire Behavior Modeling

Overview

Three factors influence the spread of wildfire in the wildland fire environment: fuels, topography, and weather. Understanding how these factors interact to produce a range of fire behavior is fundamental to determining treatment strategies and priorities in the WUI. In the wildland environment, vegetation is synonymous with fuels. When sufficient fuels for continued combustion are present, the level of risk for those residing in the WUI is heightened. Fire spreads in three ways: 1) surface fire spread, in which the flaming front remains on the ground surface (in grasses, shrubs, small trees, etc.) and resistance to control is comparatively low; 2) crown fire, in which the surface fire “ladders” up into the upper levels of the forest canopy and spreads through the tops (or crowns) independent of or along with the surface fire, and when sustained is often beyond the capabilities of suppression resources; and 3) spotting, in which embers are lifted and carried with the wind ahead of the main fire and ignite in receptive fuels; if embers are plentiful and/or long range (>0.5 mile), resistance to control can be very high. Crown fire and spotting activity have been a concern for fire managers, particularly under extreme weather conditions. In areas where homes are situated close to timber fuels and/or denser shrubs and trees, potential spotting from woody fuels to adjacent fuels should always be acknowledged.

For this plan, an assessment of fire behavior has been carried out using well-established fire behavior models: FARSITE, FlamMap, BehavePlus, and FireFamily Plus housed within the Interagency Fuel

Treatment Decision Support System (IFTDSS), as well as ArcGIS Desktop Spatial Analyst tools. Data used in the Risk-Hazard Assessment is largely obtained from LANDFIRE.

Finally, we used ArcGIS Pro to run a weighted sum raster process to add all the inputs together. Risk assessment inputs were assigned weights in accordance with their potential influence on wildfire risk and Core Team input (Figure D.3). The distance from the nearest fire station(s) to the community typically determines fire response times. The WUI and highly valued resources designate areas that constitute life, property, and critical infrastructure. Lastly, fire occurrence and fire behavior characteristics (crown fire activity, burn probability, flame length, and rate of spread) determine where a fire is likely to occur and the type, intensity, and speed at which the fire spreads.

Information regarding the modeling approach and components is included in Appendix D.

RISK-HAZARD ASSESSMENT RESULTS

The Risk-Hazard Assessment modeling approach uses a weighted sum model, which “stacks” geographically aligned data sets and evaluates an output value derived from each cell value of the overlaid data set in combination with the weighted assessment. In a weighted sum model, the weighted values of each pixel from each parameter data set are added together so that the resulting data set contains pixels with summed values of all the parameters. This method ensures that the model resolution is maintained in the results and thus provides finer detail and range of values for denoting fire risk. Figure D.2 in Appendix D illustrates the individual data sets and the relative weights assigned within the modeling framework. These include fire behavior parameters, fire occurrence density, HVRAs, WUI, and distance from fire stations. Figure 3.1 is the Risk-Hazard Assessment for the planning area and classifies the planning area into low, moderate, and high risk categories. Additional information on the Risk-Hazard Assessment process is provided in Appendix D.

The Risk-Hazard Assessment is highly influenced by fuels and the WUI. Generally, forested regions composed of conifer fuels that are found on steep slopes or have yet to experience recent wildfire display the highest risk to wildfire. For example, unburned pinyon-juniper stands found along the slopes of the Grand Mesa and near WUI areas display extreme risk from wildfire. Similar patterns are observed in the unburned conifer forests that surround the Uncompahgre Plateau. Furthermore, desert scrub and sagebrush fuels typically found in the dry low country near communities such as Gateway and Glade Park typically experience frequent FRIs with high rates of spread and short flame lengths. Fuels in these areas are typically composed of GS (grass-shrub fuels), where bunchgrass species and sagebrush (*Artemisia tridentata*) typically comprise the fuels.

Regions with the lowest risk from wildfire usually fall outside the WUI. Other areas of low wildfire risk are usually composed of recently burned forests and rangelands, alpine areas, agricultural plots, water bodies, and large tracts of aspen forests. Overall, risk reduction efforts should be focused on the forests and rangelands within the WUI that place communities at high to extreme risk from wildfire.

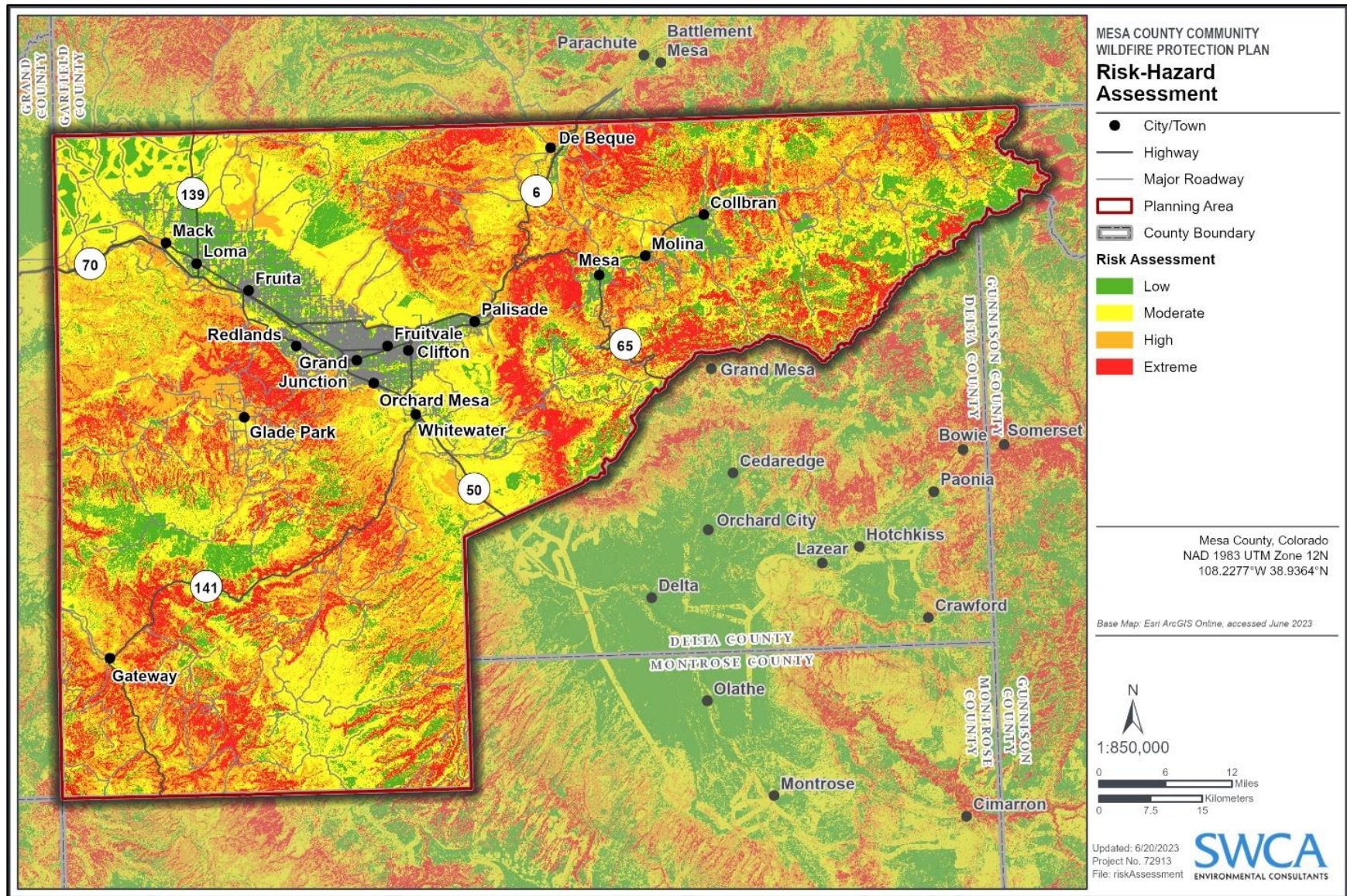


Figure 3.1. Risk-Hazard Assessment for Mesa County.

SOCIALLY VULNERABLE POPULATIONS

It is essential to accurately and comprehensively identify socially vulnerable populations within Mesa County (Figure 3.2). Wildfire can disproportionately affect those in poverty because of factors such as inadequate housing, social exclusion, lack of property, and inability to evacuate effectively (Fothergill and Peek 2004). Furthermore, those with fewer assets and less financial security will have a lower ability to absorb losses and maintain resilience to additional hazard impacts. Other vulnerable groups include the disabled and elderly, who often face additional hardships regarding evacuations and health impacts due to smoke inhalation (Palaiologou et al. 2019).

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

This CWPP does not attempt to identify all socially vulnerable populations in Mesa County. Additional information on how wildfire may affect socially vulnerable populations is available here:

<https://wildfirerisk.org/>

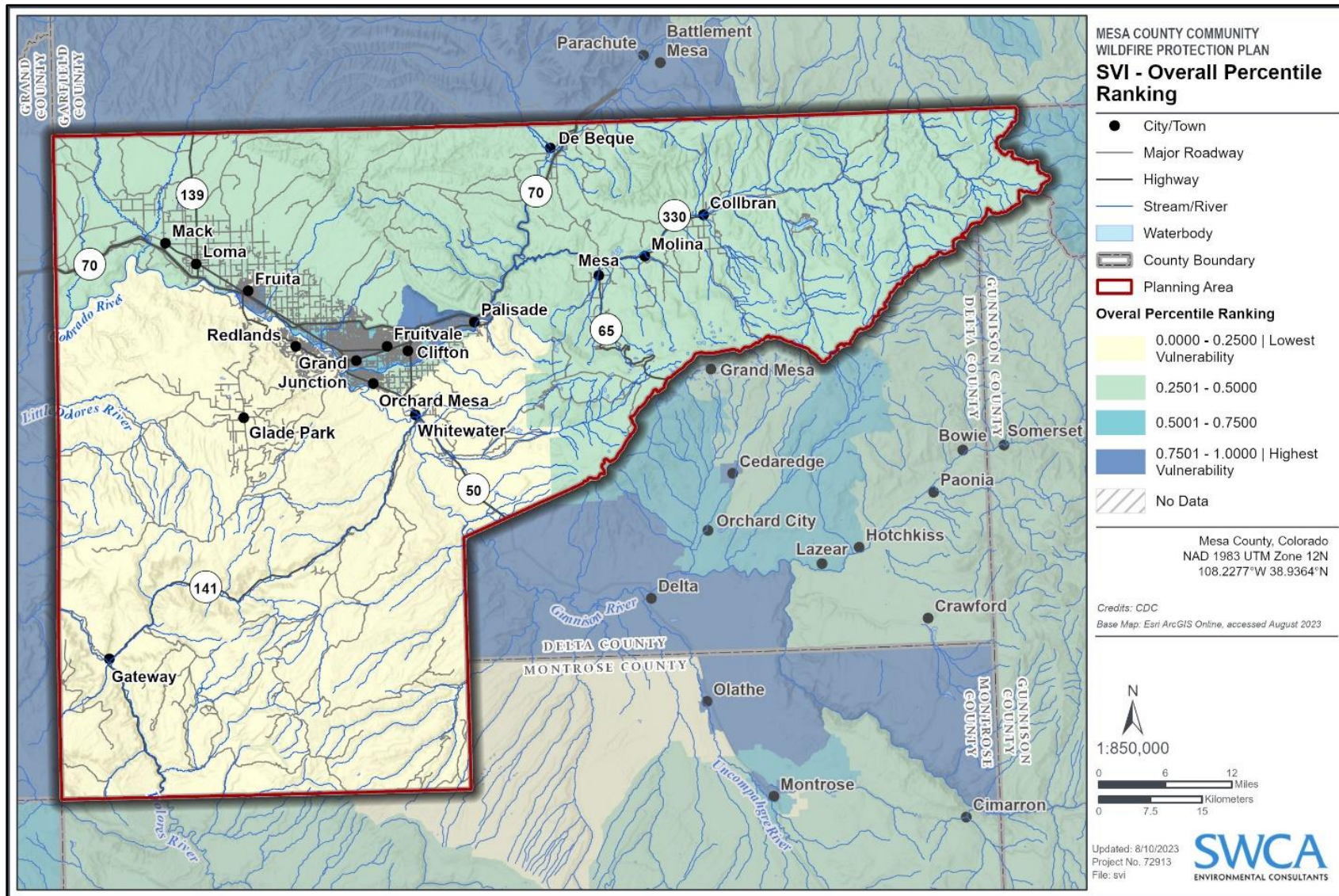


Figure 3.2. Social vulnerability indicators (SVIs) identified in the Colorado State Forest Atlas and referenced to the American Communities Survey (ACS).

The ACS data were available and sourced from the Centers for Disease and Control (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR) public database.

VALUES AT RISK

An earlier compilation of the critical infrastructure in the planning area, coupled with the community assessments, public outreach, and Core Team input, has helped in the development of a list of VARs from wildland fire (Figure 3.3). These data are also supplemented with HVRA data, which is a data set that is being gathered nationwide and available through the IFTDSS. The public was encouraged to provide additional VARs during the public outreach period, via the public survey. Based on feedback provided, this section and the associated mapping was revised.

In addition to critical infrastructure (see Map J.9 in Appendix J), VARs can also include natural, cultural, and socioeconomic resources (see Maps J.6, J.7, and J.8, respectively). It is important to note that although an identification of VARs can inform treatment recommendations, a number of factors must be considered in order to fully prioritize areas for treatment; these factors include appropriateness of treatment, land ownership constraints, locations of ongoing projects, available resources, and other physical, social, or ecological barriers to treatment.

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

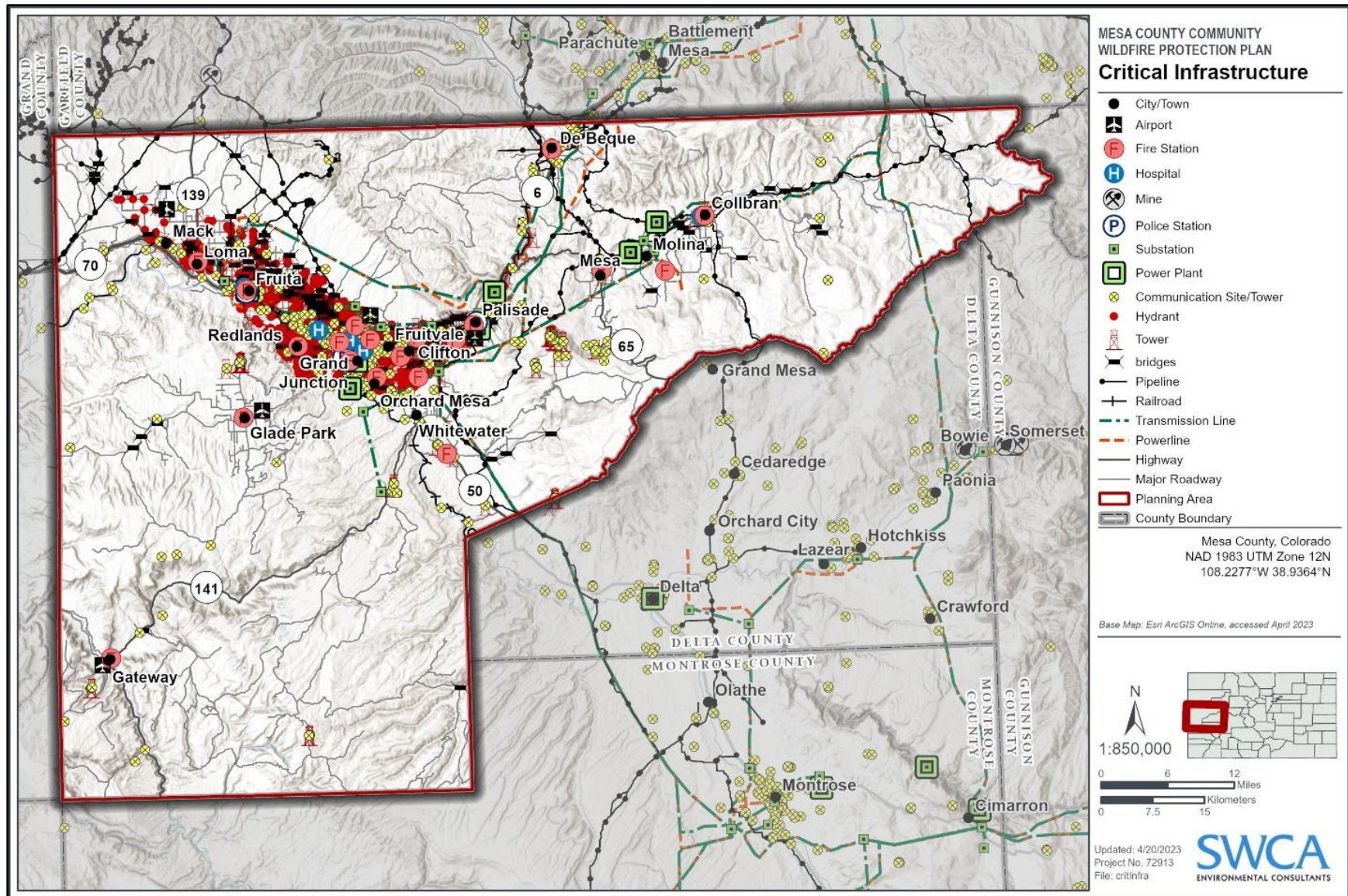


Figure 3.3. Critical infrastructure within Mesa County.

NATURAL VALUES AT RISK

The CWPP planning area has a variety of natural resources of particular concern to land managers, such as rare habitats and listed plant and wildlife species (Figures 3.4 and 3.5; see Map J.6 in Appendix J). Examples of natural values identified by the Core Team include the following:

- Colorado River ecosystem
- Gunnison River ecosystem
- Natural areas
- Native species
- Wildlife habitat
- Threatened and endangered species
- Wetland areas
- Ranchland
- Air quality
- Public land (e.g., Grand Mesa and Uncompahgre National Forests, BLM land, and Colorado National Monument)
- Watershed protection (Colorado River, Gunnison River, Verga Lake, Mesa Lakes)
- Ski areas (Powderhorn Ski Resort)
- Trail systems (e.g., Bangs Canyon, McInnis Canyons, Palisade Rim)
- Scenic viewsheds
- BLM Areas of Critical and Environmental Concern (Bullen and Martsolf 2010)
- Colorado Natural Heritage Program Potential Conservation Areas (as described in the 2010 Mesa County Hazard Mitigation Plan [source: Colorado Natural Heritage Program 2009])

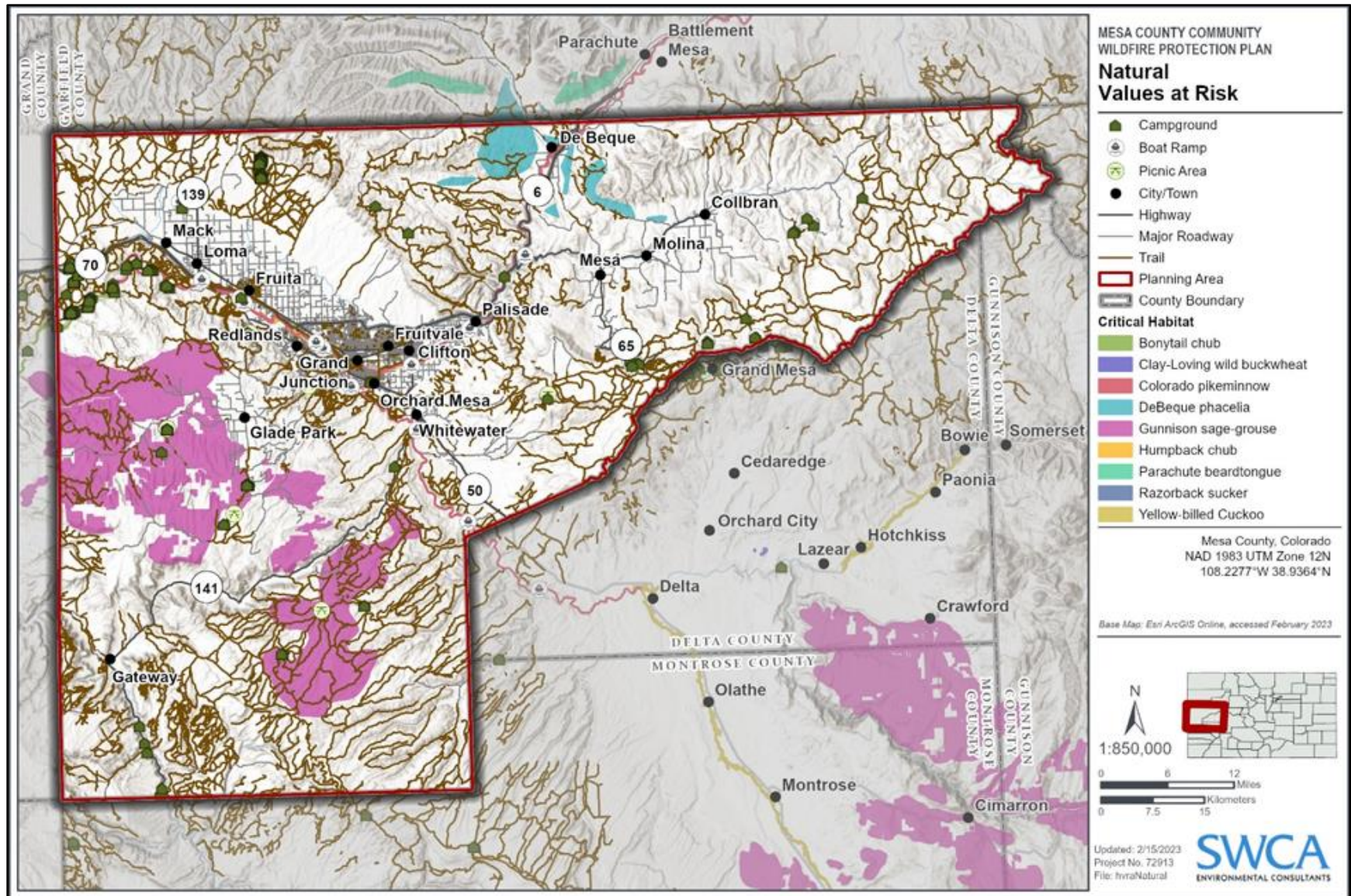


Figure 3.4. Natural values at risk within Mesa County.



Figure 3.5. A natural VAR, the Grand Mesa.

SOCIOECONOMIC VALUES AT RISK

Social values include population, recreation, infrastructure, agriculture, and the built environment (Figures 3.6–3.8; see Map J.8 in Appendix J). Much of the built environment in the planning area falls within the WUI zones. Examples include the following:

- Agricultural lands
- Churches
- Ranchlands
- Utility lines, infrastructure, etc.
- Fire departments
- Railroad bridges
- Highways
- Wells, pipelines, and other related infrastructure
- Water storage

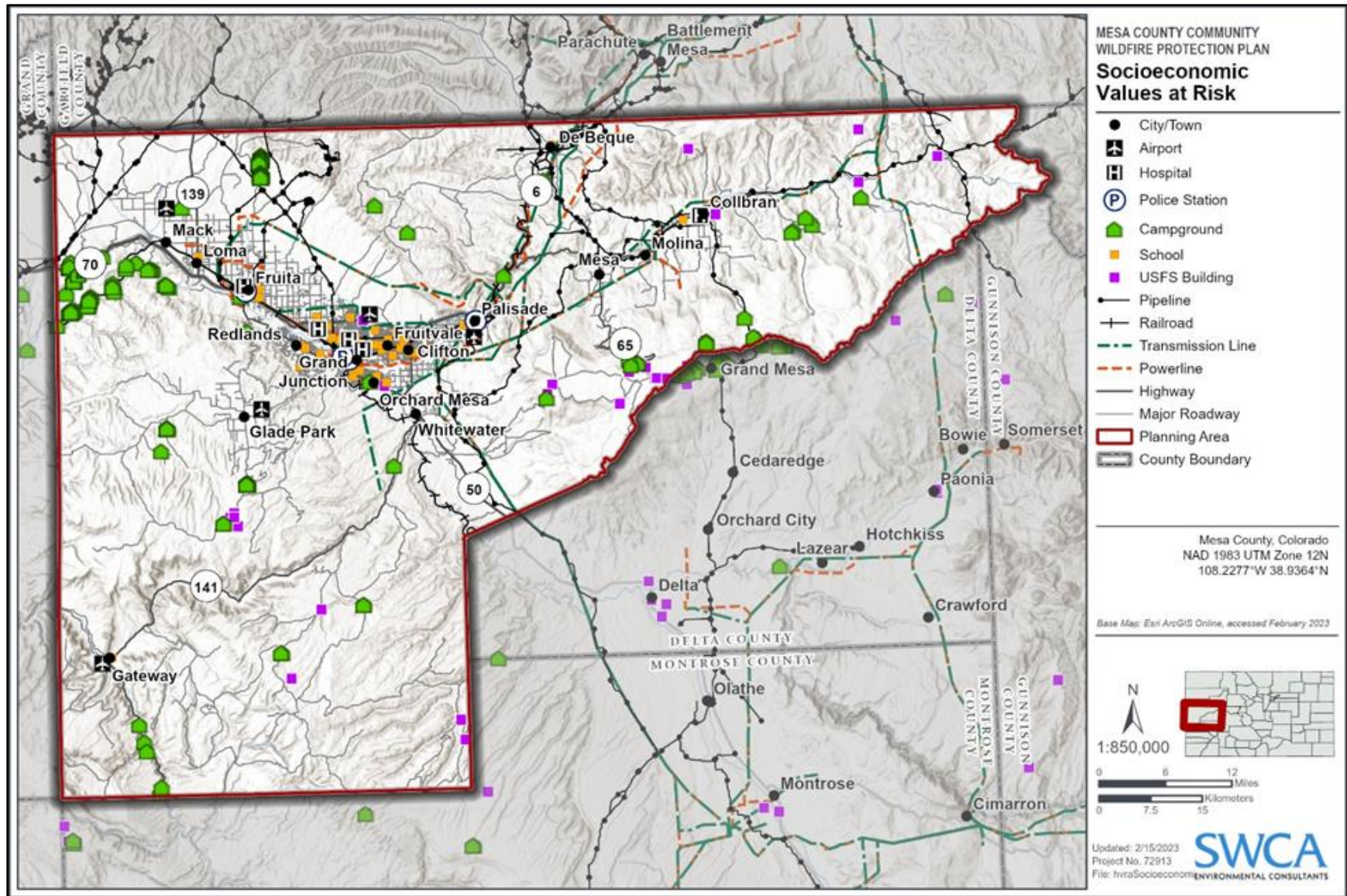


Figure 3.6. Socioeconomic VARs within Mesa County.



Figure 3.7. Example of a socioeconomic VAR, recreation site in Mesa County.



Figure 3.8. Example of a socioeconomic VAR, a ski resort in Mesa County.

CULTURAL VALUES AT RISK

Many historical landmarks are scattered throughout the county (see Map J.7 in Appendix J). Particular cultural VARs (Figures 3.9 and 3.10) in the CWPP planning area are the following:

- All existing archaeological sites
- Old homesteads
- Old schoolhouses
- Historic buildings
- National Register of Historic Places sites

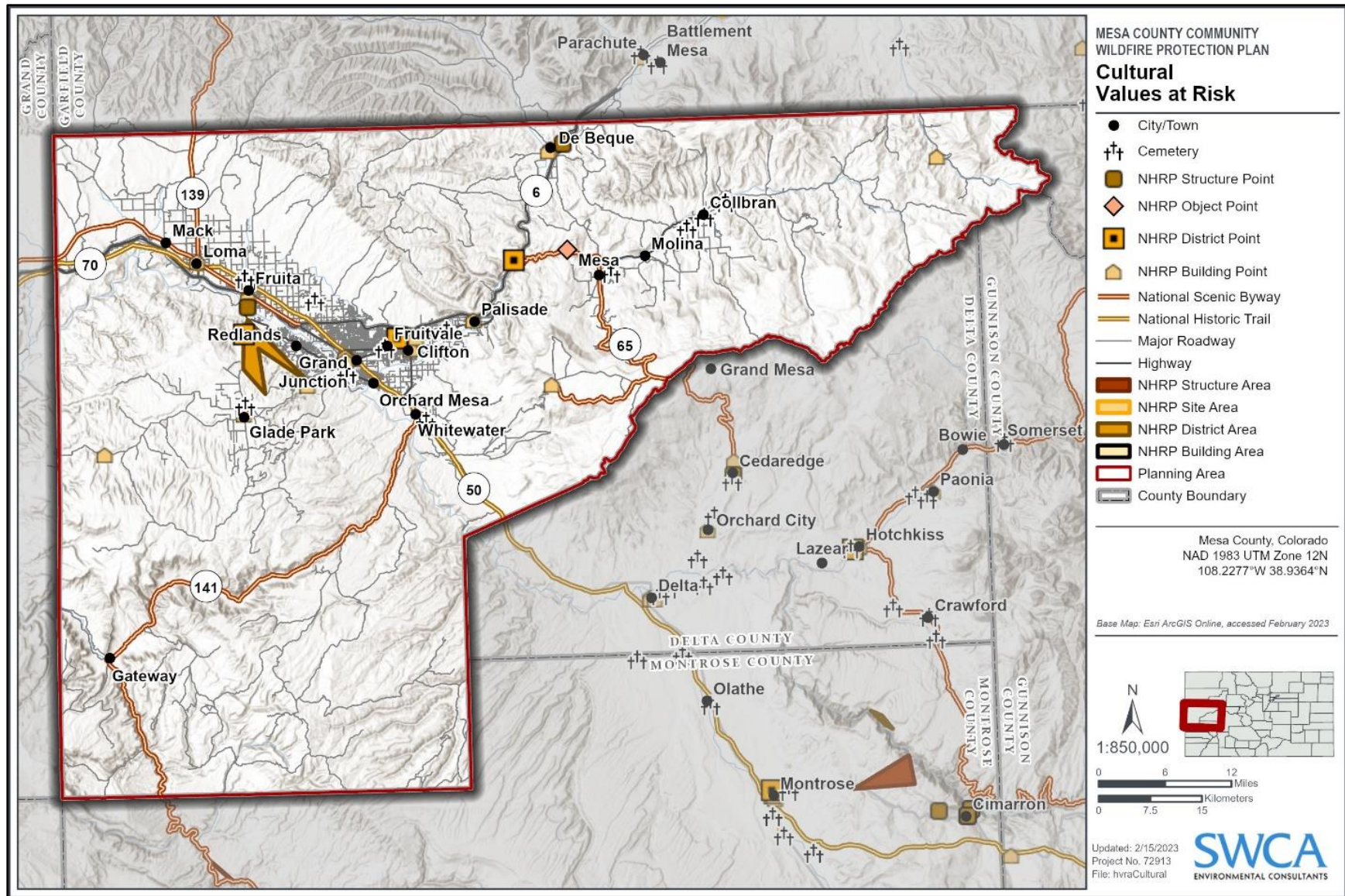


Figure 3.9. Cultural VARs within Mesa County



Figure 3.10. Example of a cultural VAR, De Beque house in the town of De Beque (photo credit: J. Beall, 2013).

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CHAPTER 4 – MITIGATION STRATEGIES

This chapter provides project recommendations and implementation guidance. However, mitigation does not stop there. In addition to the recommendations, recognizing wildfire mitigation, preparedness, and resilience means being prepared both pre- and post-fire. Post-fire response and rehabilitation information can be found at the end of this chapter.

This plan has been aligned with the Cohesive Strategy and its Phase III Western Regional Action Plan by adhering to the nationwide vision:

“To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and collectively, learn to live with wildland fire.” (Wildland Fire Leadership Council 2023).

Thus, CWPP recommendations have been structured around the three main goals of the Cohesive Strategy: restoring and maintaining landscapes, fire-adapted communities, and wildfire response. Many of the recommendations listed can be implemented at the homeowner or community level. Projects requiring large-scale support can be prioritized based on the Risk-Hazard Assessment.

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



GOAL 1: RESILIENT LANDSCAPES

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

This region has been home to an active and committed fuel treatment program by land managers for many years. Figure 4.1 shows existing fuel treatments that have been completed or planned in and around the planning area. This information is derived from the DFPC, CSFS, Team Rubicon, BLM, RiversEdge West, Mesa County Sheriff's Office, and USFS. The reader is referred to agency websites and the [Federal Register](#) for the latest information on planned or ongoing actions on adjacent public land (Figure 4.1). The treatment momentum already

observed surrounding the planning area should be built upon in order to increase fuel treatment effectiveness across the landscape. The Core Team has listed fuel treatments on private lands and watershed health improvements as high priority mitigation actions. See recommendations in Chapter 4.

RECOMMENDATIONS FOR HAZARDOUS FUEL REDUCTION

Fuels should be modified with a strategic approach to reduce the threat that high-intensity wildfires pose to lives, property, and other values. Moderating extreme fire behavior, reducing structural ignitability, creating defensible space, providing safe evacuation routes, and maintaining all roads for firefighting access are methods of fuels reduction likely to be used around communities located in a WUI zone. The use of multiple treatment methods often magnifies the benefits. See Figure 4.1 for a map of past and existing interagency fuel treatment projects across Mesa County.

Fuel treatments are often planned and executed separately on private and public property. However, it is crucial that landowners and land managers work together to comprehensively reduce wildfire risk by cooperating on fuel reduction strategies from the wildlands to the home ignition zone (HIZ).

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

Fuels Management

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

Fuels should be modified with a strategic approach to reduce the threat that high-intensity wildfires pose to lives, property, and other values. This section provides information on fuel treatment methodologies that can be applied to first protect structures (defensible space), then near community boundaries (fuel breaks, cleanup of adjacent open spaces), and finally in the wildlands beyond community boundaries (larger-scale forest health and restoration treatments). The emphasis of each of these treatment types is unique. Proximate to structures, the recommendations focus on reducing fire intensity consistent with Firewise and International Fire Code standards. Further into open space areas, treatments tend to emphasize forest health and increasing resiliency to catastrophic wildfire and other disturbances.

Treating fuels in the WUI can lessen the risk of intense or extreme fire behavior (Martinson and Omi 2013; Safford et al. 2009). Studies and observations of fires burning in areas where fuel treatments have occurred have shown that the fire either remains on or drops to the surface, thus avoiding destructive crown fire, as long as activity fuels are treated or removed (Graham et al. 2004; Pollet and Omi 2002; Prichard et al. 2010; Safford et al. 2012; Waltz et al. 2014). Fuel mitigation efforts therefore should be focused specifically where these critical conditions could develop in or near CARs.

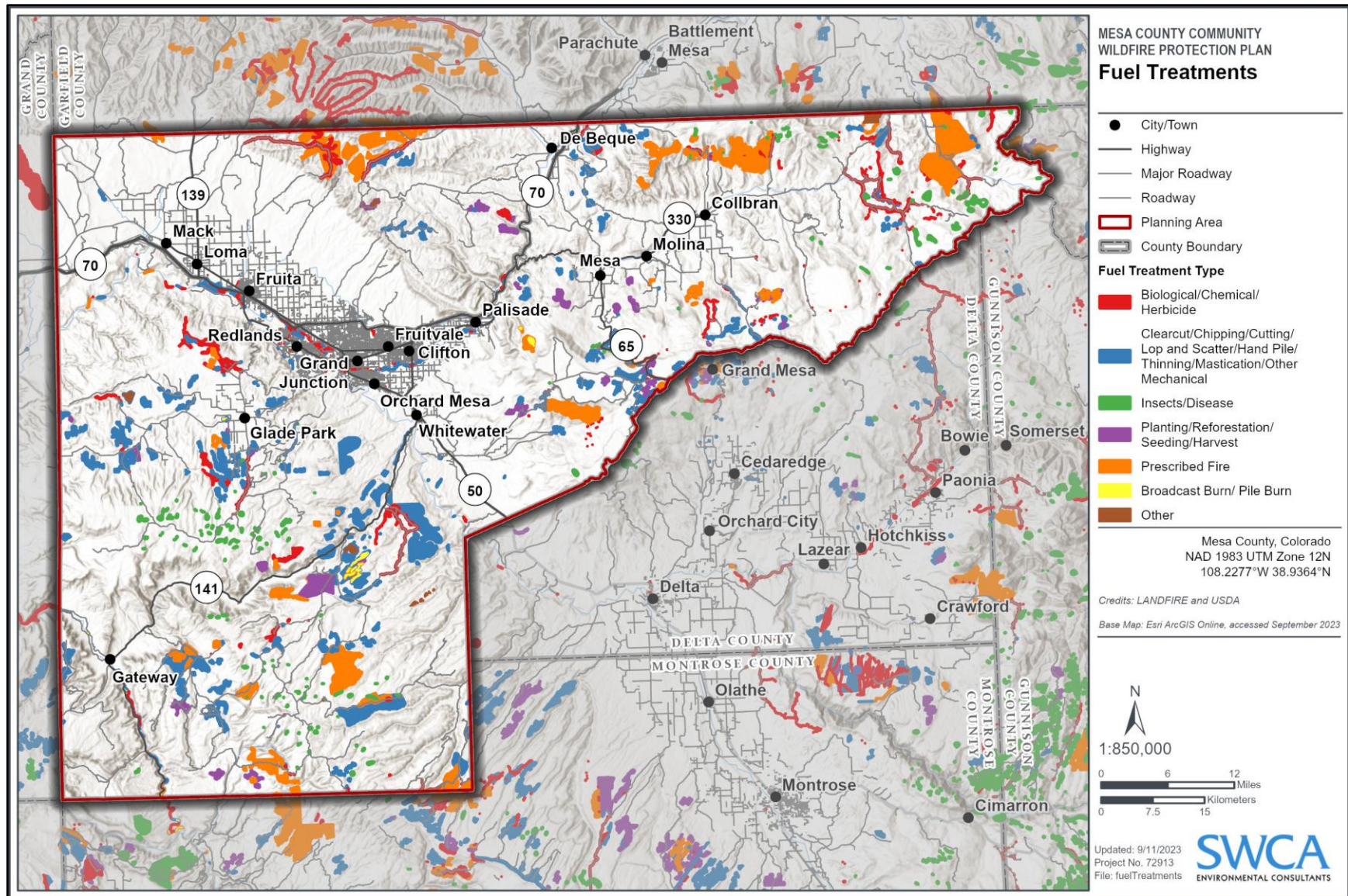


Figure 4.1. Existing fuel treatments across all jurisdictions from 1999 through 2022.

The USFS has mapped potential operational delineations (PODs) throughout its land in Mesa County. As defined by the USFS, PODs are “spatial units or containers defined by potential control features, such as roads and ridge tops, within which relevant information on forest conditions, ecology, and fire potential can be summarized. PODs combine local fire knowledge with advanced spatial analytics to help managers develop a common understanding of risks, management opportunities, and desired outcomes to determine fire management objectives” (USFS 2023). PODs are often a good starting point for fuel treatment planners to begin formulating wildfire mitigation strategies on public land.

Landscape-Scale Recommended Treatments

The landscape-scale fuel treatment recommendations outlined in this plan are based on an assessment of the dominant fuel types within the county. By identifying and outlining specific treatments based on the fuel types present within each community, land managers and property owners can apply these treatments at the local level.

Table 4.1, in conjunction with a map of priority fuels (Figure 4.2), summarizes recommendations for landscape-scale treatments associated with dominant fuel types throughout the planning area. See Figure 4.3 for a pie chart denoting the five priority fuels in Mesa County and the area of land they encompass. Many of these treatment recommendations are general across the communities because similar conditions occur in those areas. The specific communities in which it is recommended to implement landscape-scale fuel treatments are defined in Table 4.1 as a guide for implementation. Additionally, Table 4.2 includes broad, long-term recommendations and strategies to increase the resiliency of Mesa County’s landscapes to wildfire. These recommendations are aligned with the National Cohesive Strategy described above. Table 4.2 also addresses the requirement for an action plan and assessment strategy by providing monitoring guidelines and a timeline for implementation. This timeline is obviously dependent on available funding and resources, as well as National Environmental Policy Act (NEPA) protocols for any treatments pursued on public land. When applying fuel treatments, every effort should be made to align treatments with the Colorado State Forest Action Plan (CSFS 2020) with consideration of all appropriate best management practices and sound science. In addition, treatments should be strategically located in areas to maximize effectiveness of other existing and ongoing projects (see Figure 4.1).

When possible, simultaneously planning for the management of multiple resources while reducing fuels will ensure that the land remains viable for multiple uses in the long term. The effectiveness of any fuel reduction treatment depends on the degree of maintenance and monitoring that is employed. Monitoring will also ensure that objectives are being met in a cost-effective manner.

The treatment list is by no means exhaustive and should be considered purely a sample of required projects for the future management of the planning area. Many projects may be eligible for grant funds available from federal and/or state sources. For a list of funding sources, please refer to Appendix L.

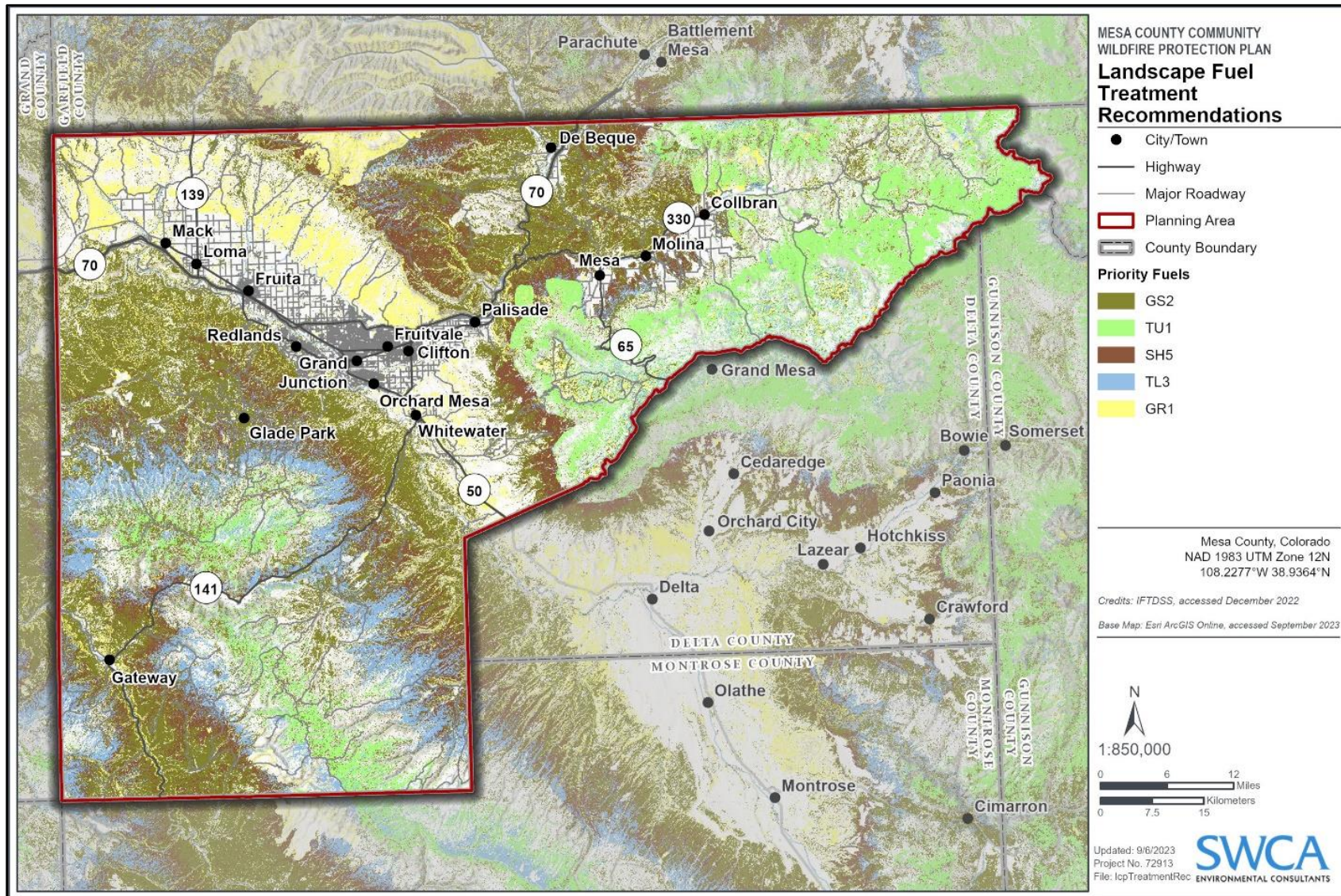


Figure 4.2. Dominant fuel types in Mesa County that typically contribute to high wildfire intensity and rates of spread. These fuels should be prioritized when planning landscape-level, cross-jurisdictional fuels treatments.

Note: see the Fuels and Topography subsection of Chapter 2 and Appendix D for detailed descriptions of each fuel type.

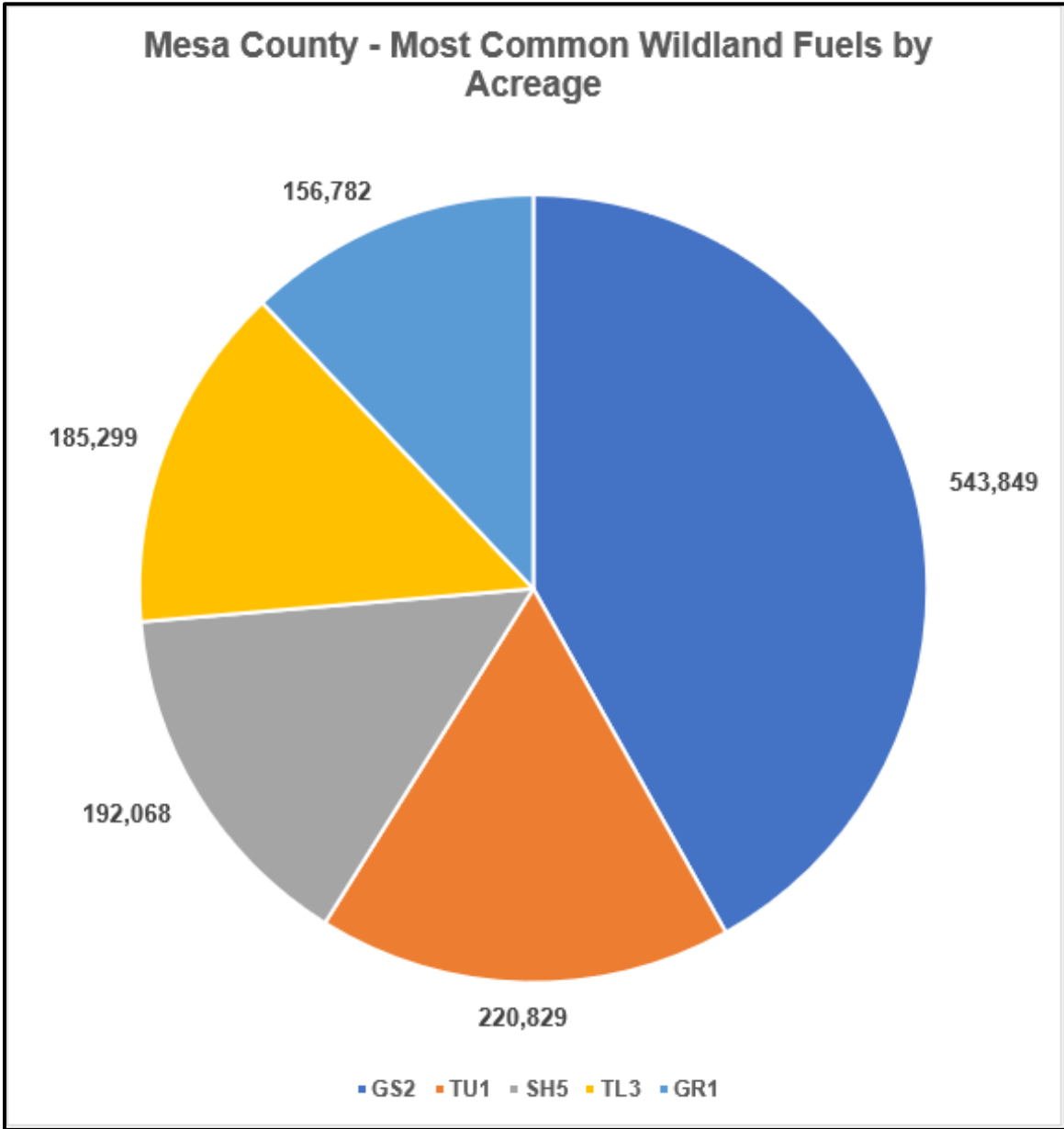


Figure 4.3. Pie chart showing the land area covered by the dominant fuel types within Mesa County.

Note: see the Fuels and Topography subsection of Chapter 2 and Appendix D for detailed descriptions of each fuel type.

Table 4.1 Fuel Model Characteristics with Associated Fuel Treatment Recommendations for Relevant Communities across Mesa County

Fuel Model	Characteristics	Description	Recommended Treatment	Recommended Communities
GS2	Shrubs are 1–3 feet high; moderate grass load. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (2.1 tons/acre).	Grass shrub fuels make up the majority of fuels present in Mesa County. These fuels are often found in transition zones from arid grasslands to pinyon-juniper dominated foothills. High rates of spread can make suppression difficult under severe weather conditions. The fuel type most commonly found near WUI areas in Mesa County is GS2.	Grass shrub fuels can be effectively managed with prescribed burning. Burn units should be no greater than 300 acres and must have treated fuels within 66 feet of established containment lines. Specific burn prescriptions and weather parameters will be site dependent and should be determined by the local fuel treatment planning specialist in coordination with state and federal agencies. Fuel breaks should be established in WUI areas where control and suppression is a concern. Communities bordering this fuel type should implement evacuation and alert protocols.	Glade Park De Beque Dolores River Corridor Gateway Fruita Mesa, Molina, and Collbran Glade Park Horse Canyon
TU1	Fuel bed is low load of grass and/or shrubs with litter. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (1.3 tons/acre).	Timber understory is primarily composed of rocky mountain aspen forest and woodland with Douglas-fir, lodgepole pine, and sub-alpine fir. These fuels are primarily found on the upper slopes of the Grand Mesa and Uncompahgre Plateaus	Timber understory fuels can be treated effectively with mechanical and hand thinning of the overstory and understory vegetation. Opportunities to incorporate logging as a fuel treatment method may exist in this fuel type. Existing roads can offer good anchor points for fuel breaks and indirect containment lines. TU1 fuels near roads and key egress points should be prioritized for treatment.	Brush Creek Campbell Point Mesa, Molina, and Collbran Pinyon Mesa
SH5	Heavy shrub load. Fuel bed depth 4–6 feet. Spread rate very high (50–150 chains/hour); flame length very high (12–25 feet).	Heavy shrub fuels are primarily composed of pinyon-juniper woodland with intermixed grass components. These fuels are primarily found on the lower slopes of plateaus and mesas and throughout hilly regions of the county.	Within Mesa County, heavy shrub fuels are most commonly responsible for extreme fire behavior. This is due to high fuel loading, light flashy fuels, and steep slopes where this fuel type is often found. A combination of thinning, mastication, and prescribed fire can be effective in reducing fire intensity and aiding suppression efforts near the WUI.	Glade Park Brush Creek De Beque Escalante Mesa, Molina, and Collbran Glade Park Horse Canyon Pinyon Mesa UnawEEP Canyon
TL3	Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 foot); fine fuel load (0.5 ton/acre).	Timber litter fuels are ground fuels composed of litter from Gambel oak, mixed montane shrubland, and pinyon-juniper shrubland. These areas experience high fuel loading, and fire is carried mostly by ground fuels. These fuels are primarily found on the slopes of the Uncompahgre Plateau and are a sign of dense and overstocked forests.	Timber litter fuels often contain thick litter layers with dead and down woody material. Slashing, lop and scatter, and pile and burn are all good techniques to reduce fuel loading in timber litter fuels. Areas near roads and communities should be prioritized for treatments. Commercial logging can be effective in drastically reducing fuel loads in this fuel type.	Campbell Point Escalante Mesa, Molina, and Collbran Glade Park Pinyon Mesa UnawEEP Canyon

Fuel Model	Characteristics	Description	Recommended Treatment	Recommended Communities
GR1	Grass is short, patchy, and possibly heavily grazed. Spread rate is moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (0.40 ton/acre).	Short and patchy grass fuels make up most of the lowland fuels throughout the county, particularly north and east of Grand Junction. Fire can move quickly in these fuels, and short fire return intervals are common depending on ignition frequencies.	Grass fuels in Mesa County experience frequent fire return intervals, and care should be taken to mitigate fast-moving grass fires during periods of severe fire weather. Communities near these fuels should plan for evacuations and establish alert protocols. Prescribed herbivory and mowing can be effective in creating fuel breaks and reducing fuel continuity on the landscape.	Glade Park De Beque Fruita Mesa, Molina, and Collbran Grand Junction Loma, Mack, and Appleton Palisade Three Eagles Way Whitewater

Note: this table is to be used in conjunction with Figures 4.2 and 4.3.

Table 4.2. Broad, Long-Term Recommendations to Create Resilient Landscapes (Fuel Treatments)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	H	2023-2028	Reduce tamarisk and Russian olive vegetation.	All riparian areas throughout the county; priority areas: <ul style="list-style-type: none"> Colorado and Gunnison River corridors Colorado Parks and Wildlife areas Redlands Orchard Mesa Fruita Palisade 	Private, county, state, and federal lands.	Utilize the partnership between Rivers Edge West and the City of Grand Junction and Fruita as a template. Build collaboration by working with a variety of agencies, non-profits, and local watershed groups. Removal of tamarisk by cut and stump treatment or entire root extraction. Thin-from-below treatments in cottonwood to raise the crown base height to >8 feet. This helps to reduce potential crown fire in cottonwood. Slash removal and disposal. Selective removal of other non-natives from the riparian ecosystem. Follow-up revegetation treatments. See Appendix D for a more detailed description of the methods used. Staggered removal and reclamation are important to ensure maintenance of yellow-billed cuckoo habitat. The bird has adapted to Russian olive understory and cottonwood overstory. Ensure effectiveness of reclamation before beginning removal on a new property.	Protect critical habitat for the yellow-billed cuckoo, cottonwood galleries, within a 15-mile reach of designated critical habitat for the following: <ul style="list-style-type: none"> humpback chub, Colorado pikeminnow, razorback sucker, bonytail chub The desired habitat is a complex vertical structure – a cottonwood and willow gallery. Help mitigate extreme fire behavior in timber fuels and reduce potential spread to communities adjoining the river. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Monitor effects on wildlife populations, soils, understory vegetation, invasive species, and water yield. Potential for community monitoring programs that include schools and youth groups. Contact: RiversEdge West – Rusty Lloyd rlloyd@riversedgewest.org (970) 256-7400 Also trained youth corps: Western Colorado Conservation Corp – J. Roberts jroberts@mesapartners.org (970) 241-1027	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	H	2023-2026	Conduct fuel treatments to address ignitions in high use riparian areas.	Natural creeks, drainages, and streams where human activity is high. Riparian areas throughout urban zones are the highest priority. <ul style="list-style-type: none"> North desert and roller dam 	Multi-agencies – private, BLM, parks and wildlife, Desert River Collaborative	Conduct hazardous fuel treatments in riparian areas utilizing a toolbox approach for methodologies. <ul style="list-style-type: none"> Work with homeowners to create and remove slash piles in riparian areas near property. Utilize the County's masticator for areas where slash piles are not appropriate. Focus on the removal of invasive species. Conduct fuel treatments that improve the ability to contain human caused ignitions. 	<ul style="list-style-type: none"> Reduce the overuse of riparian areas. Limit the spread of invasive plants and the accumulation of trash. Dispose of hazardous fuels. Decrease the potential for severe wildfire behavior. Improve the feasibility of future fuel reduction projects. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Conduct annual surveys along riparian corridors in urban areas. Utilize nearby property owners as points of contact for reporting on ignitions occurring in nearby riparian areas.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	M	2023-2029	Treat and remove invasive species and hazardous fuels along the railroad right-of-way (ROW).	Railroad throughout the extent of the county. priority areas are between Palisade and De Beque where frequent fires along the railroad have occurred	Railroad, BLM, County	Treat areas directly within the railroad right of way (ROW). Coordinate with the railroad on determining treatment parameters and responsibility. Utilize mowers, weed whackers, and other mechanical treatments. Consider and evaluate the effectiveness of cultural and biological treatments.	<ul style="list-style-type: none"> Help reduce railroad-associated ignitions in the railroad ROW. Limit the inter-county and inter-state spread of invasive plants. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Work with the railroad to establish an action plan and treatment cataloging protocol.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
M		2023-2029	Treat and remove invasive species and hazardous fuels along the highway right-of-way (ROW).	County, state, and federal highways and ROWs. Glade Park is an area of concern.	Colorado Department of Transportation, Mesa County	Regular maintenance needed to ensure clearance of vegetation and reduced fuels density Monitoring should occur prior to fire season (February) and in the fall (October). <ul style="list-style-type: none"> Coordinate with the Colorado Department of Transportation and Mesa County Public Works. Explore the option of using prison crews to carry out mowing and maintenance of right-of-way. Extend the mowing width to the fence line. 	<ul style="list-style-type: none"> Protect life and property Reduce the ability for wildfire to spread in and from the highway ROW protect evacuation routes in event of a wildfire. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Work with transportation agencies to establish an action plan and treatment cataloging protocol.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
H		2023-2026	Establish fuel breaks in coordination with state and federal agencies and private landowners	Mesa County, areas of concern, areas of high risk, and areas close to the WUI. Specific communities include Glade Park and Plateau Valley	Mesa County, state, federal, and private lands	Strategic placement of treatments on public and private land will improve effectiveness. Fuel break prescriptions should be site-specific, depending on fuel type, topography, soils, and adjacent land management practices. Examples include mowing and blading strips along fence lines or shaded fuel breaks in a wildlife-friendly mosaic pattern. <p>Coordinate with the following entities on fuel break determination and construction: UCR, CSFS, Mesa County, and the County Fire Warden.</p> <p>Utilize the risk assessment maps and areas of concern maps to prioritize the location for fuel breaks.</p> <p>Reference fire behavior, and fuel model maps to plan appropriate prescriptions and prepare for expected fire behavior.</p>	<ul style="list-style-type: none"> Help mitigate extreme fire behavior and provide an area from which firefighters can safely suppress a fire. Reduce the rate of spread of wildfire. Provide pre-planning for severe wildfires. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Regular maintenance is needed to ensure access is clear of vegetation or obstructions. Monitoring should occur prior to fire season (February) and in the fall (October). <p>Catalog fuel breaks in an online GIS platform. Ensure suppression resources have access to this catalog.</p>	<ul style="list-style-type: none"> GSA Federal Excess Personal Property (FEPP) Firewise Grants BRIC RCP Fire Prevention and Safety (FP&S) Grants (FEMA) Community Wildfire Defense Grants (CWDG) National Urban and Community Forestry Challenge Cost Share Grant Program U.S. Endowment for Forestry and Communities Western Bark Beetle Program Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
H		2023-2026	Protect critical infrastructure and key resources (CIKA)	Mesa County, Utility company rights-of-way, public infrastructure.	Utility company infrastructure and lands. County, state, and federal lands. Public infrastructure	Coordinate with local utility companies. Review the wildfire mitigation plan (WMP) for the Delta-Montrose Electric Association (DMEA) service area and other utilities as applicable. <ul style="list-style-type: none"> Maintain clearance under power lines and around posts. Identify and remove hazard trees in close proximity to lines. Utilize appropriate measures for utilities and the specific critical infrastructure. Establish multiple objectives to achieve comprehensive protection of CIKA. Support transition to underground utility lines 	Prevent destruction of energy or communications infrastructure in event of a wildfire. <p>Examples of CIKA include:</p> <ul style="list-style-type: none"> Powerlines and transmission lines Substations Communication towers Water infrastructure Align with the following plan: <ul style="list-style-type: none"> Mesa County HMP (2020) 	Work with utility companies to establish an action plan and treatment cataloging protocol.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
M		2023-2030	Address Pinyon Ips Bark Beetle infestations	Mesa County	Federal, state, and local FPDs	<p>To help dispose of hazardous fuels acquire:</p> <ul style="list-style-type: none"> biomass chippers air curtain burners dump bed trailers green waste facilities <p>Consider the availability and effectiveness of vegetation management contractors who can also help dispose of hazardous fuels.</p> <p>Pursue funding avenues to acquire more equipment so fuel treatments can be carried out</p> <p>Provide homeowner education on how private landowners can address ips on their property</p> <p>Conduct Strategic thinning at the right time to address the Ips Beetle infestations.</p> <p>Fuel treatments can help improve the resiliency of pinyon stands to the Ips Beetle which will improve forest health.</p>	<ul style="list-style-type: none"> Dispose of hazardous fuels Decrease the potential for severe wildfire behavior Improve the feasibility of fuel reduction projects <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) Colorado Forest Action Plan (2020) 	<p>Convene annually to track the status and availability of equipment to the County.</p> <p>Annual discussion regarding cost/benefit analysis for purchases.</p> <p>Catalog treatments in an online GIS platform.</p>	<ul style="list-style-type: none"> National Urban and Community Forestry Challenge Cost Share Grant Program Firewise grants U.S. Endowment for Forestry and Communities NFP SRS Title III
H		2023-2026	Increase the use of prescribed burning as a fuel reduction method.	Mesa County	County, state, and federal lands	<p>Gain support for using prescribed burns to reduce fuel loads and to improve ecosystem health, where grazing needs allow.</p> <ul style="list-style-type: none"> Formulate burn plans with state and federal guidelines. Train personnel to be NWCG-certified burn bosses (RXB2). Reach out to surrounding fire agencies to collaborate on prescribed burns. This will improve the capacity to accomplish many/large acreage burns. 	<ul style="list-style-type: none"> Protect communities and infrastructure by reducing fuel loads. Improve landscape resiliency to severe wildfire Promote healthy successional vegetation Provide habitat for fire-adapted species. <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) Colorado Forest Action Plan (2020) 	<p>Survey post-burn severity and record prescribed burning operations in an online GIS platform.</p> <p>Establish annual goals and objectives for prescribed burning operations.</p>	<ul style="list-style-type: none"> GSA Federal Excess Personal Property (FEPP) Firewise Grants BRIC RCP Fire Prevention and Safety (FP&S) Grants (FEMA) Community Wildfire Defense Grants (CWDG) National Urban and Community Forestry Challenge Cost Share Grant Program U.S. Endowment for Forestry and Communities Western Bark Beetle Program Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
H		2023-2028	Collaborate with federal and state partners on roadside thinning and roadside wildfire mitigation projects. Consider wildlife migration corridors and passages. Funding may be available if these factors are addressed.	Highest risk roadways as identified in the risk assessment.	County, state, federal agencies, and private landowners	<p>Frequent maintenance/removal of hazardous fuels:</p> <ul style="list-style-type: none"> Set appropriate fuel buffer standards for high-risk roads Treat hazardous fuels on high-risk roadsides (e.g., invasive species and potential ladder fuels) <p>Consider increased implementation, updates, and/or development of vegetation management plans for high-risk roads</p>	<p>Create strategic fuel breaks along roadways to reduce the potential for wildfire ignitions and wildfire spread along roadways.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) Colorado Forest Action Plan (2020) Colorado State Forest Service Five-Year Strategic Plan (2021) 	<p>Regular monitoring and maintenance are needed to ensure fuels on roadsides do not become hazardous.</p> <p>Annual assessment regarding collaboration. Assess success and implement lessons learned for the following year. Catalog treatments in an online GIS platform.</p>	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	M	2023-2028	Remove abandoned structures and clean up yard debris.	Private lands across all communities.	County and private lands	<p>Establish a community bulletin for homeowners to post information on abandoned structures and messy yards. Consider working with local volunteer groups to increase capacity.</p> <ul style="list-style-type: none"> Conduct mechanical thinning and manual clearing. Develop an enforcement program providing the County with cause to clean up derelict or abandoned lots. Develop an incentive program for homeowners. 	<ul style="list-style-type: none"> Protect life and property by preventing the spread of fire from wildland to structural fuels. Improve firefighter safety by providing clear access to structures in the WUI. <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) 	Develop a community task force to carry out assessments of properties. Create an online bulletin board for community members to report abandoned structures and messy yards.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	M	2023-2030	Seek grants for projects to improve watershed resiliency to wildfires and subsequent flooding.	Watersheds with threats to life and property.	The county, cities, conservation districts, or tribes are eligible to be sponsors; landowner-scale restoration can occur under the umbrella of the sponsor.	<p>Integrate Wildfire Ready Watersheds into the County's watershed planning process. Utilized the WRW action plan and resources for project design and implementation.</p> <ul style="list-style-type: none"> Stabilize streambanks to prevent erosion Repair dams and levees Remove hazardous riparian debris Establish vegetation within watersheds Identify drinking water concerns for municipal watersheds 	<p>Prevent natural disasters such as floods and wildfires from having devastating impacts on local communities and the environment.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) Colorado State Forest Service Five-Year Strategic Plan (2021) Colorado State Water Plan (2023) 	Ongoing design, planning, and implementation of projects as necessary.	<ul style="list-style-type: none"> Emergency Watershed Protection (EWP)_Program BRIC Regional Catastrophic Preparedness (RCP) grants Forest Restoration & Wildfire Risk Mitigation (CSFS) 2022 Infrastructure Investments and Jobs Act

Community-Scale Recommended Treatments

Community-scale fuel treatments aim to reduce wildfire risk to specific communities by utilizing an array of mitigation tools that can be implemented by homeowners, landowners, and agencies. Community-scale treatments are often most effective at reducing wildfire hazards and risk when planned and paired with adjacent landscape-level fuel treatment efforts.

Figure 4.4 shows collaboratively identified areas of concern. These are areas where land managers are currently considering or should consider employing mitigation measures to protect life, property, and other values. It is recommended that treatment plans be developed to execute mitigation measures in these areas. Treatment types will be site specific but should address a need to slow fire spread or mitigate potential extreme fire behavior parameters, such as high flame lengths or fireline intensity. Wildfire does not stop at jurisdictional boundaries, and therefore, it is crucial that projects are implemented across borders with coordination at all jurisdictional levels.

Within these areas of concern, specific fuel treatment spatial boundaries (Figures 4.5–4.7) and associated recommendations (Table 4.3) have been created using the results of the Risk-Hazard Assessment, subject matter expert input, and CSFS guidance.

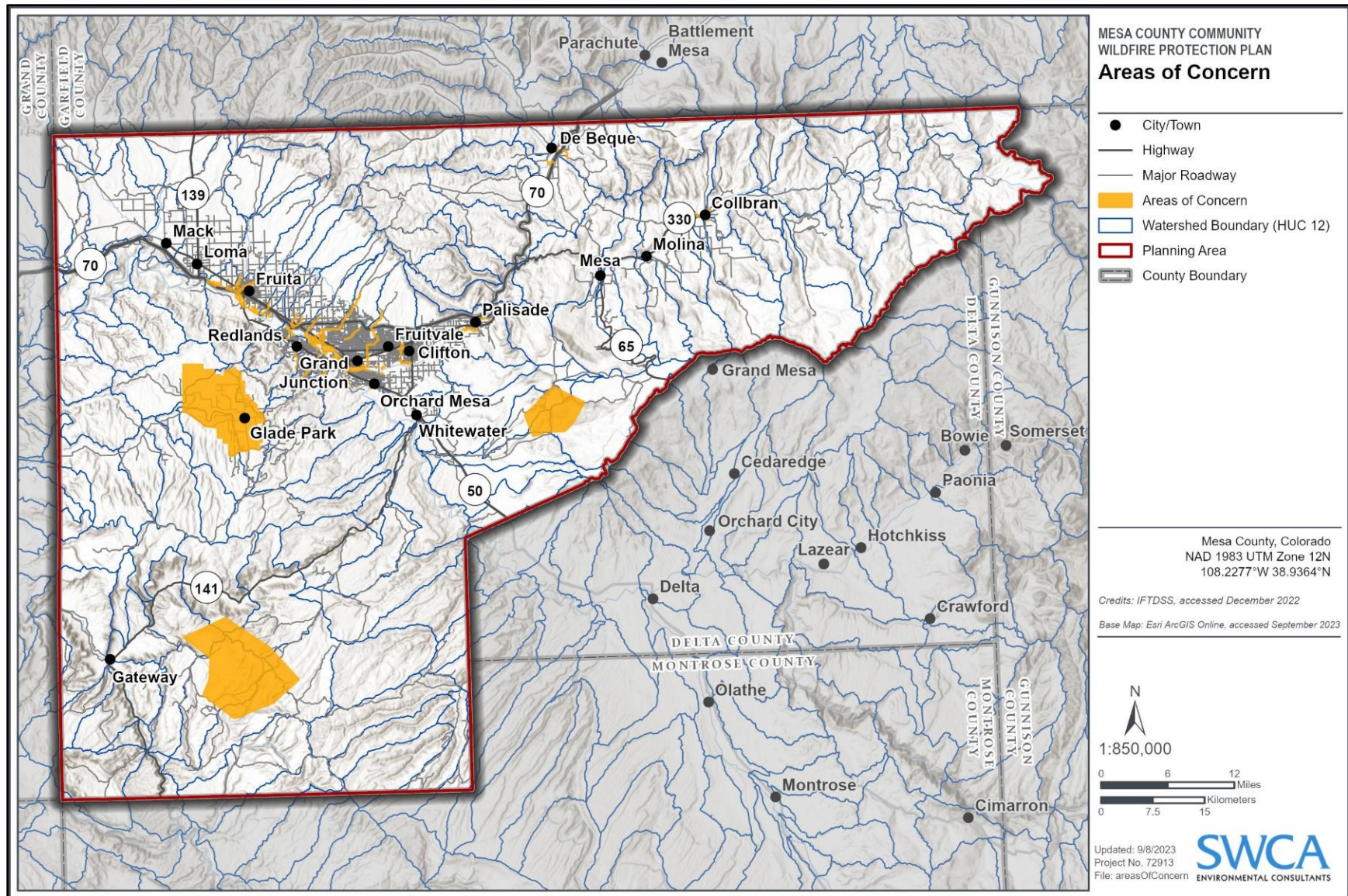


Figure 4.4. Collaboratively identified areas of concern within Mesa County.

