MAY 2025

TREASURE COUNTY

COMMUNITY WILDFIRE PROTECTION PLAN

Working together to build fire adapted communities, resilient to wildfire

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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 Sam Lashley at sam.lashley@swca.com or Treasure County Department of Emergency Services Coordinator Nicole Stephenson at nstephenson@treasurecountymt.com

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

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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 Treasure County Community Wildfire Protection Plan and agree that the CWPP is viable, complete, and realistic in terms of risk reduction and implementation.

Signature	**Signature**
Name (printed)	**Name (printed)**
Date	**Date**
Agency/Position (printed)	**Agency/Position (printed)**

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EXECUTIVE SUMMARY

The 2025 Treasure County Community Wildfire Protection Plan (CWPP) provides a strategic framework for reducing wildfire risk, improving emergency preparedness, and guiding community action. It identifies priority areas for hazardous fuels reduction and outlines opportunities to strengthen wildfire resilience through collaboration, education, and proactive mitigation. The plan also supports access to funding for implementing wildfire mitigation projects. As a living document, the Treasure County CWPP is intended to be reviewed and revised every 5 years, or more frequently in response to significant wildfire events, emerging risks, or changes in community priorities.

Treasure County's wildfire environment is shaped by a combination of rangelands, forested draws, and riparian corridors, many of which are privately owned. Limited access routes, small firefighting forces, continuous fuels, and remoteness all contribute to heightened wildfire risk. Given these challenges, the contributions of homeowners, landowners, and the broader community toward reducing wildfire risk are essential. Wildfire mitigation in Treasure County relies on individual responsibility, agency coordination, and ongoing public engagement.

WHAT IS THE GOAL OF A CWPP?

The goal of a CWPP is to improve community 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 for projects while incorporating public 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):

1. **Collaboration:** Local and state government representatives, in consultation with federal agencies or other interested groups, must collaboratively develop a CWPP.
2. **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 and their essential infrastructures.
3. **Reducing 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.

This 2025 CWPP update intends to provide a countywide scale of wildfire risk and protection needs, bring together all responsible wildfire management and suppression entities in Treasure County to address the identified needs, and support these entities in planning and implementing the necessary mitigation measures. Additional information on the planning process is available in Appendix A.

WHAT ARE THE KEY ISSUES ADDRESSED?

The 2025 Treasure County CWPP identifies the following wildfire-related concerns based on community input and the Core Team's local knowledge:

- **Hazardous Fuels Reduction –** Prioritizing fuel treatments in wildland-urban interface (WUI) areas, particularly around Hysham, Tullock Creek Road, Sarpy Creek Road, and other rural clusters, using targeted prescriptions to reduce intensity and increase defensibility. Private

landowner knowledge and participation is emphasized due to the county's high percentage of private ownership.

- **Improving Evacuation Routes and Emergency Access –** Addressing ingress/egress concerns stemming from dead-end, narrow, or poorly maintained roads. Roadside vegetation management and route assessments were identified as key needs.
- **Public Education and Outreach –** Promoting defensible space, home hardening, and personal preparedness through local channels and partnerships with organizations like Montana Department of Natural Resources and Conservation (DNRC) and FireSafe Montana.
- **Enhancing Fire Response Capabilities –** Supporting the all-volunteer Treasure County Rural Volunteer Fire Department (TCRVFD) and improving water availability across the planning area, especially in areas that lack reliable hydrants or drafting sites.
- **Strengthening Multiagency Coordination –** Promoting cooperation between Treasure County Disaster and Emergency Services (Treasure County DES), DNRC, local fire department, the Bureau of Land Management (BLM), and neighboring counties through mutual aid agreements and inter-local coordination.
- **Protecting Critical Infrastructure and Values at Risk –** Protecting agriculture operations, grazing lands, homes, and rural infrastructure from wildfire, while maintaining the viability of water resources like the Yellowstone River.
- **Addressing Climate-Related Wildfire Challenges –** Responding to ongoing drought, tree mortality, and changing fire behavior driven by climate variability.

HOW WAS THE 2025 TREASURE COUNTY CWPP UPDATE DEVELOPED?

The 2025 Treasure County CWPP was developed through collaboration among a multi-jurisdictional Core Team that included Treasure County Disaster and Emergency Services, DNRC, the TCRVFD, and other local agencies and stakeholders. Core Team meetings were held in June, July, and November 2024 to guide the planning process, review data, and develop actionable recommendations.

This update builds upon the 2007 Treasure County CWPP and integrates new fire behavior modeling, updated community data, and lessons learned from recent fire events and landowner experiences. Agency input, community surveys, and expert insights contributed to shaping the plan's priorities and strategies.

WHAT WAS THE PUBLIC INVOLVEMENT?

Public engagement played a central role in the CWPP update. Treasure County promoted awareness of the CWPP process and offered multiple ways for residents to participate. Outreach tools included a public survey, flyers distributed through local networks, and an open house event designed to gather feedback and share risk information.

A diverse Core Team of land managers, county officials, emergency response personnel, and agency partners was formed to guide the planning process and provide valuable local knowledge and input.

The draft CWPP was available for public comment from May 5, 2025, to May 19, 2025, allowing residents to review recommendations and provide input. This feedback helped refine the CWPP to better align with local priorities. Details of the public involvement process are included in Appendix F.

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 Treasure County. The Risk-Hazard Assessment uses the Montana Wildfire Risk Assessment (MWRA) to model fire behavior, identify areas of high risk, and analyze threats to highly valued resources and assets (HVRAs). The Core Team reviewed existing data, stakeholder input, and local expertise to ensure that the assessment reflects current wildfire conditions, changing hazards, and new mitigation priorities since the 2007 Treasure County CWPP planning effort.

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

- Fire history and ignition causes
- Probability of wildfire occurrence
- Fire intensity under various weather and fuel conditions
- Exposure of structures and high-value assets
- Community-level susceptibility based on location and vegetation

The results of this risk assessment, outlined in Chapter 3, help land managers, fire officials, and community members develop strategic wildfire risk reduction efforts. This includes identifying areas of concern, prioritizing hazardous fuels reduction, improving emergency preparedness, and informing land use and development decisions. Further technical details on the modeling process can be found in the Fire Behavior Modeling and Methodology section of Appendix C.

WHAT ARE THE STRATEGIES TO ADDRESS WILDFIRE HAZARDS?

The National Cohesive Wildland Fire Management Strategy provides a framework for addressing wildfire hazards through three key goals: Resilient Landscapes, Fire-Adapted Communities, and Safe and Effective Wildfire Response. These goals guide the Treasure County CWPP in reducing wildfire risk, improving preparedness, and enhancing coordination between agencies, landowners, and the public.

Goal 1: Restore and Maintain Resilient Landscapes

Landscapes, regardless of jurisdictional boundaries, are resilient to fire, insects, disease, invasive species, and disturbances, in alignment with management objectives. Recommendations to reduce wildfire hazards and improve landscape resilience in Treasure County include**:**

- Maintain defensible space zones around structures.
- Conduct fuel treatments on rangeland, riparian corridors, and forested draws.

- Implement strategic fuel breaks where access and landowner cooperation allow.
- Manage invasive vegetation, particularly in riparian zones and along roads.

Goal 2: Fire-Adapted Communities

Human populations, livestock, and infrastructure are prepared to withstand, respond to, and recover from wildland fires through proactive mitigation and education efforts. Strategies for Treasure County include:

- Expand wildfire preparedness education, including readiness guides and defensible space programs.
- Promote ignition-resistant construction practices.
- Support homeowner-led mitigation efforts with technical assistance from DNRC and FireSafe Montana.
- Host outreach events and encourage peer-to-peer knowledge-sharing among rural landowners.
- Implement post-fire recovery programs for landowners, farmers, and ranchers.

Goal 3: Safe and Effective Wildfire Response

All jurisdictions participate in making and implementing safe, effective, and efficient risk-based wildfire management decisions. Recommendations for improving wildfire response capabilities include the following:

- Provide wildland fire training for TCRVFD and mutual aid partners.
- Improve rural water access by identifying and securing new draft locations and portable tank sites.
- Enhance radio communication and coordination protocols among responding agencies.
- Explore opportunities for equipment upgrades and grant-supported resource sharing.

HOW WILL THE PLAN BE IMPLEMENTED?

The CWPP is non-regulatory, but its implementation relies on collaborative action. Local landowners, volunteer fire departments, county agencies, and state/federal partners all play critical roles in carrying out the recommendations. On-the-ground implementation will require site-specific planning that considers land ownership, access, fuels, and community support.

Project implementation will also depend on securing funding and partnerships. Appendix G outlines potential grant programs and funding sources. As part of this plan, Treasure County and its partners are encouraged to develop annual action plans to track progress and adjust priorities as needed.

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 the signing and every 5 years following.

Due to the dynamic nature of wildfire risk, evolving land use patterns, and changing fire behavior, there are several triggers that may warrant an update before the 5-year mark. These include significant wildfire

events, major policy or regulatory changes, shifts in community priorities, or new data from fire behavior modeling and risk assessments. CWPPs greater than 10 years old are outdated and will not be prioritized when considered for competitive funding opportunities.

The best practice for Treasure County is to treat the CWPP as a living document, updating it annually with new mitigation projects, funding opportunities, and community engagement efforts. Immediate revisions should be considered following a major wildfire to incorporate lessons learned, reassess priorities, and refine mitigation strategies.

CORE TEAM

Name	Organization	Title
Ken Rolandson	Town of Hysham	Mayor
Marlo Moehr	Treasure County	Commissioner
David Rickett	Treasure County	Fire Warden
Nicole Stephenson	Treasure County Disaster and Emergency Services	DES Coordinator
Travis Gamble	Treasure County Disaster and Emergency Services	Deputy Fire Warden
Will Seastrom	Treasure County Sheriff's Office	Sheriff
Arlo Jensen	Town of Hysham	Town Council Member
Wes Duncan	Town of Hysham	Town Council Member
Patrick Nelson	Treasure County Town Council	Town Council Member
Stuart Thrower	Treasure County Town Council	Town Council Member
Bill Hutchison	Treasure County Rural Volunteer Fire Department	Fire Chief
Kipp Schwarzrock	Treasure County Rural Volunteer Fire Department	President of Fire Board
Carmen Borchelt	Montana Department of Natural Resources and Conservation	Community Preparedness & Fire Prevention Specialist
Jeff Brown	Montana Department of Natural Resources and Conservation	Fire Management Officer
Mike Boetcher	Montana Department of Natural Resources and Conservation	Assistant Fire Program Manager
Sarah Kleinhanzl	Montana Department of Natural Resources and Conservation	Wildfire Resilience Specialist
Jeff Bird	Natural Resources Conservation Service	District Administrator, Hysham Field Office
Cole Stumpf	Natural Resource Conservation Service, and Treasure County Rural Volunteer Fire Department, Treasurer Fire Board	Pheasants Forever/Range Conservationist, Hysham Field Office
Dale Butori	Montana Disaster and Emergency Services	District Field Officer
Issac Wald	Bureau of Land Management	Fire Mitigation/Education Specialist

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CHAPTER 1 – INTRODUCTION

The United States is facing urgent forest and watershed health concerns. In recent years, wildfires have shown a trend of increasing severity, with the total acres burned and the average acres burned per fire rising significantly over time. Since 2000, there has been a clear increase in the total acreage burned, with particularly high spikes observed in 2007, 2012, 2015, and 2020 (National Oceanic and Atmospheric Administration [NOAA] 2024). From 2013 to 2022, an average of 7.2 million acres were impacted annually due to wildfire, more than doubling the annual average of acres burned in the 1990s (Congressional Research Service 2023). The average acres burned per fire have also increased notably in recent years, especially after 2015, reflecting larger and more destructive fires (NOAA 2024). The 2015 fire season had the most acreage impacted in a single year (between 1960 and 2022) at 10.13 million acres. 2020 was the second most extensive year for wildfire with 10.12 million acres burned (Congressional Research Service 2023). These statistics demonstrate that wildfires are becoming larger and harder to control.

The 2020 Montana Forest Action Plan states that forests in Montana, 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 analysis of the current gap between existing and necessary wildland fire management strategies. A top priority in Montana is aligning current and future wildland fire management strategies with designated fire and fuel priority areas to effectively direct 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 (Montana Department of Natural Resources and Conservation [DNRC] 2020a).

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 2025 Treasure County CWPP, identifies potential new priority areas where mitigation measures are needed to protect from wildfire impacts the 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.

ALIGNMENT WITH THE COHESIVE STRATEGY

The 2025 CWPP update 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)

ALIGNMENT WITH PLANS AND AGREEMENTS

For all wildfire hazards that are, or may become, declared emergencies or major disasters under the Stafford Act, the State of Montana (specifically the DNRC) has entered into a cooperative wildland fire management agreement with multiple federal agencies, including the Bureau of Land Management (BLM), U.S. Forest Service (USFS), National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), and Bureau of Indian Affairs (BIA) (DNRC 2023a). The purpose of these agreements is to enhance wildfire response and management efficiency by coordinating the exchange of equipment, personnel, supplies, services, and funds among the parties involved. These agreements are detailed in the Montana Master Cooperative Wildland Fire Management and Stafford Act Response Agreement, which aim to streamline efforts in prevention, preparedness, communication, education, fuels treatment,

hazard mitigation, fire planning, response strategies, suppression, and post-fire rehabilitation, ensuring a unified and effective approach to managing wildland fires and other related emergencies in Montana (DNRC 2023a).

This CWPP is an update of the 2007 CWPP and aligns with multiple local, state, and federal planning documents, which are summarized in Appendix B, along with relevant fire policy and legislative direction. This CWPP is also aligned with the 2021 Treasure County Multi-Hazard Mitigation Plan, which identifies wildfire as a high-priority hazard and emphasizes interagency coordination, fuels reduction, and infrastructure protection (Treasure County Disaster and Emergency Services [Treasure County DES] 2021). The Multi-Hazard Mitigation Plan and CWPP ensure that wildfire mitigation is integrated into land use planning, emergency operations, and community preparedness efforts. Both plans reinforce Treasure County's ability to secure funding, resources, and support for wildfire mitigation, preparedness, and response in coordination with DNRC, USFS, BLM, and other agencies.

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.

PLANNING AND REGULATORY BACKGROUND

Detailed information regarding planning and regulatory background and land management strategies can be found in Appendix B, 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 local Treasure County coordinators with Montana Disaster and Emergency Services invited engagement from adjacent government agencies in the development of this 2025 Treasure County CWPP, forming the Core Team. The Core Team drives the planning process through decision-making, data sharing, experience, and communication with community members. Throughout the planning process Core Team members engaged with stakeholders, organized public engagement events, and supported the development of actionable project recommendations. The project kicked off on June 6, 2024, and the Core Team convened again on July 17, 2024, November 7, 2024, and April 24, 2025. Additional information about Core Team meeting accomplishments, attendees, and schedule are available in Appendix F.

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

- Improve wildfire resilience and adaptation of Treasure County.
- Develop a CWPP update with 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.
- Develop actions and recommendations to mitigate risks to people and property.
- Provide resources, information, and actionable planning for conducting fuel mitigation on private and public lands.
- Implement a process to implement and track project progress.

PLANNING AREA

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

Treasure County encompasses 984.5 square miles and has an estimated population of 772 people (U.S. Census Bureau 2023). The Census Bureau estimates that there are 449 housing units, reflecting the county's predominantly rural character, where development is sparse and largely spread out across private lands, with only small portions managed by various government agencies (U.S. Census Bureau 2023). The Core Team has identified the following communities as having the highest wildfire risk: Sarpy Creek Road, Tullock Creek Road, and the Rock Canyon Lane community.

Additional information regarding the county is provided in Appendix A, Community Background and Resources.

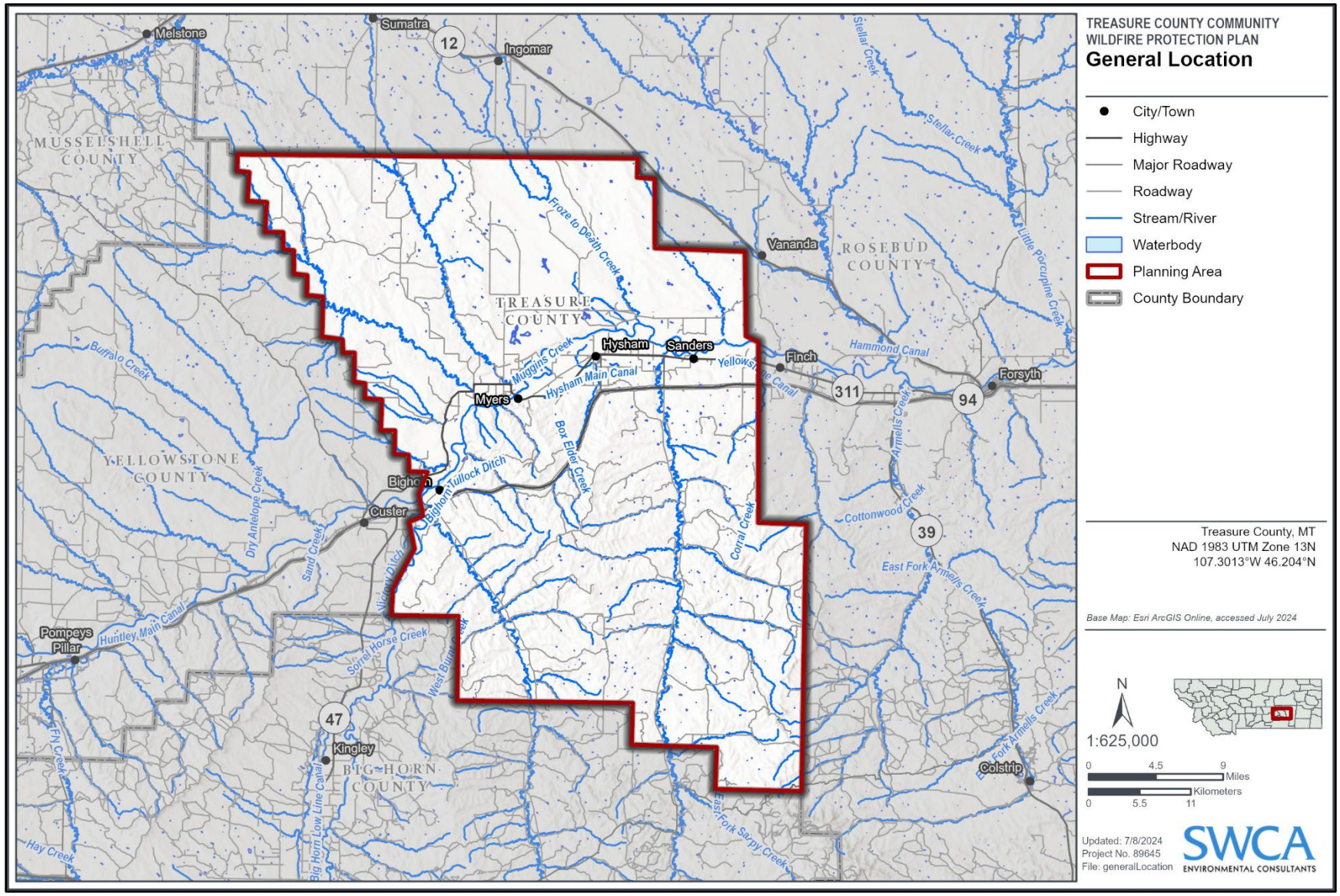

Figure 1.2. Treasure County general location.

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LAND OWNERSHIP

Treasure County is located in east-central Montana and spans approximately 979 square miles. The county is predominately rural, with agriculture and livestock operations dominating much of the landscape (Figures 1.3 and 1.4). The largest town, Hysham, serves as the county seat, with the population largely concentrated along the Yellowstone River Valley (Treasure County 2007; Treasure County DES 2021).

Figure 1.3. Typical landscape in Treasure County.

Figure 1.4. Typical landscape in Treasure County.

Private lands constitute 91.77% of the county's total area, presenting unique challenges and opportunities for wildfire management (Table 1.1; Figure 1.5). Collaborative efforts between private landowners and governmental agencies are essential for effective fire prevention and mitigation. The remaining lands are managed by the State of Montana (5.86%), BIA (1.71%), BLM (0.15%), and other governmental entities, including local government (0.50%) and the USFWS (0.01%) (see Table 1.1) (U.S. Census Bureau 2023).

Table 1.1. Breakdown of Land Ownership in Treasure County

Land Ownership	Acres	% of Planning Area
Private	581,125	91.77%
State	37,099	5.86%
Bureau of Indian Affairs	10,797	1.71%
Local Government	3,196	0.50%
Bureau of Land Management	943	0.15%
U.S. Fish and Wildlife Service	70	0.01%
Total	**633,231**	**100.00%**

ACCOMPLISHMENTS SINCE THE 2007 CWPP

Treasure County has made progress in wildfire mitigation and resilience since its last CWPP in 2007. Key achievements include the implementation of a comprehensive fuels reduction program and the development of targeted initiatives to address wildfire hazards (Treasure County 2007). One of the major accomplishments has been the reduction of wildfire risk in the Lower Bighorn drainage through a targeted implementation plan that focuses on reducing hazardous fuels (Natural Resources Conservation Service [NRCS] 2021). Approximately 1,540 acres have been mechanically thinned to reduce the wildfire potential significantly and improve forest health and resilience (Figure 1.6) (NRCS 2021). See Figures 1.7 through 1.12 for a look at pre- and post-treatment examples of recently completed fuel treatments in Treasure County.

Additionally, the 2021 Multi-Hazard Mitigation Plan update has strengthened community resilience by identifying critical wildfire risk areas, updating critical facilities and infrastructure maps, and developing new mitigation strategies. This updated plan promotes public safety and aims to protect private properties, infrastructure, and the environment from natural hazards, including wildfires (Treasure County 2021).

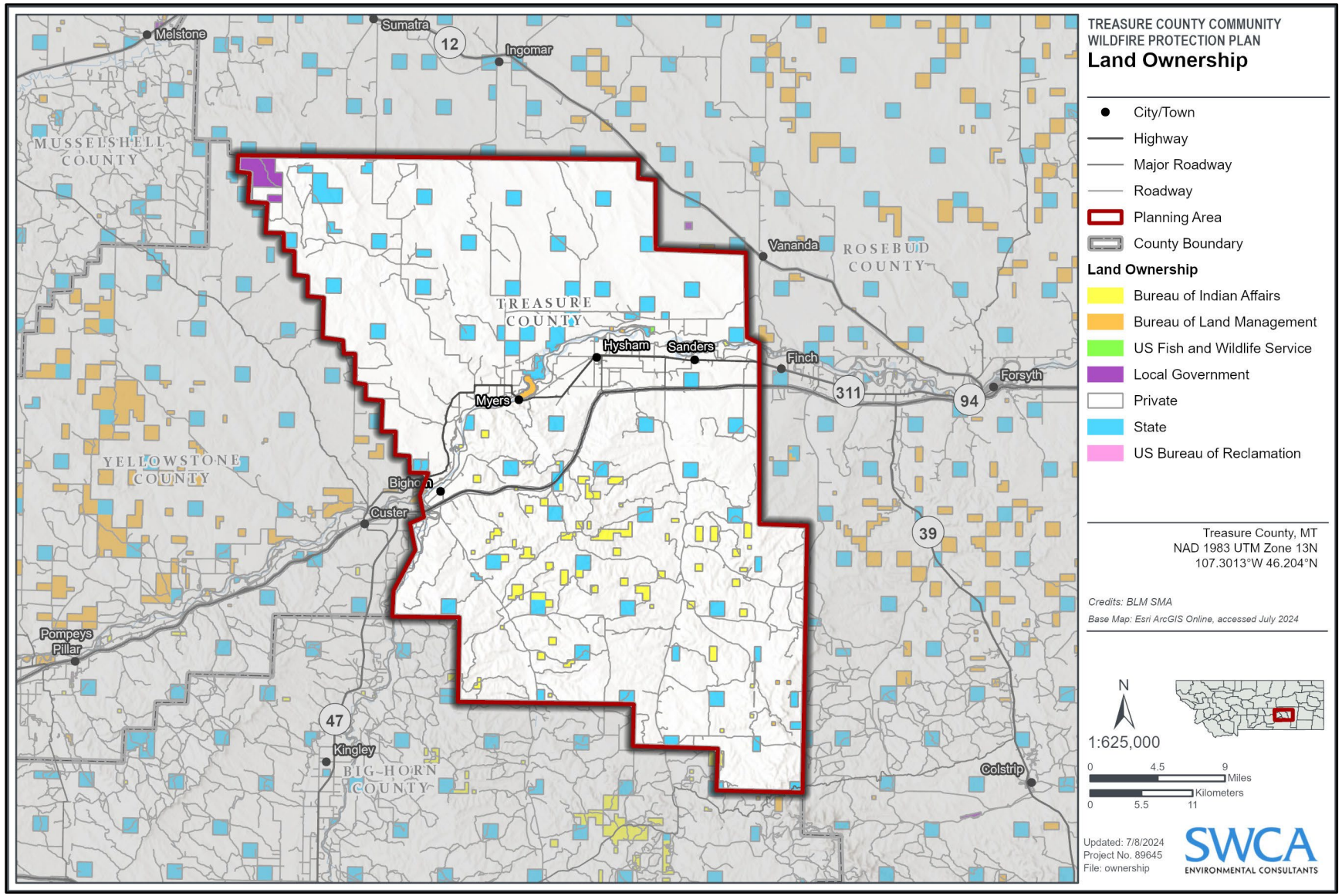

Figure 1.5. Treasure County land ownership.