The areas of concern shown above were delineated by a diverse and collaborative Core Team using the results of the comprehensive wildfire Risk-Hazard Assessment (Chapter 3), as well as fuel loading and continuity characteristics, structure locations, and local knowledge. Due to the prevalence of tamarisk along riparian corridors, areas of concern were also delineated along waterways within municipal boundaries to emphasize the importance of invasive species management, as well as vegetation management in areas with heavy riparian fuels.

While residents within these areas of concern should prioritize fuel treatments in the HIZ (see Appendix F, Figure F.1), it is advisable to reduce fuels beyond the HIZ for properties within the WUI. See Appendix G for a list of homeowner resources and Appendix C for additional details on wildfire risk for specific communities across Mesa County. Figures 4.5, 4.6, and 4.7 present proposed community fuel treatments and associated recommendations (Table 4.3) to be implemented on a combination of private, local, state, and federal land for the purpose of increasing community-level landscape resiliency to wildfire spread and impacts.

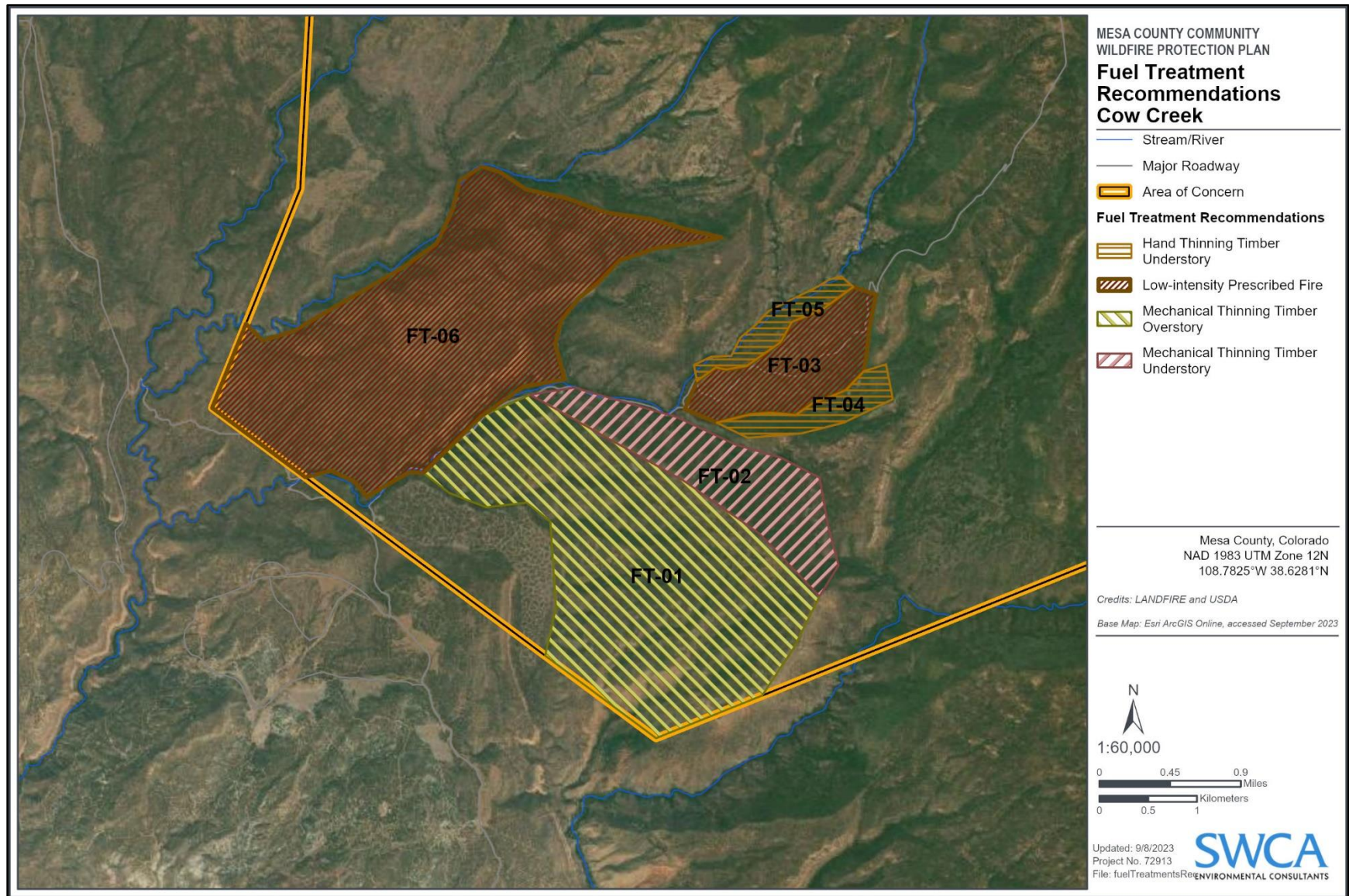


Figure 4.5. Fuel treatment recommendations for the Cow Creek area of concern.

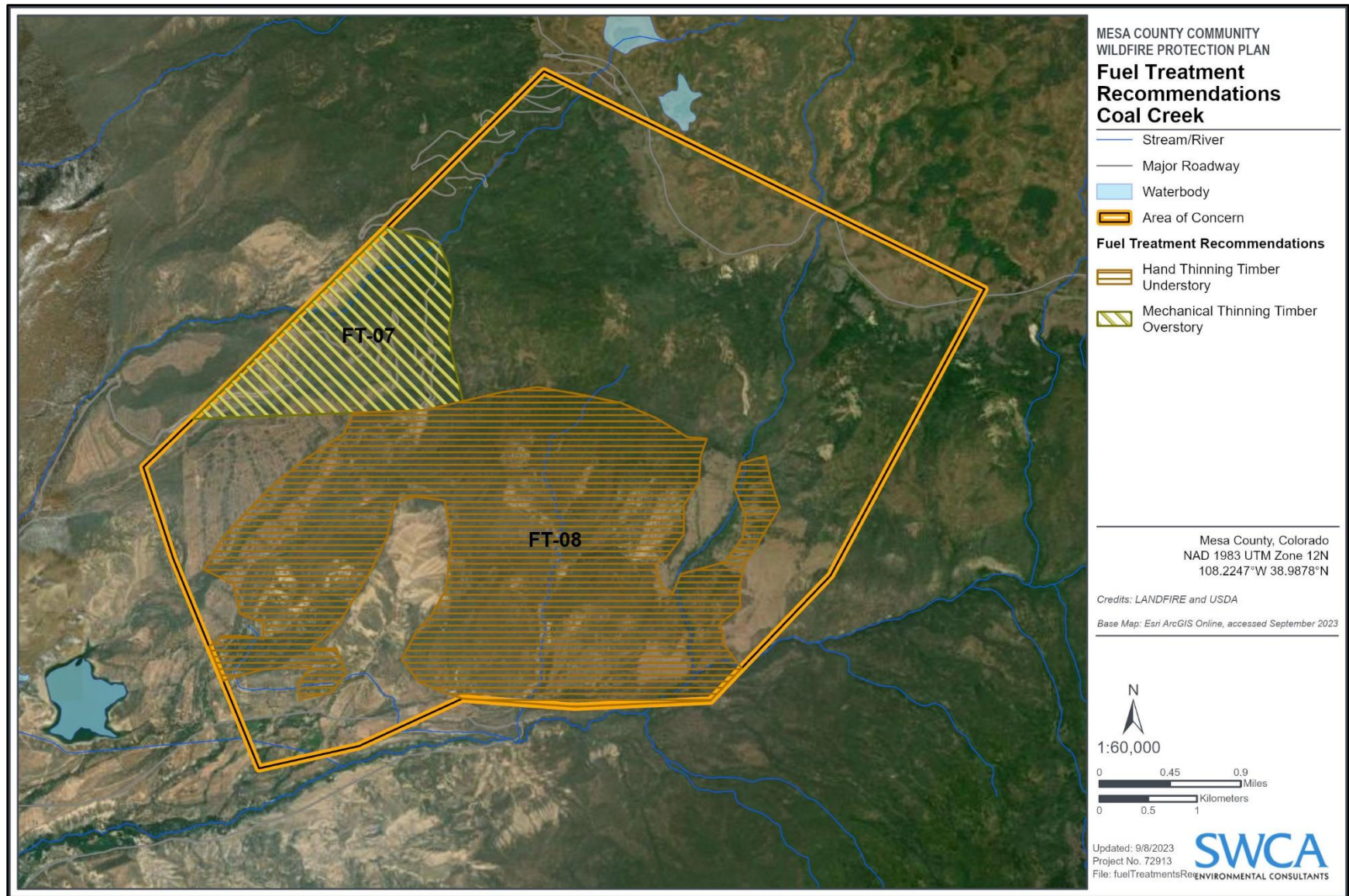


Figure 4.6. Fuel treatment recommendations for the Coal Creek area of concern.

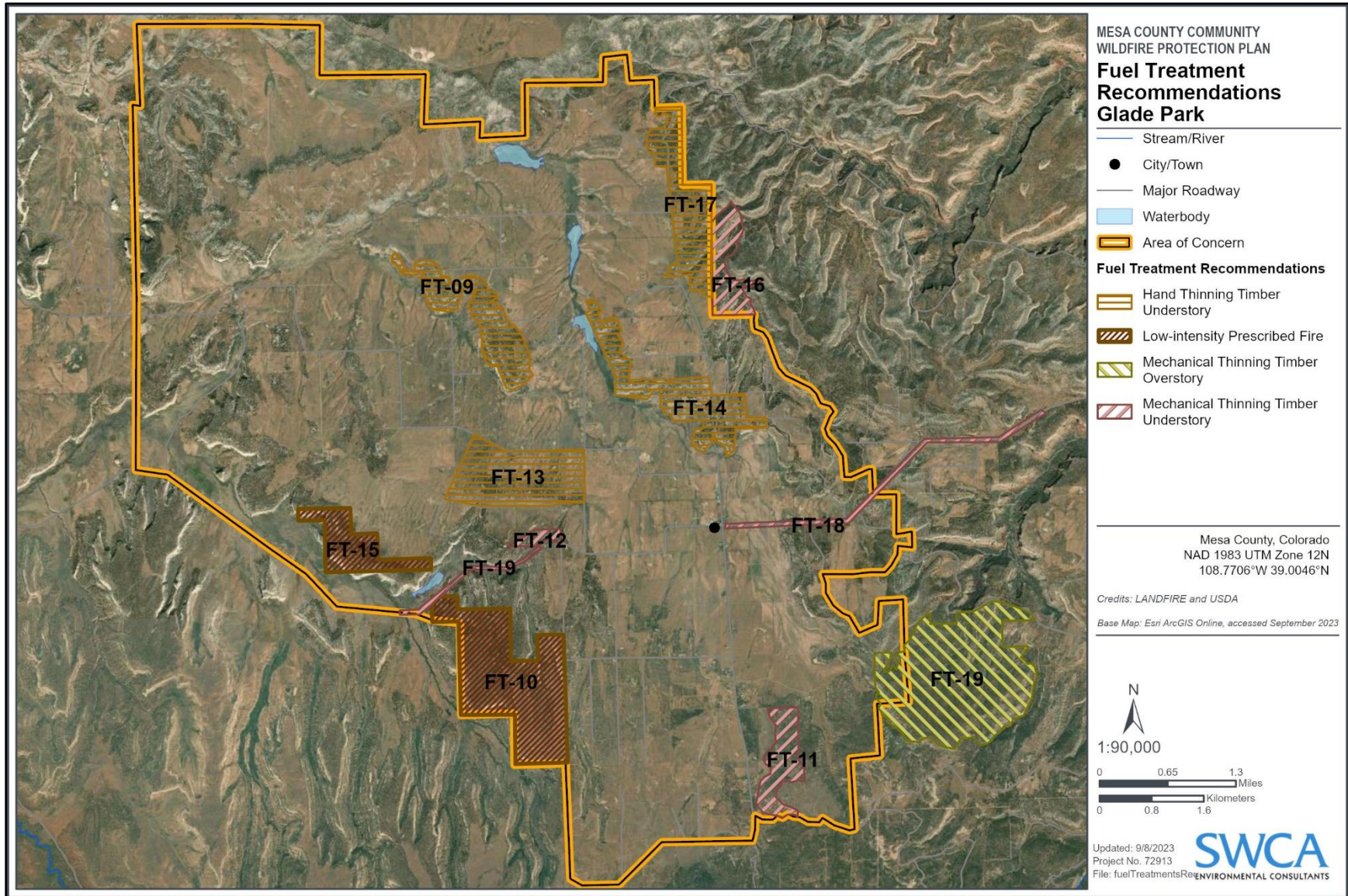


Figure 4.7. Fuel treatment recommendations for the Glade Park area of concern.

Table 4.3 Recommendations for Community-Level Fuel Treatments

Fuel Treatment ID	Description
FT-01	Use mechanical fuel reduction techniques to effectively reduce fuel loading and continuity in pinyon-juniper fuels.
FT-02	In taller vegetation, utilize mechanical thinning to reduce ladder fuels and subsequently wildfire intensity.
FT-03	Utilize prescribed fire in light and flashy grass and shrub fuels. Fire in this vegetation type will enhance healthy ecological succession and reduce the momentum of severe wildfire on the landscape.
FT-04	Treat fuels on either side of the proposed prescribed burn unit by prepping containment lines and reducing fuel loads throughout. Reduce the ability for fuel beds to catch spots and carry fire by removing dead and down fuels and ladder fuels.
FT-05	Treat fuels on either side of the proposed prescribed burn unit by prepping containment lines and reducing fuel loads throughout. Reduce the ability for fuel beds to catch spots and carry fire by removing dead and down fuels and ladder.
FT-06	Utilize prescribed fire in light and flashy grass and shrub fuels. Fire in this vegetation type will enhance healthy ecological succession and reduce the momentum of severe wildfire on the landscape.
FT-07	Utilize the existing road network to perform mechanical thinning of the fuels in this area. This will reduce fuel continuity and loading in the area of concern.
FT-08	Utilize hand-thinning techniques to reduce impacts to riparian areas. Pair fuel treatment methods with fuel reduction methods such as mastication, piling and burning, or broadcast burning.
FT-09	Pile and burn pinyon-juniper fuels to reduce fuel continuity and loading near several private residences. Mechanical mastication can be a viable option as well.
FT-10	Construct containment lines using mechanical and hand-thinning techniques. Ensure mowing of containment lines, and use existing roads as potential containment boundaries. Establish conservative weather parameters for prescribed burning operations as fuels are west of communities in Glade Park and the prevailing winds are from the west.
FT-11	Work with homeowners to implement HIZ treatments. Reduce fuel continuity and loading by piling and burning pinyon-juniper vegetation.
FT-12	Thin dense roadside fuels on BLM-managed land to reduce wildfire risk to nearby homes.
FT-13	Provide homeowners with information, resources, and opportunities to facilitate fuel treatments within the HIZ.
FT-14	Provide homeowners with information, resources, and opportunities to facilitate fuel treatments within the HIZ.
FT-15	Construct containment lines using mechanical and hand-thinning techniques. Ensure mowing of containment lines, and use existing roads as potential containment boundaries. Establish conservative weather parameters for prescribed burning operations as fuels are west of communities in Glade Park and the prevailing winds are from the west.
FT-16	Treat hazardous fuels on public land adjacent to private residences. Implement piling and burning or prescribed fire after mechanical treatments.
FT-17	Work with homeowners to implement HIZ fuel treatments. Treat roadside fuels, including grass fuels, by mowing.

Fuel Treatment ID	Description
FT-18	Implement roadside fuel-thinning treatments to reduce the ability for ignitions to spread into the WUI. Mowing, mastication, and piling and burning are efficient techniques to accomplish this.
FT-19	Implement roadside fuel-thinning treatments to reduce the ability for ignitions to spread into the WUI. Mowing, mastication, and piling and burning are efficient techniques to accomplish this.

Note: See Figures 4.5–4.7 (above) for Fuel Treatment ID locations. See Appendix F for descriptions of fuel treatment methodologies and Goal 2: Fire-Adapted Communities for recommendations on reducing structural ignitability.



GOAL 2: FIRE-ADAPTED COMMUNITIES

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

RECOMMENDATIONS FOR PUBLIC EDUCATION AND OUTREACH

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

Most residents in the WUI understand the risk that wildfire poses to their communities. However, it is important to continually engage the community as a partner in order to expand wildfire mitigation options across land ownership (McCaffrey 2004, 2020; McCaffrey and Olsen 2012; Winter and Fried 2000). The Core Team has acknowledged that enhancing community involvement in prevention and mitigation is a top priority.

Methods to improve public education could include increasing awareness about fire department response and resource needs; providing workshops at demonstration sites showing Firewise landscaping techniques or fuels treatment projects; organizing community cleanups to remove green waste; publicizing availability of government funds for treatments on private land; and, most importantly, improving communication between homeowners and local land management agencies to improve and build trust, particularly since the implementation of fuel treatments and better maintenance of existing treatments needs to occur in the interface between public and private land.

Although many residents are familiar with Firewise Communities, many others could benefit from greater exposure to this program. Workshops demonstrating and explaining Firewise Communities principles have been suggested to increase homeowner understanding of home protection from wildfire. One goal is for communities to apply to become a Firewise Community, recognized in the State as a shining example for fire prevention. Information about the program is available at <http://www.firewise.org/usa/index.htm>. Greater participation in the Firewise Communities program could improve local understanding of wildfire and, in turn, improve protection and preparedness.

Other methods to improve public education could include providing signs indicating fire danger level (low, moderate, high, extreme) to be displayed in highly visible areas where they do not already exist; increasing awareness about fire department response and fire department resource needs; developing fire evacuation plans; providing workshops at demonstration sites showing Firewise Communities landscaping techniques or fuels treatment projects; organizing community cleanups; publicizing availability of government funds for thinning; and, most importantly, improving communication between homeowners and local land management agencies to improve and build trust.

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

Table 4.2 lists public education recommendations to be implemented in the county.

RECOMMENDATIONS FOR REDUCING STRUCTURAL IGNITABILITY

Table 4.2 provides a list of community-based recommendations to reduce structural ignitability that should be implemented throughout the Mesa County CWPP planning area. Reduction of structural ignitability depends largely on public education that provides homeowners the information they need to take responsibility for protecting their own properties. A list of action items that individual homeowners can follow is provided below. Carrying out fuels reduction treatments on public land may only be effective in reducing fire risk to some communities; if homeowners have failed to provide mitigation efforts on their own land, the risk of home ignition remains high, and firefighter lives are put at risk when they carry out structural defense.

Preparing for wildland fire by creating defensible space around the home is an effective strategy for reducing structural ignitability as discussed under Cohesive Strategy Goal 1: Resilient Landscapes. Studies have shown that burning vegetation beyond 120 feet of a structure is unlikely to ignite that property through radiant heat (Butler and Cohen 1996), but firebrands that travel independently of the flaming front have been known to destroy houses that had not been impacted by direct flame impingement. Additionally, once fire is established in urban structure fuels, it can be extremely difficult to extinguish and has a high potential to spread to other nearby structures.

Hardening the home to ignition from embers, including maintaining vent coverings and other openings, is also strongly advised to protect a home from structural ignitability. Managing the landscape around a structure by removing weeds and debris within a 30-foot radius and keeping the roof and gutters of a home clean are two maintenance measures proven to limit combustible materials that could provide an ember bed and ignite the structure. Adjacent structures such as those comprised of combustible materials can also impact home ignitability (e.g., garages, sheds, and wooden fences). See Ember Ignition Hazards in Chapter 2.

Some structural ignitability hazards are related to homes being in disrepair, vacant or abandoned lots, and minimal yard maintenance. In order to influence change in homeowner behavior, county ordinances may be needed.

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

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	M	2023-2028	Increase public education and outreach regarding wildfire.	Countywide	Local FPDs, HOAs, Two Rivers Wildfire Coalition, state and federal agencies	<p>Increase education through community training.</p> <ul style="list-style-type: none"> Targeted wildfire info sessions Distribute wildfire and natural hazard education materials. Distribute a list of mitigation actions broken down by cost. Utilize Appendix G of the CWPP: Homeowner Resources Promote the use of and referral to the West Region Wildfire Council web page. Education and outreach for people who live outside of Fire protection districts. Offer hands-on workshops to highlight individual home vulnerabilities and how-to techniques to reduce the ignitability of common structural elements. Utilize current popular information sources (Nextdoor, social media, Twitter, etc.) <p>Implement youth fire prevention programs (can work with camps, schools, clubs, etc.)</p> <ul style="list-style-type: none"> Outreach to encourage more young people to join emergency response teams Distribute Firewise information to school children during Fire Prevention Week. <p>Utilize and improve existing signage</p> <ul style="list-style-type: none"> Spread seasonally adjusted fire prevention messages along highways and in public open space areas to reduce human ignitions and promote defensible space. Promote the use of existing electronic signs at fire stations and other locales to display fire prevention information, safety messages, and fire danger ratings linked to safety actions. 	<p>Protect communities and infrastructure by raising awareness of local citizens and those traveling in the area about actions that can prevent fires.</p> <p>Deliver a clear and consistent message to the public.</p> <p>Reach diverse audiences.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) 	<p>Yearly updates to materials.</p> <p>Annual review of the number of events implemented.</p> <p>Set goals for the following year.</p>	<ul style="list-style-type: none"> RCP BRIC Firewise grants National Urban and Community Forest Program FP&S (FEMA) Environmental Protection Grants (EPA) Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	H	2023-2025	Create and promote defensible space standards. Encourage home hardening. Improve homeowner mitigation efforts and opportunities.	WUI, countywide, high-risk areas as identified in the risk assessment.	Private, County Planning Commission, local FPDs, West Region Wildfire Council, HOAs, Two Rivers Wildfire Coalition, and community leaders	<p>Adhere to CSFS recommended defensible space standards (e.g., support 100 feet of defensible space).</p> <ul style="list-style-type: none"> Clean and maintain fuel buffers in ingress/egress routes. Support the creation/maintenance of two methods of egress out of a community. Support landscaping methods across multiple properties that reduce fire potential (e.g., connect fuel treatments across different properties). Develop a staffing plan to support enforcement and seek funding to implement the plan. Provide tax incentives for defensible space actions. Work with insurance commissions & companies to determine the potential to provide incentives for defensible space associated with reduced insurance premiums. Consider fuels pickup/disposal options. Build staff capacity via grant funding to conduct home assessments and follow up with homeowners. Assist vulnerable populations (e.g. elderly, disabled, etc.) with carrying out mitigations efforts and adopting firesafe practices. <p>Promote education on the reduction of structural ignitability.</p> <ul style="list-style-type: none"> Raise awareness of the dangers of trash and debris build-up on properties and the risk that yard waste and debris fuels can pose a fire danger. Create guidance and encourage residents to encourage yard clean-ups on private property 	<p>Reduce loss of life and structures by reducing ignitability through defensible space and home hardening.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	<p>Annual home hardening and defensible space program evaluation – including assessment of staff and available funding.</p>	<ul style="list-style-type: none"> Firewise FP&S (FEMA) EPA Environmental Education Grants CWDG BRIC Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) National Urban and Community Forest Program FP&S

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	H	2023-2025	Update current fire and building codes. Develop and enact WUI Codes. Focus on land use plans, existing building codes, and subdivision codes.	County and local municipalities	The county planning commission and town governments FPDs, OEM	Strengthen municipal and county codes for homes and structures located within the WUI. <ul style="list-style-type: none"> Provide a list of examples of the costs of acceptable building materials. See a table of action items for homeowners to reduce structural ignitability in Appendix F of the CWPP. Continue to develop and adopt the latest building standards and codes. Clearly define the WUI in the county code. Consider countywide adoption of the International WUI code. Provide HOA model covenants and architectural guidelines. Public education (esp. Builders, agency staff, architects, realtors). 	Reduce wildfire risk and loss of structures through effective regulation. Align with the following plans: <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	Annual program evaluation and updates as necessary. Consider updates to the building code, where needed	<ul style="list-style-type: none"> Firewise grants FP&S (FEMA) CWDG BRIC CSFS
	H	2023-2025	Improve evacuation zones, route education and outreach to the public.	Countywide	Federal, state, and local agencies. Mesa County Sherriff's Office FPDs Two Rivers Wildfire Coalition	Identify evacuation routes. Fuel treatments adjacent to roads can reduce fire behavior along important travel routes used for ingress by emergency vehicles and egress by residents. <ul style="list-style-type: none"> Identify parcel owners along primary evacuation routes. Seek grant opportunities to support priority project implementation. Evacuation Planning <ul style="list-style-type: none"> Create/distribute education material on evacuations. Provide handouts on preparing "Go Bags" – an emergency supply bag that can be accessed in cases of evacuation. Hold meetings and community functions to provide guidance for creating household emergency plans. Construct a livestock and pet evacuation and sheltering plan. <ul style="list-style-type: none"> Utilize Appendix B for guidance on pet evacuation planning. Utilize USDA's disaster planning for animal facilities; CSU Extension's livestock resources webpage; and PetAid Colorado Disaster Services 	Improve preparedness by facilitating the communication between family members and neighbors about which procedures to follow in the event of a wildfire. Align with the following plans: Mesa County HMP (2020)	Annual Maintenance Yearly updates to materials	<ul style="list-style-type: none"> RCP BRIC Firewise grants National Urban and Community Forest Program FP&S (FEMA)
	M	2023-2028	Implement Firewise Communities programs	Countywide	County, subdivisions. (HOAs, etc. organized homeowners), contractors, Two Rivers Wildfire Coalition, developers, realtors, FPDs	Improve education and knowledge of Firewise practices. <ul style="list-style-type: none"> Continue current Firewise practices. Include Firewise information in short-term rental contracts. Free neighborhood & property assessments and mitigation planning; website sign-ups Provide wildfire assessor training. Provide home hardening resource lists, examples, and cost estimates. Consider direct mailers. Distribute Firewise information to school children during Fire Prevention Week. Re-establish a Firewise coordinator. Work with communities to participate in Firewise Communities and prepare for fire events. Hold Firewise booths at local events, for example, the Peach Festival in Palisade or during Fire Awareness Week each year. <ul style="list-style-type: none"> Conduct Firewise/Ready, Set, GO! Workshops. Offer hands-on workshops to highlight individual home vulnerabilities and how-to techniques to reduce the ignitability of common structural elements. Conduct more public meetings to educate citizens about Firewise. Provide links to Firewise websites, downloadable forms, and other resources at meetings or workshops. 	Reduce wildfire risk through greater adoption of Firewise and structure hardening measures. Align with the following plans: <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	Establish a program to assess the frequency and location of activities	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program FP&S (FEMA) Environmental Protection Grants (EPA) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	M	2023-2028	Spread awareness to the community on various human-caused ignitions	Countywide	County, subdivisions. (HOAs, etc. organized homeowners), developers, realtors, Two Rivers Wildfire Coalition, FPDs, and houseless service providers	<p>Inform and educate the public about methods to reduce human-caused wildfire ignitions.</p> <ul style="list-style-type: none"> Educate around sources of human-caused wildfire ignitions (e.g., target practice, driving through or parking in tall, dry vegetation; discarded cigarette butts; fireworks; campfires, etc.). Communicate hazardous conditions surrounding homes/structures (e.g., exposed propane tanks, electrical hazards, hazard trees, limited defensible place, etc.) Provide materials with resources for the public to understand how and with what funding they can take action to reduce risks. Integrate tourism and STR advertising. Collaborate with DFPC to further understand ignition causes. <p>Utilize Appendix G of the CWPP: Homeowner Resources</p>	<p>Protect communities and infrastructure through increased awareness of fire danger for residents and visitors.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	<p>Assess the need for maintenance and updates to the material on an annual basis</p>	<ul style="list-style-type: none"> RCP BRIC Firewise grants National Urban and Community Forest Program FP&S (FEMA)
	M	2023-2028	Develop capacity within the county to facilitate a collaborative approach to community education and wildfire preparedness.	Countywide	The county planning commission and town governments FPDs, OEM, Two Rivers Wildfire Coalition	<p>Promote interagency collaboration for protecting life and property throughout Mesa County's communities by building wildfire resilience.</p> <ul style="list-style-type: none"> Spreading awareness of mitigation activities Education projects Fundraising activities <p>Highlight the effectiveness of the Two Rivers Coalition to date, denoting the potential benefit of additional staffing support.</p>	<p>Increase public education and engagement in the wildfire mitigation process.</p> <p>Align with the following Plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	<p>Annual evaluation to determine if the capacity for interagency collaboration and community involvement has been met.</p>	<ul style="list-style-type: none"> BRIC Firewise grants National Urban and Community Forest Program FP&S (FEMA) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	L	2023-2026	During future Mesa County CWPP update processes, address concerns regarding wildfire risk to drinking water and wastewater infrastructure.	Mesa County	Mesa County, City of Grand Junction	<ul style="list-style-type: none"> Conduct an analysis on wildfire risk to water infrastructure. Determine sediment thresholds for water treatment systems and how large wildfires may impact water treatment operations. Plan and implement mitigation strategies that improve the resiliency of water infrastructure to wildfire. 	<p>Enhance the resiliency of water treatment infrastructure to wildfire.</p> <p>Establish priority HVRAs.</p>	<p>Coordinate annually with municipalities and water treatment operators to determine priorities and concerns.</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for fire departments and first responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	M	2023-2026	Decrease ignitions from unboxed populations.	County-wide, riparian corridors located within municipal boundaries, parks and open spaces adjacent to wildland fuels.	Mesa County, City of Grand Junction	<p>Create a task force or team of PIOs and County officials, including members of the community to create an outreach and implementation program to reduce human-caused ignitions.</p> <ul style="list-style-type: none"> Unify coordination, messaging, and goals and objectives. Evaluate areas of concern for implementation. Provide information and resources guiding individuals in the safe use of heating and cooking materials. Provide unboxed populations with opportunities to make use of fuel sources that reduce the risk of wildland ignitions. Consider implementing a fuel canister recycling program for the purpose of reducing the use of open flames and canister waste. Apply for Community Resilience Centers Program 	<p>Reduce wildland ignitions and ignitions in the WUI.</p>	<p>Quarterly PIO meeting to discuss strategies to reduce human-caused ignitions.</p> <p>Annual evaluation of program goals and objectives. Use human-caused ignition data. Coordinate with DFPC.</p>	<ul style="list-style-type: none"> Firewise grants FP&S (FEMA) EPA Environmental Education Grants CWDG



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

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

RECOMMENDATIONS FOR IMPROVING FIRE RESPONSE CAPABILITIES

The county is divided into 13 FPDs, all of which have been proactive in seeking funds to support and improve their services. Effective wildfire response capabilities are crucial to safeguarding the life, property, and health of the local population. These capabilities can be strengthened by implementing various measures, including enhancing preparedness, fostering interagency coordination, acquiring necessary resources, and promoting community education.

Public education surrounding emergency notification and response to fire incidents is essential to reducing community dependence on fire departments in emergency situations. This is especially important in areas with longer response emergency service times in comparison to municipal zones. Enhancing community preparedness through education plays a critical role in supporting local fire departments in their fire response efforts. This can be achieved through greater communication and collaboration between fire departments, local organizations, and individuals within the community. It is recommended that Fire Chiefs share feedback on funding and grant successes, allowing each district to benefit from a collective learning approach.

Table 4.5 provides recommendations for improving firefighting capabilities. Many of these recommendations are general in nature.

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Table 4.5. Recommendations for Safe and Effective Wildfire Response

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	H	2023-2025	Provide wildland fire training to local firefighters.	All county fire departments	FPDs, fire stations, rural volunteer fire departments	<ul style="list-style-type: none"> Develop agreements between agencies to provide training opportunities for fire staff. Ensure fire departments require all firefighters to be red carded. A red card is required for firefighters to work on an active federal fire incident. Increase funds for volunteer fire department training for response to fires in the WUI. Reach out to the National Wildfire Coordination Group (NWCG) for training materials, online courses, and instructor needs. Provide training opportunities for firefighter trainees to meet NWCG standards. 	<ul style="list-style-type: none"> Improve local fire department wildland fire response and suppression capabilities. Reduce the damage caused by wildfires. Reduce the likelihood of firefighter injuries and fatalities. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) 	<p>Provide annual red card training/refreshers/pack test events before the start of fire season.</p> <p>Provide online wildfire training classes/refreshers courses</p>	<ul style="list-style-type: none"> Emergency Management Performance Grant (EMPG) (FEMA) RCP BRIC Volunteer Fire Assistance (VFA) Grant (Colorado DFPC) Firewise grants Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	H	2023-2025	Provide wildland firefighting equipment and personal protective equipment to FPDs and road and bridge staff.	All county fire departments, Mesa County	FPDs, fire stations, rural volunteer fire departments, Mesa County	<p>Identify equipment needs and secure funding for wildland firefighting resources and personal protective equipment (PPE)</p> <ul style="list-style-type: none"> Identify priority equipment needs and notify appropriate personnel. Acquire equipment such as chainsaws, Type 6 fire apparatus, Mk.3 pumps, Nomex clothes, and fire shelters. <p>To obtain equipment:</p> <ul style="list-style-type: none"> Modifying/approving budgets to obtain equipment Achieve funding through fundraising/grant applications (e.g., federal, state, local, and independent grants and private donations). Collecting hand-me-downs and/or capitalizing on surplus supplies. Hiring local contractors in the event of a wildfire 	<ul style="list-style-type: none"> Improve local fire department wildland fire response and suppression capabilities. Reduce the damage caused by wildfires. Reduce the likelihood of firefighter injuries and fatalities. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) 	<p>Convene annually to document the status and amount of heavy firefighting equipment in the county.</p> <p>Complete an inventory of wildland firefighting resources (fire shelters, chainsaws, drip torches, line-packs, pumps, pumpkins, hose, fittings, etc.)</p>	<ul style="list-style-type: none"> EMPG (FEMA) RCP BRIC Firewise grants Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) SRS Title III
	H	2023-2026	Develop a countywide, interagency forum for fire training.	Mesa County	County, state, and federal	<p>Develop an online and/or in-person forum where agencies and the County can post-fire training schedules and districts can post training needs.</p> <ul style="list-style-type: none"> Identify potential training opportunities for staff and volunteers in the local area to save training and travel costs. Hire training officers to help with capacity and instruction (research NWCG instructor qualifications). Contact the Upper Colorado River (UCR) Fire Management Unit and the Colorado State Forest Service (CSFS) for additional support and cooperation as needed. 	<ul style="list-style-type: none"> Provide training opportunities. Improve wildland fire fighting capabilities and capacity. Create interagency cooperation and agreements 	<p>Conduct annual cooperator meetings. Review completion rates, certifications, and training needs.</p>	<ul style="list-style-type: none"> EMPG (FEMA) RCP BRIC Volunteer Fire Assistance (VFA) Grant (Colorado DFPC) Firewise grants Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
M		2023-2030	Identify or create strategically located water resources for fire suppression operations.	Glade Park, Plateau Valley, and other rural areas in Mesa County	County, state, federal, and private lands. Water resources in spatial relation to FPDs, fire stations, and rural volunteer fire departments.	<p>Ensure adequate water resources are placed and identified in strategic locations around the county during peak wildfire season. Locations of water resources should be cataloged in an online mapping program.</p> <ul style="list-style-type: none"> Implement temporary water storage solutions on private lands (dip tanks, pumpkins, cisterns). Conduct portable dip tank training with fire personnel. Create a countywide map of temporary water resources. Improve existing fire flows in remote areas to meet fire flow requirements Make sure fire flows in new developments meet fire flow requirements Install water tanks where feasible. In locations water tanks cannot be installed, have tanks filled and pre-loaded to be transported to areas of need in the event of a fire Install additional tanks and standpipes Install helicopter dip tanks where appropriate Initiate a detailed study of feasible locations for water development improvements Install hand pumps or other methods independent of the grid for accessing private well water Ensure suppression crews have the appropriate “keys” for hydrants or standardized water fittings 	<ul style="list-style-type: none"> Improve fire-fighting response Alleviate public and agency concerns for limited water supply in some WUI areas. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) Mesa County HMP (2020) 	<p>Conduct inventory of the county's water storage and water supply areas</p> <p>Convene annually to document actions taken and document the status of firefighting water supply resources</p> <p>Ensure firefighting resources are equipped with a GIS map on a tablet/computer showing proximity to available water resources.</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
M		2023-2030	Improve wildfire response navigation capabilities.	Mesa County	FPDs, fire stations, rural volunteer fire departments, and local communities.	<ul style="list-style-type: none"> Require reflective addresses on houses and structures Utilize GIS services to provide up-to-date, detailed maps of driveways, alleys, and access roads to fire response personnel. 	<ul style="list-style-type: none"> Improve firefighting response capabilities. Enhance public safety. Increase situational awareness <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) Mesa County HMP (2020) 	<p>Conduct inventory/assessment of reflective addressing so areas/regions can be prioritized.</p> <p>Conduct geospatial inventory of driveways, alleys and access roads and update accordingly</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP
H		2023-2026	Carry out detailed pre-incident planning and training workshops within districts and with neighboring districts and mutual aid partners.	FPDs, state, and federal fire programs	Mesa County, state, and federal	<p>Establish interagency agreements for joint training exercises and mutual aid</p> <p>Conduct the following joint training exercises</p> <ul style="list-style-type: none"> Live fire line construction. Timber falling and fire line chainsaw use. Prescribed fire operations. Medical emergency scenarios. Fire size up and multi-agency dispatch. 	<ul style="list-style-type: none"> Improve wildfire suppression response times and effectiveness. Facilitate cooperation amongst firefighting agencies. Reduce the risk of firefighter injury or death. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) Mesa County HMP (2020) Colorado Forest Action Plan (2020) Colorado State Forest Service Five-Year Strategic Plan (2021) 	<p>Conduct annual fire readiness reviews. Conduct detailed after-action reviews (AARs)</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
H		2023-2025	Revitalize the Interagency Fire Chiefs Association.	Mesa County FPDs	Mesa County Fire Chiefs Association, UCR Fire Management Unit, state and federal fire agencies	<p>Create a regional Fire Chiefs Association</p> <ul style="list-style-type: none"> Incorporate Fire Chiefs from nearby counties. Engage State and Federal agencies. Establish a "board" and conduct meetings. Establish goals and objectives for the Association. 	<ul style="list-style-type: none"> Improve interagency cooperation. Establish an association capable of creating, informing, and assessing wildfire-related management decisions. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) Mesa County HMP (2020) Colorado State Forest Service Five-Year Strategic Plan (2021) 	<p>Conduct quarterly review meetings. Establish a mailing list. Facilitate and review public comments on Association actions.</p>	<p>FEMA, State funds, and private grants</p> <ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
M		2023-2028	Improve evacuation capabilities and maintain evacuation notification resources.	Mesa County, rural communities, urban communities	Mesa County – Office of Emergency Services, Sherriff's Office	<p>Mesa County utilizes the IPAWS evacuation notification system.</p> <ul style="list-style-type: none"> Improve delivery of notifications. Identify evacuation routes. Inform civilians of evacuation routes and evacuation protocols. Create a multi-hazard evacuation plan. 	<ul style="list-style-type: none"> Improve evacuation capabilities. Preserve life during natural disasters. Reduce the burden on law enforcement and wildfire suppression resources. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) 	<p>Conduct regular IPAWS system testing. Update evacuation information on County websites. Consider creating a small informational campaign designed to inform citizens of evacuation protocol and resources.</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
H		2023-2026	Improve reporting and documentation of fires.	Mesa County	Mesa County – Office of Emergency Services, Sherriff's Office, and local FPDs	<p>Create a reporting methodology and protocol for reporting and recording all wildfires in the County. Utilize a geographic information system for storing fire occurrence data. Efforts should be taken to ensure small wildfires are recorded as well. The national situation report only lists fires above 100 acres.</p>	<p>Inform planning decisions with a robust fire occurrence dataset.</p>	<p>Coordinate with interagency dispatch centers and establish fire reporting protocols with other fire agencies.</p>	<ul style="list-style-type: none"> Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

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An important step in the implementation of the Mesa County CWPP is developing an action plan and assessment strategy that identifies roles and responsibilities, funding needs, and timetables for completing highest-priority projects. Chapter 4 identifies tentative timelines and monitoring protocols for project recommendations, the details of which are outlined below.

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

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

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

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

Table 5.1. Recommended Monitoring Strategies

Strategy	Task/Tool	Lead	Remarks
Photographic record (documents pre- and post-fuels reduction work, evacuation routes, workshops, classes, field trips, changes in open space, treatment type, etc.)	Establish field GPS location; photo points of cardinal directions; keep photos protected in archival location	Core Team member	Relatively low cost; repeatable over time; used for programs and tracking objectives
Number of acres treated (by fuel type, treatment method)	GPS/GIS/fire behavior prediction system	Core Team member	Evaluating costs, potential fire behavior
Number of HIZs/defensible space treated to reduce structural ignitability	GPS	Homeowner	Structure protection
Number of residents/citizens participating in any CWPP projects and events	Meetings, media interviews, articles	Core Team member	Evaluate culture change objectives Annual lessons learned review encouraged among stakeholders
Number of homeowner contacts (brochures, flyers, posters, etc.)	Visits, phone	Core Team member	Evaluate objectives Annual lessons learned review encouraged among stakeholders
Number of jobs created, contracts, grants	Census data and county records	Core Team member	Evaluate local job growth
Education outreach: number, kinds of involvement	Workshops, classes, field trips, signage	Core Team member	Evaluate objectives Annual lessons learned review encouraged among stakeholders
Emergency management: changes in agency response capacity	Collaboration, grants to fund fire department needs such as new personnel and equipment	Agency representative	Evaluate mutual aid Annual review
Codes and policy changes affecting CWPP	Qualitative	Core Team	CWPP changes
Number of stakeholders	Added or dropped	Core Team	CWPP changes
Wildfire acres burned, human injuries/fatalities, infrastructure loss, environmental damage, suppression, and rehabilitation costs	Wildfire records	Core Team	Compare with 5- or 10-year averages

FUELS TREATMENT MONITORING

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

The strategies outlined in this section consider several variables:

- Do the priorities identified for treatment reflect the goals stated in the plan? Monitoring protocols can help address this question.

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

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

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

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

Moderate—Level 2: Multiple Permanent Photo Points

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

High—Level 3: Basic Vegetation Plots

A series of plots can allow monitors to evaluate vegetation characteristics such as species composition, percentage of cover, and frequency. Monitors then can record site characteristics such as slope, aspect, and elevation. Parameters would be assessed pre- and post-treatment.

The monitoring agency should establish plot protocols based on the types of vegetation present and the level of detail needed to analyze the management objectives. This method is appropriate for foresters or other personnel monitoring fuel treatments on forested land.

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

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

IMPLEMENTATION

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

CWPP EVALUATION

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

Table 5.2. Four general steps can be used to evaluate the CWPP:

<p>1. Identify objectives: What are the goals identified in the plan? How are they reached? Is the plan performing as intended?</p>	<ul style="list-style-type: none"> a. Structural ignitability b. Fuel treatments c. Public education and outreach d. Multi-agency collaboration e. Emergency response
<p>2. Assess the changing environment: How have population characteristics and the wildfire environment changed?</p>	<ul style="list-style-type: none"> a. Population change <ul style="list-style-type: none"> i. Increase or decrease ii. Demographics b. Population settlement patterns <ul style="list-style-type: none"> i. Distribution ii. Expansion into the WUI c. Vegetation <ul style="list-style-type: none"> i. Fuel quantity and type ii. Drought and disease impacts
<p>3. Review action items: Are actions consistent with the plan's objectives?</p>	<ul style="list-style-type: none"> a. Check for status, i.e., completed/started/not started b. Identify completed work and accomplishments c. Identify challenges and limitations d. Identify next steps
<p>4. Assess results: What are the outcomes of the action items?</p>	<ul style="list-style-type: none"> a. Multi-agency collaboration <ul style="list-style-type: none"> i. Who was involved in the development of the CWPP? ii. Have partners involved in the development process remained involved in the implementation? iii. How has the planning process promoted implementation of the CWPP? iv. Have CWPP partnerships and collaboration had a beneficial impact to the community? b. Risk assessment <ul style="list-style-type: none"> i. How is the risk assessment utilized to make decisions about fuel treatment priorities? ii. Have there been new wildfire-related regulations? iii. Are at-risk communities involved in mitigating wildfire risk? c. Hazardous fuels <ul style="list-style-type: none"> i. How many acres have been treated? ii. How many projects are cross-boundary? iii. How many residents have participated in creating defensible space? d. Structural ignitability <ul style="list-style-type: none"> i. Have there been updates to fire codes and ordinances? ii. How many structures have been lost to wildfire? iii. Has the CWPP increased public awareness of structural ignitability and reduction strategies? e. Public education and outreach <ul style="list-style-type: none"> i. Has public awareness of wildfire and mitigation strategies increased? ii. Have residents been involved in wildfire mitigation activities? iii. Has there been public involvement? iv. Have vulnerable populations been involved? f. Emergency response <ul style="list-style-type: none"> i. Has the CWPP been integrated into relevant plans (e.g., hazard mitigation or emergency operations)? ii. Is the CWPP congruent with other hazard mitigation planning efforts? iii. Has the availability and capacity of local fire departments changed since the CWPP was developed?

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TIMELINE FOR UPDATING THE CWPP

The HFRA allows for maximum flexibility in the CWPP planning process, permitting the Core Team to determine the time frame for updating the CWPP. However, it is suggested that a formal revision be made on the fifth anniversary of signing and every 5 years following. Furthermore, due to the dynamic nature of wildfire litigation and the natural landscape, there are several triggers that may warrant a Plan update before the 5-year mark. Among these triggers are extensive wildfire or other disaster event, changes to the local planning outlook (e.g., significant update to Hazard Mitigation Plan), and local adoption of the international WUI code. The Core Team members are encouraged to meet on an annual basis to review the project list, discuss project successes, strategize regarding project implementation funding, and determine if there is a need for plan revision.

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ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
AMMs	avoidance and minimization measures
ATV	all-terrain vehicle
BAER	Burned Area Emergency Rehabilitation
BLM	Bureau of Land Management
BMP	best management practice
CAR	community at risk
CE	categorical exemption
CERT	Community Emergency Response Team
ch/hr	chains per hour
CIG	Conservation Innovation Grants
CNHP	Colorado Natural Heritage Program
Cohesive Strategy	National Cohesive Wildland Fire Management Strategy
county	Mesa County
CRS	Congressional Research Service
CSFS	Colorado State Forest Service
CWA	Clean Water Act
CWPP	community wildfire protection plan
DEM	digital elevation model
DFPC	Colorado Division of Fire Prevention and Control
DHS	Department of Homeland Security
DNR	Colorado Department of Natural Resources
EAS	Emergency Alert System
EIR	Environmental Impact Report
EMS	Emergency Management System
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESRI	Environmental Systems Research Institute
FAC	fire-adapted community
FEMA	Federal Emergency Management Agency
FIREMON	Fire Effects Monitoring and Inventory System
FLAME	Federal Land Assistance, Management and Enhancement Act
FP&S	Fire Prevention and Safety
FPD	fire protection district

FRA	Federal Responsibility Area
FRI	fire return interval
GACC	Geographic Area Coordination Centers
GAID	Geographic Area Interagency Division
GJFO	Grand Junction Field Office
GIS	geographic information system
GMUG	Grand Mesa, Uncompahgre and Gunnison
GPS	global positioning system
HFRA	Healthy Forests Restoration Act of 2003
HIZ	home ignition zone
HMP	hazard mitigation plan
HVRA	highly valued resource or asset
ICC	International Code Council
IFTDSS	Interagency Fuel Treatment Decision Support System
ISO	Insurance Services Office
JPA	Joint Powers Agreement
LRA	Local Responsibility Area
MFI	mean fire interval
MND	mitigated negative declaration
NAM	North American Monsoon
NEPA	National Environmental Policy Act
ND	negative declaration
NFP	National Fire Plan
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWCG	National Wildfire Coordinating Group
OES	Office of Emergency Services
PERI	Public Entity Risk Institute
PPE	personal protective equipment
PRISM	PRISM Climate Group
RAWS	remote automated weather station
RFA	Rural Fire Assistance
SAF	Society of American Foresters

SAFER	Staffing for Adequate Fire and Emergency Response
SE	statutory exemption
SWCA	SWCA Environmental Consultants
SWReGAP	Southwest Regional Gap Analysis Project
ULI	Urban Land Institute
USDA	U.S. Department of Agriculture
USFA	U.S. Fire Administration
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VAR	value at risk
VCC	Vegetation Condition Class
VDEP	Vegetation Departure
WFDSS	Wildland Fire Decision Support System
WRSC	Western Regional Strategy Committee
WUI	wildland urban interface

GLOSSARY

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

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

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

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

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

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

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

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

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

Climate Adaptation: Adaptation is an adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (CA GOPR 2020).

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

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

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

Community Emergency Response Team (CERT): The CERT program educates volunteers about disaster preparedness for the hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical

operations. CERT offers a consistent, nationwide approach to volunteer training and organization that professional responders can rely on during disaster situations, allowing them to focus on more complex tasks (Ready 2021).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Fire Brand: A burning ember that detaches from burning vegetation during a wildfire and is lofted into the air by wind and convective forces.

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

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

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

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

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

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

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

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

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

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

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

Fire Severity: A qualitative measure of the immediate effects of fire on the fire severity ecosystem. It relates to the extent of mortality and survival of plant and animal life both aboveground and

belowground and to loss of organic matter. It is determined by heat released aboveground and belowground. Fire severity is dependent on intensity and residence dependent of the burn. For trees, severity is often measured as percentage of basal area removed. An intense fire may not necessarily be severe (Wooten 2021).

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

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

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

Foliar Moisture Content: Moisture content (dry weight basis) of live foliage, foliar moisture content expressed as a percent. Effective foliar moisture content incorporates the moisture content of other canopy fuels such as lichen, dead foliage, and live and dead branchwood (Wooten 2021).

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

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

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

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

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

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

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

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

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

Fuel Moisture Content: This is expressed as a percent or fraction of oven dry fuel moisture content weight of fuel. It is the most important fuel property controlling flammability. In living plants, it is physiologically bound. Its daily fluctuations vary considerably by species but are usually above 80 to 100 percent. As plants mature, moisture content decreases. When herbaceous plants cure, their moisture content responds as dead fuel moisture content, which fluctuates according to changes in temperature, humidity, and precipitation (Wooten 2021).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Passive Crown Fire: A type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods. Passive crown fire encompasses a wide range of crown fire behavior, from occasional torching of isolated trees to nearly active crown fire. Passive crown fire is also called torching or candling. A fire in the crowns of the trees in which trees or groups of trees torch, ignited by the passing front of the fire. The torching trees reinforce the spread rate, but these fires are not basically different from surface (SWCA).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Values and Assets at Risk: The elements of a community or natural area considered valuable by an individual or community that could be negatively impacted by a wildfire or wildfire operations. These values can vary by community and can include public and private assets (natural and manmade) –

such as homes, specific structures, water supply, power grids, natural and cultural resources, community infrastructure-- as well as other economic, environmental, and social values (CA GOPR 2020).

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

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

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

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

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

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

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

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

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

route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuels reduction to provide safer evacuation from the at-risk community.” A CWPP offers the opportunity to establish a localized definition and boundary for the wildland urban interface (USFA 2020).



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APPENDIX A: Planning and Policy Background

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PLANNING PROCESS

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

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

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

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

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

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

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

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

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

FIRE MANAGEMENT POLICY

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

LEGISLATIVE DIRECTION

County Direction

Fire Code

While Mesa County has not adopted a specific fire code, the City of Grand Junction, the county's most populous municipality and the county seat, has adopted the 2018 Edition of the International Fire Code. The code is found in Municipal Code Chapter 15.44 and was adopted with the aim of safeguarding life and property from the hazardous conditions presented by fire, explosion, and chemical release (City of Grand Junction 2023). Though no fire code has been implemented throughout the county, Mesa County has adopted the 2018 International Building code, which works in conjunction with the International Fire Code. Implementation, administration, and enforcement of the provisions of the fire code are carried out by the Mesa County Building Department (Mesa County 2023b).

More information regarding the International Building Code and International Fire Code with regard to Mesa County can be found here: https://www.mesacounty.us/building/adopted_codes_and_regulations/

State Direction

Colorado 2023 Legislation

After a catastrophic 2022, Governor Jared Polis signed 11 wildfire prevention and recovery bills in 2023, marking the state's ongoing efforts to combat wildfires in Colorado. The legislation includes the establishment of an emergency insurance plan, tax incentives for specific reconstruction or repair materials, standardized fire-resistant building codes, homeowner financial assistance for structure hardening, wildfire investigations, evacuation modeling, and the purchase of a \$26 million firefighting helicopter, among others. These 11 wildfire prevention and recovery bills are summarized below.

Fire Response

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

Insurance and Rebuilding Codes

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

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

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

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

Fire Prevention

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

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

Fire Investigations and Workforce Capacity

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

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

Emergency Preparedness

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

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

Colorado Minimum CWPP Standards

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

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

The standards specify that the planning process should be as inclusive as possible to address the needs of socially vulnerable populations and ensure all residents' concerns are represented in the plan. CSFS also requires mapping of the wildland urban interface, completion of a risk assessment, and identification of priority projects to provide the community with actionable recommendations on risk reduction and resilience. The Forest service recommends updating CWPPs at 5-year intervals to ensure project objectives, demographics, and risk assessments are relevant (CSFS 2022).

Colorado Strategic Wildfire Action Program

In 2021, Colorado Senate Bill 21-258 was signed by Governor Polis. This bill designates \$17.5 million to immediately address the wildfire crisis in Colorado through mitigation and community resilience work. This objective will be realized by increasing funding to the Forest Restoration and Wildfire Risk Mitigation Grant Program and other fire-related funding mechanisms, providing funds to hire additional mitigation and firefighting personnel, and establishing a hazard mitigation and capacity development fund. This bill marks a statewide recognition of the extreme hazards wildfires create and an investment in creating more fire resilient landscapes (Colorado Department of Natural Resources [DNR] 2022b).

Colorado Forest Action Plan

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

1. **Forest Conditions** focuses on the current conditions of Colorado's forests, including present and future pressures, facing from Climate Change (e.g., longer fire seasons, and more uncharacteristic wildfires).
2. **Living with Wildfire** focuses on the natural role wildfire plays in Colorado's forests and rangelands. It emphasizes that fire the exclusion and suppression efforts of the past are no longer appropriate and, when combined with the impacts of climate change, have put communities at heightened risk from wildfire. It also states that communities must practice wildfire risk reduction strategies as WUI expand across the state.

3. **Watershed Protection** focuses on the risks that uncharacteristic droughts and wildfires pose to Colorado's watersheds. This theme emphasizes the link between forest health and watershed health.
4. **Forest Products** focuses on the importance of logging in Colorado and describes the economic impact that declines in forest health (e.g., wildfire, overgrowth, and disease and insect associated mortality) have had on the industry.

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

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

In 2022, Colorado passed HB-1111, which increases the amount of lost property insurers must cover upfront and extends the time frame victims of wildfire have to rebuild their homes. This bill was signed by Governor Polis in 2022 and outlines standards and restrictions for home insurers when covering instances of total loss from wildfire events. This bill includes, but is not limited to, the following requirements:

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

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

Federal Direction

Federal wildfire planning has historically been guided by the U.S. Department of the Interior, who stated in its 1998 Wildland Fire Management Department Manual (U.S. Department of the Interior 1998) that all public lands with burnable vegetation must have a fire management plan. However, more recent federal guidance has played an instrumental role in planning efforts. In response to a landmark fire season in 2000, the National Fire Plan (NFP) was established to develop a collaborative approach among various governmental agencies to actively respond to severe wildland fires and ensure sufficient firefighting capacity for the future. The NFP was followed by a report in 2001 entitled "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-year Comprehensive Strategy", which was updated in 2002 to include an implementation plan.

This plan was updated once more in 2006, with a similar focus on using a collaborative framework for restoring fire-adapted ecosystems, reducing hazardous fuels, mitigating risks to communities, providing economic benefits, and improving fire prevention and suppression strategies. The 2006 implementation plan also emphasizes information sharing and monitoring of accomplishments and forest conditions, a

long-term commitment to maintaining the essential resources for implementation, a landscape-level vision for restoration of fire-adapted ecosystems, the importance of using fire as a management tool, and continued improvements to collaboration efforts (Forests and Rangelands 2006). Progress reports and lessons learned reports for community fire prevention are provided annually.

In 2003, the U.S. Congress recognized widespread declining forest health by passing the HFRA, and President Bush signed the act into law (Public Law 108–148, 2003). The HFRA was revised in 2009 to address changes to funding and provide a renewed focus on wildfire mitigation (H.R. 4233 - Healthy Forest Restoration Amendments Act of 2009). The HFRA expedites the development and implementation of hazardous fuels reduction projects on federal land and emphasizes the need for federal agencies to work collaboratively with communities.

A key component of the HFRA is the development of CWPPs, which facilitate the collaboration between federal agencies and communities to develop hazardous fuels reduction projects and place priority on treatment areas identified by communities in a CWPP. A CWPP also allows communities to establish their own definition of the WUI, which is used to delineate priority areas for treatment. In addition, priority is placed upon municipal watersheds, critical wildlife habitat, and areas impacted by wind throw, insects, and disease. Communities with an established CWPP are given priority for funding of hazardous fuels reduction projects carried out in accordance with the HFRA.

In 2014, the final stage of the development of a national cohesive strategy for wildfire was developed: *The National Strategy: The Final Phase in the Development of the National Cohesive Wildland Fire Management Strategy* (Forests and Rangelands 2014). The national strategy takes a holistic approach to the future of wildfire management:

To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire.

In order to achieve this vision, the national strategy goals are:

1. **Restore and maintain landscapes:** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
2. **Fire-adapted communities:** Human populations and infrastructure can withstand wildfire without loss of life and property.
3. **Wildfire response:** All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions (Forests and Rangelands 2014:3).

PAST PLANNING EFFORTS

Local

2018 Uncompahgre Watershed Plan: The Uncompahgre Watershed Plan was published in 2018 and is a highly collaborative plan developed by a multi-stakeholder party that included federal agencies, local cities and governments, water use associations, conservation districts, and nonprofit conservation groups. The plan is designed to provide a framework for maintaining year-round flows, stable stream temperatures, and good water quality while preserving ecosystem function, stakeholder utilization, and recreation opportunities. Described in the plan are necessary management measures and monitoring strategies, responsible agencies, and issues of concern, including the impacts of forest health to aquatic ecosystems. Appropriate action plans to address collectively identified issues are also included (Uncompahgre Watershed Partnership 2018).

2004 Mesa County Fire Plan: The Mesa County Fire Plan (University of Oregon 2004) provides detailed analysis of the state statutes relating to wildfire, including Colorado Revised Statutes 30-10-513, Sheriff in charge of forest or prairie fire-expenses, and Colorado Revised Statutes 30-10-512, Sheriff to act as fire warden. The plan provides example fire scenarios, describing interagency agreements and the stages of response. In addition, it provides details of Cooperative Resource Rate Forms, and the Emergency Fire Fund (EFF) and Wildfire Emergency Response Fund (WERF), relating to compensation for cooperators. The plan provides community members with details regarding wildfire mitigation and defensible space cost-share programs. Finally, the plan includes a WUI hazard assessment for the county. This assessment combines a fuel hazard layer (slope, fuels, aspect, and disturbance regime), a risk layer (lightning strikes, roads, and railroads), and a values layer (housing density) to form a combined hazard assessment. The overall fire hazard for the county was determined to be moderate to high, with the greatest hazards in areas of high housing density, heavier fuels, and steeper ground.

2012 Mesa County Community Wildfire Protection Plan (CWPP): The plan was developed in 2012 to update an existing plan from 2004. The plan addresses wildfire threats to communities in Mesa County and provides recommendations to reduce the probability, occurrence, and impacts of catastrophic wildfire. The plan includes an analysis of the fire regimes in the County, a fire risk model, identification of specific high-risk communities, and ideas for specific actions that can be taken to assist in protecting human life and reducing property loss in the event of a wildfire. Recommended mitigation strategies include developing defensible space and fuel breaks, conducting fuel treatments, creating evacuation plans, and engaging in public education (Mesa County 2012). This 2023 Mesa County CWPP is the update to the 2012 Mesa County CWPP.

2020 Mesa County Hazard Mitigation Plan (HMP): The Mesa County Hazard Mitigation Plan (HMP) was most recently updated in 2020 and addresses all natural hazards in the county, including avalanches, dam failure, drought, earthquakes, floods, and wildfires. The plan provides hazard profiles and mitigation strategies for each hazard type. Mitigation actions related to wildfire include identifying and prioritizing fuel reduction projects around critical infrastructure in wildfire hazard areas and carrying out community education regarding the risk of wildfires. The plan also provides detailed wildfire profiles on larger communities in the county and several FPDs (Mesa County 2020).

2023 Mesa County Wildfire Operating Plan: The 2023 Mesa County Wildland Fire Operating Plan (WFOP) is a planning document that outlines cooperative wildfire protection in the County, based on various agreements and authorities. The WFOP aims to establish procedures, policies, and responsibilities for coordinating efforts and preventing, detecting, and suppressing wildfires within the County. Encompassed within the plan are interagency cooperation, communications protocols, resource, standards, fire prevention, cost sharing, training, and other information pertaining to wildfire management and response operations. The plan highlights the Incident Command System (ICS) as the standardized emergency management system, providing a structure for incident response actions within the County. Planning and operational frameworks for mutual aid, joint projects, smoke management, and cost efficacy are each described within the plan. In accordance with the master agreement, the Plan is reviewed annually and remains effective through 2026 unless extended (Mesa County Emergency Management 2023).

010 Community Wildfire Protection Plan for Ten Areas within the Plateau Valley Fire Protection District: This plan was developed in 2010 to provide an assessment of wildfire risk in the Plateau Valley FPD and establish priorities for hazard reduction activities, as well as develop a longer-range fuels management and response plan for the district and adjacent agency lands. Furthermore, the plan was developed to provide educational information and resources for the community. The plan assesses individual communities or subdivisions throughout the district and provides mitigation recommendations for reducing fire risk and hazard (Mesa County 2012).

2008 Community Wildfire Protection Plan for Redlands-Glade Park Wildland Urban Interface with Colorado National Monument: This plan was developed in 2008 to identify fire hazards along the boundary between the Colorado National Monument and private land. The purpose of the plan was to help the communities immediately surrounding the Colorado National Monument to clarify and refine its priorities for the protection of life, property, and critical infrastructure in the WUI. The plan included a community risk assessment of the Redlands area of the city of Grand Junction and portions of unincorporated Mesa County. Individual homes were assessed as part of this process. An action plan was developed for mitigating identified hazards (Mesa County 2008).

State

2022 Wildfire Preparedness Plan: The 2022 Wildfire Preparedness Plan was prepared by the DFPC and provides an overview of the DFPC's wildfire response capabilities. Specific numbers and types of ground, aviation, and other support resources are outlined, along with additional needs and considerations (DFPC 2022a).

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

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

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

Colorado Water Plan: The Colorado Water Plan was developed by the Colorado Water Conservation Board in 2015, at the direction of then-Governor John Hickenlooper, and provides a framework for developing solutions to water challenges that Colorado faces and directives for measuring progress. An updated plan is set to be released in early 2023. The current plan acknowledges relevant water laws, and details water demands, water supply management, and watershed health throughout the state. It also includes how Colorado should align resources, policies, and legislation with growing water needs, as well as a critical action plan laying out necessary tasks, with responsible partners for implementation (Colorado Water Conservation Board 2015).

Southwestern Water Conservation District Strategic Plan: The Southwestern Water Conservation District was established in 1941 to address water supply issues in southwestern Colorado and develop supply resources. Their most recent Strategic Plan was adopted in 2022, is valid through 2026, and

outlines strategic priorities to accomplish the Conservation District's mission. These include involvement with collection and analysis of data regarding water quality, supply, and demand, taking vocal advocacy roles for watersheds within their boundaries, balancing water needs among stakeholders, supporting infrastructure maintenance and development, and building public outreach efforts. Goals and indicators of success are also set for each priority (Southwestern Water Conservation District 2022a).

Southwestern Water Conservation District 2022 Action Plan: The Southwestern Water Conservation District's 2022 Action Plan provides specific 2022 goals for the Conservation District that address strategic priorities outlined in their Strategic Plan. The goals include mentions of exact projects that will be taken on and names of stakeholder collaborators for said actions. Included in the plan are goals to collaboratively address water planning issues with state water resource agencies and continuing to work within Dolores River sub-basins to assess current water supply and demand conditions (Southwestern Water Conservation District 2022b).

Colorado Flood Hazard Mitigation Plan: The Colorado Flood Hazard Mitigation Plan was most recently updated in 2018 and summarizes Colorado's vulnerability to flooding as well as strategies that can be implemented to manage and reduce associated dangers. Relevant issues to Mesa County that are addressed in the plan are the occurrence of ice dam and post-wildfire floods, and the possibility of debris flows exacerbating flooding or occurring during and after flooding events. The plan addresses Colorado legislation regarding developing flood-prone areas, state and local mitigation funding sources, and regional vulnerabilities. It also includes tables of ongoing and recommended actions, responsible agencies, and implementation considerations. In the plan, Mesa County is given a moderate flood exposure projection (Colorado Water Conservation Board 2018).

Federal

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

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

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

Grand Mesa, Uncompahgre and Gunnison National Forests Land Management Plan: The Draft Revised Land Management Plan for Grand Mesa, Uncompahgre, and Gunnison National Forests was finished in August 2021 and is the guiding policy for the Uncompahgre National Forest. The purpose of the plan is to guide project strategies and measures within the national forest in a way that ensures sustainable outcomes and uses. Topics include ecological sustainability through the use of fuels

management such as prescribed fire, as well as maintaining and enhancing watershed health (USFS 2021c).

PUBLIC LAND MANAGEMENT

LAND MANAGEMENT STRATEGIES

Local and State Land

In Colorado, wildfires burned 665,454 acres of land in 2020, which was the largest and most destructive season recorded in Colorado's history (*Colorado Sun* 2020). It is estimated that wildfire suppression efforts in Colorado cost over \$266 million in 2020 (NIFC 2020). Mesa County experienced one of the worst fires in county history, the Pine Gulch Fire. This fire was started by a lightning strike on July 31, 2020, approximately 18 miles north of Grand Junction in Mesa and Garfield Counties. On August 18, a thunderstorm produced 40-mph sustained winds for 3 to 4 hours, which resulted in the fire perimeter increasing by 30,000 acres in one night. The Pine Gulch Fire is the third largest wildfire in Colorado state history (Mesa County Sheriff's Office 2023).

Mesa County is actively working to identify and execute projects in priority areas for the purpose of reducing hazardous fuels and wildfire risk across the county. Mesa County Department of Parks and Recreation has been working with the Lower Valley Fire Department on identifying locations to focus wildfire mitigation efforts. The Little Salt Wash between North Mesa and North Maple and between North Mesa and Cherry Street is the location of the most recent wildfire mitigation planning effort. Contract crews will be clearing dead vegetation and reducing hazardous fuels in the area. In addition to fuel mitigation, the Department of Parks and Recreation will also be conducting outreach and education regarding increased wildfire risk due to throwing green waste in the right of ways near the salt wash.

In the last 2 years, Colorado has established over \$145 million in state funds related to wildfire mitigation and restoration. Among these funds are those allocated to the DNR and the Colorado Strategic Wildfire Action Program (COSWAP), where \$25 million in funds went toward wildfire mitigation programs. \$17.5 million of these funds went to COSWAP to develop restoration projects, on-the-ground fuels reduction, and efforts to protect property and infrastructure within the state. In addition, \$44 million were allocated to protecting watersheds from wildfire, with \$30 million provided to the Colorado Water Conservation Board for post-wildfire restoration of lands affected by Colorado's largest recent fires (Colorado Gov 2022). Prioritizing the management and treatment of fuels near watersheds will help protect and maintain important aquatic resources within Colorado (USDA 2020).

Colorado law requires the Director of the DFPC to develop an annual Wildfire Preparedness Plan. Yearly average temperatures and precipitation forecasts play a large role in wildfire outlook and greatly dictate the tone of the plan. The 2022 Wildfire Preparedness Plan acknowledges the contribution of above average temperature and below average precipitation forecasts to the current drought conditions and future wildfire risks. The plan aims to forecast yearly wildfires and determine the amount and availability of aerial firefighting resources, state wildfire engines, wildfire hand crews, and modify the dispatching process/mobilization plan as needed. It also provides a breakdown of the hierarchy of local, county, and state jurisdictions when dealing with fires as well as any additional needs or important information based on the yearly conditions (DFPC 2022a).

The state of Colorado has joined forces with major federal agencies, namely the Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), U.S. Department of Agriculture, Bureau of Indian Affairs, and National Park Service (NPS), to form the Colorado Cooperative Wildland Fire

Management and Stafford Act Response Agreement. The agreement focuses on interagency cooperation, the use of interagency fire resources, operations, and preparedness (DFPC 2021).

Federal Land

Colorado National Monument

The Colorado National Monument is managed by the NPS and was proclaimed as a national monument through congressional legislation in 1976 to preserve the monument's "extraordinary examples of natural erosion" in addition to its wide array of resources and opportunities for recreational enjoyment (NPS 2005). Encompassing 20,500 acres of the Colorado Plateau, the Colorado National Monument is comprised of a variety of land features and habitats. The Monument is a popular tourist destination, hosting about 720,000 visitors per year to experience its many trails, panoramic views, and points overlooking backcountry canyons (CNMA 2020; NPS 2005). An urban center adjacent to the monument is that of Grand Valley, housing the cities of Grand Junction and Fruita.

The 2005 Colorado National Monument General Management Plan (GMP) Environmental Impact Statement (EIS) is a guiding document that outlines a forward-looking management framework, assisting NPS managers in addressing issues faced by the monument in the future. Though the GMP EIS does not outline specific operations regarding wildfire management, it does recognize fire as a key ecological function across the monument's existing habitats and emphasizes the impacts that fire suppression practices have had on natural disturbance regimes. The GMP repeatedly refers to fire disturbance as a desirable condition for the monument's ecological systems throughout, identifying opportunities where management practices may be appropriate (NPS 2005).

Grand Mesa, Uncompahgre, and Gunnison National Forests

The Grand Mesa, Uncompahgre and Gunnison (GMUG) National Forests cover 3.2 million acres within the central and southern Rocky Mountains. The primary vegetation types within these forests include spruce-fir (17%), aspen (14.6%), spruce-fir-aspen (13.5%) and lodgepole pine (9%). The National Forests have developed ecosystem-wide standards with a focus on maintaining and restoring threatened, endangered, and sensitive species under their Forest Assessment Plan (USFS 2021a).

The GMUG National Forests are managed by the USFS, and their guiding document is the Land Management Plan (USFS 2007a). Within the plan, minimum impact fire suppression tactics are emphasized. However, prescribed fire may be employed in areas where there is a need for community protection (e.g., the WUI). With respect to fire management, the Land Management Plan emphasizes fire prevention, watershed and aquatic resource protection, insect and disease management, community protection, firefighter safety, and hazardous fuel reductions (USFS 2007b). The plan is currently undergoing revisions to incorporate improved management strategies, new science, and other key updates. The planning team's latest update indicates that they are responding to comments and hope to have the plan finalized in late spring or early summer 2023.

Manti-La Sal National Forest

A small portion of the Manti-La Sal National Forest occurs in Mesa County. The Manti-La Sal National Forest covers roughly 1.4 million acres between southeast Utah and western Colorado and encompasses 4,582 acres within Mesa County. The national forest is split between three land areas: the San Pitch Division, Manti Division, and La Sal Division. The county's portion of the national forest is managed by the Moab and Monticello Ranger Districts. There are 11 major vegetation types throughout the Manti-La Sal

National Forest, with the primary types being aspen, ponderosa pine, Douglas-fir, pinyon-juniper, sage brush, and oak brush (USFS 1986).

The Manti-La Sal National Forest is managed by the USFS, and its guiding document is the Manti-La Sal National Forest Land and Resource Management Plan (USFS 1986). The forest has a history of fire suppression, and management historically involved putting out all fires regardless of their cause. This was paired with fuels treatment and prescribed burns to lessen the intensity of the fires in these previously suppressed and overgrown forests.

The USFS has recognized that wildfire is inevitable and plays an essential role in the forest's ecosystems, and now has a fuels management program that aims to support a national strategy to restore and maintain landscapes, develop fire-adapted communities, and better develop an effective wildfire response (USDA 2022). The goals of the Manti-La Sale National Forest's fire program are to reduce fire risk to visitors and employees, reduce fire risk to nearby communities, and restore and maintain fire-adapted ecosystems. Common activities can include fuel treatments (e.g., mechanical thinning and prescribed burns) to reduce the volume of hazardous fuels. The USFS has also continued to support a "let it burn" management strategy, when safe and appropriate (USDA 2022). In addition, it emphasizes watershed management and has developed a protocol to minimize disturbance and the effects of wildfire on water quality and flow (USDA 2022).

Upper Colorado River District Office (BLM)

Wildfire response and fuels programs on BLM-managed lands in Mesa County are overseen by the BLM's Upper Colorado River District Office in Grand Junction. The Upper Colorado River District Office manages 1.85 million surface acres. The district is composed of the Grand Junction and Colorado River Valley Field Offices and encompasses 4 million acres of subsurface minerals. The BLM's Upper Colorado River District includes several specially designated areas, including McInnis Canyons National Conservation Area and the northern portion of Dominguez-Escalante National Conservation Area. The Little Book Cliffs Herd Management Area is located within the Grand Junction Field Office (GJFO). The BLM's current wildfire management regime recognizes the importance of wildfire as a natural ecological process and prioritizes structure protection, firefighter safety, and public safety when responding to incidents (BLM 2022).

Grand Junction Field Office (BLM)

The GJFO planning area comprises 1.1 million acres of BLM-administered public lands and 1.2 million acres of federal mining estates, spread across four counties in western Colorado, including Mesa County. The Affected Area section of the Grand Junction Field Office Draft Resource Management Plan and Environmental Impact Statement outlines fire regime management, highlighting the goals for wildland management on BLM-managed lands (BLM 2012). Additionally, the Best Management Practices and Standard Operating Procedures section provides a comprehensive list of the wildland fire ecology and management actions that will be employed to achieve the established resource objectives.

The plan accounts for the key role that wildfire plays in many of Colorado's vegetative communities and recognizes the impacts that historic fire exclusion has had on fuel load conditions and ecosystems reliant on fire occurrence. While protecting human life is the overriding priority of all fire management decision within the project area, the plan states that wildland fire management actions will be utilized to reinstate natural ecosystem characteristics and advance the health of public lands (BLM 2012).

Overall, the plan seeks to utilize proper resource management to maintain historical fire regimes while through the use of planned and unplanned fire in conjunction with non-fire fuel reduction actions where necessary. Further fire management practices such as emergency stabilizations, community support,

resilience building, and preventative measures are also outlined to best align with the planning area's strategic approach (BLM 2012).

Uncompahgre Field Office (BLM)

The Wildland Fire Ecology and Management section of the Proposed Uncompahgre Field Office Resource Management Plan¹ (BLM 2019) described the goals and objectives of wildland fire management on BLM-managed lands. The plan recognizes the role and ecological importance of unplanned natural wildfire and allows natural wildfire to persist where and/or when it can help meet the BLM's resource objectives. The primary goals of the plan are to prioritize public and firefighter safety when responding to wildfire, while providing protection of property from wildfire. The plan also emphasizes integrating fire and fuels management to meet public health safety goals, while also meeting natural and cultural resources objectives across landscapes, agencies, and political boundaries.

Overall, the BLM's plan allows for planned and unplanned ignitions and utilizes a wide range of wildland fire management options. These can include allowing natural fire, full suppression (when deemed necessary), and various types of fuel treatments (e.g., mechanical thinning, herbicide application and prescribed burns). Typically, wildland fire management is managed to align with other goals and objectives for other resources, such as invasive plant management, rangeland management, and timber management (BLM 2019).

STEWARDSHIP AGREEMENTS

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

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

Intergovernmental Agreements

Mesa County enters into Intergovernmental Agreements (IGAs) and Memorandums of Understanding (MOUs) to plan in cooperation with other jurisdictions and agencies and to address areas of mutual concern. IGAs and MOUs address coordination of planning, water and sewer service, transfer of development rights, and other subjects of joint interests (Mesa County 2023c).

¹ The proposed resource management plan is currently under litigation.

Federal Agreements

- MOU-18-MU-11020402-017: Mesa County, USDA, USFS, GMUG (expired March 1, 2023)
- MOU- MCA 97-18: BLM and Mesa County (no expiration)
- MOU: USFWS and Mesa County (expires February 26, 2023)
- MOU-BoCC2014-247: NPS Colorado National Monument and Mesa County (expired November 24, 2019)
- MOU-MCA96-69: U.S. Department of Energy and Mesa County consultation regarding the Cheney Repository (no expiration)

Municipal Agreements

- MCA 83-26: Grand Junction and Mesa County development review coordination and cooperation for comprehensive planning
- IGA-MCA 98-10: Mesa County, Grand Junction, and Palisade relating to the Cooperative Planning Agreement Area Buffer
- IGA-MCA 98-11: Mesa County, Fruita, and Grand Junction Cooperative Planning Agreement Area for Buffer
- MCA 2004-136: Grand Junction and Mesa County Land Use decisions by the county in the Grand Junction Watershed Area

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APPENDIX B:

Community Background and Resources

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LOCATION AND GEOGRAPHY

Mesa County is located in west-central Colorado. The county boundary defines the Mesa County CWPP planning area, which includes multiple cities, towns, communities, and roadways. The largest city is Grand Junction, which is also the county seat. Overall, the county is rural and contains a large amount of agricultural land. Approximately 80% of the land in the county is federally managed by the BLM, USFS, and NPS, collectively, with the remainder privately held or state managed (see Figure 1.3).

The county is named for its mesas and has a total area of 3,341.11 square miles, of which 3,327.75 square miles (or 99.60%) is land and 13.36 square miles (or 0.40%) is water (U.S. Census Bureau 2021). Mesa County exhibits extremely diverse topography, from the high desert of the Grand Valley, a major fruit-growing region around Grand Junction, which sits at 4,597 feet in elevation, to the impressive Grand Mesa, which rises to an average elevation of 11,000 feet with a maximum elevation at Crater Peak at 11,333 feet.

Major physiographic features are the Colorado River and its tributaries, including the Gunnison and Dolores Rivers; the Uncompahgre Plateau, dissected by Unaweep Canyon; Grand Mesa; and the Grand Valley. Grand Junction is situated along the Colorado River where it meets the Gunnison River from the south. To the west of Grand Junction are the canyons and mesas that make up the Colorado National Monument, and to the north are the prominent Book Cliffs.

The main transportation corridors through the planning area are Interstate 70 (I-70), which crosses the county in the northwestern portion; U.S. Highway 50, which diverges from I-70 at Grand Junction and heads southeast; Colorado Highway 330, which crosses the northeastern portion; and Colorado Highway 140, which crosses the southern portion. Several other state highways and a network of county roads also serve as transportation corridors throughout the county.

Table B.1. Breakdown of Land Ownership in Mesa County

Land Ownership	Acres	% of Planning Area
Bureau of Land Management (BLM)	981,137	45.86
Private	571,215	26.7
United States Forest Service (USFS)	551,711	25.79
National Park Service (NPS)	20,429	0.95
Bureau of Reclamation	7,594	0.35
Mesa County	5,292	0.25
Colorado State	1,462	0.07
Other	384	0.02
Total	2,139,226	100



Figure B.1. Typical landscape in Mesa County.



Figure B.2. Typical landscape in Mesa County.

ROADS AND TRANSPORTATION

The road system within Mesa County is composed of several regional corridors including I-70, U.S. 6, U.S. 50, CO-141, and CO-340, in addition to other major roadways. I-70 and US Route 6 enter through the northwestern corner of the county jointly, where they continue through the center of the county, exiting through the county's northern border just north of De Beque. U.S. 50 enters through the county's southeastern border before eventually merging into South 5th Street in Grand Junction. This roadway

connects the county to larger municipalities within adjacent counties such as the cities of Delta and Montrose. CO-141 enters through the southern edge of the county, traversing along the southern portion of the county until merging into U.S. 50. State Highway 340 (aka Broadway) emerges from I-70 just south of Fruita, and cuts through several neighborhoods along the southern side of the Colorado River before merging with Grand Avenue in Grand Junction. Other major roadways within the county are present throughout the county, which provide transport through a variety of rural and/or less trafficked areas. Access to other county lands consists of narrow, winding roads, including maintained two-lane roads, some one-lane gravel roads, numerous four wheel-drive dirt/OHV roads, and multiple dead-end roads.



Figure B.3. Photograph showing an unsurfaced road in Mesa County.

WATER RESOURCES

Watersheds are defined as an “area of land that drains water, sediment, and dissolved materials to a common receiving body or” (EPA 2022a). They connect landscapes, ecosystems, and societies, making their health crucial for both nature and human dependence. A healthy watershed consists of natural land cover that supports hydrologic and geomorphic processes, as well as the habitat requirements for native ecological communities (EPA 2022b). Key components include headwater streams, floodplains, riparian corridors, biotic refugia, instream habitat, biotic communities, and natural vegetation. Healthy watersheds provide essential ecosystem services like clean drinking water, reliable water supplies, recreation opportunities, and increased property values (EPA 2022b).

Aquatic invasive species have been found in Highline Lake, Colorado River, and irrigation canals. To prevent their spread, it is recommended that response personnel clean fire response apparatus and take several precautions when utilizing water delivery systems. When using water for firefighting, it's engines should be filled from hydrants, water tenders, or dedicated pumps. Spraying untreated water into local water bodies, especially if it's from a different watershed, should be avoided. Leakage, overflow, and the relocating of water from one site to another should be avoided at all stages of the water delivery and equipment cleaning process. To decontaminate ground equipment before transitioning to a new water source, three methods are suggested: hot waterpower washing, sun drying, or using chemical

disinfectants. Spare clean equipment can be carried for replacement when decontamination is not practical (NWCG 2017).

Wildfires can significantly impact watershed health, especially when they are large and severe. Native land cover, sediment transport, stream flows, and aquatic habitat can be dramatically altered, which may result in deleterious impacts to watershed health (Wildfire Ready Watersheds 2023). Climate change has increased wildfire conditions in the southwestern United States, particularly in Colorado, leading to a greater likelihood of severe wildfires and degradation of watershed quality. This includes increased debris flows, sedimentation rates, flooding potential, loss of aquatic habitat, and degradation of aquatic ecology (Rhoades et al. 2019). As watersheds become more vulnerable to wildfires, greater mitigation efforts are necessary to protect their health.

Ensuring cistern compatibility with fire apparatus connections and clearing vegetation for apparatus access are common water supply issues. However, homes are more likely to survive wildfires through fire-resistant building materials, designs, and vegetation clearance around the dwelling. Access to water supply and roads wide enough for fire apparatus transportation is crucial for effective wildfire suppression and structure protection.

TOPOGRAPHY

The topography of Mesa County is complex and variable and reflects its montane and Colorado Plateau ecosystems. Dominant high elevation features in Mesa County are typically forested and include the Grand Mesa in the eastern portion of the county; Piñon Mesa in western portion; the southern extent of the Roan Plateau in the northern portion; and the Uncompahgre Plateau in the southern portion. Lower elevations in the county are characterized by rangelands and desert vegetation. The county is home to numerous steep sandstone canyon systems that originate off some of the high elevation mesas. Some of these canyon systems are designated federal wilderness managed by the BLM and include the Black Ridge west of Grand Junction and Dominguez Canyon Wilderness areas southeast of Grand Junction. Colorado National Monument is another canyon region that has received federal protection. This monument is renowned for its red rock canyons and wide vistas.

The high-elevation mesas in the county receive most of the county's precipitation and provide important water sources for local agriculture and municipalities. Additionally, these high elevation areas also contribute to the flows of the Colorado and Gunnison Rivers. The confluence of these two rivers is in Grand Junction. From here, the Colorado River flows westward through Grand Valley into Utah. Many of Mesa County's municipalities and agricultural areas are located in Grand Valley near the Colorado River and include, but are not limited to, Palisade, Grand Junction, Fruita, and Loma.

POPULATION

The following information is drawn primarily from U.S. census data (U.S. Census Bureau 2021). In 2021, the population estimate of Mesa County was 157,335 persons, an increase of 7.2% over the 2010 census numbers of 146,723. In 2021, there were 68,652 households in the county. The county has a population density of 46.8 people per square mile as of 2020. The past decade has marked a demographic shift toward urbanization within the county, with the 2010 census finding that over half the county's population now lives in incorporated areas (MCEM 2020). Most people within Mesa County reside in a stretch of urbanized landscape spanning across Grand Valley from Fruita to Palisade (MCEM 2020). Other incorporated towns include Collbran and De Beque, and unincorporated areas of the county include Clifton, Fruitvale, Mesa, Mack, Loma, Gateway, Glade Park, and Whitewater. The U.S. Census Bureau regards Grand Junction, Fruita, Collbran, De Beque, and Palisade, and all unincorporated areas of Mesa

County as the Grand Junction Metropolitan Statistical Area. Therefore, census data were not available for some of the unincorporated towns.

RECREATION

Mesa County is home to many public lands that provide a variety of recreation opportunities along the Colorado Plateau. Portions of Uncompahgre National Forest, Grand Mesa National Forest, Dominguez-Escalante National Conservation Area, McInnis Canyons National Conservation Area, Colorado National Monument, and other natural areas are within the county. These lands offer visitors and residents a plethora of activities including hiking, camping, climbing, and mountain biking. Mesa County contains many rivers and reservoirs that attract summer visitors to rafting, kayaking, and fishing (Mesa County 2023d). The Gunnison and Colorado Rivers, along with Vega reservoir and Mesa Lakes provide ample opportunity for these activities. Winter sports such as ice fishing, cross country skiing, downhill skiing, and ice climbing are also widely available in several areas atop the Grand Mesa such as Powderhorn Ski Resort.

The Colorado National Monument spans 32 square miles and is located immediately south of Grand Junction making it easily accessible to visitors year-round. Intertwined with the natural and cultural resources and scenery are opportunities to understand and appreciate those values through driving, viewing, hiking, climbing, picnicking, camping, educational programs and outreach, and opportunities to experience natural soundscapes and solitude. Whether here for a few hours or a few days, visitors can enjoy a variety of unique opportunities for exploration and recreation (NPS 2023). Due to the high variety of recreation opportunities within the county, Mesa is a highly sought-after tourism location. Therefore, recreational activities are of high financial value to the county and should be protected from the potential damages of wildfire.

During peak seasons and large events, a significant number of people can congregate in relatively small areas, which results in large populations potentially needing to evacuate should an emergency occur.



Figure B.4. Recreation Infrastructure in Grand Junction, Mesa County (Nin, D. 2013).

Threatened Species and Endangered Species

Several Federal and State threatened and endangered species reside in and around Mesa County in the various parks, forests, and wilderness areas. Federal animal species include Canada lynx (*Lynx canadensis*), gray wolf (*Canis lupus*), Mexican spotted owl (*Strix occidentalis lucida*), yellow-billed cuckoo (*Coccyzus americanus*), Gunnison sage-grouse (*Centrocercus minimus*), bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*), and silverspot butterfly (*Speyeria nokomis nokomis*) (IPaC 2023). The monarch butterfly (*Danaus plexippus*), a migratory butterfly, is currently a candidate for listing. Mesa County is also home to several listed plant species: Colorado hookless cactus (*Sclerocactus glaucus*), De Beque phacelia (*Phacelia submutica*), and parachute beardtongue (*Penstemon debilis*) (IPaC 2023). Colorado also has several state-listed species, which include the Boreal toad Southern Rocky Mountain Population (*Anaxyrus boreas*), burrowing owl (*Athene cunicularia*), the kit fox (*Vulpes macrotis*) (CNHP 2023). Listed below are additional threatened and endangered species:

- Bald eagle (*Haliaeetus leucocephalus*), state threatened
- Least tern (*Sterna antillarum*), federal endangered, state endangered
- Plains sharp-tailed grouse (*Tympanuchus phasianellus jamesii*), state endangered
- Southwestern willow flycatcher (*Empidonax traillii extimus*), federal endangered, state endangered
- Whooping crane (*Grus americana*), federal endangered, state endangered
- Lynx (*Lynx canadensis*), federal endangered, state endangered
- River otter (*Lontra canadensis*), state threatened
- Wolverine (*Gulo gulo*), state endangered

It is important to note that the state of Colorado also lists numerous species of concern as occurring in Mesa County. The BLM also has numerous sensitive species that occur within Mesa County. Information on the names of these species along with their basic habitat requirements can be found here: <https://cnhp.colostate.edu/ourdata/trackinglist/> (CNHP 2023).

Mesa County has critical habitat listed for many of the species listed above. Therefore, it is important that wildlife specialists from state and federal agencies should be consulted before any large-scale fuel reduction projects are carried forward.

FOREST HEALTH CONSIDERATIONS

Native insect and disease epidemics within plant communities are usually part of a natural disturbance cycle similar to wildfire. They are often cyclic in nature and are usually followed by the natural succession of vegetation over time. Of primary interest are those that attack tree species because of the implications for fire management. Present-day insect epidemics in forests are more extensive than they have been in the past (Kurz et al. 2008). This may be a result of drought-related stress and/or faster completion of insect life cycles due to warmer climate regimes. Stands of trees that have been killed by insects have varying degrees of associated fire danger depending on the time lapse following an insect attack and structure of the dead fuels that remain. However, forests with a large degree of mortality following an insect attack may have the potential to experience extremely high fire danger, especially if a large degree of needle cover remains in the canopy.

INSECTS

Tree mortality is strongly correlated with extreme and prolonged drought and subsequent bark beetle attacks in Colorado (USFS 2011). Stands of trees that have been killed by insects have varying degrees of associated fire danger depending on the time lapse following an insect attack and structure of the dead fuels that remain (Kulakowski and Veblen 2007; USFS 2019a). However, forests with a large degree of mortality following an insect attack may have the potential to experience extremely high fire danger, especially if a large degree of needle cover remains in the canopy (USFS 2019b).

Insect epidemics have impacted Colorado's forests for over two decades now and continue to persist. Most notable of these has been the mountain pine beetle epidemic, but other insects and diseases have also impacted Colorado's forests and woodlands. In 2021 alone, the Colorado State Forest Service (CSFS) estimated that 145,500 acres of forests in Colorado were impacted by boring or defoliating insects (CSFS 2021).

Problematic insects impacting the county's forest and woodland regions commonly include, but are not limited to (CSFS 2021; USFS 2010, 2017b, 2022e):

- Pinyon ips (*Ips confusus*)
- Spruce beetle (*Dendroctonus rufipennis*),
- Mountain pine beetle (*Dendroctonus ponderosae*)
- Douglas-fir beetle (*Dendroctonus pseudotsugae*)
- Western spruce budworm (*Choristoneura freemani*)
- Western pine beetle (*Dendroctonus brevicomis*)
- Western tent caterpillar (*Malacosoma californicum*)
- Large aspen tortrix (*Choristoneura conflictana*)
- Western balsam bark beetle (*Dryocoetes confusus*)

DISEASES

Diseases of trees, such as parasitic plants, fungi, and bacteria, can also affect forests in the Mesa County CWPP planning area. These diseases impact forest systems by degrading the productivity and health of the forest. Trees that are killed by disease have the similar potential to increase fire hazards. Diseases that are having more significant impacts on the Mesa County planning area's forests (USFS 2010) and woodlands are listed below.

- Armillaria root disease (caused by *Armillaria solidipes*)
- Dwarf Mistletoe (*Arceuthobium* spp., *Phoradendron* spp.)
- Pinyon Dwarf Mistletoe (*Arceuthobium divaricatum*)
- Annosus Root Disease (*Heterobasidion*, *H. annosum*, *H. parviporum*)
- Cytospora Canker of Conifers (*Valsa kunzei* (= *Leucostoma kunzei*) (asexual stage is *Cytospora kunzei*, = *Leucocytospora kunzei*).

Treatments on federal land would be subject to the National Environmental Policy Act (NEPA) and associated analysis of impacts to these species. Treatments in areas that may impact threatened and endangered species would require application of certain mitigation measures to prevent degradation to habitat.

EMBER IGNITION HAZARDS

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

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

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

ENVIRONMENTAL CHALLENGES

DROUGHT AND CLIMATE

Frequent drought, suppression-based management tactics, tree mortality, climate change, changing land use, and increased human intrusion into wildlands have all worked together to increase wildfire likelihood and community vulnerability to wildfire (CSFS 2020). These factors have interacted to increase the risk of uncharacteristically large high-severity fires (CSFS 2020). In the past few years, fires have grown to record sizes in Colorado and are burning longer, hotter, and more intensely than they have in the past (CSFS 2021).

According to the National Interagency Fire Center (NIFC), the occurrence of catastrophic wildfires in the southwestern U.S has greatly increased over the last 20 years. Westerling et al. (2016) found that the frequency of large wildfires has continued to increase with each decade since 1970.

The shifting climate, particularly rising temperatures, changing wind patterns, and increasing temporal and spatial variability of water availability, are considerably escalating wildfire risk across the state. Since 1990, mean annual temperatures in Colorado have increased by 2°F. Climate change projections expect this to tend to continue and possibly accelerate, depending on CO₂ emission scenarios. By the mid-

twenty-first century, Colorado is expected to have 40 fewer days when the temperature in the high elevation areas drops below 32°F (CSFS 2020).

Furthermore, Colorado has experienced and is expected to experience more extreme and prolonged drought in the coming decades. Warm drought periods in Colorado have already significantly increased the risk of wildfire across the state, especially in forested parts of Mesa County (CSFS 2020). Together, these impacts mean lower and more ephemeral winter and spring snowpacks, longer and warmer growing seasons (i.e., longer and more hazardous fire seasons), increased drought stress on forests, woodlands, and rangelands, and continued tree mortality in forest and woodland areas. Colorado has been no stranger to catastrophic wildfire in recent years. The degradation of Colorado's forests and woodlands combined with increased development in the WUI and impacts from climate change suggest that large destructive fires in Colorado will become more likely in Colorado's future.

It is important to note that fire is a natural part of Colorado's diverse landscapes and is essential to many ecosystems across the state. Almost all of Colorado's diverse ecosystems are fire-dependent or fire-adapted (CSFS 2020). Frequent, uncharacteristically large, high-severity wildfires are the primary source of the catastrophic damage listed above (CSFS 2020). Wildfire, when not directly or indirectly intensified by human actions, has historically worked to balance ecosystems, and restore their natural functions.

TREE MORTALITY

Widespread tree mortality due to rising temperatures, droughts, extreme wildfires, and insect outbreaks is a natural process in forest ecosystems. However, if these occur at a higher frequency due to compound disturbances, forest health may be negatively affected. In addition to disrupting ecosystem functions, widespread tree mortality near developed or recreational areas may present hazards as trees can fall and potentially endanger the public and infrastructure.

During periods of extreme drought, physiological stress can inhibit plant and tree defenses (due to the limits on photosynthates being mobilized for defense) and make trees more susceptible to disease pests and pathogens. Furthermore, extreme water stress in trees, combined with insect- and disease-related mortality, can also make forests more prone to extreme fire events. Tree mortality throughout Colorado is strongly correlated with extreme and prolonged drought and subsequent bark beetle attacks (USFS 2011). Forests with a large degree of mortality following an insect attack may have the potential to experience extremely high fire danger, especially if a large degree of needle cover remains in the canopy (USFS 2019b). Considering that deceased trees can pose an increased risk of intense wildfire, fuel reduction treatments, such as thinning and prescribed fire, not only reduce the risk of catastrophic wildfire but can also reduce the severity of future bark beetle outbreaks (Goodwin et al. 2020).

Additionally, sudden aspen decline (SAD) (a severe, rapid dieback and mortality of aspen stands) has also impacted aspen forests throughout the southwestern United States and, particularly, aspen groves on the Uncompahgre Plateau and Grand Mesa (USFS 2017b). Aspen die-off can leave dead trees standing and result in increased fuel accumulation, which can increase the potential for high-severity fire, in what are normally forests with low potential for high-severity fire (USFS 2007a).

Specific to Mesa County, USFS surveys of the region have shown that the county's forests and woodlands have experienced either mortality or defoliation from numerous diseases and insects (USFS 2017b, 2019b). The pinyon ips (*Ips confusus*) is estimated to have impacted large amounts of the region's pinyon-juniper woodlands (USFS 2019c). This has resulted in a substantial increase in defoliation and mortality in Mesa County (CSFS 2021), heightening the wildfire risk in this ecotone. Additionally, in Grand Mesa National Forest (especially in forests situated on Grand Mesa), large areas have been impacted by the spruce beetle (*Dendroctonus rufipennis*), Douglas-fir beetle (*Dendroctonus pseudotsugae*), and

aspen defoliation (USFS 2017b, 2019c). Between 1996 and 2017, the spruce beetle has had the largest impact (with an estimated 62,000 acres being affected), while the Douglas-fir beetle has also had a significant impact (with an estimated 2,400 acres being affected) (USFS 2017b, 2019c). Aspen defoliation (caused by a combination of defoliators and other biotic and abiotic causa agents) has been estimated to have affected approximately 3,000 acres in the Grand Mesa National Forest (USFS 2019c). All of these have combined to heighten wildfire risk in Mesa County.

ECOSYSTEM SERVICES

Ecosystem services are the benefits humans derive from natural resources. Mesa County offers a wide variety of ecosystem services via healthy fire, forest ecosystems, and watersheds.

Historical low-intensity surface fires maintained open grasslands, improved landscape resilience, and fostered forest succession and biodiversity. Fire adapted ecosystems support wildlife habitats, timber industry, and eco-tourism while controlling forest insects and diseases such as dwarf mistletoe and spruce budworm (BLM 2023).

Mesa County's alpine tundra, montane forest, aquatic, and sagebrush basin environments provide ecosystem services enjoyed by residents and visitors. The county attracts 1.6 million visitors annually (Grand Junction 2016), contributing to the local economy through activities like fishing, hunting, wildlife viewing, and off-highway vehicle use. The county's ecosystems also supply clean water downstream and play roles in carbon sequestration, clean air, and material production. Uncharacteristic wildfires pose threats to these crucial services, impacting quality of life and the county's economy (MCEM 2020). In addition to direct damage, high-severity wildfires deteriorate air quality, pollute waterways, displace native species, and increase carbon dioxide emissions. Rising greenhouse gases, including carbon dioxide, contribute to climate change and play a critical role in intensifying the frequency and severity of wildfires.

FIRE RESPONSE CAPABILITIES

INCIDENT MANAGEMENT

Fire management in Colorado is a cooperative interagency partnership among federal, state, and local entities. Wildland fire response is typically directed and managed by regional interagency fire centers in Colorado. The Grand Junction Regional Communications Center is the public safety answering point and is responsible for dispatching local fire resources within Mesa County, determining the appropriate agency and whether the fire is on public or private land. The Grand Junction Interagency Dispatch Center is responsible for dispatching resources for fires on federal land. Where there may be confusion regarding the jurisdictional boundary, the County Sheriff's Office Fire Team or fire districts respond to assist in initial attack.

On confirmation of the jurisdictional boundary, the county will continue to support the fire or be called off depending on the situation. If the fire becomes too large for county resources to handle, a Type III incident team is called in. If complexity dictates, a Complex Incident Management Team may be needed; however, complex incidents are rare in the county. The Fire Operating Plan lays out how air resources are ordered, who has suppression responsibility, and the Incident Command System. The Colorado Division of Fire Prevention and Control is responsible for determining if the fire qualifies as a state responsibility fire.

In case of a fire, the Grand Junction Regional Communications Center has an emergency notification system that can telephone schools, businesses, and homes. This is a reverse 911 system that can make up to 2,000 calls a minute and will call back up to three times to make sure the message gets through.

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

LOCAL RESPONSE

Fire Protection Districts

The county has 13 FPDs, with a mixture of full-time career firefighters and VFDs that provide initial attack response on lands within their districts (Figure B.5). As stated in the 2023 Wildland Fire Operating Plan, the County Sheriff is responsible for wildfire protection on all non-federal lands in the county that are outside of Fire Protection District or Fire Department boundaries (Mesa County Emergency Management 2023). Wildfire does not respect jurisdictional boundaries and often threatens a multitude of resources and communities across the landscape. One such resource is municipal watersheds that provide drinking water resources to multiple communities. To ensure the safety of the watershed areas and to address perceived inequities in the current fire protection system, county fire protection districts should explore the opportunity for increased intergovernmental cooperation. Listed below are the names of the 13 Fire Protections Districts within the county (Mesa County 2022):

- Central Orchard Mesa (operating as the Mesa County Fire Authority)
- Clifton
- De Beque
- East Orchard Mesa
- Gateway Unaweep
- Glade Park Volunteer Fire Department
- Grand Junction Rural Fire Department
- Grand Valley
- Lands End (operating as the Mesa County Fire Authority)
- Lower Valley
- Palisade
- Plateau Valley
- Redlands Sub-District

Members of the local fire protection districts are required to undergo rigorous training for wildfire response. For fires on private lands, qualifications for resources used on fires need to meet local agency standards. Personnel assigned to fires on federal lands must have completed National Wildfire Coordinating Group (NWCG) Wildland Fire Qualifications and be “red carded,” meaning they have also completed a fitness test before being used on a fire. Many members of the local fire protection districts hold these NWCG qualifications and the BLM, the USFS, and the NPS provide on-the-job-training for local agency personnel seeking wildfire training.

Volunteer Fire Response

The County Fire Warden emphasizes the importance of volunteers receiving the appropriate wildland fire training and makes a push to get many volunteers red carded and cross trained in S130 Basic Wildland Firefighting and S-190 fire behavior training classes.

The Glade Park Volunteer Fire Department falls under the jurisdiction of the sheriff as it is not a recognized local government. Mesa County underwrites insurance for VFDs, because when a wildfire occurs, they are working on behalf of the sheriff. Local fire departments and VFDs must be certified for the following: 1) state certification for different categories of Emergency Management Service, 2) hazardous material management certification, 3) structural firefighting NFPA qualifications, 4) and NWCG wildfire qualifications.

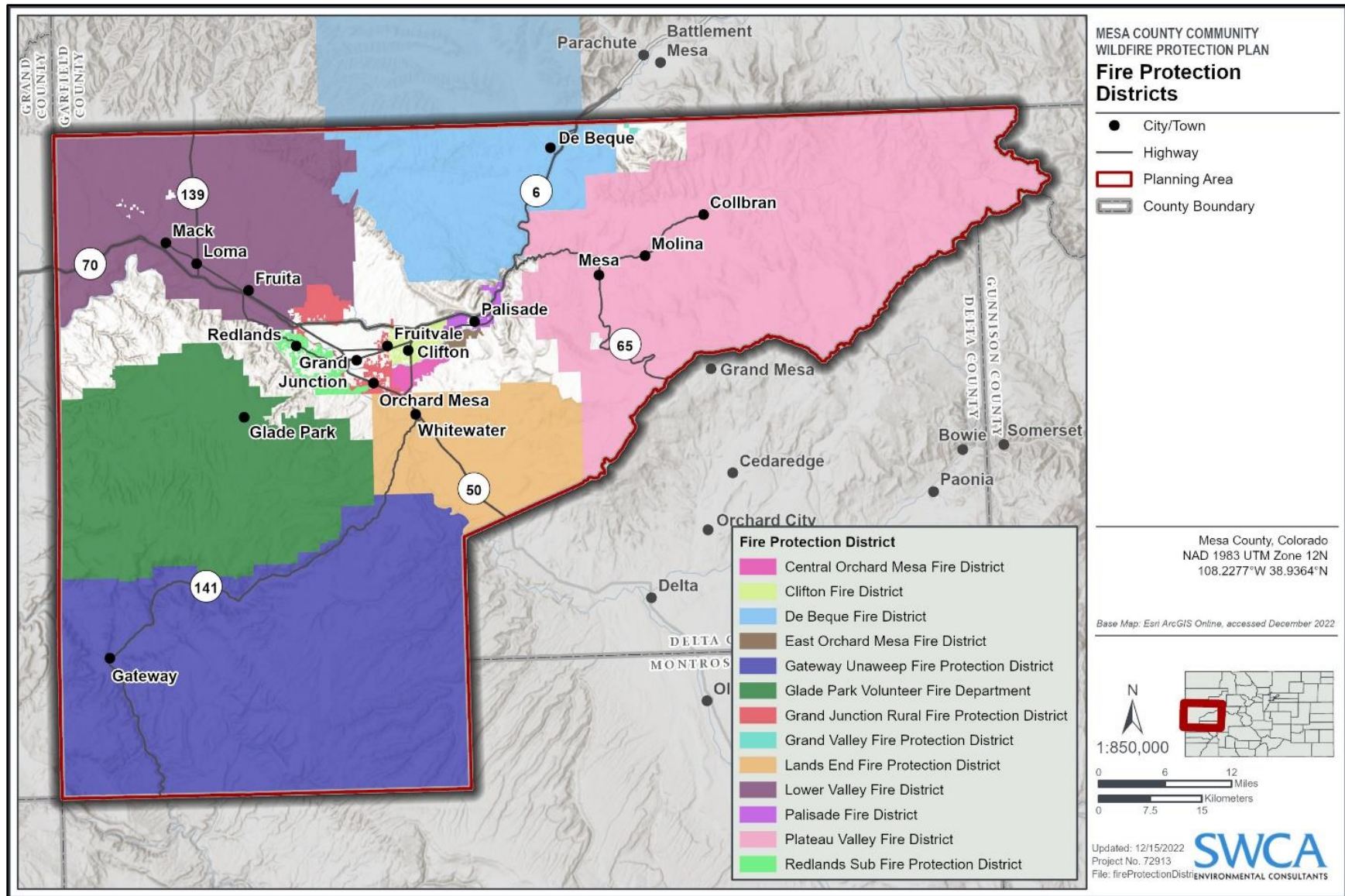


Figure B.5. Fire protection districts and fire station locations.

STATE RESPONSE

Colorado Division of Fire Prevention and Control

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

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

If the County Sheriff and DFPC have determined that the county capacity has been exceeded, then the DFPC director will approve state assistance based on the assessment of capacity and availability of funds. If state assistance is approved, then the fire becomes a state responsibility and DFPC assumes cost and management responsibility, along with ongoing involvement from local and County partners (DFPC 2022b).

Mesa County falls in the Headwaters Region of the Northwest District. The Craig Interagency Dispatch Center is responsible for dispatching the initial attack resources of state responsibility areas in the DFPC Northwest district (DFPC 2021).

In Colorado, the state can either provide assistance for fighting fires or can be responsible for fighting fires.

State Assistance for Fires includes the following management strategies and resources (DFPC 2022a):

- Seeks to encourage rapid initial attack actions where fire is unwanted to reduce the size, duration, costs, and impacts of wildfires.
- Can provide personnel, enabling local agencies to respond to their next incident, and volunteer firefighters to return to their regular jobs.
- Provides funding and resources for local and county responsibility fires. The fire does not have to exceed the capacity of the Fire Department or the county for a county to receive funding.
 - This can include funding and reimbursement for aviation and handcrew resources during the initial attack phase of fires on non-federal lands. Ordered resources are based on the Closest Forces concept, whether they are state or federal agency resources to reduce response times.
- Resource support can include DFPC engines, module, and overhead resources, as well as technical assistance from DFPC Fire Management staff.

State Responsibility for Wildfire covers the following conditions and scenarios (DFPC 2022a):

- The state is responsible if the county requests assistance from DFPC.

- DFPC and Sheriff have conducted an assessment and have determined that the county capacity has been exceeded.
- DFPC Director approves the state's responsibility based on assessment of capacity and availability of funds.
- If approved for State Responsibility, DFPC assumes cost and management responsibility, along with ongoing involvement from local and county partners.

FEDERAL RESPONSE

Colorado National Monument

Fire response for the National Monument is a multiagency effort with primary response being the responsibility of the Upper Colorado River Interagency Fire Management Unit (Mesa County 2008). Response for the park is dispatched through via the Grand Junction Interagency Dispatch Center (GACC 2023). Additional wildfire response in areas surrounding the park is provided by the Grand Junction Rural Fire Protection District, Lower Valley Fire Protection District, and Glade Park Fire Protection District. (Mesa County 2008).

Grand Mesa Uncompahgre and Gunnison National Forest (GMUG NF)

On USFS land, the USFS has the responsibility for initial attack (initial response). In Mesa County, Fire response in the GMUG National Forests is dispatched via the Grand Junction Interagency Dispatch Center for the northern portion of the Forest, and the Montrose Interagency Dispatch Center for the other portions of the forests within Mesa County (RMCG 2023).

The GMUG NF currently directs four Type 6 Fire Engines. The GMUG also has access to the Type 2 Skyway Wildland Fire Module located in Grand Junction Colorado, and the Buzzard Creek Crew (a Job Corps Crew) located in Collbran Colorado (USFS 2021).

Manti-La Sal National Forest

The eastern terminus of the Manti-La Sal National Forest falls within southwestern Mesa County. On USFS land, the USFS has the responsibility for initial attack (initial response). Fire response in the Manti-La Sal National Forest is dispatched via the Moab interagency Fire Center, which is in Moab, Utah. The Moab Interagency fire Center is not a part of the Rocky Mountain coordinating Group, but, rather, falls under the guidance of the Great Basin Coordinating Center (GBCC 2022).

Grand Junction Field Office

The Grand Junction Field Office (GJFO), headquartered in Grand Junction, Colorado, is responsible for management and coordination of initial response attack for the majority of BLM land in Mesa County. BLM land managed by the Grand Junction Field Office within Mesa County falls under the jurisdiction of the Upper Colorado River (UCR) Fire Management Unit. The Grand Junction Interagency Dispatch Center, also known as the Grand Junction Air Center, is located at the Grand Junction Airtanker Base. It provides incident support to various interagency partners, including the Upper Colorado River Fire Management Unit (UCR Fire Management Unit n.d.).

As outlined in The GJFO Approved Resource Management Plan, the GJFO's fire response prioritizes prevention, coordination with partners, and utilizing mitigative strategies to maximize public safety.

The office employs multiple approaches to ensure that their wildfire response works to minimize ecological impacts (BLM 2015).

Uncompahgre Field Office

The Uncompahgre field office is responsible for management and coordination of initial response attack for a portion of BLM lands in southern Mesa County. BLM lands in Mesa County fall under the jurisdiction of the Upper Colorado River and Southwest Fire Management Units. BLM lands in the Upper Colorado Fire Management Unit (in the northern part of the county) are dispatched via the Upper Colorado River Interagency Fire Management Unit. BLM lands under the responsibility of the Southwest District are dispatched via the Montrose Interagency Dispatch Center.

The UFO's headquarters is in the city of Montrose and is home the UFOs main wildfire response station – the Montrose Fire Center. This fire center has several fire response vehicles, which include the Chief's command truck, two wildfire response trucks, and two chase tracks. A smaller fire station for the UFO is situated in San Miguel County, Colorado, and has one engine and one chase vehicle (5280fire 2022). The UFO can also access the Type 2 Skyway Wildland Fire Module located in Grand Junction Colorado. There is also a BLM Type-3 helicopter in Rifle, Colorado, that can assist with suppression efforts.

INTERAGENCY RESPONSE

The Upper Colorado River Interagency Fire Management Unit (UCR) consists of the BLM, USFS, and NPS, collaborating on fire management in west central Colorado. They engage in various activities, such as fuels treatments, fire prevention, and fire suppression). The UCR operates a dispatch center and air tanker base at Grand Junction regional airport. Federal firefighting resources are adjusted based on the National Fire Danger Rating System (NFDRS), which determines the severity code for the fire season.

During high wildfire potential, additional resources like hotshot crews, smokejumpers, engines, and helicopters are put on standby. The UCR's Grand Junction dispatch center provides daily updates on committed resources during the fire season. The UCR comprises the Colorado River Valley and Grand Junction Field Offices of the BLM, Grand Valley Ranger District of the Grand Mesa, Uncompahgre, and Gunnison National Forests, White River National Forest, and Colorado National Monument. The UCR trains land managers from these agencies as red carded firefighters and offers wildfire courses for local fire department volunteers. Additionally, they coordinate with the County Fire Warden and Office of Emergency Management for effective communication.

POTENTIAL OPERATIONAL DELINEATIONS (PODS)

Potential Operational Delineations (PODs) are fire management/planning units that are spatially delineated based off of potential control features such as roads, rivers, waterbodies, major fuel changes, etc. (Figure B.6), which can potentially be used as a fire containment feature. PODs are developed collaboratively by a variety of fire managers, scientists, and stakeholders (USFS 2022f).

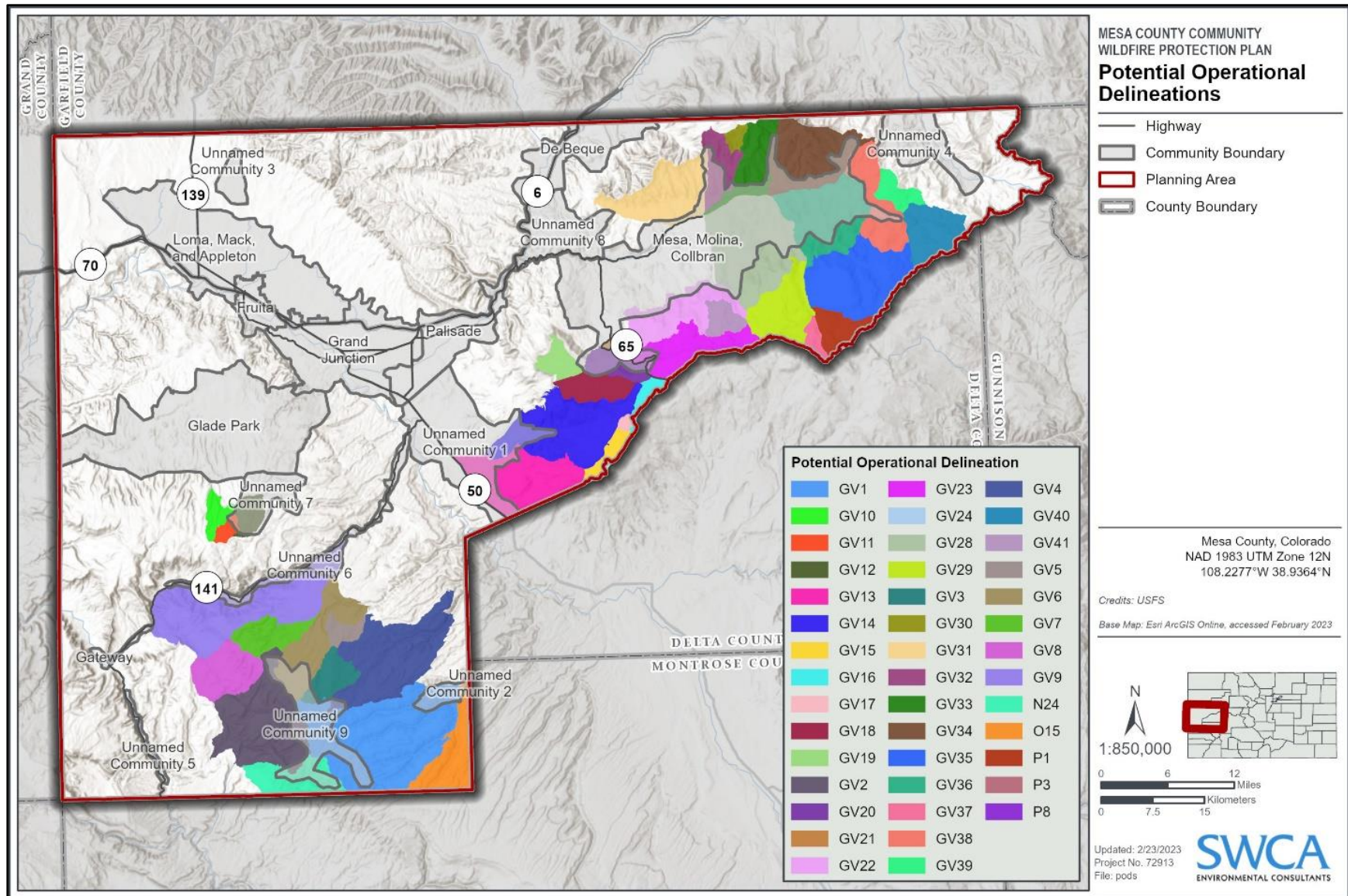


Figure B.6. PODs within Mesa County.

Click here to learn more about PODs: <https://www.fs.usda.gov/rmrs/potential-operational-delineations-pods>

Click here to view a *PODs at a Glance* summary sheet:

https://www.fs.usda.gov/rmrs/sites/default/files/documents/PODs-at-a-glance_RMRS_Jan2022.pdf

MUTUAL AID

The wildland fire community is well known for its development of mutual aid agreements at the federal, state, and local levels. Such mutual aid agreements allow for the closest forces to respond to an incident as quickly as possible regardless of jurisdiction. Such agreements may also describe how reimbursement will be conducted; state resources responding to wildfires on federal land may have their associated costs reimbursed by the responsible federal agency, and the reverse is true for federal resources suppressing a wildfire on state land.

Road Systems

Some communities in Mesa County are accessed only via unsurfaced roads through desert shrublands and forested areas on the Grand Mesa, which are often narrow and windy with many dead-ends and blind corners. These access roads are particularly hazardous during emergency evacuation, especially where they are lined by thick, dense vegetation. Fuel treatment may be needed along some roads where vegetation is overhanging and could prevent safe evacuation of residents or safe access by emergency responders. In addition, access to many communities is limited to one major road in and out which may prove hazardous during emergency evacuation.

People

The safe and efficient evacuation of people from wildfire requires several factors, including:

Emergency notification methods:

Mesa County uses an Emergency Notification System to provide essential information quickly during an emergency. Landlines are automatically signed up for the Emergency Notification System, but cell phone users need to sign up. To get alerts sent to your cell phone sign up on the Emergency Notification System and Community Alerts system on the Grand Junction Regional Communication Center website:

<https://member.everbridge.net/index/892807736721759/#/signup>

National alert systems that can be utilized locally in the event of an emergency:

- Emergency Alert System (EAS).
- Wireless Emergency Alerts (WEAs).
- Visit the Emergency Alerts page on the Ready.gov website to learn more:
<https://www.ready.gov/alerts>

Visit the CO trip system provided by the Colorado Department of Transportation (CDOT) to find travel alerts and road conditions: <https://www.cotrip.org/home#notifications>.

Visit the National Weather Service Radio Station provided by National Oceanic and Atmospheric Administration (NOAA) for a nationwide network of radio stations broadcasting continuous weather information directly from the nearest National Weather Service office. NOAA Weather Radio broadcasts 24 hours per day, 7 days per week, with information about:

- Official weather warnings
- Watches
- Forecasts
- Hazard information

Beyond alert systems utilized by Mesa County, word of mouth also plays a role in emergency notification, especially in more rural areas where residents may not be subscribers to EAS partner content. When safe to do so, residents should call or text friends, neighbors, and contacts to ensure that they are aware of active alerts.

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

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

Locked gates, poor or missing signage, and conflicts with emergency vehicles driving into the community can cause public confusion during a complicated evacuation. Uncertainty about where to find temporary refuge can cause families to become separated and delay reunions. Some individuals without transportation or with limited mobility may be accidentally left behind. Make sure to have an evacuation plan and go bag(s) ready. Know your evacuation routes and rallying points. Make sure you are signed up to receive emergency notifications. Be sure to bring important belongings such as prescriptions, documentation, or other life-dependent items. Help your local community members if it is safe to do so. It is important to note, if a wildfire is in your area, you do NOT need to wait for government evacuation orders to evacuate. Please see Appendix G, Homeowner Resources, for links to resources mentioned above.

Public awareness:

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

Community Emergency Response Team

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

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



Figure B.7. Example of a narrow road in Mesa County.

Animals and Livestock

In the event of a wildfire, it is important that residents, fire responders, and the Mesa County Office of Emergency Management have a plan for evacuation of pets and livestock. Evacuation planning often neglects to describe how animals will be evacuated and where they will be taken. The loading of horses, for example, during a fire and smoke situation, and transport of stock vehicles down narrow roads under stressful situations, can be very difficult. Some public education regarding livestock in the event of an evacuation is included in the Mesa County Wildfire Preparedness page (MCEM 2023).

If you need assistance evacuating or sheltering livestock, please call (970) 244-1835.

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

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

PUBLIC EDUCATION AND OUTREACH PROGRAMS

Public education and outreach programs are a common factor in virtually every agency and organization involved with wildfire. The Mesa County Sherriff's office "encourages citizens to know how to handle themselves before, during, and after a wildfire situation" (MCSO 2023).

LOCAL AND STATE PROGRAMS

Two Rivers Wildfire Coalition

The Two Rivers Wildfire Coalition is a non-profit group based out of Grand Junction, Colorado. The Coalition maintains several partnerships with local, state, and federal entities such as Mesa County Fire Chiefs Association, Colorado State Forest Service, and the BLM's Upper Colorado River Fire Management. The Coalition provides several resources to local residents including wildfire preparedness, property management for wildfire, and a series of ongoing workshops that are a part of a learning network. Information on natural resources, and community impacts due to wildfire are also available along with information on the latest planning documents. The coalition is an advocate for public engagement and community cooperation. There are several ways to get involved with the organization including the neighborhood ambassadors' program and the learning network.

Neighborhood Ambassadors: The goal of the neighborhood ambassador program is to identify an advocate, and single point of contact, through which risk reduction in WUI neighborhoods can be supported. We provide assessments, mentorship, organizing support, access to experts, and funding opportunities to neighborhoods with an approved Neighborhood Ambassador.

Neighborhood Ambassador Program Volunteer Activity Description and Commitment Form:

<https://docs.google.com/document/d/1FCS7-Kipfqmw0CS9u4NHcl1SZ9SwTXCT/edit>

Mesa County Fire Protection Districts

Most of Mesa County's Fire Protection Districts maintain websites that contain outreach pages designed to increase community wildfire awareness and preparedness. These pages provide residents with a wealth of knowledge on living with wildland fire risks and appropriate actions for mitigating dangers. Links point users towards information on active burn bans, emergency preparedness, evacuation procedures, maintaining home-ignition-zones, responsibly recreating in fire-prone forests, and accessing state and federal planning guidelines. The Fire Protection District website pages can be accessed here:

- Lower Valley FPD: <https://www.lowervalleyfire.com/>
- De Beque FPD: <https://www.debequefire.org/>
- Grand Valley FPD: <https://www.gvfpd.org/>
- Plateau Valley FPD: <https://5280fire.com/home/colorado-fire-apparatus-stations/mesa-county/plateau-valley-fire-protection-district/>
- Lands End FPD: <https://landsendfpd.colorado.gov/>
- Glade Park FPD: <https://www.glade-park.com/glade-park-fire-department.html>
- Gateway Unaweep FPD: <https://gufd.org/>
- Palisade FPD: <https://palisade.colorado.gov/palisade-fire-and-emergency-medical-services>
- Clifton FPD: <https://cliftonfire.colorado.gov/>
- Central Orchard Mesa FPD: <https://www.centralorchardmesafd.org/>
- Grand Junction Rural FPD: <https://gjrfpd.org/>

Colorado Division of Fire Prevention and Control (DFPC)

The DFPC offers various resources for topics such as building safety, fire prevention, community risk reduction, firework safety, vehicle safety, and the fire safety evaluation system (FSES) (DFPC 2022c). In addition, the DFPC has their own Wildland Fire Management Communications and Outreach Specialist, you can view their contact information here: <https://dfpc.colorado.gov/home/public-information>.

In addition, the DFPC hosts building safety month, Fire Prevention Week, Community Risk Reduction Week, and more. You can find more information on the DFPC Campaigns and Public Education webpage located here: <https://dfpc.colorado.gov/FLScampaigns?web=1&wdLOR=c61B38F2B-6998-4994-BC02-E114F1CDA5E3>

NATIONAL PROGRAMS

Ready, Set, Go!

The Ready, Set, Go! Program, which is managed by the International Association of Fire Chiefs, was launched in 2011 at the WUI conference. The program seeks to develop and improve the dialogue between fire departments and residents, providing teaching for residents who live in high-risk wildfire areas—and the WUI—on how to best prepare themselves and their properties against fire threats. Mesa County utilizes the Ready, Set, Go! Program for its public outreach with a focus on making communities “fire adapted”.

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

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

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

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

National Fire Protection Association

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

The NFPA develops easy-to-use educational programs, tools, and resources for all ages and audiences, including Fire Prevention Week, an annual campaign that addresses a specific fire safety theme. The NFPA’s Firewise Communities program (www.firewise.org) encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.

The NFPA is a premier resource for fire data analysis, research, and analysis. The Fire Analysis and Research division conducts investigations of fire incidents and produces a wide range of annual reports and special studies on all aspects of the nation's fire problem.

National Interagency Fire Center

The National Interagency Fire Center (NIFC) provides a wide array of fire resources and services. The National Interagency Coordination Center offers communication assistance to over 32,000 firefighters and 50 major events at one given time (NIFC 2022). The Predictive Services Group creates wildfire forecasts and predictions from fuel and weather data. The NIFC has a Remote Automated Weather Base with over 2,000 weather stations which help inform the Predictive Services Group.

The National Wildfire Coordinating Group, which is nested under the NIFC, provides operational coordination to federal, state, local, tribal, and territorial partners (NWCG 2022). The NIFC also has a training branch where training curriculums are developed to be used across the nation. For those too young to participate in the standard training, NIFC offers FireWorks, an educational program designed for kids K-12. The program teaches children topics such as wildland fire science, ecosystem fluctuations, human interaction on the environment, and other environmental science topics. The NIFC also provides public education resources:

- [Wildfire Readiness – Home](#)
- [Wildfire Readiness – Business](#)
- [Wildfire Readiness – Farm and Ranch](#)
- [Weekend Wildfire Preparedness](#)
- [What to Do if a Wildfire is Approaching](#)
- [Wildfire Risk – Community](#)
- [Prepare and Protect Your Home](#)
- [Prepare Your Community](#)
- [One Less Spark, One Less Wildfire](#)
- [Only You Can Prevent Wildfires](#)

U.S. Fire Administration's WUI Toolkit

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

Wildfire Research Center (WiRē)

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

forests. Core to WiRē's approach are four main concepts. One, residents are critical actors in the wildland-urban interface wildfire problem. Two, action is central to adaptation. Three, people and their decisions are complex. Finally, four, decisions are not made in a vacuum.

To achieve its goals and serve communities, WiRē will typically conduct a "rapid wildfire risk assessment," which assesses what contributes to wildfire risk, such as, building materials, vegetation near homes, background fuels, local topography, and access to emergency fire services. Additionally, they also conduct "social surveys", which assess residents' perceptions about wildfire, wildfire risk, risk mitigation behavior, and assess their willingness towards taking action to reduce wildfire risk.

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

STATE

APPENDIX C:

2012 Community Risk-Hazard Assessments for

WUI Communities

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COMMUNITY RISK-HAZARD DESCRIPTIONS

The following is a description of risks and hazards for communities throughout Mesa County. The assessment is twofold: 1) GIS-derived risk and hazard analysis completed in 2023, and 2) on-the-ground NFPA 1144 assessments that were completed in 2012. The Core Team conducted a comprehensive review of the data derived from the 2012 on-the-ground NFPA 1144 assessments in 2023, and the information was determined to be accurate. Any outdated or no longer valid information has been updated (Table C.1). Some communities did not have assessments completed in 2012, so these communities should be prioritized for assessments in the future. Community names and regions may differ between the 2023 and 2012 assessment processes as change in the County and available data has occurred in the 11 years between planning efforts.

Included in the 2023 CWPP update are community maps (Figure C.3, for example) showing the updated 2023 GIS derived Risk-Hazard Assessment, which takes into consideration the revised WUI delineation (Figure C.2), revised fuels, updated fire behavior modeling approaches, and recent fire occurrence. Next is a summary table of on-the-ground NFPA 1144 risk assessments completed in 2012 (Table C.1). Following the summary table are detailed descriptions of each community assessed in 2012 with accompanying pictures.

The intent of this section is to provide more detailed information at a fire district level in order to aid prioritization of recommendations. Specific recommendations from the 2012 Mesa County CWPP update process are included for each community at the end of the document (Table C.2). These community write-ups do not provide as much detail as a community-level CWPP and should not replace community-level planning.

1-MILE WUI BUFFERS*

According to the HFRA, the WUI can be defined by a CWPP. In this CWPP, the WUI is defined as an area extending 1 mile from the boundary of an at-risk community (Figure C.2).

The following maps represent the WUI boundaries for each community, which were delineated by the Core Team. The 1-mile buffer represents an area where WUI fuel treatments should be considered in order to provide additional protection to the community from potential wildfire spread. In some cases, the WUI may extend beyond the 1-mile area to meet a strategic suppression point or topographic feature to enhance protection, as dictated by land management agencies.

*The maps use different scales to provide detail, but all buffer distances are the same (1 mile).

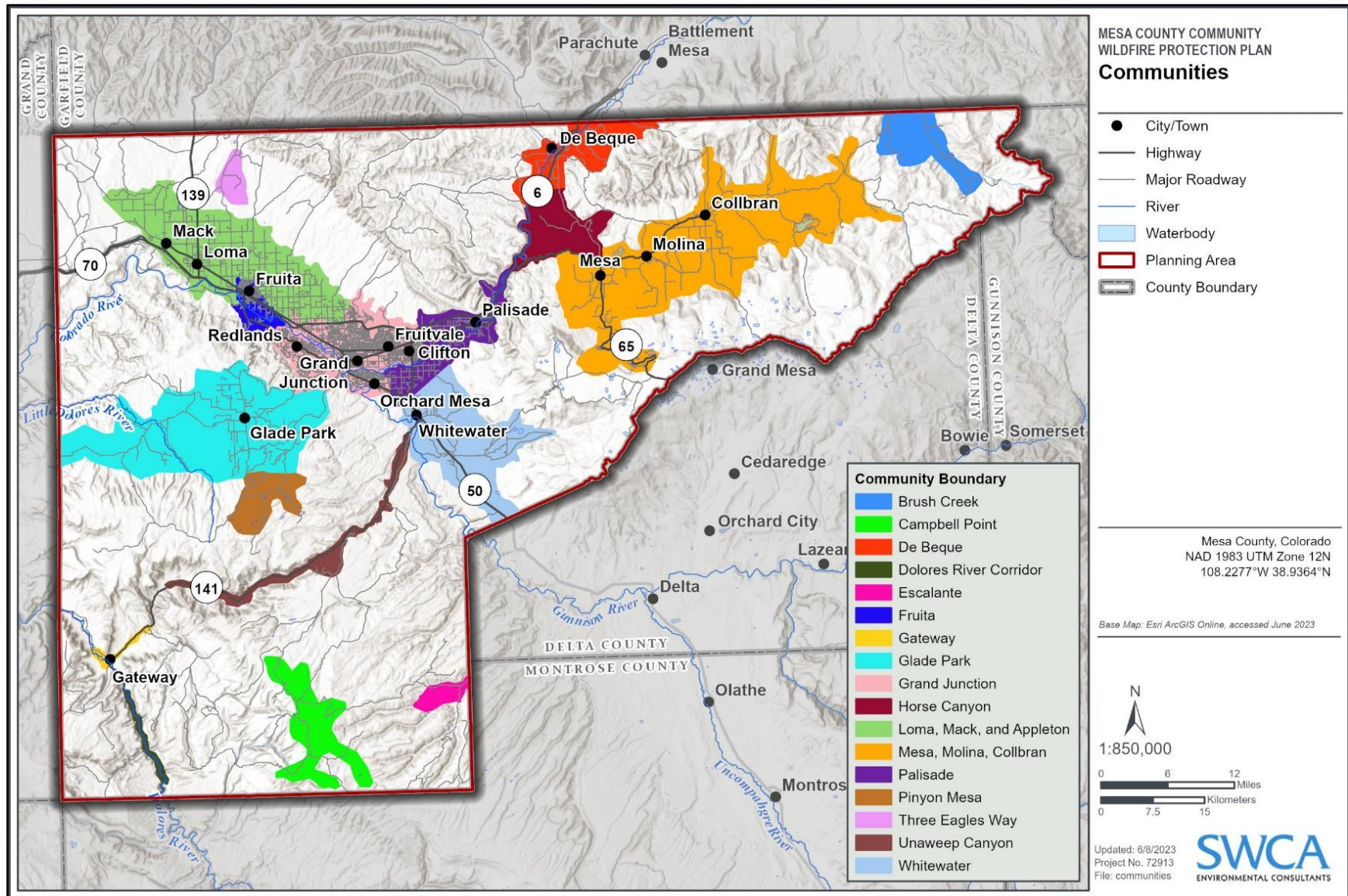


Figure C.1. 2023 Mesa County CWPP Update community delineations.

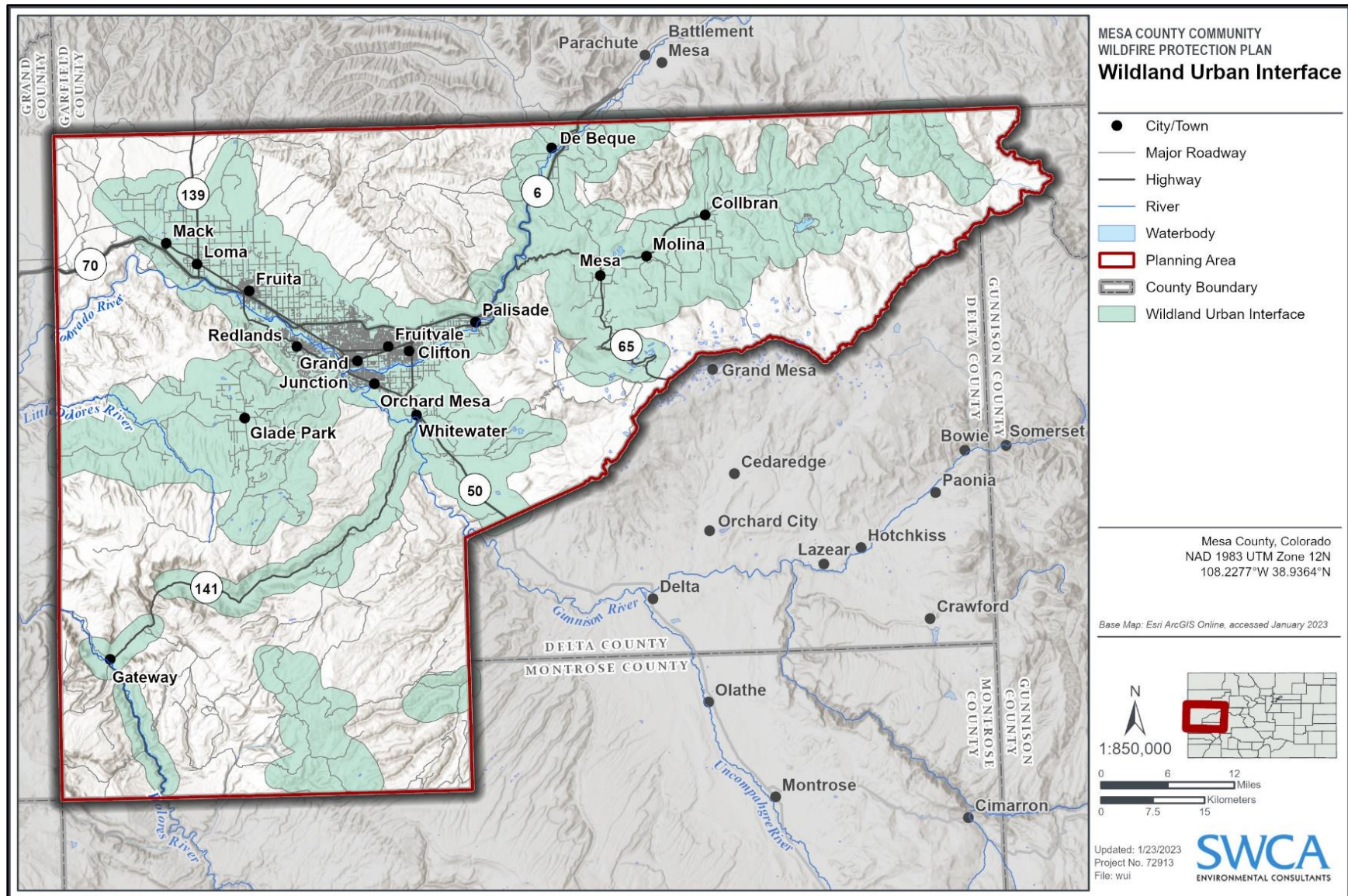


Figure C.2. 2023 Mesa County CWPP Update WUI community polygon delineations.

2023 COMMUNITY GIS RISK ASSESSMENT MAPS

De Beque

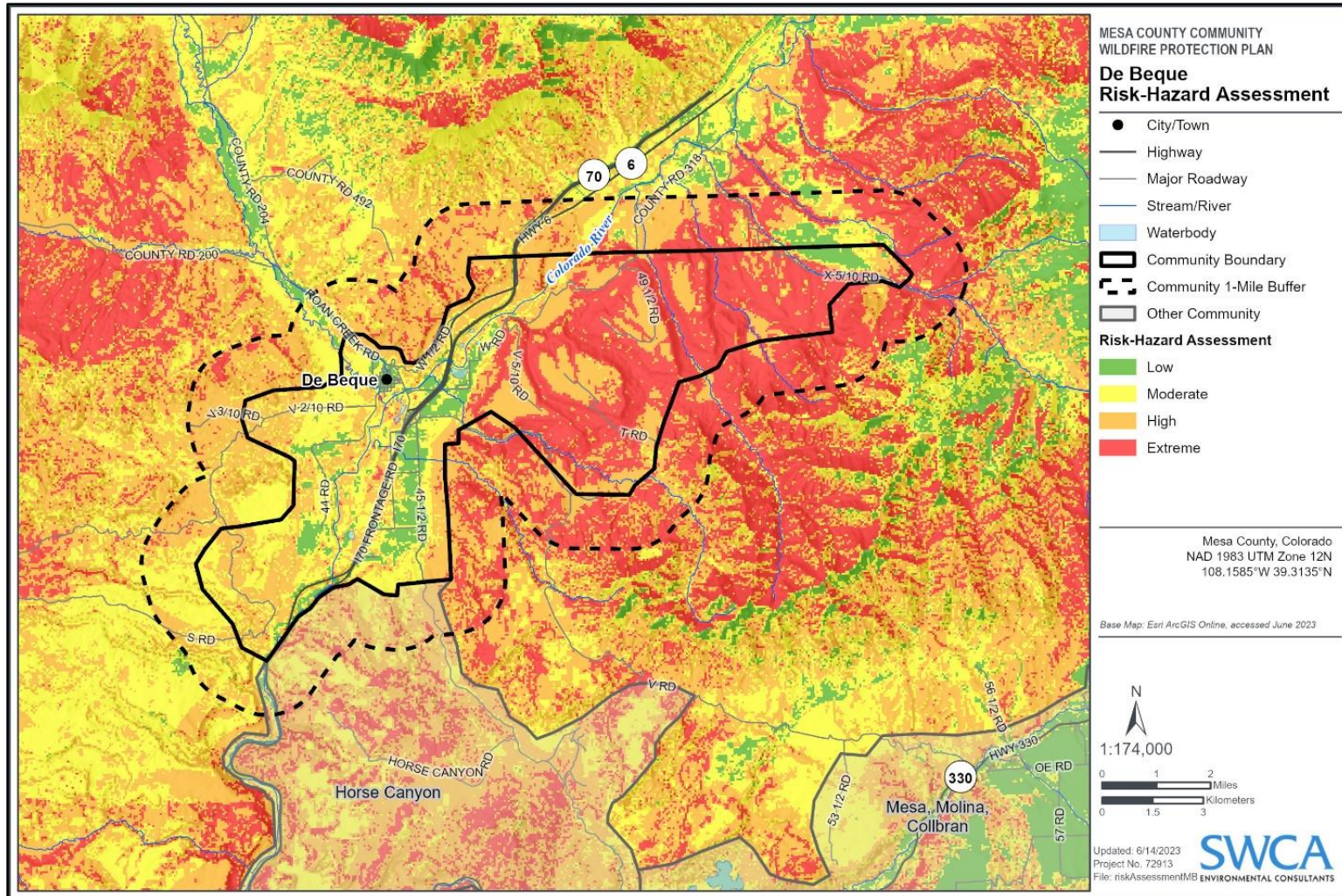


Figure C.3. De Beque Risk-Hazard Assessment.