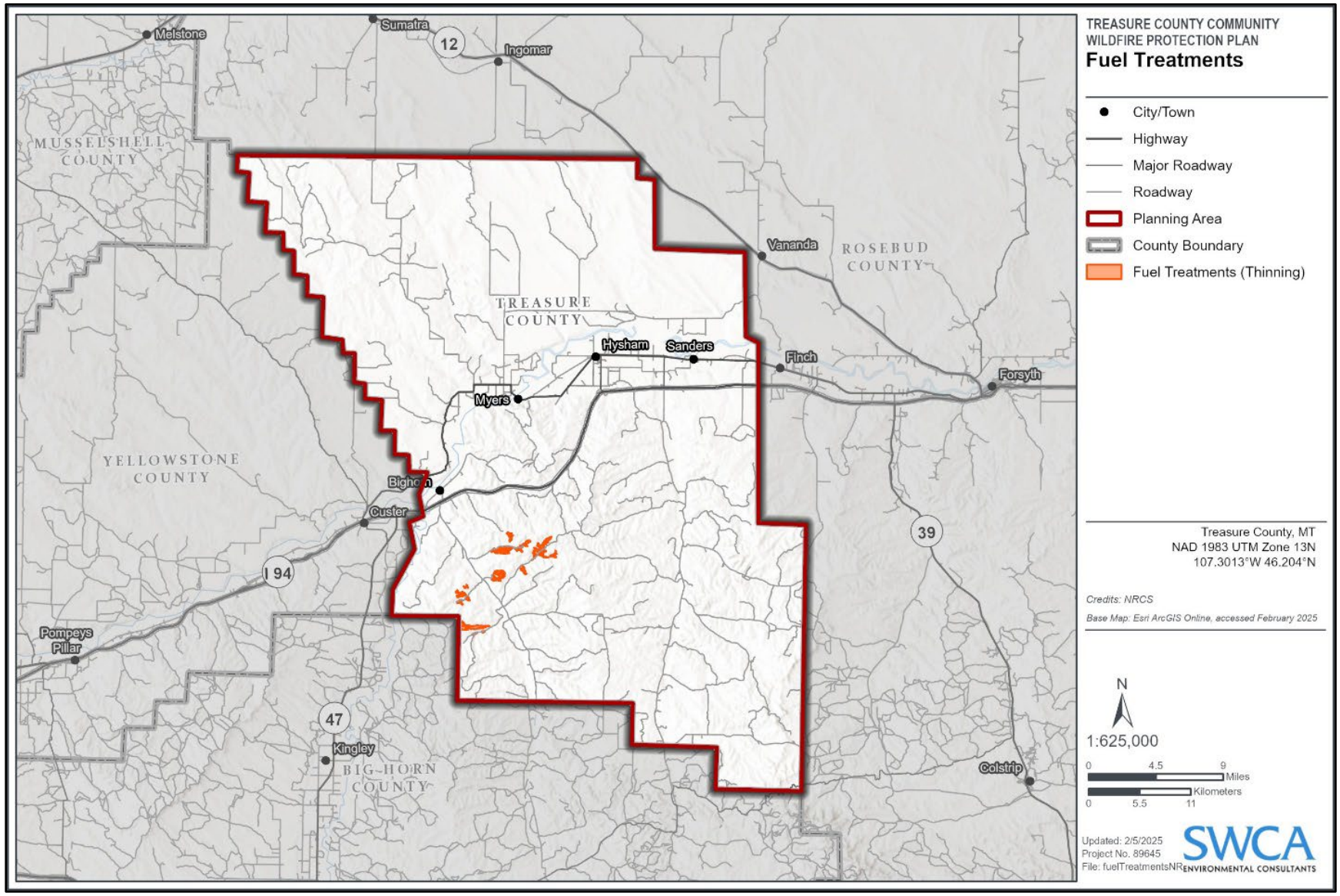

Figure 1.6. Fuel treatments conducted in Treasure County since the 2007 CWPP.

Pre-Treatment

Post-Treatment

Figure 1.7. Treatment Example 1.

Pre-Treatment

Post-Treatment

Figure 1.8. Treatment Example 2.

Pre-Treatment

Post-Treatment

Figure 1.9. Treatment Example 3.

Pre-Treatment

Post-Treatment

Figure 1.10. Treatment Example 4.

Pre-Treatment

Post-Treatment

Figure 1.11. Treatment Example 5.

Pre-Treatment

Post-Treatment

Figure 1.12. Pre- and Post-Treatment Example 6.

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CHAPTER 2 – FIRE ENVIRONMENT

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 (Figure 2.1), 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. Please refer to Figure 2.1 for a geographic visualization of the WUI and its delineation within Treasure County. Additional details regarding the development of the WUI are provided below.

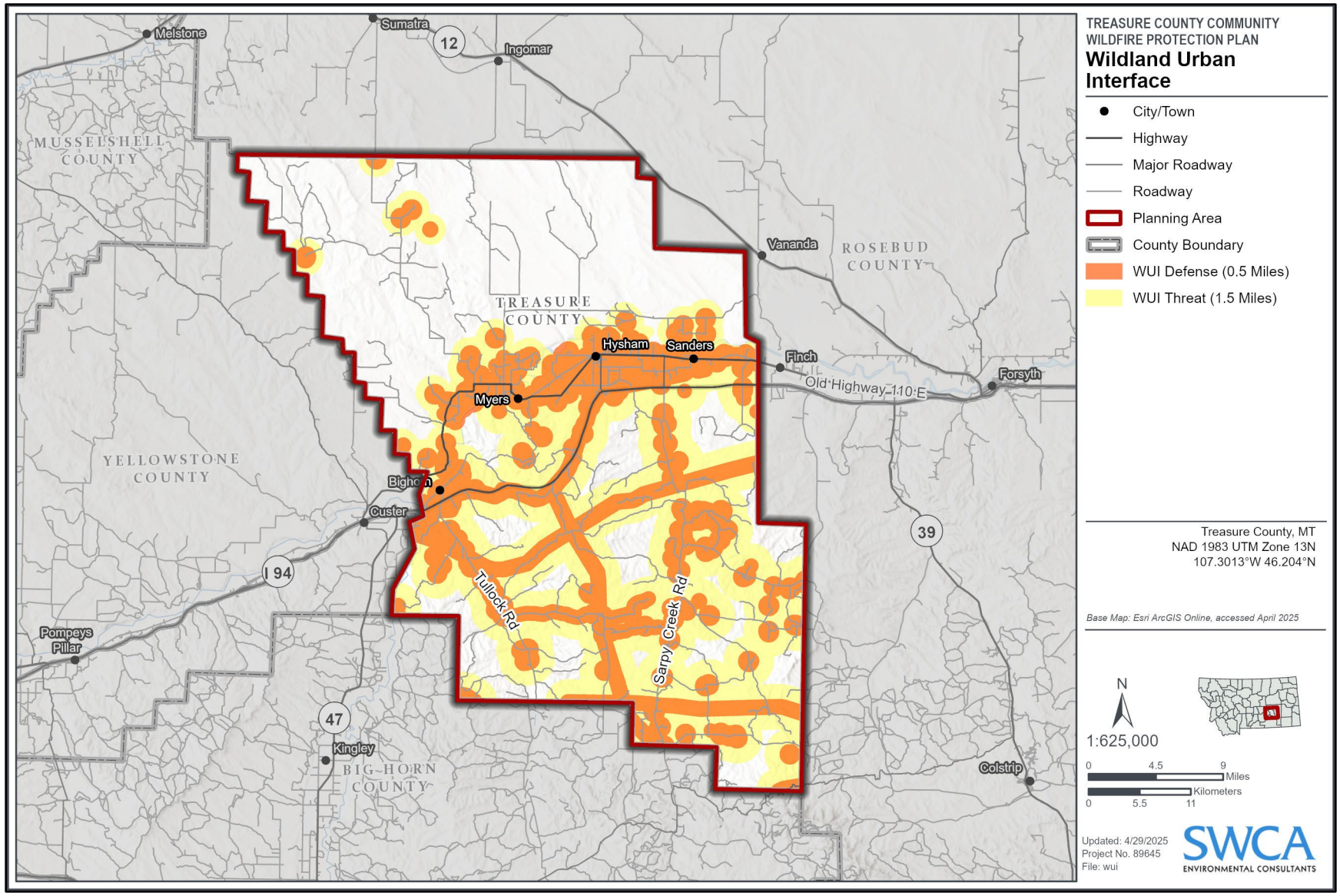

Figure 2.1. Treasure County WUI map.

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The Treasure County Core Team and SWCA collaboratively delineated a WUI boundary by buffering all occupied structures, critical ingress/egress routes (e.g., I-94, U.S. 10, Sarpy Creek Road), and key infrastructure (115-kV transmission lines, communication towers) by 0.5 mile for the WUI defense zone and by 1.5 miles for the WUI threat zone. This two-tier buffer approach is drawn directly from the Healthy Forests Restoration Act (HFRA) Section 101(16)(B)(ii) and (C), which allows communities to include areas within 1.5 miles of at-risk communities or evacuation routes when those areas contain features (such as critical transportation corridors, topographic breaks, or infrastructure) that influence fire behavior or spotting potential (U.S. Congress 2003). The 0.5-mile "defense" buffer targets near-home treatments (defensible space, home hardening) and aligns with the practical reach of initial-attack resources in Treasure County's rolling grasslands. The additional mile ("threat" zone) captures documented ember-cast and wind-driven fire spread beyond 0.5 mile, ridgetop spotting pathways along the Yellowstone River corridor, and other landscape features that can directly threaten assets.

This HFRA-aligned, locally calibrated delineation ensures that mitigation efforts (fuel breaks, prescribed fire, targeted grazing) are prioritized where they will most effectively reduce wildfire risk to life, property, and infrastructure.

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. Treasure County, like many rural areas in Montana, faces growing challenges related to housing development in WUI zones (see Figure 2.1). The county's population growth, combined with the demand for homes in scenic, undeveloped areas, has led to more housing being built near wildfire-prone lands. Between 2010 and 2022, Montana's population increased by 132,137 people (+13.3%), with a rapid increase in housing growth within WUI zones, which has doubled in some areas since 1990 (Headwaters Economics 2020). A recent 2022 report from the Federal Emergency Management Agency (FEMA) and U.S. Fire Administration (USFA) stated that more than 46 million residences in 70,000 communities across the United States are at risk for WUI fires (USFA 2022). When it comes to wildfire, this trend is of special concern because the presence of humans and development in WUI conditions are linked with an increased risk of loss of human life, property, natural resources, and assets.

VEGETATION AND LAND COVER

The vegetation in Treasure County is crucial in understanding fire behavior and the natural role of fire within the region's forest ecosystems. Vegetation distribution is primarily a function of elevation, slope, aspect, substrate (surface material), and associated climatic regimes. Because a range of elevation changes and topographic features exist across the focus areas, characteristics in vegetative communities are variable in the county. Additionally, there are non-vegetative forms of landcover that can impact fire dynamics. To facilitate a clearer understanding and visual representation, these land cover types have been categorized and geographically delineated, with general groupings in Figure 2.3 below (agriculture, barren, developed, herb, shrub, sparse, tree, and water). Some of these groups are composed of distinct communities, which allows for clear interpretation of the distribution and extent of these key, general vegetative groups and land cover types within Treasure County.

For the purposes of developing effective wildfire management, it is also important to identify the specific vegetative characteristics of a given area. Among these distinct vegetative communities present throughout Treasure County, three major communities dominate the landscape: Inter-Mountain Basins

Big Sagebrush Steppe, Northwestern Great Plains Mixedgrass Prairie, and Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna. Understanding these classifications provides insights into how different types of vegetation influence fire behavior and hazard potential, which is crucial for mitigation and prevention strategies (e.g. fuel reduction, wildfire suppression and response).

At lower elevations, Inter-Mountain Basins Big Sagebrush Steppe dominates the landscape, covering approximately 35.4% of the county. This region consists of broad plains and gentle slopes, where big sagebrush (*Artemisia tridentata*) is the most common shrub (Treasure County 2007). The understory is characterized by native grasses such as bluebunch wheatgrass (*Pseudoroegneria spicata*) and Sandberg bluegrass (*Poa secunda*), along with various herbaceous plants (NRCS 2021). These areas historically experienced low-intensity surface fires that helped maintain the open nature of the landscape and limited shrub encroachment (NRCS 2021).

Adjacent to these sagebrush steppe areas are Northwestern Great Plains Mixedgrass Prairie, which makes up about 28.4% of the county. This prairie is composed of a mixture of warm-season and cool-season grasses, including western wheatgrass (*Pascopyrum smithii*) and little bluestem (*Schizachyrium scoparium*) (Treasure County 2007). The relatively flat terrain and dense grass cover make this area more prone to fast-moving grass fires, especially during dry periods (NRCS 2021).

At mid-elevations, the landscape begins to transition into more rugged terrain, where the predominant vegetation type is Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna, covering approximately 17.5% of the county. Ponderosa pine (*Pinus ponderosa*) is the dominant species, often growing in open stands with a grassy understory of species like needle-and-thread (*Hesperostipa comata*) and Idaho fescue (*Festuca idahoensis*) (NRCS 2021). These woodlands are typically found on slopes and ridges, where the elevation creates cooler, drier conditions. Historically, this zone experienced frequent, low-intensity fires, which helped reduce undergrowth and maintain more open, fire-resilient stands (Treasure County 2007).

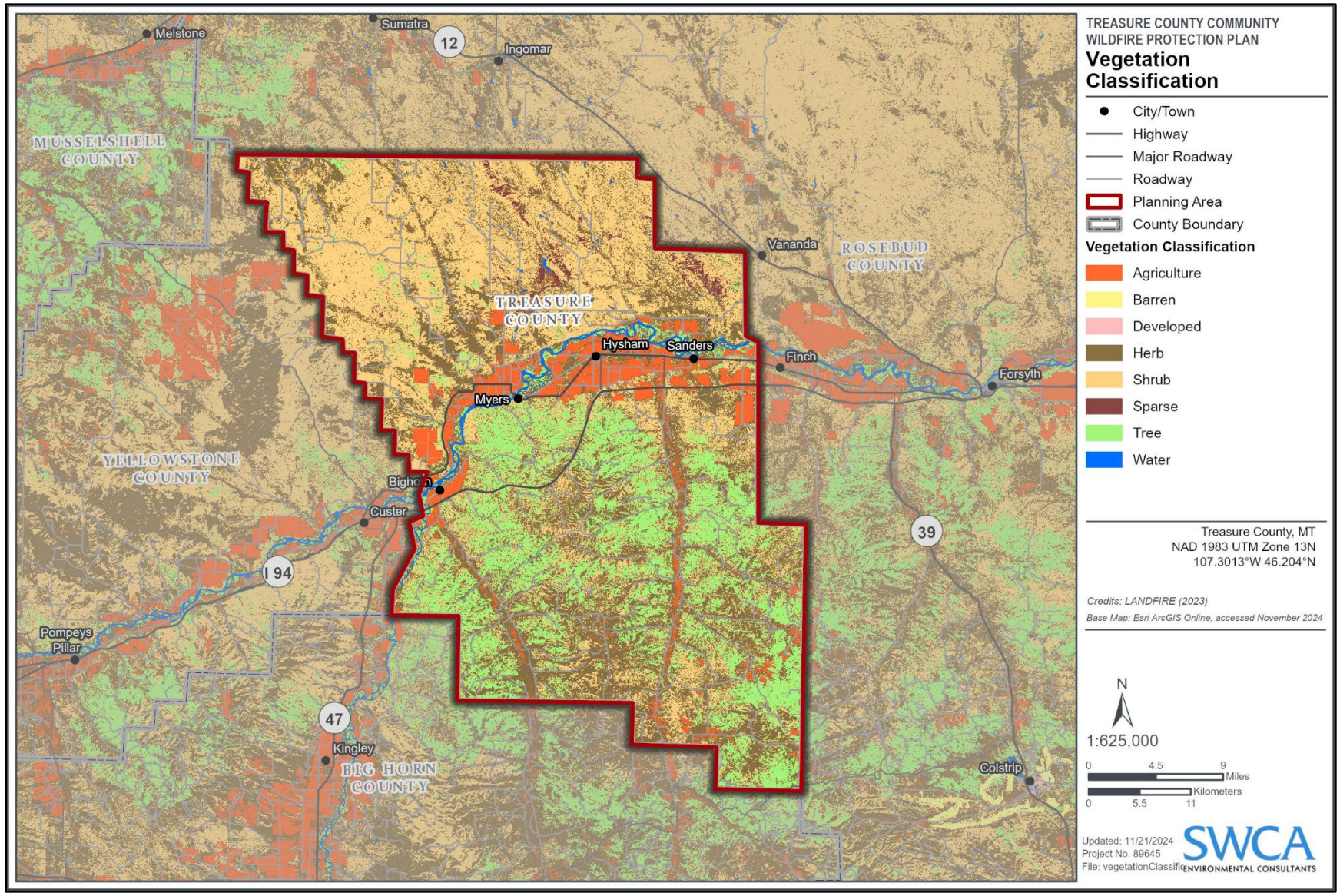

Figure 2.3. Vegetation classifications in Treasure County.

FUELS AND TOPOGRAPHY

Treasure County's topography is defined by the Yellowstone River Valley, rolling hills, and timbered slopes, creating a varied landscape that shapes fuel distributions and wildfire behavior. The Yellowstone River runs through the center of the county, dividing relatively flat grasslands to the north from rugged, timbered hills to the south. Elevations range up to 4,262 feet, with lower elevations characterized by grasslands and agricultural areas and higher elevations supporting dense timber and shrublands (Treasure County 2007; Treasure County DES 2021). This diverse terrain poses challenges for wildfire management, particularly in remote areas where steep slopes and limited access can complicate firefighting efforts. In addition, hot, dry conditions can exacerbate fire behavior across the county's varied landscapes (Treasure County DES 2021).

Using the Scott and Burgan (2005) 40 fuels model, fuels in Treasure County were classified based on their dominant vegetation and distribution (Table 2.1 describes the 12 most common fuel types in the CWPP planning area). In the flat, open grasslands of the central and northern regions, GR2 (grasslands) and GS2 (grass-shrub) fuel types dominate. GR2 fuels represent moderately coarse, continuous grasslands that average 1 foot in height, while GS2 fuels consist of a mix of grasses and sagebrush (*Artemisia tridentata*), with shrubs reaching heights of 1 to 3 feet (NRCS 2021). These fine fuels, combined with wind and low moisture during the dry season, create conditions for rapid fire spread. This susceptibility is heightened north of the Yellowstone River, where large expanses of continuous fuels enable wildfires to spread quickly across the landscape (Treasure County DES 2021).

Table 2.1. Most Common Fuel Types in Treasure County

Existing Fuel Type	Acres in Planning Area	Percent of Planning Area
GS2 – Grass-Shrub: Shrubs are 1 to 3 feet high with a moderate grass load. Spread rate is high; flame length is moderate. Fine fuel load (2.1 tons/acre).	328,015.78	51.80%
GR2 – Grass, moderately coarse continuous grass, average depth about 1 foot. Spread rate high; flame length moderate; fine fuel load (1.1 tons/acre).	212,685.69	33.59%
NB3 – Non-Burnable: Agricultural lands that do not support fire spread under normal conditions.	16,969.04	2.68%
GS1 – Grass-Shrub: Shrubs are about 1 foot high with a low grass load. Spread rate is moderate; flame length is low.	10,058.29	1.59%
AG2 – Agriculture (Burnable Wheat Fields): Identical to GR2. Moderately coarse, continuous grass, with an average depth of about 1 foot. Spread rate is high; flame length is moderate.	9,938.43	1.57%
AG1 – Agriculture (Burnable Crop Rows): Identical to GR1. Sparse grass, generally short, either naturally or due to heavy grazing, and may be sparse or discontinuous. Spread rate is low; flame length is low.	9,021.14	1.42%
NB9 – Non-Burnable: Represents bare ground areas that are non-burnable under normal conditions.	8,737.17	1.38%

Existing Fuel Type	Acres in Planning Area	Percent of Planning Area
TU1 – Timber Understory: Low load of grass and/or shrub with litter. Spread rate is low; flame length is low.	8,622.20	1.36%
TL3 – Timber Litter: Moderate load of conifer litter and light load of coarse fuels. Spread rate is very low; flame length is low.	7,083.42	1.12%
NB8 – Non-Burnable: Represents open water bodies that are non-burnable under normal conditions.	5,437.43	0.86%
TL8 – Timber Litter: Moderate load of long-needle pine litter; may include a small amount of herbaceous load. Spread rate is moderate; flame length is low.	5,325.56	0.84%
SH1– Shrub: Woody shrubs and shrub litter. Low shrub fuel load, with a fuel bed depth of about 1 foot; some grass may be present. Spread rate is very low; flame length is very low.	4,899.35	0.77%
Other* – Various other fuel types	6,436.86	1.02

Source: Scott and Burgan (2005).

Note: See Table 2.2 for adjective class definitions for predicted fire behavior.

* Sum of various fuel types each comprising less than 0.4% of the planning area's total acreage.

Table 2.2. Adjective Class Definitions for Predicted Fire Behavior

Adjective Class	Rate of Spread (ch/h)	Flame Length (feet)
Very Low	0–2	0–1
Low	2–5	1–4
Moderate	5–20	4–8
High	20–50	8–12
Very High	50–150	12–25
Extreme	>150	>25

South of the Yellowstone River, the terrain becomes increasingly rugged, transitioning to rolling hills and dissected plateaus where SH5 (dense shrublands) and GS2 fuel types prevail. SH5 fuels include dense woody shrubs and shrub litter, interspersed with grasses, which contribute to higher fuel loads and more intense fire behavior. These areas frequently feature pinyon-juniper woodlands dominated by Rocky Mountain juniper (*Juniperus scopulorum*), adding to the complexity of suppression efforts in the foothills and ridges (Treasure County 2007). The rugged topography in this region not only increases fire intensity but also limits accessibility, making proactive mitigation efforts essential (Treasure County DES 2021). In the southwestern portion of the county, near the border with Big Horn County, higher elevations support timbered landscapes dominated by TL3 (timber litter) and TL8 (long-needle litter) fuel types. These areas are primarily composed of ponderosa pine (*Pinus ponderosa*), with significant accumulations of needle litter and downed woody debris on the forest floor. While fires in these timbered zones tend to spread more slowly than in grasslands, the heavy fuel loads present a higher potential for severe, high-intensity wildfires, particularly during prolonged droughts (NRCS 2021; Treasure County 2007).

Non-burnable areas, classified as NB3 (agricultural land) and NB9 (bare ground), are interspersed throughout the county, especially along the Yellowstone River Valley and in cultivated zones. Although

considered non-burnable, these areas can act as conduits for wildfire spread under extreme wind conditions, with embers igniting nearby vegetated areas (Treasure County DES 2021).

Treasure County's topographic setting and range of fuel types underscores the need for tailored wildfire mitigation strategies. In lower-elevation grasslands, where fine fuels like grasses promote rapid fire spread, management efforts focus on reducing fuel continuity to slow fire growth and intensity (USFWS 2024). Prescribed fire is a key tool in this effort, helping to reduce accumulated vegetation under controlled conditions (USFWS 2024). Managed grazing is another strategy used to reduce fine fuels, as it helps control grass height and density, lowering the potential for rapid fire spread (USFWS 2024). The shrublands and timbered areas, which contain denser and heavier fuels, require more intensive treatments to mitigate wildfire risks, such as mechanical thinning. This approach is commonly used to reduce tree density, thus decreasing ladder fuels and helping to limit the potential for crown fires (DNRC 2020a). Slashing smaller trees followed by prescribed burns removes surface fuels, while piled materials are burned separately when necessary (DNRC 2020a). Understanding how these fuel types interact with the planning area's land cover and terrain is critical for effective fire management planning.