Brush Creek

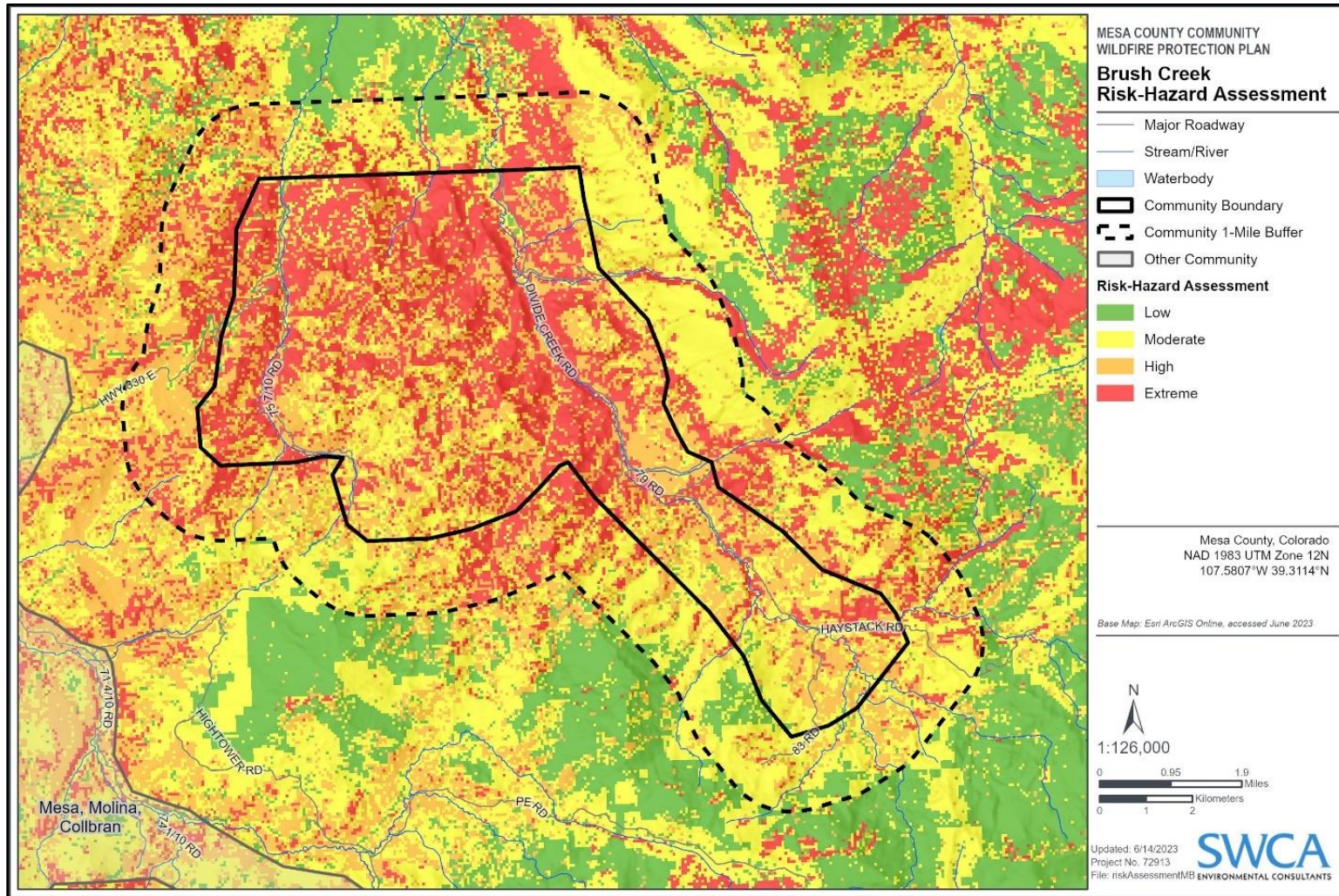


Figure C.4. Brush Creek Risk-Hazard Assessment.

Campbell Point

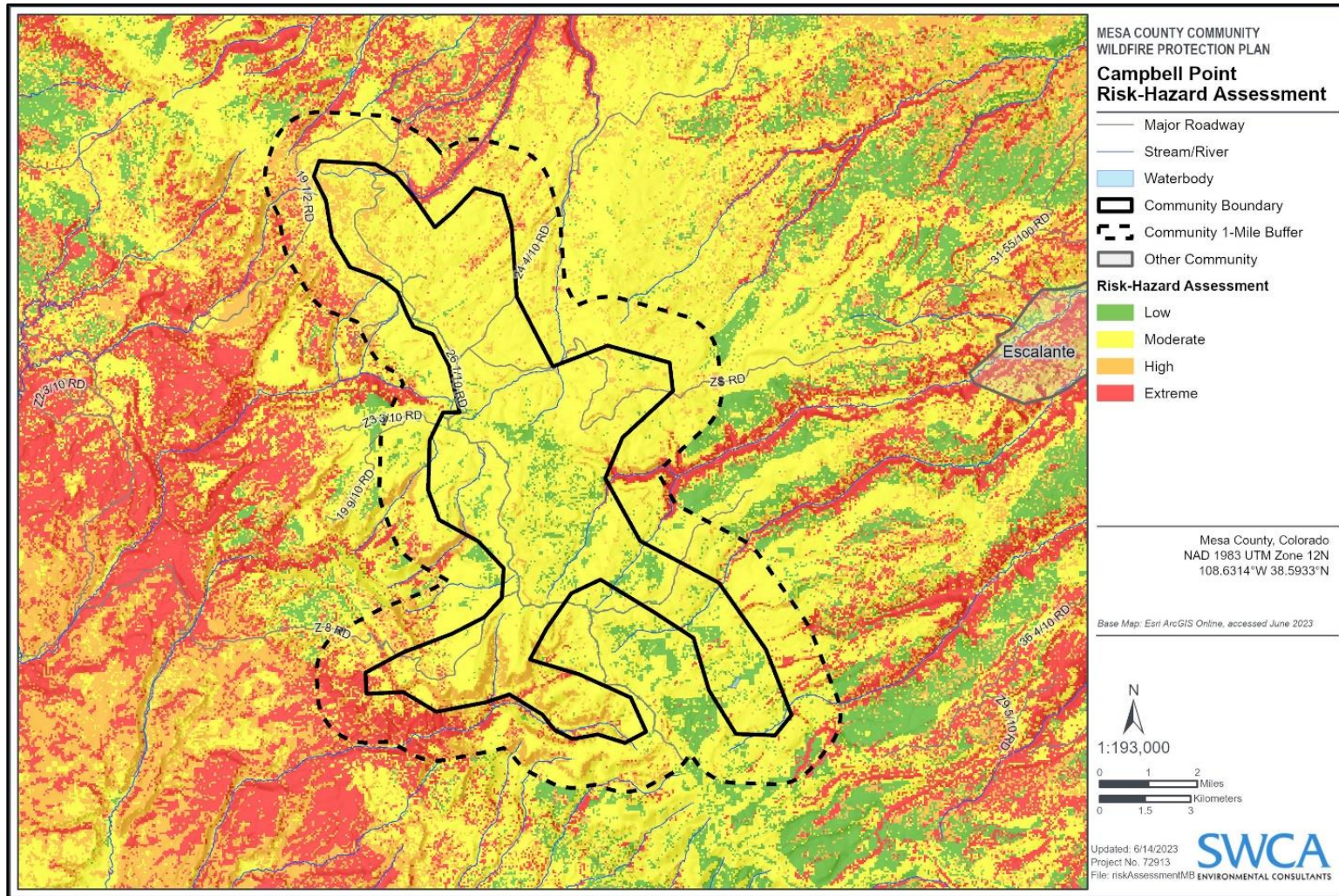


Figure C.5. Campbell Point Risk-Hazard Assessment. This community was delineated in 2023 and does not include 2012 NFWA risk assessment data.

Dolores River Corridor

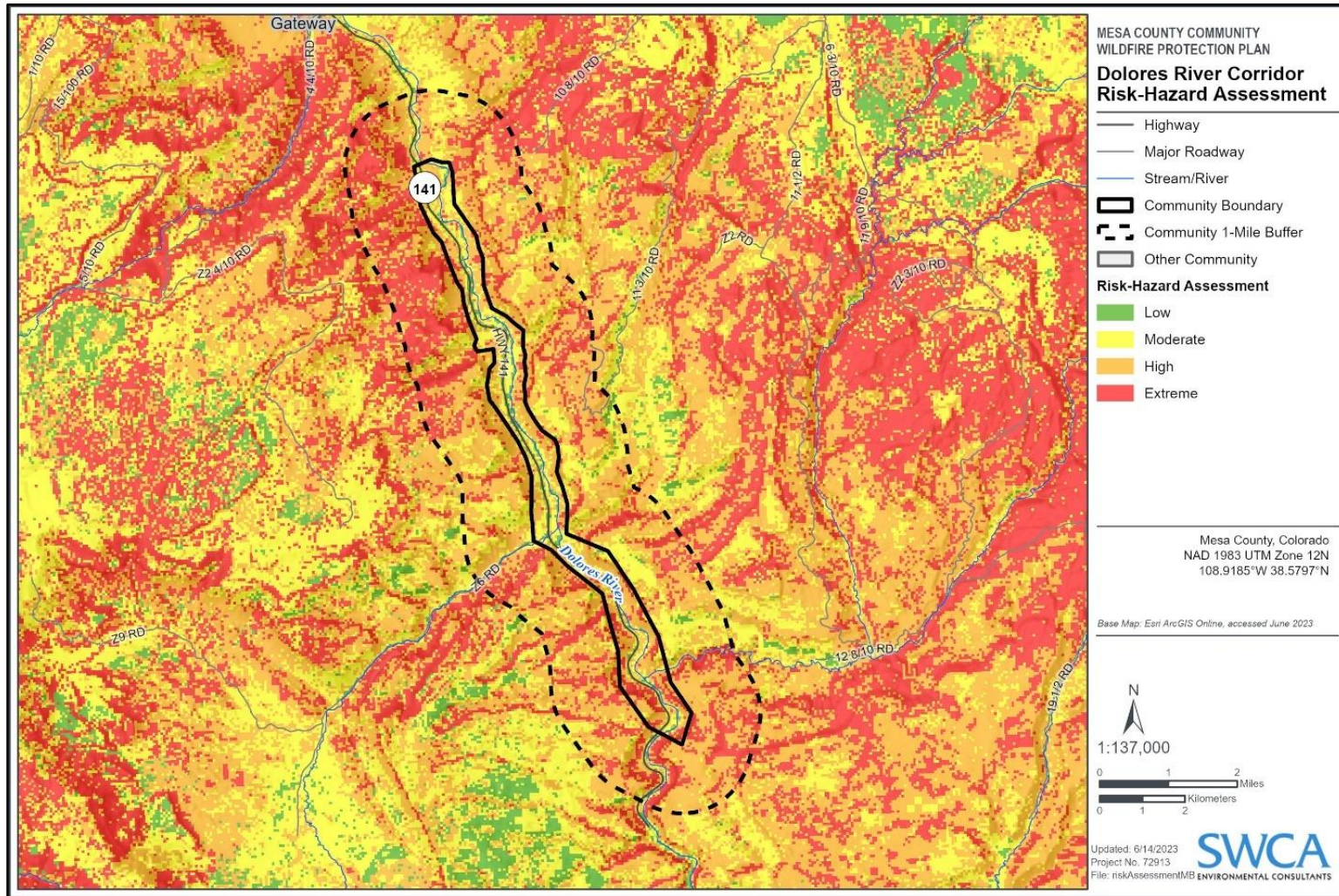


Figure C.6. Dolores River Corridor Risk-Hazard Assessment.

Escalante

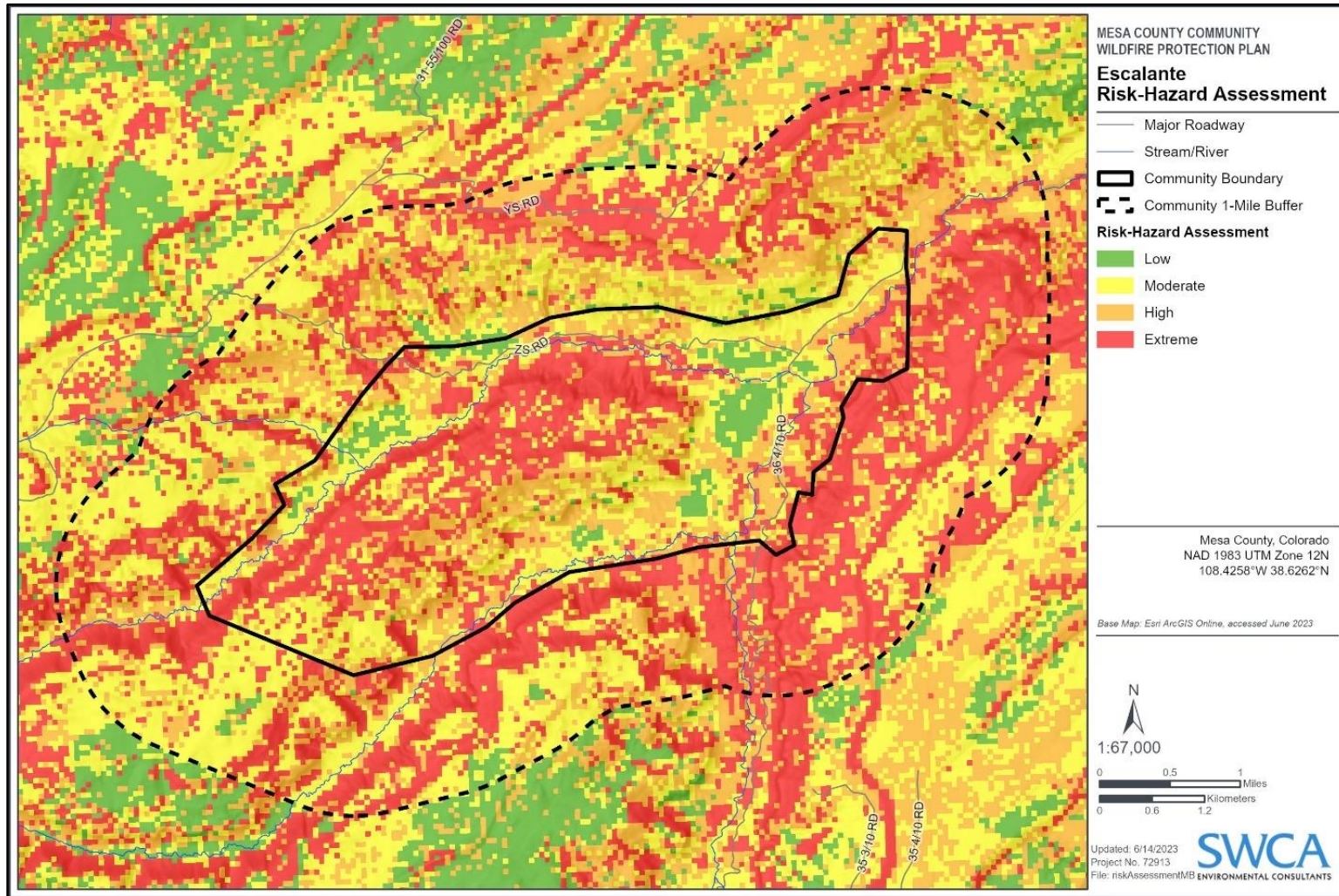


Figure C.7. Escalante Risk-Hazard Assessment. This community was delineated in 2023 and does not include 2012 NFPA risk assessment data.

Fruita

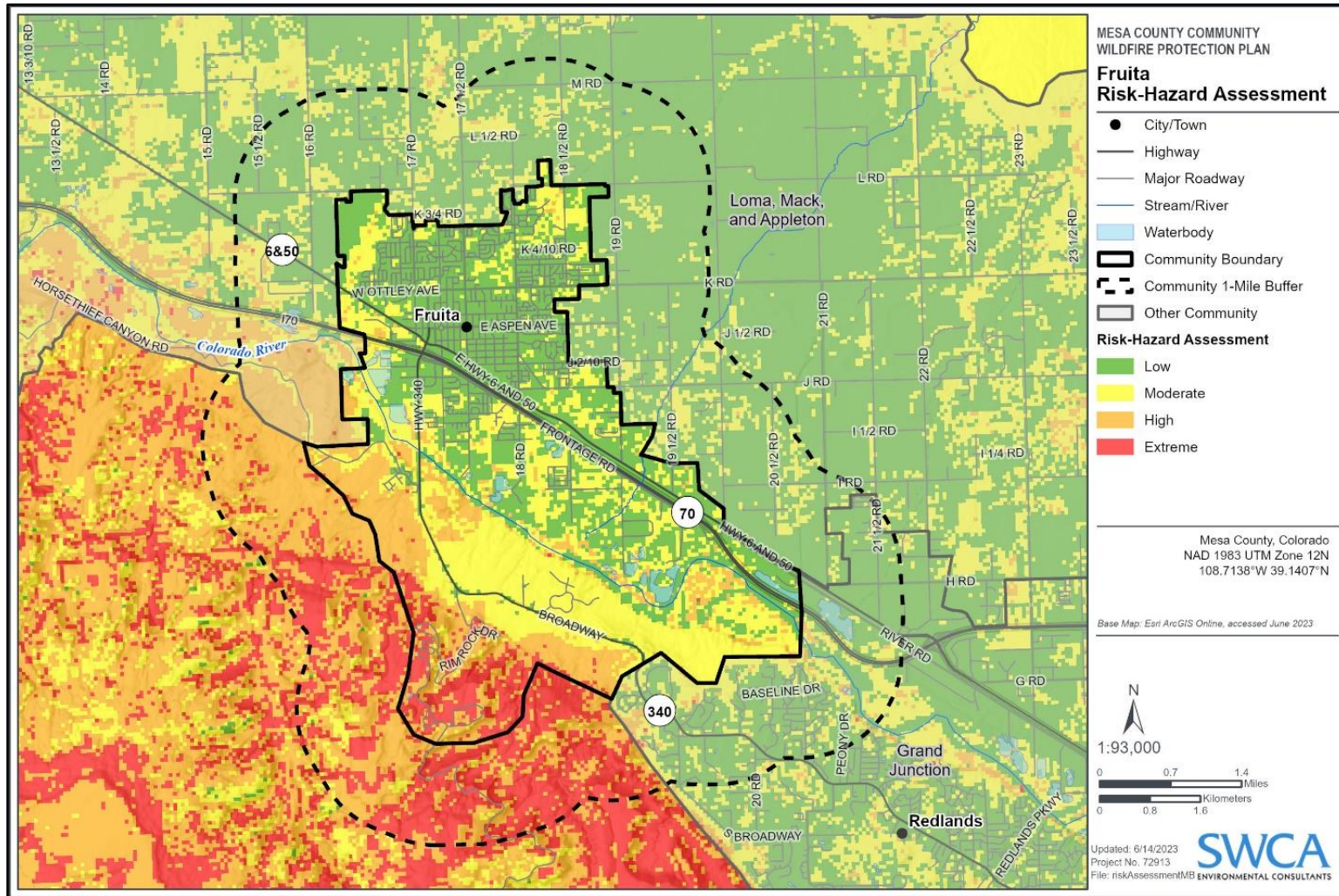


Figure C.8. Fruita Risk-Hazard Assessment.

Gateway

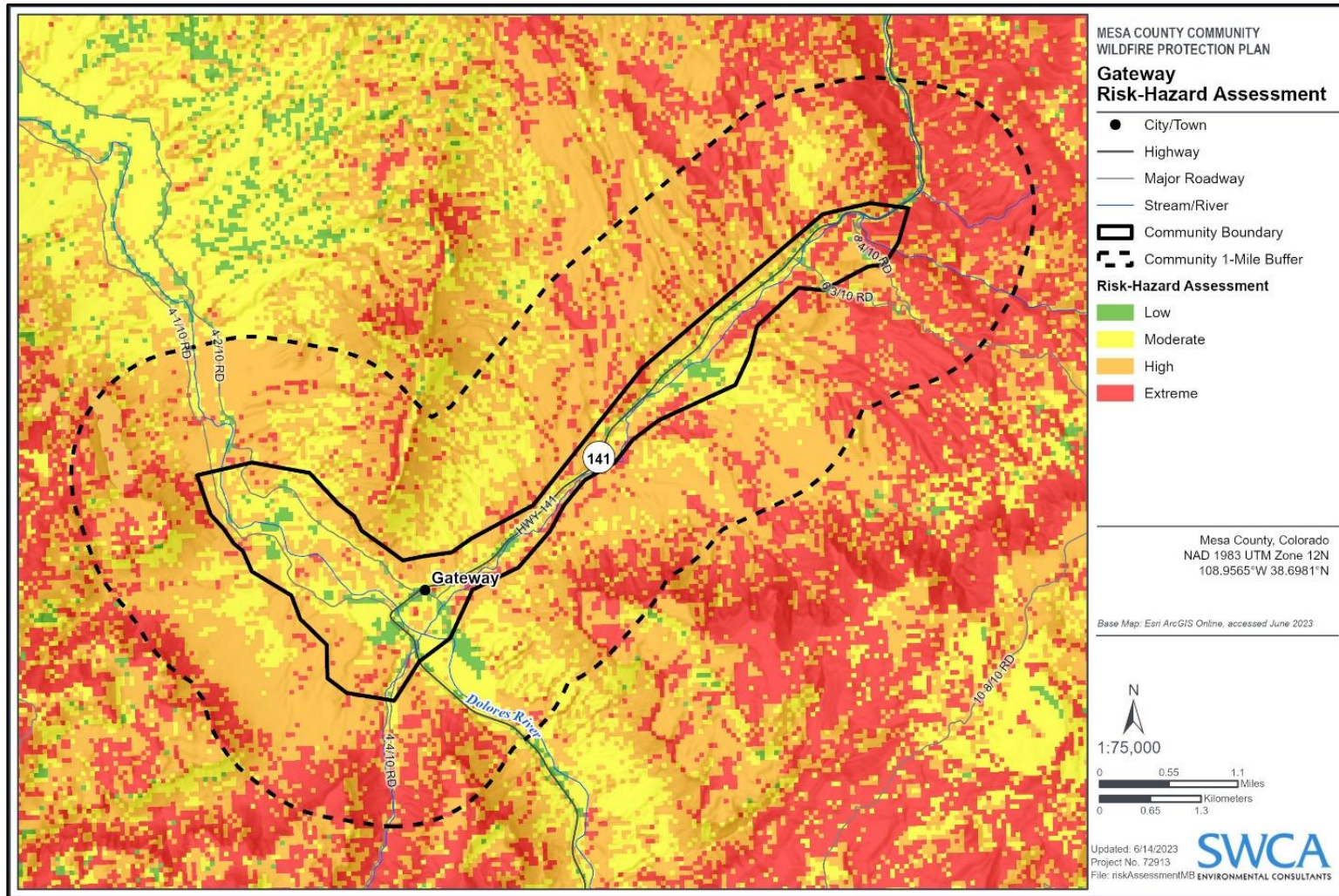


Figure C.9. Gateway Risk-Hazard Assessment. This community was delineated in 2023 and does not include 2012 NFPA risk assessment data.

Glade Park

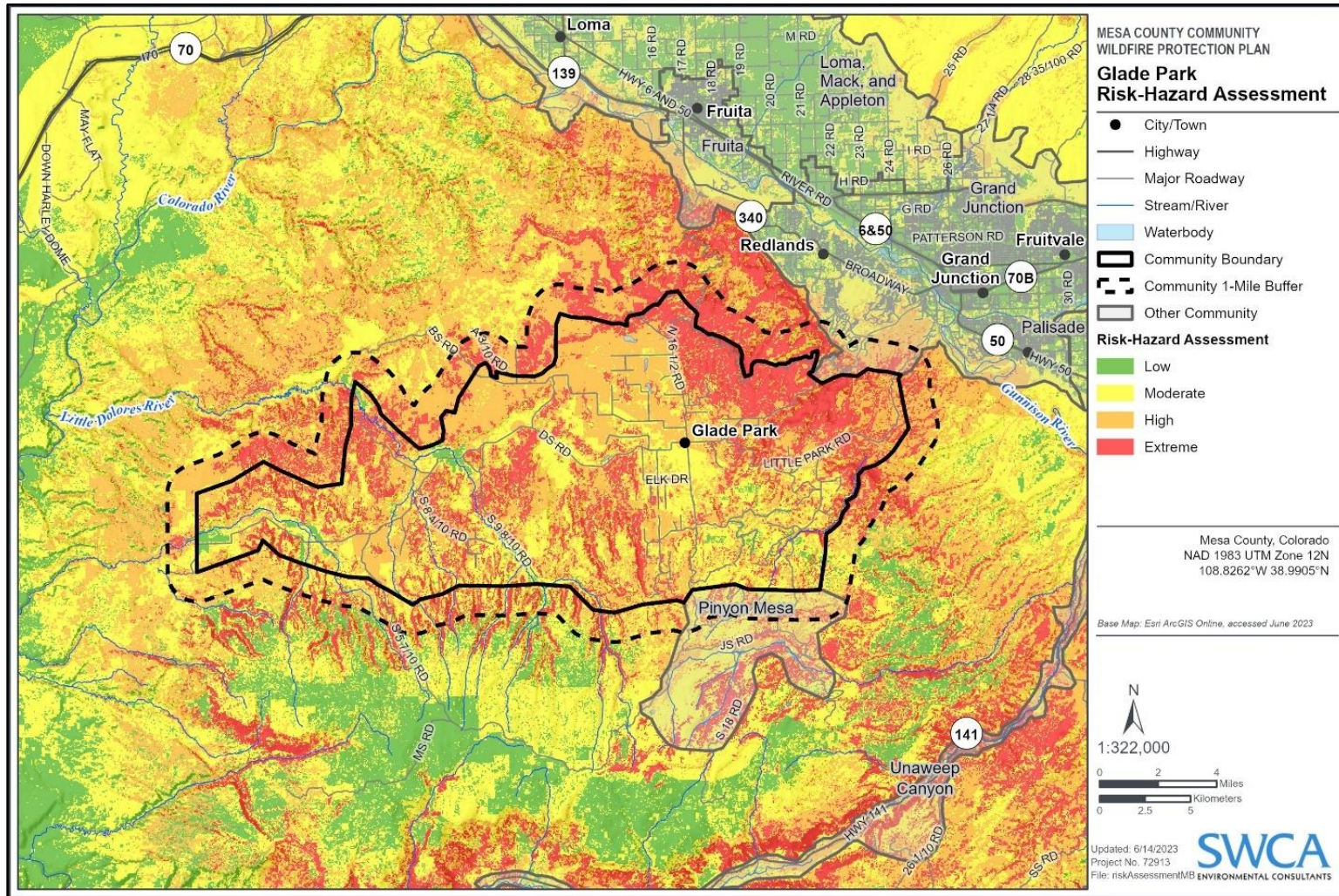


Figure C.10. Glade Park Risk-Hazard Assessment.

Grand Junction

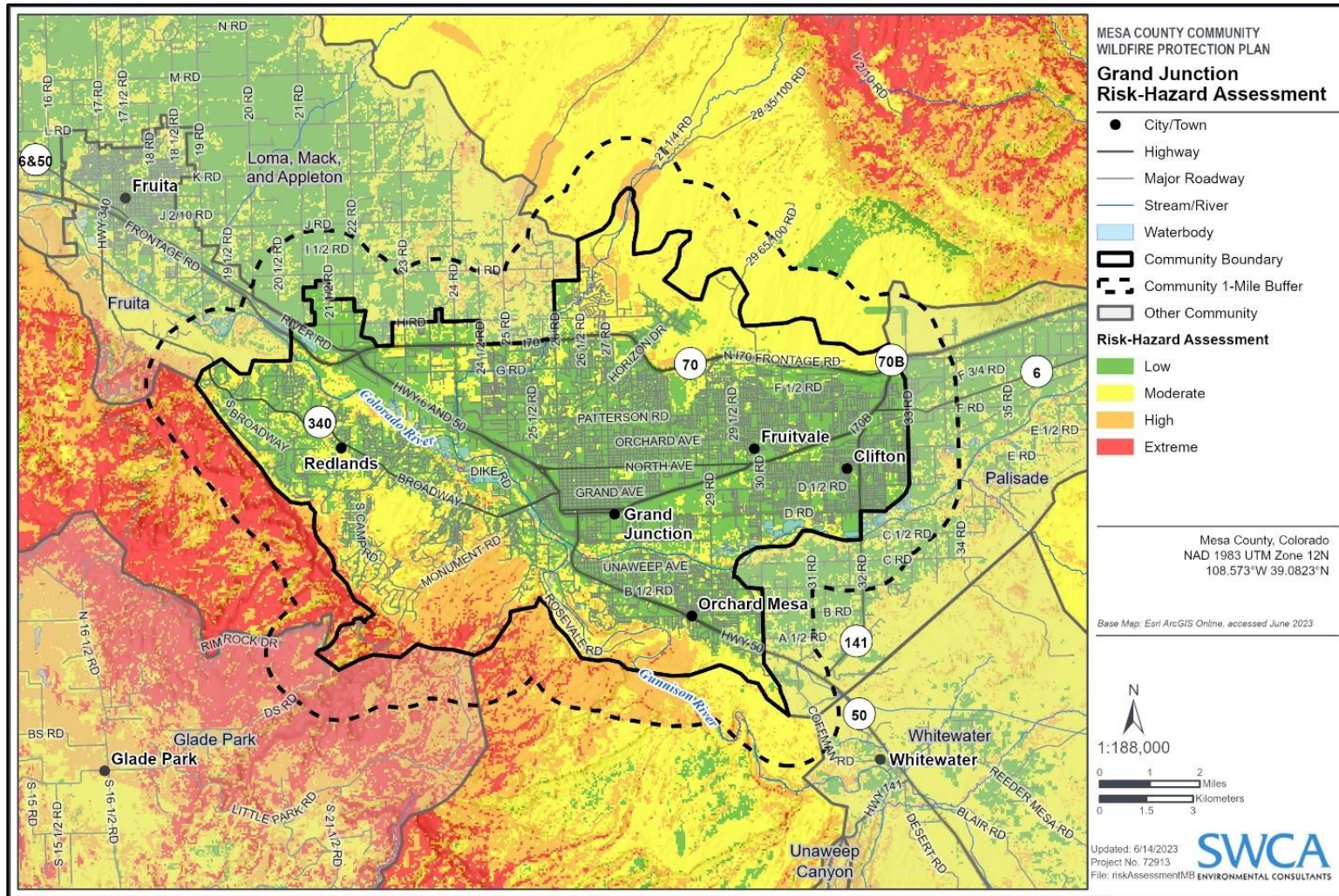


Figure C.11. Grand Junction Risk-Hazard Assessment.

Horse Canyon

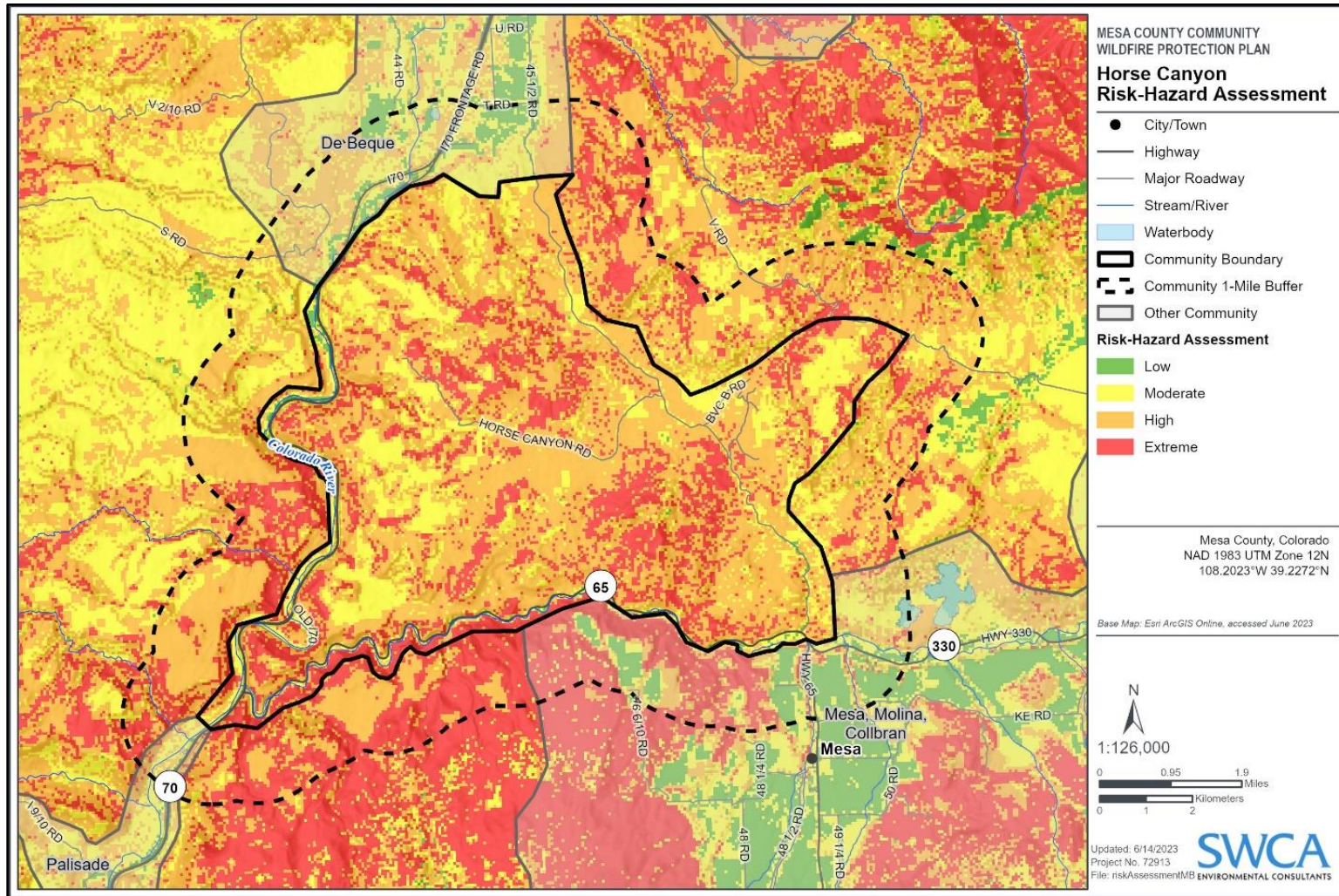


Figure C.12. Horse Canyon Risk-Hazard Assessment. This community was delineated in 2023 and does not include 2012 NFPA risk assessment data.

Loma, Mack, and Appleton

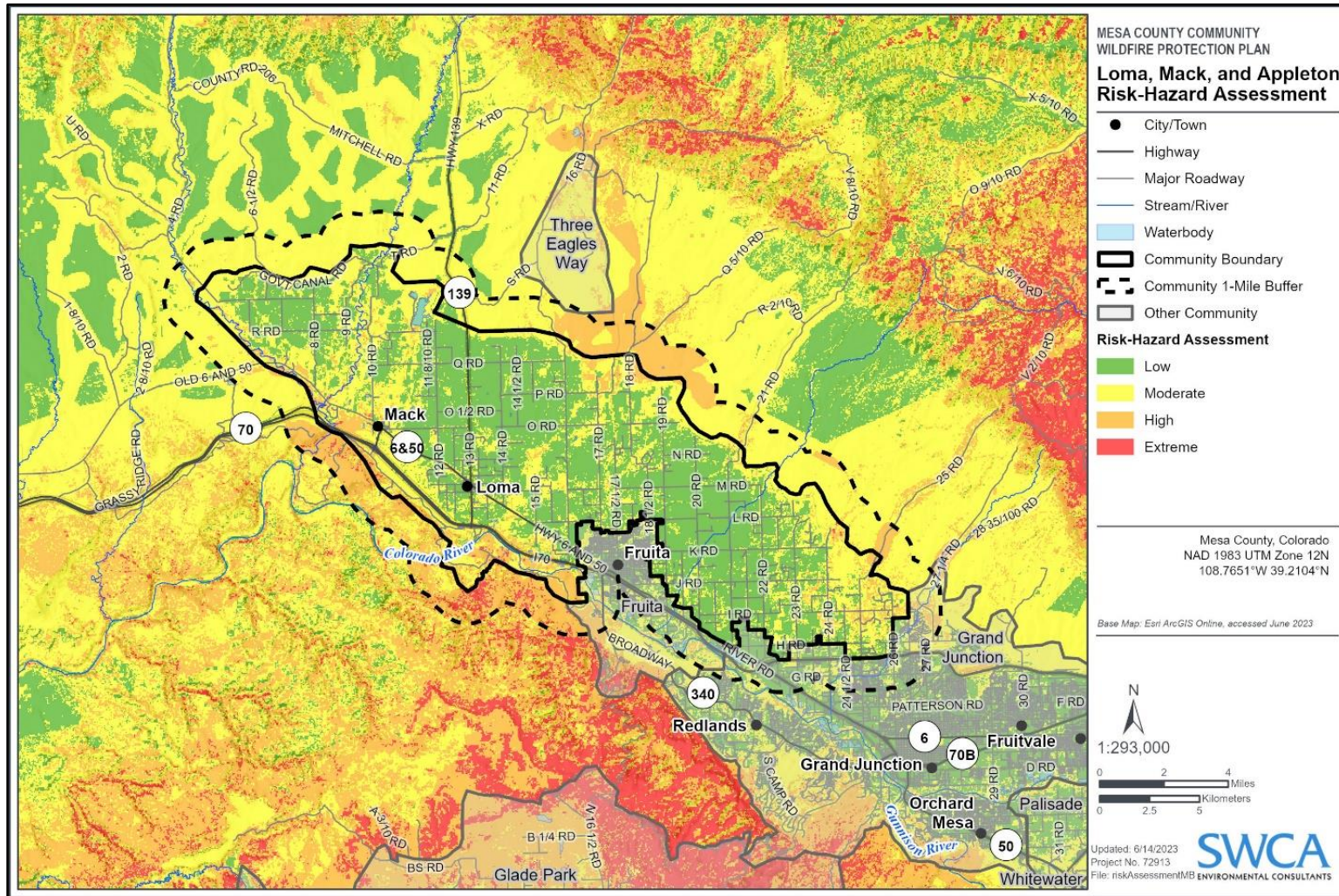


Figure C.13. Loma, Mack, and Appleton Risk-Hazard Assessment.

Mesa, Molina, and Collbran

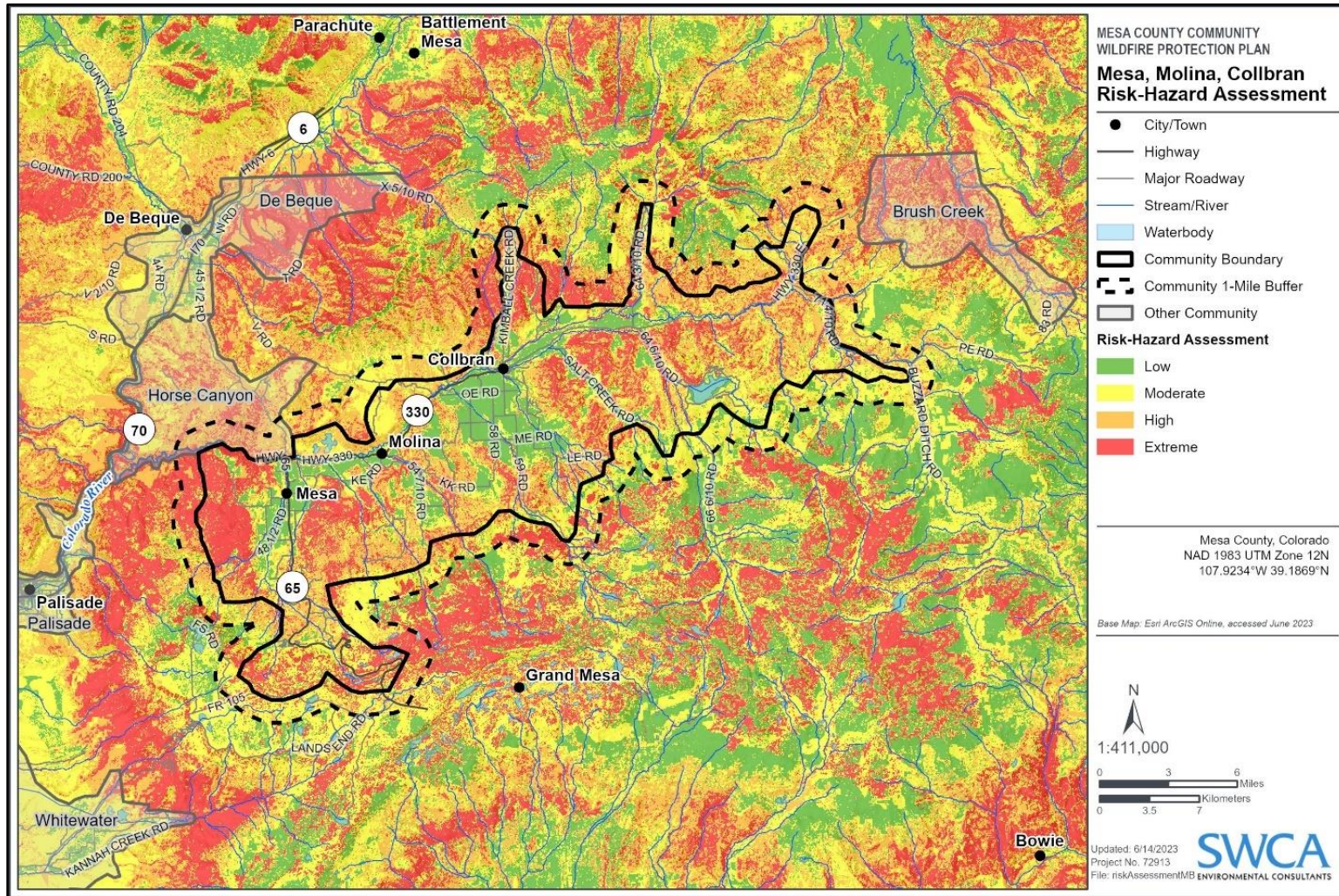


Figure C.14. Mesa, Molina, and Collbran Risk-Hazard Assessment.

Palisade

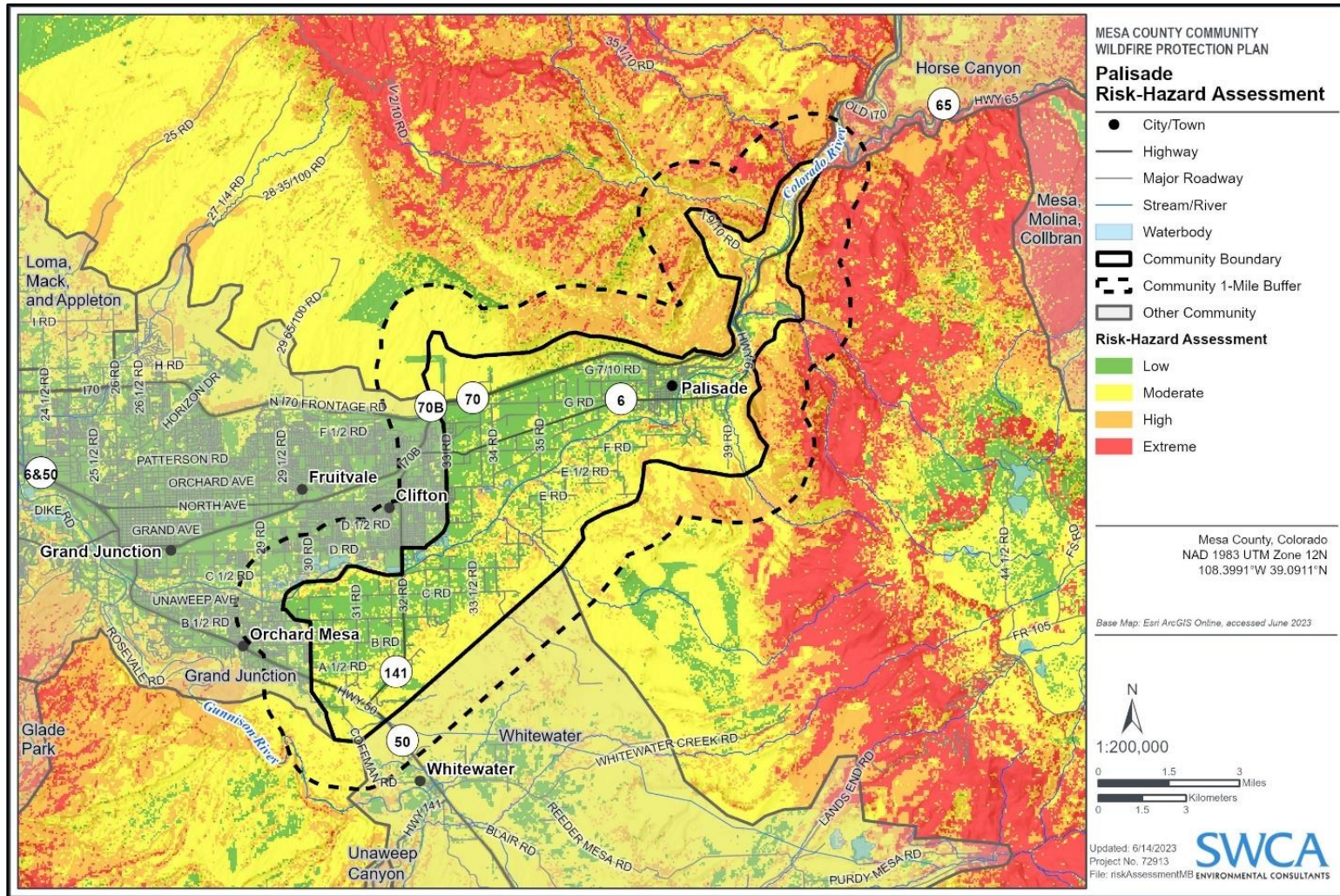


Figure C.15. Palisade Risk-Hazard Assessment.

Pinyon Mesa

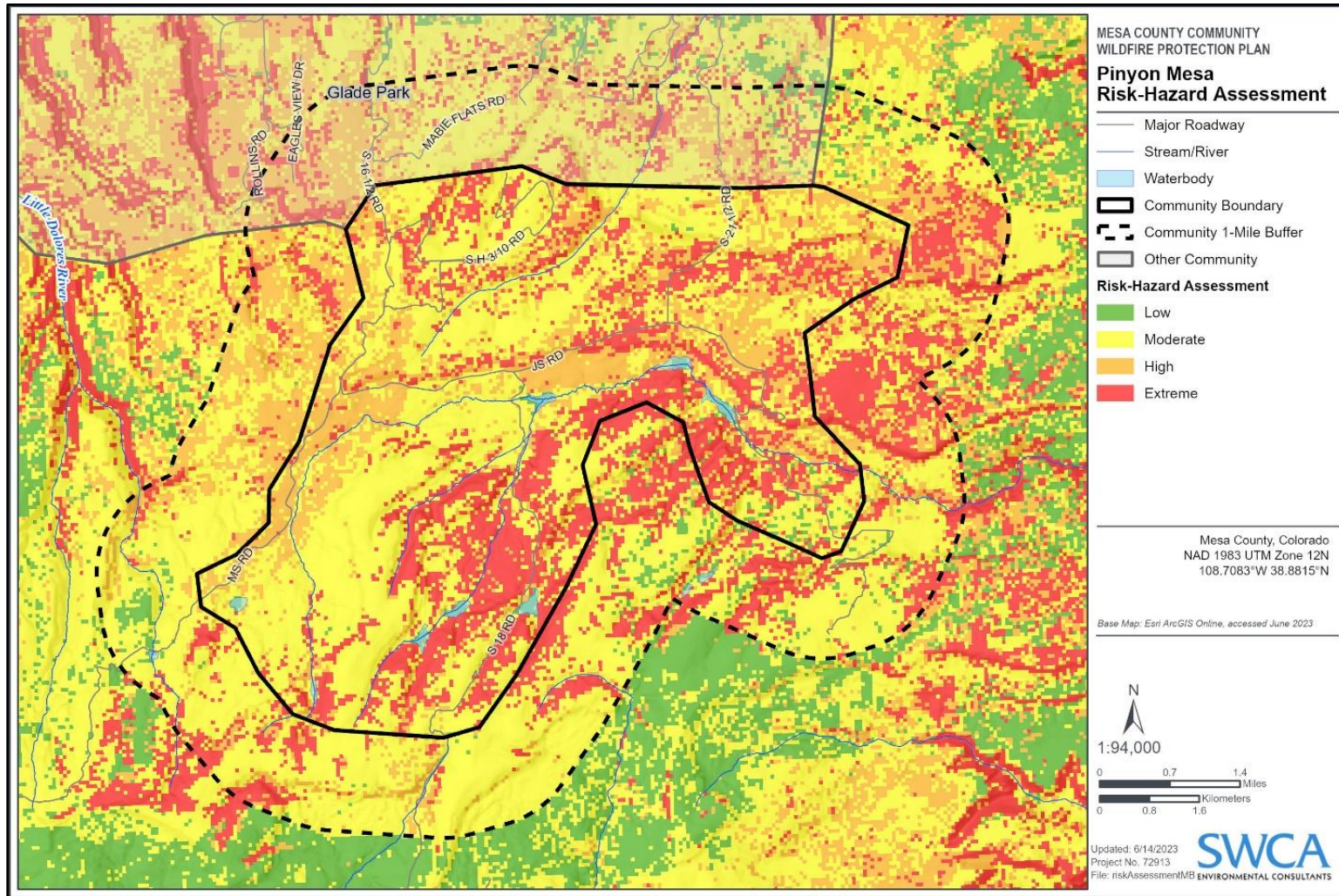


Figure C.16. Pinyon Mesa Risk-Hazard Assessment. This community was delineated in 2023 and does not include 2012 NFPA risk assessment data.

Three Eagles Way

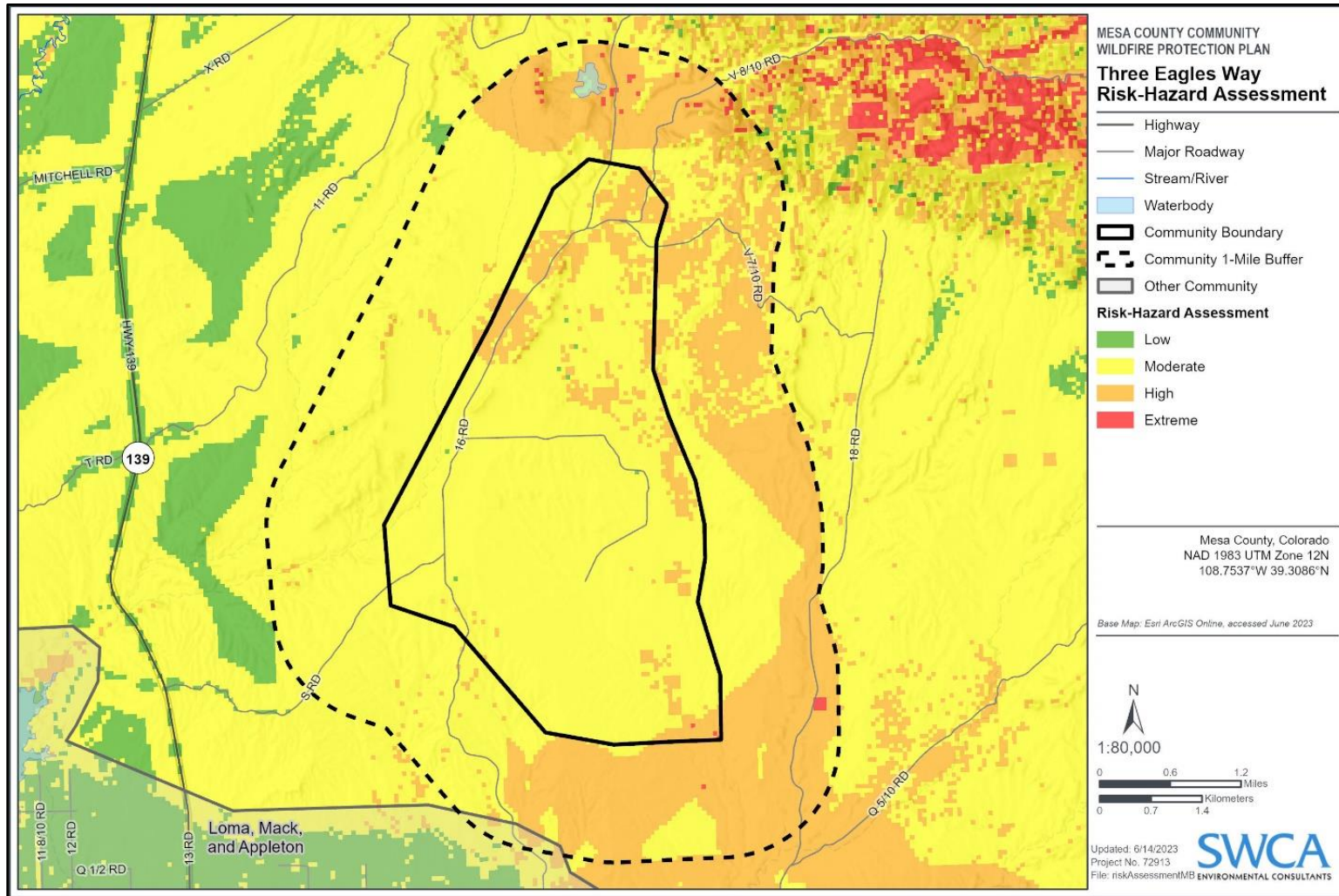


Figure C.17. Three Eagles Way Risk-Hazard Assessment. This community was delineated in 2023 and does not include 2012 NFPA risk assessment data.

Unaweep Canyon

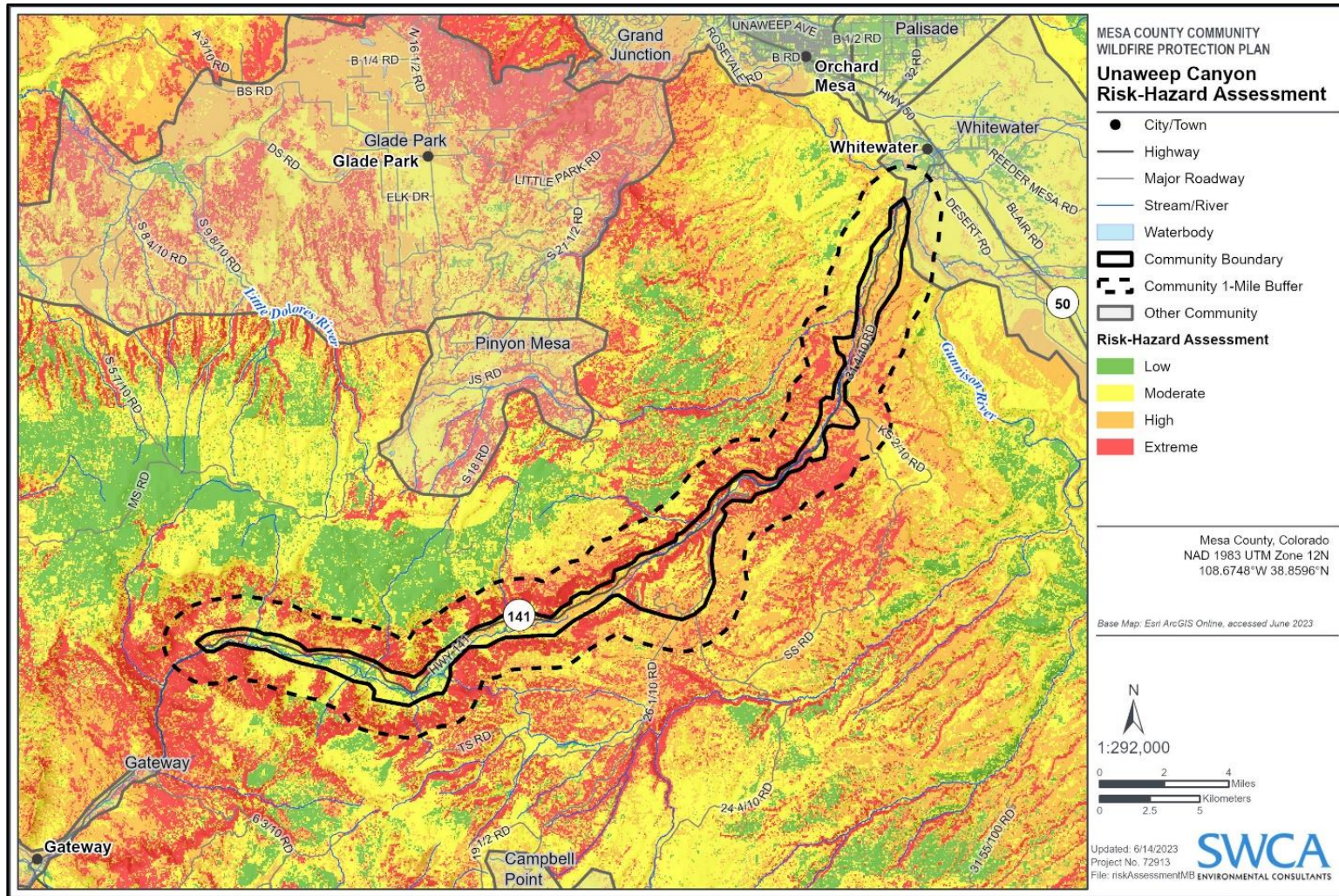


Figure C.18. Unaweep Canyon Risk-Hazard Assessment. This community was delineated in 2023 and does not include 2012 NFPA risk assessment data.

Whitewater

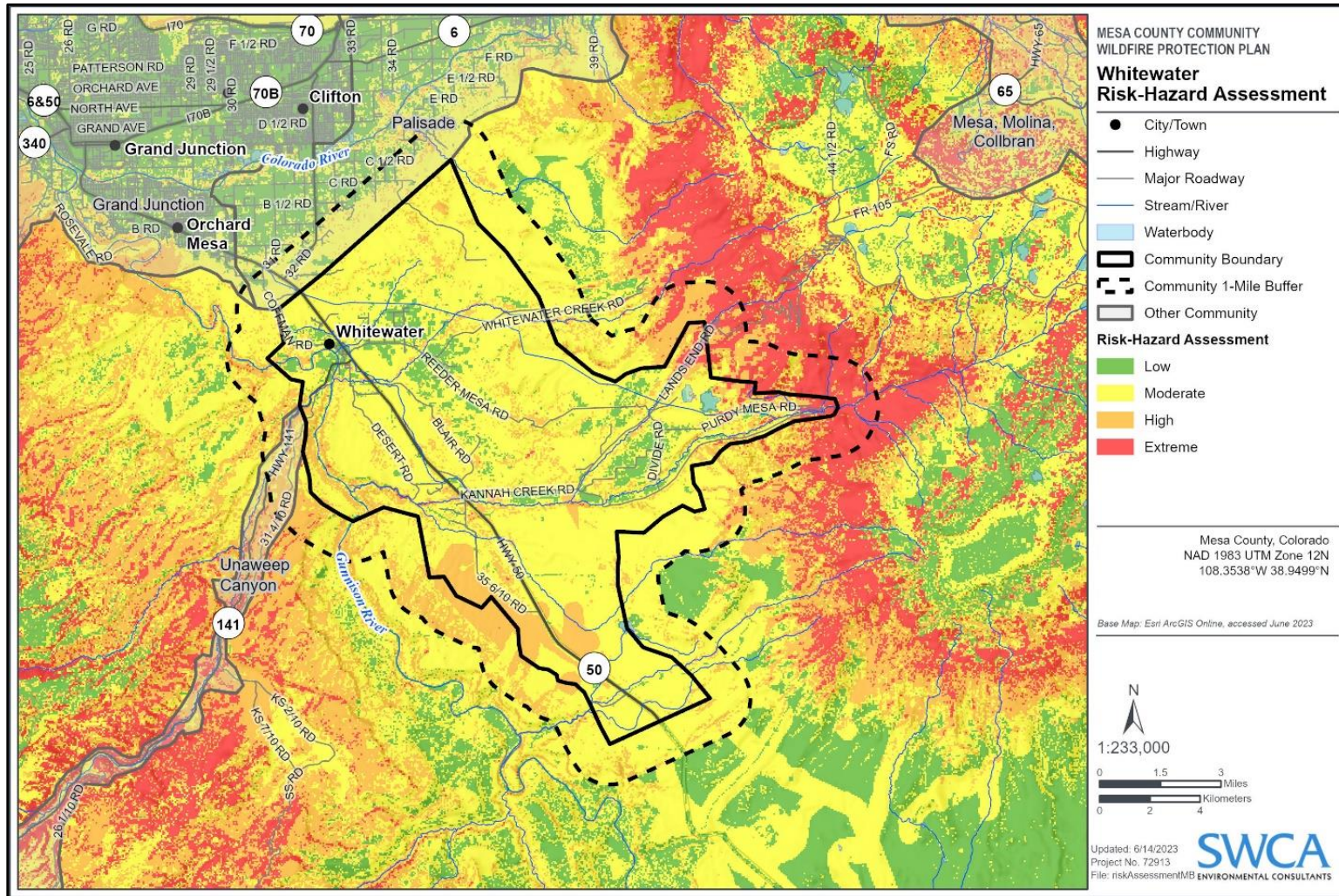


Figure C.19. Whitewater Risk-Hazard Assessment.

2012 MESA COUNTY CWPP SUMMARIZED COMMUNITY RISK ASSESSMENTS

Table C.1. Summarized Community Risk Assessments for 2012 Delineated Communities. All information is sourced from the 2012 Mesa County CWPP.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Plateau Valley Fire District						
Vega Vista Road	Plateau Valley	139 (Extreme)	High and Extreme	Close to lake for potential water supply and safe zone in event of evacuation, HOA for coordinating efforts.	Some summer homes with limited maintenance, thick continuous fuels, homes on a slope, minimal to no defensible space, combustible construction, poor accessibility along driveways, minimal turnaround space.	Poor access for emergency vehicles, no surface water or hydrants, minimal vegetation management by absent homeowners. Recommend developing a wildfire awareness committee, implement defensible space, participate in Firewise practices.
Horizon Estates	Plateau Valley	131 (Extreme)	Extreme	Some metal roofs, some defensible space development, good access to main road.	Steep topography, community at top of slope, timber fuels and aspen decline occurring, many second homes with limited maintenance, access roads steep and narrow, minimal defensible space, no water supply but some ponds in vicinity.	Remote area, restricted access, no water supply, lack of maintenance, continuous brush fuels, 25% of homes have completed defensible space. Recommend homeowners initiate Firewise practices and formation of a wildfire awareness committee.
Aspen Park	Plateau Valley	124 (Extreme)	High and Extreme	Newer construction homes, metal roofs, potential water supply from the lake,	Poor ingress/egress, dead end road, limited separation between structures, in timber fuels with declining aspen stands.	Poor or restricted access, many second homes with limited maintenance, no water supply. Homes moderate and high risk. Recommend creating a wildfire awareness committee, better address markers, participation in Firewise.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Plateau Valley Fire District (continued)						
Buzzard Creek Drainage	Plateau Valley	118 (Extreme)	Extreme	Potential water supply from lake and creek, good accessibility to main road.	Homes in drainage amongst heavy riparian fuels, poor accessibility due to locked gates and long steep driveways, little defensible space, minimal set back from slope.	Restricted ingress, many homes moderate risk but some high risk due to heavy fuels. Recommend defensible space and thinning of brush, develop shelter in place and safety zones.
Vega Drainage (Grand Mesa Scenic Byway west of Mesa)	Plateau Valley	116 (Extreme)	Extreme	Potential water supply from lake, good accessibility to main road.	Homes in drainage amongst heavy riparian fuels, poor accessibility due to locked gates and long steep driveways, little defensible space, minimal set back from slope.	No comments
Powderhorn Ski Area	Plateau Valley	111 (High)	High and Extreme	New construction homes, hydrant system, extensive road network, many homes have manicured lots.	Surrounding fuels are timber and aspen is declining, some homes have minimal defensible space, remote area at distance from fire station.	Thick brush and timber fuels, potential lightning ignitions, large areas of aspen decline, lack of defensible space. Recommend thinning of thick timber and brush; residents and businesses to implement defensible space.
Old Grande Mesa Road	Plateau Valley	109 (High)	High and Extreme	Minimal homes and structures, Kiwanis camp (Camp Hope) has evacuation plan and water supply	Non surfaced steep grade road, heavy fuels and continuous canopies, topography could influence fire behavior.	Establish shelter in place locations and evacuation plan.
Mesa	Plateau Valley	103 (High)	Moderate and High	Good access to main road, close to fire station.	Homes situated above drainage with thick fuels, history of fire occurrence, poor defensible space, poor separation of structures.	Rated as moderate. Thick fuels. Recommend thinning, residents to implement defensible space.
Coon Creek	Plateau Valley	96 (High)	High and Extreme	Some pastures and grasslands could act as safety zones, large lots with good separation.	Accessibility relatively poor, dead end road, defensible space is minimal, water availability is limited. Long driveways.	Poor access, limited water supply. Residents should expand defensible space and develop resident evacuation plan. Explore possibility for dry hydrants. Rated High-Moderate risk.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Plateau Valley Fire District (continued)						
Kimball Creek	Plateau Valley	95 (High)	High	Larger lots, more open farmland, BLM treat adjacent lands with prescribed fire.	Some long, gated driveways, high fire occurrence, limited water supply, adjoins heavy wildland fuels.	High fire risk, remote location, no water supply, dense vegetation in creek area, gated driveways. Recommend residents verify addresses, landowners implement Firewise practices, development of a shelter in place and safety zone plan.
Molina	Plateau Valley	84 (High)	Moderate and High	Some grazing creating more open areas, close to fire station, good access to main road.	Steeper wooded topography, poor access to driveways, limited water supply, defensible space is limited.	Lack of water supply, potential evacuation issues, dense fuels, rated high-moderate. Recommend creating fuel breaks along Highway 330, residents to implement defensible space, establish shelter in place.
Collbran/Plateau City	Plateau Valley	54 (Moderate)	Moderate and High	Defensible space good in town, hydrant system, close to fire station.	Thick riparian fuels along Plateau Creek and Highway 330, some combustible construction.	Dense vegetation along Highway 330 and thick riparian fuels along Plateau Creek. Remove or reduce vegetation and ladder fuels along Highway 330. Develop evacuation plan.
Glade Park Volunteer Fire Department						
Miracle Rock Road	Glade Park	114 (Extreme)	High and Extreme	Some BLM land interspersed with ongoing fuel treatment, flat to rolling topography,	History of high fire occurrence, thick continuous fuels, limited water supply, combustible construction.	No specific comments
Miller Ranch/Elk Reserve	Glade Park	111 (High)	High and Extreme	Good separation between structures, large lot sizes, HOA for organized evacuation	Steep grades, inaccessible roads, thick continuous fuels, some combustible buildings, minimal defensible space, empty lots not maintained.	No community level plan.
Little Park Road	Glade Park	93 (High)	High/Extreme	Slightly lighter fuels than neighboring communities, metal roofs and non-combustible siding common.	Limited water supply, poor defensible space, at distance from fire station.	Mixture of moderate and high risk. Implement defensible space, remove combustible materials, improve driveway access, remove combustible roof materials.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Glade Park Volunteer Fire Department (continued)						
Ladder Canyon	Glade Park	108 (High)	High and Extreme	Good separation between structures, metal roofs and non-combustible siding common.	Inaccessible driveways, locked gates, minimal defensible space, limited water supply.	No community level plan.
DS Road (from Central Glade Park west to Utah border)	Glade Park	63 (Moderate)	Range of Moderate-Extreme (highest risk on southern side of road in PJ fuels)	Light grassland and agricultural fuels, large lots with good separation between structures, good accessibility.	Limited water supply and western portion is at considerable distance from fire station.	Mixture of moderate and high risk. Implement defensible space, remove combustible materials, improve driveway access, remove combustible roof materials.
Central Glade Park (1 mile radius of Glade Park Store)	Glade Park	57 (Moderate)	Moderate/High (highest risk north of Glade Park store)	Lighter grassland fuels, grazing and some irrigation, minimal slope, good accessibility.	Some homes had minimal defensible space; fuels could experience fast moving wildfire due to open exposure.	No community level plan.
Lower Valley Fire District						
Fruita	Lower Valley	56 (Moderate)	Moderate	Light fuels, some agricultural lands providing buffer to wildland, hydrant system, good accessibility.	Some combustible construction, limited separation between structures.	No community level plan.
Fruita Wash	Lower Valley	101 (High)	High and Extreme	Hydrant system, close to fire station, good road network close by.	Heavy fuel volumes in drainage close to homes, inaccessibility for emergency vehicles, lack of defensible space, some thick riparian fuels.	No community level plan.
Mack	Lower Valley	65 (Moderate)	Moderate	Agricultural and industrial intermix buffers wildland fuels, hydrant system, easily accessible.	Vacant lots with minimal maintenance, potential fire spread from surrounding brush/grassland.	No community level plan.
Loma	Lower Valley	46 (Moderate)	Moderate with patches of high and extreme.	Large agricultural lots, good defensible space, easy accessibility.	Concerns related to fire occurrence, ditch burning.	No community level plan.
Pollock Canyon Estates	Lower Valley	75 (High)	High with patches of Extreme	Many homes built into mesa with low combustibility, HOA for coordination	Remote community, locked gate, poor accessibility within subdivision, medium fuels, no water supply.	No community level plan.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Grand Junction Rural Fire Protection District, Grand Junction Fire Department, Redlands Sub Fire Protection District						
River Corridor	Grand Junction	107 (High)	High and Extreme	Reliable water supply, close to fire departments, good accessibility.	High fire frequency, high-use area, high departure from historic hydrology and vegetation, some thick riparian fuels, little defensible space.	No community level plan.
Redlands	Grand Junction	105 (High)	Moderate-Extreme	Good accessibility, close to fire department.	Lack of defensible space, combustible construction, WUI community, limited water supply, combustible roofing.	No community level plan.
Grand Junction Rural Fire Protection District, Grand Junction Fire Department, Redlands Sub Fire Protection District continued						
Orchard Mesa	Grand Junction	77 (High)	Moderate-Extreme	Good accessibility, water from hydrants, less than 5 miles from station.	Poor defensible space, some thick riparian fuels.	No community level plan.
Preserve	Grand Junction	75 (High)	Moderate-Extreme	System of hydrants and close to fire department, newer construction homes	Poor accessibility to driveways, thick continuous fuels, history of fire occurrence	No community level plan.
Ridges/Redlands Mesa Golf Course	Grand Junction	51 (Moderate)	Moderate	Light fuels, irrigated maintained yards, hydrant systems.	WUI community, topography could generate more intense fire behavior,	No community level plan.
Clifton Fire Department						
Fruitvale Wash areas	Clifton	78 (High)	Moderate with patches of high and extreme.	Urban setting, hydrant water supply, close to FD.	Thick riparian fuels, minimum separation between structures, lack of defensible space between homes backing on to wash.	No community level plan.
Central Orchard Mesa Fire District (Mesa County Fire Authority)						
Central Orchard Mesa	Mesa County Fire Authority	93 (High)	Moderate with patches of high and extreme along river.	Good access for emergency vehicles, irrigated, close to FD.	History of fire occurrence, thick fuels in wash areas, combustible siding and roofing, lack of defensible space, agricultural values at risk.	No community level plan.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
East Orchard Mesa Fire District						
East Orchard Mesa	East Orchard Mesa	85 (High)	Moderate with patches of high and extreme along river.	Good access for emergency vehicles, irrigated, close to FD.	Agricultural burning, lack of defensible space, upslope of brush fuels, agricultural values at risk.	No community level plan.
Palisade Fire District						
Palisade	Palisade	79 (High)	Moderate with patches of high and extreme.	Agricultural irrigated lands, good access, hydrant system being replaced, close to FD.	Thick riparian fuels along river and wash areas, minimal defensible space, combustible construction.	No community level plan.
Palisade Fire District continued						
Horse Mountain	Unincorporated	120 (Extreme)	High and Extreme	Some homes have good defensible space, good separation between structures, some homes have new construction with low combustibility.	Poor accessibility, intermixed with wildland fuels and heavy infestation of cheat grass, water unavailable, topographic influences, many homes fall outside Palisade Fire District, history of fires.	No community level plan.
Rapid Creek	Palisade	90 (High)	High and Extreme	Recently annexed into Palisade Fire Protection District, some homes have new construction with low combustibility, hydrant system.	Poor access, intermixed with wildland fuels, topographic influences, minimal defensible space, many wooden decks.	No community level plan.
Gateway UnawEEP Fire Protection District						
UnawEEP Canyon	Gateway	96 (High)	High and Extreme	New home construction has low combustibility, some grazed pasture land breaks up fuels and may provide safety zones, good access from main road.	Water unavailable, distance from FD, homes adjacent to thick wildland and riparian fuels, little defensible space.	No community level plan.
Gateway	Gateway	69 (Moderate)	Moderate and High	Close to FD, hydrant water supply, good access, some new construction.	Combustible building materials, minimum separation of structures, lack of defensible space.	No community level plan.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Lands End Fire Protection District						
Whitewater	Mesa County Fire Authority	64 (Moderate)	Moderate with patches of extreme along railroad	Urban setting, light fuels, good access, close to FD.	Hydrant system suffering low pressure, combustible construction, minimal separation between structures.	No community level plan.
Kannah Creek	Mesa County Fire Authority	82 (High)	High with patches of Extreme	Large open pastures, good separation between structures, homes close to main road.	Water unavailable, combustible building materials, intermixed in thick wildland fuels, primary watershed for GJ.	No community level plan.
Lands End Fire Protection District (Mesa County Fire Authority)						
Purdy Mesa	Mesa County Fire Authority	84 (High)	High and Extreme	Large lots, good separation between structures, homes close to main road.	Exposed area to high winds, thick greasewood and cheat grass, water unavailable, combustible building materials.	No community level plan.
Lower Reeder Mesa	Mesa County Fire Authority	61 (Moderate)	Moderate	Minimal fuels, grazed, close to FD, good separation between structures.	Combustible construction, water unavailable.	No community level plan.
Upper Reeder Mesa	Mesa County Fire Authority	96 (High)	High and Extreme	Good accessibility, good separation between structures.	Intermixed with thick continuous wildland fuels, prone to high winds, water unavailable, distance from FD.	No community level plan.
De Beque Fire District						
De Beque	De Beque	67 (Moderate)		Good accessibility, hydrant systems, light fuels in town	Older combustible construction, minimal defensible space, heavier fuels in drainage.	No community level plan.
South of De Beque	De Beque	47 (Moderate)		Intermixed agricultural and pasture land, irrigated fuels good separation between structures, good accessibility,	Some combustible construction, adjacent to wildland fuels.	No community level plan.

MESA COUNTY 2012 DETAILED COMMUNITY RISK ASSESSMENTS

De Beque

The town of De Beque was rated as moderate using this risk assessment protocol. The town is set among light sparse grassland fuels with some shrubby riparian fuels in drainages. Most homes are readily accessible for emergency vehicles from the main road and are situated close to the fire station, located in the center of town. There is water available from hydrants around the town. Many of the homes are older with combustible construction with wooden siding and decks and many have minimal defensible space; however, fuels are light, and roads break up the fuel continuity. There is some oil and gas development west of the town, but most pads are easily accessible for emergency vehicles and have good defensible space.

There are a number of housing development areas in the district including 35-acre parcels for sale in the 620-acre Mustang Ranch area, which is 12 miles west of De Beque and is surrounded by BLM lands. This subdivision was subdivided in 2009 and there are many travel trailers located on it. This area has very continuous pinyon-juniper and sagebrush fuels. There is very high wildfire occurrence here with several large fires over 100 acres in the last 20 years within a few miles. This subdivision is rated as extreme due to a lack of access, no water sources, unmarked lots, and very poor egress. There are no full-time residences, so lot maintenance is limited.

Housing development should be periodically reviewed as they may increase the risk rating to the district in future years.

NFPA Rating (2012): 67/112 (Moderate)



Figure C.20. Town of De Beque.

Fruita

The city of Fruita was rated as moderate using this risk assessment protocol. The interface areas of the town are the areas of most concern. Accessibility is generally good throughout with good ingress/egress and turnaround space. Fuels are light in the interface areas, with some agriculture and grassland areas intermixed with homes. Most interface homes have between 30 and 70 feet of defensible space and light fuels in the yard. Many homes had combustible construction with wooden siding and decks. Water is readily available from hydrants and most homes in the Fruita area are situated within 5 miles of the fire department.

NFPA Rating: 56/112 (Moderate)



Figure C.21. Fruita.

Fruita Wash

Main concerns for the Fruita Fire Department are the wash areas that run through the town on City of Fruita property. Many homes directly adjoin these areas and HOAs have been working with the City of Fruita to remove some of the thick brush and riparian fuels, but large areas still remain untreated and pose a fire hazard. The wash areas were rated as high using this risk assessment protocol because of the fuel volumes, inaccessibility for emergency vehicles, lack of defensible space between them and the nearest structures, and combustible materials that would act as bridge fuels between the wash and residential structures, including wooden fencing and decks. There is some water availability from nearby hydrants.

NFPA Rating: 101/112 (High)



Figure C.22. Fruita Wash.



Figure C.23. Fruita Wash.

Gateway

The town of Gateway was rated as moderate–high using this risk assessment protocol. The community is made up of homes on smaller lots with the greatest risk being associated with home construction and combustible building materials. There is minimal separation between structures posing a risk for fire spread in the event of a wildfire entering the town. Many homes have limited defensible space, and some homes have poor yard maintenance. Some of the new commercial buildings in the town are made from stucco and xeriscape, and therefore present low risk for wildfire. The community is surrounded by mesas and patchy pinyon-juniper fuels on the outskirts and grassland and riparian fuels along the river and wash areas. There is water supply via a hydrant system in town and the community is served by the Gateway Fire Department, also located in town.

NFPA Rating: 69/112 (Moderate–High)



Figure C.24. The community of Gateway showing light grass fuels in the foreground and riparian cottonwood fuels close to homes.

Ladder Canyon

The Ladder Canyon area is a part of the Glade Park community and includes the 21.5 Road and Little Park Ranches, Rough Canyon Road, and Rim View Drive, and is rated as high risk using this assessment protocol. The community is made up of larger homes with private driveways, situated in thick pinyon-juniper woodland. The access roads were non-surfaced and rough in places and many homes had locked gates creating an accessibility issue for firefighters. There was little to no defensible space around homes and limited irrigation of surrounding vegetation. Most homes were constructed with metal or asphalt shingle roofing and non-combustible siding, though some had combustible decks. Water availability is limited to private wells or would need to be hauled to the site. There are no hydrants in the area. There is no homeowner's association (HOA) for this community.

NFPA Rating: 108/112 (High)



Figure C.25. Ladder Canyon.

Little Park Road

This community made up of homes located along Little Park Road is rated as high risk using this assessment protocol; however, it is a little more open than the Ladder Canyon community and is dominated more by grassland than pinyon-juniper fuels. There was little to no defensible space around homes and limited irrigation of surrounding vegetation. Most homes were constructed with metal or asphalt, shingle roofing and non-combustible siding, though some had combustible decks. Water availability is limited to private wells or would need to be hauled to the site. The community is less than 5 miles from the nearest fire station and had good accessibility for emergency response. The road is surfaced, and homes are more accessible from the main road.

NFPA Rating: 93/112 (High)



Figure C.26. Little Park Road area.

Central Glade Park

The Central Glade Park community is made up of homes in the open grassland and sagebrush areas of Glade Park close to the Community Center and Glade Park Store (BS Road and B ¼ Roads). The community is rated as moderate risk using this assessment protocol. The dominant fuel types are light grassland and agricultural fuels that are more open but can be prone to fast-moving wildfire particularly when cured or during drought. There is more grazing in the area, which tends to reduce fuel loading. Most homes were constructed with metal or asphalt shingle roofing and non-combustible siding, though some had combustible decks. Most homes had 70 100 feet of defensible space and were built on minimal slope. There are some hydrants in the area, improving water availability. The homes are located off of a main surfaced road with good accessibility to the nearest fire station.

NFPA Rating: 57/112 (Moderate)



Figure C.27. Central Glade Park.

Elk Reserve and Miller Ranch

Elk Reserve is the newer subdivision to Miller Ranch. The assessment area includes the south end of 16.5 Road, Mabie Flats Road, and H 3/10 Road. The area is rated as high using this risk assessment protocol. The Elk Reserve area is particularly high risk due to windy, narrow, and rough roads, with some steep grades and poor ingress and egress. Accessibility for fire trucks is extremely limited. There are currently many vacant lots indicating that there is potential for expansion of the area, though most lot sizes are more than 35 acres in size, leaving good separation between adjacent structures. The topography is steep with small canyons. The fuels are made up of thick pinyon-juniper woodland with continuous canopies. Most new homes in the Elk Reserve community score well in terms of combustibility, being built with non-combustible siding or stucco and metal or asphalt shingle roofing. The Miller Ranch area is made up of older homes with some combustible building materials. Miller Ranch homes have better accessibility to the main road and better ingress and egress. Defensible space is minimal in both areas and most homes have limited setback from the slope. The Miller Ranch community has an HOA.

NFPA Rating: 111/112 (High)



Figure C.28. Miller Ranch/Elk Reserve area.

DS Road

The DS Road area includes all pinyon-juniper portions of Glade Park not rated as separate subdivisions. These areas were rated as moderate risk using this fire risk assessment protocol. The risk assessment was averaged along the DS Road from Glade Park to the Utah border. Fuels in the area range from light grassland and agricultural fuels to thicker pinyon-juniper. Lots tend to be larger with greater separation between structures. Accessibility is good with access from the main road. Some driveways, however, may be long and non-surfaced impacting ingress and egress for firefighters. Many homes have greater than 70 feet but less than 100 feet of defensible space. Water is limited in some areas and the most westerly portion of the area is greater than 5 miles from the nearest fire station.

NFPA Rating: 63/112 (Moderate)



Figure C.29. DS Road facing west toward the Utah border.

Miracle Rock Area

The Miracle Rock area includes 9.8 Road, 8.4 Road, 7.5 Road, and 5.7 Road and is rated as extreme using this risk assessment protocol. The community is characterized by large lots, big homes, and long driveways. Homes are situated in medium pinyon-juniper woodland fuels and more light open sagebrush. The area is dotted with private and BLM-managed lands in which the BLM has carried out some fuel treatments; the Colorado Division of Parks and Wildlife has also carried out sage-grouse (*Centrocercus urophasianus*) habitat improvements in the area that may mitigate fire spread. There is less than 30 feet of defensible space around most structures and few homes have irrigated yards. Most homes have combustible siding and decks and aboveground utilities, but there is good separation between structures due to lot size. Topography in the area is flat to rolling. There is a history of high fire occurrences in the area with more fire starts than other areas in the district. There is no available water in the form of hydrants so water would need to be transported into the area or drawn from stock ponds if available.

NFPA Rating: 114/112 (Extreme)



Figure C.30. Miracle Rock Road area.

Orchard Mesa

These are homes that are situated along the riverbank in the Orchard Mesa portion of the city. This area is a part of the Grand Junction community and is rated as high risk using this risk assessment protocol. The risk is associated mainly with a lack of defensible space around homes and combustible construction, including wooden siding and decks. The homes are situated with little setback from the slope and there are some heavy fuels below the homes creating the potential for fire to move from the river drainage upslope to the homes. Fuels are generally medium, made up of riparian cottonwood and tamarisk galleries with thick brush understories. Accessibility is good for most homes with surfaced roads, and sufficient turnaround space for emergency vehicles. Water is available from hydrants throughout the community and most homes are within 5 miles of the nearest fire station.

NFPA Rating: 77/112 (High)



Figure C.31. Orchard Mesa.

River Corridor

The remaining areas of the river corridor through Grand Junction were assessed collectively. The river corridor was rated as high risk using this risk assessment protocol. The river corridor has river bottom fires every few years and is an area of concern for the fire department. Some areas have poor ingress/egress due to narrow roads or inaccessible driveways. Fuels were primarily medium, made up of riparian cottonwood galleries with thick understory of tamarisk. The Tamarisk Coalition and the City of Grand Junction have been conducting some hazardous fuels treatments to remove invasive tamarisk from the area, but some areas still remain in need of treatment. The density of the tamarisk makes it a potential fire hazard and a potential ladder fuel that would ignite native cottonwood. Many homes have little to no defensible space and combustible construction, including wooden siding and decks. During the summer the river corridor is heavily used by rafters and other recreationists visiting open space areas such as Watson Island. High visitor numbers provide potential ignition sources, particularly from campfires and cigarettes. The river is also frequented by transients who light campfires year-round, posing an additional fire hazard. Water is available from hydrants in some areas; where hydrants are absent, water could be drafted from the river.

NFPA Rating: 107/112 (High)



Figure C.32. Watson Island Open Space.



Figure C.33. River corridor.

Redlands

The Redlands area was rated as high risk using this risk assessment protocol. Much of this risk is associated with a lack of defensible space around structures, combustible building construction medium fuels and limited water availability. The community is characterized by larger lots with larger homes and generally good separation between structures. The community is situated in the WUI with wildland fuels continuous with agricultural or residential fuels. Irrigated areas have less associated hazard; however, some areas have thick clumpy fuels with continuous canopies. Accessibility is typically good with moderately wide paved roads with sufficient turn-around space for emergency vehicles. Defensible space is a primary concern since many homes have less than 30 feet of defensible space around structures and many older homes have combustible construction, especially decks. Much of the area has only limited hydrants and many hydrants experience low pressure, diminishing their utility in the event of a wildfire; water would need to be transported to the area. There is significant public concern amongst Redlands residents regarding limited water supply and proximity of homes to wildland fuels and public open space, including homes adjacent to the Walter Walker State Wildlife Area (SWA) and the Leatha Jean Stassen SWA. The Redlands Village subdivision has united residents to pursue development of a more reliable water supply from the Ute Water Authority for firefighting, including developing a petition and holding neighborhood fire prevention meetings.

NFPA Rating: 105/112 (Extreme)

GIS Assessment Rating: Moderate–extreme



Figure C.34. Redlands home along edge of the mesa.

The Preserve

The community at the Preserve was rated as high risk using this risk assessment protocol. The Preserve is a small community of larger homes in a private subdivision. The homes tend to be of newer construction with less combustible building materials and on average 30 to 70 feet of defensible space. Most homes have irrigated yards that provide defensible space however they are surrounded by thick riparian fuels of cottonwood, tamarisk, and Russian olive with continuous canopies that pose a considerable fire hazard. Accessibility is also a concern because some driveways are narrow and surrounded by heavy fuels. Some homes also have insufficient turn-around space for emergency vehicles. There is a history of fire occurrence in the area and fire spread between structures could be rapid due to limited separation between structures. The community has a system of hydrants throughout and good water availability, they are also located within 5 miles of the nearest fire station.

NFPA Rating: 75/112 (High)



Figure C.35. The Preserve.



Figure C.36. Fuels at the Preserve.

Fruitvale Wash area

The Fruitvale community is made up of mostly urban developed land with few wildland fire hazards and is therefore low risk. However, some of the wash areas that cut through residential streets are a concern to fire departments and are rated here separately as high risk. An example of this is on 31 Road, between E ½ and Peterson. These areas have good access for emergency vehicles but are dominated by thick heavy riparian fuels that are not maintained and are therefore choking the wash areas. In conjunction the riparian fuels are immediately adjacent to homes with less than 70 feet of defensible space. There is minimal separation between structures which could contribute to rapid fire spread. Most homes are constructed with combustible siding and decks and back yards are bordered by wooden fencing that is in direct contact with the wash area. The community is served by hydrants and is located within a mile of the nearest fire station.

NFPA Rating: 78/112 (High)



Figure C.37. Fruitvale area wash showing thick fuels backed up to homes.

The Ridges/Redlands Mesa Golf Course Community

The Ridges/Redlands Mesa Golf Course Community was rated as moderate risk using this risk assessment protocol. Most homes in the Ridges area are located in light fuels with maintained yards. The homes in the Redlands Mesa Golf Course area are surrounded by irrigated and manicured yards with 30 to 70 feet of defensible space and light fuels that pose minimal hazard. The area is easily accessible with adequate access for emergency vehicles as well as plentiful water supply. Some homes do have combustible siding and decks but roof construction rates well in terms of combustibility. The topography in the area is a concern since steep terrain increases fire behavior and fire spread rates; in addition, wind-driven versus fuel-driven fire could be a concern because the community is located in the WUI where fire could move from heavier fuels towards the community. The urban and manicured

nature of the area coupled with good accessibility and plentiful water supply would mitigate most hazards in this community.

NFPA Rating: 51/112 (Moderate)



Figure C.38. Ridges/Redlands Mesa Golf Course community.

Loma

The town of Loma is rated as moderate using this risk assessment protocol. Homes tend to be on larger lots with more irrigated agriculture in the interface areas. A main concern of the fire department is agricultural and ditch burning and the potential for escape. Wildland fuels are sparse and light; however, the area has experienced wildland fires. Most homes have 70 to 100 feet of defensible space and irrigated lots. Agricultural fields act as a buffer to wildland fuels during the majority of the year; however, during periods of curing, crops could be a fire hazard. Most homes are easily accessible from the main road and are accessible for emergency vehicles. Water is available from hydrants in the town.

NFPA Rating: 46/112 (Moderate)



Figure C.39. Loma.

Mack

The community of Mack is rated as moderate using this risk assessment protocol. The interface community is made up of agricultural and industrial land intermixed with homes. Wildland fuels are light, made up primarily of a grassland shrub community. There are a number of vacant lots where fuel loading has the potential to increase with a lack of maintenance, and some thick brush fuels have developed posing a hazard to neighboring properties. Many homes have a lack of defensible space and have combustible construction, including wooden siding and decks. Water is available from hydrants and the community is easily accessible for emergency vehicles.

NFPA Rating: 65/112 (Moderate)



Figure C.40. Mack derelict lot.

In June each year the Fruita/Loma/Mack areas are host to the Country Jam, which is a four-day country music event in the area that attracts thousands of visitors to the area. The fire department works with the organizers to ensure that fire prevention procedures are followed prior to and during the event, but because of the increased population during the event there is always increased hazard and fire risk associated that should be planned for.

Pollock Canyon Estates

Pollock Canyon Estates are located in the Lower Valley Fire District. The community is a gated subdivision and many of the homes are built into the side of the mesa. Those homes that are standalone tend to be constructed in adobe style with non-combustible materials. The community was rated as high using this risk assessment protocol. Most of the risk is associated with poor accessibility due to the remoteness of the community and road conditions throughout the subdivision, which are narrow and unsurfaced. There is no available water in the form of hydrants, water would need to be transported to the community in the event of a fire, and the nearest fire station is over 5 miles away, so response times could be slow. Fuels in the area are medium, predominantly pinyon-juniper and shrub fuels but with continuous canopies. Standalone homes often had only minimal defensible space. Homes built in the rock face would generally be non-combustible unless the fire burned up to the structure or entered as embers through vents or windows.

NFPA Rating: 76/112 (High)



Figure C.41. Pollock Canyon Estates.

Vega Vista Road

The Vega Vista subdivision is located on a bench on the north side of Vega Lake. The community is surrounded by Vega State Park. The community was rated as extreme using this risk assessment protocol. This subdivision has approximately 70 structures, with many full-time residents but some summer homes with reduced year-round maintenance. An HOA oversees maintenance of roads. Accessibility is a major concern in the area, particularly related to roads within the subdivision that are narrow, steep, and non-surfaced. There are numerous small drainages that run upslope, creating a chimney effect in the event of a wildland fire. Access to homes and suitable turnaround areas for fire trucks is limited. Fuels are moderate to heavy with some thick pinyon-juniper and oak brush with continuous canopies. There is very minimal defensible space around homes and many homes have limited setback from the slope, which in some places is greater than 41% in gradient. Many homes have combustible construction with wooden siding and decks that overhang the slope and have vegetation growing above and below them. Direct water availability is limited but water could be drawn from the lake if necessary. The closest fire station is over 5 miles from the area. In the event of a fire, the district has an evacuation plan for residents to evacuate down to the lake shore. The area is known to have issues with landslides along the main road which could hinder evacuation away from the community. Amongst other recommendations, the Plateau Valley CWPP makes recommendations for a Vega Vista Wildfire Awareness Committee to coordinate fuel reduction efforts and defensible space activities with community members.

NFPA Rating: 139/112 (Extreme)



Figure C.42. Vega Vista subdivision.

Vega Drainage

The Vega Drainage area is located west of Vega Vista and Vega Lake; many of the homes are bordered by Vega State Park. The Plateau Valley CWPP makes numerous recommendations for wildfire mitigation for Vega State Park. The homes in this area were rated as extreme using this risk assessment protocol. Homes are dotted along the drainage in some thick fuels, including cottonwood and aspen. Accessibility is a concern due to limited ingress/egress along driveways, due to locked gates or narrow access; access to the main highway is good. There is very little defensible space around homes and most homes are located on or with very little setback to the steep slope. Some homes have combustible construction, including siding and decks. Direct water availability is limited but water could be drawn from the lake if necessary. The closest fire station is over 5 miles from the area.

NFPA Rating: 116/112 (Extreme)



Figure C.43. Vega State Park Visitor Center (photo: Kyle Compton).

Aspen Park

The Aspen Park is a small community situated on the south side of Vega Lake. The community is rated as extreme using this risk assessment protocol. Homes are built in higher elevation timber, primarily in a dense aspen forest that is undergoing decline. Understory fuels are thick and act as potential ladder fuels. Access roads are non-surfaced with moderate slopes, impacting ingress/egress. There is only one way in and out of the subdivision via Park View Lane, therefore leading to a poor accessibility score. Most homes appear to be second homes with minimal vegetation management. Separation between structures is limited and there is very little defensible space around homes, though home construction tends to be newer with fewer combustible materials and mostly metal roof construction. Direct water availability is limited but water could be drawn from the lake if necessary. The closest fire station is over 5 miles from the area.

NFPA Rating: 124/112 (Extreme)



Figure C.44. Aspen Park.

Buzzard Creek Drainage

The Buzzard Creek Drainage is located northeast of Collbran. The community is rated as extreme using this risk assessment protocol. Buzzard Creek has similar characteristics to the Vega Drainage, with some homes situated in the bottom of the drainage with poor ingress and egress due to narrow and sometimes gated driveways. The upper portion of the drainage supports mostly agriculture and is more open. Some homes are situated in thick fuels, including cottonwood and aspen with a thick brush understory and ladder fuels. There is very little defensible space around homes and most homes are located on or with very little setback to the steep slope. Some homes have combustible construction, including siding and decks. Direct water availability is limited but water could be drawn from Vega Lake and transported if necessary. The closest fire station is Collbran, and some homes fall over 5 miles from this station. The Plateau Valley CWPP makes numerous recommendations for the reduction of brush fuels in this community.

NFPA Rating: 118/112 (Extreme)

Kimball Creek

Kimball Creek is located north of the town of Collbran and is bordered by BLM lands to the east and west. The community was rated as high using this risk assessment protocol. The area is characterized as having larger lots with more open ranch and farm properties. There is some thicker pinyon-juniper and brush type fuels on the mesa interspersed among the grassland. Kimball Creek flows west of Kimball Creek Road and has some areas of thick riparian vegetation that pose a hazard to homes close in the drainage. Some homes have longer gated driveways with limited turnaround area for fire trucks and there is less than 70 feet of defensible space around most homes. Some homes had no address markers. The area experiences higher occurrences of wildfire than other areas and adjoins BLM land and heavier wildland fuels. The BLM performs annual prescribed burns each year to reduce hazardous fuels. Many

homes have combustible construction, with wooden siding and decks. Water availability is limited with no hydrants in the area. The majority of the community is located greater than 5 miles from the nearest fire station.

NFPA Rating: 95/112 (High)



Figure C.45. Kimball Creek (Photo: Unitedcountry.com)



Figure C.46. Collbran area.

Collbran/Plateau City

The Collbran/Plateau City area **Error! Reference source not found.** is rated as moderate using this risk assessment protocol. Collbran is the largest community in the valley with approximately 400 residents. This area is served by the Collbran Fire Department. The southern side of Colorado State Highway 330 that runs through Collbran is the area of greatest risk due to thick brush fuels. This area has been highlighted in the Plateau Valley CWPP as an area requiring hazardous fuels reduction. Homes located in the town of Collbran are generally rated low risk due to greater defensible space and road networks that break up wildland fuels. Areas of thick fuel along Plateau Creek pose fire hazard and risk to the north of the town. The communities have water availability from hydrants and the potential to draw water from Plateau Creek; they have good access to firefighting resources from Collbran. Most homes have approximately 30 space but some homes have combustible construction with wooden siding and decks. The Plateau Valley CWPP includes recommendations for fuels treatment along Colorado State Highway 330 to break up fuel continuity through the town of Collbran.

NFPA Rating: 54/112 (Moderate)

Molina

Molina is an unincorporated community west of Collbran and Plateau City. The community is rated as high using this risk assessment protocol. This assessment concentrated on homes on the south side of the valley, along Colorado State Highway 330. Topography of this area is steeper and wooded. Access is good along the main road but some side roads and driveways are narrow and unsurfaced creating ingress/egress problems for emergency vehicles in the event of fire and/or evacuation. Fuels are moderate, made up of pinyon-juniper and grasslands, with some grazing, which lowers the fuel loading. Defensible space is limited around most homes, and some homes are located close to the slope and thick wildland brush fuels. Many homes are constructed with combustible materials, including wooden siding and decks. Water availability is noted as a concern in the Plateau Valley CWPP and recommendations are included to consider dry hydrant installation.

NFPA Rating: 84/112 (High)

Coon Creek

Coon Creek is a small subdivision located on the east side of Colorado State Highway 65 and bordered by BLM land to the east. The community is rated as high using this risk assessment protocol. Homes are situated on large parcels (~40 acres), with good separation between structures. The fuels in the subdivision are moderate to high, made up of thick oak brush and scattered pinyon-juniper. Some pastures and grasslands break up the continuity and could act as safety zones. Accessibility is relatively poor as roads are non-surfaced and poorly maintained in areas and there is only one way in and out. Homes are situated down long driveways hindering access by emergency vehicles. Defensible space is minimal around some homes. Water availability is limited, with no hydrants or municipal sources; however, fishing ponds may provide some limited supply in the event of fire. The Plateau Valley CWPP makes recommendations for improving defensible space and developing an evacuation plan.

NFPA Rating: 96/112 (High)



Figure C.47. Coon Creek.

Mesa

Mesa is an unincorporated community at the crossroads of Colorado State Highway 65 and KE Roads. The community is rated as high using this risk assessment protocol. To the east of the community is irrigated pastureland, and to the west is Mesa Creek drainage and rolling hills and pasture. The drainage has thick fuel buildup of riparian fuels and cottonwood gallery. Many of the homes are situated above the drainage. The community experienced a wildfire in 2009 that spread from the creek upslope consuming two homes on the east side of the drainage. Accessibility is good in town, but homes that are situated down long steep driveways close to the creek have limited ingress/egress and poor access for emergency vehicles. Many homes have poor defensible space and combustible construction, including wooden siding and decks. New hydrants have been installed in the community. The Plateau Valley CWPP makes recommendations for homeowners to implement defensible space around homes, particularly those close to Mesa Creek.

NFPA Rating: 103/112 (High)



Figure C.48. Mesa.



Figure C.49. Home destroyed in 2009 Mesa Creek Fire.

Old Grand Mesa Road

This road intersects Colorado State Highway 65 about 5.8 miles to the south of the town of Mesa and winds upslope to connect with Highway 65 two miles east of Powderhorn Ski Resort. The area is rated as high using this risk assessment protocol. There are a small number of structures along the road as well as the Kiwanis Summer Camp at the top of the slope on the southern end. The road is non-surfaced, narrow, steep, and winding and, due to limited turnaround space, would be difficult for emergency vehicles to access. Evacuation is also a concern and a number of plans should be developed to account for different fire locations. Fuels are medium to heavy, made up primarily of oak brush at lower elevations and mixed conifer and aspen at higher elevations. The area is steep and dissected with numerous small drainages that can channel fire spread. Most structures have been maintained for reduced combustibility with metal roofs and the Kiwanis Camp have carried out defensible space around most buildings. The camp has a natural spring as a water supply, as well as a swimming pool to draw water from in the event of a fire. The Plateau Valley CWPP makes recommendations for development of a shelter-in-place plan and evacuation planning for residents.

NFPA Rating: 109/112 (High)



Figure C.50. Grand Mesa (Photo: Jim Loomis)

Horizon Estates

This estate is located to the east of Powderhorn Ski Resort in a high elevation mixed conifer forest setting. The community is rated as extreme using this risk assessment protocol. The community is situated at the top of a steep slope covered in continuous oak brush and pinyon-juniper woodland. Most homes are located within aspen stands that are currently undergoing decline. There is very little separation between homes and minimal defensible space around the majority of the homes. Some homeowners have carried out defensible space around their properties that may slow the spread of fire. Many homes are second homes with limited year-round maintenance. Many homes have poor

construction with combustible decks and siding. Some homes have metal roofs. Access roads are extremely narrow with very little turn-around space for emergency vehicles. There is no water availability within the community but there are a few small ponds that water could be drawn from. The Plateau Valley CWPP makes recommendations for homeowners to implement Firewise practices in the community.

NFPA Rating: 131/112 (Extreme)



Figure C.51. Horizon Estates.

Powderhorn Ski Area

The Powderhorn Ski Resort is located in the southern portion of the PVFPD at an elevational range of 8,000 to 9,000 feet. The ski area is located outside the PVFPD boundary and is known as the Grand Mesa Metropolitan District #1 (GMMD). An Intergovernmental Agreement (IGA) has been established between the PVFPD and the GMMD. This IGA outlines emergency response services for the GMMD area, including wildfire response support. The resort and ski runs are located on USFS lands on the north face of the Grand Mesa. The Wildwood and Powder Ridge Estates are located adjacent to the ski area and the ski resort comprises a number of condos. The area is rated as high using this risk assessment protocol. The Powder Ridge and Wildwood Estates are made up of new construction with use of primarily non-combustible materials. Many homes, however, have minimal defensible space, but there is an extensive road network breaking up fuels and improving accessibility within the area. The community is remote and scores poorly on accessibility due to evacuation and emergency response delays. Surrounding fuels comprise mixed conifer and aspen, which are undergoing sudden aspen decline, creating increased fuel loading. Hydrants are available throughout the area but surface water supplies are limited. A surface pool for snow-making activities could be drawn from if necessary. The condo building does have internal sprinklers, but other buildings in the ski resort do not. The Plateau Valley CWPP recommends defensible space activities around the resort structures.

NFPA Rating: 111/112 (High)



Figure C.52. Powderhorn Ski Area.

Horse Mountain

The Horse Mountain community was rated separately from the Palisade community because it is an area of concern to the Palisade Fire Department due to past wildfire. The community is rated as extreme risk. Accessibility is poor throughout the community due to unsurfaced roads and driveways and poor ingress/egress. Many street signs are present but not reflective. Fuels are medium brush fuels but there is heavy infestation of cheatgrass that increases fire risk. Homes are immediately adjacent to wildland fuels in an area with a history of wildfire. Topography is rolling and some homes are situated upslope of fuels. Most homes have combustible siding and decks though some homes have metal roofs. Water is unavailable in the area and would need to be hauled in, many homes fall outside the Palisade fire district, severely slowing response times to a fire. Some homes have implemented good defensible space and treated fuels in the vicinity of the home but most residents would benefit from implementing increased defensible space around structures.

NFPA Rating: 120/112 (Extreme)



Figure C.53. Cheatgrass in the Horse Mountain area.

Rapid Creek Drainage

The Rapid Creek area was rated as high risk using this risk assessment protocol. Homes are situated in thick pinyon-juniper and have only minimal defensible space. The area is difficult to access due to steep and narrow, unsurfaced roads and some limited turnaround space for emergency vehicles. The steeper topography surrounding the creek can channel winds and is conducive to more extreme fire behavior. Homes in the area have recently been annexed into the Palisade Fire District and are within a mile of a station. Homes also have some water available from a hydrant system but water pressure is low. Home construction is good with more adobe construction, there are however wooden decks on most homes and pinyon-juniper close to structures.

NFPA Rating: 90/112 (High)



Figure C.54. Rapid Creek.

Palisade

The community of Palisade was rated as high risk using this risk assessment protocol. The greatest hazards are at the edge of the community in the WUI areas, particularly along the river corridor and around wash areas. A large portion of the community is agricultural and hazards will be seasonable due to variable irrigation use throughout the year. Accessibility is good throughout much of the town but fuel concentrations in riparian areas are high and some pastureland is adjacent to flashy wildland fuel. There is minimal defensible space around most homes and homes are constructed from combustible siding, roofs, and decks. There is a hydrant water system throughout town; however, the hydrants have low water pressure and are currently being considered for replacement. Some of the larger wineries have sprinklers in their tasting rooms and warehouses but many do not. The area is subject to increased vehicle traffic and influx of visitors during certain times of the year (peach festival, wine tours, etc.), which could contribute to fire risk and concerns for evacuation in the event of a wildfire. The district currently has a lot of old apparatuses in need of update. Additionally, the District Chief has been pursuing funding for a new fire station for the district for many years. The 1950s-era, 6,100-square-foot station next to Town Hall at 175 E. Third Street lacks sufficient space for equipment and crews.

NFPA Rating: 79/112 (High)



Figure C.55. Palisade river corridor showing homes upslope of thick fuels.

The Pinyon Mesa area is situated above and south of Glade Park. Vegetation on Pinyon Mesa is a mix of oak brush, pinyon-juniper woodlands, ponderosa pine, and aspen. There are scattered summer homes, hunting cabins, and ranch buildings on the private land portions on Pinyon Mesa that are at moderate risk to wildfire, due to lack of defensible space clearing and poor access.

Unaweep Canyon

The community dotted along Unaweep Canyon was rated as high using this risk assessment protocol. Homes are situated on large lots among thick pinyon-juniper punctuated by some grazed pastureland. Some homes are also located close the river, adjacent to thick riparian fuels made up of Gambel oak, tamarisk, and cottonwood. Many newly constructed homes have non-combustible siding and roofs but older homes tend to have combustible siding and decks. There was very little defensible space around homes, though some properties have large pastures that could act as safety zones or slow the spread of wildfire to structures. There is no water available along the canyon so all water would need to be hauled from Gateway or drafted from the river. Many homes lie over 5 miles from the nearest fire department. The area is served by the Gateway Fire Department, which is a VFD.

NFPA Rating: 96/112 (High)



Figure C.56. Home in Unaweep Canyon showing proximity to pinyon-juniper fuels.

Whitewater

The town of Whitewater was rated as moderate using this risk assessment protocol. The majority of homes are in an urban setting with no wildland issues. The greatest risk areas are homes on the edge of town that are adjacent to wildland fuels; however, these fuels are primarily light grasses and sparse vegetation with a lower fire hazard. Water supply is a concern for the fire department because water pressure in the hydrant system is so low that they are considered out of service. Many homes have combustible construction and minimal defensible space, but access is generally good and the fire department is located in town for rapid response.

NFPA Rating: 64/112 (Moderate)

GIS Assessment Rating: Moderate



Figure C.57. Urban area of Whitewater.

Kannah Creek

The community along Kannah Creek was rated as high using this risk assessment protocol. There are only a few homes along Kannah Creek with larger lots and some grazing that breaks up fuel continuity, but homes are dotted among wildland areas where fuels have built up over decades of fire suppression. The creek is also a primary watershed for Grand Junction and therefore a priority area for protection from catastrophic wildfire. The area has a history of fire starts (for example the 2008 Coal Creek Fire that started as a lightning strike but was subsequently managed for resource benefit on Grand Mesa National Forest). The wildland fuels in the area are thick, particularly areas of greasewood in the valley and on the mesa top, which exhibits fast rates of spread when burned. Many homes also back up to thick riparian fuels in the drainage and along washes. Some newer homes have non-combustible construction but wooden decks. Older homes tend to have combustible siding and roofs. Accessibility is a concern for the fire department because of long driveways and limited turnaround for emergency vehicles. There are some hydrants in the area, but water pressure is extremely low and most water would need to be hauled in the event of a fire. Water supply is a particular concern of the fire department.

NFPA Rating: 82/112 (High)



Figure C.58. 2008 Coal Creek Fire burning through pinyon-juniper on Grand Mesa National Forest. Photo Credit: Wildland Fire Lessons Learned Center



Figure C.59. Kannah Creek home.

Purdy Mesa

The Purdy Mesa community was rated as high using this risk assessment protocol. Most properties on the mesa are larger lots with some small farms and grazing. Homes are dotted among wildland fuels with cheatgrass and greasewood posing a particular hazard. Some drainages have thick Russian olive and tamarisk often in close proximity to homes. Many homes have 70 to 100 feet of defensible space, though some have combustible siding and decks. In the event of a fire, water is unavailable and would need to be hauled in. Most fires in the area are agricultural burns and ditch burns, but a wildfire in the area may grow rapidly due to the exposed nature of the mesa and fast winds. Accessibility is generally good in the area with good access from the main road.

NFPA Rating: 84/112 (High)



Figure C.60. Purdy Mesa showing the patchwork of wildland and agricultural fuels.

The Reeder Mesa community was split between the lower valley portion with lower risk and the upper mesa portion, which exhibited higher risk due to changes in the fuel complex.

Lower Reeder Mesa

The Lower Reeder Mesa community was rated as moderate using this risk assessment protocol. Homes were on larger lots than Whitewater with very minimal surrounding fuels. Many homes had combustible construction but had good defensible space due to a lack of wildland fuels. Many lots were grazed increasing the vegetation management. There is no water supply in the area, so water would have to be hauled from Whitewater, but the community is close to the Lands End Fire Department, providing more rapid response.

NFPA Rating: 61/112 (Moderate)



Figure C.61. Lower Reeder Mesa showing sparse vegetation.

Upper Reeder Mesa

The upper portion of Reeder Mesa was rated as high using this risk assessment protocol. The community is made up of larger lots with homes dotted among wildland fuels of thick and tall rabbitbrush and sagebrush. The area is prone to high winds and fuels are continuous in some areas causing concern for the Lands End Fire Department. Many homes are built with combustible construction and have very minimal defensible space. However, homes have good separation. There is no available water on the mesa, so in the event of a wildfire all water would need to be hauled in. Accessibility to homes is generally good but response times would be slow from Whitewater due to windy roads to access the mesa.

NFPA Rating: 96/112 (High)



Figure C.62. Home on Reeder Mesa showing thick brush fuels.

Unincorporated Areas of Mesa County

Grand Junction and Palisade Watersheds

At-risk areas in unincorporated regions of Mesa County include the municipal watersheds of the City of Grand Junction and the Town of Palisade, as well as the area known as Pinyon Mesa (technically within the response area of Glade Park VFD). The City of Grand Junction, in conjunction with the USFS, completed an Environmental Assessment (EA) of the city's watershed in 2008. Fuels within the Grand Junction Watershed consist primarily of decadent stands of pinyon-juniper and oak brush. The EA characterized the city's watershed as being at high risk of a catastrophic fire event that could have potentially devastating effects on the water supply within the Kannah Creek basin, which is the primary source of domestic water for over 40,000 Grand Junction city residents (USFS 2008). Likewise, the Town of Palisade completed a Watershed Fire Mitigation Plan in 2009. Palisade's watershed is composed of extensive oak brush and pinyon-juniper woodlands that are at high risk of catastrophic fire (Robertson 2009). More details regarding both watersheds are provided in Section 5.3.5. Proposed mitigation projects are included in table 4.14.



Figure C.63Error! No text of specified style in document. **1. Continuous pinyon-juniper fuels in the Palisade watershed.**

West Divide and Alkali Creeks

Located at the extreme east end of Mesa County, the West Divide and Alkali Creek drainages have scattered cabins, lodges, and ranches. The vegetation is mostly oak brush and other mixed mountain shrub with aspen and other conifers at higher elevations. This area is at high-risk due to continuous and long response times for fire resources. Other values at risk include significant natural gas development in the form of wells, pipelines, and compression stations.



Figure C.64.Error! No text of specified style in document. **2 Fuels in West Divide drainage.**

Housetop Mesa

The Housetop Mesa Estates is in Mesa County adjacent to Garfield County on the north side of the Battlements, southwest of Parachute, Colorado. This 11-home subdivision is intermixed with thick continuous pinyon-juniper vegetation. Due to vegetation, lack of defensible space, and long response time for emergency responders, this area is rated extreme. Several large fires over 100 acres have occurred west of here in the past 5 years.

MESA COUNTY 2012 CWPP COMMUNITY RECOMMENDATIONS

In 2012, the Core Team utilized the above risk and hazard assessment data to develop wildfire mitigation actions that could be applied in each community. These recommendations were revised using the 2023 risk assessment to formulate the updated 2023 recommendations. The initial 2012 matrices are provided below for reference.

Table C.2. Detailed Community Risk-Hazard Assessments for 2012 Delineated Communities (all data are sourced from the 2012 Mesa County CWPP)

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Unincorporated Areas of Mesa County					
Municipal Watersheds	Private/USFS/ BLM	Continue fuel reduction vegetation thinning on BLM and USFS lands	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	UCR.
Pinyon Mesa, West Divide, Alkali Creek, Housetop Mesa	Private	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Grand Junction Rural Fire Protection District, Grand Junction Fire Department, Redlands Sub Fire Protection District					
Colorado River Corridor, including Orchard Mesa	Public, Colorado River State Park, Colorado Division of Parks and Wildlife	Install fire danger signage utilizing NFDRS system along all access areas, picnic areas and campgrounds that make up the Colorado Riverfront Trail and James M. Robb Colorado River State Park.	Inform the public of high fire risk so as to reduce potential ignitions in the area.	High Summer 2013	Colorado State Parks, Mesa County, Colorado Division of Parks and Wildlife (Habitat Partnership Program as funding source), Mesa County. For funding sources refer to Appendix F.
		Fuel break projects. Create mowed areas or shaded fuel breaks along boundaries of public and private lands.	Protect neighboring properties adjacent to public lands. Increase accessibility along trail system.	High Summer 2013	Colorado State Parks, Mesa County, Colorado Division of Parks and Wildlife (Habitat Partnership Program as funding source), Mesa County. For funding sources refer to Appendix F.
		Continue ongoing tamarisk and Russian olive eradication projects currently undertaken by City of Grand Junction and Tamarisk Coalition.	Remove hazardous fuels from WUI community. Restore native vegetation along a degraded river system.	High Ongoing efforts along entire corridor	Colorado State Parks, Mesa County, Colorado Division of Parks and Wildlife (Habitat Partnership Program as funding source), Mesa County. Colorado State Parks can apply for Great Outdoors Colorado funds for tamarisk removal.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		<p>Defensible space projects around homes along boundary with river corridor and/or public lands.</p> <p>Utilize CSFS Defensible Space guidelines.</p> <p>Consider replacing wooden fencing with fire-proofed materials and or create buffer of non-vegetated area between private fence line and neighboring property.</p>	<p>Mitigate potential fire spread from river corridor and public lands onto private property.</p> <p>Protect homes and provide a safe area for fire suppression.</p>	<p>High</p> <p>Fall 2012</p>	<p>Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.</p>
		<p>Promote and encourage communities to host neighborhood clean-up days (in addition to spring clean-up within city limits). Have centralized deposit of green waste for collection and transport to composting facility.</p>	<p>Remove slash following community fuels reduction projects thereby reducing wildfire hazard and mitigating ongoing concerns that property owners dump slash along river corridor.</p>	<p>High</p> <p>Fall 2012</p>	<p>Homeowners, homeowner's associations, Mesa County, City of Grand Junction.</p>
Redlands	Walter Walker SWA, Leatha Jean Stassen SWA - Colorado Division of Parks and Wildlife	<p>Fuel reduction treatments along property lines (mowing, mechanical thinning), tamarisk eradication where it will aid in wildlife habitat protection throughout property.</p>	<p>Protect neighboring properties along Wagon Trail Drive, Rushmore Drive, Chaco Court, McKinley Court, and Sand Castle Lane.</p> <p>Alleviate concerns voiced by the public from Redlands Village Subdivision.</p>	<p>High</p> <p>Summer 2013</p>	<p>Colorado Division of Parks and Wildlife in conjunction with residents of Redlands Village Subdivision. Consider creating a fuels reduction task force of volunteers. Colorado Division of Parks and Wildlife can apply for Great Outdoors Colorado funds for tamarisk removal, as well as the Habitat Partnership Program as a funding source. For funding sources refer to Appendix F.</p>
	Private	<p>Hydrant expansion project to increase coverage of hydrants in Redlands Village subdivision and ensure sufficient water pressure for proper operation.</p>	<p>Enhance firefighting capabilities.</p> <p>Alleviate concerns voiced by the public from Redlands Village Subdivision.</p>	<p>High</p> <p>Summer 2013</p>	<p>Ute Water Authority, Redlands Village Residents, Redlands Sub Fire Dept. For funding sources refer to Appendix F.</p>
		<p>Defensible space projects around homes.</p> <p>Utilize CSFS Defensible Space guidelines.</p>	<p>Mitigate potential fire spread from wildlands and public lands onto private property.</p> <p>Protect homes and provide a safe area for fire suppression.</p>	<p>High</p> <p>Fall 2012</p>	<p>Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.</p>

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Properties interfacing with Colorado National Monument (outlined in the Monument/ Glade Park and Redlands Interface CWPP (2008))	Private and NPS	<p>Work with NPS fuels specialists to coordinate fuel break development along private/NPS boundaries as highlighted in the Glade Park-Redlands-Colorado National Monument CWPP.</p> <hr/> <p>Defensible space projects around homes. Utilize CSFS defensible space guidelines. Provide accompanying public education and outreach.</p>	Mitigate potential fire spread from the Monument onto private land and vice versa.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. NPS fuels specialists utilizing fuels treatment budget. For funding sources refer to Appendix F.
Grand Junction	Grand Junction Fire Department	<p>Enhance response by purchasing a Type 3 WUI truck with short wheel base.</p> <hr/> <p>Pre-fire planning for river corridor access. Include mock incident.</p>	<p>Aid in access to WUI areas along the river corridor.</p> <hr/> <p>Identify the most in-accessible areas and develop a plan to overcome access issues before a fire occurs.</p>	<p>Moderate Fall 2013</p> <hr/> <p>High Spring 2012</p>	Grand Junction Fire Department.
The Preserve	Private	<p>Defensible space projects and combined community maintenance of roadside verges and access areas. Reduce overhanging vegetation around driveways.</p>	Reduce fire risk around homes and limit potential spread between properties. Provides a safer area for firefighters to suppress fire.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Ridges/ Redlands Golf Course	Private	Hold a public outreach event to inform residents about potential fire spread from wildland areas.	Raise awareness of fire risk in a community where perceived risk of fire is low.	High Fall 2012	Ridges/Redlands Golf Course.
Glade Park					
Glade Park	Glade Park Volunteer Fire Department	<p>Encourage residents to work with the BLM and NPS regarding fuel treatment efforts along jurisdictional boundaries</p> <hr/> <p>Pursue funding for water storage facilities and/or cisterns in communities with limited water supply</p> <hr/> <p>Carryout mapping of water supplies on private lands- ponds, stock tanks, etc.</p>	<p>Develop a landscape level fuels reduction effort that more effectively reduces fire risk in the WUI.</p> <hr/> <p>Facilitate fire suppression efforts.</p> <hr/> <p>Facilitate fire suppression efforts.</p>	<p>High Summer 2013</p> <hr/> <p>High Spring 2013</p> <hr/> <p>High Spring 2013</p>	Glade Park Volunteer Fire Department. In conjunction with local residents. County Fire Warden.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		Carry out annual fire department recruitment drives .	Increase volunteers and enhance fire response.	Moderate Ongoing	
	County Roads	Implement road side thinning along County Roads.	Keeps access roads clear so as to act as evacuation routes. Also reduces potential for ignition from human activity along the road system.	High Fall 2012	Mesa County Roads Department.
		Install fire danger signs along main roads and access roads to high risk communities. Utilize the NFDRS fire danger system.	Inform the public of the current fire danger in the area. Reduce human ignitions.	High Spring 2013	Mesa County Sheriff's Office, Mesa County Emergency Management.
Ladder Canyon, Little Park Road, DS Road, 16 1/2 Road, Elk Reserve and Miller Ranch, Miracle Rock Road	Private	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.
		Develop a community wildfire prevention group to coordinate the development of an evacuation plan for residents and livestock.	Provide a coordinated effort in the community to protect life and property.	High Spring 2013	Homeowners, Glade Park Fire Department, County Fire Warden.
		Encourage residents to work with the BLM, NPS, CSFS, and local fire department regarding fuel treatment efforts along jurisdictional boundaries. Where possible, implement landscape-level treatments that include both private and BLM treatment areas.	Develop a landscape level fuels reduction effort that more effectively reduces fire risk in the WUI.	High Summer 2013	Homeowner, UCR, CSFS, and NPS. For funding sources refer to Appendix F.
		Install a 30,000-gallon plus cistern in a safe area to augment water supply for tenders.	Provide a water supply for fire suppression.	Moderate Fall 2013	Homeowners, County Fire Warden.
Palisade Fire Department					

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Palisade	Private	Increase public education and outreach regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	Palisade Fire Department. In conjunction with local residents. Palisade local government. Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Develop a community wildfire prevention group to engage local volunteers in thinning efforts in the wash area, and monitor re-sprouts in thinned areas to ensure the treatment is maintained. Organize community clean-up days to provide collaborative thinning effort and green waste removal.	Reduce hazardous fuels that are currently impinging upon residential areas and in direct contact with homes.	High Spring 2013	
		Implement defensible space around homes following CSFS guidelines. Pay special attention to rear of property that adjoins wash areas. Consider replacing wooden fences with composite materials.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	
		Palisade Fire Department	Continue to seek funding/sponsorship to purchase needed PPE for all personnel	Ensure all volunteers have necessary equipment for safety.	
		Explore in-house training opportunities to assist volunteers in meeting necessary wildfire qualifications.	Alleviate financial burden of travel associated with wildfire training.	Moderate Spring 2013	
		Establish a schedule for equipment replacement to assist in scheduling grant applications.	Highlight the need for new and updated equipment to increase fire response capabilities.	Moderate Spring 2013	
		Continue to seek funding and assistance in building a new fire station for the District.	House the necessary resources for the District.	High Ongoing	
Horse Mountain	Private	Increase public education and outreach regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	CSFS, UCR, County Fire Warden.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		Develop a community wildfire prevention group to engage local volunteers in fire prevention efforts. Task group with: 1) Developing a community evacuation plan for people and livestock.	Provide coordinated effort in a community that falls outside of a fire protection district.	High Fall 2012	County Fire Warden, Palisade Fire Department.
		Organize community clean-up days to provide collaborative thinning effort and green waste removal.	Protect properties from fire spread and provide a safe area for fire suppression.	Moderate Ongoing	Homeowners. For funding sources refer to Appendix F.
		Implement defensible space around homes following CSFS guidelines.	Protect properties from fire spread and provide for safe fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.
		Treat cheatgrass infestation wherever possible. Utilize CSU Extension Services for best management practices.	Alleviate risk associated with a highly flammable vegetation. Assist in the removal of this non-native species from the ecosystem.	Moderate Ongoing.	Homeowners.
		Install a 30,000-gallon plus cistern in a safe area to augment water supply for tenders.	Provide a water supply for fire suppression.	Moderate Fall 2013	Homeowners, County Fire Warden.
Rapid Creek	Private	Increase public education and outreach regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	CSFS, UCR, County Fire Warden.
		Implement defensible space around home following CSFS guidelines.	Protect properties from fire spread and provide for safe suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Gateway Unaweep Fire Protection District					
Unaweep Canyon	Private	Consider installing a cistern (30,000-gallon plus) in a safe area to augment water supply for tenders.	Facilitate fire suppression efforts by reducing times needed to shuttle water to incident.	High Spring 2013	Gateway Unaweep Fire Department, Homeowners, County Fire Warden.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		Develop a community wildfire prevention group to engage local volunteers in thinning efforts and coordinate development of an evacuation plan for people and livestock.	Provides volunteers for implementing actions outlined in the CWPP. Ensures local residents are familiar with the proposed evacuation plan.	High Spring 2013	Gateway Unawep Fire Department, Homeowners.
		Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Increase public education and outreach regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Protect properties from fire spread.	High Spring 2013	Homeowners, Gateway Unawep Fire Department.
Gateway	Private	Develop a community wildfire prevention group to engage local volunteers in thinning efforts and coordinate development of an evacuation plan for people and livestock.	Provides volunteers for implementing actions outlined in the CWPP. Ensures local residents are familiar with the proposed evacuation plan.	High Spring 2013	Gateway Unawep Fire Department, Homeowners
Gateway	Private	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Entire district	BLM	Reduce fuel loading using landscape level fuels treatments on Federal lands adjacent to private properties.	Reduce potential for large fires.	High Fall 2012	UCR.
Lands End Fire Protection District					
Lands End Fire Protection District	Lands End Fire Department	Continuing recruitment drive to increase the pool of volunteers.	Improve response times and firefighting capability.	High Ongoing	Lands End Fire Department, County Fire Warden.
		Seek funding to assist volunteers in necessary wildfire training .	Ensure all firefighters have had adequate wildfire training to operate safely.	High Spring 2012	Lands End Fire Department, County Fire Warden.
		Seek grant funding for essential PPE for new volunteers.	Provides essential safety gear for all firefighters.	High Spring 2012	Lands End Fire Department, County Fire Warden.
		Seek funding to purchase a 4x4 all-terrain vehicle for access to remote areas.	Enhances response to incidents in the WUI where access may be limited.	Moderate Spring 2013	Lands End Fire Department, County Fire Warden.
Kannah Creek and Purdy Mesa	Private	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Increase public education and outreach regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Protect properties from fire spread.	High Spring 2013	Homeowners, Lands End Fire Department.
		Organize community clean-up days to provide collaborative thinning effort and green waste removal.	Facilitate clean-up of slash, reducing residual fuels.	High Spring 2013	

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Kannah Creek and Purdy Mesa	Private	Fire Department to work with homeowners to assess access issues , particularly relating to turnaround for emergency vehicles.	Facilitate fire suppression efforts by providing safe entry for emergency vehicles.	High Summer 2012	Lands End Fire Department, Homeowners.
		Develop a water sources map for the area to identify available water sources on private land, including ponds and wells.	Facilitate fire suppression efforts by coordinating- pre-fire, available water resources.	Moderate Spring 2013	Lands End Fire Department, Homeowners.
		Consider installing a cistern (30,000-gallon plus) in a safe area to augment the water supply for tenders.	Facilitate fire suppression efforts by reducing times needed to shuttle water to incident.	High Spring 2013	Lands End Fire Department, Homeowners, County Fire Warden.
		Develop a community wildfire prevention group to engage local volunteers in thinning efforts and coordinate development of an evacuation plan for people and livestock.	Provides volunteers for implementing actions outlined in the CWPP. Ensures local residents are familiar with the proposed evacuation plan.	High Spring 2013	Lands End Fire Department, Homeowners.
Whitewater	Private	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Increase public education and outreach regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Protect properties from fire spread.	High Spring 2013	Homeowners, Lands End Fire Department.
		Work with water authority regarding water pressure issue ; cite public safety.	Provide adequate water supply to hydrant system.	High Summer 2012	Lands End Fire Department, Water District, Mesa County.
Lower Reeder Mesa	Private	Consider installing a cistern (30,000-gallon plus) in a safe area to augment the water supply for tenders.	Reduce time needed to shuttle water to incident.	Moderate Spring 2013	Homeowners, Lands End Fire Department.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		Develop a water sources map for the area to identify available water sources on private land, including ponds and wells.	Reduce time needed to shuttle water to incident.	Moderate Spring 2013	Homeowners, Lands End Fire Department.
Upper Reeder Mesa	Private	Consider installing a cistern (30,000-gallon plus) in a safe area to augment the water supply for tenders.	Facilitate fire suppression efforts by reducing times needed to shuttle water to incident.	High Spring 2013	Lands End Fire Department, Homeowners, County Fire Warden.
		Develop a community wildfire prevention group to engage local volunteers in thinning efforts and coordinate development of an evacuation plan for people and livestock.	Provides volunteers for implementing actions outlined in the CWPP. Ensures local residents are familiar with the proposed evacuation plan.	High Spring 2013	Lands End Fire Department, Homeowners.
		Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Entire District	BLM	Reduce fuel loading using landscape level fuels treatments Federal lands adjacent to private properties.	Reduce potential for large fires.	High Fall 2012	UCR.
Lower Valley Fire District					
Fruita	Lower Valley Fire District	Hire a Deputy Chief/Fire Marshal to build public outreach efforts and focus on fire prevention.	Tasks an individual to focus on fire prevention, freeing up time for the District Chief to focus on operations.	High Summer 2013	Lower Valley Fire District, in conjunction with local residents. County Fire Warden.
		Hire an administrative assistant to focus on grant applications for increased funding.	Additional funding can be used to purchase new equipment and pay for training volunteers.	High Spring 2013	

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		Purchase a software program for mapping fire prevention and water infrastructure in the District. Develop and update mapping annually.	Facilitate fire suppression efforts.	High Spring 2013	
		Carry out annual fire department recruitment drives.	Increase volunteers and enhance fire response.	Moderate Ongoing.	
	Private	Implement roadside thinning along County Roads.	Keeps access roads clear so as to act as evacuation routes. Also reduces potential for ignition from human activity along the road system.	High Fall 2012	Mesa County Roads Department.
		Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Fruita Wash areas	Private and City of Fruita	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		<p>Continue collaboration with the Tamarisk Coalition to reduce prevalence of tamarisk and Russian olive in wash areas and riparian areas throughout the community.</p> <p>Homeowners to coordinate with the City and fire department to develop defensible space between structures and wash. HOA groups should continue to aggressively pursue thinning on City lands.</p>	<p>Help mitigate extreme fire behavior in timber fuels and reduce potential spread to communities adjoining the river.</p> <p>Build collaboration by working with variety of agencies, non-profits and local watershed groups.</p>	<p>Spring 2014 High</p>	<p>HOA groups, City of Fruita, Lower Valley Fire Department.</p>
		<p>Develop a community wildfire prevention group to engage local volunteers in thinning efforts in the wash area, and monitor re-sprouts in thinned areas to ensure the treatment is maintained</p>	<p>Provides volunteers for implementing actions outlined in the CWPP.</p>	<p>Moderate Fall 2013</p>	<p>HOA groups, City of Fruita, Lower Valley Fire District, homeowners.</p>
Loma	Private	<p>Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability.</p>	<p>Protect properties from fire spread and provide a safe area for fire suppression.</p>	<p>Moderate Fall 2013</p>	<p>Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.</p>
Mack	Private	<p>Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability.</p>	<p>Protect properties from fire spread and provide a safe area for fire suppression.</p>	<p>Moderate Fall 2013</p>	<p>Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.</p>
		<p>City to target derelict lots and enforce clean-up due to public safety concerns.</p>	<p>Reduce hazardous fuel loadings that are building up on derelict and abandoned lots.</p>	<p>Moderate Fall 2013</p>	<p>Mesa County.</p>

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Plateau Valley Fire Protection District					
Vega Vista Subdivision, Aspen Park (continued over page)	Private	Increase signage along Highway 330 showing fire danger, evacuation routes and safety zones.	Alert residents and visitors of the high fire danger in the area and safe evacuation routes and safety zones.	High Summer 2013	Plateau Valley Fire Department, in conjunction with local residents. County Fire Warden. For funding sources refer to Appendix F.
		Create a wildfire awareness committee to help handle mailings and information to educate homeowners about wildfire risk and to collaborate with Vega State Park about evacuation and shelter in place plans, as well as joint purchase of clearing equipment with the park to be used on community work days.	Provide a united community effort for fire prevention.	High Spring 2013	
		Make sure all address markers are clear and visible.	Facilitate fire suppression efforts.	High Spring 2013	
		Implement defensible space around homes and fuels reduction projects between homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	
		Implement a fuel break on the north and west edge of Vega Vista Subdivision, possibly extending west to BLM land on Campbell Mountain.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Vega Drainage	Private /State Park	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Develop shaded fuel breaks on Vega State Park land along N 6/10 Road to reduce wildfire spread to Aspen Park subdivision and structures uphill. Implement a fuels reduction project on the south side of Aspen Park, utilizing mechanical thinning.	Prevent fire spread from State Park lands to neighboring residents.	High Fall 2012	Vega State Park.
		Develop shelter in place and safety zone agreements with the PVFPD in the event of a wildfire that restricts access and escape routes.	Provide a safe place for residents to shelter if they are un-able to evacuate during a wildfire.	High Spring 2013	Plateau Valley Fire Department, homeowners.
Buzzard Creek Drainage	Private/BLM	Property owners to thin ladder fuels and remove dead and downed material along roadsides.	Reduce hazardous fuels to mitigate extreme fire behavior and provide a safe evacuation route.	High Spring 2013	Homeowners.
		Reduce fuel loading using landscape level treatments on adjacent federal lands surrounding Kimball and Buzzard creeks.	Reduce large fire potential.	High Spring 2013	UCR.
		Develop shelter in place and safety zone agreements with the PVFPD in the event of a wildfire that restricts access and safety routes.	Provide a safe place for residents to shelter if they are un-able to evacuate.	High Spring 2013	Plateau Valley Fire Department, homeowners.
		Explore possibilities of installing dry hydrants at private ponds or above ground water sources.	Facilitate fire suppression efforts.	High Spring 2013.	Plateau Valley Fire Department, homeowners, County Fire Warden.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Kimball Creek	Private	Residents to verify address with Mesa County Assessor's office and post addresses clearly at residence.	Facilitate fire suppression efforts.	High Spring 2013	Homeowners.
		Landowners in the upper half of the PVFPD may consider establishing and maintaining ponds where possible and installing dry hydrants for potential fire suppression purposes	Facilitate fire suppression efforts as water is unavailable.	High Spring 2013	Homeowners.
		PVFPD to coordinate with landowners for shelter in place and staging locations for residents and livestock in the event that the northern half of the area cannot be evacuated.	Provide a safe place for residents to shelter if they are un-able to evacuate.	High Spring 2013	Plateau Valley Fire Department, homeowners.
Kimball Creek	Private	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.
	County Roads	Reduce bridging fuels on Kimball Creek road where the terrain becomes narrow, potentially restricting emergency vehicle access.	Provide a safe evacuation route for residents and emergency personnel.	High Spring 2013	Mesa County Roads Department.
Collbran /Plateau City	Private and County	Develop evacuation plan for the main portion of Collbran.	Provide a safe evacuation route for residents and emergency personnel.	High Spring 2013	Plateau Valley Fire Protection District, City of Collbran.
		Establish safety zones for sections of the community in the event of surrounding wildfire.	Provide a safe place for residents to shelter if they are un-able to evacuate.	High Spring 2013	Plateau Valley Fire Protection District, City of Collbran.
	Private	Remove or reduce vegetation and ladder fuels on the southeast side of the Highway 330 across from structures to break continuity of fuels.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	City of Collbran.
		Reduce vegetation bridging Highway 330 where it becomes High Street between 2288 and 2019 High Street.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	City of Collbran.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		Complete defensible space for residences at the intersection of High Street at 58 ½ Road. Complete defensible space for residences on the north side of Spring Street and the north end of Plateau Avenue.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Utilize brush control herbicides wherever possible in oak and re-sprouting brush to mitigate re-sprouting of these plant species.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	City of Collbran
Molina	County	Create fuel breaks along Highway 330 and up the KE and LE ½ roads to provide safer access and reduce fuel continuity.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	Mesa County Roads Department.
	Private	Homeowners are encouraged to create maximum defensible space in dense brush covered slopes and Cottonwood Creek, and to implement Firewise construction where possible.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Fall 2012	Homeowners.
		Consider installing dry hydrants at private ponds.	Facilitate fire suppression efforts.	Moderate Fall 2013	Mesa County, PVFPD.
Coon Creek	Private	Establish and use safety zones for people and livestock.	Provide a safe place to shelter in the event that residents are unable to evacuate during a wildfire.	High Fall 2012	Homeowners, County Fire Warden, PVFPD.
		Develop evacuation plan for residents and livestock.	Access is a concern in the neighborhood so establishing more than one evacuation route is essential to life safety.	High Fall 2012	Homeowners, County Fire Warden, PVFPD.
		Explore possibilities for dry hydrants to be installed at private ponds on the east side of the subdivision.	Facilitate fire suppression efforts.	Moderate Spring 2013	Mesa County, PVFPD.
		Utilize brush control herbicides wherever possible in oak and re-sprouting brush to mitigate re-sprouting of these plant species.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	Homeowners.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		<p>Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability.</p> <p>Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines.</p> <p>Organize for a CSFS representative to visit properties and advise on defensible space strategies.</p>	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Mesa	Private and County	Vegetation thinning and fuel breaks are recommended to break up fuel continuity and protect structures at the top of the drainage.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Fall 2012	Homeowners.
		Homeowners are encouraged to verify addresses with Mesa County Assessor’s Office	Facilitate fire suppression efforts.	High Summer 2012	Homeowners.
Mesa	Private	Homeowners to implement defensible space recommendations on both the west side of town adjacent to Mesa Creek, as well as surrounding moderate risk houses along KE road to the east.	Reduce hazardous fuels to mitigate extreme fire behavior and provide a safe area for fire suppression efforts.	High Fall 2012	Homeowners.
Old Grand Mesa Road	Private	All residents are encouraged to validate their addresses with Mesa County Assessor’s Office and clearly post addresses at end of driveways.	Facilitate fire suppression efforts.	High Summer 2012	Homeowners.
		Establish shelter-in-place locations and evacuation plan for residents and animals.	Provide a safe place to shelter in the event that residents are unable to evacuate during a wildfire.	High Fall 2012	Homeowners.
		Establish a shelter-in-place plan for the Kiwanis Summer Camp in the event that evacuation through the southern end of Old Grand Mesa Road is not available.	Provide a safe place to shelter in the event that residents are unable to evacuate during a wildfire.	High Fall 2012	Homeowners.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		<p>Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability.</p> <p>Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines.</p> <p>Organize for a CSFS representative to visit properties and advise on defensible space strategies.</p>	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	<p>Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.</p> <p>For funding sources refer to Appendix F.</p>
Horizon Estates	Private	Residents should verify their addresses with the Mesa County Assessor's Office.	Facilitate fire suppression efforts.	High Summer 2012	Homeowners.
		Homeowners should initiate Firewise Guidelines- ensuring firewood is stacked at least 30 feet from the home, replace old flammable decks, screen vents, and opening around homes.	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	Homeowners.
		The community could pursue becoming a certified Firewise Communities USA.	Provide impetus for carrying out defensible space and Firewise practices.	Moderate Fall 2013	Homeowners. Firewise Communities USA www.firewise.org .
		Homeowners should implement defensible space following CSFS guidelines particularly on the north side of the property which is upslope of thick wildland fuels.	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	<p>Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.</p> <p>For funding sources refer to Appendix F.</p>
		Explore possibility of installing dry hydrants at neighborhood lake.	Facilitate fire suppression efforts.	Moderate Spring 2013	Mesa County, PVFPD.
		Form a Wildfire Committee to act as wildfire education ambassadors for residents and second homeowners.	Unite homeowners in mitigation efforts. Provide a forum through which residents can develop evacuation plans and share fire prevention approaches.	High Summer 2012	Homeowners.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Powderhorn Ski Area	Private	Implement at least 100 feet of Zone 1 defensible space through the area immediately to the east of Golden Wood Condo area. Fuels should be thinned around Valley View and Golden Wood Condo areas.	Protect properties from fire spread and provide a safe area for fire suppression.	High Summer 2012	Property owners.
		Implement defensible space on the northern side of the Administration building.	Protect properties from fire spread.	High Summer 2012	Property owners.
		Implement a fuel break on the north side of Powderhorn Ski Area.	Protect properties from fire spread from the south.	High Summer 2012	USFS
		Increase fire safety signage around the resort and along access routes. Special event organizers should emphasize the fire danger message to visitors. Produce a fire danger and fire prevention leaflet for visitors.	Inform residents and visitors of the high fire danger in the area.	High Summer 2012	Property owners.
		Maintain grasses in the summer months, mow around buildings and around aboveground gas tanks.	Protect properties from fire spread and provide a safe area for fire suppression.	High Summer 2012	Property owners.
		Thin or remove dead standing and dead/downed trees in the forest to the south of gas tanks. The forested area is at the top of a densely vegetated drainage which is accumulating fuels.	Protect properties from fire spread and provide a safe area for fire suppression.	High Summer 2012	Property owners.
		Establish shelter in place and evacuation plans with the PVFPD as well as the USFS.	Provide a safe place to shelter in the event that residents are unable to evacuate during a wildfire.	High Summer 2012	PVFPD, USFS, property owners.
Throughout District	BLM/USFS	Reduce fuel loading using landscape level fuel treatments on adjacent federal lands.	Reduce large fire potential.	High Fall 2012	UCR.
Clifton Fire Department					
Fruitvale	Private	Increase public education and outreach regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	Clifton Fire Department.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
		<p>Develop a community wildfire prevention group to engage local volunteers in thinning efforts in the wash areas within subdivisions and monitor re-sprouts in thinned areas to ensure the treatment is maintained.</p> <p>Organize community clean-up days to provide collaborative thinning effort and green waste removal.</p>	<p>Reduce hazardous fuels that are currently impinging upon residential areas and in direct contact with homes.</p>	<p>High Spring 2013</p>	<p>Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.</p>
		<p>Implement defensible space around home following CSFS guidelines. Pay special attention to rear of property that adjoins wash areas. Consider replacing wooden fences with composite materials.</p>	<p>Protect properties from fire spread and provide a safe area for fire suppression.</p>	<p>High Spring 2013</p>	

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APPENDIX D:

Fire Behavior Modeling/GIS Background and
Methodology

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FIRE BEHAVIOR MODELING

FIRE BEHAVIOR MODELS

Data utilized for the fire behavior models was pulled from several credible sources. Fire occurrence data was acquired from the National Interagency Fire Center (NIFC). The USFS's 97th percentile wildfire suppression difficulty index (SDI) was incorporated in the risk assessment. "SDI factors in topography, fuels, expected fire behavior under prevailing conditions, fireline production rates in various fuel types with and without heavy equipment, and access via roads, trails, or cross-country travel" (USFS 2023). WUI delineations and fire station service areas were conducted by SWCA. HVRAs come from IFTDSS and have been reviewed and amended by the Core Team. The Core Team also customized model input weighting for fire behavior modeling to more closely reflect conditions and concerns regarding Mesa County specifically.