For more detailed information on fuels and fire behavior modeling, refer to Appendix C, Fire Behavior Modeling/GIS Background and Methodology.

EMBER IGNITION HAZARDS

Ember exposure is a significant threat to homes and structures in the WUI, particularly during wildfires. Long-range spotting occurs when embers, also known as firebrands, are carried by wind, convection currents, or gravity far beyond the immediate fire area, sometimes miles ahead of the flaming front (Maranghides and Mell 2013; National Wildfire Coordination Group [NWCG] 2021a, 2023). The ability of firebrands to ignite structures depends on factors such as their size, the wind speed, the characteristics of the receiving material, and the duration of exposure (Maranghides and Mell 2013).

The atmospheric conditions significantly influence firebrand production and travel distance. High wind speeds and unstable atmospheres, as measured by indices like the Haines Index, allow embers to travel greater distances (USFS 1988; NWCG 2022). Conversely, humid conditions tend to extinguish embers before they can ignite fuels, while dry, hot air enables them to smolder for longer periods (NWCG 2022). The type and arrangement of vegetation also play a critical role; resinous tree species like subalpine fir and Gambel oak produce smaller, lighter firebrands that travel farther than firebrands from thick-barked species like ponderosa pine and Douglas-fir (NWCG 2021a).

Local topography affects where embers land and the potential for ignition. Ridges and steep valleys tend to collect firebrands, increasing the likelihood of ignitions in these areas (Nazare et al. 2021). Structures situated on wind-aligned slopes or in topographically complex areas are particularly vulnerable to ember deposition and fire spread (Nazare et al. 2021). Burning structures, vehicles, and ornamental vegetation can also act as secondary sources of embers, creating additional risks in densely populated WUI areas with low structure separation distances (Maranghides et al. 2022; Suzuki and Manzello 2021). Spotting from these sources can ignite nearby combustible materials, leading to further fire spread.

For more detailed information on ember ignition hazards and recommended actions, see Chapter 6, Homeowner Actions.

FIRE BEHAVIOR

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. The varied elevation and biophysical nature of Treasure County have resulted in a diverse array of vegetation types with their unique fire ecology. Understanding of fire regimes helps prioritize and plan for fuels treatments across a fire management region.

At lower elevations, the Northern Prairie Grasslands are characterized by frequent fires that remove aboveground biomass without harming the root systems of dominant grass species (USFS 2005a). This enables rapid regrowth, which helps maintain the structure and composition of these grasslands. Moving up in elevation, the landscape transitions into Sagebrush Shrublands, where fire return intervals are typically longer. In these shrublands, fires range from 40 to 150 years, depending on fuel continuity, with both replacement and mixed-severity fires occurring (USFS 2005b). In mid-to-higher elevational areas in southern Treasure County, Rocky Mountain juniper and ponderosa pine are the dominant vegetation contributing to fuel loading and continuity (Montana Field Guide 2025). These woodlands experience frequent fires approximately every 15 years, with the fire return interval changing with elevation and prevalence of human-caused ignitions (Montana Field Guide 2025). Ponderosa woodlands were historically maintained by frequent low-severity surface fires, which cleared out underbrush and reduced fuel loads while allowing for the growth of grasses and forbs. These frequent surface fires, occurring every 3 to 30 years, were essential in maintaining the open structure of the ponderosa pine forests (USFS 2005c).

Similar to other areas in Montana, fire suppression, changing land use, and changing land management have resulted in a significant disruption in the natural fire regimes in the region (Montana State University 2021). As a result of fire suppression, many of Treasure County's landscapes have seen changes in vegetation density and composition (Treasure County DES 2021). Ponderosa pine woodlands, for example, have become overgrown with dense regeneration saplings, and heavy layers of duff and litter now cover the forest floor, making these areas more susceptible to high-severity fires (Treasure County 2007). Similarly, in sagebrush shrublands, the exclusion of fire has allowed for fuel buildup, which can lead to more intense and widespread fires when they occur (Treasure County 2007). The long-term impact of fire suppression has led to a reassessment of wildfire management strategies in Montana (Montana State University 2021). Land managers are now working to restore natural fire regimes through practices such as prescribed burning and mechanical thinning. These efforts are aimed at reducing hazardous fuels, maintaining ecosystem health, and lowering the risk of catastrophic wildfires.

The following sections provide detailed descriptions of the specific fire regimes associated with the dominant vegetation types in Treasure County:

Northern Prairie Grasslands

Northern prairie grasslands are prevalent in Treasure County at elevations ranging from 1,900 to 3,500 feet (USFS 2005a). These grasslands are dominated by a mixture of cool- and warm-season grasses, including western wheatgrass (*Pascopyrum smithii*), needle-and-thread (*Hesperostipa comata*), and bluebunch wheatgrass (*Pseudoroegneria spicata*), which create a visually dominant canopy across

these prairies (USFS 2005a). Forbs such as black samson (*Echinacea angustifolia*) and prairie clovers (*Dalea* spp.) are also present, adding diversity to the ecosystem, while shrubs such as Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*) and rabbitbrush (*Chrysothamnus* spp.) are less prevalent, typically comprising less than 5% of the vegetation cover (USFS 2005a). The fire regimes in these grasslands are shaped by the availability of fine fuels, such as grasses, and the continuity of vegetation. The fire return intervals in Northern Prairie Grasslands typically range from 22 to 50 years, depending on site characteristics like elevation, aspect, and fuel load (Treasure County 2007; USFS 2005a). Historically, replacement fires dominated, removing most of the aboveground biomass without significantly impacting the root systems of the dominant grass species, allowing for rapid post-fire recovery (USFWS 2024). In addition to replacement fires, mixed-severity fires occurred in areas with more fragmented or patchy vegetation, creating a mosaic of burned and unburned areas. These mixed fires helped maintain biodiversity by creating varied structural stages within the grassland ecosystem (Treasure County 2007). When fire is absent for prolonged periods, fuel buildup from dead grasses can lead to smoldering fires that reduce productivity and increase mortality in the grassland community (USFWS 2024).

Sagebrush Shrublands

Sagebrush shrublands are common in Treasure County and typically occur in elevations ranging from 3,000 to 7,000 feet in well-drained soils (USFS 2005b). The dominant species, basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), forms a dense canopy across these shrublands. Variants like Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and rabbitbrush (*Chrysothamnus* spp.) are also common in certain areas, particularly on alkaline soils (USFS 2005b). The understory is composed of native grasses such as slender wheatgrass (*Pseudoroegneria spicata*), needle-and-thread (*Hesperostipa comata*), and bluebunch wheatgrass (*Pseudoroegneria spicata*) (USFS 2005b). The fire regimes in these sagebrush shrublands are highly dependent on the fuel loading and continuity. The fire return intervals for this vegetation type range from 40 to 150 years depending on site characteristics, such as elevation, aspect, precipitation, and the amount of fine fuels present (Treasure County 2007; USFS 2005b). Historically, fires in these sagebrush shrublands were primarily replacement severity, meaning that the fires often consumed the entire sagebrush canopy, causing a reset in the shrubland ecosystem (U.S. Geological Survey [USGS] 2022). Mixed-severity fires occurred in areas with more fragmented fuel loads, creating a mosaic of burned and unburned patches. The fire return intervals in these systems are estimated to average 60 years, though they can range from 10 to 150 years (USFS 2005b).

Ponderosa Pine Woodlands

Ponderosa pine woodlands are common in Treasure County and typically occur at lower elevation as well as ridgelines (Treasure County 2007). These woodlands are typically found on hot, dry south and west-facing slopes with well-drained soils, often forming the transition between grasslands and higher elevation forests (USFS 2005c). Ponderosa pine (*Pinus ponderosa*) dominates these stands, while Douglas-fir (*Pseudotsuga menziesii*) and Rocky Mountain juniper (*Juniperus scopulorum*) may occasionally occur on shaded microsites or areas with increased moisture (Treasure County 2007). Historically, frequent low-severity surface fires were the dominant disturbance in these Ponderosa pine ecosystems, occurring every 3 to 30 years (USFS 2005c). These fires maintained an open canopy and encouraged the growth of grasses and forbs such as Idaho fescue (*Festuca idahoensis*), rough fescue (*Festuca campestris*), and needle-and-thread (*Hesperostipa comata*) (Treasure County 2007; USFS 2005c). These frequent fires helped to reduce fuel loads and prevent the establishment of dense thickets, maintaining the characteristic open woodland structure. In addition to surface fires, mixed-severity fires occurred approximately every 50 to 70 years (USFS 2005c). Further, these fires created a mosaic of burned and

unburned patches across the landscape, contributing to structural diversity. Stand-replacement fires were rare, typically occurring every 300 to 700 years, impacting small patches and allowing for regeneration of Ponderosa pine in open, sunlit areas (USFS 2005c).

Great Plains Ponderosa Pine Woodland and Savanna

A mixture of the above fire regimes, these woodlands and savannas are dominated by a mixture of tree species, including Rocky Mountain juniper (*Juniperus scopulorum*) and ponderosa pine (*Pinus ponderosa*), which comprise a majority of the canopy across southern Treasure County (Montana Field Guide 2025). Rocky Mountain Juniper woodlands occur sparsely within Treasure County at elevations above 3,900 feet (Montana Field Guide 2025). Grasses such as bluebunch wheatgrass (*Pseudoroegneria spicata*) are also present, adding fine fuels loads to the fire regime, whereas shrubs are less prevalent (Montana Field Guide 2025). The continuity and loading of fine fuels shape the fire regime in these woodlands. The fire return interval is approximately 15 years, depending on site characteristics like elevation, aspect, and fuel load (Montana Field Guide 2025). Historically, replacement fires dominated, removing most of the aboveground biomass without significantly impacting the root systems of the dominant tree species, allowing for rapid post-fire recovery (Montana Field Guide 2025). In addition to replacement fires, mixed-severity fires occurred in areas with more fragmented or patchy vegetation, creating a mosaic of burned and unburned areas. These mixed fires helped maintain biodiversity by creating varied structural stages within the woodland ecosystem (Montana Field Guide 2025). However, due to the increasing prevalence of drought and insect outbreaks, the natural fire severity and return interval have changed. When fire is absent for prolonged periods, fuel buildup from dead trees can lead to smoldering fires that reduce productivity and increase mortality in the woodland community (Montana Field Guide 2025).

Impacts from Cheatgrass

Cheatgrass (*Bromus tectorum*) is an invasive annual grass that poses challenges in many regions of the western United States due to its impacts on native ecosystems and fire regimes (Montana Fish, Wildlife and Parks 2021). In Treasure County, cheatgrass presence is primarily linked, particularly in open rangelands and fire-prone areas such as the Lower Bighorn drainage (Treasure County 2007). In invaded ecosystems, cheatgrass can promote unnatural fine fuel growth (Montana Fish, Wildlife and Parks 2021) and, at times, dominate the post-fire landscape, which can increase the potential for and recurrence of future wildfire (Zouhar 2003). Once cured in midsummer, cheatgrass creates highly flammable fine fuels, significantly increasing wildfire risk by shortening fire return intervals to less than 10 years, compared to the historical 25 to 40 years for native grasslands. This feedback loop of increased fire frequency and cheatgrass dominance exacerbates habitat degradation and soil erosion, with economic impacts on grazing lands and wildlife-dependent industries. Local mitigation strategies, including targeted grazing, herbicide treatments, and fuels management, are critical to controlling cheatgrass spread.

CLIMATE AND WEATHER PATTERNS

Treasure County experiences a semiarid continental climate, characterized by hot, dry summers and cold, below-freezing winters. This climate significantly influences wildfire risk, particularly as the area is prone to drought conditions that increase the likelihood and severity of wildfires (Treasure County DES 2021). Data for the following narrative was collected from two weather stations representing different portions of the county: Hysham in the northern portion and Hysham SSE in the southern portion. See Table 2.3 for information on period of record, mean precipitation, and maximum, minimum, and mean of the annual

temperature for each portion of the county. Figures 2.4 and 2.5 provide graphics to visualize the weather statistics across each station.

Annual precipitation in the county is relatively low, averaging around 14.9 inches, with only very slight differences on average between the northern and southern regions. Seasonal precipitation varies across months, with Treasure County receiving most of its moisture in May and June. Snow is the predominant form of precipitation during the winter months, especially at higher elevations in the southern regions.

Temperature patterns in Treasure County are consistent with those found throughout western Montana, featuring warm, dry summers where temperatures frequently reach the mid-80s, and winters that drop well below freezing. The mean annual maximum temperatures range from 59.1°F in the southern portion to 60.4°F in the north, while the mean annual minimum temperatures range from 30.1°F in the south to 34.1°F in the north. The northern portion of the county sees a mean annual temperature of 47.2°F, while the southern portion records a slightly cooler mean annual temperature of 44.6°F.

Table 2.3. Mean Annual Temperature and Precipitation by Station in Treasure County

			Mean Annual Temperature (°F)		
Location	Period of Record	Mean Annual Precipitation (Inches)	Max	Min	Mean Annual
Hysham	1991–2020	14.92	60.4	34.1	47.2
Hysham 25 SSE	1991–2020	14.90	59.1	30.1	44.6

Source: NOAA (2024)

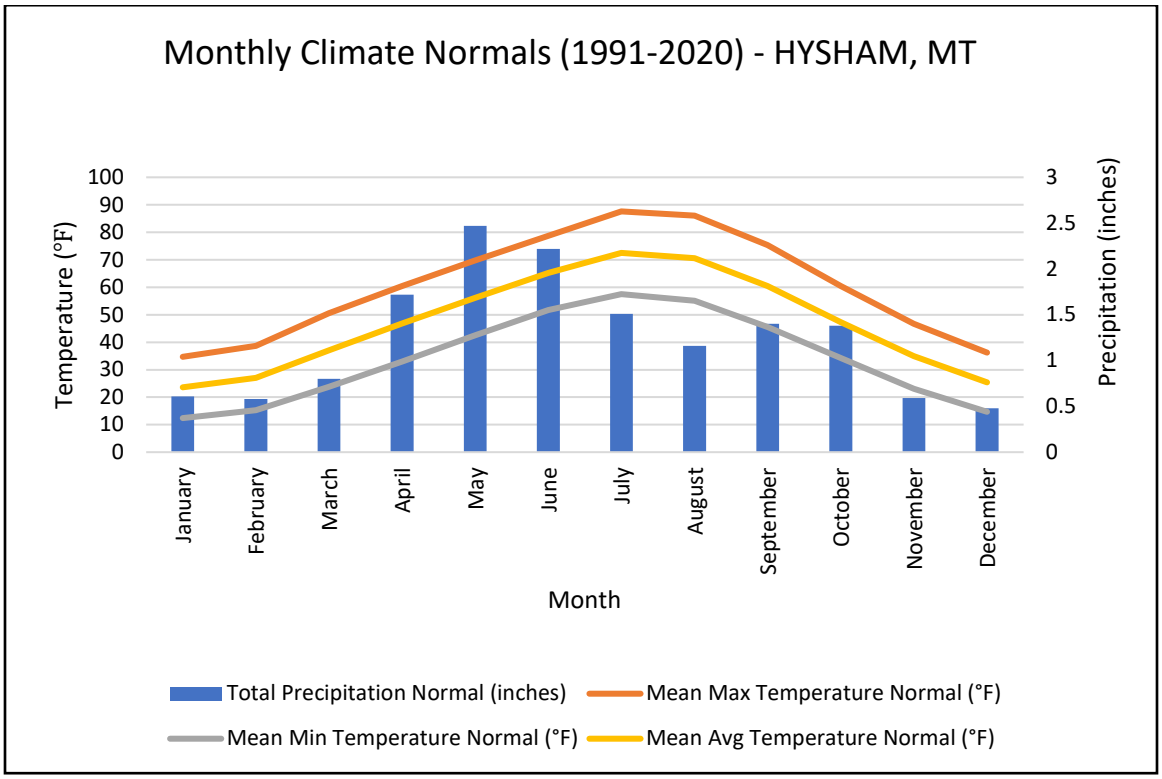

Figure 2.4. Monthly climate averages for the Hysham region, Montana, 1991–2020.
Source: NOAA (2024).

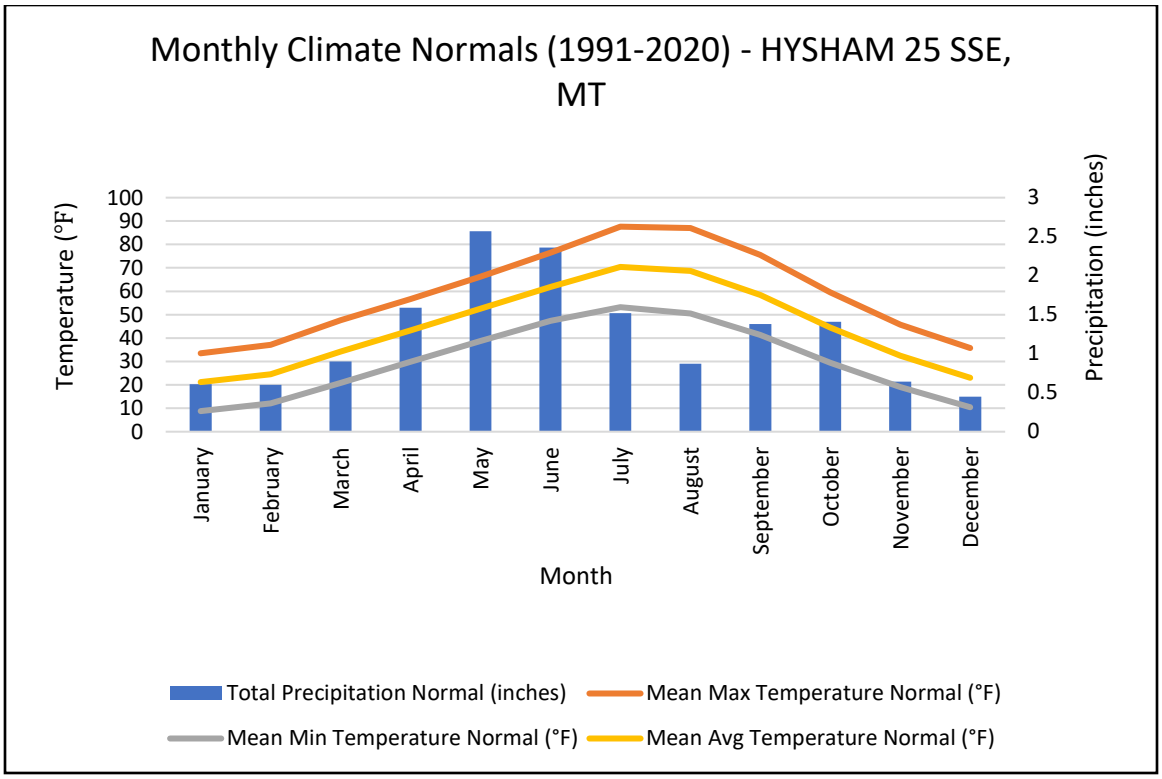

Figure 2.5. Monthly climate averages from the Hysham 25 SSE station in the southern region of Treasure County, Montana, 1991–2020.

Source: NOAA (2024).

FIRE HISTORY

Fire management in Montana 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 2014).

Treasure County's landscape, consisting mostly of rolling grasslands and mixed shrublands, has historically been prone to fast-moving grass fires, especially during dry and windy conditions, underscores the community's recognition of them as a significant hazard. Unlike the forested regions of western Montana, Treasure County's wildfires have primarily been driven by grass and brush fuels, making these fires particularly dangerous to agriculture and infrastructure. The absence of frequent wildfires over much of the twentieth century led to significant fuel buildup in Treasure County's landscapes, increasing the risk of large, fast-moving, and intense fires. This risk has been exacerbated by disease, insect infestations, and an accumulation of dead and dying trees.

In Montana, the 2021 wildfire season was one of the most destructive in recent years, burning nearly 940,000 acres across the state, with suppression costs exceeding $47.5 million (Montana Free Press

2021). Wildfire suppression efforts in Treasure County are crucial due to the rural and remote nature of much of the landscape, which can make access and firefighting operations challenging (Treasure County DES 2021). Between 2002 and 2023, Montana has spent $500 million on wildland fire suppression, spending an average of $30 million every year, with 2017 being the most expensive year at $64.3 million spent on suppression (Montana State Legislature 2024).

RECENT FIRE OCCURRENCE

In recent decades, fires in Treasure County have become more frequent and severe (Treasure County DES 2021). The county has faced multiple state-level disaster declarations due to wildfires, particularly in severe fire seasons exacerbated by drought conditions (Treasure County 2007).

The 2012 Tullock Creek Fire, which burned over 10,500 acres, threatened the communities of Bighorn and Hysham. The Big Coulee Fire in 2017, driven by high winds and drought conditions, scorched approximately 12,500 acres, impacting grazing lands and prompting emergency declarations. Similarly, the Pryor Creek Fire in 2021 burned over 8,800 acres, threatening critical infrastructure and residential areas (Treasure County DES 2021). Additionally, the Horse Creek Fire in 2012 scorched over 7,000 acres of grass and timber near Hysham, prompting evacuations and firefighting efforts from local and federal resources (Treasure County DES 2021).

More recently, large-scale wildfires have continued to highlight the escalating complexity and cost of suppression in Treasure County. In 2020 the Gass Flats Fire, which burned approximately 10,959 acres, required a multi-agency response, including aerial resources and extended ground operations due to difficult terrain and wind-driven spread (Montana Public Radio [MPR] 2020). In 2022, the Busma Road Fire (Figure 2.6) ignited near Hysham and rapidly grew to over 12,886 acres, prompting evacuation orders along Sumatra Road and mobilizing more than 150 firefighting personnel (MPR 2020; MTN News 2022).

Although no structures were reported lost, the Busma Road Fire resulted in substantial suppression costs and contributed to legislative discussions about utility company liability in wildfire incidents. Notably, Montana House Bill 490, introduced in 2025, sought to limit liability for utilities provided they followed approved wildfire mitigation plans, raising significant debate about accountability and risk (Montana Public Radio 2025).

Figure 2.7 identifies recent wildfire boundaries in the region dating back to 2000. Figures 2.8 through 2.14 provide charts and mapped statistics regarding wildfire occurrence dating back to 2000.

FIRE RESPONSE

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 B to learn more about planning and policy in Treasure County.

Figure 2.6. Active fire behavior during the Busma Road Fire in Treasure County, Montana, illustrating heavy smoke production and rapid spread through grass and sagebrush vegetation.

Source: Treasure County Core Team.

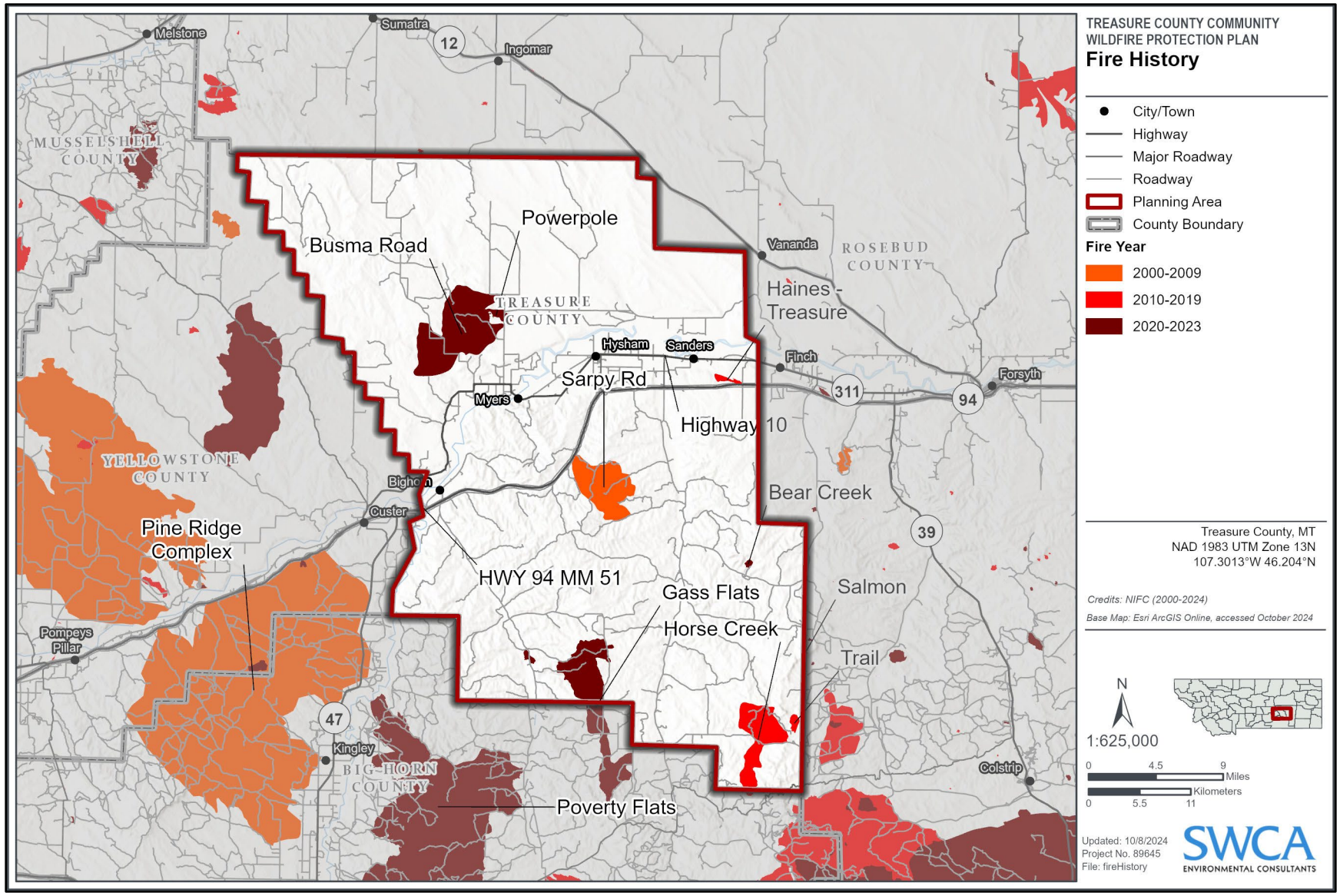

Figure 2.7. Recent wildfire history in Treasure County.