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

Fire spreads in three ways: 1) surface fire spread—the flaming front remains on the ground surface (in grasses, shrubs, small trees, etc.) and resistance to control is comparatively low; 2) crown fire—the surface fire "ladders" up into the upper levels of the forest canopy and spreads through the tops (or crowns) independent of or along with the surface fire, and when sustained is often beyond the capabilities of suppression resources; and 3) spotting—embers are lifted and carried with the wind ahead of the main fire and ignite in receptive fuels; if embers are plentiful and/or long range (>0.5 mile), resistance to control can be very high. Spotting is often the greatest concern to communities in the path of a wildland fire. In areas where homes are situated close to riparian fuels and/or denser shrubs and trees, potential spotting from woody fuels to adjacent fuels should be acknowledged.

Treating fuels in the WUI can lessen the risk of intense or extreme fire behavior. Studies and observations of fires burning in areas where fuel treatments have occurred have shown that the fire either remains on or drops to the surface, thus avoiding destructive crown fire. Also, treating fuels decreases spotting potential and increases the ability to detect and suppress any spot fires that do occur. Fuels mitigation efforts therefore should be focused specifically on where these critical conditions could develop in or near communities at risk.

For this plan, an assessment of fire behavior has been carried out using well-established fire behavior models: FARSITE, FlamMap, BehavePlus, and FireFamilyPlus, as well as ArcGIS Desktop Spatial Analyst tools. Data used for fire behavior modeling is largely obtained from LANDFIRE. Fire behavior models were simulated using 97th percentile weather parameters and dead fuel moisture data from FireFamilyPlus. This was done so that potential fire behavior can be shown under moderate and extreme conditions.

LANDFIRE

LANDFIRE is a national remote sensing project that provides land managers a data source for all inputs needed for Fire, FlamMap, and other fire behavior models. The database is managed by the USFS and the U.S. Department of the Interior and is widely used throughout the United States for land management planning. More information can be obtained from <http://www.landfire.gov>.

FARSITE

FARSITE is a computer model based on Rothermel's spread equations (Rothermel 1983); the model also incorporates crown fire models. FARSITE uses spatial data on fuels, canopy cover, crown bulk density, canopy base height, canopy height, aspect, slope, elevation, wind, and weather to model fire behavior across a landscape. In essence, FARSITE is a spatial and temporal fire behavior model. FARSITE is used to generate fuel moisture and landscape files as inputs for FlamMap. Information on fire behavior models can be obtained from <http://www.fire.org>.

FireFamilyPlus

FireFamilyPlus is a software package used to calculate 90th and 97th percentile fuel moisture values and indices from the U.S. National Fire Danger Rating System (NRDS) using local weather from Remote Automated Weather Stations (RAWS) (Bradshaw and McCormick 2000). The FireFamilyPlus was used to calculate the percent of fuel moisture for live and dead fuels for the length of the fire season, which was defined as April 1 to October 31. These fuel moisture outputs were needed to model fire behavior and generate output metrics.

FlamMap

Like FARSITE, FlamMap uses a spatial component for its inputs but only provides fire behavior predictions for a single set of weather inputs. In essence, FlamMap gives fire behavior predictions across a landscape for a snapshot of time; however, FlamMap does not predict fire spread across the landscape. FlamMap has been used for the risk assessment to predict fire behavior across the landscape under extreme (worst case) weather scenarios.

FIRE BEHAVIOR MODEL INPUTS

Fuels

The fuels in the planning area are classified using Scott and Burgan's (2005) Standard Fire Behavior Fuel Model classification system. This classification system is based on the Rothermel surface fire spread equations, and each vegetation and litter type are broken down into 40 fuel models. This classification has been selected because of the amount of herbaceous fuel in the planning area. These herbaceous fuels have a dynamic fuel moisture component that affects the intensity at which they would burn based on the degree of seasonal curing. The Scott and Burgan (2005) system acknowledges this feature of herbaceous fuels and classifies them accordingly.

The general classification of fuels is by fire-carrying fuel type (Scott and Burgan 2005):

- (NB) Non-burnable
- (GR) Grass
- (GS) Grass-Shrub
- (SH) Shrub
- (TU) Timber-Understory
- (TL) Timber Litter
- (SB) Slash-Blowdown

Table D.1 provides a description of each fuel type.

Map J.1 in Appendix J illustrates the fuels classification throughout the planning area.

Table D.1. Fuel Model Classification for the Mesa County CWPP Planning Area

1. Nearly pure grass and/or forb type (Grass)
i. GR1: Grass is short, patchy, and possibly heavily grazed. Spread rate is moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (0.40 ton/acre).
ii. GR2: Moderately coarse continuous grass, average depth about 1 foot. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (1.10 tons/acre).
2. Mixture of grass and shrub, up to about 50% shrub cover (Grass-Shrub)
i. GS1: Shrubs are about 1-foot high, low grass load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (1.35 tons/acre).
ii. GS2: Shrubs are 1–3 feet high, moderate grass load. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (2.1 tons/acre).
3. Shrubs cover at least 50% of the site; grass sparse to non-existent (Shrub)
i. SH1: Low fuel load, depth about 1 foot, some grass fuels present. Spread rate very low (0–2 chains/hour); flame length very low (0–1 feet).
ii. SH2: Moderate fuel load (higher than SH1), depth about 1 foot, no grass fuels present. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (5.2 tons/acre).
iii. SH5: Heavy shrub load. Fuel bed depth 4–6 feet. Spread rate very high (50–150 chains/hour), flame length very high (12–25 feet).
iv. SH7: Very heavy shrub load, possibly with pine overstory. Fuel bed depth 4–6 feet. Spread rate high (20–50 chains/hour); flame length very high (12–25 feet).
4. Grass or shrubs mixed with litter from forest canopy (Timber-Understory)
i. TU1: Fuel bed is low load of grass and/or shrub with litter. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (1.3 tons/acre).
ii. TU5: Fuel bed high load conifer with shrub understory. Spread rate moderate (5–20 chains/hour); flame length moderate (4–8 feet).
5. Dead and downed woody fuel (litter) beneath a forest canopy (Timber Litter)
i. TL3: Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 foot); fine fuel load (0.5 ton/acre).
ii. TL8: Long needle litter; long needle fuel. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet).
6. Insufficient wildland fuel to carry wildland fire under any condition (non-burnable)
i. NB1: Urban or suburban development; insufficient wildland fuel to carry wildland fire.
ii. NB3: Agricultural field, maintained in non-burnable condition.
iii. NB9: Bare ground.

Notes: Based on Scott and Burgan's (2005) 40 Fuel Model System.

More detailed information on fuels within the planning area can be found in Chapter 2.

Topography

Topography is important in determining fire behavior. Slope steepness, slope aspect, elevation, and landscape features can all affect fuels, local weather (by channeling winds and affecting local temperatures), and the rate of spread of wildfire. The topography in the planning area is extremely

diverse, from the relatively flat, gently sloping Grand Valley to the steep mesas of the Grand Mesa and the Colorado National Monument. Aspect and slope can assert significant influence on fire behavior, so where topography does fluctuate, flame lengths and rate of spread could vary considerably. The Colorado and Gunnison Rivers for example can influence diurnal and topographic winds due to canyon walls funneling wind and uneven rates of heating between water and bare ground both of which generate unpredictable winds. River corridors and tributaries may funnel fire and intensify fire behavior.

More detailed information regarding topography in Mesa County can be found in Appendix B.

Weather

Of the three fire behavior components, weather is the most likely to fluctuate. Accurately predicting fire weather remains a challenge for forecasters, particularly during drought conditions. As spring and summer winds and rising temperatures dry fuels, particularly on south-facing slopes, conditions can deteriorate rapidly, creating an environment that is susceptible to wildland fire. Fine fuels (grass and leaf litter) can cure rapidly, making them highly flammable in as little as one hour following light precipitation. Low live fuel moistures (typical in drought conditions throughout Colorado) of shrubs and trees can significantly contribute to fire behavior in the form of crowning and torching. With a high wind, grass fires can spread rapidly, engulfing communities, often with a limited warning for evacuation.

Weather data was utilized from a remote automated weather (RAW) station in Mesa County called Dominguez. Using an additional fire program (FireFamilyPlus) with the RAW station data, weather files that included prevailing wind direction and 20-foot wind speed were created. Fuel moisture files were then developed for downed (1-hour, 10-hour, and 100-hour) and live herbaceous and live woody fuels. These files represent weather inputs in FlamMap; 97th-percentile weather is used to predict the most extreme scenario for fire behavior.

More detailed information regarding climate and weather can be found in Chapter 2.

FIRE BEHAVIOR MODEL OUTPUTS

Flame Length

Map J.2 in Appendix J illustrates the flame length classifications for the planning area. Flame lengths are determined by fuels, weather, and topography. Flame length is a particularly important component of the Risk-Hazard Assessment because it relates to potential crown fire (particularly important in timber areas) and suppression tactics. Direct attack via handline construction is usually limited to flame lengths less than 4 feet. For Flame lengths of more than 4 feet, indirect suppression is a common tactic. In Mesa County, flame lengths are classified into six categories ranging from 0 to 25+ feet in height. Flame lengths of 11- to 25+ feet are commonly found along the lower slopes of the Grand Mesa and Uncompahgre Plateau as well as in heavily timbered areas in alpine ecosystems. Throughout the valleys and shrublands, flame lengths of 1 to 8 feet are common.

Burn Probability Integrated Hazard

Map J.3 in Appendix J illustrates the burn probability in the planning areas. Burn probability is a spatial estimate of fire likelihood each year and is derived by simulating fire spread under certain conditions. This CWPP utilizes the burn probability estimates calculated in IFTDSS. IFTDSS calculates burn probability and conditional flame length for a fixed set of weather conditions for a single burn period. Simulated fires are started from randomly located ignition points. Ignitions are only located and retained on burnable

fuels, if an ignition is located on a non-burnable fuel it is discarded (IFTDSS 2023). In Mesa County, pinyon-juniper shrublands and grass shrublands are the most likely to burn in any given year.

Rate of Spread

Map J.4 in Appendix J illustrates the rate of spread classifications for the planning area. Rate of spread is a complex metric that is most heavily influenced by a combination of weather, topography, and fuels. Rate of spread is quantified using chains per hour and is classified into a 7-category scale. A chain is a forestry unit of measurement equivalent to 66 feet. The rates of spread are more diverse than flame length and fireline intensity with rates in the low, moderate, high, and extreme categories. Low to moderate (0–20 chains/hour) rates of spread are found in higher elevation regions along the Grand Mesa and Uncompahgre Plateau. The highest rates of spread (50–150+ chains/hour) are associated with the grass and shrub fuels in the unincorporated parts of the county around Glade Park, Gateway, east and west of De Beque, and along the Colorado State Highway 330 corridor. Extreme rates of spread are found around many communities and the Core Team acknowledges that the rate of spread of wildfire is the greatest concern in terms of fire behavior and risk. Agricultural and urban areas are clearly delineated in this model by their low rate of spread; however, these fuel types can also pose a severe hazard during certain times of the year and are often areas of ignition through human activity in urban areas or agricultural burning of crops and land.

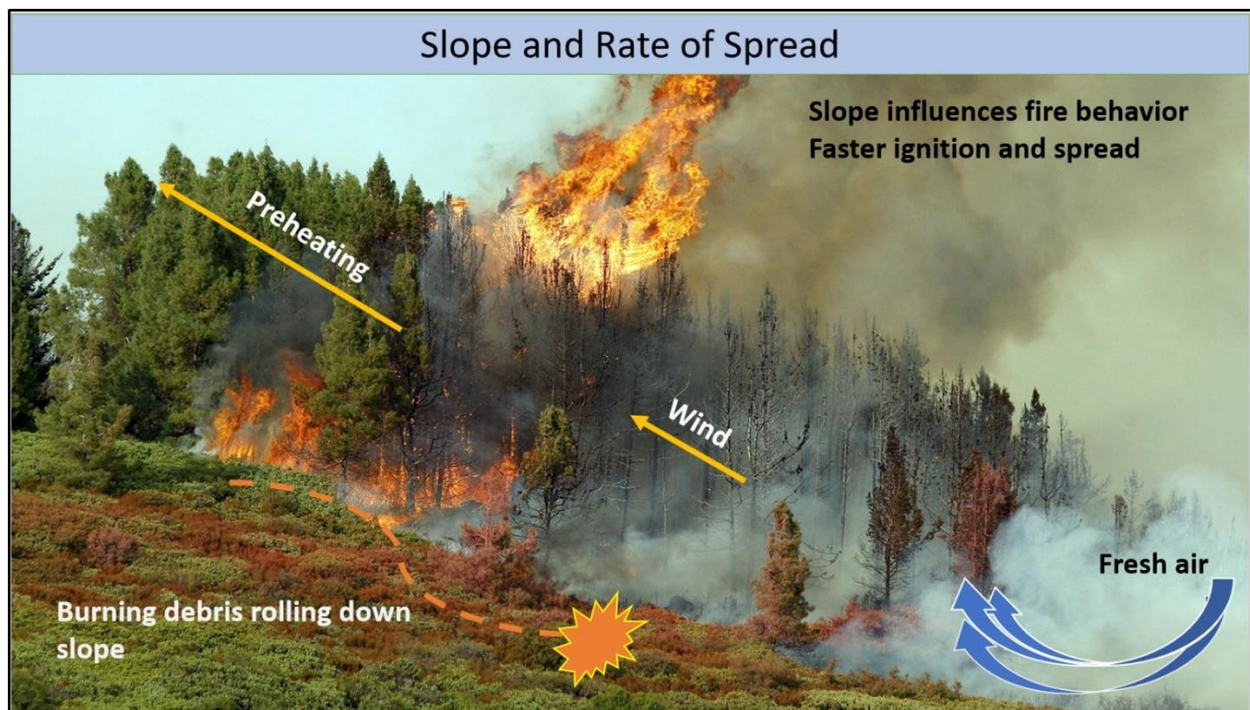


Figure D.1. Effect of topography on fire behavior.

Crown Fire Activity

Map J.5 in Appendix J illustrates the range of crown fire activity from surface fire (in grass-dominated areas) to passive and active crown fire (in timber-dominated fuels). Crown fire activity is represented by categories none, surface, passive, and active. Active crown fires are most predicted in the high alpine forests and tall shrubs on steep slopes, while passive crown fires are more predicted in the lodgepole pine forests. Both active and passive crown fire activity is found in areas of dense and tall vegetation

typically on steep slopes or in vegetated draws. Surface fires are usually predicted in flatter areas of the county as well as sparse shrublands and grasslands in both low and high elevations.

Fire Occurrence/Density of Starts

Map J.6 in Appendix A illustrates the fire occurrence density for the planning area. Fire occurrence density has been determined by performing a density analysis on fire start locations with ArcGIS Desktop Spatial Analyst. These locations have been provided by the county, the CSFS, and the BLM as GIS points, and when combined the points show the location of fire starts within the project area over the last 22 years (1985–2012). The density analysis has been performed over a 5-mile search radius. The density of previous fire starts is used to determine the risk of ignition of a fire. Map 6 in Appendix A reveals a definite pattern of fires close to populated areas and along all highways. High fire density is observed throughout the central core of the county, with the greatest density (>1 fire per square mile) occurring around Grand Junction and the Redlands and between Palisade and De Beque on BLM lands.

The fire occurrence maps are used to provide information on areas where human- and lightning ignited fires are prevalent and hence could be more prone to fire in the future.

Figures 2.11 and 2.17 in Chapter 2 illustrate the fire history for the planning area. These perimeter occurrences have been provided by NIFC, Monitoring Trends in Burn Severity (MTBS), and local input. These perimeters show the known and estimated location of fire perimeters within the planning area from 1931 to 2021.

Figure 2.18 (Chapter 2) reveals a cluster pattern of fires in the WUI regions of the county. Fire occurrences are most common near the major towns/municipalities and highways. The fire history map is used to provide information on areas where human-ignited fires are prevalent and hence could be more prone to fire in the future and where there is a higher density of lightning ignitions due to topographic conditions and receptive forest fuels.

Other Data Layers

The USFS's 97th percentile wildfire suppression difficulty index (SDI) was incorporated in the risk assessment. "SDI factors in topography, fuels, expected fire behavior under prevailing conditions, fireline production rates in various fuel types with and without heavy equipment, and access via roads, trails, or cross-country travel" (USFS 2023). WUI delineations and fire station service areas were conducted by SWCA. HVRAs come from IFTDSS and have been reviewed and amended by the Core Team. The Core Team also customized model input weighting for fire behavior modeling to more closely reflect conditions and concerns regarding Mesa County specifically.

Composite Risk-Hazard Assessment GIS Modeling Process

The Composite Risk-Hazard Assessments are comprised of multiple inputs which can be grouped into three categories: hazard, threat, and values. The result is a raster data layer that weighs and sums those inputs to determine risk. Think of a deck of cards with each card representing a data set. Datasets in the hazard category include historical weather data, topography, vegetation and fuel regimes. Datasets in the threat category include fire history points and perimeters. The values category includes the WUI, distance from the fire station, and natural, cultural, and socioeconomic assets datasets.

As shown in Figure D.2 the elements in the shaded boxes were used to prepare a landscape file for the planning area. This landscape file compiles multiple LANDFIRE datasets, including fuels, slope, elevation, and aspect into one layer that can then be used to develop fire behavior outputs.

Next, in Esri ArcGIS Pro, the fire history, fire station, WUI, and HVRA datasets were processed to merge and create buffers where appropriate and converted the layers to rasters with the same spatial extent and resolution as the IFTDSS fire behavior outputs (30-meter cell size).

Lastly, ArcGIS Pro was used to run the aforementioned weighted sum raster process to add all the inputs together. A list of weights, as agreed upon by and with input from the Core Team (provided in Figure D.3), was used for all input layers. In addition, while weighted sum composite rasters can be better for describing more detailed variations in risk, they can be overwhelming and difficult to understand. Therefore, a reclassified raster was created from the weighted sum composite, using the natural breaks (Jenks) method, with four categories of low, medium, high, and extreme risk.

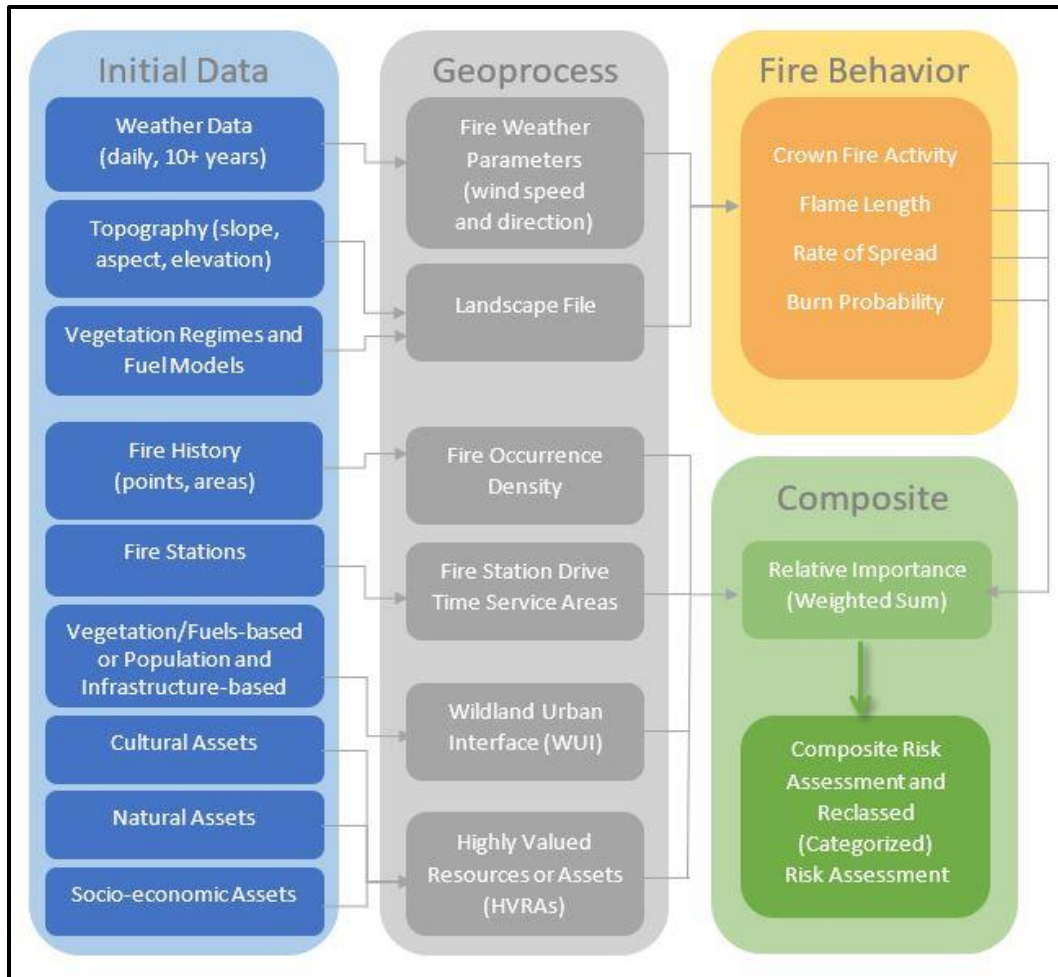


Figure D.2. Conceptual representation of the Risk-Hazard Assessment model data inputs and processes.

COMPOSITE RISK-HAZARD ASSESSMENT GIS MODEL

All data used in the risk assessment have been processed using ESRI ArcGIS Pro and the ESRI Spatial Analyst Extension. Information on these programs can be found at <http://www.esri.com>. Data have been gathered from all relevant agencies, and the most current data have been used.

All fire parameter datasets have been converted to a raster format (a common GIS data format comprising a grid of cells or pixels, with each pixel containing a single value). The cell size for the data is

30 × 30 meters (98 × 98 feet). Each of the original cell values have been reclassified with a new value between 1 and 4, based on the significance of the data (1 = lowest, 4 = highest). Prior to running the models on the reclassified datasets, each of the input parameters have been weighted; that is, they are assigned a percentage value reflecting that parameter's importance in the model. We used the weighted sum raster overlay geoprocessing tool to stack each geographically aligned dataset and evaluate an output value derived from each cell value of the overlaid dataset in combination with the weighted assessment.

In a weighted sum model (Figure D.2), the weighted values of each cell from each parameter dataset are added together so that the resulting dataset contains cells with summed values of all the parameters. The resulting dataset contains only values 1 through 4 (1 = low, 2 = medium, 3 = high, 4 = extreme) to denote fire risk. The assigned weights that we used in our risk assessment are described in Figure D.3. This method ensures that the model resolution is maintained in the results and thus provides finer detail and range of values for denoting fire risk.

Figure 4.2 in Chapter 4 is the risk assessment for the planning area; it combines all the fire behavior parameters described above. The risk assessment classifies the planning area into low, moderate, high, and extreme risk categories.

The risk assessment depicts diverse wildfire risk across Mesa County. The most extreme risk (shown in red) is associated with the shrubland fuels around Glade Park, along the Colorado State Highway 141 corridor and Unaweep Canyon, along the Colorado State Highway 330 corridor through Plateau Valley, and along the I-70 corridor from Palisade to De Beque. A more detailed discussion of the GIS Risk/Hazard Assessment map is provided below.

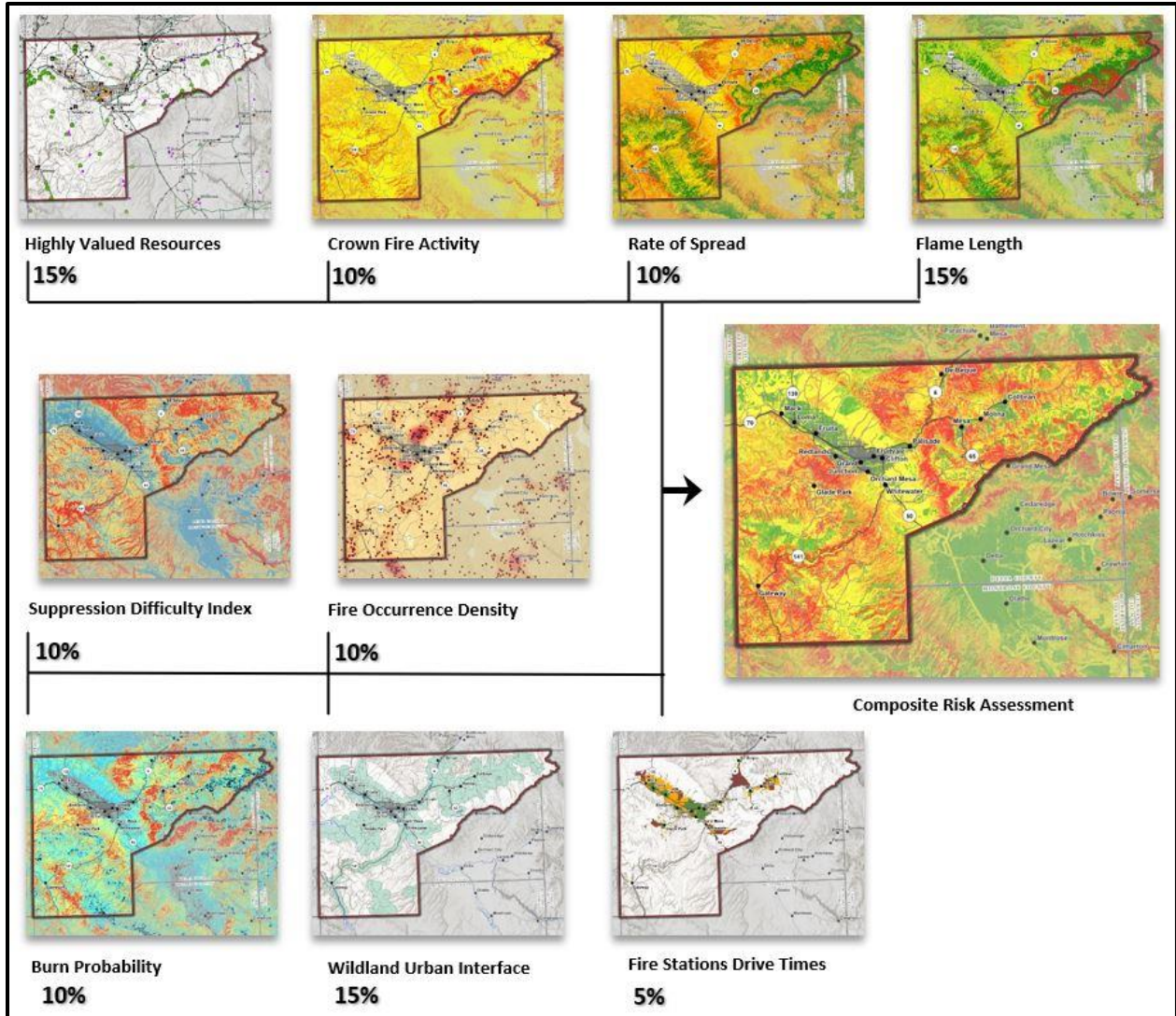


Figure D.3. Composite Risk-Hazard Assessment inputs. Model weight percentages were determined by the Core Team and wildfire subject matter experts.

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SWCA

APPENDIX E:
Project Recommendations

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Table E.1. Broad, Long-Term Recommendations to Create Resilient Landscapes (Fuel Treatments)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	H	2023-2028	Reduce tamarisk and Russian olive vegetation.	All riparian areas throughout the county; priority areas: <ul style="list-style-type: none"> Colorado and Gunnison River corridors Colorado Parks and Wildlife areas Redlands Orchard Mesa Fruita Palisade 	Private, county, state, and federal lands.	Utilize the partnership between Rivers Edge West and the City of Grand Junction and Fruita as a template. Build collaboration by working with a variety of agencies, non-profits, and local watershed groups. Removal of tamarisk by cut and stump treatment or entire root extraction. Thin-from-below treatments in cottonwood to raise the crown base height to >8 feet. This helps to reduce potential crown fire in cottonwood. Slash removal and disposal. Selective removal of other non-natives from the riparian ecosystem. Follow-up revegetation treatments. See Appendix D for a more detailed description of the methods used. Staggered removal and reclamation are important to ensure maintenance of yellow-billed cuckoo habitat. The bird has adapted to Russian olive understory and cottonwood overstory. Ensure effectiveness of reclamation before beginning removal on a new property.	Protect critical habitat for the yellow-billed cuckoo, cottonwood galleries, within a 15-mile reach of designated critical habitat for the following: <ul style="list-style-type: none"> humpback chub, Colorado pikeminnow, razorback sucker, bonytail chub The desired habitat is a complex vertical structure – a cottonwood and willow gallery. Help mitigate extreme fire behavior in timber fuels and reduce potential spread to communities adjoining the river. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Monitor effects on wildlife populations, soils, understory vegetation, invasive species, and water yield. Potential for community monitoring programs that include schools and youth groups. Contact: RiversEdge West – Rusty Lloyd rlloyd@riversedgewest.org (970) 256-7400 Also trained youth corps: Western Colorado Conservation Corp – J. Roberts jroberts@mesapartners.org (970) 241-1027	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	H	2023-2026	Conduct fuel treatments to address ignitions in high use riparian areas.	Natural creeks, drainages, and streams where human activity is high. Riparian areas throughout urban zones are the highest priority. <ul style="list-style-type: none"> North desert and roller dam 	Multi-agencies – private, BLM, parks and wildlife, Desert River Collaborative	Conduct hazardous fuel treatments in riparian areas utilizing a toolbox approach for methodologies. <ul style="list-style-type: none"> Work with homeowners to create and remove slash piles in riparian areas near property. Utilize the County's masticator for areas where slash piles are not appropriate. Focus on the removal of invasive species. Conduct fuel treatments that improve the ability to contain human caused ignitions. 	<ul style="list-style-type: none"> Reduce the overuse of riparian areas. Limit the spread of invasive plants and the accumulation of trash. Dispose of hazardous fuels. Decrease the potential for severe wildfire behavior. Improve the feasibility of future fuel reduction projects. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Conduct annual surveys along riparian corridors in urban areas. Utilize nearby property owners as points of contact for reporting on ignitions occurring in nearby riparian areas.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	M	2023-2029	Treat and remove invasive species and hazardous fuels along the railroad right-of-way (ROW).	Railroad throughout the extent of the county. priority areas are between Palisade and De Beque where frequent fires along the railroad have occurred	Railroad, BLM, County	Treat areas directly within the railroad right of way (ROW). Coordinate with the railroad on determining treatment parameters and responsibility. Utilize mowers, weed whackers, and other mechanical treatments. Consider and evaluate the effectiveness of cultural and biological treatments.	<ul style="list-style-type: none"> Help reduce railroad-associated ignitions in the railroad ROW. Limit the inter-county and inter-state spread of invasive plants. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Work with the railroad to establish an action plan and treatment cataloging protocol.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
M		2023-2029	Treat and remove invasive species and hazardous fuels along the highway right-of-way (ROW).	County, state, and federal highways and ROWs. Glade Park is an area of concern.	Colorado Department of Transportation, Mesa County	Regular maintenance needed to ensure clearance of vegetation and reduced fuels density. Monitoring should occur prior to fire season (February) and in the fall (October). <ul style="list-style-type: none"> Coordinate with the Colorado Department of Transportation and Mesa County Public Works. Explore the option of using prison crews to carry out mowing and maintenance of right-of-way. Extend the mowing width to the fence line. 	<ul style="list-style-type: none"> Protect life and property Reduce the ability for wildfire to spread in and from the highway ROW protect evacuation routes in event of a wildfire. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Work with transportation agencies to establish an action plan and treatment cataloging protocol.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
H		2023-2026	Establish fuel breaks in coordination with state and federal agencies and private landowners	Mesa County, areas of concern, areas of high risk, and areas close to the WUI. Specific communities include Glade Park and Plateau Valley	Mesa County, state, federal, and private lands	Strategic placement of treatments on public and private land will improve effectiveness. Fuel break prescriptions should be site-specific, depending on fuel type, topography, soils, and adjacent land management practices. Examples include mowing and blading strips along fence lines or shaded fuel breaks in a wildlife-friendly mosaic pattern. <p>Coordinate with the following entities on fuel break determination and construction: UCR, CSFS, Mesa County, and the County Fire Warden.</p> <p>Utilize the risk assessment maps and areas of concern maps to prioritize the location for fuel breaks.</p> <p>Reference fire behavior, and fuel model maps to plan appropriate prescriptions and prepare for expected fire behavior.</p>	<ul style="list-style-type: none"> Help mitigate extreme fire behavior and provide an area from which firefighters can safely suppress a fire. Reduce the rate of spread of wildfire. Provide pre-planning for severe wildfires. Align with the following plans: <ul style="list-style-type: none"> Mesa County HMP (2020) Mesa County Fire Plan (2004) Colorado Forest Action Plan (2020) 	Regular maintenance is needed to ensure access is clear of vegetation or obstructions. Monitoring should occur prior to fire season (February) and in the fall (October). <p>Catalog fuel breaks in an online GIS platform. Ensure suppression resources have access to this catalog.</p>	<ul style="list-style-type: none"> GSA Federal Excess Personal Property (FEPP) Firewise Grants BRIC RCP Fire Prevention and Safety (FP&S) Grants (FEMA) Community Wildfire Defense Grants (CWDG) National Urban and Community Forestry Challenge Cost Share Grant Program U.S. Endowment for Forestry and Communities Western Bark Beetle Program Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
H		2023-2026	Protect critical infrastructure and key resources (CIKA)	Mesa County, Utility company rights-of-way, public infrastructure.	Utility company infrastructure and lands. County, state, and federal lands. Public infrastructure	Coordinate with local utility companies. Review the wildfire mitigation plan (WMP) for the Delta-Montrose Electric Association (DMEA) service area and other utilities as applicable. <ul style="list-style-type: none"> Maintain clearance under power lines and around posts. Identify and remove hazard trees in close proximity to lines. Utilize appropriate measures for utilities and the specific critical infrastructure. Establish multiple objectives to achieve comprehensive protection of CIKA. Support transition to underground utility lines 	Prevent destruction of energy or communications infrastructure in event of a wildfire. <p>Examples of CIKA include:</p> <ul style="list-style-type: none"> Powerlines and transmission lines Substations Communication towers Water infrastructure Align with the following plan: <ul style="list-style-type: none"> Mesa County HMP (2020) 	Work with utility companies to establish an action plan and treatment cataloging protocol.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	M	2023-2030	Address Pinyon Ips Bark Beetle infestations	Mesa County	Federal, state, and local FPDs	<p>To help dispose of hazardous fuels acquire:</p> <ul style="list-style-type: none"> biomass chippers air curtain burners dump bed trailers green waste facilities <p>Consider the availability and effectiveness of vegetation management contractors who can also help dispose of hazardous fuels.</p> <p>Pursue funding avenues to acquire more equipment so fuel treatments can be carried out</p> <p>Provide homeowner education on how private landowners can address ips on their property</p> <p>Conduct Strategic thinning at the right time to address the Ips Beetle infestations.</p> <p>Fuel treatments can help improve the resiliency of pinyon stands to the Ips Beetle which will improve forest health.</p>	<ul style="list-style-type: none"> Dispose of hazardous fuels Decrease the potential for severe wildfire behavior Improve the feasibility of fuel reduction projects <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) Colorado Forest Action Plan (2020) 	<p>Convene annually to track the status and availability of equipment to the County.</p> <p>Annual discussion regarding cost/benefit analysis for purchases.</p> <p>Catalog treatments in an online GIS platform.</p>	<ul style="list-style-type: none"> National Urban and Community Forestry Challenge Cost Share Grant Program Firewise grants U.S. Endowment for Forestry and Communities NFP SRS Title III
	H	2023-2026	Increase the use of prescribed burning as a fuel reduction method.	Mesa County	County, state, and federal lands	<p>Gain support for using prescribed burns to reduce fuel loads and to improve ecosystem health, where grazing needs allow.</p> <ul style="list-style-type: none"> Formulate burn plans with state and federal guidelines. Train personnel to be NWCG-certified burn bosses (RXB2). Reach out to surrounding fire agencies to collaborate on prescribed burns. This will improve the capacity to accomplish many/large acreage burns. 	<ul style="list-style-type: none"> Protect communities and infrastructure by reducing fuel loads. Improve landscape resiliency to severe wildfire Promote healthy successional vegetation Provide habitat for fire-adapted species. <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) Colorado Forest Action Plan (2020) 	<p>Survey post-burn severity and record prescribed burning operations in an online GIS platform.</p> <p>Establish annual goals and objectives for prescribed burning operations.</p>	<ul style="list-style-type: none"> GSA Federal Excess Personal Property (FEPP) Firewise Grants BRIC RCP Fire Prevention and Safety (FP&S) Grants (FEMA) Community Wildfire Defense Grants (CWDG) National Urban and Community Forestry Challenge Cost Share Grant Program U.S. Endowment for Forestry and Communities Western Bark Beetle Program Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	H	2023-2028	Collaborate with federal and state partners on roadside thinning and roadside wildfire mitigation projects. Consider wildlife migration corridors and passages. Funding may be available if these factors are addressed.	Highest risk roadways as identified in the risk assessment.	County, state, federal agencies, and private landowners	<p>Frequent maintenance/removal of hazardous fuels:</p> <ul style="list-style-type: none"> Set appropriate fuel buffer standards for high-risk roads Treat hazardous fuels on high-risk roadsides (e.g., invasive species and potential ladder fuels) <p>Consider increased implementation, updates, and/or development of vegetation management plans for high-risk roads</p>	<p>Create strategic fuel breaks along roadways to reduce the potential for wildfire ignitions and wildfire spread along roadways.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) Colorado Forest Action Plan (2020) Colorado State Forest Service Five-Year Strategic Plan (2021) 	<p>Regular monitoring and maintenance are needed to ensure fuels on roadsides do not become hazardous.</p> <p>Annual assessment regarding collaboration. Assess success and implement lessons learned for the following year. Catalog treatments in an online GIS platform.</p>	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	M	2023-2028	Remove abandoned structures and clean up yard debris.	Private lands across all communities.	County and private lands	<p>Establish a community bulletin for homeowners to post information on abandoned structures and messy yards. Consider working with local volunteer groups to increase capacity.</p> <ul style="list-style-type: none"> Conduct mechanical thinning and manual clearing. Develop an enforcement program providing the County with cause to clean up derelict or abandoned lots. Develop an incentive program for homeowners. 	<ul style="list-style-type: none"> Protect life and property by preventing the spread of fire from wildland to structural fuels. Improve firefighter safety by providing clear access to structures in the WUI. <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) 	Develop a community task force to carry out assessments of properties. Create an online bulletin board for community members to report abandoned structures and messy yards.	<ul style="list-style-type: none"> Building Resilient Infrastructure and Communities (BRIC) Grants National Fire Plan (NFP) Grants Firewise Grants Regional Catastrophic Preparedness (RCP) grants 2022 Infrastructure Investments and Jobs Act Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	M	2023-2030	Seek grants for projects to improve watershed resiliency to wildfires and subsequent flooding.	Watersheds with threats to life and property.	The county, cities, conservation districts, or tribes are eligible to be sponsors; landowner-scale restoration can occur under the umbrella of the sponsor.	<p>Integrate Wildfire Ready Watersheds into the County's watershed planning process. Utilized the WRW action plan and resources for project design and implementation.</p> <ul style="list-style-type: none"> Stabilize streambanks to prevent erosion Repair dams and levees Remove hazardous riparian debris Establish vegetation within watersheds Identify drinking water concerns for municipal watersheds 	<p>Prevent natural disasters such as floods and wildfires from having devastating impacts on local communities and the environment.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) Colorado State Forest Service Five-Year Strategic Plan (2021) Colorado State Water Plan (2023) 	Ongoing design, planning, and implementation of projects as necessary.	<ul style="list-style-type: none"> Emergency Watershed Protection (EWP)_Program BRIC Regional Catastrophic Preparedness (RCP) grants Forest Restoration & Wildfire Risk Mitigation (CSFS) 2022 Infrastructure Investments and Jobs Act

Table E.2. Recommendations for Creating Fire-Adapted Communities (Public Education and Reducing Structural Ignitability)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	M	2023-2028	Increase public education and outreach regarding wildfire.	Countywide	Local FPDs, HOAs, Two Rivers Wildfire Coalition, state and federal agencies	<p>Increase education through community training.</p> <ul style="list-style-type: none"> Targeted wildfire info sessions Distribute wildfire and natural hazard education materials. Distribute a list of mitigation actions broken down by cost. Utilize Appendix G of the CWPP: Homeowner Resources Promote the use of and referral to the West Region Wildfire Council web page. Education and outreach for people who live outside of Fire protection districts. Offer hands-on workshops to highlight individual home vulnerabilities and how-to techniques to reduce the ignitability of common structural elements. Utilize current popular information sources (Nextdoor, social media, Twitter, etc.) <p>Implement youth fire prevention programs (can work with camps, schools, clubs, etc.)</p> <ul style="list-style-type: none"> Outreach to encourage more young people to join emergency response teams Distribute Firewise information to school children during Fire Prevention Week. <p>Utilize and improve existing signage</p> <ul style="list-style-type: none"> Spread seasonally adjusted fire prevention messages along highways and in public open space areas to reduce human ignitions and promote defensible space. Promote the use of existing electronic signs at fire stations and other locales to display fire prevention information, safety messages, and fire danger ratings linked to safety actions. 	<p>Protect communities and infrastructure by raising awareness of local citizens and those traveling in the area about actions that can prevent fires.</p> <p>Deliver a clear and consistent message to the public.</p> <p>Reach diverse audiences.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) 	<p>Yearly updates to materials.</p> <p>Annual review of the number of events implemented.</p> <p>Set goals for the following year.</p>	<ul style="list-style-type: none"> RCP BRIC Firewise grants National Urban and Community Forest Program FP&S (FEMA) Environmental Protection Grants (EPA) Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	H	2023-2025	Create and promote defensible space standards. Encourage home hardening. Improve homeowner mitigation efforts and opportunities.	WUI, countywide, high-risk areas as identified in the risk assessment.	Private, County Planning Commission, local FPDs, West Region Wildfire Council, HOAs, Two Rivers Wildfire Coalition, and community leaders	<p>Adhere to CSFS recommended defensible space standards (e.g., support 100 feet of defensible space).</p> <ul style="list-style-type: none"> Clean and maintain fuel buffers in ingress/egress routes. Support the creation/maintenance of two methods of egress out of a community. Support landscaping methods across multiple properties that reduce fire potential (e.g., connect fuel treatments across different properties). Develop a staffing plan to support enforcement and seek funding to implement the plan. Provide tax incentives for defensible space actions. Work with insurance commissions & companies to determine the potential to provide incentives for defensible space associated with reduced insurance premiums. Consider fuels pickup/disposal options. Build staff capacity via grant funding to conduct home assessments and follow up with homeowners. Assist vulnerable populations (e.g. elderly, disabled, etc.) with carrying out mitigations efforts and adopting firesafe practices. <p>Promote education on the reduction of structural ignitability.</p> <ul style="list-style-type: none"> Raise awareness of the dangers of trash and debris build-up on properties and the risk that yard waste and debris fuels can pose a fire danger. Create guidance and encourage residents to encourage yard clean-ups on private property 	<p>Reduce loss of life and structures by reducing ignitability through defensible space and home hardening.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	<p>Annual home hardening and defensible space program evaluation – including assessment of staff and available funding.</p>	<ul style="list-style-type: none"> Firewise FP&S (FEMA) EPA Environmental Education Grants CWDG BRIC Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) National Urban and Community Forest Program FP&S

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	H	2023-2025	Update current fire and building codes. Develop and enact WUI Codes. Focus on land use plans, existing building codes, and subdivision codes.	County and local municipalities	The county planning commission and town governments FPDs, OEM	Strengthen municipal and county codes for homes and structures located within the WUI. <ul style="list-style-type: none"> Provide a list of examples of the costs of acceptable building materials. See a table of action items for homeowners to reduce structural ignitability in Appendix F of the CWPP. Continue to develop and adopt the latest building standards and codes. Clearly define the WUI in the county code. Consider countywide adoption of the International WUI code. Provide HOA model covenants and architectural guidelines. Public education (esp. Builders, agency staff, architects, realtors). 	Reduce wildfire risk and loss of structures through effective regulation. Align with the following plans: <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	Annual program evaluation and updates as necessary. Consider updates to the building code, where needed	<ul style="list-style-type: none"> Firewise grants FP&S (FEMA) CWDG BRIC CSFS
	H	2023-2025	Improve evacuation zones, route education and outreach to the public.	Countywide	Federal, state, and local agencies. Mesa County Sherriff's Office FPDs Two Rivers Wildfire Coalition	Identify evacuation routes. Fuel treatments adjacent to roads can reduce fire behavior along important travel routes used for ingress by emergency vehicles and egress by residents. <ul style="list-style-type: none"> Identify parcel owners along primary evacuation routes. Seek grant opportunities to support priority project implementation. Evacuation Planning <ul style="list-style-type: none"> Create/distribute education material on evacuations. Provide handouts on preparing "Go Bags" – an emergency supply bag that can be accessed in cases of evacuation. Hold meetings and community functions to provide guidance for creating household emergency plans. Construct a livestock and pet evacuation and sheltering plan. <ul style="list-style-type: none"> Utilize Appendix B for guidance on pet evacuation planning. Utilize USDA's disaster planning for animal facilities; CSU Extension's livestock resources webpage; and PetAid Colorado Disaster Services 	Improve preparedness by facilitating the communication between family members and neighbors about which procedures to follow in the event of a wildfire. Align with the following plans: Mesa County HMP (2020)	Annual Maintenance Yearly updates to materials	<ul style="list-style-type: none"> RCP BRIC Firewise grants National Urban and Community Forest Program FP&S (FEMA)
	M	2023-2028	Implement Firewise Communities programs	Countywide	County, subdivisions. (HOAs, etc. organized homeowners), contractors, Two Rivers Wildfire Coalition, developers, realtors, FPDs	Improve education and knowledge of Firewise practices. <ul style="list-style-type: none"> Continue current Firewise practices. Include Firewise information in short-term rental contracts. Free neighborhood & property assessments and mitigation planning; website sign-ups Provide wildfire assessor training. Provide home hardening resource lists, examples, and cost estimates. Consider direct mailers. Distribute Firewise information to school children during Fire Prevention Week. Re-establish a Firewise coordinator. Work with communities to participate in Firewise Communities and prepare for fire events. Hold Firewise booths at local events, for example, the Peach Festival in Palisade or during Fire Awareness Week each year. <ul style="list-style-type: none"> Conduct Firewise/Ready, Set, GO! Workshops. Offer hands-on workshops to highlight individual home vulnerabilities and how-to techniques to reduce the ignitability of common structural elements. Conduct more public meetings to educate citizens about Firewise. Provide links to Firewise websites, downloadable forms, and other resources at meetings or workshops. 	Reduce wildfire risk through greater adoption of Firewise and structure hardening measures. Align with the following plans: <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	Establish a program to assess the frequency and location of activities	<ul style="list-style-type: none"> Firewise grants National Urban and Community Forest Program FP&S (FEMA) Environmental Protection Grants (EPA) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
	M	2023-2028	Spread awareness to the community on various human-caused ignitions	Countywide	County, subdivisions. (HOAs, etc. organized homeowners), developers, realtors, Two Rivers Wildfire Coalition, FPDs, and houseless service providers	<p>Inform and educate the public about methods to reduce human-caused wildfire ignitions.</p> <ul style="list-style-type: none"> Educate around sources of human-caused wildfire ignitions (e.g., target practice, driving through or parking in tall, dry vegetation; discarded cigarette butts; fireworks; campfires, etc.). Communicate hazardous conditions surrounding homes/structures (e.g., exposed propane tanks, electrical hazards, hazard trees, limited defensible place, etc.) Provide materials with resources for the public to understand how and with what funding they can take action to reduce risks. Integrate tourism and STR advertising. Collaborate with DFPC to further understand ignition causes. <p>Utilize Appendix G of the CWPP: Homeowner Resources</p>	<p>Protect communities and infrastructure through increased awareness of fire danger for residents and visitors.</p> <p>Align with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	<p>Assess the need for maintenance and updates to the material on an annual basis</p>	<ul style="list-style-type: none"> RCP BRIC Firewise grants National Urban and Community Forest Program FP&S (FEMA)
	M	2023-2028	Develop capacity within the county to facilitate a collaborative approach to community education and wildfire preparedness.	Countywide	The county planning commission and town governments FPDs, OEM, Two Rivers Wildfire Coalition	<p>Promote interagency collaboration for protecting life and property throughout Mesa County's communities by building wildfire resilience.</p> <ul style="list-style-type: none"> Spreading awareness of mitigation activities Education projects Fundraising activities <p>Highlight the effectiveness of the Two Rivers Coalition to date, denoting the potential benefit of additional staffing support.</p>	<p>Increase public education and engagement in the wildfire mitigation process.</p> <p>Align with the following Plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County HMP (2020) 	<p>Annual evaluation to determine if the capacity for interagency collaboration and community involvement has been met.</p>	<ul style="list-style-type: none"> BRIC Firewise grants National Urban and Community Forest Program FP&S (FEMA) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	L	2023-2026	During future Mesa County CWPP update processes, address concerns regarding wildfire risk to drinking water and wastewater infrastructure.	Mesa County	Mesa County, City of Grand Junction	<ul style="list-style-type: none"> Conduct an analysis on wildfire risk to water infrastructure. Determine sediment thresholds for water treatment systems and how large wildfires may impact water treatment operations. Plan and implement mitigation strategies that improve the resiliency of water infrastructure to wildfire. 	<p>Enhance the resiliency of water treatment infrastructure to wildfire.</p> <p>Establish priority HVRAs.</p>	<p>Coordinate annually with municipalities and water treatment operators to determine priorities and concerns.</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for fire departments and first responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
	M	2023-2026	Decrease ignitions from unboxed populations.	County-wide, riparian corridors located within municipal boundaries, parks and open spaces adjacent to wildland fuels.	Mesa County, City of Grand Junction	<p>Create a task force or team of PIOs and County officials, including members of the community to create an outreach and implementation program to reduce human-caused ignitions.</p> <ul style="list-style-type: none"> Unify coordination, messaging, and goals and objectives. Evaluate areas of concern for implementation. Provide information and resources guiding individuals in the safe use of heating and cooking materials. Provide unboxed populations with opportunities to make use of fuel sources that reduce the risk of wildland ignitions. Consider implementing a fuel canister recycling program for the purpose of reducing the use of open flames and canister waste. Apply for Community Resilience Centers Program 	<p>Reduce wildland ignitions and ignitions in the WUI.</p>	<p>Quarterly PIO meeting to discuss strategies to reduce human-caused ignitions.</p> <p>Annual evaluation of program goals and objectives. Use human-caused ignition data. Coordinate with DFPC.</p>	<ul style="list-style-type: none"> Firewise grants FP&S (FEMA) EPA Environmental Education Grants CWDG

Table E.3. Recommendations for Safe and Effective Wildfire Response

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
H		2023-2025	Provide wildland fire training to local firefighters.	All county fire departments	FPDs, fire stations, rural volunteer fire departments	<ul style="list-style-type: none"> Develop agreements between agencies to provide training opportunities for fire staff. Ensure fire departments require all firefighters to be red carded. A red card is required for firefighters to work on an active federal fire incident. Increase funds for volunteer fire department training for response to fires in the WUI. Reach out to the National Wildfire Coordination Group (NWCG) for training materials, online courses, and instructor needs. Provide training opportunities for firefighter trainees to meet NWCG standards. 	<ul style="list-style-type: none"> Improve local fire department wildland fire response and suppression capabilities. Reduce the damage caused by wildfires. Reduce the likelihood of firefighter injuries and fatalities. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) 	<p>Provide annual red card training/refreshers/pack test events before the start of fire season.</p> <p>Provide online wildfire training classes/refreshers courses</p>	<ul style="list-style-type: none"> Emergency Management Performance Grant (EMPG) (FEMA) RCP BRIC Volunteer Fire Assistance (VFA) Grant (Colorado DFPC) Firewise grants Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
H		2023-2025	Provide wildland firefighting equipment and personal protective equipment to FPDs and road and bridge staff.	All county fire departments, Mesa County	FPDs, fire stations, rural volunteer fire departments, Mesa County	<p>Identify equipment needs and secure funding for wildland firefighting resources and personal protective equipment (PPE)</p> <ul style="list-style-type: none"> Identify priority equipment needs and notify appropriate personnel. Acquire equipment such as chainsaws, Type 6 fire apparatus, Mk.3 pumps, Nomex clothes, and fire shelters. <p>To obtain equipment:</p> <ul style="list-style-type: none"> Modifying/approving budgets to obtain equipment Achieve funding through fundraising/grant applications (e.g., federal, state, local, and independent grants and private donations). Collecting hand-me-downs and/or capitalizing on surplus supplies. Hiring local contractors in the event of a wildfire 	<ul style="list-style-type: none"> Improve local fire department wildland fire response and suppression capabilities. Reduce the damage caused by wildfires. Reduce the likelihood of firefighter injuries and fatalities. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) 	<p>Convene annually to document the status and amount of heavy firefighting equipment in the county.</p> <p>Complete an inventory of wildland firefighting resources (fire shelters, chainsaws, drip torches, line-packs, pumps, pumpkins, hose, fittings, etc.)</p>	<ul style="list-style-type: none"> EMPG (FEMA) RCP BRIC Firewise grants Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS) SRS Title III
H		2023-2026	Develop a countywide, interagency forum for fire training.	Mesa County	County, state, and federal	<p>Develop an online and/or in-person forum where agencies and the County can post-fire training schedules and districts can post training needs.</p> <ul style="list-style-type: none"> Identify potential training opportunities for staff and volunteers in the local area to save training and travel costs. Hire training officers to help with capacity and instruction (research NWCG instructor qualifications). Contact the Upper Colorado River (UCR) Fire Management Unit and the Colorado State Forest Service (CSFS) for additional support and cooperation as needed. 	<ul style="list-style-type: none"> Provide training opportunities. Improve wildland fire fighting capabilities and capacity. Create interagency cooperation and agreements 	<p>Conduct annual cooperator meetings. Review completion rates, certifications, and training needs.</p>	<ul style="list-style-type: none"> EMPG (FEMA) RCP BRIC Volunteer Fire Assistance (VFA) Grant (Colorado DFPC) Firewise grants Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
M		2023-2030	Identify or create strategically located water resources for fire suppression operations.	Glade Park, Plateau Valley, and other rural areas in Mesa County	County, state, federal, and private lands. Water resources in spatial relation to FPDs, fire stations, and rural volunteer fire departments.	<p>Ensure adequate water resources are placed and identified in strategic locations around the county during peak wildfire season. Locations of water resources should be cataloged in an online mapping program.</p> <ul style="list-style-type: none"> Implement temporary water storage solutions on private lands (dip tanks, pumpkins, cisterns). Conduct portable dip tank training with fire personnel. Create a countywide map of temporary water resources. Improve existing fire flows in remote areas to meet fire flow requirements Make sure fire flows in new developments meet fire flow requirements Install water tanks where feasible. In locations water tanks cannot be installed, have tanks filled and pre-loaded to be transported to areas of need in the event of a fire Install additional tanks and standpipes Install helicopter dip tanks where appropriate Initiate a detailed study of feasible locations for water development improvements Install hand pumps or other methods independent of the grid for accessing private well water Ensure suppression crews have the appropriate “keys” for hydrants or standardized water fittings 	<ul style="list-style-type: none"> Improve fire-fighting response Alleviate public and agency concerns for limited water supply in some WUI areas. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) Mesa County HMP (2020) 	<p>Conduct inventory of the county's water storage and water supply areas</p> <p>Convene annually to document actions taken and document the status of firefighting water supply resources</p> <p>Ensure firefighting resources are equipped with a GIS map on a tablet/computer showing proximity to available water resources.</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
M		2023-2030	Improve wildfire response navigation capabilities.	Mesa County	FPDs, fire stations, rural volunteer fire departments, and local communities.	<ul style="list-style-type: none"> Require reflective addresses on houses and structures Utilize GIS services to provide up-to-date, detailed maps of driveways, alleys, and access roads to fire response personnel. 	<ul style="list-style-type: none"> Improve firefighting response capabilities. Enhance public safety. Increase situational awareness <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) Mesa County HMP (2020) 	<p>Conduct inventory/assessment of reflective addressing so areas/regions can be prioritized.</p> <p>Conduct geospatial inventory of driveways, alleys and access roads and update accordingly</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP
H		2023-2026	Carry out detailed pre-incident planning and training workshops within districts and with neighboring districts and mutual aid partners.	FPDs, state, and federal fire programs	Mesa County, state, and federal	<p>Establish interagency agreements for joint training exercises and mutual aid</p> <p>Conduct the following joint training exercises</p> <ul style="list-style-type: none"> Live fire line construction. Timber falling and fire line chainsaw use. Prescribed fire operations. Medical emergency scenarios. Fire size up and multi-agency dispatch. 	<ul style="list-style-type: none"> Improve wildfire suppression response times and effectiveness. Facilitate cooperation amongst firefighting agencies. Reduce the risk of firefighter injury or death. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) Mesa County HMP (2020) Colorado Forest Action Plan (2020) Colorado State Forest Service Five-Year Strategic Plan (2021) 	<p>Conduct annual fire readiness reviews. Conduct detailed after-action reviews (AARs)</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
H		2023-2025	Revitalize the Interagency Fire Chiefs Association.	Mesa County FPDs	Mesa County Fire Chiefs Association, UCR Fire Management Unit, state and federal fire agencies	<p>Create a regional Fire Chiefs Association</p> <ul style="list-style-type: none"> Incorporate Fire Chiefs from nearby counties. Engage State and Federal agencies. Establish a "board" and conduct meetings. Establish goals and objectives for the Association. 	<ul style="list-style-type: none"> Improve interagency cooperation. Establish an association capable of creating, informing, and assessing wildfire-related management decisions. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County Fire Plan (2004) Mesa County Wildfire Annual Operating Plan (2011) Mesa County HMP (2020) Colorado State Forest Service Five-Year Strategic Plan (2021) 	<p>Conduct quarterly review meetings. Establish a mailing list. Facilitate and review public comments on Association actions.</p>	<p>FEMA, State funds, and private grants</p> <ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
M		2023-2028	Improve evacuation capabilities and maintain evacuation notification resources.	Mesa County, rural communities, urban communities	Mesa County – Office of Emergency Services, Sherriff's Office	<p>Mesa County utilizes the IPAWS evacuation notification system.</p> <ul style="list-style-type: none"> Improve delivery of notifications. Identify evacuation routes. Inform civilians of evacuation routes and evacuation protocols. Create a multi-hazard evacuation plan. 	<ul style="list-style-type: none"> Improve evacuation capabilities. Preserve life during natural disasters. Reduce the burden on law enforcement and wildfire suppression resources. <p>Aligns with the following plans:</p> <ul style="list-style-type: none"> Mesa County HMP (2020) 	<p>Conduct regular IPAWS system testing. Update evacuation information on County websites. Consider creating a small informational campaign designed to inform citizens of evacuation protocol and resources.</p>	<ul style="list-style-type: none"> EMPG (FEMA) Firewise grants BRIC RCP Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)
H		2023-2026	Improve reporting and documentation of fires.	Mesa County	Mesa County – Office of Emergency Services, Sherriff's Office, and local FPDs	<p>Create a reporting methodology and protocol for reporting and recording all wildfires in the County. Utilize a geographic information system for storing fire occurrence data. Efforts should be taken to ensure small wildfires are recorded as well. The national situation report only lists fires above 100 acres.</p>	<p>Inform planning decisions with a robust fire occurrence dataset.</p>	<p>Coordinate with interagency dispatch centers and establish fire reporting protocols with other fire agencies.</p>	<ul style="list-style-type: none"> Funding for Fire Departments and First Responders Forest Restoration & Wildfire Risk Mitigation (CSFS) Wildfire Mitigation Incentives for Local Government (CSFS) Wildfire Mitigation Resources & Best Practices (CSFS)

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APPENDIX F: Fuel Treatment Types and Methods

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FUELS TREATMENT TYPES

DEFENSIBLE SPACE

Defensible space is perhaps the fastest, most cost effective, and most efficacious means of reducing the risk of loss of life and property. Although fire agencies can be valuable in providing guidance and assistance, creating defensible space is the responsibility of the individual homeowner. The CSFS provides defensible space recommendations in its article “Creating Defensible Space Zones” (Dennis 2006).

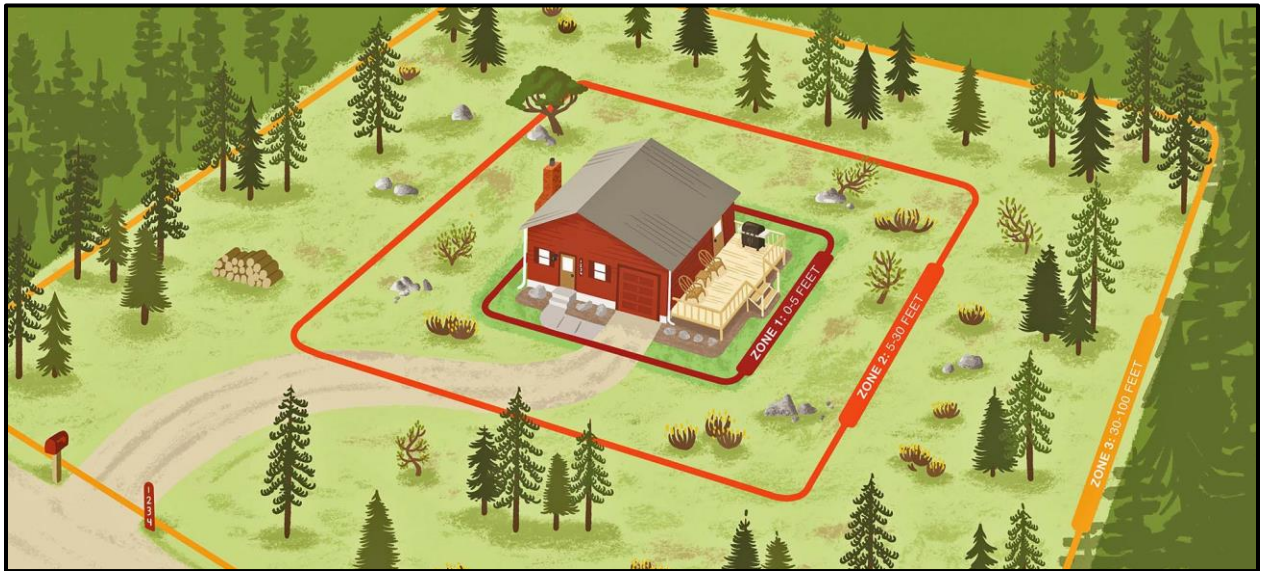


Figure F.1. Defensible space zones providing clearance between a structure and adjacent woodland or forest fuels.

Source: NFPA 2022

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

It should be emphasized that defensible space is just that—an area that allows firefighters to work effectively and with some degree of safety to defend structures. While defensible space may increase a home's chance of surviving a fire on its own, a structure's survival is not guaranteed, with or without firefighter protection. Nevertheless, when these principles are consistently applied across a neighborhood, everybody benefits. Specific recommendations should be based on the particular hazards

adjacent to a structure such as slope steepness and fuel type. Local fire authorities or a state forester should be contacted if a professional assessment seems warranted. Firewise guidelines and the

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

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

Recommendations for treating Zone 1 include (NFPA 2022):

- Remove all flammable vegetation, including shrubs, slash, mulch and other woody debris.
- Do not store firewood or other combustible materials inside this zone.
- Prune tree branches hanging over the roof and remove all fuels within 10 feet of the chimney.
- Regularly remove all pine needles and other debris from the roof, deck, and gutters.
- Rake and dispose of pine needles, dead leaves, mulch, and other organic debris within 5 feet of all decks and structures. Farther than 5 feet from structures, raking material will not significantly reduce the likelihood of ignition and can negatively affect other trees.
- Do not use space under decks for storage.

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

Recommendations for treating Zone 2 include (NFPA 2022):

- Mow grasses to 4 inches tall or less.
- Avoid large accumulations of surface fuels such as logs, branches, slash, and mulch.
- Remove enough trees to create at least 10 feet* of space between crowns. Measure from the outermost branch of one tree to the nearest branch on the next tree.
- Small groups of two or three trees may be left in some areas of Zone 2. Spacing of 30 feet* should be maintained between remaining tree groups to ensure fire doesn't jump from one group to another.
- Remove ladder fuels under remaining trees. This is any vegetation that can bring fire from the ground up into taller fuels.
- Prune tree branches to a height of 6-10 feet from the ground or a third of the total height of the tree, whichever is less.
- Remove stressed, diseased, dead, or dying trees and shrubs. This reduces the amount of vegetation available to burn and improves forest health.
- Common ground junipers should be removed whenever possible because they are highly flammable and tend to hold a layer of flammable material beneath them.
- You can keep isolated shrubs in Zone 2, as long as they are not growing under trees. Keep shrubs at least 10 feet* away from the edge of tree branches.
- Periodically prune and maintain shrubs to prevent excessive growth. Remove dead stems annually.

- Spacing between clumps of shrubs should be at least 2 1/2 times* their mature height. Each clump should have a diameter no more than twice the mature height of the vegetation. Example: For shrubs that grow 6 feet tall, space clumps 15 feet apart or more (measured from the edge of the crowns of vegetation clumps). Each clump of these shrubs should not exceed 12 feet in diameter.

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

Zone 3 This zone, which consists of an area of 30-100 feet around the structure, focuses on mitigation that keeps fire on the ground, but it is also a space to make choices that can improve forest health. Healthy forests include trees of multiple ages, sizes, and species, where adequate growing room is maintained over time. If the distance of 100 feet to the edge of Zone 3 stretches beyond your property lines, it is encouraged to work with adjoining property owners to complete an appropriate defensible space. If your house is on steep slopes or has certain topographic considerations, this zone may be larger.

Recommendations for treating Zone 3 include (NFPA 2022):

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

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

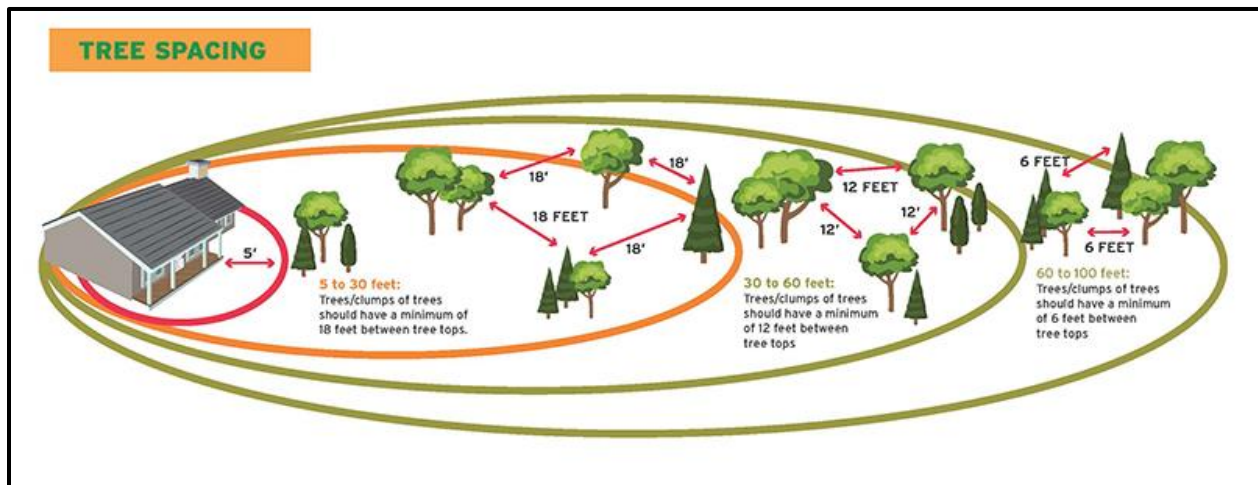


Figure F.2. Recommended tree spacing.