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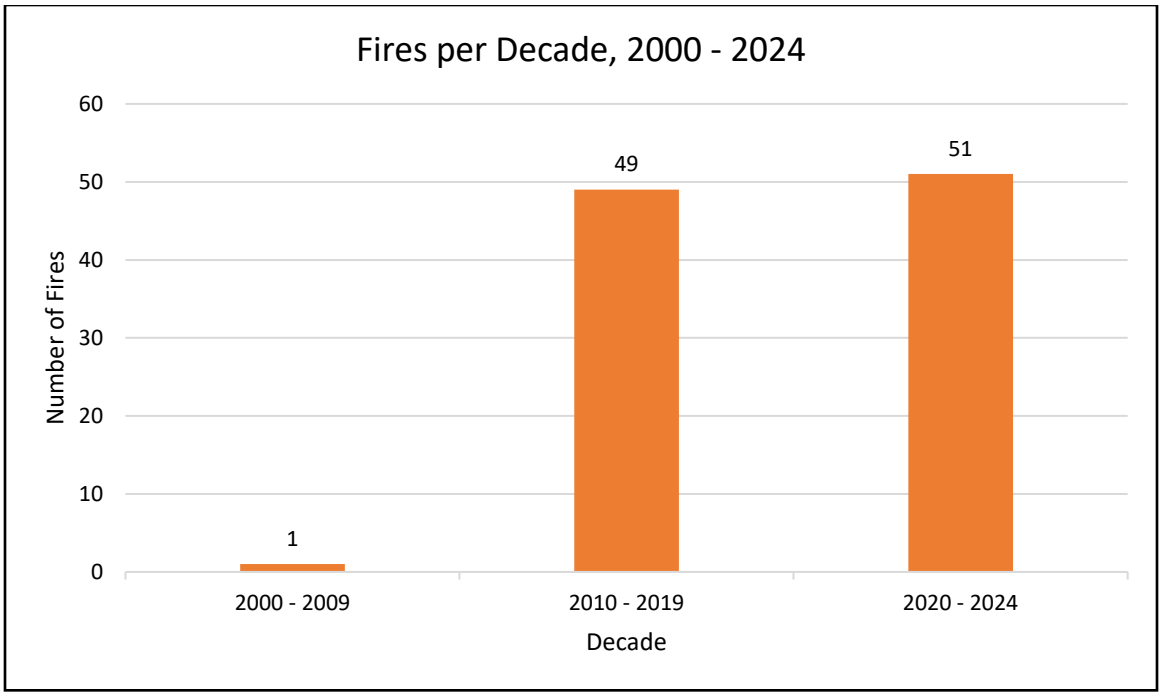

Figure 2.8. Decadal wildfire frequency for Treasure County based on available data from 2000 through 2024.

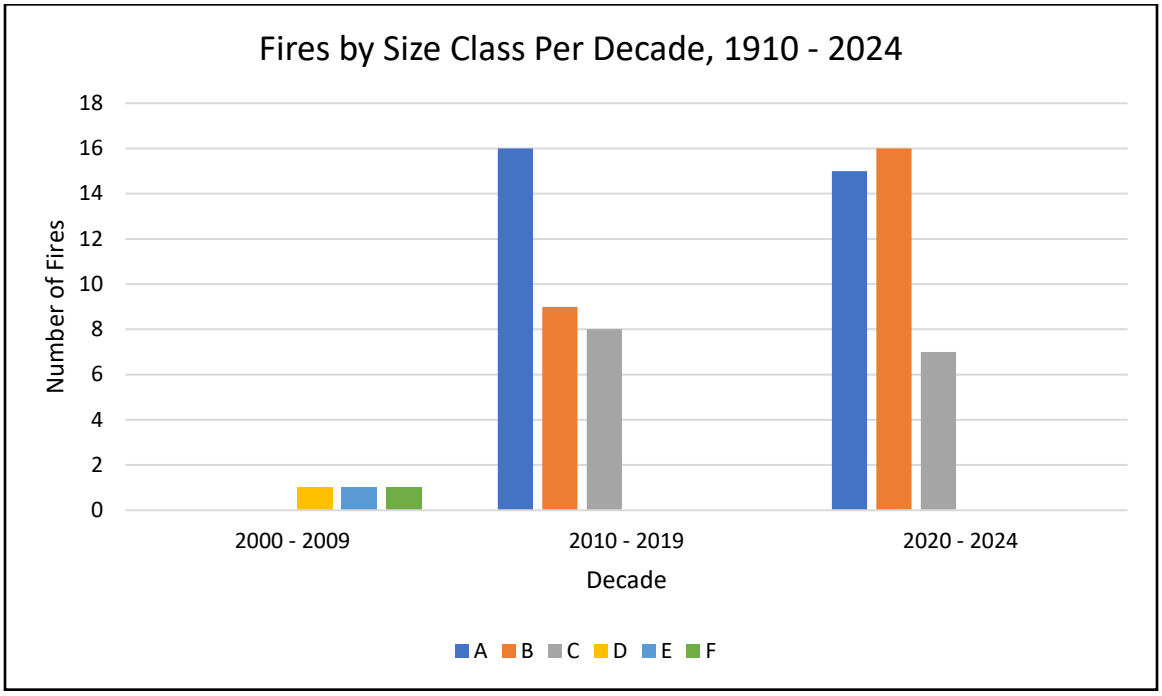

Figure 2.9. Fire size statistics for Treasure County based on fire history data from 1910 through 2024

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.

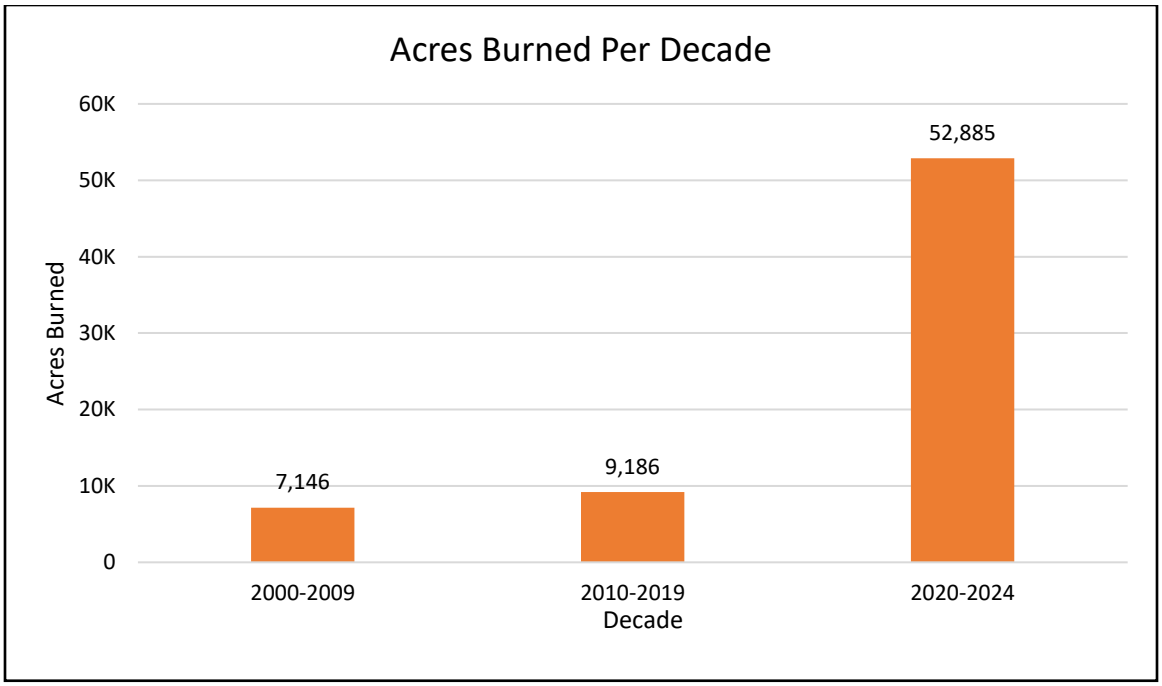

Figure 2.10. Acres burned per decade for Treasure County based on fire history data from 2000 through 2024.

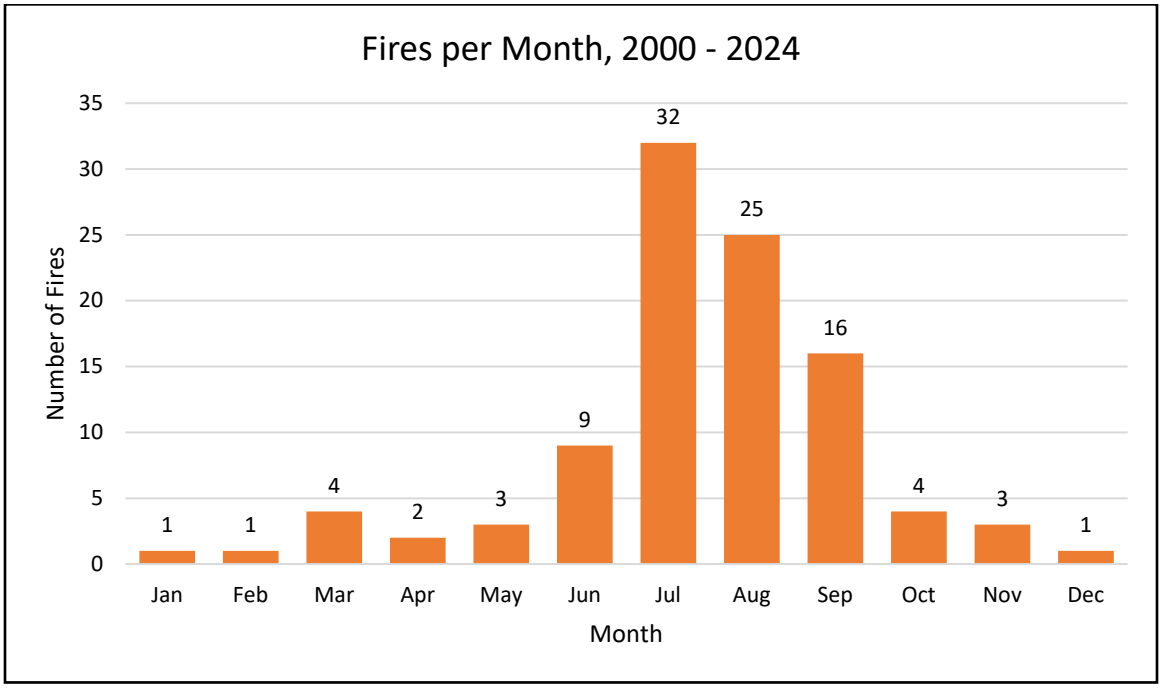

Figure 2.11. Number of recorded fires per month in Treasure County from 2000 through 2024.

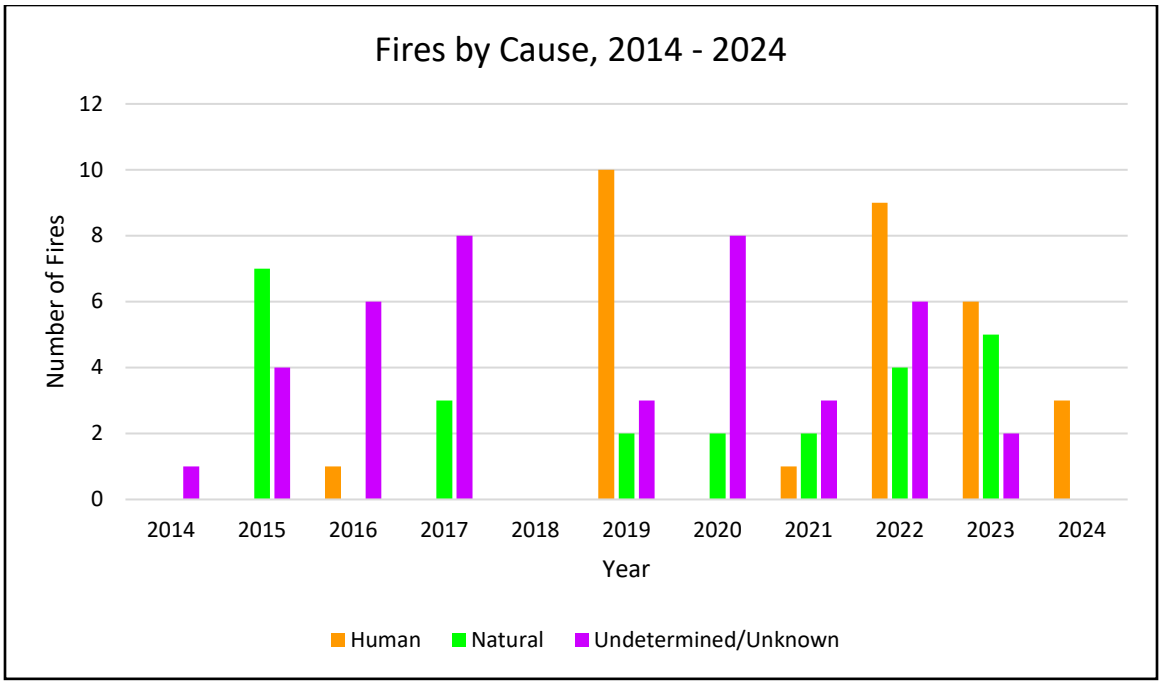

Figure 2.12. Cause of wildfire ignitions in Treasure County from 2014 through 2024.

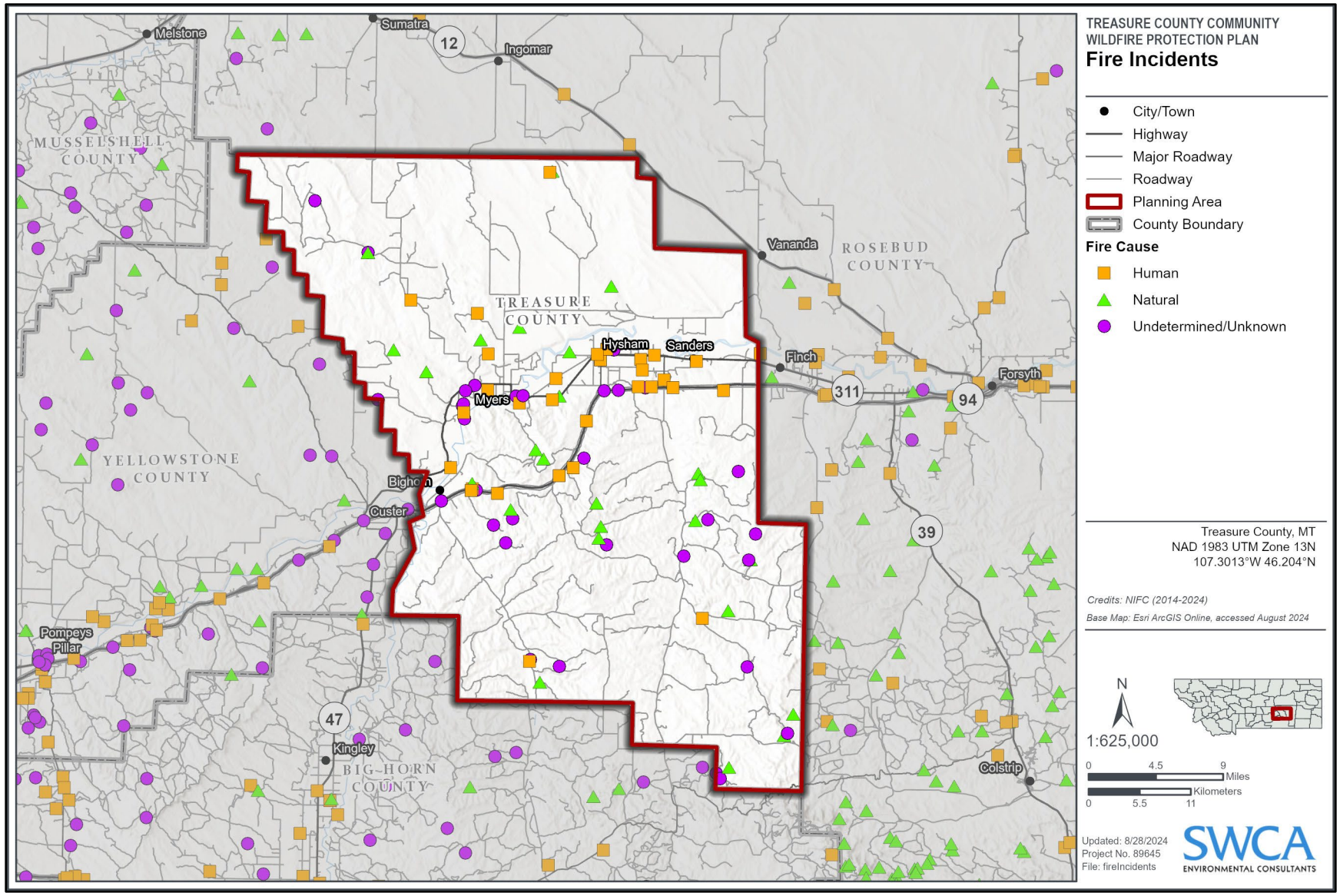

Figure 2.13. Location of wildfire incidents in Treasure County.

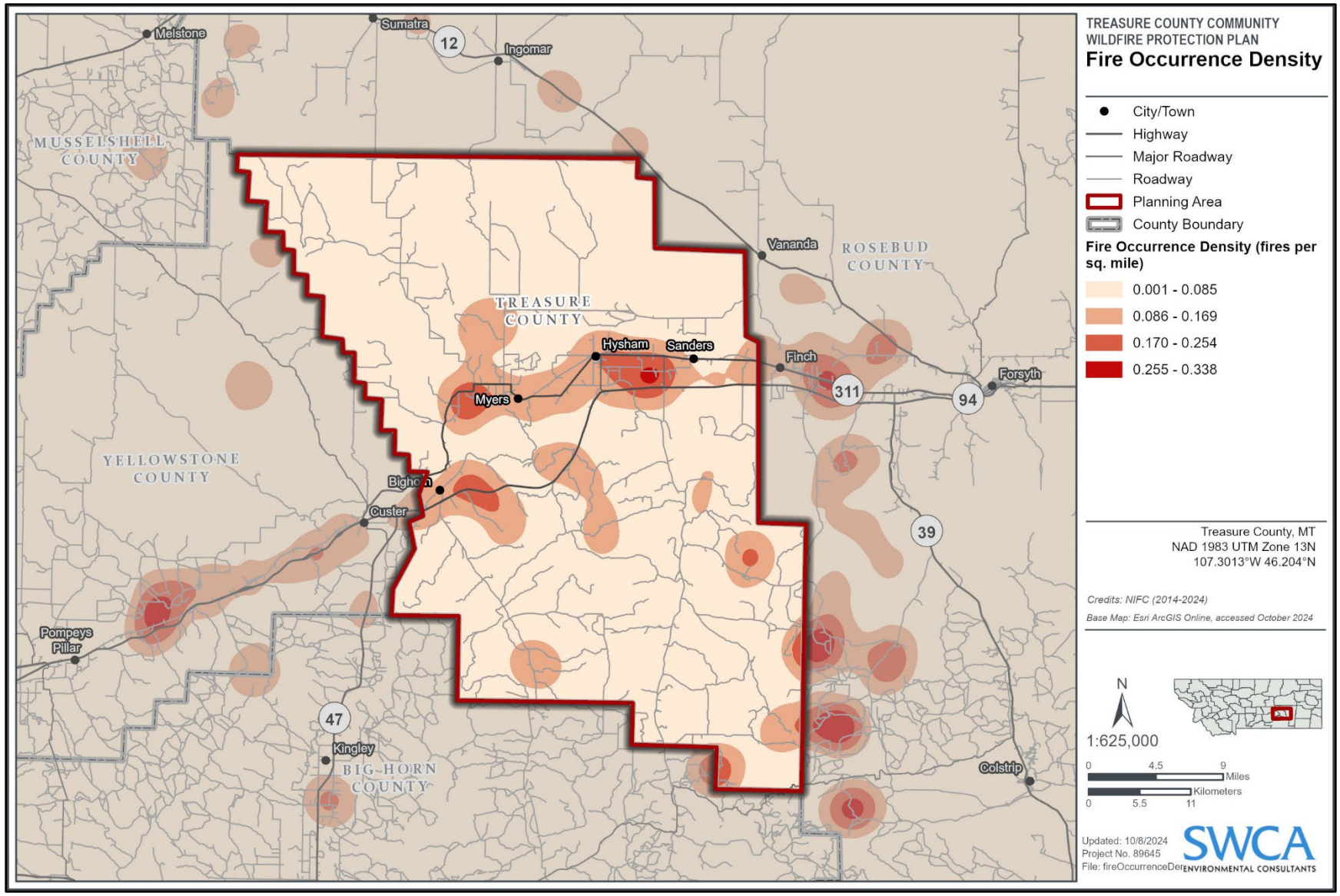

Figure 2.14. Fire occurrence densities in Treasure County.

A primary decision tool used 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 2024). 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.

Regional Fire Response

Fire response in Treasure County (Figure 2.15) is primarily managed by the Treasure County Rural Volunteer Fire Department (TCRVFD), the county's sole fire district. The TCRVFD, an all-volunteer department with a total of 30 volunteer firefighters, provides basic structural fire protection, wildfire suppression, and emergency response under an inter-local agreement with the Town of Hysham. However, the TCRVFD faces challenges due to limited resources and equipment, complicating responses to larger or more complex incidents. Treasure County is supported by mutual aid agreements with neighboring departments in Rosebud, Bighorn, and Musselshell Counties. Local ranches, such as the PV Ranch and Redlands, enhance firefighting capacity by contributing private firefighting equipment. The Treasure County Sheriff's Office and Disaster and Emergency Services play critical roles in maintaining communication, coordinating emergency responses, and ensuring public safety during wildfire events, working closely with the TCRVFD, DNRC, and federal agencies like the BLM.

The DNRC leads state fire management, coordinating wildfire management across local, state, and federal agencies. The DNRC supports rapid initial attack actions, provides additional personnel, and offers funding and resources for local and county responsibility fires. If a fire exceeds local capacity, the DNRC director can approve state assistance. On federal lands, the BLM oversees fire management, with the Billings Miles City Field Office coordinating initial attacks. The BLM collaborates with local responders to suppress wildfires, protect resources, and maintain recreational and scenic values, ensuring a coordinated response across Treasure County's interspersed public and private lands.

For more information, see the Fire Protection Capabilities section in Appendix A.

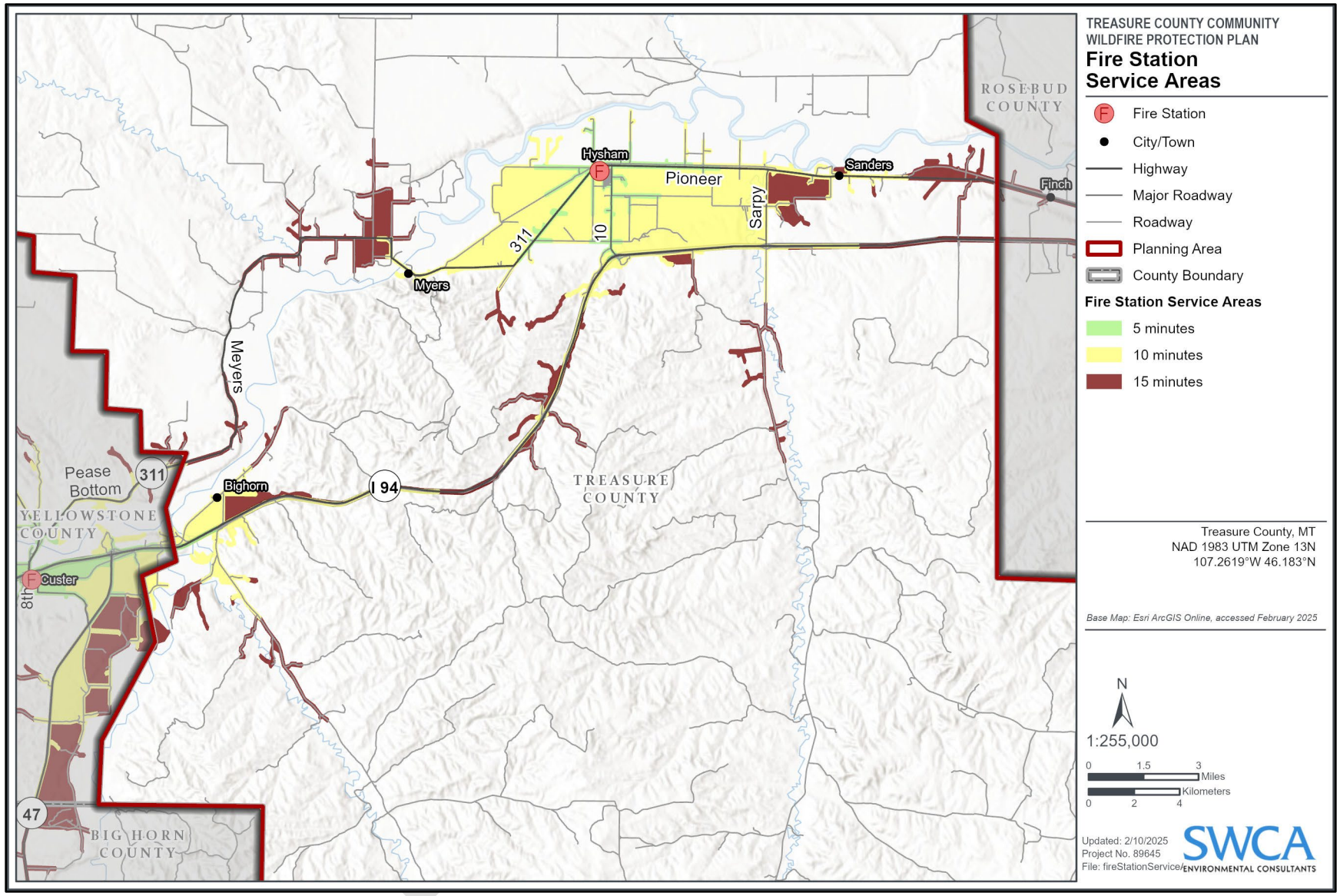

Figure 2.15. Fire department service area response times for the TCRVFD.

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CHAPTER 3 – RISK-HAZARD ASSESSMENT

Disclaimer

The purpose of this risk assessment is solely to provide a community- and landscape-level overview of general wildfire risks within the assessment area as of the date hereof, and to provide a potential resource for community pre-fire planning. This risk assessment is premised on various assumptions and models, 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 in preparing this risk assessment. SWCA shall have no liability for any damage, loss (including loss of life), injury, property damage, or other damages whatsoever arising from or in connection with this risk assessment, including any person's use or reliance on the information contained in this risk assessment. Any reproduction or dissemination of this risk assessment or any portion hereof shall include the entirety of this plan disclaimer.

PURPOSE

Upon completion of a Quantitative Wildfire Risk Assessment for the planning area, 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 through outreach and education regarding methods for reducing the damaging consequences of fire. A Quantitative Wildfire Risk Assessment can also aid in the identification and prioritization of fuel treatments based on where wildfire risk is greatest. The assessment uniformly evaluates risk across all jurisdictions within or adjacent to wildland fuels. While individual property owners may plan and implement treatments independently, collaborative mitigation efforts with neighboring landowners are highly encouraged. Larger, boundary-spanning collaborative treatments offer more effective protection for individual private properties, the surrounding community, and neighboring

public lands compared with smaller, isolated efforts scattered in time and space. For more information about fuel treatments, see Chapter 4, Mitigation Strategies.

For this CWPP, areas of high wildfire hazard and risk were identified using the Montana Wildfire Risk Assessment (MWRA) through the modeling and mapping of fire behavior, the analysis of highly valued resources and assets (HVRAs), and the incorporation of stakeholder and expert input.

Further details on the modeling process are provided in Appendix C.

MODELING THE FIRE ENVIRONMENT

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

To assess potential fire behavior, sophisticated spatial wildland fire computer models are used to simulate how a fire would burn in an area under given weather conditions. The calculations, developed by fire experts, incorporated the measured fire activity and behavior of live fires under controlled conditions such as slope, humidity, and wind. Conditions in the real world are much more variable; however, the fire behavior models have been validated and proven as a useful tool in forecasting fire spread. Fire modeling is integral for managers developing strategic plans on active fires and in fuel planning to define areas of high wildfire risk and prioritize mitigation work.

To understand wildfire modeling it is important to be aware of how wildfire spreads. Wildfire spreads via surface fire (Figure 3.1), crown fire (Figure 3.2), and spotting (Figure 3.3), with all three commonly occurring during red flag conditions. Active crown fire is when 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 is often beyond the capabilities of suppression resources. There are two types of crown fire: active and passive. Active crown fire (see Figure 3.2) is when fire spreads actively from tree to tree. Passive crown fire is when ground fuels are established in ladder fuels and burn individual tree crowns.

If embers are plentiful and/or long range (>0.5 mile), rates of spread and resistance to control can be very high. An ember load index is a value describing the relative load of embers an area (represented by a pixel) of the landscape experiences given landscape burn probability, weather, topography, and fuels. See Appendix C for a more detailed description of the modeling methodology.

Crown fire and spotting activity have been a concern for fire managers, particularly under extreme weather conditions. In areas where homes are situated close to timber fuels and/or denser shrubs and trees, potential spotting from intensely burning fuels that are adjacent to unburned fuels should always be considered (see Figure 3.3). See the Embers and Home Ignition Hazards subsection and Figure 3.4 for a diagram and explanations describing the factors that affect ember production and travel.

Figure 3.1. A low-intensity surface fire.
Source: photograph by Brandon Oberhardt, USFS (2016).

Figure 3.2. Active crown fire.
Source: photograph by Mike McMillan, USFS (2013).

Figure 3.3. Spotting, in which embers are lifted and carried with the wind ahead of the main fire and ignite receptive fuels, including homes.
Source: Boulder Fire-Rescue.

EMBERS AND HOME IGNITION HAZARDS

Typical wildland-urban fire patterns indicate that embers are the principal source of structure ignitions (Cohen 2023). 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, terrain, and atmospheric conditions that are conducive to ember production and travel distance as these directly influence spot fire behavior. Strategic landscape fuel reduction activities such as fuel breaks and thinning can help reduce the likelihood of ember production and spotting. Homeowners should note surrounding vegetation (trees, grasses, shrubs, and vegetation litter or debris) and implement home hardening practices, such as installing ember-resistant vent covers, and removing leaf litter from decks, gutters, roofs, and the base of combustible materials such as wood siding and fences, to reduce structural ignitions from falling ember showers. See Figures 3.4 and 3.5 to learn more about ignition hazards. Programs to aid landowners in preventative efforts and cases of wildfire are provided in Chapter 6, Homeowner Actions.

Figure 3.4. An example home in the WUI with ember ignition hazards identified by numbered flames.
Source: University of Nevada (2022).

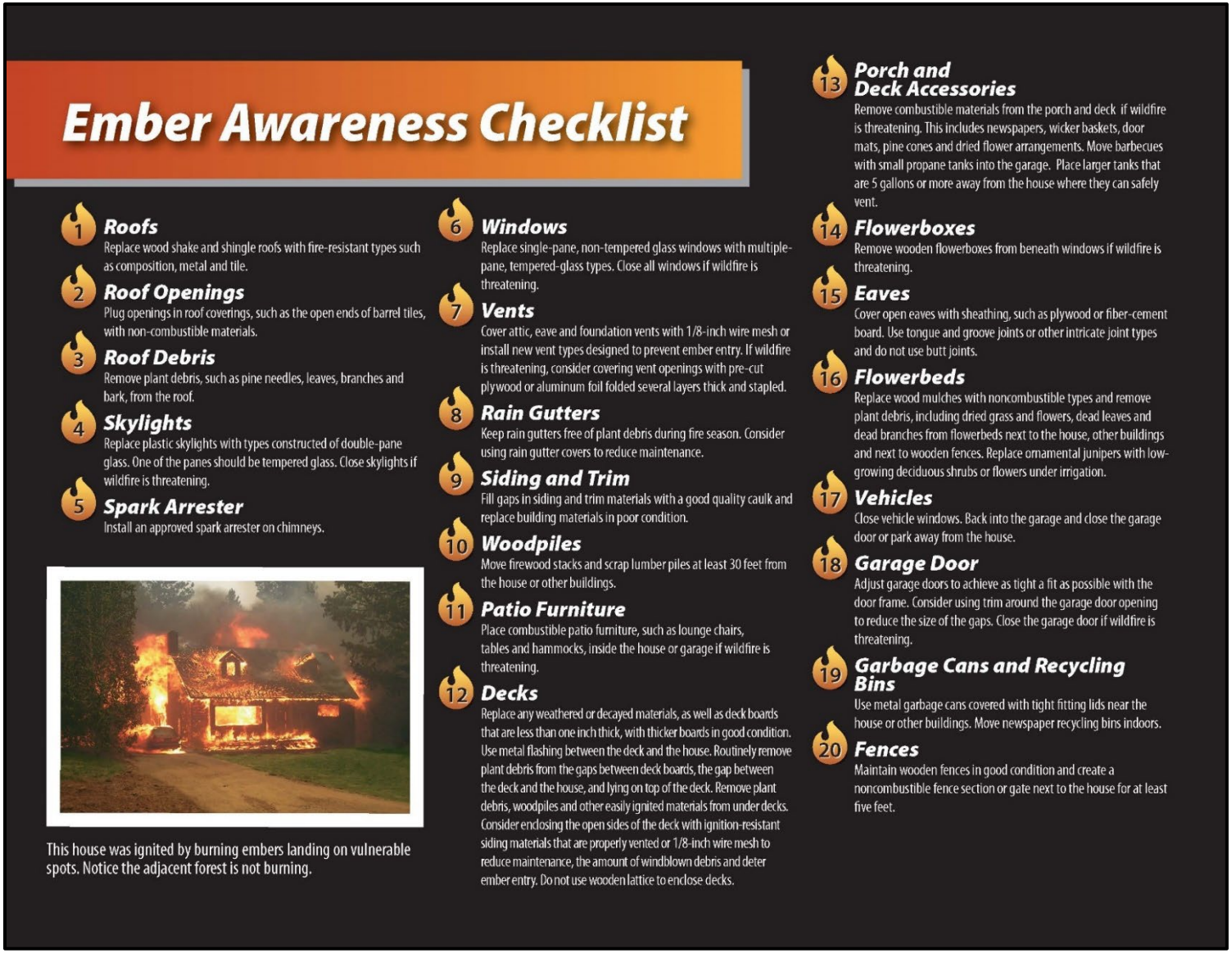

Figure 3.5. Ember awareness checklist to be used in conjunction with Figure 3.4.

Source: University of Nevada (2022).

MONTANA WILDFIRE RISK ASSESSMENT

The Montana Wildfire Risk Assessment (MWRA), developed by Pyrologix, was produced in collaboration with the DNRC. The purpose of this assessment is to provide communities across Montana with a standardized evaluation of wildfire hazard, vulnerability, and risk by employing state-of-the-art modeling techniques and up-to-date data on existing conditions. This assessment enables land managers and officials to compare wildfire risks across jurisdictional boundaries and implement effective strategies to mitigate wildfire risks in various communities throughout the state.

The MWRA addresses several limitations of previous wildfire risk assessments. Notable improvements include:

- Recalibration of the Montana fuelscape to reflect recent wildfire and other disturbance events.
- Incorporation of custom fuel models to represent the potential for fire spread into agricultural and urban areas.
- Mitigation of data seamlines at the state boundary and across landscapes.
- Utilization of a standardized set of HVRAs across Montana.

The MWRA is a powerful tool designed to assess the wildfire risk to communities within the WUI in Montana. In wildfire risk modeling, risk is understood as a combination of hazard and vulnerability (Figure 3.6). For the purposes of this assessment, risk is defined by four main factors:

Burn probability: The likelihood that a given area (mapped at 0.22-acre resolution) will burn.

Fire intensity: The amount of energy released during combustion (measured in kilowatts per meter per second), which describes the heat produced by the active flames.

Exposure: The proximity of HVRAs to wildfire hazards (e.g., homes within the WUI or key watersheds).

Susceptibility: The ease with which an HVRA can be damaged by wildfire.

This robust framework allows decision-makers to prioritize mitigation efforts and ensure better preparedness for wildfire risks in Montana's diverse landscapes. See Figure 3.6 for a diagram of the Quantitative Wildfire Risk Framework used to inform the MWRA.

A detailed methodology of the MWRA is provided in Appendix C, Fire Behavior Modeling/GIS Background and Methodology.

Factors used to determine wildfire hazard include the predicted fire behavior if a wildfire were to occur represented by outputs such as flame length, rate of spread, and fireline intensity. These fire behavior outputs are directly influenced by fuel type, fuel density, and crown height, as well as other landscape characteristics such as slope and aspect. Hazard is derived by calculating the modeled chance of a fire occurring by the expected intensity of the fire if it did occur.

Vulnerability is a function of an asset's exposure, its position on the landscape in relation to wildland fuels, and its susceptibility to direct flames, radiant heat, or embers from a fire.

When the hazard values are multiplied by the weighted vulnerability values, a quantified risk is generated: a numeric output representing the probability of damage or loss to an asset based on fire intensity and the asset's fire resilience (or lack thereof).

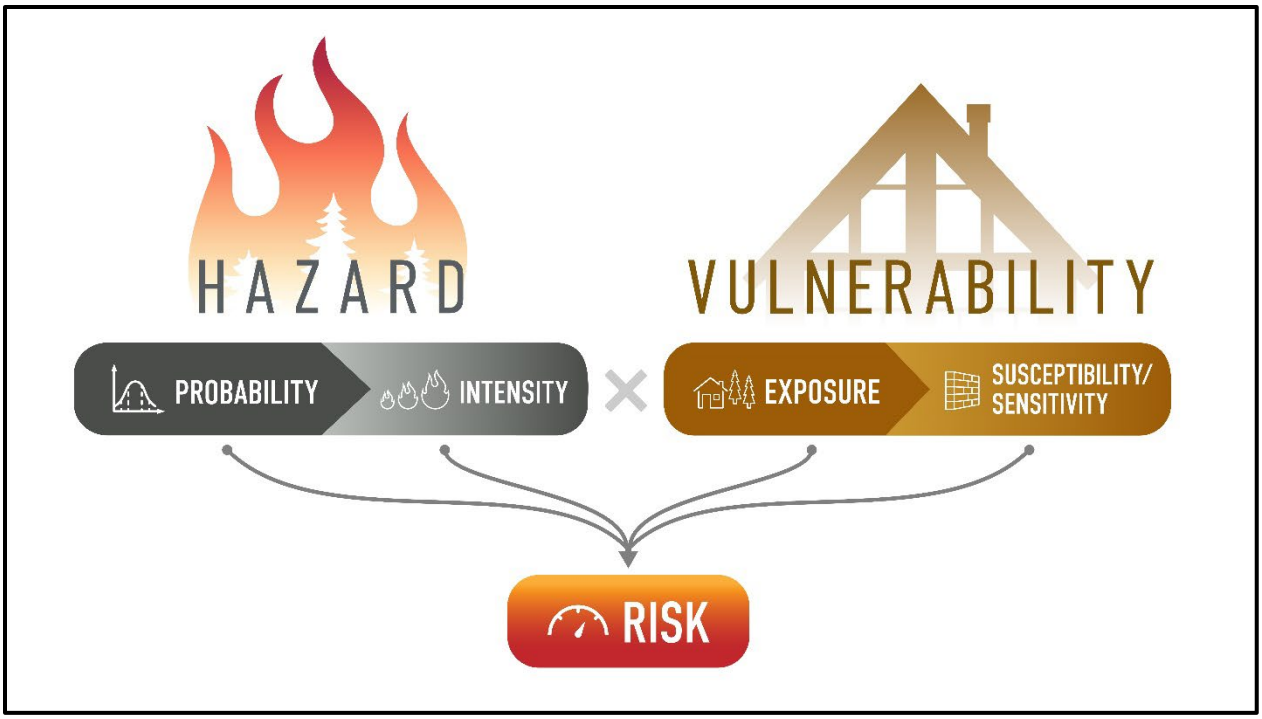

Figure 3.6. Pyrologix's Quantitative Wildfire Risk Framework for the MWRA Quantitative Wildfire Risk Assessment, derived from Scott et al. (2013).

WILDFIRE RISK IN TREASURE COUNTY

Quantitative Wildfire Risk Assessments are developed around three primary components: 1) the likelihood of a wildfire occurring, 2) the expected intensity of a wildfire, and 3) the exposure of resources and assets to wildfire hazards. Highly valued resources and assets (HVRAs) are key elements on the landscape that, if impacted by wildfire, would negatively impact the lives, property, and livelihood of the community. The HVRAs for the MWRA were established through a workshop involving statewide experts, during which fire effects were discussed in relation to these critical resources and assets.

The MWRA uses nationally available spatial datasets to assess the exposure and vulnerability of HVRAs to wildfire, including people and property, infrastructure, watersheds, and vegetation. Below is a summary of the HVRAs used in the MWRA:

- **Property**: This dataset represents residential, commercial, and critical infrastructure locations, using Montana's "Structures & Addresses Framework," with supplemental data from the DNRC.
- **Infrastructure:** This includes high- and low-voltage transmission lines and communication sites (e.g., cellular towers and radio transmitters), sourced from the Homeland Infrastructure Foundation-Level Data (HIFLD) program.
- **Watersheds**: Drinking water protection areas were identified using USFS Region 1 data, mapping surface water intakes and watersheds with erosion potential modeled in fire severity scenarios.

To prioritize HVRAs, a relative importance (RI) value was assigned to each asset and resource. This allows HVRAs to be weighted differently in the overall risk calculation based on their importance. For example, the "People and Property" HVRA received the highest importance, reflecting the potential

human and economic losses from wildfire. Infrastructure values, such as a wooden power pole, are important for supplying power to the community. However, their loss typically results in a short-term electrical disturbance with, arguably, a smaller economic and societal impact compared with the loss of a family home. This RI weighting ensures that the community value and societal impact of each HVRA is accurately factored into the overall wildfire risk assessment. Figure 3.7 outlines the relative importance ratings assigned to each HVRA category analyzed in the risk assessment. “People and Property” was assigned the highest value, followed by “Infrastructure” and “Surface Drinking Water Resources.”

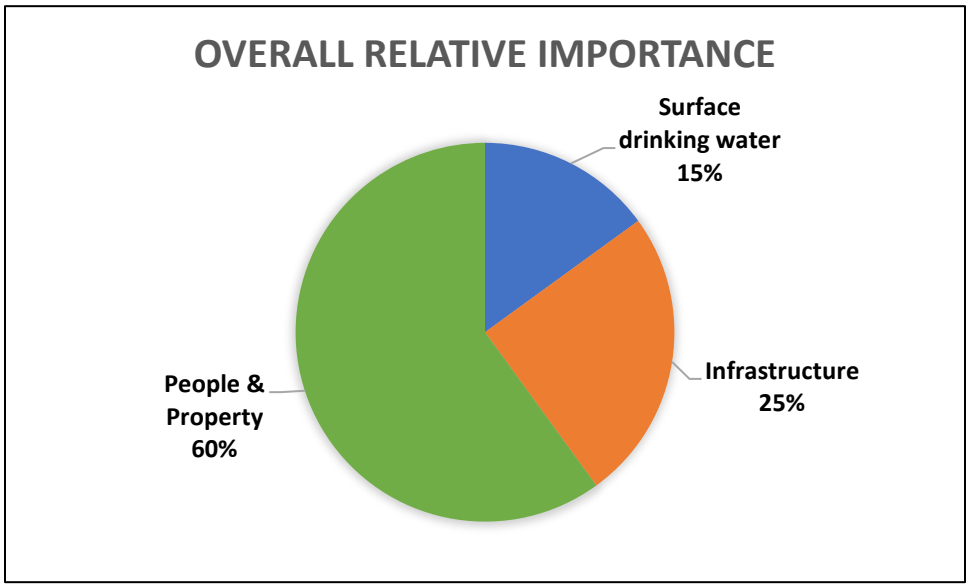

Figure 3.7. Overall RI weighting (ranking) of collaboratively determined HVRAs for the state of Montana.

Source: Pyrologix (2020).

In Figure 3.8, the areas where the HVRAs in Treasure County overlap areas of high wildfire probability and hazard (see Figure 3.6) are shown as high risk. This output identifies areas on the landscape that could be prioritized for wildfire risk mitigation activities. See Chapter 4 for project recommendations aimed at reducing wildfire risk by building resilient landscapes.

As depicted in Figure 3.8, fuels, community, development, and fire behavior directly influence wildfire risk to assets. Examples of assets include residential commercial structures and energy and water infrastructure. Wildlands in the northern and southern portions of the county show uniformly high risk, while scattered localized areas comprising population centers and areas with property or infrastructure assets present very high and extreme risk levels. These elevated risk levels are more frequent in the southern portion of the county, where there are high timber fuel loads and a greater presence of people and property. Although the fire hazard and probability are low along the I-94/Old Highway10/Myers Road transportation corridor due to the presence of frequently non-burnable agricultural lands, the overall risk is elevated around structures due to the vulnerability of those assets.

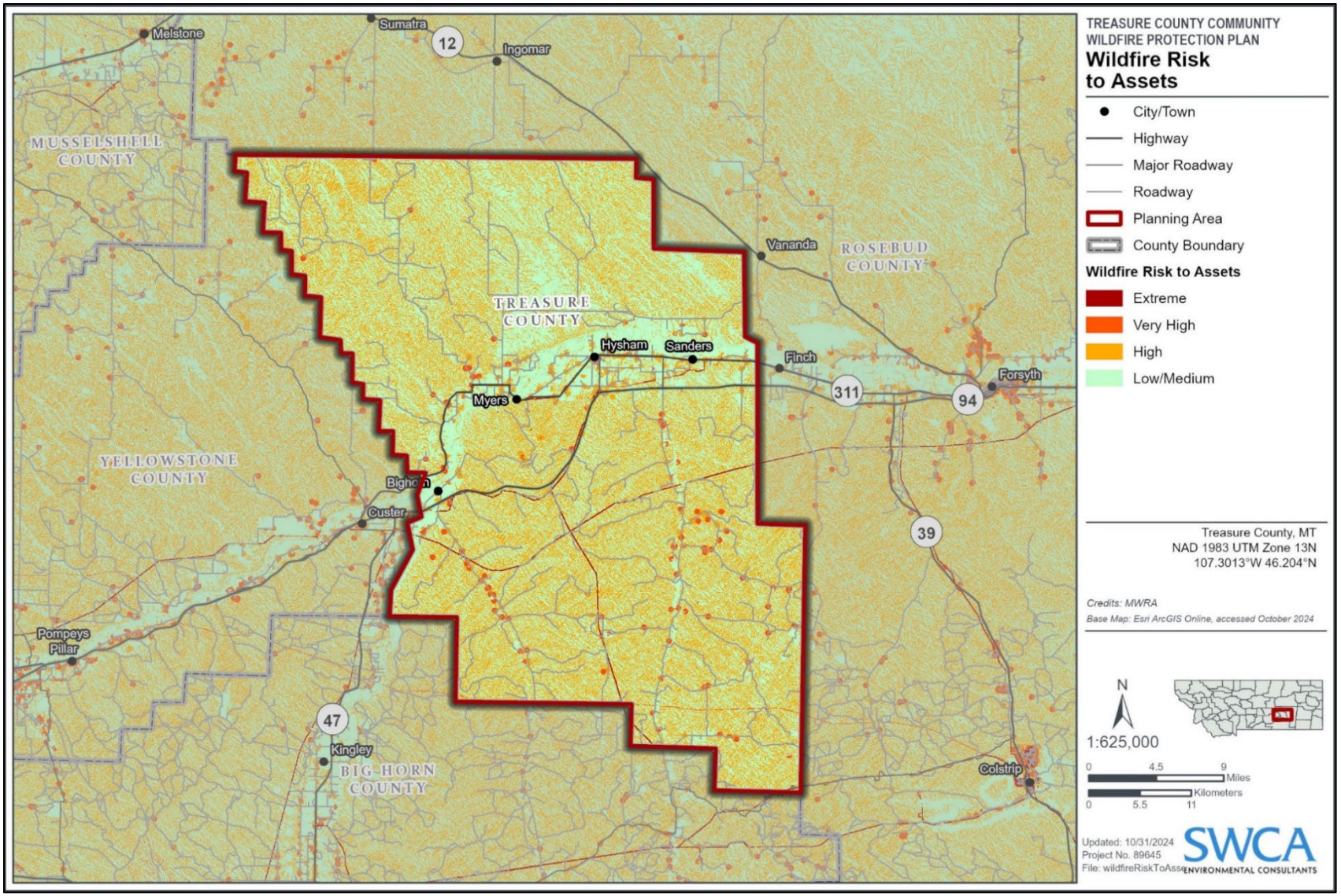

Figure 3.8. Wildfire risk to assets in the Treasure County CWPP planning area.