Source: NFPA 2022



Figure F.3. Recommended minimal vertical clearance.

Source: CAL FIRE 2022

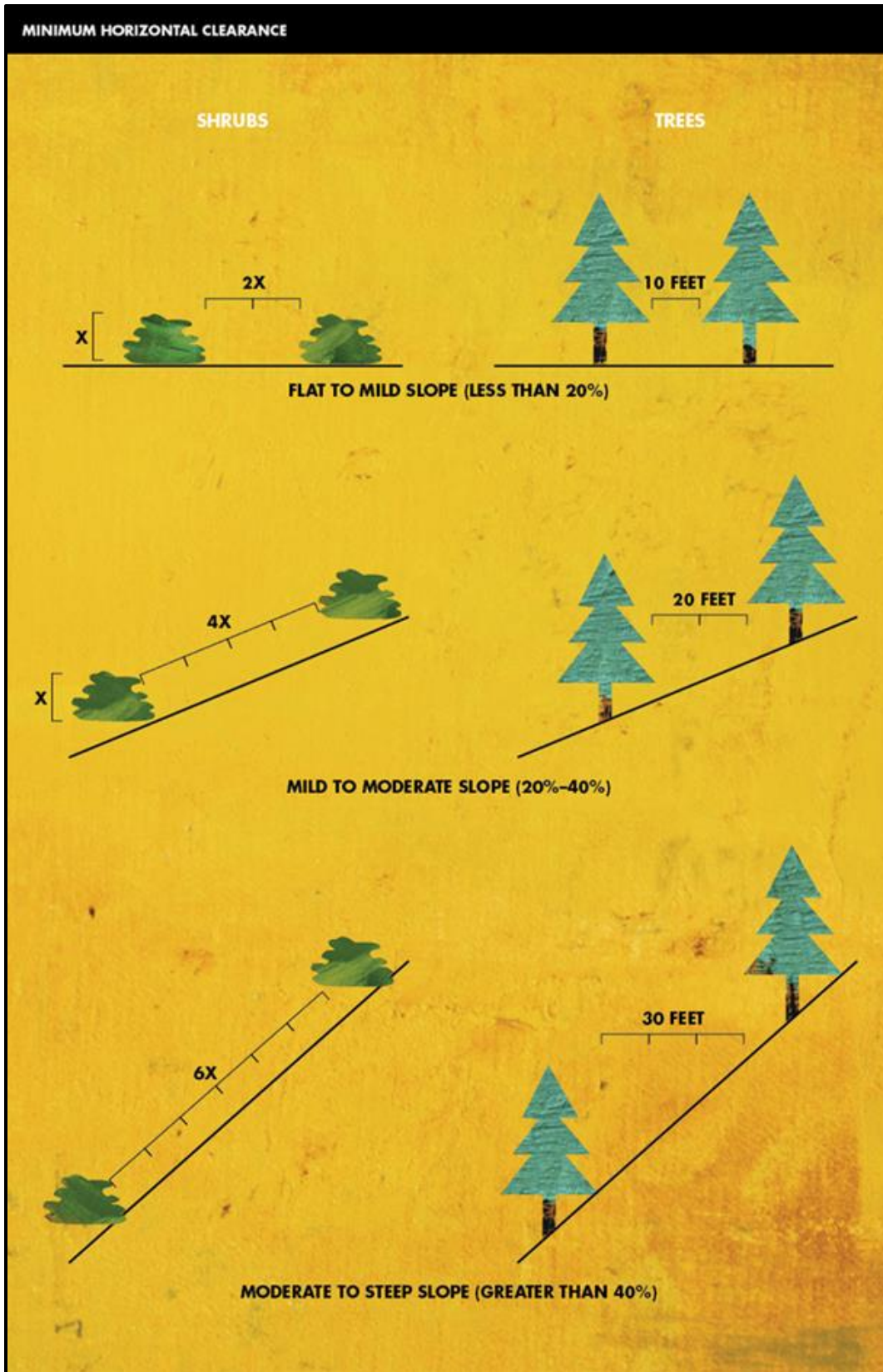


Figure F.4. Recommended minimal horizontal clearance.

Source: CAL FIRE 2022

Specific recommendations should be based on the hazards adjacent to a structure such as slope steepness and fuel type. Firewise guidelines and the Homeowner’s Guide (see Appendix G) are excellent resources but creating defensible space does not have to be an overwhelming process. The NFPA offers a free [Community Wildfire Risk Assessment Tutorial](#) and an online learning module: [Understanding the Wildfire Threat to Homes](#). Both tools are great resources for learning about, and implementing, defensible space.

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

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

Year	Project	Actions
1	Basic yard cleanup (annual)	Dispose of clutter in the yard and under porches. Remove dead branches from yard. Mow and rake. Clean off roofs and gutters. Remove combustible vegetation near structures. Coordinate disposal as a neighborhood or community. Post 6-inch reflective address numbers visible from road.
2	Understory thinning near structures	Repeat basic yard cleanup. Limb trees up to 6–10 feet. Trim branches back 15 feet from chimneys. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
3	Understory thinning on private property along roads and drainages	Limb trees up to 6–10 feet. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
4	Overstory treatments on private property	Evaluate the need to thin mature or diseased trees. Prioritize and coordinate tree removal within neighborhoods to increase cost effectiveness.
5	Restart defensible space treatment cycle	Continue the annual basic yard cleanup. Evaluate need to revisit past efforts or catch those that were bypassed.

FUEL BREAKS AND OPEN SPACE CLEANUP

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

fuel breaks may be created by thinning along roads. This provides access for mitigation resources and firefighters, as well as enhancing the safety of evacuation routes.

Some areas adjacent to communities require fuel reduction to mitigate a hazardous condition, although are not suitable for fuel breaks. The most prevalent examples of this in the county are river and riparian corridor that run through many communities.

LARGER SCALE TREATMENTS

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

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

ACTION ITEMS FOR HOMEOWNERS TO REDUCE STRUCTURAL IGNITABILITY

Limited Investment (<\$250)

- Regularly check fire extinguishers and have a 100-foot hose available to wet perimeter of home.
- Maintain defensible space within 30 feet around home. Collaborate with neighbors to provide adequate fuels mitigation in the event of overlapping property boundaries.
- Ensure that house numbers are easily readable from the street.
- Keep wooden fence perimeters free of combustible materials. If possible, non-combustible material should link the house and fence.
- Store combustible materials (propane, grills, firewood) away from the house.
- Remove flammable material from around propane tanks.
- Clear out materials from under decks and near structures. Stack firewood at least 30ft away from the house.
- Reduce your workload by considering local weather conditions. First, consider mitigating hazards on the side of your property that faces the prevailing wind direction. Then work around to cover the whole property.
- Keep gutters free of combustible material. Gutters can act as collection points for embers. Gutter cleaning costs: \$0.50 - \$1.50 sq ft. \$110 - \$185 for a one-story home. \$125 - \$250 for a two-story home (national average)
- Maintain roofs by installing flashing, fixing holes, replacing shingles, and closing gaps. \$150 - \$400 for minor repairs (national average).

Moderate Investment (<\$1,500)

- When landscaping in the home ignition zone (HIZ) (approximately 30 feet around the property), select non-combustible plants, lawn furniture, and landscaping material. Combustible plant material like junipers and ornamental conifers should be pruned and kept away from siding. If possible, trees should be planted in groups and no closer than 10 feet to the house. Tree crowns should have a spacing of at least 18 feet when within the HIZ. Vegetation at the greatest distance from the structure and closest to wildland fuels should be carefully trimmed and pruned to reduce ladder fuels, and density should be reduced with approximately 6-foot spacing between trees and crowns.
- Work on mitigating hazards on adjoining structures. Sheds, garages, barns, etc. These can act as ignition points to your home.
- Clear and thin vegetation along driveways and access roads so they can act as a safe evacuation route and allow emergency responders access to the home.
- Construct a gravel turnaround in your driveway to improve access and mobilization of fire responders. Single-car turnaround: \$400 - \$600. Two-car turnaround: \$800 - \$1200.
- Install a roof irrigation system. \$230 - \$1500.

High Investment (\$1,500+)

- Install an environmentally friendly and fire-resistant xeriscape yard. \$5 - \$20 sq ft.
- Install screen vents with non-combustible meshing. Mesh openings should not exceed nominal 1/8 - 1/16inch size. \$2.50 sq ft. Average cost per home approximately \$5,000.
- Enclose open space underneath permanently located manufactured homes using non-combustible skirting. \$300 - \$3,000 with an average of \$1,700. Added features include home egress: \$50 - \$85 and skirting vents: \$7 - \$25 each.
- Construct a non-combustible wall or barrier between your property and wildland fuels. This could be particularly effective at mitigating the effect of radiant heat and fire spread where 30 feet of defensible space is not available around the structure.
- Install fire resistant Soffits and under eave vents to protect your home from heat and embers that can be trapped beneath roof overhangs. Soffit and fascia: \$7,000. Vents: \$1,500.
- Replace exterior windows and skylights with tempered glass or multilayered glazed panels. Average home cost: \$11,500.
- Update your roof to a non-combustible construction. Look for materials that have been treated and given a fire-resistant roof classification of Class A. \$10,000 - 15,000+.
- Upgrade exterior walls with fire resistant materials. Siding: \$12,000+, Sheathing: \$4,000+.
- Relocate propane tanks underground. \$1,500 - \$ 8,150.

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

FUEL TREATMENT METHODS

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

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

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

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

Table F.2. Summary of Fuels Treatment Methods

Treatment	Comments
Machine mowing	Appropriate for large, flat, grassy areas on relatively flat terrain.
Manual treatment with chipping or pile burning	Requires chipping, hauling, and pile burning of slash in cases where lop and scatter is inappropriate. Pile burning must comply with smoke management policy.
Brush mastication	Brush species tend to re-sprout vigorously after mechanical treatment. Frequent maintenance of treatments is typically necessary. Mastication tends to be less expensive than manual (chainsaw) treatment and eliminates disposal issues.
Timber mastication	Materials up to 10 inches in diameter and slopes up to 30% can be treated. Eliminates disposal issues. Environmental impact of residue being left on-site is still being studied.
Prescribed fire	Can be very cost effective for public land but not close to the city. Ecologically beneficial. Can be used as training opportunities for firefighters. May require manual or mechanical pretreatment. Carries risk of escape. Unreliable scheduling due to weather and smoke management constraints.
Feller buncher	Mechanical treatment on slopes more than 30% or of materials more than 10 inches in diameter may require a feller buncher rather than a masticator. Costs tend to be considerably higher than masticator.
Grazing (goats)	Can be cost effective. Ecologically beneficial. Can be applied on steep slopes and shrubby and flashy fuels. Requires close management.

MANUAL TREATMENT

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

Strategic timing and placement of fuels treatments is critical for effective fuels management practices and should be prescribed based on the conditions of each particular treatment area. Some examples of this would be to place fuel breaks in areas where the fuels are heavier and in the path of prevailing winds and to mow grasses just before they cure and become flammable. Also, burning during the hotter end of the prescription is important since hotter fires are typically more effective at reducing heavy fuels and shrub growth. In areas where the vegetation is sparse and not continuous, fuels treatments may not be necessary to create a defensible area where firefighters can work. In this situation, where the amount of fuel to carry a fire is minimal, it is best to leave the site in its current condition to avoid the introduction of more flammable, exotic species such as cheatgrass

MECHANIZED TREATMENTS

Mechanized treatments include mowing, mastication, and whole tree felling. These treatments allow for more precision than prescribed fire and are often more cost-effective than manual treatment.

Mowing, including all-terrain vehicle (ATV) and tractor-pulled mower decks can effectively reduce grass and brush fuels adjacent to structures. For heavier fuels, a number of different masticating machines can be used, including drum- or blade-type masticating heads mounted on machines and ranging in size from a small skid-steer to large front-end loaders. Some masticators are capable of grinding standing timber up to 10 inches in diameter. Other masticators are more effective for use in brush or surface fuels. Mowing and mastication do not actually reduce the amount of on-site biomass but alter the fuel arrangement to a less combustible profile.

Mowing of fuel breaks and around perimeters should take place at least once every growing season depending on the regrowth of vegetation over the course of the fire season. It is acknowledged that this may not be viable for all producers, in which case focus should be placed on areas that would pose greatest risk to life and property (e.g., the southwest edges of communities). Areas with cheatgrass should be mowed in the early spring and later in the season, depending on the amount of regeneration that takes place throughout the course of the season. Although mowing will not permanently remove stands of exotics, limiting the production of seedheads will help control their density and spread over time.

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

Mechanical shears mounted on feller bunchers are used for whole tree removal. The stems are typically hauled off-site for utilization while the limbs are discarded. The discarded material may be masticated, chipped, or burned in order to reduce the wildfire hazard and to speed the recycling of nutrients.

GRAZING

Fuel modifications targeted toward decreasing both vertical and horizontal continuity in fuels is critical as a prevention method against fire proliferation. The primary objectives for these modifications are treating surface fuels and producing low-density and vertically disconnected stands. Goat grazing is an effective, nontoxic, nonpolluting, and practically carbon-neutral vegetation treatment method. A goat grazing system typically consists of a high density of goats enclosed by a metallic or electrified fence guided by herders. Goats feed on a variety of foliage and twigs from herbaceous vegetation and woody plants (Lovreglio et al. 2014).

PRESCRIBED BURNING

Prescribed burning is also a useful tool to reduce the threat of extreme fire behavior by removing excessive standing plant material, litter, and woody debris while limiting the encroachment of shrubby vegetation (see Figure 4.8). Where possible, prescribed fire could occur on public land since fire is ecologically beneficial to this fire-adapted vegetation community and wildlife habitat. Some areas, particularly along roadsides, may be susceptible to the invasion of exotic species, so this practice should be carried out with management of invasive species in mind.

All prescribed fire operations will be conducted in accordance with federal and state laws and regulations. Public safety would be the primary consideration in the design of any prescribed burn plan so as to not negatively impact the WUI. Agency use of prescribed fire on public land would be carried out within the confines of the agency's fire management planning documents and would require individual prescribed burn plans that are developed for specific burn units and consider smoke management concerns and sensitive receptors within the WUI. Smoke monitors could be placed in areas where smoke concerns have been raised in the past.

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

Several burns may be needed to meet full resource management objectives, so a solid maintenance plan is needed to ensure success.

Cultural Burning

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

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

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

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

Impacts of Prescribed Fire to Communities

Prescribed fires can have impacts on air quality that may impact local communities. Impacts on a regional scale are typically only acute when many acres are burned on the same day, which is uncommon in this region. Local problems are occasionally acute due to the large quantities of smoke that can be produced in a given area during a short period of time. Residents with respiratory problems may be impacted during these burning periods since smoke consists of small particles of ash, partly consumed fuel, and liquid droplets that are considered air pollutants.

Other combustion products include invisible gases such as carbon monoxide, carbon dioxide, hydrocarbons, and small quantities of nitrogen oxides. Oxides of nitrogen are usually produced at temperatures only reached in piled or windrowed slash or in very intense wildfires that are uncommon in the region. In general, prescribed fires produce inconsequential amounts of these gases. Inappropriate management of prescribed fires can be bothersome to residents, and it can negatively affect community health.

Smoke from burning vegetation produces air pollutants that are regulated by both the U.S. Environmental Protection Agency (EPA) and the state of Colorado (Colorado General Assembly 2020). Additionally, smoke can increase ambient air pollution levels to a point where it exceeds air quality standards (Colorado General Assembly 2020). Therefore, effective smoke management is a vital component of planning and conducting prescribed fires. The Colorado Department of Public Health & Environment has smoke management guidelines that protect the health and welfare of Californians from the impacts of smoke. In Mesa County, a permit from Mesa County Public Health (MCPH) must be obtained to start a prescribed burn and can only do so during “permissive burn days” which are outline on the MCPH webpage. To Learn more about Burn Permits in Mesa County, please visit: <https://health.mesacounty.us/openburn/>

In addition, the NWCG released the NWCG Smoke Management Guide for Prescribed Fire in 2020 (NWCG 2020). This plan is designed to act as a guide to all those who use prescribed fire. Smoke management techniques, air quality regulations, public perception of prescribed fire, foundational science behind prescribed fire, modeling, smoke tools, air quality impacts, and more are all discussed in this plan. The document is meant to pair with NWCG’s Interagency Prescribed Fire Planning and Implementation

Procedures Guide for planning and addressing smoke when prescribed fire is used (NWCG 2020). To view the plan, please visit: <https://www.nwcg.gov/sites/default/files/publications/pms420-3.pdf>.

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

Thinning and Prescribed Fire Combined

Combining thinning and prescribed fire can be the most effective treatment (Graham et al. 2004). In forests where fire exclusion or disease has created a buildup of hazardous fuels, prescribed fire cannot be safely applied, and pre-burn thinning is required. The subsequent use of fire can further reduce residual fuels and reintroduce this ecologically imperative process.

MANAGEMENT OF NON-NATIVE PLANTS

Like many ecosystems throughout Colorado, the county landscape is undergoing gradual degradation as a result of infestation by non-native species (Parker et al. 2005). These species have contributed to changing fire regimes in the county, heightening the risk of fire. A number of methods have been developed for removal of non-natives; the appropriate technique will depend on the infestation density, management objectives, environmental concerns, costs, and social considerations (Parker et al. 2005). The county maintains a list of noxious weeds rated from A to C based on the current degree of infestation of the species and the potential for eradication within the Mesa County Noxious Weed Plan (Mesa County 2020b). Additionally, the USDA maintains a list of introduced, invasive, and noxious plants by state (USDA 2022). Fuel treatment approaches should always consider the potential for introduction or proliferation of invasive non-native species as a result of management actions.

Riparian areas throughout the county have in recent decades have impacted by tamarisk intrusion. A vigorous program of removal is ongoing and showing success in many areas. Despite this, the eradication and control of tamarisk and long-term commitment are challenging, and multiple techniques are required to reduce its extent and minimize its spread. Techniques used for the management of tamarisk include mechanical, chemical, and biological methods. The current tamarisk removal programs should be used as a model for future treatments.

The methods used will depend on the size of the tamarisk stand, the characteristics of the riparian area, and the distance to a community. Tamarisk eradication has been ongoing in the county on municipal, county, BLM, and USFS administered lands; RiversEdge West has been a partner in many of these efforts. Sharing experiences and working across agency boundaries should continue to aid in enhancing this ongoing effort.

Recommendations specific to treatment of tamarisk (and Russian olive) include (summarized from CDNR 2004):

- Use previous projects as templates for future treatments (e.g., RiversEdge West in partnership with the City of Grand Junction and the Town of Fruita, Colorado National Monument treatments).

- Use the RiversEdge West or other groups such as the Nature Conservancy to do presentations to community groups.
- Encourage volunteerism; people can join the RiversEdge West for volunteer projects in the county.
- Engage private landowners who have tamarisk on their properties. CSU's Cooperative Extension Offices can provide landowner and volunteer training days at state parks, providing proper techniques for tamarisk control.
- Utilize the CSU Cooperative Extension Office for literature on tamarisk removal.
- Utilize the best scientific information from the biennial tamarisk symposium in Grand Junction.
- Encourage watershed organizations and water conservancy districts to take a leadership role in developing local partnerships to formulate and implement plans.
- Use school groups and youth groups for implementing treatments or providing monitoring (e.g., fuel reduction work and tamarisk removal in the county has also been carried out by the Western Colorado Conservation Corp [WCCC], which is trained in the above methods).
- Pursue Great Outdoors Colorado (GOCO) funds for treating tamarisk by the Colorado Division of Parks and Wildlife; this would alleviate hazardous fuels concerns on some state property in WUI areas of the Redlands and the Colorado River corridor.
- Use the local community spark plugs to facilitate access to private landowners with a tamarisk infestation.
- Engage with groups that are already active in removal of tamarisk as part of other county ventures: Colorado River Front Foundation and Commission, Mesa County Facilities and Parks Department, GOCO, Mesa Land Trust, Colorado State Parks, etc.

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APPENDIX G: Homeowner Resources

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ADDITIONAL LINKS AND RESOURCES

LOCAL RESOURCES

- Mesa County Sheriff's Office Wildland Fire Management: <https://sheriff.mesacounty.us/divisions/emergency-services/wildland-fire-management/>
- Fire Restrictions: <https://sheriff.mesacounty.us/divisions/emergency-services/fire-restrictions/>
- Fire Restrictions Map: <https://mcgis.mesacounty.us/portal/apps/MapSeries/index.html?appid=4d2a1edb1afb4e838e9131ff675aa47f>
- Emergency Management: <https://sheriff.mesacounty.us/divisions/emergency-services/emergency-management/>
- Burn Season/ Burn Permitting: <https://health.mesacounty.us/openburn/>
- Mesa County Wildland Fire Management: <https://beta.mesacounty.us/departments/sheriff/divisions/emergency-services/wildland-fire-management>
- After a Wildfire: <https://beta.mesacounty.us/departments/sheriff/divisions/emergency-services/wildland-fire-management/after-wildfire>
- After The Disaster Guidebook: <https://beta.mesacounty.us/sites/default/files/2023-01/After-the-Disaster-Guidebook-toolkit-for-landowners-impacted-by-wildfire.pdf>
 - Electricity Safety After a Wildfire
 - Inspect Your Meter
 - Reset Your Breaker Box
 - Contact Your Power Company
 - Grand Valley Power by 970-242-0040.
 - Xcel Energy 1-800-895-1999.
- During a Wildfire: <https://beta.mesacounty.us/departments/sheriff/divisions/emergency-services/wildland-fire-management/during-wildfire>
 - Be Prepared For A Wildfire
 - Sign Up For Emergency Alerts
 - How To Prepare for an Evacuation
 - When to Evacuate
 - Inside the House
 - Outside the House
 - What to Take and Do
- 6 P's Ready in Case Immediate Evacuation is Required
 - People and Pets.
 - Papers, phone numbers, and important documents.
 - Prescriptions, vitamins, and eyeglasses.
 - Pictured and irreplaceable memorabilia.
 - Personal computer hard drive and disks.
 - Plastic - credit cards and cash.

- Flood Danger After A Wildfire: <https://beta.mesacounty.us/departments/sheriff/divisions/emergency-services/wildland-fire-management/after-wildfire/flood>
 - Get Flood Insurance: <https://www.fema.gov/flood-insurance>
 - How Flooding Occurs
 - Flash Floods Safety & Preparation: <https://www.ready.gov/floods>
 - Floods After Fires (English): <https://beta.mesacounty.us/sites/default/files/2022-12/emergency-services-wildland-fire-management-floods-follow-fires-fema-flyer-english.pdf>
 - Floods After Fires (Spanish): <https://beta.mesacounty.us/sites/default/files/2022-12/emergency-services-wildland-fire-management-floods-follow-fires-fema-flyer-spanish.pdf>
 - Flood Warning: Take Action
 - Flood Watch: Be Prepared
 - Flood Advisory: Be Aware
 - Flood Safety Tips and Resources: <https://www.weather.gov/safety/flood>
 - Debris Flow Danger
 - What is a Debris Flow?
 - What Causes a Debris Flow?
 - Debris Flow Warning Signs
 - Example of Post-Wildfire Debris Flow, Las Lomas Canyon 2016: <https://www.youtube.com/watch?v=NwyDkrdQkL4>
- Health and Safety Information After a Wildfire: <https://beta.mesacounty.us/departments/sheriff/divisions/emergency-services/wildland-fire-management/after-wildfire/health-and>
 - Safe Cleanup of Wildfire Ash
 - Avoiding Possible Health Issues
 - Clean Up
- Protect Yourself from Ash Factsheet: <https://beta.mesacounty.us/sites/default/files/2022-12/emergency-services-emergency-management-fire-information-protect-yourself-from-ash-factsheet.pdf>
 - Wildfire Smoke
 - Who is at Risk?
 - Strategies to Reduce Exposure to Wildfire Smoke
 - Preparation is Key
 - Mesa Air Quality Conditions: https://health.mesacounty.us/conditions_airquality/

STATE RESOURCES

Colorado Division of Fire Prevention and Control (DFPC)

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

- Wildfire Information Resource Center: <https://dfpc.colorado.gov/sections/wildfire-information-resource-center>

Colorado State Forest Service

For Homeowners

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

Misc.

- Colorado Forest Atlas: <https://coloradoforestatlas.org/>
 - Includes spatial maps for the 2020 Forest Action Plan, Wildfire Risk Reduction Planner, and Wildfire Risk Viewer

Colorado Misc.

- Colorado Emergency Alert Notification Sign-up: <https://www.tchd.org/DocumentCenter/View/3703/Sign-Up-for-Emergency-Alert-Notifications-by-County-PDF>
- Community Preparedness – Living in the WUI and Vehicle Safety Tips: <https://dfpc.colorado.gov/communityfireprep>
- Colorado Wildfire Preparedness Plan: <https://dfpc.colorado.gov/colorado-wildfire-preparedness-plan>
- Colorado Association of Realtors Colorado Project Wildfire: <https://coloradorealtors.com/projectwildfire/>

- Common Colorado Insects and Diseases: <https://csfs.colostate.edu/forest-management/common-forest-insects-diseases/>
- Ignition Resistant Construction Design Manual: https://coloradosprings.gov/sites/default/files/2020_ignition_resistant_design_manual_march_2020.pdf
- Colorado Property and Insurance Wildfire Preparedness Guide: https://93j20c.p3cdn2.secureserver.net/wp-content/uploads/2021/08/Wildfire_22x8.5_2021.pdf

NATIONAL RESOURCES

National Fire Protection Association (NFPA):

Protecting Your Home

- Understanding the Wildfire Threat to Homes: <https://www.nfpa.org/News-and-Research/Publications-and-media/Blogs-Landing-Page/Fire-Break/Blog-Posts/2020/12/08/Interactive-online-resource-helps-build-understanding-of-wildfire-risks>
- Preparing Homes for Wildfire: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Preparing-homes-for-wildfire>
- If your Home Doesn't Ignite, It Can't Burn: <https://www.youtube.com/watch?v=RqKFDDBGd5o>
- How do Homes Burn in a Wildfire? <https://www.youtube.com/watch?v=3QthynXympl>
- Wildfire Community Preparedness Day Toolkit: <https://go.nfpa.org//14662/2022-01-11/8j6nqh>
- 5 Key Areas Around the Home You Must Examine When Assessing Wildfire Risk: <https://www.youtube.com/watch?v=MIUQVL3BvVg>
- Your Home and Wildfire, Choices That Make a Difference: <https://www.youtube.com/watch?v=pfbEcMeYFFA>
- Home Hardening Fact Sheets: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA/Firewise-USA-Resources/Research-Fact-Sheet-Series>

Preparation and Evacuation

- Wildfire Preparedness Tips: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Wildfire-safety-tips>
- Wildfire Preparedness for Household Pets: <https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionPetsChecklist.pdf>
- Wildfire Preparedness for Horses and Livestock: <https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionHorseChecklist.ashx>
- Backpack Emergency GO! Kit: <https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionBackPackGoKit.ashx>
- Outthink a Wildfire; Wildfire Action Policies: <https://www.nfpa.org/wildfirepolicy>

FEMA

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

RED CROSS

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

EPA

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

READY.GOV

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

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

MISC.

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

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APPENDIX H:

Post-Fire Recovery and Restoration

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POST-FIRE RESPONSE AND REHABILITATION

The recent increase in severe fires has highlighted the numerous complexities of post-fire response. Research indicates that high-severity burn areas may produce erosion and runoff rates 5 to 10 times higher than the rates produced by moderate-severity burn areas (Sierra Nevada Conservancy 2021). Following a fire, heavy rains may result in widespread floods carrying trees, boulders, and soil through canyons, ultimately damaging communities and critical infrastructure. In addition, aquatic resources, such as the Gunnison River, the Dolores River, the Colorado River and its tributaries and headwaters, as well as water processing facilities, may be negatively impacted or contaminated by post-fire debris, sediment, and ash. The county recognizes landslides and debris flow as a critical hazard, as past events have taken lives and caused significant property damage (Mesa County 2020a). Slope-adjacent roadways are particularly vulnerable to debris flow.

The most recent severe fire occurrence in the county was the Pine Gulch Fire which resulted in over 139,000 acres burned between July and September of 2020. The fire burned portions of the east and west slopes of the continental divide, impacting forested and alpine environments. The fire's burn intensity was attributable to several factors, including abnormally high temperatures, dry fuels due to drought, and steep terrains. These factors coupled with the presence of 40 mph winds lead to extreme fire behavior, with the fire growing 30,000 acres on the night of August 18th, requiring elevated response efforts (Mesa County Sheriff's Office 2023).

Most of forested regions in the Pine Gulch fire perimeter experienced high severity fire, while many areas dominated by shrub cover experiences moderate to high severity fire (MTBS 2023). Soil cover is dramatically reduced in areas with moderate soil burn severity (SBS), leading to increased water repellency and runoff. By contrast, soil cover is nearly non-existent in areas experiencing high SBS and the surface mineral soil has been burned to fine powder. Exposed, granular mineral soil is readily transported during rain events resulting in elevated soil erosion and sediment loading in streams, creeks, and rivers (BAER 2021).

The USFS's post-fire emergency stabilization program is called the Burned Area Emergency Response (BAER) program. The goal of the BAER program is to discover post-wildfire threats to human life and safety, property, and critical natural or cultural resources on USFS lands and take appropriate actions to mitigate unacceptable risks (BAER 2021). BAER teams are composed of trained professionals in different fields: soil scientists, engineers, hydrologists, biologists, botanists, archaeologists, and others who quickly assess the burned area and advise emergency stabilization treatments (BAER 2021).

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

- Ensuring public health and safety—prompt removal of downed and hazard trees, addressing watershed damage, and mitigating potential flooding.
- Rebuilding communities and assessing economic needs—securing the financial resources necessary for communities to rebuild homes, business, and infrastructure.
- Restoring the damaged landscape—restoration of watersheds, soil stabilization, and tree planting.
- Reducing fire risk in the future—identifying hazard areas and implementing mitigation.
- Prioritizing the needs of vulnerable and disadvantaged communities during response and disaster recovery efforts.
- Reducing post-fire recovery time by replanting native species.

- Ensuring fire protection measures enhance sustainability of restoration projects e.g., introducing prescribed fire to a fire-dependent ecosystem where fire had previously been excluded.
- Retaining downed logs for erosion control and habitat maintenance.
- Evaluating and updating disaster recovery plans every 5 years to respond to changing needs and characteristics of the community.
- Coordinating with planning, housing, health and human services, and other local, regional or state agencies to develop contingency plans for meeting short-term, temporary housing needs of those displaced during a catastrophic wildfire event.
- Incorporating forecasted impacts from climate change into trends and projections of future risk and consideration of policies to address identified risk.
- Updating codes and ordinances to specify procedures and standards for planning and permitting the reconstruction of buildings destroyed by wildfire.

The USFS and CSFS provide science-based frameworks to guide post-fire restoration efforts in State Forest lands of Colorado. This guidance outlines methods of ecological management and a step-by-step framework for agencies to follow in post-fire planning (CSFS 2022). A list of resources to guide post-wildfire rehabilitation is available at: <https://csfs.colostate.edu/forest-management/restoration-rehabilitation/>

COMMUNITY RESPONSE AND RECOVERY

Recovery of the vegetated landscape is often more straightforward than recovery of the human environment. Assessments of the burned landscape are often well-coordinated through the use of interagency crews who are mobilized immediately after a fire to assess the post-fire environment and make recommendations for rehabilitation efforts.

For the community impacted by fire, however, there is often very little planning at the local level to guide their return after the fire. Residents impacted by the fire need assistance making insurance claims; finding temporary accommodation for themselves, pets, and livestock; rebuilding or repairing damaged property; removing debris and burned trees; stabilizing the land for construction; mitigating potential flood damage; repairing infrastructure; reconnecting to utilities; and mitigating impacts to health. Oftentimes, physical impacts can be mitigated over time, but emotional impacts of the loss and change to surroundings are long-lasting and require support and compassion from the community.

After the Fire

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

Returning Home

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

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

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

- Wait to return home until fire officials declare it is safe to do so.
- Use caution when walking through burned areas. Hazards, such as hot spots and flare ups, may still exist.
- Keep a “Fire watch” for several hours after returning to watch for smoke and sparks.
- Leave immediately if there is heat or smoke coming from a damaged structure.
- Avoid damaged or fallen power lines, poles, and downed wires.
- Mark ash pits properly and warn others of them. Stay clear of pits when possible.
- Keep animals close by- do not allow them to wander as hot spots and embers can burn their paws.
- Listen to instructions given by those in charge. Remain calm and deal with the most urgent issues first.
- If there is damage to your property, contact your insurance company.

Insurance Claims

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

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

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

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

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

Community Safety: Post-Fire Floods and Debris Flows

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

Mobilizing Your Community

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

As opposed to wildfire response, post-fire response is not typically managed by a unified state or federal team. Rather, each organization and each tier of government acts on its own authority. This produces a greater demand for coordination at the local level and the sharing of information between organizations to coordinate recovery efforts. The local Emergency Manager as well as the state Office of Emergency Management will generally coordinate response efforts and facilitate recovery resources (Colorado Silver Jackets 2021).

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

Communities are also encouraged to establish a post-fire coordinator. The post-fire coordinator is appointed by the community to facilitate a coordinated response to a wildfire and to aid the community's post-fire recovery efforts. The post-fire coordinator is likely to collaborate with local, state, and federal organizations that participate in emergency response and post-fire recovery efforts. It is important that the post-fire coordinator have demonstrated management, internet, and social media skills, community knowledge, and experience with government agencies and programs (Colorado Silver Jackets 2021).

The recovery coordinator should become familiar with representatives from local, state, and government agencies that will be helping with coordination or funding of post-fire recovery. The following resources may be helpful for the post-fire and volunteer coordinators (Colorado Silver Jackets 2021):

1. Housing
 - a. FEMA
 - b. Federal Housing Administration
 - c. California Department of Housing and Community Development
 - d. The Salvation Army
2. Debris Removal
 - a. Colorado Division of Homeland Security and Emergency Management
 - b. USACE
3. Debris Modeling
 - a. Colorado Geological Survey
 - b. USGS
4. Hazardous Waste and Pollution
 - a. Colorado Department of Public Health and Environment
5. Pets and Livestock
 - a. American Society for the Prevention of Cruelty to Animals
 - b. Colorado Department of Agriculture
6. Food
 - a. USDA Supplemental Nutrition Assistance Program
 - b. Colorado Department of Human Services—Food Distribution Program
 - c. Care and Share Food Bank for Southern Colorado
 - d. Colorado Department of Education
7. Social Services
 - a. Colorado Department of Labor and Employment t
 - b. FEMA Disaster Unemployment Assistance
 - c. U.S. Administration for Children and Families
8. Farm Rehabilitation
 - a. Farm Service Agency
 - b. USDA Rural Development Disaster Assistance
 - c. Natural Resources Conservation Service (NRCS) General Environmental Quality Incentives Program Financial Assistance
9. General
 - a. The American Red Cross
 - b. Colorado Department of Homeland Security and Emergency Management
 - c. USFS
 - d. NPS

e. Colorado Division of Fire Prevention and Control

Any large wildfire will also involve an Incident Command System (ICS), an appropriately sized team assigned to aid in post-fire recovery. Learn more are <https://www.nps.gov/articles/wildland-fire-incident-command-system-levels.htm>.

Communication

After a team is assembled and immediate tasks are identified, find the best way to spread information in your community. You may distribute flyers, set up a voicemail box, work to find pets or livestock that have been displaced, develop a mailing list for property owners, hold regular public meetings, etc. It is important that a long-term communications plan is developed (Natural Hazards Center 2020). Applying the following steps can aid in successful communication (Colorado Silver Jackets 2021):

- Communicate through familiar and trusted messengers
- Provide clear, actionable information
- Tailor messages and information pathways for target audience
- Communicate hazards that still exist
- Use diverse communication networks
- Ensure cross-organizational communication
- Work with educational institutions
- Encourage alert system participation

POST-FIRE REHABILITATION AND RESOURCES

Wildfires that cause extensive damage necessitate dedicated efforts to avert issues afterwards. As aforementioned, loss of vegetation increases soil susceptibility to erosion; water runoff may increase and lead to flooding; sediments and debris may be transported downstream and damage properties or saturate reservoirs putting endangered species and water reserves at risk (USFS 2021e). Following a fire, the primary priority is emergency stabilization to prevent additional damage to life, property, or natural resources. The soil stabilization work starts immediately and may proceed for up to a year. The rehabilitation effort to restore damage caused by the fire starts after the fire is out and may persist for various years. For the most part, rehabilitation efforts focus on the lands not likely to recover naturally from wildfire damage (USFS 2021e).

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

Examples of potential treatments include (USFS 2021b):

- Hillside stabilization (for example, placing bundles of straw parallel to the slope to slow erosion)
- Hazard tree cutting

- Felling trees perpendicular to the slope contour to reduce runoff
- Mulching areas seeded with native vegetation
- Stream enhancements and construction of catchments to control erosion, runoff, and debris flows
- Planting or seeding native species to limit spread of invasive species

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

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

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

Specific Treatment Details

Hillslope Treatments

Cover Applications:

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

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

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

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

Erosion Barrier Applications:

Erosion control mat: organic mats staked on the soil surface to provide stability for vegetation establishment.

Log erosion barrier: trees felled perpendicular to the hillslope to slow runoff.

Fiber rolls (wattles): rolls placed perpendicular to the hillslope to reduce surface flows and reduce erosion.

Silt fencing: permeable fabric fencing installed parallel to the slope contour to trap sediment as water flows down the hillslope.

Channel Treatments

Check dam: small dams built to trap and store sediment in stream channels.

In-channel tree felling: felling trees in a staggered pattern in a channel to trap debris and sediment.

Grade stabilizer: structures made of natural materials placed in ephemeral channels for stabilization.

Stream bank armoring: reinforcing streambanks with natural materials to reduce bank cutting during stream flow.

Channel deflector: an engineered structure to direct flow away from unstable banks or nearby roads.

Debris basin: constructed to store large amounts of sediment moving in a stream channel.

Road and Trail Treatments

Outsloping and rolling dips (water bars): alter the road shape or template to disperse water and reduce erosion.

Overflow structures: protect the road by controlling runoff and diverting stream flow to constructed channels.

Low water stream crossing: culverts replaced by natural fords to prevent stream diversion and keep water in the natural channel.

Culvert modification: upgrading culvert size to prevent road damage.

Debris rack and deflectors: structure placed in a stream channel to collect debris before reaching a culvert.

Riser pipes: filter out debris and allow the passage of water in stream channels.

Catchment-basin cleanout: using machinery to clean debris and sediment out of stream channels and catchment basins.

Trail stabilization: constructing water bars and spillways to provide drainage away from the trail surface.

These treatments and descriptions are further detailed at: <https://afterwildfirenm.org/post-fire-treatments/treatment-descriptions>

For more information about how to install and build treatments, see the Wildfire Restoration Handbook at: https://www.rmfi.org/sites/default/files/hero-content-files/Fire-Restoration-HandbookDraft_2015_2.compressed_0.pdf

Timber Salvage

Many private landowners may decide to harvest trees killed in the fire, a decision that can be controversial. Trees remaining post-fire can be instrumental for soil and wildlife habitat recovery, but dead standing trees may also pose safety concerns and fuel loadings may still be conducive to future high intensity wildfires. Burned soils are especially susceptible to soil compaction and erosion so it is recommended to have professionals perform the timber salvage. Several programs assist landowners with timber salvage, including the NRCS Environmental Quality Incentives Program (EQIP) (CUSP 2016).

Invasive Species Management and Native Revegetation

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

Planting native seeds is an economical way to restore a disturbed landscape. Vegetation provides protection against erosion and stabilizes exposed soils. In order to be successful, seeds must be planted

during the proper time of year and using correct techniques. Use a native seed mixture with a diversity of species and consider the species' ability to compete with invasive species. Before planting, the seedbed must be prepared with topsoil and by raking to break up the hydrophobic soil layer. If you choose to transplant or plant native species, consider whether the landscape has made a sufficient recovery to ensure the safety of the individuals (CUSP 2016).

Long-Term Community Recovery

On non-federal land, recovery efforts are the responsibility of local governments and private landowners. Challenges associated with long-term recovery include homes that were severely damaged or were saved but are located in high-severity burn areas. Furthermore, homes saved but located on unstable slopes or in areas in danger of flooding or landslides present a more complicated challenge.

Economically, essential businesses that were burned or were otherwise forced to close pose a challenge to communities of all sizes. Given these complications, rebuilding and recovery efforts can last for years, with invasive species control and ecosystem restoration lasting even longer (CUSP 2016). It is critical that a long-term plan is in place and there is sufficient funding and support for all necessary ecosystem and community recovery. To learn about more post-fire recovery resources, visit the After the Flames website here: <https://aftertheflames.com/resources/>.

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SWCA

APPENDIX I: Project Outreach

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2023 COMMUNITY OUTREACH

Table I.1 presents examples of the public outreach completed as part of the CWPP development. To maximize audience reached, online resources were used to provide information to the public and solicit feedback. Figures I.1 through I.3 show examples of online posts. Community survey results are summarized below.

Table I.1. Public Outreach Resources

Resource Description	Location	URL	Date
Mesa County Community Public Survey Link (Figure I.3)	Distributed via multiple sources	https://forms.office.com/Pages/ResponsePage.aspx?id=9rCYT_sm0EGp-Jso45xj3hOQIP9AEbFBvLmpPdcOQ8ZUNTQxQ1dCUjFLMEtPMjdHTVgwOUFXMjNBQs4u&origin=QRCode	June 8, 2023
Western Slope News reported on the upcoming Mesa County CWPP. A link for community survey (Figure I.3) is linked at the bottom of the article.	Western Slope News Website	https://www.westernsloopenow.com/news/mesa-county-updates-wildfire-protection-plan/	June 30, 2023
8abc News interviewed the Emergency Manager for Mesa County asking people to fill out the survey (Figure I.3)	8abc News Website	https://www.kjct8.com/2023/06/12/mesa-county-develops-new-community-wildfire-protection-plan/	June 12, 2023
Mesa County Sheriff's Office Announcement	Crimewatch website	https://crimewatch.net/us/co/mesa/sheriff/134177/post/mesa-county-community-wildfire-protection-plan-update	June 8, 2023
Interview with the Mesa County Emergency Manager to promote the Public Survey	KKCO 11 News Website	https://www.nbc11news.com/2023/06/12/mesa-county-develops-new-community-wildfire-protection-plan/	June 12, 2023
Mesa County Sheriff's Office Facebook Announcement with project flyer (Figure I.1)	Mesa County Sheriff's Office Facebook Page	https://www.facebook.com/Mesacountysheriffsoffice/posts/pfbid02fckoDzf7YZb8CxiUTNQbqybWY7hNJPi5UDuM2k1UPWESS9bg8dJrHXvig3crCE	June 14, 2023
Mesa County News Article	Mesa County Website	https://www.mesacounty.us/news/sheriff/mesa-county-community-wildfire-protection-plan-update	June 8, 2023
Mesa County News Article	Mesa County Website	https://www.mesacounty.us/news/sheriff/your-home-risk-wildfire-find-out-draft-2023-mesa-county-community-wildfire-protection#:~:text=The%20Draft%202023%20Mesa%20County%20CWPP%20will%20be%20open%20for,wildfire%20protection%20in%20Mesa%20County.	August 14, 2023
Westerns Slope Now News Article	Western Slope Now Website	https://www.westernsloopenow.com/top-stories/the-county-wants-your-help-with-the-community-fire-plan/	August 14, 2023
Mesa County Sheriff Public Notice	Mesa County Sheriff's Office Website	https://crimewatch.net/us/co/mesa/sheriff/134177/post/public-input-requested-2023-mesa-county-community-wildfire-protection-plan	August 14, 2023
Mesa County News Article	Mesa County Website	https://www.mesacounty.us/news/administration/we-need-your-input-2023-draft-mesa-county-community-wildfire-protection-plan	August 24, 2023

MESA COUNTY

COMMUNITY WILDFIRE PROTECTION PLAN



SWCA[®]
ENVIRONMENTAL CONSULTANTS

THE PLAN

Mesa County has contracted SWCA Environmental Consultants to collaborate with municipal, state, and federal land management agencies to develop the 2023 Mesa County Community Wildfire Protection Plan Update (CWPP).

You (the public) can play a part in crafting fire mitigation recommendations to protect your community. Read below to find out more about the collaborative Community Wildfire Protection Plan process and public involvement.



WHAT DOES A COMMUNITY WILDFIRE PROTECTION PLAN DO?

- Identify areas at risk for wildland fire
- Make recommendations for hazardous fuels treatments (vegetation thinning)
- Prioritize areas for wildfire mitigation funding
- Make recommendations for homeowners to reduce fire risk
- Ask the public to share ideas about wildfire prevention and identify community values at risk

COMMUNITY FACT

The 2020 Mesa County Hazard Mitigation Plan identifies hazards in the County and provides guidance for mitigation actions and emergency response. A primary goal of the Hazard Mitigation Plan is to support community wildfire protection planning.

WHY YOU SHOULD BE INVOLVED

A CWPP is designed to assist the County and landowners in mitigating wildfire risk. It is important that this process is collaborative. Please scan the QR code below to take a brief survey to give us your feedback on wildfire risk reduction in your community.



Figure I.1. CWPP flyer page 1.

FIRE ADAPTED COMMUNITIES
People and communities are prepared to receive, respond to and recover from wildfire.

SAFE, EFFECTIVE WILDFIRE RESPONSE
All jurisdictions coordinate to implement safe, effective, risk-based management decisions.

RESILIENT LANDSCAPES
Landscapes are resilient to fire, insect, and disease disturbances, regardless of jurisdictional boundaries.

POST-FIRE RECOVERY
Preparing communities for inevitable fire effects, through pre-fire planning for post-fire response.

ORIGIN OF COMMUNITY WILDFIRE PROTECTION PLANS

CWPPs developed from the Healthy Forests Restoration Act of 2003. This Act provides communities with the opportunity to influence how and where federal agencies implement fuel reduction projects on federal lands and how additional funds may be distributed for projects on non-federal lands. A CWPP is a great way for the public to provide input and represent their communities. The 2023 CWPP will identify fire hazards and community values at risk in Mesa County and provide recommendations to reduce the risk of wildfire to life and property.

The main goals of a CWPP as described in HFRA (2003) are:

- Collaboration- must be developed by local & state government, consulting with federal agencies.
- Prioritized fuel reduction- must identify the most at risk areas for treatment of hazardous fuel and recommend actions to protect communities and infrastructure.
- Treatment of structural ignitability- must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.
- Definition of a WUI- gives each Core Team of agency stakeholders the ability to define their wildland urban interface (WUI) areas, where homes and structures come into contact with wildland fuels.
- Community risk analysis- using field based or geographic information system methodology, the Core Team assesses all hazards and risks associated with wildfire spread throughout the planning area.
- Discussion of fire fighting preparedness- to identify ways to enhance fire response.
- Community involvement- to ensure that the planning effort incorporates public input and grassroots level planning.

PROJECT CONTACT ARIANNA.PORTER@SWCA.COM

Figure I.2. CWPP flyer page 2.



Figure I.3. A QR Code linking community members to a survey about the upcoming CWPP.

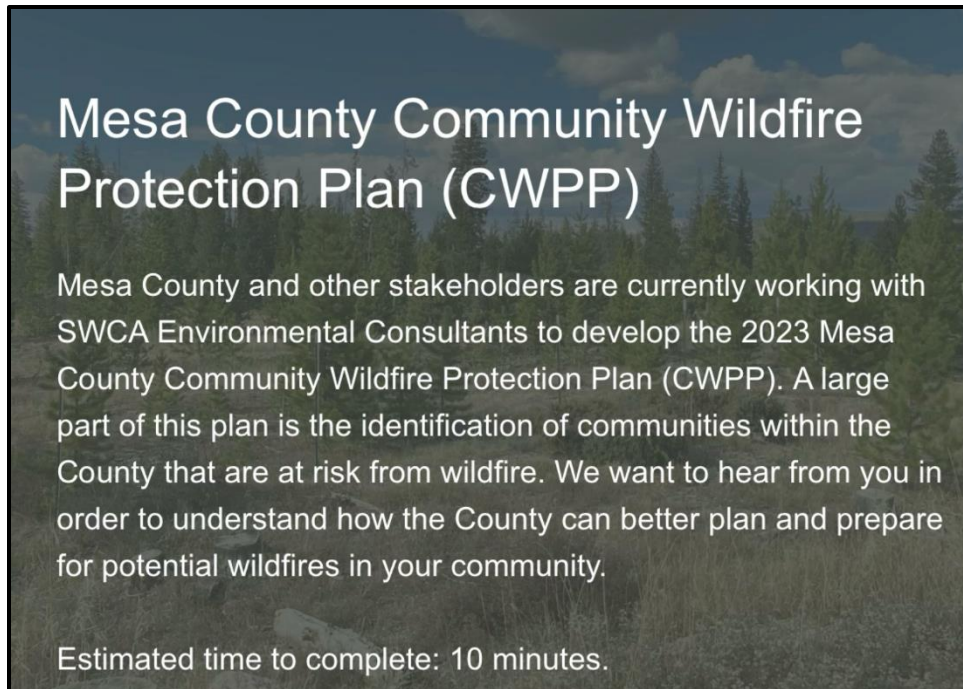


Figure 1.4. A screen shot of the introductory text to the community survey.

PUBLIC COMMENT PERIOD

During the public comment period of the CWPP process, respondents provided feedback and information on various aspects related to wildfire preparedness in their community. This included information and feedback about assessments of community preparedness and property risks, concerns about wildfire vulnerability, prioritization of wildfire preparedness actions, challenges to making homes fire-safe, funding priorities, prescribed fire usage, evacuation planning, emergency kits, knowledge of evacuation routes, willingness to evacuate under different circumstances, familiarity with emergency notifications, and registration for local emergency notifications. This feedback was incorporated into the plan's content generally and into the project recommendations (see Chapter 4).

COMMUNITY SURVEY RESULTS

The public survey period was open from June 8 to August 27, 2023, and SWCA received 16 total responses. Concerns raised during this feedback process were addressed through diligent adaptations, edits, and additions to the plan's content and mitigative project recommendations.

1. How prepared is your community for large wildfire?

Level of Preparation	Number of Responses	Percentage of Total
Well prepared	1	6.25%
Moderately prepared	8	50.0%
Poorly prepared	6	37.5%
No Answer	1	6.25%
Grand Total	16	100.0%

2. How would you rate your house in terms of risk from wildfire? (Consider the proximity of your house to tracts of undeveloped land, vegetated land, emergency response, and access.)

Level of Risk	Number of Responses	Percent
High	5	31.3%
Medium	5	31.3%
Low	6	37.5%
No Answer	0	0%
Grand Total	16	100.0%

3. My home is vulnerable to wildfire because of..... (Select top 2 choices)

Fuels on neighboring properties*	Fuels on my property*	Proximity to Colorado River Fuels*	Building Materials*	Water supply*	Accessibility*	Adjacent ignition sources*	Not Up to Code*	No Answer*
11	3	1	1	1	1	4	1	1

*Indicates the number of times the particular concern was selected

4. Rate the following actions in their importance to making the community better prepared for wildfire (Please RANK 1-5; 1 is most important):

- **Community education on wildfire prevention and awareness**
- **Home hardening (using fire-resistant building and construction materials. Ex. metal roofing)**
- **Improved water supply – (i.e., expansion of public water systems, increased number of hydrants, and installation of wells)**
- **Cleanup of live and dead vegetation and yard debris around homes by individual property owners**
- **Better firefighting equipment/increased personnel**
- **Fuel treatments on public lands to reduce the amount of live and dead vegetation available to burn in a fire**
- **Other**

When asked to prioritize actions for improving community wildfire preparedness, 44% of respondents emphasized the significance of "fuel treatments on public lands" to reduce combustible vegetation. Meanwhile, 25% of respondents prioritized "cleanup of vegetation and yard debris by property owners" and another 25% ranked "community education on wildfire prevention" as their most crucial measure.

5. My biggest challenge to making my home fire safe is.... (Please RANK 1-4; 1 is most important):

- Time
- Financial burden of carrying out mitigation measures and maintaining clearance
- Not knowing what to do
- Contractor availability
- There is no challenge
- I think my home is already safe
- Other

When asked about the biggest challenge to making their homes fire-safe, 38% of respondents identified the "financial burden of implementing mitigation measures and maintaining clearance" as the most significant obstacle. Meanwhile, 19% of respondents submitted "there is no challenge" in achieving home fire safety as their top ranked repose.

6. I would be most interested in funding to help me and my community with.... (Please RANK 1-7; 1 is most important):

- Green waste disposal - (i.e., removal of leaves, branches, wood from cleared areas)
- Home wildfire hazard assessments
- Wildfire prevention education
- Water supply development - (i.e., extend public water systems, add additional hydrants, install fire wells, and acquire portable water supplies)
- Funding for fire departments - (i.e., to secure additional apparatus/equipment, fund training, fund additional staff)
- Timber/fuel treatments on private land
- Timber/fuel treatments on public land
- Home hardening (using fire-resistant building and construction materials. Ex. metal roofing)
- Other

When asked about what they would be most interested in funding to help themselves and their community, 63% of respondents expressed the highest interest in supporting fuel treatments on both private and public lands. Additionally, 13% of participants prioritized "green waste disposal," while another 13% emphasized "wildfire prevention education" as their top funding choice.

7. Are you currently using prescribed fire to treat your property?

Answer	Number of Responses	Percentage
Yes	6	37.5%
No	8	50.0%
No, but I am interested in learning more	2	12.5%
Grand Total	16	100.0%

8. Do you have an updated evacuation plan for you/your family?

Answer	Number of Responses	Percent
Yes	8	50.0%
No	8	50.0%
Grand Total	16	100.0%

9. Do you have an emergency evacuation kit ready?

Answer	Number of Responses	Percent
Yes	6	37.5%
No	8	50.0%
Not sure what an evacuation kit is	2	12.5%
Grand Total	16	100.0%

10. Are you familiar with local evacuation routes?

Answer	Number of Responses	Percent
Yes	10	62.5%
No	5	31.3%
No answer	1	6.25%
Grand Total	16	100%

11. How likely are you to leave your home under an optional evacuation order?

Answer	Number of Responses	Percent
Will evacuate	9	56.3%
Will not evacuate	1	6.25%
Not sure	5	31.3%
No answer	1	6.25%
Grand Total	16	100.0%

12. How likely are you to leave your home under a mandatory evacuation order?

Answer	Number of Responses	Percent
Will evacuate	13	81.3%
Will not evacuate	0	0%
Not sure	2	12.5%
No answer	1	12.5%
Grand Total	16	100.0%

13. Do you know how to sign up for local emergency notifications?

Answer	Number of Responses	Percent
Yes	10	62.5%
No	6	37.5%
No answer	0	0%
Grand Total	16	100.0%

14. Are you registered for local emergency notifications?

Answer	Number of Responses	Percent
Yes	10	62.5%
No	6	37.5%
No answer	0	0%
Grand Total	16	100.0%

2012 OUTREACH EFFORTS

Public involvement in the 2012 CWPP planning process was encouraged through a range of media. A Facebook page was developed for the county (entitled Mesa County Community Wildfire Protection Plan). The page included a description of the planning process and included links to an online community survey and other relevant pages for the county. The page was also used to announce two public meetings to gather input on the plan. The online survey was also distributed to all county employees and made available on the county website. Paper copies were distributed at both public meetings and to the Core Team. Flyers advertising the meetings were produced and distributed by the Core Team. Informational flyers were also distributed at the public meetings, providing information on the planning process and outreach efforts.

The public involvement process was launched through a press release by the Mesa County Sheriff's Department and the CSFS. Emergency Manager Andy Martsof also made a radio announcement on the local radio station (KJOL), discussing fire preparedness, the CWPP, and public outreach efforts. In addition, KREX News Channel 5 aired a news story on January 26, 2012, regarding the CWPP outreach efforts and fire risk in the county, in which reporters visited a high risk community and spoke with Deputy Fire Warden John Coleman. The public meeting times and locations were posted in the *Daily Sentinel* and were announced on other local news networks.

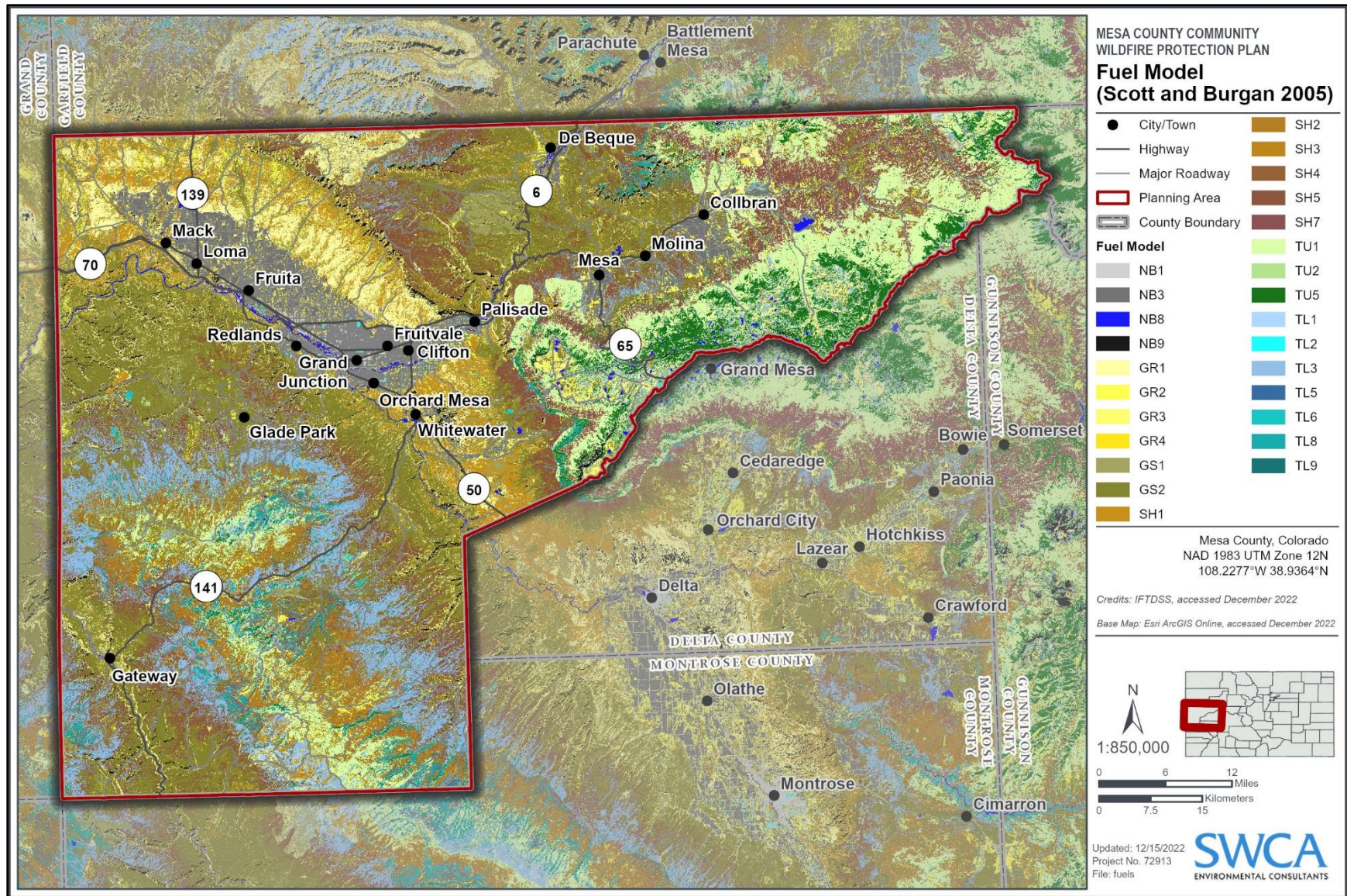
Two public meetings were held to gather information from the public regarding wildfire on private and public lands. The first meeting was held on January 26, 2012, and was incorporated into the community meeting for Glade Park residents. This meeting was chosen because it attracts a large number of residents from Glade Park, an area of particularly high fire risk. Members of the Core Team attended the meeting and SWCA made an announcement regarding the planning process and introduced the concept of a CWPP. SWCA discussed the main themes that came out of assessments in Glade Park, particularly the need for defensible space around homes in pinyon-juniper dominated environments, then provided ways in which the public could provide its input, through the survey, Facebook, and handouts provided to residents. Members of the public reviewed a draft risk assessment map and identified particular hazard areas to the Core Team.

The second meeting was held at Wingate Elementary School on January 27, 2012. The meeting was a traditional format with a PowerPoint presentation session and then an open forum. SWCA presented general information about CWPPs and their goals and objectives, as well as the stages in the planning process. The presentation contained information relating to the geographic information system (GIS) risk assessments and some of the key findings from the field assessments, as well as example recommendations to mitigate risk. The presentation ended with a discussion regarding defensible space practices in the county. Following the SWCA presentation, the BLM presented information regarding fuel treatments on public lands in the county, including a discussion of the techniques used for thinning and burning. This presentation was followed by an announcement by the CSFS regarding cost share funding for defensible space treatments on private land. Accompanying these presentations was literature providing additional detail on federal and state programs for fire prevention. Following the presentation, the audience was asked to provide feedback on fire risk concerns on private and public lands. Attendees were particularly concerned about hazardous fuels on public lands adjacent to their homes.

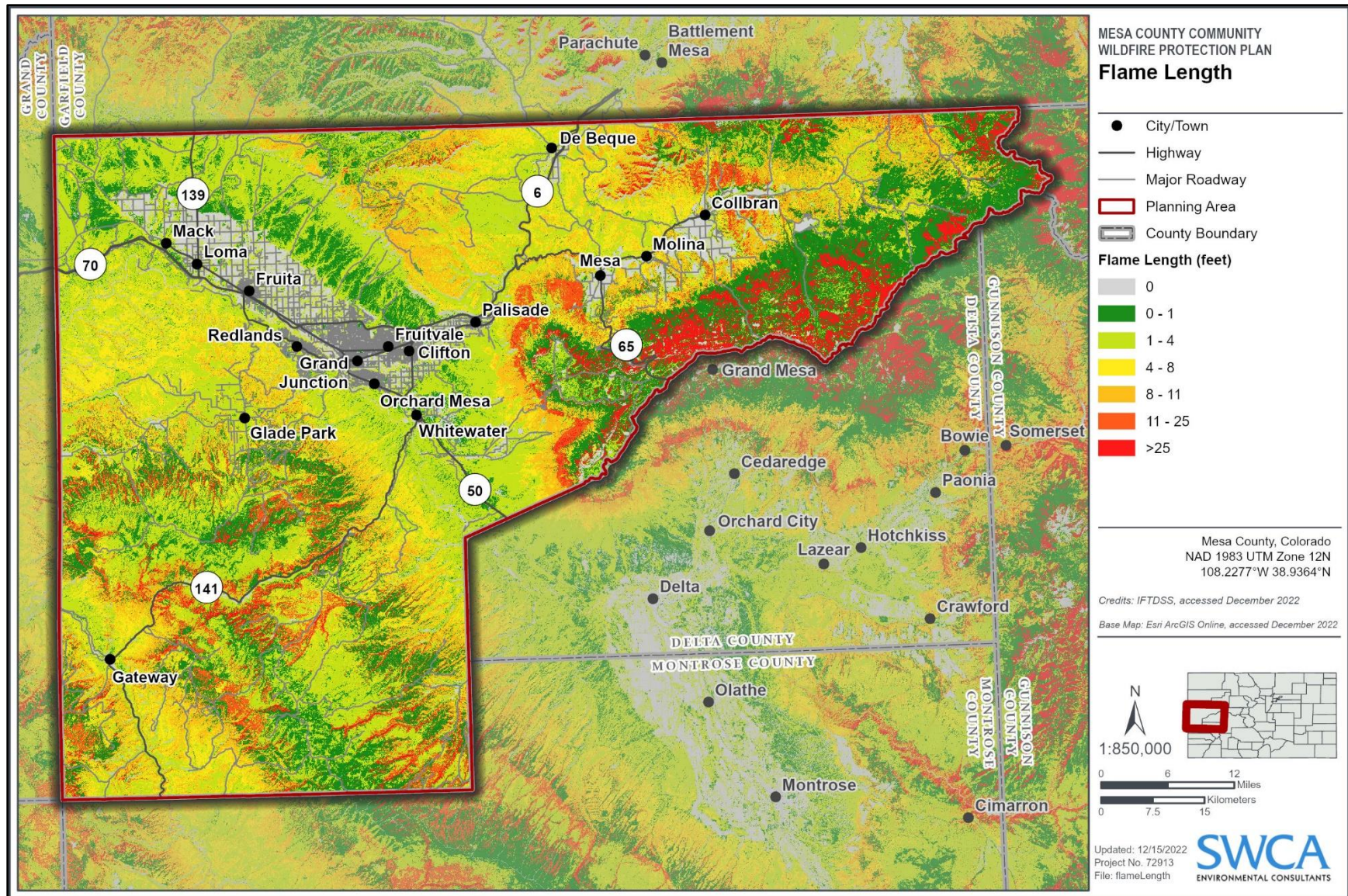
SWCA

APPENDIX J:
Additional Mapping

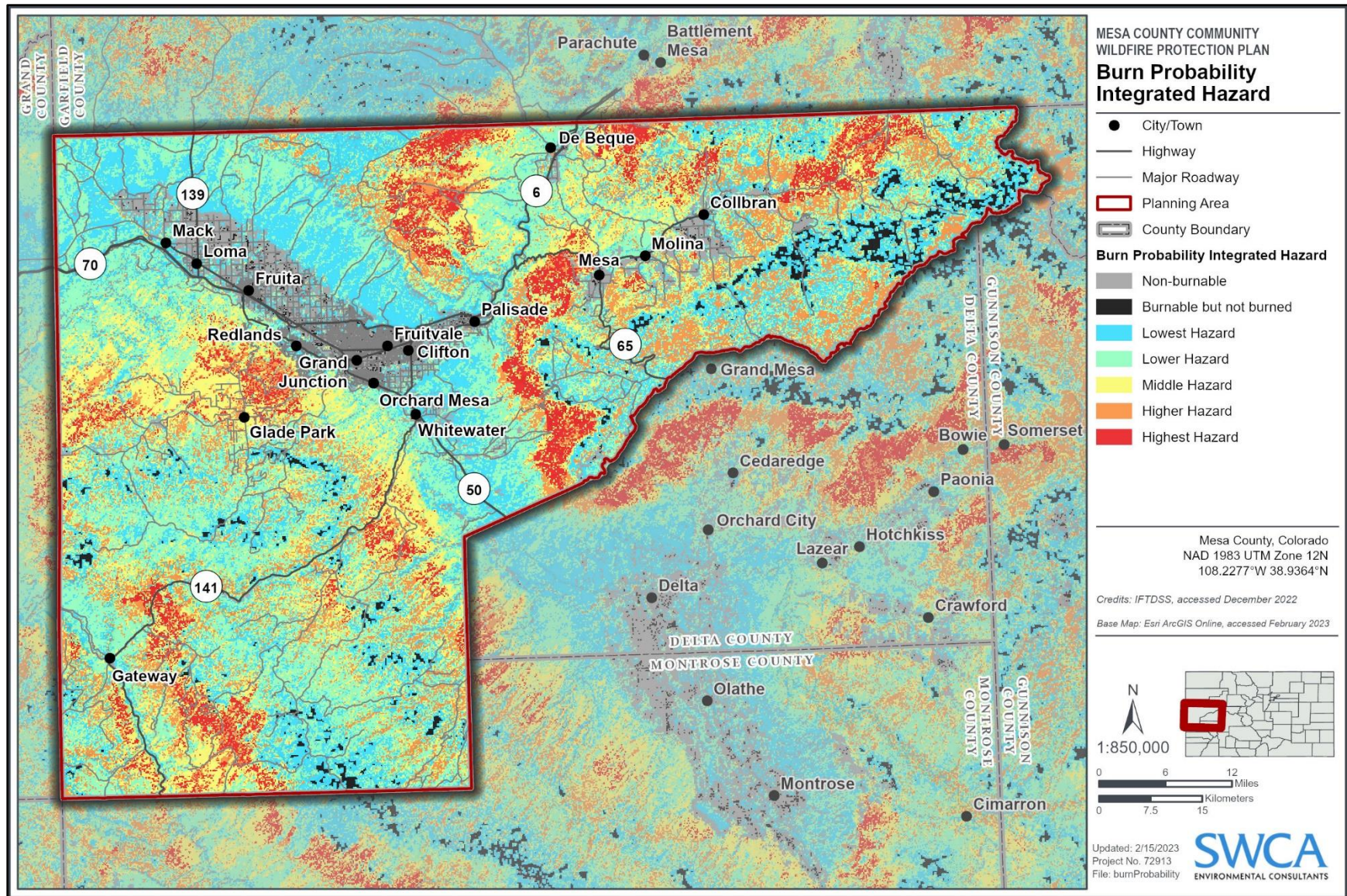
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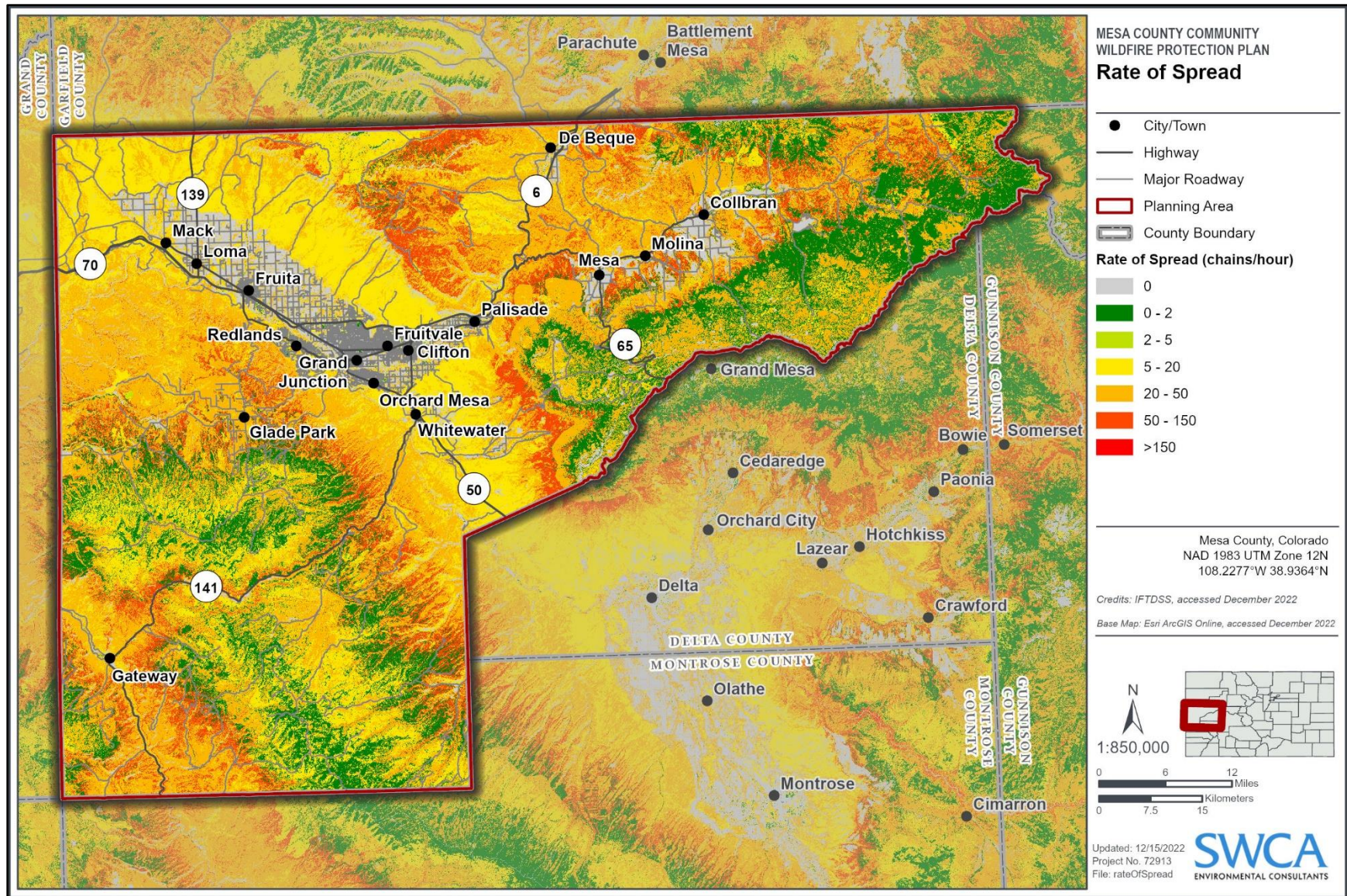
Map J.1. Scott and Burgan 40 fire behavior fuel models.