The dots represent building footprints, while the red lines indicate transmission lines.

Source: Pyrologix (2022a).

While timber fuels are known to produce higher flame lengths, grass-fueled fires can spread rapidly and with intense flames under windy conditions. During extreme weather, often referred to as red flag conditions, fire behavior can escalate unpredictably, posing significant threats to valued resources. It is important to note that this assessment does not fully account for the most extreme fire conditions, meaning areas that may seem to be at lower risk could still face severe wildfire impacts. Therefore, it is critical to implement mitigation measures, such as creating defensible space around properties, establishing effective alert systems, and having clear evacuation protocols, even in regions that do not appear to be at the highest risk.

The risk to assets map is useful when trying to understand wildfire risk to existing HVRAs, such as existing homes across the landscape. However, it is also important to look at wildfire risk comprehensively across the landscape in open space areas as well as developed zones. The Expected Risk to Potential Structures dataset allows for this analysis (Figure 3.9).

Flame length is a critical factor in assessing fire behavior and potential impacts to both natural and built environments, providing insight into the intensity of a fire. It refers to the distance from the base of the flame to its tip, measured on a slant when the flames are tilted due to wind and slope effects. Figure 3.10 illustrates the flame length characteristics in Treasure County and allows land managers to compare areas on the landscape that are currently developed to those that are not. The expected risk to potential structures map is created by multiplying flame lengths and probability to determine, for every pixel on the landscape, whether structure loss is expected if a structure were to be there. No HVRA data are incorporated into this map except that denser developed areas can be seen on the maps as “unburnable” due to their lack of wildland fuels. The wildland fire models do not model structure-to-structure spread. Note that, even in dense urban areas, wildfire risk can be low but is never zero.

Moderate risk to potential structures dominates the planning area due to relatively low flame lengths, even under very high fire danger conditions. If this exercise were to incorporate more extreme (and rare) model parameters such as lower fuel moisture content and high winds, high to extreme risk levels could be found across wider portions of the planning area.

Treasure County is characterized by a diverse landscape with a range of wildfire risk factors present. The portion of the planning area north of the Yellowstone River is dominated by shrub and herb landscapes, with sparse timber areas. This type of vegetation creates lower risk in the presence of structures when compared to timber fuels. Potential structures along the Yellowstone River and the I-94/Old Highway10/Myers Road transportation corridor would be surrounded by largely unburnable agricultural lands and urban centers. As previously mentioned, however, grassy fuels in these areas still pose a hazard, lending to elevated risk levels along this corridor. South of the Yellowstone River are denser stands of tree communities, blended with herb and shrub communities, as well as additional agricultural areas. The elevated risk to structures in the south is largely due to its contiguous vegetation and rolling terrain that results in higher fire probabilities with greater fire intensities.

The Suppression Difficulty Index (SDI) measures how challenging it would be to manage or suppress a wildfire under severe fire weather conditions. It evaluates suppression difficulty based on factors such as flame length, terrain/topography, fireline production rates, and proximity to access routes. The SDI is crucial for identifying areas where fires may be particularly difficult to contain or suppress, aiding in the development of effective fire management strategies and resource allocation. See Figure 3.11 for an illustration of the modeled SDI throughout the planning area. Table 3.1 describes how flame length can be integrated in terms of its implications on SDI.

Table 3.1. Flame Length Interpretations for Fire Suppression Efforts

Flame Length (feet)	Interpretation
<4	• Fires can generally be attacked at the head or flanks by persons using hand tools. • Hand line should hold the fire.
4–8	• Fires are too intense for direct attack on the head by persons using hand tools. • Hand line cannot be relied on to hold the fire. • Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8–12	• Fires may present serious control problems—torching out, crowning, and spotting. • Control efforts at the fire head will probably be ineffective.
>12	• Crowning, spotting (ember spread), and major fire runs are probable. • Control efforts at head of fire are ineffective.

Source: USFS (2011).

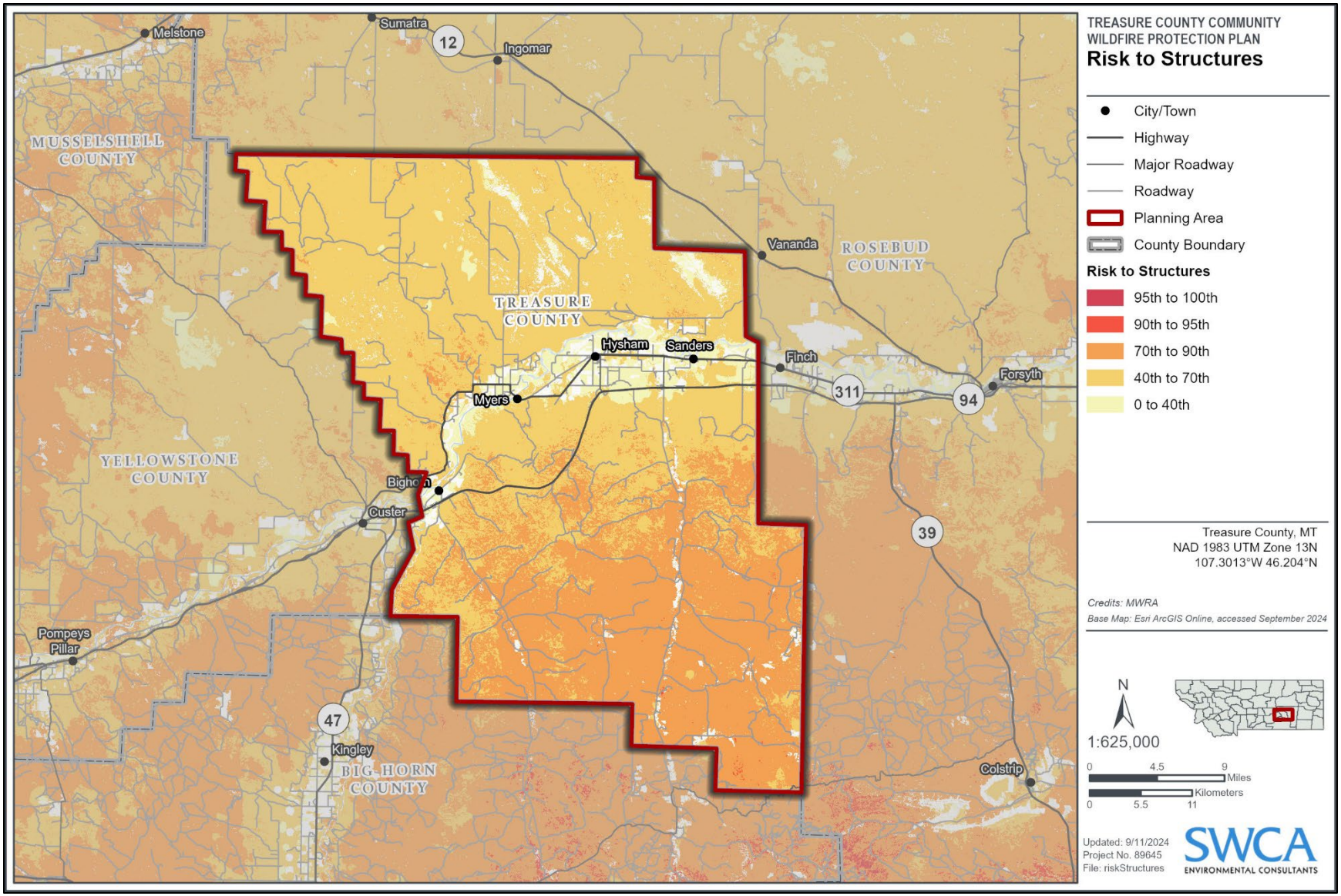

Figure 3.9. Risk to potential structures throughout the planning area. Numbers represent the percentile probability of loss of potential structures to wildfire. Ex. 70th to 90th = 70% to 90% probability of structures being lost if they were to exist in that location.

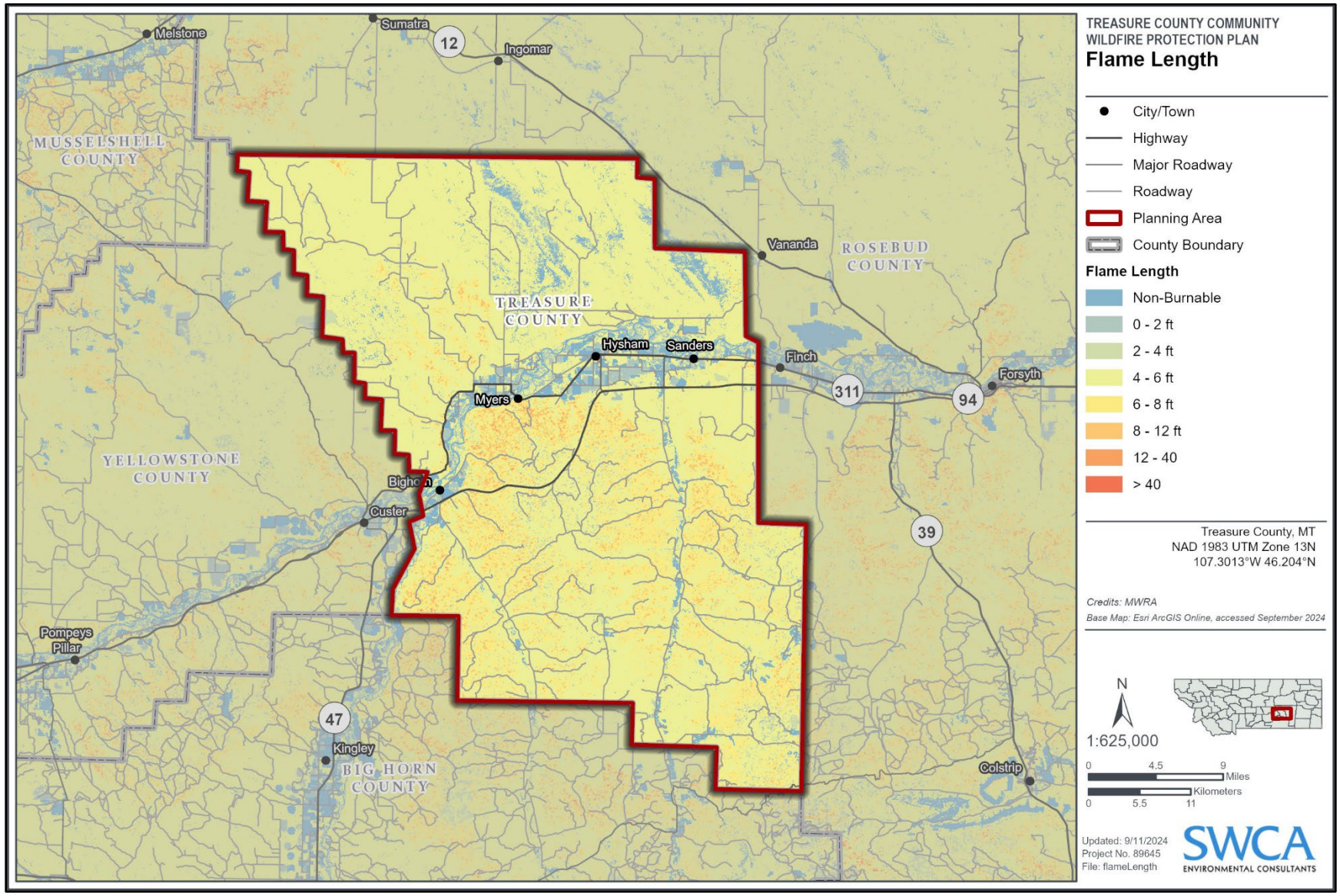

Figure 3.10. Modeled flame length of wildfire for the planning area.

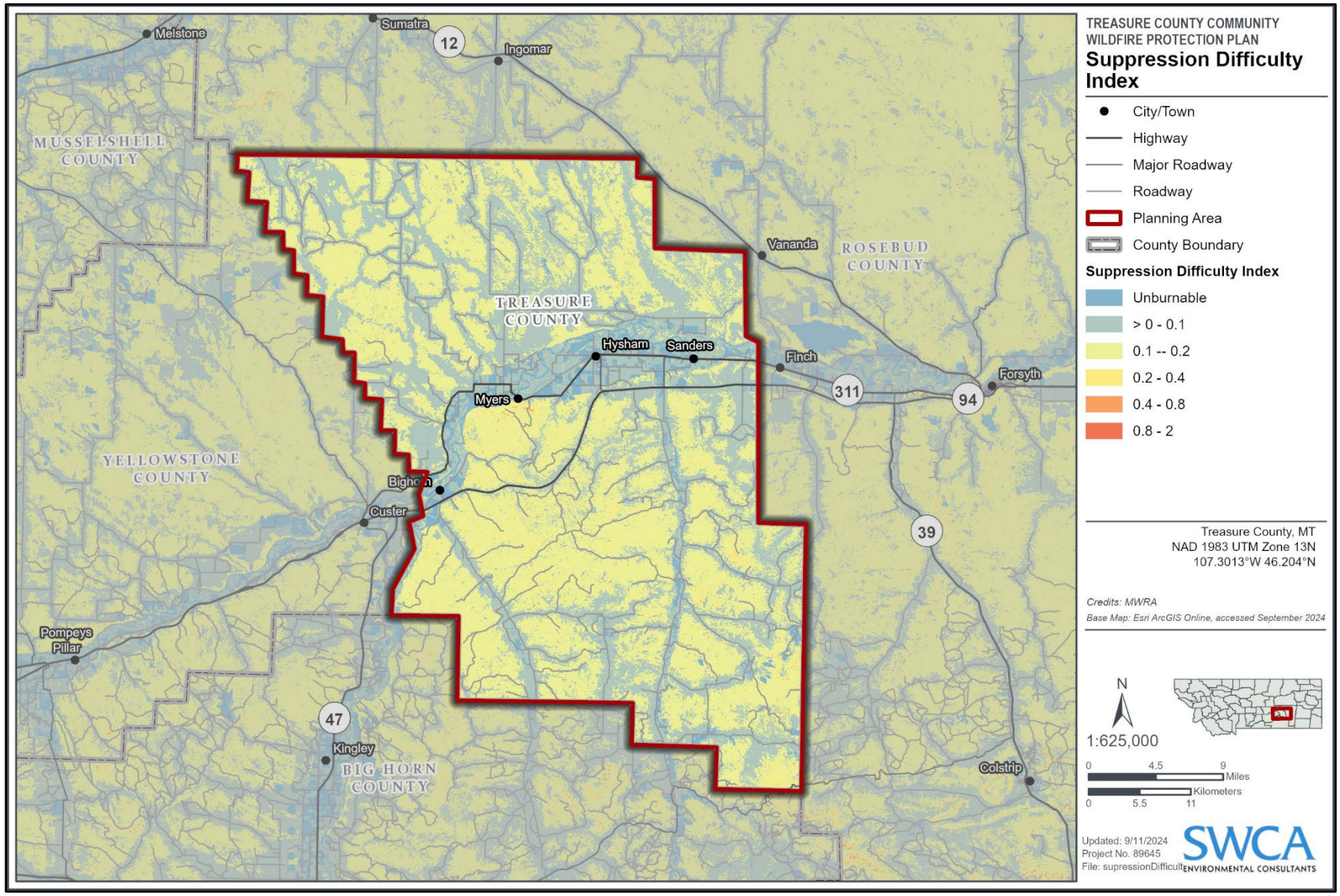

Figure 3.11. Modeled SDI on a 2-point scale from unburnable to extreme difficulty for the planning area.

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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. (Forests and Rangelands 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 MWRA.

Recommendation matrices (Tables 4.1–4.3) are used throughout this chapter to serve as an action plan for implementation. Recommendations have been aligned with the strategies in the 2020 Montana Forest Action Plan (DNRC 2020a) wherever possible.

Table 4.4 provides key information on various funding sources for mitigation projects, highlighting the applicable Cohesive Strategy goal(s) for each funding source. This allows lead agencies that are seeking funding to better understand which sources are best suited for their project. Whether the focus is on creating resilient landscapes, fostering fire-adapted communities, or enhancing wildfire response, this resource will help identify the relevant funding opportunities to support initiatives. More information on these funding sources can be found in Appendix G.

AREAS OF CONCERN

Figures 4.1 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.

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.

While residents within these areas of concern should prioritize fuel treatments in the HIZ (see Appendix D, Figure D.1 and Table D.1), it is advisable to reduce fuels beyond the HIZ for properties within the WUI. See Chapter 6 for a list of homeowner actions.

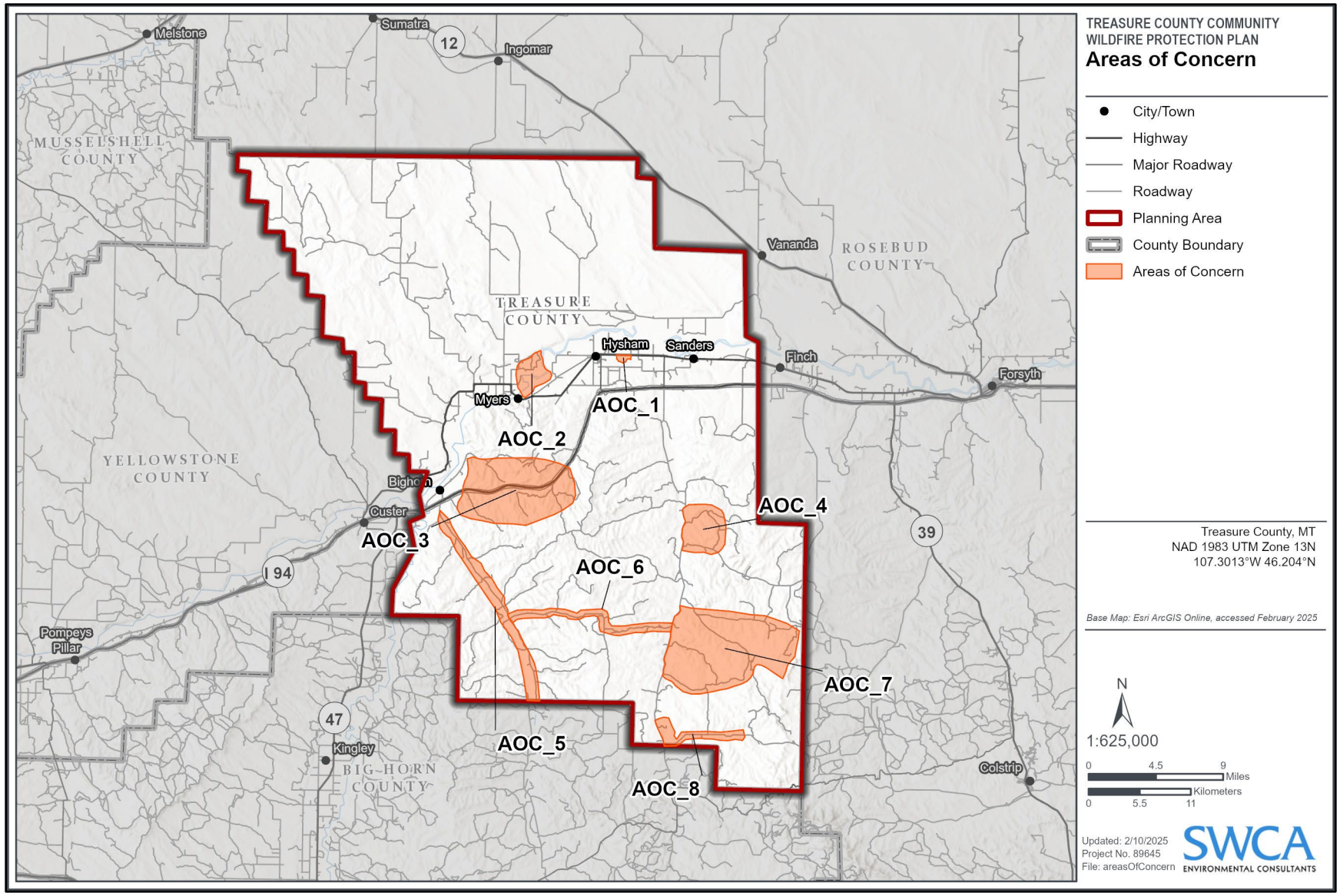

Figure 4.1. Collaboratively identified areas of concern within Treasure County.

GOAL 1: RESILIENT LANDSCAPES

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

RECOMMENDATIONS FOR HAZARDOUS FUEL REDUCTION

In Treasure County, fuels should be modified with a strategic approach to reduce the threat that high-intensity wildfires pose to lives, property, and other critical assets. Mitigating extreme fire behavior, decreasing structural ignitability, creating defensible space, providing safe evacuation routes, and maintaining roadways for firefighting access are essential components of the fuels management strategy around communities located within wildland-urban interface (WUI) zones. The application of diverse treatment methods often amplifies the effectiveness of fuels management.

Fuels treatments typically occur separately on private and public lands. However, coordinated efforts between landowners and land managers are vital to achieve comprehensive wildfire risk reduction. Collaboration on fuels reduction strategies, from the wildlands to the home ignition zone (HIZ), will significantly enhance protection measures.

It is important to differentiate the applicability of fuels treatment on public versus private lands. Prescribed burns are generally recommended for large, landscape-level treatments on public lands, while private land strategies include maintaining defensible space, mowing around boundaries, and other fire-safe practices. Consultation with fire management experts and adherence to local regulations is critical to the safe execution of these treatments.

Fuels Management

Effective fuels management in the WUI is key to ensuring homes survive wildfire events and meet mitigation goals. Research supports the idea that fuels management alters fire behavior, aiding in suppression efforts and reducing the potential for structure loss. Federal policies, such as the Healthy Forests Restoration Act (HFRA), underscore the importance of this strategy by requiring that at least 50% of federal fuel reduction funding be directed toward WUI projects.

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 communities at risk.

Fuels reduction should begin near structures, focusing on defensible space, and extend outward to community boundaries with fuel breaks and open space cleanup. Beyond the community, forest health and restoration treatments are prioritized to enhance the landscape's resilience to catastrophic wildfires. When applying fuel treatments, every effort should be made to align treatments with the Montana Forest Action Plan (DNRC 2020a) 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.

Table 4.1. Recommendations for Creating Resilient Landscapes (Hazardous Fuels Reduction)

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements

Hysham Grant Support
Prepare and apply for Fire Mitigation Assistance Grant (FMAG).
	Hysham	Treasure County DES, DNRC	• Gather comprehensive wildfire risk data specific to Hysham, including:
			  ○ Vegetation types
			  ○ Topography
			  ○ Climate patterns
			  ○ Historical fire occurrences
			• Compile the collected data and analysis into a detailed and well-organized FMAG application.
			• Highlight the specific needs and risks of Hysham.
			• Engage with local and state agencies, including the DNRC and Treasure County DES, to gather additional support and information.
				Secure funding through the FMAG to support wildfire mitigation efforts in Hysham, reducing fire hazards while enhancing community safety and resilience.	Monitor the status of the FMAG application through regular updates from the grant agency.
					Continuously update the wildfire risk data to reflect current conditions and remain eligible for future opportunities.