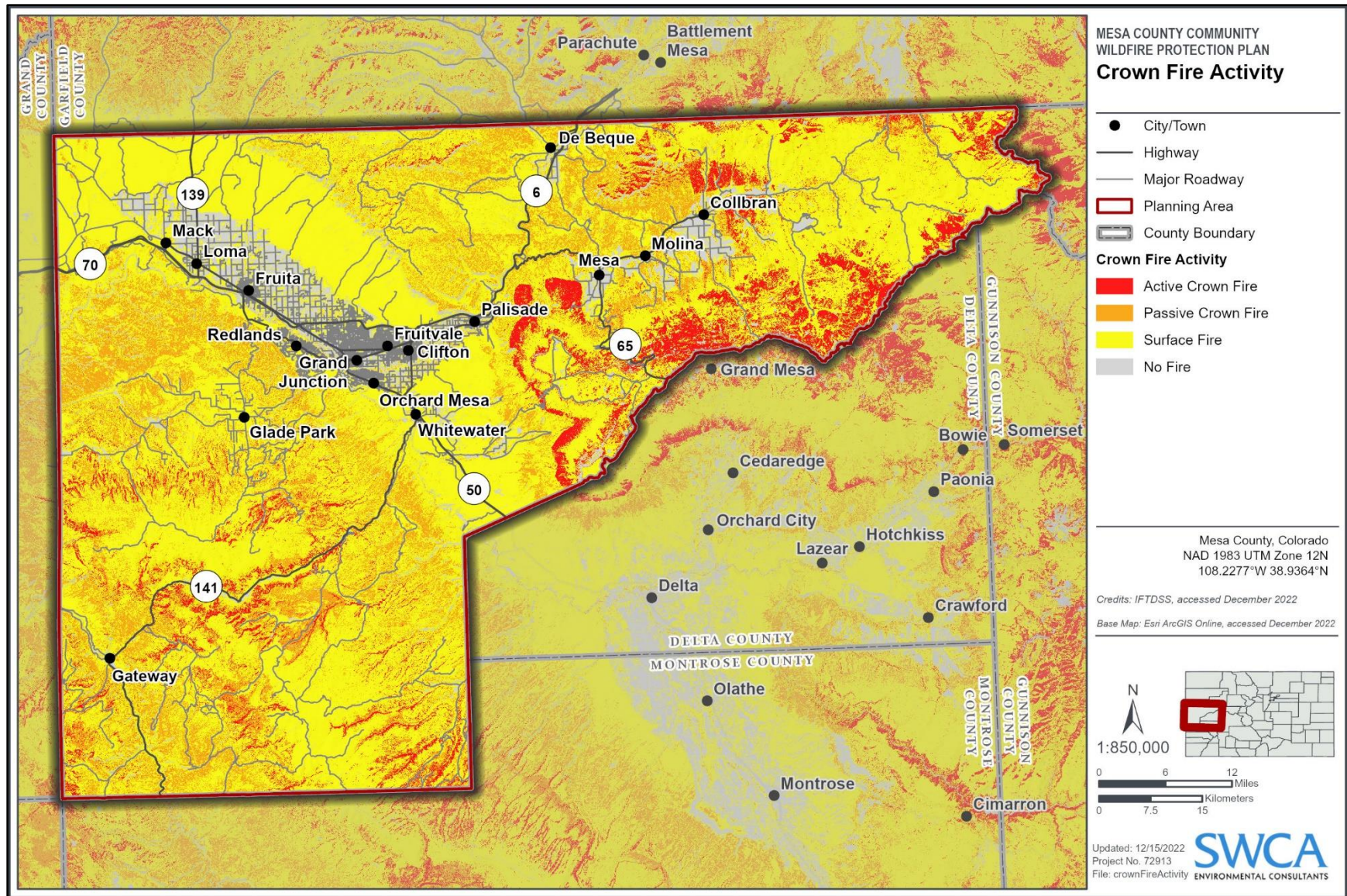
Map J.2. Risk-Hazard Assessment outputs: flame length.



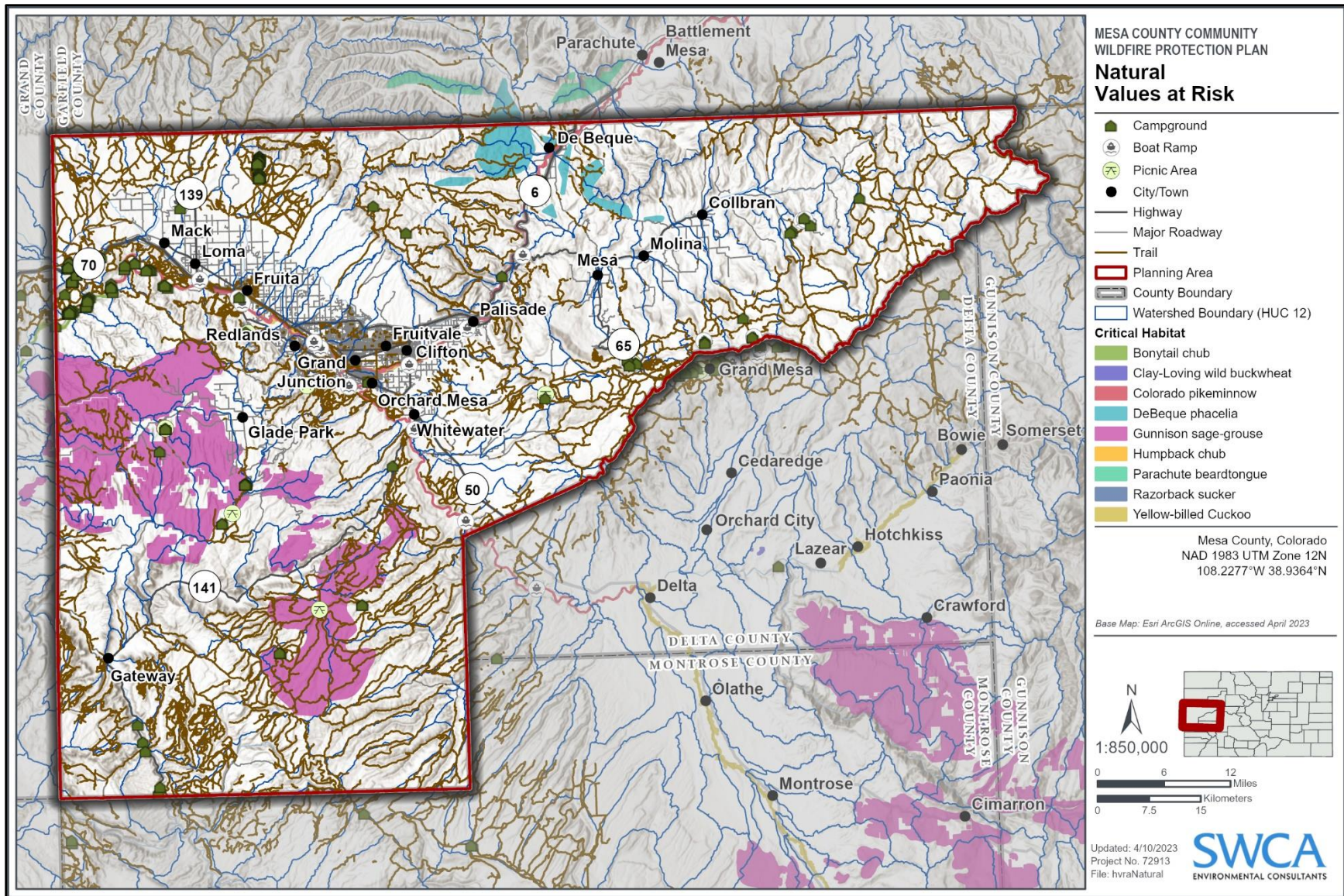
Map J.3. Risk-Hazard Assessment outputs: burn probability.



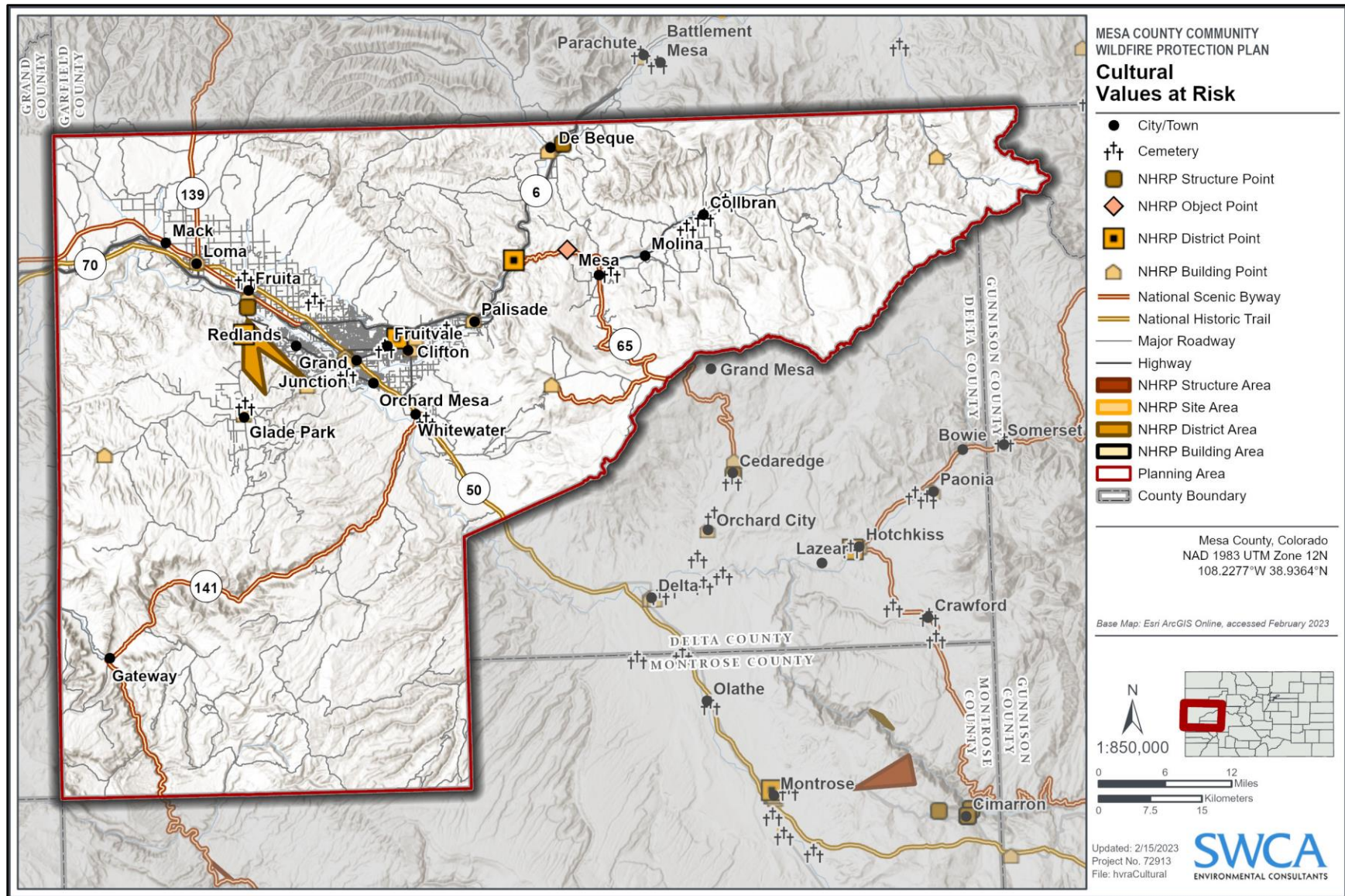
Map J.4. Risk-Hazard Assessment outputs: rate of spread.



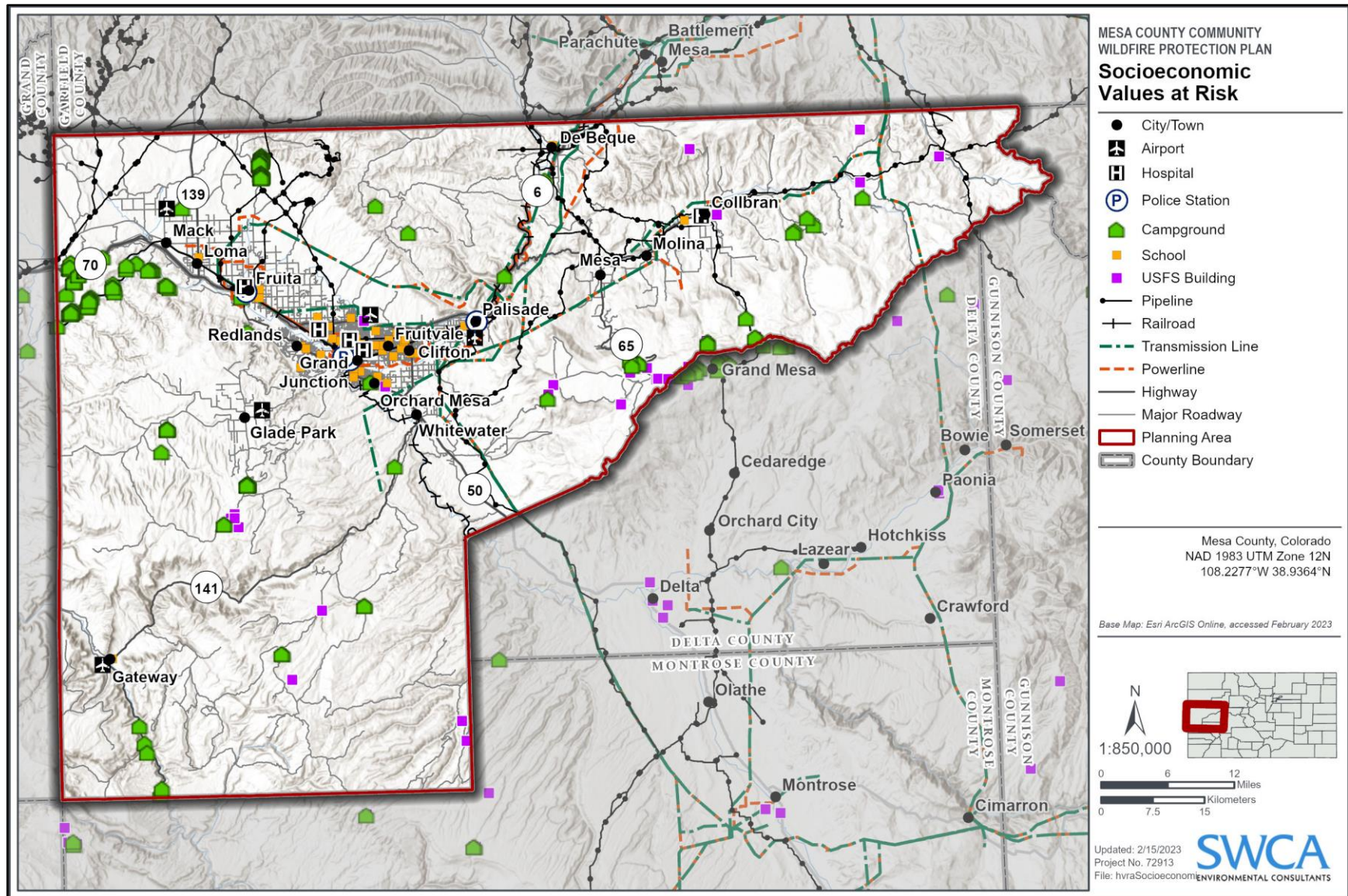
Map J.5. Risk-Hazard Assessment outputs: crown fire activity.



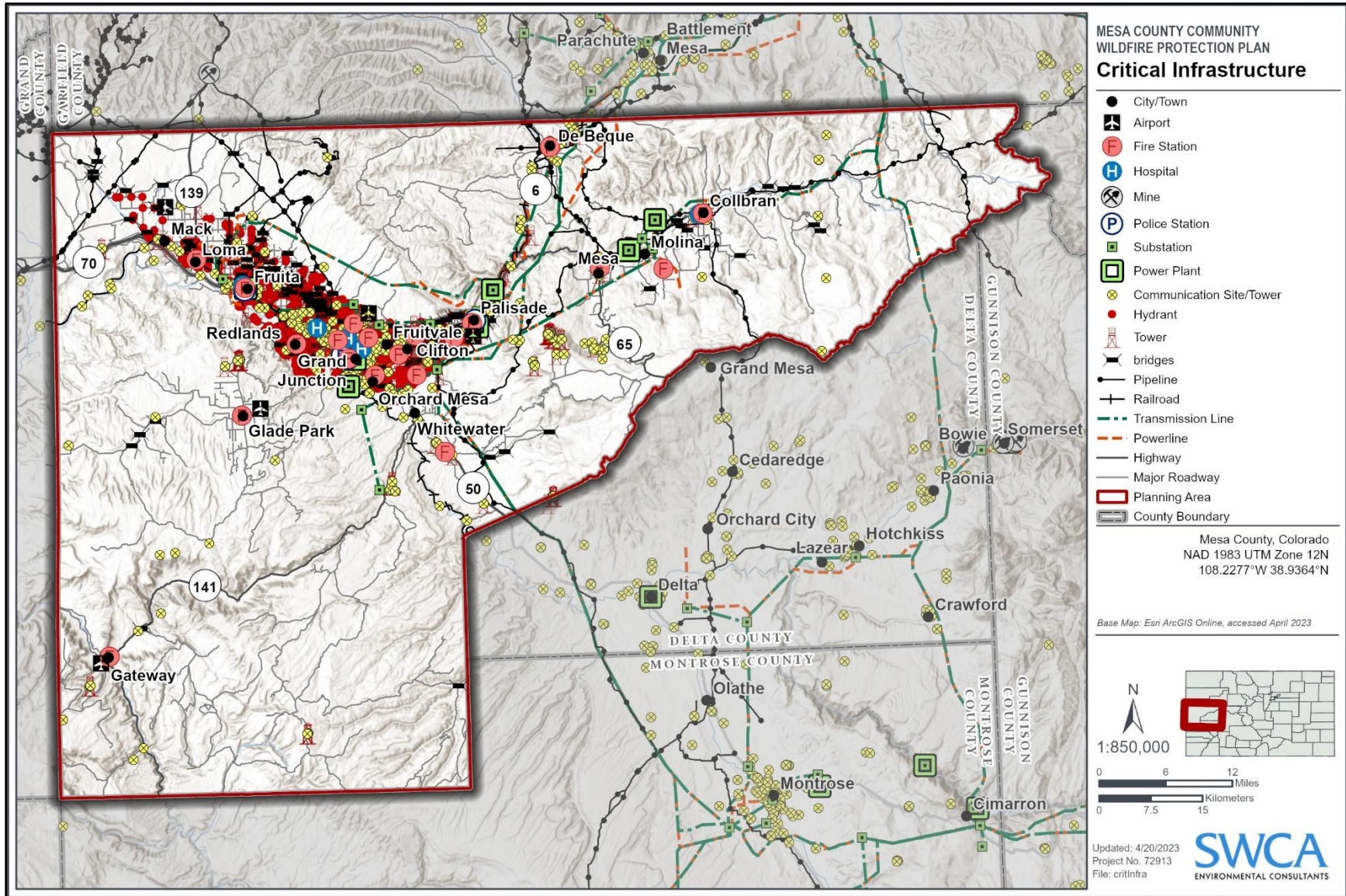
Map J.6. Highly valued natural resources at risk.



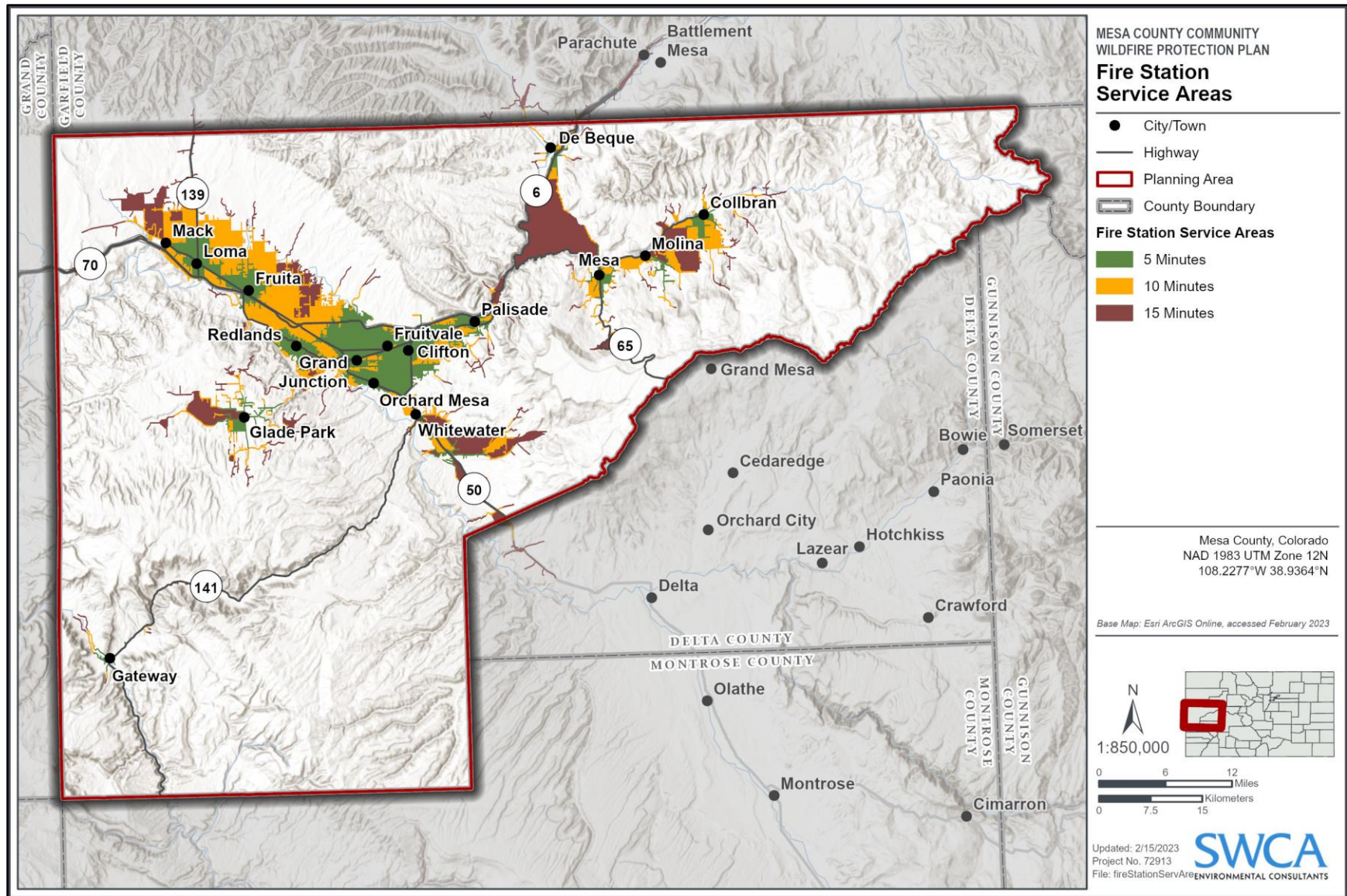
Map J.7. Highly valued cultural resources at risk.



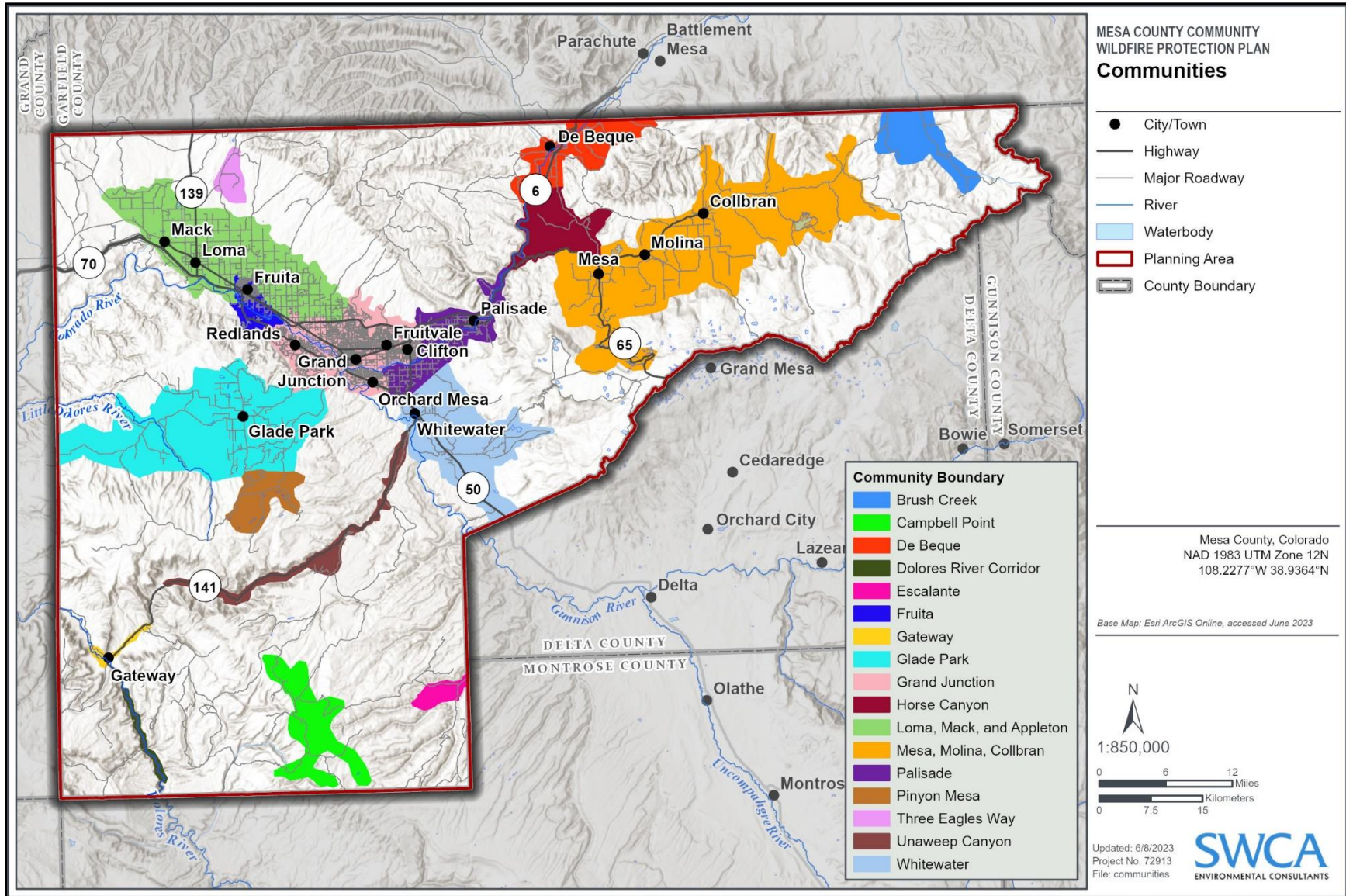
Map J.8. Highly valued socioeconomic resources at risk.



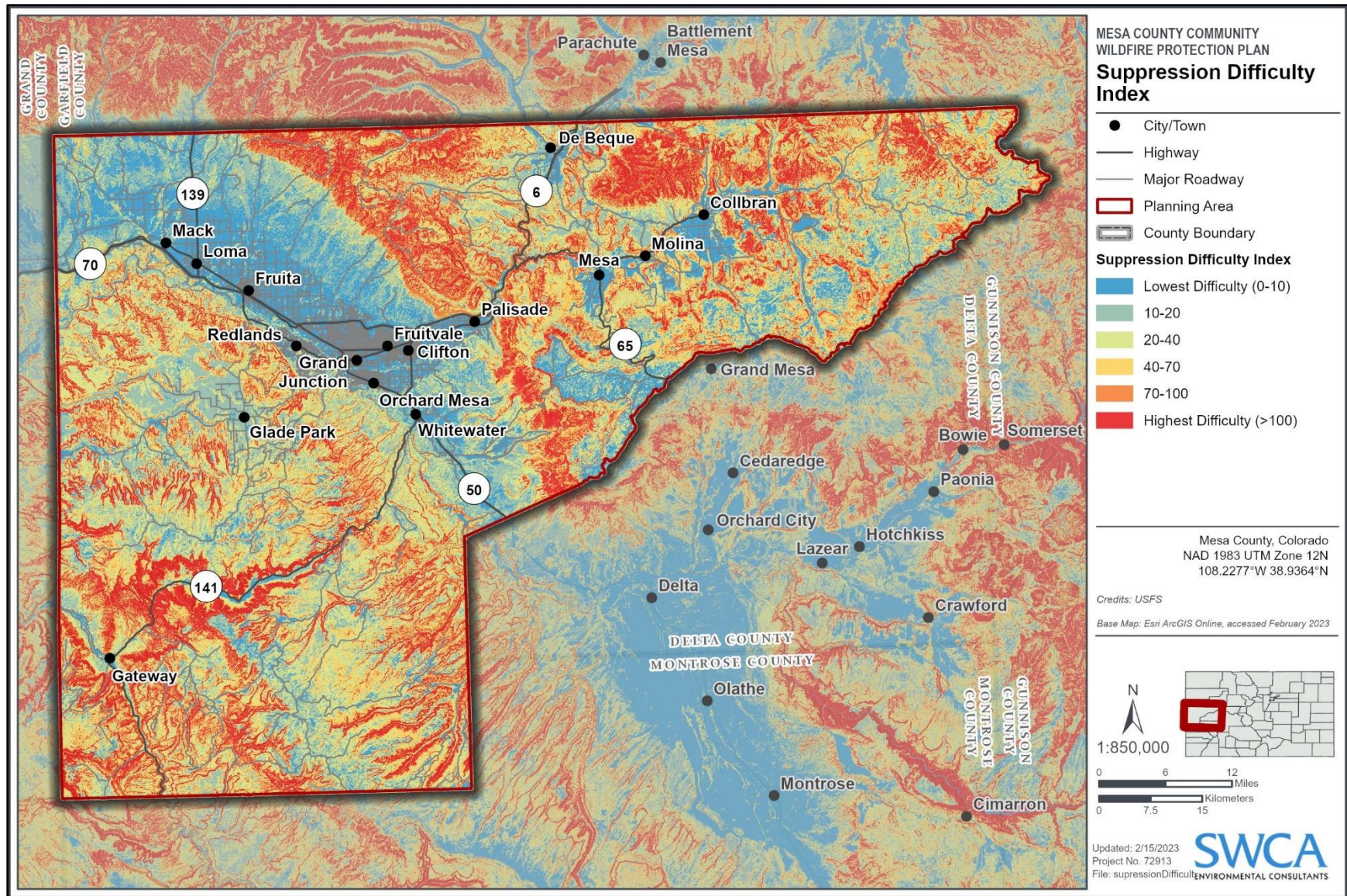
Map J.9. Critical infrastructure.



Map J.10. Fire station service areas.



Map J.11. Mesa County communities.



Map J.12. Suppression difficulty index.

SWCA

APPENDIX K:

Forms

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The SWCA 1144 Assessment form, derived from the NFPA standard methodology for assessing wildland fire ignition hazards around existing structures, serves as a valuable tool for evaluating wildfire risk to communities. For future Mesa County CWPP updates, SWCA recommends utilizing this form for future on-the-ground wildfire risk assessments of communities in Mesa County.

The 1144 community assessment form has proven to be highly effective in comprehensively evaluating wildfire risk for groups of properties within a community. The assessment takes into consideration various parameters including ingress and egress, characteristics of the home ignition zone, and building construction. These parameters collectively contribute to the creation of a risk score, enabling the prioritization of communities for risk reduction activities and the establishment of mitigation planning efforts.

However, the assessment of communities using this form should be overseen by a trained professional. This ensures the accuracy and reliability of the assessment process, further enhancing the overall effectiveness of the SWCA 1144 assessment form in examining wildfire risk to communities.

SWCA – 1144 Assessment	
Community	Notes:
Surveyor	
Survey Date/Time	
Means of Access	
Ingress and Egress	
2 or more roads in and out score 0	
1 road in and out 7	
Road Width	
> 24 ft 0	
> 20 ft < 24 ft 2	
< 20 ft 4	
Road Conditions	
Surfaced road, grade < 5% 0	
Surfaced road, grade > 5% 2	
Non-surfaced road, grade < 5% 2	
Non-surfaced road, grade > 5% 5	
Other than all season 7	
Fire Access	
< 300 ft with turnaround 0	
> 300 ft with turnaround 2	
< 300 ft with no turnaround 4	
> 300 ft with no turnaround 5	
Street Signs	
Present – reflective 0	
Present – non-reflective 2	
Not present 5	

Notes:	
Vegetation (Fuel Models)	
<i>Predominant Vegetation</i>	
<i>Primary Predominant Vegetation</i>	
Non-Burnable (NB) Score 2	
Grass (GR) Score 5	
Grass-Shrub (GS) Score 10	
Shrub (SH) Score 15	
Timber-Understory (TU) Score 20	
Timber-Litter (TL) Score 25	
Slash-Blow (TU) Score 30	
Notes:	
<i>Defensible Space</i>	
> 100 ft around structure 1	
> 70 ft < 100 ft around structure 3	
> 30 ft < 70 ft around structure 10	
< 30 ft around structure 25	
Topography Within 300 ft of Structures	
<i>Slope</i>	
< 9% 1	
10% to 20% 4	
21% to 30% 7	
31% to 40% 8	
>41% 10	
<i>Additional Rating Factors (rate all that apply)</i>	
Topographic features 1-5	
History of high fire occurrence 1-5	
Severe fire weather potential 1-5	
Separation of adjacent structures 1-5	
Notes:	
Roofing Assembly	
<i>Roofing</i>	
Class A - metal roof, clay/concrete tiles, slate, asphalt shingles 0	
Class B - pressure treated composite shakes and shingles 3	
Class C - untreated wood shingle, plywood, particle board 15	

Unrated - Extremely poor roofing conditions 25	
Notes:	
Building Construction	
Siding Materials (predominant)	
Non-combustible (brick/concrete) 5	
Fire Resistive (stucco/adobe) 10	
Combustible (wood or vinyl) 12	
Deck and fencing (predominant)	
No deck or fence/non-combustible 0	
Combustible deck and fence 5	
Building Set-Back	
> 30 ft to slope 1	
< 30 ft to slope 5	
Notes:	
Available Fire Protection	
Water Sources	
Water Source? yes/no	
Water Source Type hydrant, water tank, other	
Other Water Source	
Water Source Score Hydrant = 1 Water Tank = 3	
Organized Response	
Station < 5 mi from community 1	
Station > 5 mi from community 3	
Notes:	
Placement of Gas and Electric Utilities	
Both underground 0	
One above, one below 3	
Both above ground 5	
Values at Risk Observations	
Forest Health Observations	
Land Use Observations	

Misc Observations				
Total				
Hazard Rating Scale	<40 Low	>40 Moderate	>70 High	>112 Extreme

SWCA

APPENDIX L: Funding Sources

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FUNDING SOURCES

The following section provides information on federal, state, and private funding opportunities for conducting wildfire mitigation projects.

FEDERAL FUNDING INFORMATION

Source: 2022 Infrastructure Investments and Jobs Act

Agency: Multiple

Website: <https://www.congress.gov/bill/117th-congress/house-bill/3684>

Description: The Infrastructure Investments and Jobs act allocated funding through various departments for infrastructure projects including, but not limited to roads, bridges, and major projects; passenger and freight rail; highway and pedestrian safety; public transit; broadband; ports and waterways; airports; water infrastructure; power and grid reliability and resiliency; resiliency, including funding for coastal resiliency, ecosystem restoration, and weatherization; clean school buses and ferries; electric vehicle charging; addressing legacy pollution by cleaning up Brownfield and Superfund sites and reclaiming abandoned mines; and Western Water Infrastructure.

Specifically, the Community Wildfire Defense Grant Program is a \$1 billion program where the Department of Agriculture will provide grants to communities at risk from wildfire to develop or revise their community wildfire protection plans and carry out projects described within those plans. It will include a mix of formula and competitive funds. Applications are expected to open early in 2023.

Section 40803 addresses wildfire risk reduction, section 40804 deals with ecosystem restoration, section 40806 handles the establishment of fuel breaks in forests and other wildland vegetation, and section 70302 addresses reforestation. To learn more about the Act, please see guidebook located here <https://www.whitehouse.gov/wp-content/uploads/2022/05/BUILDING-A-BETTER-AMERICA-V2.pdf>

Source: Tribal Lands Landscape Scale Restoration Grants

Agency: First Nations Development Institute

Website: <https://www.firstnations.org/projects/landscape-scale-restoration/>

Description: For more than 41 years, First Nations Development Institute (First Nations), a Native-led 501(c)(3) nonprofit organization, has worked to strengthen American Indian economies to support healthy Native communities by investing in and creating innovative institutions and models that strengthen asset control and support economic development for American Indian people and their communities. First Nations began its national grantmaking program in 1993. Through mid-year 2021, First Nations has successfully managed 2,276 grants totaling more than \$46 million to tribal and community institutions across Indian Country. First Nations supports a series of grants focused on controlling and protecting food systems, water, languages, traditional ecological knowledge, and land. They support landscape restoration grants funded through the USDA Forest Service to support priority forest landscapes at a high wildfire risk. You can find more information about this grant here: <https://www.grants.gov/web/grants/view-opportunity.html?oppld=342979>.

Source: Building Resilient Infrastructure and Communities (BRIC) Grant Program**Agency:** Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA)**Website:** <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

Description: BRIC will supports states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. You can find more information on the BRIC program here: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

Source: Hazard Mitigation Grant Program (HMGP)**Agency:** FEMA**Website:** <https://www.fema.gov/grants/mitigation/hazard-mitigation>

Description: The HMGP provides funding to state, local, tribal, or territorial governments (and individuals or businesses if the community applies on their behalf) to rebuild with the intentions to mitigate future losses due to potential disasters. This grant program is available after a presidentially declared disaster.

Source: Hazard Mitigation Grant Program (HMGP) – Post Fire**Agency:** FEMA**Website:** <https://www.fema.gov/grants/mitigation/post-fire>

Description: The HMGP Post Fire grant program provides assistance to communities for the purpose of implementing hazard mitigation measures following a wildfire. Mitigation measures may include:

- Soil stabilization
- Flood diversion
- Reforestation

Source: Flood Mitigation Assistance (FMA) Grant**Agency:** FEMA**Website:** <https://www.fema.gov/grants/mitigation/floods>

Description: The Flood Mitigation Assistance Program is a competitive grant program that provides funding to states, local communities, federally recognized tribes, and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA chooses recipients based on the applicant's ranking of the project and the eligibility and cost-effectiveness of the project.

Source: Emergency Management Performance Grant (EMPG)**Agency:** FEMA**Website:** <https://www.fema.gov/grants/preparedness/emergency-management-performance>

Description: The EMPG program provides funding to state, local, tribal, and territorial emergency management agencies with the overall goal of creating a safe and resilient nation. The two main objectives of the program are 1) closing capability gaps that are identified in the state or territory's most recent Stakeholder Preparedness Review (SPR); and 2) building or sustaining those capabilities that are identified as high priority through the Threat and Hazard Identification and Risk Assessment (THIRA)/SPR process and other relevant information sources. The grant recipient and Regional Administrator must come to an agreement on program priorities, which are crafted based on National, State, and regional priorities.

Source: Fire Management Assistance Grant (FMAG)

Agency: FEMA

Website: <https://www.fema.gov/assistance/public/fire-management-assistance>

Description: Fire Management Assistance is available to state, local, and tribal governments for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster. The Fire Management Assistance declaration process is initiated when a state submits a request for assistance to the FEMA Regional Director at the time a "threat of major disaster" exists. The entire process is accomplished on an expedited basis and a FEMA decision is rendered in a matter of hours. Before a grant can be awarded, a state must demonstrate that total eligible costs for the declared fire meet or exceed either the individual fire cost threshold, which applies to single fires, or the cumulative fire cost threshold, which recognizes numerous smaller fires burning throughout a state.

Source: Regional Catastrophic Preparedness (RCP) Grants

Agency: FEMA

Website: <https://www.fema.gov/grants/preparedness/regional-catastrophic>

Description: The Regional Catastrophic Preparedness Grant program provides funding to increase collaboration and capacity in regard to catastrophic incident response and preparation.

Source: America the Beautiful Challenge

Agency: National Fish and Wildlife Foundation

Website: <https://www.nfwf.org/programs/america-beautiful-challenge>

Description: The America the Beautiful Challenge is an annual initiative to streamline funding for conservation and restoration work to build watershed and forest resilience. The program emphasizes restoration of rivers, coasts, wetlands, grasslands, and forests to protect from drought, flooding, and wildfire. ATBC encourages public-private partnerships to benefit landscape scale conservation and resilience efforts.

Source: Emergency Forest Restoration Program (EFRP)

Agency: USDA Farm Service Agency (FSA)

Website: <https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/emergency-forest-restoration/index>

Description: The Emergency Forest Restoration Program (EFRP) helps the owners of non-industrial private forests restore forest health damaged by natural disasters. The EFRP does this by authorizing payments to owners of private forests to restore disaster damaged forests. The local FSA County Committee implements EFRP for all disasters with the exceptions of drought and insect infestations.

Eligible practices may include debris removal, such as down or damaged trees; site preparation, planting materials, and labor to replant forest stand; restoration of forestland roads, fire lanes, fuel breaks, or erosion-control structures; fencing, tree shelters; wildlife enhancement.

To be eligible for EFRP, the land must have existing tree cover; and be owned by any nonindustrial private individual, group, association, corporation, or other private legal entity.

Source: Emergency Conservation Program (ECP)

Agency: USDA Farm Service Agency (FSA)

Website: <https://www.fsa.usda.gov/programs-and-services/conservation-programs/emergency-conservation/index>

Description: The Emergency Conservation Program (ECP) helps farmers and ranchers to repair damage to farmlands caused by natural disasters and to help put in place methods for water conservation during severe drought. The ECP does this by giving ranchers and farmers funding and assistance to repair the damaged farmland or to install methods for water conservation. The grant could be used for restoring conservation structures (waterways, diversion ditches, buried irrigation mainlines, and permanently installed ditching system).

Source: Environmental Quality Incentives Program (EQIP)

Agency: National Resource Conservation Service (NRCS)

Website: <https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives>

Description: The Environmental Quality Incentives Program (EQIP) is a voluntary program authorized under the Agricultural Act of 2014 (2014 Farm Bill) that helps producers install measures to protect soil, water, plant, wildlife, and other natural resources while ensuring sustainable production on their farms, ranches, and working forest lands.

Source: Emergency Watershed Protection (EWP) Program

Agency: National Resource Conservation Service (NRCS)

Website: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/>

Description: The program offers technical and financial assistance to help local communities relieve imminent threats to life and property caused by floods, fires, windstorms, and other natural disasters that impair a watershed.

Eligible sponsors include cities, counties, towns, conservation districts, or any federally recognized Native American tribe or tribal organization. Interested public and private landowners can apply for EWP Program recovery assistance through one of those sponsors.

EWP Program covers the following activities.

- Debris removal from stream channels, road culverts, and bridges
- Reshape and protect eroded streambanks
- Correct damaged drainage facilities
- Establish vegetative cover on critically eroded lands
- Repair levees and structures
- Repair conservation practices

Source: Funding for Fire Departments and First Responders**Agency:** DHS, U.S. Fire Administration**Website:** <https://www.fema.gov/grants/preparedness/firefighters/assistance-grants>

Description: Includes grants and general information on financial assistance for fire departments and first responders. Programs include the Assistance to Firefighters Grant Program, Reimbursement for Firefighting on Federal Property, State Fire Training Systems Grants, and National Fire Academy Training Assistance.

Source: Tribal Environmental General Assistance Program (GAP)**Agency:** Environmental Protection Agency (EPA)**Website:** <https://www.epa.gov/tribal-pacific-sw/epa-region-9-tribal-environmental-gap-funding>

Description: Funding under this program is used to aid Native American tribes in establishing and implementing their own reservation-specific environmental protection programs. To find out more about this funding opportunity please contact Tribal Branch Manager, Jeremy Bauer, at bauer.jeremy@epa.gov.

Source: Specific EPA Grant Programs**Agency:** Environmental Protection Agency (EPA)**Website:** <https://www.epa.gov/grants/grants-your-region-information-specific-epa-region-8>

Description: Various grant programs are listed under this site. Listed below are examples of grants offered:

- Multipurpose Grants to States and Tribes: <https://www.epa.gov/grants/multipurpose-grants-states-and-tribes>
- Environmental Education Grants: <https://www.epa.gov/education/grants>
- Environmental Justice Grants: <https://www.epa.gov/environmentaljustice/environmental-justice-grants-funding-and-technical-assistance>

Source: Conservation Innovation Grants (CIG)**Agency:** National Resource Conservation Service**Website:** <https://www.nrcs.usda.gov/programs-initiatives/cig-conservation-innovation-grants>

Description: CIG State Component. CIG is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. Under CIG, Environmental Quality Incentives Program (EQIP) funds are used to award competitive grants to non-federal governmental or nongovernmental organizations, tribes, or individuals. CIG enables the Natural Resources Conservation Service (NRCS) to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with federal, state, and local regulations. The NRCS administers the CIG program. The CIG requires a 50/50 match between the agency and the applicant. The CIG has two funding components: national and state. Funding sources are available for water resources, soil resources, atmospheric resources, and grazing land and forest health.

Source: Urban and Community Forestry Program, National Urban and Community Forestry Challenge Cost Share Grant Program

Agency: U.S. Forest Service

Website: <https://www.fs.usda.gov/managing-land/urban-forests/ucf>

Description: U.S. Forest Service funding will provide for Urban and Community Forestry Programs that work with local communities to establish climate-resilient tree species to promote long-term forest health. The other initiative behind this program is to promote and carry out disaster risk mitigation activities, with priority given to environmental justice communities. For more information, contact a Forest Service Regional Program Manager.

Source: Community Wildfire Defense Grant

Agency: U.S. Forest Service

Website: <https://www.fs.usda.gov/managing-land/fire/grants>

Description: The Community Wildfire Defense Grant is intended to help communities with a high wildfire risk plan and implement the goals of the National Cohesive Wildland Fire Management Strategy. These goals include restoring and maintaining landscapes, creating fire adapted communities, and improving wildfire response. Funds are available to develop or update community wildfire protection plans and to implement projects listed in CWPPs that are less than 10 years old. At-risk communities are those positioned in fire prone areas, low-income communities, and those that have been impacted by a severe disaster.

Source: Catalog of Federal Funding Sources; Land Resources

Agency: Multiple

Website: <https://ordspub.epa.gov/ords/wfc/f?p=165:512:16627993499812:::512::>

Description: The Land Finance Clearing House is a catalogue of federal funding sources for all things land related.

Examples of the types of grants found at this site are:

- Forest and Woodlands Resource Management Grant: https://sam.gov/fal/a798ad78cac749639b48270db3e86fdc/view?index=cfda&page=2&organization_id=100011100
- Environmental Education Grant: <https://www.epa.gov/education/grants>
- Public Assistance Grant Program: <https://www.fema.gov/assistance/public>
- Hazard Mitigation Grant: <https://www.fema.gov/grants/mitigation/hazard-mitigation>

Source: Catalog of Federal Funding Sources; Water Resources

Agency: Multiple

Website: <https://ordspub.epa.gov/ords/wfc/f?p=165:12:16627993499812:::12::>

Description: The Water Finance Clearing House is a catalogue of federal funding sources for all things water related.

Examples of the types of grants found at this site are:

- Water Conservation Field Services Program: <https://www.usbr.gov/waterconservation/>

- Colorado Community Development Block Grant: <https://oedit.colorado.gov/community-development-block-grant-planning-feasibility-studies-grant#:~:text=The%20Community%20Development%20Block%20Grant%20%28CDBG%29%20Planning%20and,least%20one%20full-time%20equivalent%20job%20per%20%2420%2C000%20funded.>
- Colorado State Water Quality Grants: <https://cdphe.colorado.gov/water-quality/funding-grants-and-loans/water-quality-grants>

Source: Firewise Communities

Agency: Multiple

Website: <https://www.nfpa.org/about-nfpa/awards>

Description: Many different Firewise Communities activities are available to help homes and whole neighborhoods become safer from wildfire without significant expense. Community cleanup days, awareness events, and other cooperative activities can often be successfully accomplished through partnerships among neighbors, local businesses, and local fire departments at little or no cost.

The kind of help you need will depend on who you are, where you are, and what you want to do. Among the different activities that individuals and neighborhoods can undertake, the following often benefit from seed funding or additional assistance from an outside source:

- Thinning/pruning/tree removal/clearing on private property—particularly on very large, densely wooded properties
- Retrofit of home roofing or siding to non-combustible materials
- Managing private forest
- Community slash pickup or chipping
- Creation or improvement of access/egress roads
- Improvement of water supply for firefighting
- Public education activities throughout the community or region

Source: The National Fire Plan (NFP)

Agency: U.S. Department of Interior and USDA

Website: <http://www.forestsandrangelands.gov/>

Description: Many states are using funds from the NFP to provide funds through a cost-share with residents to help them reduce the wildfire risk to their private property. These actions are usually in the form of thinning or pruning trees, shrubs, and other vegetation and/or clearing the slash and debris from this kind of work. Opportunities are available for rural, state, and volunteer fire assistance.

Source: Staffing for Adequate Fire and Emergency Response (SAFER)

Agency: FEMA

Website: <https://www.fema.gov/grants/preparedness/firefighters/safer>

Description: The purpose of SAFER grants is to help fire departments increase the number of frontline firefighters. The goal is for fire departments to increase their staffing and deployment capabilities and ultimately attain 24-hour staffing, thus ensuring that their communities have adequate

protection from fire and fire-related hazards. The SAFER grants support two specific activities: (1) hiring of firefighters and (2) recruitment and retention of volunteer firefighters. The hiring of firefighters activity provides grants to pay for part of the salaries of newly hired firefighters over the five-year program.

Source: The Fire Prevention and Safety Grants (FP&S)

Agency: FEMA

Website: <https://www.fema.gov/grants/preparedness/firefighters/safety-awards#:~:text=Awards%20%20%20%20Organization%20%20%20,%20%20%241%2C499%2C957%20%2016%20more%20rows%20>

Description: FP&S offers support to projects that enhance the safety of the public and firefighters who may be exposed to fire and related hazards. The primary goal is to target high risk populations and mitigate high incidences of death and injury. Examples of the types of projects supported by FP&S include fire-prevention and public-safety education campaigns, juvenile fire-setter interventions, media campaigns, and arson prevention and awareness programs. In fiscal year 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include firefighter safety research and development.

Source: GSA-Federal Excess Personal Property

Agency: USFS

Website: <https://gsaccess.gov/>

Description: The Federal Excess Personal Property (FEPP) program refers to Forest Service-owned property that is on loan to State Foresters for the purpose of wildland and rural firefighting. Most of the property originally belonged to the Department of Defense (DoD). Once acquired by the Forest Service, it is loaned to State Cooperators for firefighting purposes. The property is then loaned to the State Forester, who may then place it with local departments to improve local fire programs. State Foresters and the USDA Forest Service have mutually participated in the FEPP program since 1956.

Source: Assistance to Firefighters Grants (AFG)

Agency: FEMA

Website: <https://www.fema.gov/grants/preparedness/firefighters>.

Description: The AFG program provides resources to assist fire departments in attaining critical resources such as training and equipment.

STATE FUNDING INFORMATION

Source: Colorado State Forest Service Grants & funding Assistance

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/grants/>

Description: The Colorado State Forest Service manages multiple funding programs to assist private and public landowners in managing forested lands to mitigate the risk of wildfire and steward forests for ecological, economic, and social value. A list of current programs is provided here with links to respective program sites:

Public Programs

- Forest Restoration & Wildfire Risk Mitigation: <https://csfs.colostate.edu/grants/forest-restoration-wildfire-risk-mitigation/>
- Wildfire Mitigation Incentives for Local Government: <https://csfs.colostate.edu/grants/wildfire-mitigation-incentives-for-local-government/>
- Wildfire Mitigation Resources & Best Practices Grant Program: <https://csfs.colostate.edu/grants/wildfire-mitigation-resources-best-practices-grant-program/>

Private Landowner Programs

- Forest Ag Program: <https://csfs.colostate.edu/forest-ag-program/>
- Forest Legacy Program: <https://csfs.colostate.edu/forest-legacy-program/>
- Forest Stewardship Program: <https://csfs.colostate.edu/forest-stewardship-program/>
- Tree Farm Program: <https://csfs.colostate.edu/tree-farm/>

Source: Various Funding Sources

Agency: Colorado Division of Fire Prevention and Control (DFPC)

Website: <https://dfpc.colorado.gov/sections/grants>

Description: The DFPC manages three funding programs: HB 22-1194 funding, Firefighter Safety Disease Prevention Grant, and the Volunteer Fire Assistance Grant. HB 22-1194 provides funds to structural and wildland crews to purchase personal protective equipment such as breathing apparatuses and line packs. The FFSDP grant similarly provides funding for any firefighter equipment that improves safety and prevents occupation-related diseases. The VFA Program supports rural fire stations with volunteer crews that serve communities with 10,000 people or fewer.

Source: Colorado Strategic Wildfire Action Program

Agency: Colorado Department of Natural Resources

Website: <https://dnr.colorado.gov/divisions/forestry/co-strategic-wildfire-action-program>

Description: In 2021, Senate Bill 21-258 was signed into law and established the Colorado Strategic Wildfire Action Program. This program is intended to bolster wildland firefighter capabilities by expanding workforce development, providing additional funds to hire more crew members, and helping state wildland inmate fire teams (SWIFT), find long term employment post-incarceration. This funding opportunity is intended to strategically address focal landscapes and concern areas through expanded mitigation and response capacity.

PRIVATE FUNDING INFORMATION

Source: State Farm Good Neighbor Citizenship (GNC) Grants

Agency: State Farm

Website: <https://www.statefarm.com/about-us/corporate-responsibility/community-grants/good-neighbor-citizenship-grants>

Description: State Farm funding is directed at:

- Auto and roadway safety
- Teen Driver Education

- Home safety and fire prevention
- Disaster preparedness
- Disaster recovery

Source: The Urban Land Institute (ULI)

Website: <http://www.uli.org>

Description: ULI is a 501(c)(3) nonprofit research and education organization supported by its members. The institute has more than 22,000 members worldwide, representing the entire spectrum of land use and real estate development disciplines, working in private enterprise and public service. The mission of the ULI is to provide responsible leadership in the use of land to enhance the total environment. ULI and the ULI Foundation have instituted Community Action Grants that could be used for Firewise Communities activities. Applicants must be ULI members or part of a ULI District Council. Contact actiongrants@uli.org or review the web page to find your District Council and the application information.

Source: Environmental Systems Research Institute (ESRI)

Website: <http://www.esri.com/grants>

Description: ESRI is a privately held firm and the world's largest research and development organization dedicated to geographic information systems. ESRI provides free software, hardware, and training bundles under ESRI-sponsored Grants that include such activities as conservation, education, and sustainable development, and posts related non-ESRI grant opportunities under such categories as agriculture, education, environment, fire, public safety, and more. You can register on the website to receive updates on grant opportunities.

Source: National Forest Foundation; Innovative Finance for National Forests Grant Program

Website: <https://www.nationalforests.org/grant-programs/innovative-finance-for-national-forests-grant-program>

Description: The Innovative Finance for National Forests Grant Program aims to bring in non-USFS funds to increase forest resilience. There are three main topics for funding: wildfire resilience and recovery, sustainable recreation access and infrastructure, and watershed health. In addition, three types of projects are funded: pilot programs with on-the-ground implementation, scaling projects to deliver backlogs of unfunded work, and research and development to provide to new forest information.

Source: StEPP Foundation

Website: <https://steppfoundation.org/>

Description: StEPP is a 501(c)(3) organization dedicated to helping organizations realize their vision of a clean and safe environment by matching projects with funders nationwide. The StEPP Foundation provides project oversight to enhance the success of projects, increasing the number of energy efficiency, clean energy, and pollution prevention projects implemented at the local, state, and national levels for the benefit of the public. The website includes an online project submittal system and a Request for Proposals page.

Source: Matching Awards Program

Agency: National Forest Foundation (NFF)

Website: <https://www.nationalforests.org/grant-programs/map>

Description: The NFF is soliciting proposals for its Matching Awards Program (MAP) to provide funds for direct on-the-ground projects benefitting America's National Forests and Grasslands. By pairing federal funds provided through a cooperative agreement with the U.S. Forest Service with non-federal dollars raised by award recipients, MAP measurably multiplies the resources available to implement stewardship projects that benefit the National Forest System.

Source: **Patagonia Environmental Grants and Support**

Agency: Patagonia

Website: <https://www.patagonia.com/how-we-fund/>

Description: Patagonia supports innovative work that addresses the root causes of the environmental crisis and seeks to protect both the environment and affected communities. Patagonia focuses on places where they have built connections through outdoor recreation and through their network of retail stores, nationally and internationally.

Source: **Leonardo DiCaprio Foundation Grants**

Agency: Leonardo DiCaprio Foundation

Website: <https://www.rewild.org/>

Description: The foundation supports projects around the world that build climate resiliency, protect vulnerable wildlife, and restore balance to threatened ecosystems and communities.

Source: **U.S. Endowment for Forestry and Communities**

Agency: U.S. Environmental Protection Agency, Natural Resources Conservation Service (NRCS), U.S. Forest Service, U.S. Department of Defense, U.S. Economic Development Agency

Website: <https://www.usendowment.org/>

Description: As the nation's largest public charity dedicated to keeping our working forests working and ensuring their bounty for current and future generations, the Endowment deploys the creativity and power of markets to advance their mission: The Endowment works collaboratively with partners in the public and private sectors to advance systemic, transformative and sustainable change for the health and vitality of the nation's working forests and forest-reliant communities.

FUNDING SOURCES FOR HOMEOWNERS

Source: **Forest Ag Program**

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/forest-ag-program/>

The Forest Ag Program is a voluntary program available to landowners with 40 or more acres of forested land who manage their land for harvestable wood products. The program is intended to incentivize forest management and fire resilient forests through property tax reductions for land managers. Landowners are required to complete a Forest Management Plan with a professional

forester to ensure management activities are in line with landscape objectives and best management practices.

Source: Forest Legacy Program

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/forest-legacy-program/>

The Forest Legacy Program is a federally funded initiative to assist in the acquisition or designation of conservation easements on privately owned forest land. The program was established to permanently protect portions of Colorado's forest that contribute to the state's ecological and scenic value while maintaining sustainable uses of forest resources such as recreation. Funds are primarily provided by the federal government with matching funds required by state funders or conservation organizations to purchase or secure forested lands. Conserved lands can be kept under private ownership or opened to public access through this easement program.

Source: Forest Stewardship Program

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/forest-stewardship-program/>

The Forest Stewardship Program is a voluntary initiative intended to broaden resource availability and technical assistance for privately owned forest land. The program connects landowners with professional foresters to identify property goals and develop a Stewardship Management Plan to improve overall forest health and landowner knowledge. The program goal is to expand forest stewardship principles to ensure proper management and connectivity of private forestland. Financial assistance may be available for landowners with a Forest Stewardship Plan.

Source: Wildfire Mitigation Resources & Best Practices Grant Program

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/grants/wildfire-mitigation-resources-best-practices-grant-program/>

The Colorado Legislature established the Wildfire Mitigation Resources & Best Practices Grant Program in 2022. This program provides state support to conduct outreach among landowners in high wildfire hazard areas. To be eligible, a recipient must be an agency of local government, a county, municipality, special district, a tribal agency or program, or a nonprofit organization. The Colorado State Forest Service has \$300,000 available for grant awards through this program.

Source: Homesite Assessments

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/homeowners-landowners/homesite-assessments/>

CSFS foresters are available to assist homeowners and landowners with these questions and more through homesite assessments. A forester will visit your land and examine your trees for disease, wildland fire defensible space, and overall health. They can make recommendations for disposing of diseased trees, safeguarding your trees, keeping your trees healthy and reducing their risk of disease, and mitigating the risk of catastrophic wildfire. For more information or to schedule a homesite assessment, contact a local CSFS Field Office.

Source: Colorado Tree Farm Program

Agency: Colorado State Forest Service

Website: <https://csfs.colostate.edu/tree-farm/>

The Colorado Tree Farm Program is part of the American Tree Farm System (ATFS) and is a program of the American Forest Foundation. The ATFS is a privately funded, national tree-growing effort that encourages forest management on private lands. Other forest certification organizations exist, but the American Tree Farm System is the oldest and largest forest certification program in the United States.

OTHER FUNDING INFORMATION

The following resources may also provide helpful information for funding opportunities:

- Western Forestry Leadership Coalition: <https://www.thewflc.org/>
- USDA Information Center: <https://www.nal.usda.gov/main/information-centers>
- Forest Service Fire Management website: <http://www.fs.fed.us/fire/>
- Insurance Services Office Mitigation Online (town fire ratings): <http://www.isomitigation.com/>
- National Fire Protection Association: <http://www.nfpa.org>
- National Interagency Fire Center, Wildland Fire Prevention/Education: <https://www.nifc.gov/fire-information/fire-prevention-education-mitigation>
- Department of Homeland Security U.S. Fire Administration: <https://www.usfa.fema.gov/index.html>

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APPENDIX M: Core Team Engagement

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CORE TEAM ENGAGEMENT

Throughout the planning process, the Core Team gathered at strategic times to ensure the plan was aligned with the current conditions, values, and objectives of the community as well as to review draft documents. The Core Team was comprised of key stakeholders and subject matter experts most familiar with the landscape, community, and emergency response capabilities of the County. The following section contains the names and titles of Core Team members and information on the schedule and accomplishments of each Core Team meeting.

Name	Organization	Title
Andy Martsof	Mesa County Sheriff's Office	Emergency Services Director
Sean Norris	Mesa County Planning Division	Planning Manager
Matthew Schiltz	CSFS Northwest Area, Rifle Field Office	Supervisory Forester Communications and Communities
Jesse Moreng	DFPC	Colorado River Region Battalion Chief
Ron Cousineau	CSFS Grand Junction	Northwest Area Forest Manager
Pete Firmin	CPW	Two Rivers Wildfire Coalition Co-chair
Doug Paul	BLM	Upper Colorado River Interagency Fire Management Unit (UCR) Acting Fire Mitigation Specialist
Jeremy Spetter	BLM Grand Junction	Upper Colorado River Interagency Fire Management Unit (UCR) Fuels Program Manager
Mike Jones	BLM Grand Junction	Fire Management Specialist (Mitigation and Fire Trespass)
Ben Sanders	USFS Grand Mesa, Uncompahgre, and Gunnison National Forests	Grand Valley Ranger District FMO
Bill Edwards	USFS Grand Mesa, Uncompahgre, and Gunnison National Forests	Grand Valley Ranger District District Ranger
Frank Hayde	NPS	Ranger
Rusty Lloyd	RiversEdge West	Executive Director
Christine Prins	NRCS/RiversEdge West	Private Lands Biologist
Ellis Thompson-Ellis	City of Grand Junction	Community Outreach Specialist
Melonie Montarozzo	Town of Collbran	Town Manager
Care McInnis	Town of De Beque	Municipal Judge
Chuck Balke	Town of Palisade	Fire Chief
Kimberly Bullen	City of Fruita	Public Works Director
Victoria Amato	SWCA	Principal Fire Planner
Arianna Porter	SWCA	Project Manager
Liz Hitzfelder	SWCA	Lead Geospatial Analyst
Erica Jansen	SWCA	Geospatial Analyst
Breanna Plucinski	SWCA	Assistant Project Manager
Sam Lashley	SWCA	Assistant Project Manager

Name	Organization	Title
Ryan Saggese	SWCA	Fire Planner
Tim Clute	SWCA	Fire Planner
Alexis Roberts	SWCA	Fire Planner

CORE TEAM MEETING 1

Core Team meeting 1 was held virtually via Zoom on December 6, 2022. During the initial meeting, SWCA staff provided an overview of the CWPP purpose and process, reviewed the results from the Core Team priorities survey, determined initial project objectives and components, and overviewed the schedule for future Core Team and public engagement meetings. The Core Team was instructed to review the previous CWPP to inform decisions on project recommendations and potential roadblocks to implementation. Data gaps were identified, and the Core Team was tasked with providing additional information and data layers following the meeting. SWCA was tasked with providing an updated WUI delineation map to the Core Team for the second meeting. Meeting outcomes were improved data sharing, improved understanding of all agencies' priorities for the CWPP, and preparation for the second meeting during which project recommendations were formed. Attendees of meeting 1 are listed below.

Core Team Meeting 1 Attendees		
Andy Martsolf	Jesse Moreng	Doug Paul
Kamie Long	Pete Firmin	Ben Sanders
Jeremy Spetter	Rusty Lloyd	Billy Edwards
Ari Porter	Vicky Amato	Liz Hitzfelder
Breanna Plucinski	Isaac Fournier	

CORE TEAM MEETING 2

Core Team meeting 2 was held in-person on March 22, 2023, at the Grand Junction Fire Department. The meeting lasted from 9 a.m. to 2 p.m. The intent of the meeting was to provide project and schedule updates, and discuss the WUI delineation and other draft mapping, workshop project recommendations, and next steps such as draft documents and public outreach. Maps that were presented included WUI delineation, fire occurrence, and the shared web application with various data layers. Project recommendation discussion and initial drafting was based around the three goals of the National Cohesive Strategy. A main theme for recommendations was public outreach and education to improve defensible space and awareness of risk reduction. At the conclusion of the meetings, action items for the Core Team included reviewing community narratives and web map, providing feedback on the community survey, and filling data gaps. SWCA was tasked with updating plan recommendations and risk assessment data. Outcomes of the meeting were mapped areas of concern, WUI, and draft project recommendations. Meeting 2 attendees are listed below.

Core Team Meeting 2 Attendees

Andy Martsolf	Ellis Thompson	Gus Hendricks
Christine Prins	Doug Paul	Ben Sanders
Chuck Balke	Ari Porter	Vicky Amato

CORE TEAM MEETING 3

Core Team meeting 3 was held virtually via Zoom on August 10, 2023. The intent of the meeting was for the Core Team to provide feedback and edits for the draft CWPP. The Core Team was provided with a copy of the draft CWPP 2 weeks prior to the meeting to allow review time. The meeting included discussion on action items to be implemented before the plan was released for public review. Action items for SWCA included compiling Core Team comments, finalizing an areas of concern map, incorporating additional photographs, and adding additional information on recommended fuels treatments. Core Team tasks included providing additional photographs and publicizing the draft plan for public review. The meeting outcome was a draft CWPP ready for public review. Meeting 3 attendees are listed below.

Core Team Meeting 3 Attendees

Andy Martsolf	Chuck Balke	Rusty Lloyd
Mike Jones	Matt Schiltz	Kimberly Bullen
Pete Firmin	Ari Porter	Vicky Amato
Sam Lashley		

OTHER MEETINGS

Throughout the project, various Core Team members met with SWCA staff to discuss the project.

- Ari Porter and Andy Martsolf met over Zoom and over the phone to discuss project schedule and action items throughout the project.
- Ari Porter, Andy Martsolf, Vicky Amato, and Matt Schiltz met virtually on September 14, 2023, to discuss plan requirements with the CSFS.

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