Critical Infrastructure Fuel Reduction
Identify and reduce wildfire fuels adjacent to critical infrastructure in the WUI.
	Countywide	Treasure County, energy providers, DNRC	• Conduct a survey aimed at identifying, collecting, and mapping critical infrastructure data in WUI areas of the county.
			• Evaluate the vulnerability of identified critical infrastructure areas to wildfire, considering various key factors such as:
			  ○ Vegetation type
			  ○ Fuel loads
			  ○ Topography
			  ○ Historical fire data
			  ○ Prevailing weather patterns
			• Design and tailor specific mitigation strategies for each high-risk area, focusing on applicable fuel reduction techniques.
			• Implement these strategies through coordinated efforts with TCRVFD, landowners, community organizations, and other relevant stakeholders.
				Protect essential community assets, enhance overall community safety, and build resilience against future wildfire threats.	Continuously update GIS maps to reflect changes in WUI zones, critical infrastructure, and wildfire risk factors.
					Document and analyze the results to identify successful strategies and areas for improvement.

Targeted Fuels Treatments
Conduct targeted fuels treatments and prescribed burning in collaboration with TCRVFD and landowners.
	North of I-94 and Tower Lane, Sarpy Creek Road, Wilson Road, Burnt Creek Road, Iron Springs Road, Isaac's Homestead, Howrey Island	Treasure County, TCRVFD, private landowners	• Identify areas of greatest risk using the CWPP risk assessment and on-the-ground knowledge.
			• Prioritize treatment in areas at highest risk and in close proximity to communities, infrastructure, and ecological values.
			• Create detailed treatment plans for each identified area, specifying the type of fuels treatments most appropriate for the project (mechanical thinning, fuel breaks, prescribed burns, etc.):
			  ○ North of I-94 and Tower Lane (State Trust land): Establish a fuel break and then thin out the surrounding area.
			  ○ Along Sarpy Creek Road: Create a fuel break where fuels are within 100 feet of the road.
			  ○ Near Wilson Road: Section 15, Township 38W, Range 3N (10,000 acres, noted from a public meeting).
			  ○ Burnt Creek Road: Implement fuels treatment (specific details needed).
			  ○ Iron Springs Road: Gravel road through hills with trees and sagebrush up to the road; thin back 100 feet from the center of the road and create a 200-foot fuel break.
			  ○ Isaac's Homestead (Montana Fish, Wildlife and Parks land): Address dry fuels in the area, particularly in riparian zones.
			  ○ Howrey Island (BLM land): conduct fuels cleanup; located by the river with riparian areas full of dead timber due to the 2021 flood.
			• Follow best practices and regulatory guidelines to minimize environmental impact and enhance the effectiveness of treatments.
			• Establish partnerships with TCRVFD to leverage their expertise and resources.
			  ○ Coordinate with TCRVFD and landowners to install and maintain fire breaks in strategic locations.
				Protect communities, critical infrastructure, and valued resources from the threat of wildfires.
				Enhance local collaboration in wildfire mitigation activities.
					Continuously monitor the treated areas to assess the effectiveness of the fuel treatments.

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Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements
Airport Fuels Reduction Conduct fuels reduction on lands surrounding the airport.	Airport area	Treasure County, TCRVFD	• Perform a comprehensive assessment of the airport area to identify locations with excessive fuel build-up. • Establish strong partnerships with airport authorities to coordinate fuels reduction and maintenance activities. • Implement fuels reduction thinning or other appropriate fuel reduction measures to remove or reduce vegetation that could contribute to wildfire spread. • Outline a plan for regular maintenance to ensure long-term wildfire safety throughout airport operations.	Protect critical infrastructure, enhance community safety, and reduce overall wildfire impacts.	Conduct routine inspections of the airport area to identify and address any new fuel build-up. Incorporate new data, best practices, and feedback from stakeholders.
Noxious Weed Control Programs Integrate noxious weed control programs with fuels reduction projects.	Countywide	Treasure County, DNRC	• Combine noxious weed control efforts with fuels reduction projects to address both wildfire risk and invasive species management. • Target cheatgrass and other invasive species along roadways and high-risk areas. • Create a comprehensive weed control plan that includes all control methods pertaining to the county's conditions. ○ Allow the comprehensive plan to be easily referenced or integrated into fuel reduction permitting/planning. • Work with local government agencies, landowners, and conservation groups to coordinate weed control and fuels reduction efforts. • Acquire and provide resources and support to landowners to help them manage invasive species on their properties.	Improve landscape health and wildfire resilience by integrating noxious weed control and promoting sustainable land management practices.	Track the implementation and effectiveness of weed control programs integrated with fuels reduction projects. Gather and monitor noxious weed data and use to inform long-term control practices.
Sage-Grouse Habitat Fuel Reduction Implement targeted fuel reduction to protect critical sage-grouse lekking, nesting, and brood-rearing habitats.	Countywide, prioritizing any high-priority sagebrush steppe areas within Treasure County	Treasure County, DNRC, BLM, state wildlife agencies, private landowners	• Conduct a thorough survey of high-risk sage-grouse habitat. • Identify the necessary treatment types and procedures necessary to maintain and improve sage-grouse habitats: ○ e.g., mechanical thinning of encroaching juniper, prescribed burns, herbaceous fuel management, and invasive species control to maintain native sagebrush ecosystems.	Reduce wildfire risk, maintain and improve sage-grouse habitat connectivity, and support species recovery efforts.	Conduct annual habitat condition assessments and periodic invasive species monitoring. Re-treat every 5–7 years as needed based on post-treatment photo points and lek count surveys.
Reduction of Hazardous Fuels in the WUI Conduct fuel treatment projects using timber logging, forest thinning, and prescribed fire to reduce hazardous fuels in the WUI.	Treasure County WUI	TCRVFD, NRCS, BLM, DNRC	• Conduct forest thinning projects within the WUI of Treasure County. • Use fuel treatment techniques best tailored to the treatment area. • Conduct understory thinning, overstory thinning, precommercial thinning, slashing, mastication, pile and burning, broadcast burning, and biomass removal to reduce the density and continuity of wildland fuels. • Engage with local agency partners to implement projects in priority areas of concern. • Identify opportunities to align treatment projects with maintaining or increasing forest health and resiliency to insects and disease. • Identify opportunities to align treatment projects with maintaining or increasing suitable habitat for wildlife.	Reduce the intensity of wildfires and increase community and environmental resilience to wildfires.	Establish a post-treatment monitoring plan to evaluate the long-term impact of fuel reduction projects.

Agency Collaboration
Foster collaboration among federal, state, and local governments and non-profit entities to streamline fuel reduction initiatives.
	Treasure County	Treasure County, DNRC, BLM	• Form a workgroup/task force comprising representatives from collaborating parties, encouraging clear discussion on optimizing strategic fuel treatment implementation.
			  ○ Define roles and facilitate regular meetings to discuss future and ongoing projects.
			  ○ Document individual agency objectives, strategies, and priorities for fuel treatment.
			• Use potential operational delineation (POD) boundaries to guide planning and resource allocation.
				Create a synergistic approach to fuel treatment priorities by enhancing coordination between agencies.	Periodically assess the frequency and quality of communication.

Prescribed Fire Implementation and Landscape Preparation
Implement prescribed burns with proper landscape preparation to manage wildfire risk and improve ecosystem health.
	Treasure County	TCRVFD, residents	• Identify areas suitable for prescribed burns based on risk assessments and ecological needs.
			• Develop comprehensive burn plans outlining objectives, methods, and safety measures for prescribed burns.
			  ○ Ensure plans are tailored to the specific landscape and ecological goals.
			  ○ Prepare the landscape for prescribed burns by reducing fuel loads, creating fire breaks, and ensuring access routes.
			• Conduct prescribed burns under controlled conditions with trained personnel.
			• Disseminate public notification prior to conducting prescribed burns.
				Reduce wildfire risk and improve ecosystem health through the strategic use of prescribed burns.	Monitor the effects of prescribed burns on vegetation and wildfire risk.
					Conduct follow-up assessments to ensure the effectiveness of prescribed burns.

Mitigation Actions

The maps in Figure 4.2 and Figure 4.3 illustrate recommended wildfire mitigation actions throughout Treasure County. These maps depict the spatial distribution of proposed hazardous fuel treatment units, roadside vegetation management, defensible space treatments, proposed prescribed burn units, and both existing and recommended water sources.

Hazardous Fuel Treatment Units

Fuel treatment units are identified in areas of high wildfire risk as a result of high fuel loading and proximity to structures. The goal of fuel treatments in these areas is to treat vegetation and mitigate hazardous fuels to reduce wildfire intensity. Fuel treatments may be carried out using a variety of methods, which are described in detail in Appendix D.

Roadside Vegetation Management

Roadside vegetation management aims to reduce the encroachment and loading of hazardous fuels along roadways. The goal of roadside vegetation management is to treat vegetation along roads to leverage and improve existing fuel breaks and maintain safety for evacuations and fire response personnel.

Defensible Space Treatments

Defensible space treatments have been identified around structures in the WUI and along transmission line rights-of-way. Treating hazardous fuels and implementing defensible space in these areas aims to reduce wildfire ignition risk and wildfire risk to structures.

Proposed Prescribed Burn Units

Local landowners have identified potential prescribed burn units on private ranchlands located east of Sarpy Creek Road. Prescribed burning aims to reduce hazardous fuels while maintaining natural fire regimes in open fire-adapted ponderosa pine stands. Prescribed fire may also benefit forage for livestock and reduce the spread of noxious weeds.

Recommended Water Sources

To augment existing water resources, the TCRVFD has identified the location and type of water sources to be installed to aid in fire response capabilities. Water tanks and drafting wells allow firefighters options for drafting water for firefighting operations and reduce the time and distance needed to replenish water for fire engines.

Together, these maps support implementation of the recommendations listed in Table 4.1 and provide spatial context for prioritizing mitigation actions across the landscape.

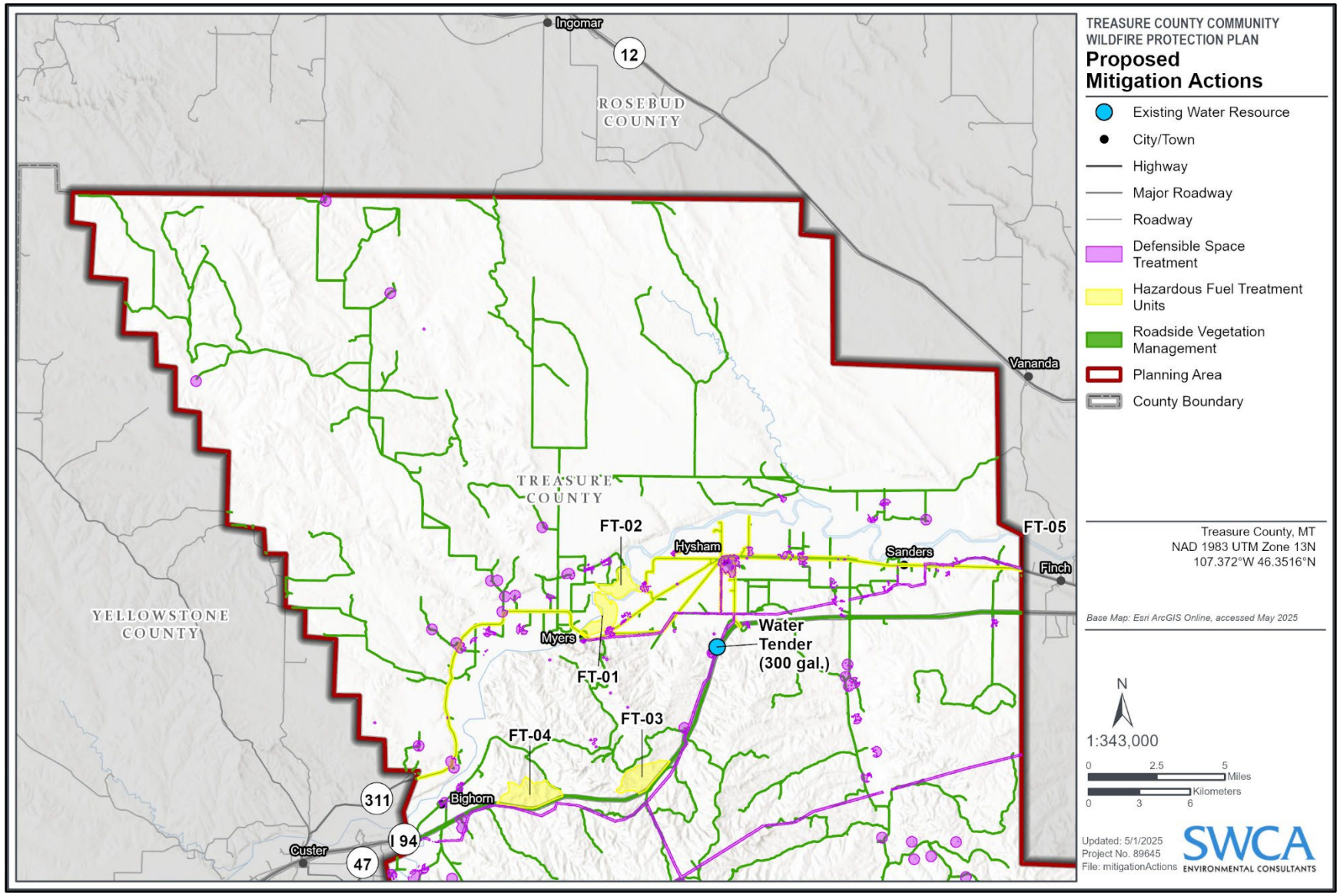

Figure 4.2. Recommended mitigation actions in northern Treasure County.

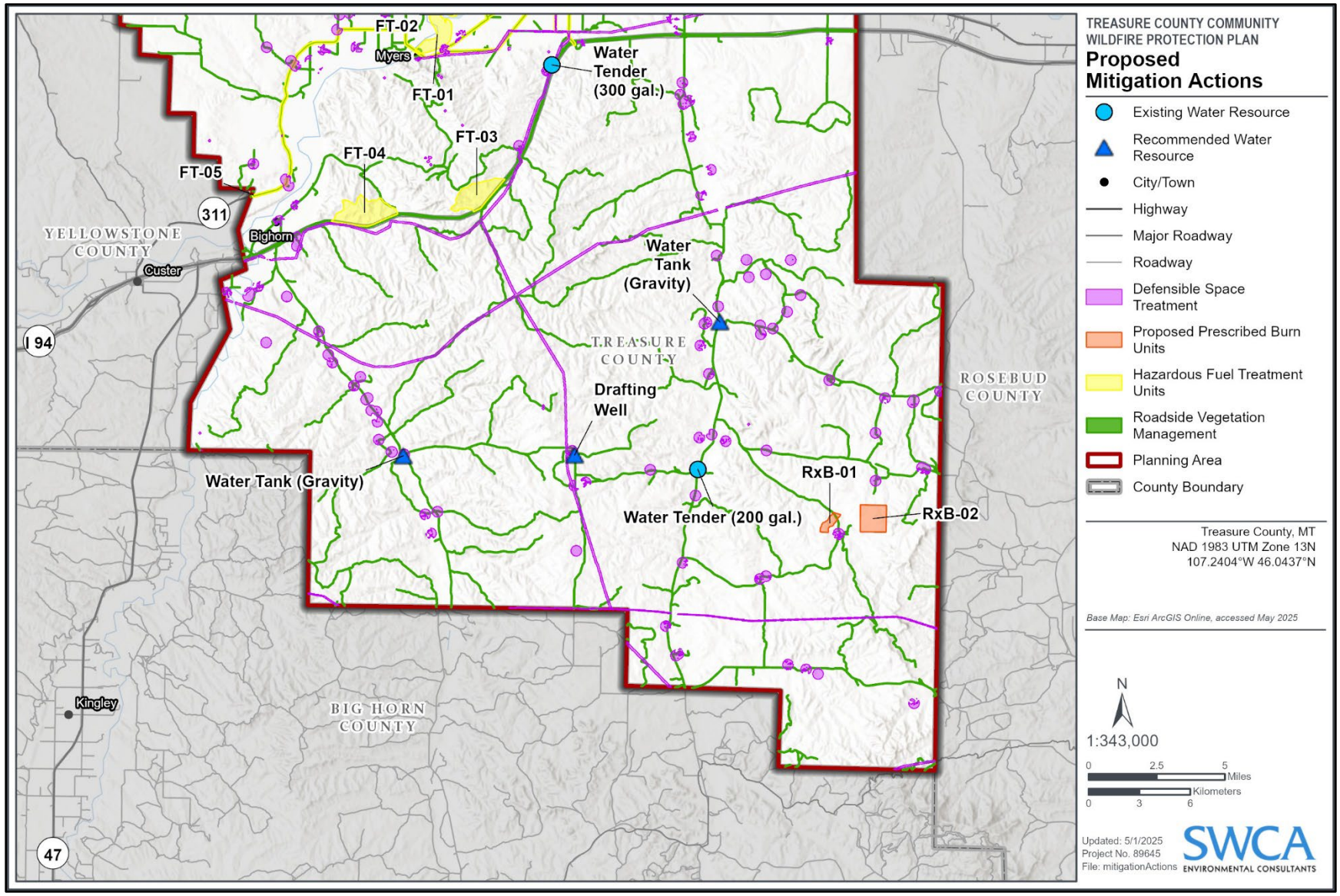

Figure 4.3. Recommended mitigation actions in southern Treasure County.

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 wildfire loss, so do human hazards. In Treasure County, a lack of knowledge about fire prevention, inadequate actions (such as failing to create defensible space), and negative behaviors (like maintaining hazardous vegetation near structures) can significantly elevate the risk of wildfire loss in the WUI. While many residents in the WUI understand the dangers posed by wildfires, it is crucial to continually engage the community as partners in wildfire mitigation efforts across different land ownerships.

The Treasure County CWPP recognizes the importance of increasing community involvement in wildfire prevention and mitigation. Public education methods could include enhancing awareness about the local fire department's needs, offering workshops on Firewise landscaping techniques, organizing community cleanups for vegetation management, and promoting government programs that provide financial assistance for treatments on private lands. Crucially, building trust and improving communication between homeowners and land management agencies is vital for ensuring the maintenance of existing fuel treatments and the implementation of new ones in the WUI.

While some residents are aware of the Firewise Communities program, many others would benefit from increased exposure. Workshops explaining the Firewise principles and their application to home protection from wildfire are encouraged to foster greater understanding. Treasure County aspires to have more communities achieve Firewise Community status, setting an example for fire prevention in Montana. Further public education methods could involve installing fire danger level signs in highly visible areas, developing community evacuation plans, and increasing awareness of fire department response capabilities.

Improving communication between homeowners and local land management agencies will be crucial in building trust and ensuring more effective fire mitigation practices across public and private lands.

Please see Chapter 6 for a comprehensive list of local, statewide, and national educational resources.

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 Treasure 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 the Ember Ignition Hazards sections 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 4.2. Recommendations for Creating Fire Adapted Communities (Public Education and Structural Ignitability)

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements
Rock Canyon Community Outreach Conduct a range of targeted outreach activities pertaining to spreading awareness on wildfire risk and potential mitigation measures.	Rock Canyon AOC-3	Treasure County	• Organize and host regular community meetings to provide residents with vital information regarding wildfire preparedness and response. • Invite experts and local officials to present and discuss best practices, and partner with TCRVFD to provide hands-on demonstrations. • Create and distribute comprehensive informational materials, including brochures, flyers, and digital content.	Enhance community awareness and preparedness in Rock Canyon, thereby fostering a safer and more resilient community.	Maintain records of attendance and participation rates for community meetings and training sessions. Implement feedback mechanisms, such as surveys and suggestion boxes, to gather input from residents on the effectiveness of the outreach program.

NRCS Program Assistance
Provide technical and financial assistance to private landowners for implementing conservation practices that improve soil health, reduce wildfire risk, enhance organic matter, and restore grasslands.
	Treasure County	NRCS, Treasure County, private landowners, DNRC	• Conduct outreach activities to inform local landowners about NRCS programs.
			  ○ Organize and host workshops focused on specific strategies such as soil health, wildfire mitigation, organic matter improvement, and grassland restoration.
			  ○ Develop and distribute informative materials tailored to the targeted audience.
			• Encourage and assist in the planning and implementation of conservation practices outlined within the listed “Current Financial Assistance Opportunities for Treasure County Landowners.”
			  ○ https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives/montana/whats-available-in-my-county/treasure-county.
			• Provide voluntary technical and financial assistance to private landowners.
			• Use a focused approach with long-range planning and local input to ensure effective implementation.
				Reduce wildfire risk and promote sustainable land management practices.
				Support producers in adopting effective and adaptive wildfire mitigation techniques.
					Assess the level of engagement and satisfaction among participants.
					Gather feedback from participants in education, outreach, and fuel management.

Donation Management for Livestock
Establish a program aimed at providing timely and effective assistance to livestock owners affected by wildfires.
	Countywide	Treasure County, livestock owner groups, local banks	• Integrate the donation management system into a livestock evacuation plan and other local emergency planning.
			• Collaborate with local cattle associations, agricultural organizations, local business, and financial institutions to gather support and financial resources.
			• Design a reimbursement program that provides financial assistance to livestock owners who suffer losses due to wildfires.
			  ○ Establish criteria for eligibility and a transparent application process for reimbursement.
			  ○ Ensure that the program is accessible and equitable for all affected livestock owners.
			• Implement checks and balances to maintain transparency and accountability in both the donation collection and distribution process.
				Mitigate the economic impact of wildfires to the agricultural community by providing financial support and resources to those in need.	Maintain detailed records of all donations received, including monetary contributions and in-kind donations.
					Gather feedback from livestock owners who receive assistance to understand their experiences and needs.

Fire-Resistant Fence Repair Funding Initiative Secure funding to support the repair and upgrade of fencing damaged by wildfires, focusing on fire-resistant materials to reduce future wildfire risks.	Residential properties in wildfire-affected areas within Treasure County	Private landowners, TCRVFD, state forestry agencies	• Partner with local fire districts and community organizations to strengthen funding applications. • Highlight the role of fire-resistant fencing in reducing wildfire spread and protecting structures. • Engage with policymakers to advocate for dedicated wildfire recovery funds. • Organize community workshops to inform residents about available funding opportunities. • Facilitate bulk purchasing agreements to reduce material costs and maximize funding efficiency.	Increase access to financial resources for wildfire-affected residents, promote fire-resistant infrastructure, and support community-wide wildfire mitigation efforts.	Track funding application outcomes. Monitor project implementation funded through secured resources.

Identification and Mapping of Coal Seams
Mitigate the risk of coal seam fires in the county through identification and mitigation.
	Southern Treasure County	Treasure County, landowners	• Perform a detailed geological survey in the southeast corner of Treasure County to locate and map coal seams.
			  ○ Collaborate with experts to use advanced mapping technology and ensure accurate identification.
			  ○ Maintain and use coal seam mapping data for future wildfire mitigation planning efforts.
			• Develop and establish defensible space around identified coal seams to reduce the risk of fire spread.
			• Construct dozer lines as physical barriers to prevent coal seam fires from spreading to adjacent areas.
			• Engage with local mining companies and landowners to coordinate efforts, establish agreements, and develop protocols for maintaining the defensible space/dozer lines.
				Enhance community safety, protect property, and reduce the potential for coal seam fires.	Continuously monitor and update the maps of coal seams as new data become available.
					Regularly inspect and retreat the established defensible space and dozer lines to ensure effectiveness.

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Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements
Prescribed Fire Awareness Inform the community of Montana Prescribed Fire Council developments through outreach and education.	Countywide	Treasure County, Montana Prescribed Fire Council	• Organize and host regular community meetings to disseminate information about the benefits and safety measures of controlled burns. • Invite experts from the Montana Prescribed Fire Council and TCRVFD to speak at these meetings. • Provide a platform for community members to ask questions and express concerns about prescribed burns. • Develop and implement an educational outreach program focused on the safe and effective use of agricultural burns. • Provide training sessions and workshops for producers and landowners on best practices for conducting agricultural burns. • Develop and distribute educational materials.	Improve community understanding and safety by staying informed of prescribed fire developments and conducting targeted outreach and education.	Assess the impact of educational outreach activities to community knowledge and attitudes toward prescribed burns. Gather feedback from community members through surveys, interviews, and public forums, using feedback to identify areas of improvement.

Reduction of Prescribed Burn Barriers
Reduce barriers for private landowners to conduct prescribed burns by creating partnerships and facilitating coordination with local experts to conduct prescribed burns on private property.
	Countywide	Treasure County, landowners, BLM, Montana Prescribed Fire Council, DNRC	• Collaboratively identify and address common challenges faced by landowners and provide solutions and support to overcome these barriers
			• Engage with local landowners to build regional partnerships surrounding prescribed burning on privately owned land, addressing liability concerns and providing information on risk mitigation measures.
			  ○ Explore options for liability insurance or indemnity agreements to protect landowners participating in prescribed burns.
			  ○ Provide resources and support to landowners to help them understand and manage liability risks.
			• Collaborate with the DNRC and Montana Prescribed Fire Council to provide resources and support for private landowners interested in conducting prescribed burns.
			• Partner with the DNRC Billings Land Office to increase their capacity to assist private landowners with prescribed burns.
				Improve landscape-scale resilience through increased participation in wildfire mitigation, and enhance coordination and the leveraging of expert knowledge and agency capacity.	Solicit feedback from participating landowners to assess their experiences and identify areas for improvement.
					Use feedback to refine partnership and coordination strategies.

Chipper Loan/Cost-Share Program
Create a chipper loan/cost-share program to support contractors and private landowners in conducting fuel reduction activities.
	Countywide	Treasure County, DNRC	• Establish a program that allows contractors and private landowners to borrow chipping equipment for fuel reduction activities.
			  ○ Develop a cost-share program to subsidize the rental or purchase of chipping equipment.
			  ○ Ensure that the program is accessible and affordable for participants.
			• Conduct outreach to inform contractors and landowners about the availability of the chipper loan and cost-share programs.
			• Provide training and resources on the safe and effective use of chipping equipment.
				Facilitate the removal of hazardous fuels and reduction of structural ignitability on private property by increasing resources and training.	Gather feedback from participants to understand their experiences and identify areas for improvement.
					Use feedback to refine and enhance the programs.

Home Wildfire Risk Assessments Conduct comprehensive assessments to identify and mitigate wildfire risks around residential properties.	Countywide	Private landowners, DNRC, TCRVFD	• Develop a program to carry out on-site evaluations by trained assessors, using standardized checklists and risk rating tools. ○ Consider collaboration with insurance companies to lower rates for compliance with assessment improvements. • Consider survey or interviews with homeowners to understand property-specific vulnerabilities. • Ensure that evaluations are based on the most up to date scientific findings regarding fire spread and industry best practices. • Offer action plans (include possible funding sources) to homeowners/renters for implementing the necessary wildfire mitigation improvements identified in the evaluation. • Offer support for homeowners/renters in implementing mitigation measure.	Enhance home defensibility, improve resident awareness, and reduce structural ignition potential.	Conduct annual reassessments or following significant wildfire events. Update mitigation measures as needed.

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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

Treasure County, is home to one fire protection district, Treasure County Rural Volunteer Fire Department (TCRVFD), which plays a critical role in the region's wildfire response. The effectiveness of wildfire response in Treasure County hinges on measures such as enhancing preparedness, promoting interagency coordination, acquiring essential resources, and engaging in community education initiatives.

Public education with regard to emergency notifications and fire response protocols is vital for minimizing the community's reliance on fire department during emergencies. This is particularly significant in rural areas with longer emergency service response times compared to more densely populated municipal zones. Strengthening community preparedness through education is a key component of bolstering the local fire departments' response capabilities. By fostering collaboration between the fire departments, local organizations, and residents, the community can play a supportive role in fire mitigation and response efforts. It is recommended that the fire chief and fire warden share insights on funding successes and best practices to enable collective learning and continuous improvement across the district.

Table 4.3 provides recommendations for improving firefighting capabilities. Many of these recommendations are general in nature.

Table 4.3. Recommendations for Safe and Effective Wildfire Response

Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements

Ingress and Egress Improvements
Improve fire response capabilities and enhance community safety by assessing and upgrading ingress and egress routes across the county.
	Countywide	Treasure County DES, TCRVFD	• Conduct a comprehensive assessment of existing ingress and egress routes throughout the county.
			  ○ Identify areas with inadequate access or potential bottlenecks that could hinder emergency response and evacuation.
			• Develop detailed plans to improve identified ingress and egress routes, focusing on widening roads, clearing obstructions, and creating turnarounds.
			• Review existing subdivision regulations to ensure they adequately support fire response and emergency access requirements.
			  ○ Propose and advocate for updates to regulations that mandate ingress/egress routes.
			• Establish partnerships with local government officials, fire department, and emergency management agencies to coordinate efforts.
			• Foster ongoing communication and collaboration to address future challenges and ensure long-term effectiveness.
				Facilitate efficient evacuation and emergency access during wildfire events, reducing the risk to lives and property.	Perform periodic inspections and assessments of ingress and egress routes to ensure they remain adequate and accessible.

Livestock Evacuation Plan Create a comprehensive livestock evacuation plan aimed at safeguarding livestock during wildfire events.	Countywide, with a focus on Treasure/Rosebud County Fairgrounds and feedlots	Treasure County DES	• Conduct a thorough assessment of potential livestock evacuation sites within the county, prioritizing areas with adequate space, shelter, and resources. ○ Focus areas: Treasure/Rosebud County Fairgrounds and other suitable feedlots • Organize public meetings to garner input and spread awareness of the planning process. • Establish formal agreements with property owners and managers of identified evacuation sites. • Create a comprehensive evacuation plan outlining procedures, responsibilities, and contact information. • Distribute the evacuation plan to all livestock owners in the county through mail, email, and local agricultural offices.	Protect livestock, minimize economic losses for producers, and enhance the overall resilience of the county's agricultural sector in the face of wildfire threats.	Organize and execute annual evacuation drills involving livestock owners, transportation providers, and evacuation site hosts. Conduct an annual review of the evacuation plan, incorporating feedback, new information, and changing conditions. Conduct surveys to assess community awareness, and gather feedback as necessary.

Increased Water Supply
Increase the availability of water supply for fire response in critical areas through strategic resource placement and landowner agreements.
	Main roads, south areas, near ponds, north side of the Yellowstone River, South of Hysham, Sarpy Creek Road area	Treasure County, TCRVFD, landowners	• Assess and prioritize areas based of overall risk and lack of adequate water supply for firefighting.
			• Install water tanks, dry hydrants, wells, and other water storage solutions in the identified critical areas, ensuring strategic placement for ease of access and effective response.
			  ○ Provide training sessions for TCRVFD on how to effectively use and maintain the new water supply infrastructure.
			  ○ Ensure fire response personnel are familiar with the location of hydrants/tanks.
			• Develop memoranda of understanding with landowners to secure access to water tanks and dry hydrants located on private property.
			  ○ Clearly outline the responsibilities of both parties regarding the use, maintenance, and access of the water supply infrastructure.
				Enhance fire response capabilities by increasing the availability of water supply in critical areas, thereby improving the effectiveness of firefighting efforts.	Conduct periodic inspections of all water tanks and dry hydrants to verify their operational status.
					Track the usage of water from the tanks and dry hydrants during fire response operations.
					Review and update memoranda of understanding as necessary.

Airport Response Training
Utilize airport fuels reduction practices as an opportunity for local fire response training.
	Treasure County airport area	Treasure County, TCRVFD, DNRC	• Organize an Exercise and S-219 Training for TCRVFD:
			  ○ Plan and conduct a wildfire response exercise in collaboration with TCRVFD to test and improve coordination and response strategies.
			  ○ Provide S-219 training (Firing Operations) to local fire department personnel to enhance their skills in managing controlled burns and other fire suppression techniques.
			  ○ Ensure that all relevant personnel are trained and prepared to respond effectively to wildfire incidents around the airport.
			• Coordinate with DNRC for training and educational materials.
				Enhance response capabilities of TCRVFD around critical infrastructure.	Evaluate the outcomes of training exercises to determine their impact on preparedness and response capabilities.
					Gather feedback from participants to identify strengths and areas for improvement in training programs.

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Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements

Reflective Street Signs and Address Markers
Improve emergency response capabilities by installing reflective street signs and clearly labeled address markers at the beginning of driveways.
	Treasure County	Treasure County, TCRVFD, residents	• Identify locations in need of updated or new street signs.
			  ○ Collaborate with local government agencies and emergency services.
			• Install reflective street signs to improve visibility for emergency responders, especially at night or in low-visibility conditions.
			• Ensure that markers are clearly visible from the road and compliant with local regulations.
			  ○ Ensure proper placement in the front of the driveway.
				Facilitate quicker and more efficient responses to emergencies by enhancing visibility and accessibility for emergency responders.	Conduct periodic inspections to ensure that street signs and address markers remain visible and in good condition.
					Replace or repair any damaged or missing signs and markers promptly.

Pre-Season Wildfire Response Coordination Meetings Conduct annual pre-season meetings to coordinate wildfire response strategies and resources.	**Treasure County**	Treasure County, fire response agencies	• Schedule annual pre-season meetings with all relevant agencies and stakeholders. • Review and update wildfire response plans and resource allocations. • Discuss lessons learned from previous wildfire seasons and identify areas for improvement.	Ensure a coordinated and effective wildfire response by conducting pre-season planning and strategy meetings.	Document the outcomes and action items from each pre-season meeting. Follow up on action items to ensure implementation before the wildfire season.

Water Availability and Fill Stations
Improve water availability for wildfire response through the installation and maintenance of gravity tanks, seasonal folding tanks, draft sites, hydrants, and fire ponds.
	Treasure County
	Communities near rivers, streams, and other water sources.
	Prioritize areas with the greatest need for water access due to fire risk.
		Treasure County, fire response agencies	• Conduct a water availability assessment to identify gaps and needs.
			  ○ Engage the local fire warden and fire chief to identify equipment and resource needs.
			  ○ Map out rivers, streams, and other water sources and assess accessibility and suitability for firefighting use.
			• Install fill stations at strategic locations near identified water sources.
			• Install and maintain gravity tanks, seasonal folding tanks, draft sites, hydrants, and fire ponds in strategic locations.
			• Train fire response teams on the proper and effective use and maintenance of these water sources.
				Improve firefighting capabilities and enhance community safety.	Track the use and performance of fill stations during fire incidents.
					Adjust locations and resources based on feedback and data.

Cross-Agency Wildfire Response Training Facilitate cross-agency training sessions to improve coordination and effectiveness of wildfire response.	**Treasure County**	Treasure County, fire response agencies	• Schedule regular cross-agency training sessions focused on wildfire response. • Develop training scenarios that simulate real-world wildfire situations. • Encourage participation from all relevant agencies and stakeholders.	Improve interagency coordination and effectiveness in wildfire response through regular joint training sessions.	Evaluate the effectiveness of training sessions through post-training assessments. Adjust training scenarios and formats based on feedback and lessons learned.

Table 4.4. Mitigation Project Funding Sources

Funding Source	Agency/ Organization	Summary	Applicable Cohesive Strategy Category		
			Resilient Landscapes (RL)	Fire Adapted Communities (FAC)	Wildfire Response (WR)
Action, Implementation, and Mitigation Grant (AIM)	Coalitions and Collaboratives/USFS	Supports wildfire risk reduction projects and planning in communities with moderate to high wildfire risk. Grants range from $10,000 to $75,000 and require a 100% match.	RL	FAC	WR
Funding for Fire Departments and First Responders	Department of Homeland Security (DHS), U.S. Fire Administration	Includes grants and financial assistance for fire departments and first responders, such as the Assistance to Firefighters Grant Program and National Fire Academy Training Assistance.			WR
Building Resilient Infrastructure and Communities Grant Program (BRIC)	Federal Emergency Management Agency (FEMA)	Supports hazard mitigation projects to reduce risks from disasters and natural hazards, focusing on capability- and capacity-building, innovation, partnerships, and large projects.	RL		WR
Emergency Management Performance Grant (EMPG)	Federal Emergency Management Agency (FEMA)	Provides funding to state, local, Tribal, and territorial emergency management agencies to create a safe and resilient nation, focusing on closing capability gaps and building or sustaining high-priority capabilities.			WR
Fire Management Assistance Grant (FMAG)	Federal Emergency Management Agency (FEMA)	Provides financial aid to states, local, and Tribal governments for mitigating, managing, and controlling fires on public or private forests and grasslands that pose a threat of major disaster.			WR
Fire Prevention and Safety Grants (FP&S)	Federal Emergency Management Agency (FEMA)	Supports projects that enhance the safety of the public and firefighters, targeting high-risk populations and mitigating high incidences of death and injury through education campaigns and prevention programs.		FAC	WR
Flood Mitigation Assistance Grant (FMA)	Federal Emergency Management Agency (FEMA)	Funds projects to reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.	RL		
Hazard Mitigation Grant Program (HMGP)	Federal Emergency Management Agency (FEMA)	Provides funding to state, local, Tribal, or territorial governments to rebuild with the intention to mitigate future losses due to potential disasters, available after a presidentially declared disaster.		FAC	WR
Noxious Weed Trust Fund Grant	Montana Department of Agriculture (MDA)	Provides funding to combat the spread of noxious weeds, which threaten ecosystems by displacing native species, increasing soil erosion, and diminishing wildlife habitats.	RL		

Funding Source	Agency/ Organization	Summary	Applicable Cohesive Strategy Category		
			Resilient Landscapes (RL)	Fire Adapted Communities (FAC)	Wildfire Response (WR)
Montana Energy Infrastructure Resilience Grant Program	Montana Department of Environmental Quality (MT DEQ)	Provides annual grants to enhance the reliability and resilience of electrical grids, focusing on mitigating wildfire risks through fire-resistant technologies, fire prevention systems, and vegetation management.	RL		WR
Forest Pest Management	Montana Department of Natural Resources and Conservation (DNRC)	Supports forest treatments that reduce susceptibility to bark beetle infestations, typically involving thinning and slash treatment to improve forest health and resilience.	RL		
Conservation District Grants	Montana Department of Natural Resources and Conservation (DNRC)	Offers state-funded grants to Montana's 58 conservation districts to conserve natural resources through locally led efforts, supporting on-the-ground projects, educational programming, and innovative conservation practices.	RL	FAC	
Volunteer Fire Capacity (VFC) Program	Montana Department of Natural Resources and Conservation (DNRC)	Provides cost-share grants to rural volunteer fire departments to improve training, acquire wildland personal protective equipment, enhance radio communications, and support the establishment of new fire districts.			WR
Montana Sage Grouse Initiative	Montana Department of Natural Resources and Conservation (DNRC)	Supports private landowners in enhancing sage-grouse habitats while promoting the long-term viability of working farms and ranches, addressing key threats to rangeland health.	RL	FAC	
Cooperative Fire Protection Capacity Grants	Montana Department of Natural Resources and Conservation (DNRC)	Enhances fire suppression capabilities of local governments in Montana, supporting local firefighters in their initial wildland fire attacks.			WR
MACD Communications Assistance	Montana Department of Natural Resources and Conservation (DNRC)	Provides support services to Montana's conservation districts to enhance their communication efforts, including low-cost WordPress websites, professional design services, and technology assistance.	RL	FAC	
Local Government Assistance (LGA)	Montana State Appropriation	Promotes engagement with federal agencies and increases county capacity to reduce wildfire risk and improve forest health, including funding for planning, coordination, and implementation of wildfire mitigation projects.			WR
County Coop Fire Protection Assistance (CCFPA)	Montana State Appropriation & State Fire Suppression Account Transfer	Increases local fire leadership, preparedness, and fire response capabilities, primarily enhancing county capacity or purchasing supplies and systems for effective local wildland fire response.			WR

Funding Source	Agency/ Organization	Summary	Applicable Cohesive Strategy Category		
			Resilient Landscapes (RL)	Fire Adapted Communities (FAC)	Wildfire Response (WR)
Community Wildfire Protection Plan Grant (CWPP Grant)	Montana State Fire Suppression Fund Account Transfer	Supports the creation or update of a countywide CWPP, enhancing community preparedness and wildfire response strategies.	RL	FAC	WR
Community Catalyst Fund	Montana Watershed Coordination Council (MWCC)	Offers $335,000 in grants to advance conservation and land stewardship efforts, emphasizing partnerships rooted in community collaboration and elevating Indigenous voices.	RL	FAC	
Habitat Restoration and Enhancement Funding	National Fish and Wildlife Foundation	Funds projects to protect fish, wildlife, and plant species and restore habitats, aiming to enhance and restore critical habitats and improve biodiversity.	RL		
Conservation Innovation Grants (CIG)	Natural Resources Conservation Service (NRCS)	Stimulates the development and adoption of innovative conservation approaches and technologies on private lands, leveraging federal investment in environmental enhancement and protection.	RL		
Emergency Watershed Protection Program (EWP)	Natural Resources Conservation Service (NRCS)	Provides technical and financial assistance to help communities address immediate threats to life and property caused by natural disasters such as floods, wildfires, and windstorms.	RL		
Environmental Quality Incentives Program (EQIP)	Natural Resources Conservation Service (NRCS)	Helps producers install measures to protect natural resources while ensuring sustainable production on their farms, ranches, and working forest lands.	RL		
Montana Forest Action Plan Grant Program (MFAP Grant)	Montana State Fire Suppression Account Transfer	Implements cross-boundary innovative projects that align with priority areas identified in the Montana Forest Action Plan, Statewide Wildfire Risk Assessment, or local CWPP.	RL		
Forest Legacy Program (FLP)	U.S. Forest Service (USFS)	Conserves environmentally and economically significant forested areas through conservation easements or land purchases, protecting forest lands from conversion to non-forest uses.	RL		
Volunteer Fire Assistance Grant (VFA)	U.S. Forest Service (USFS)	Provides funding for rural fire departments and fire councils for radio communications equipment, wildland personal protective equipment, wildland equipment and water handling, wildland training, and fire department organization and planning.			WR

Funding Source	Agency/ Organization	Summary	Applicable Cohesive Strategy Category		
			Resilient Landscapes (RL)	Fire Adapted Communities (FAC)	Wildfire Response (WR)
Volunteer Fire Capacity (VFC)	U.S. Forest Service (USFS)	Similar to VFA, this grant provides funding for rural fire departments and fire councils for radio communications equipment, wildland personal protective equipment, wildland equipment and water handling, wildland training, and fire department organization and planning.			WR
Western States Wildland Urban Interface Grant Program (WUI Grant)	U.S. Forest Service (USFS)	Protects communities within the WUI through outcome-driven, cross-boundary, innovative projects that align with priority areas identified in the Montana Statewide Wildfire Risk Assessment.	RL	FAC	
Landscape Scale Restoration (LSR)	U.S. Forest Service (USFS)	Supports restoration projects that reduce the risk of uncharacteristic wildfires, improve fish and wildlife habitats, improve water quality and watershed function, and mitigate invasive species.	RL		
Community Wildfire Defense Grant - CWPP (CWDG Program)	U.S. Forest Service (USFS)	Supports the creation or update of a countywide CWPP if the CWPP is more than 5 years old, helping communities develop comprehensive wildfire preparedness and response plans.	RL	FAC	WR
Community Wildfire Defense Grant Implementation (CWDG Implementation)	U.S. Forest Service (USFS)	Protects communities through the implementation of outcome-driven, cross-boundary, innovative projects that align with priority areas identified in the Montana Statewide Wildfire Risk Assessment and are outlined in a current CWPP.	RL	FAC	
Hazardous Fuels	U.S. Forest Service (USFS)	Focuses on hazardous fuels treatments in high-priority areas adjacent to National Forest System lands, aiming to reduce wildfire risk and enhance firefighter safety.	RL	FAC	
Community Wildfire Defense Grant (CWDG)	U.S. Forest Service (USFS)	Helps communities plan and implement wildfire protection strategies, providing grants to develop or revise CWPPs and carry out projects described within those plans.	RL	FAC	WR
Emergency Conservation Program (ECP)	USDA Farm Service Agency	Assists farmers and ranchers in repairing damage to farmlands caused by natural disasters and installing methods for water conservation during severe drought.	RL		
Emergency Forest Restoration Program (EFRP)	USDA Farm Service Agency	Provides financial assistance to non-industrial private forest owners to help restore forest health after natural disasters, supporting activities like debris removal, tree planting, and erosion control.	RL		

CHAPTER 5 – MONITORING AND EVALUATION

An essential step in implementing the Treasure County CWPP is to establish a robust action plan and assessment strategy that clearly outlines roles, responsibilities, funding needs, and timelines for completing priority projects. Chapter 4 provides tentative timelines and monitoring protocols for these projects, detailed below.

In Montana, effective wildfire risk reduction requires more than initiating projects—it necessitates a commitment to continuous improvement (DNRC 2022a). For Treasure County, implementing the CWPP will be an iterative, learning-centered process. As projects are carried out, the CWPP team and partners will assess progress, adapt to challenges, and identify new priorities based on changing community needs. The ongoing cycle of cooperative planning, action, and reflection will ensure the CWPP remains relevant and responsive. Successes, challenges, and feedback from community members will be essential to inform the future direction of this plan, fostering resilience over time.

To effectively track and visualize progress, the CWPP should incorporate a digital mapping component—such as ArcGIS or similar software—to enhance the plan's functionality in several key ways. Digital mapping allows for dynamic, spatial visualization of wildfire risk reduction projects, making it easier to see where efforts are concentrated, identify gaps, and analyze how projects relate to values at risk, such as homes, critical infrastructure, and natural resources. Unlike static maps, digital maps can be layered with real-time data, allowing users to view updates, monitor project timelines, and assess risk factors with greater precision. This mapping component will support the CWPP as a living document, which requires regular updates to stay relevant and responsive to changing conditions, new projects, and evolving community priorities. By tracking the status of projects, whether planned, in progress, or completed, digital mapping ensures continuous visibility of progress toward CWPP goals.

Local agencies, such as DNRC and FireSafe Montana, can provide technical assistance or guidance in setting up and maintaining this digital tool (DNRC 2022a). To ensure the CWPP remains current, maps should be updated as part of the annual review process. This regular update cycle will help track project status, reflect new priorities, and maintain the CWPP as a living document that supports effective, transparent wildfire risk management.

Strong local collaboration has been key to successful wildfire mitigation efforts across Montana (DNRC 2022a). Treasure County's CWPP would benefit from forming a collaborative, community-based

monitoring group, such as a fire safe council. Examples of similar groups include FireSafe Flathead and the Missoula Area CWPP Working Group, where community members, local agencies, and interest groups come together to share expertise, address challenges, and leverage resources for CWPP implementation (DNRC 2022a). Engaging diverse stakeholders—such as landowners, conservation groups, emergency management, and local businesses—ensures that community knowledge and priorities are central to monitoring and adapting CWPP efforts (DNRC 2022a).

In Treasure County, an annual review process involving community members and key stakeholders will provide a regular forum for discussing CWPP progress, reviewing lessons learned, adapting priorities, and updating maps (DNRC 2022a). This review will include both quantitative measures, such as acres treated or numbers of homes protected, and qualitative assessments of community resilience and preparedness levels (DNRC 2022a). Regular feedback from local partners and residents will allow the CWPP team to refine approaches, making the CWPP a responsive document that evolves with the community's needs and resources.

Table 5.1 outlines monitoring strategies for assessing the progress of various CWPP goals, including measures for wildfire risk reduction, community outreach, economic impacts, and ecosystem resilience. These strategies incorporate both locally relevant quantitative metrics—such as acres treated by fuel type or the number of home ignition zones established—and qualitative observations that track progress in community education, agency collaboration, and emergency preparedness.

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 shifts in community attitudes and engagement 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

Strategy	Task/Tool	Lead	Remarks
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 2025 Treasure 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 2025 Treasure 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 G.

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. See the illustration on the next page for further information on CWPP evaluation.

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 a 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.

STEPS TO EVALUATE A CWPP

1 IDENTIFY OBJECTIVES:

What are the goals identified in the plan?
How are they reached? Is the plan performing as intended?

- Structural ignitability
- Fuel treatments (landscape and home ignition zone)
- Public education and outreach
- Multi-agency collaboration
- Emergency notifications/response

2 ASSESS THE CHANGING ENVIRONMENT:

How have population characteristics and the wildfire environment changed?

Population change
- Increase or decrease
- Visitor levels
- Demographics

Population settlement patterns
- Distribution
- Expansion into the WUI

Vegetation
- Fuel quantity and type
- Drought and disease impacts

3 REVIEW ACTION ITEMS:

Are actions consistent with the plan's objectives?

- Check for status, i.e., completed/started/not started
- Identify completed work and accomplishments
- Identify lessons learned, challenges, and best practices
- Identify next steps congruent with other hazard mitigation planning efforts

4 ASSESS RESULTS:

What are the outcomes of the action items?

Multi-agency collaboration
- Who was involved in the development of the CWPP?
- Have partners involved in the development process remained involved in the implementation?
- How has the planning process promoted implementation of the CWPP?
- Have CWPP partnerships and collaboration had a beneficial impact to the community?

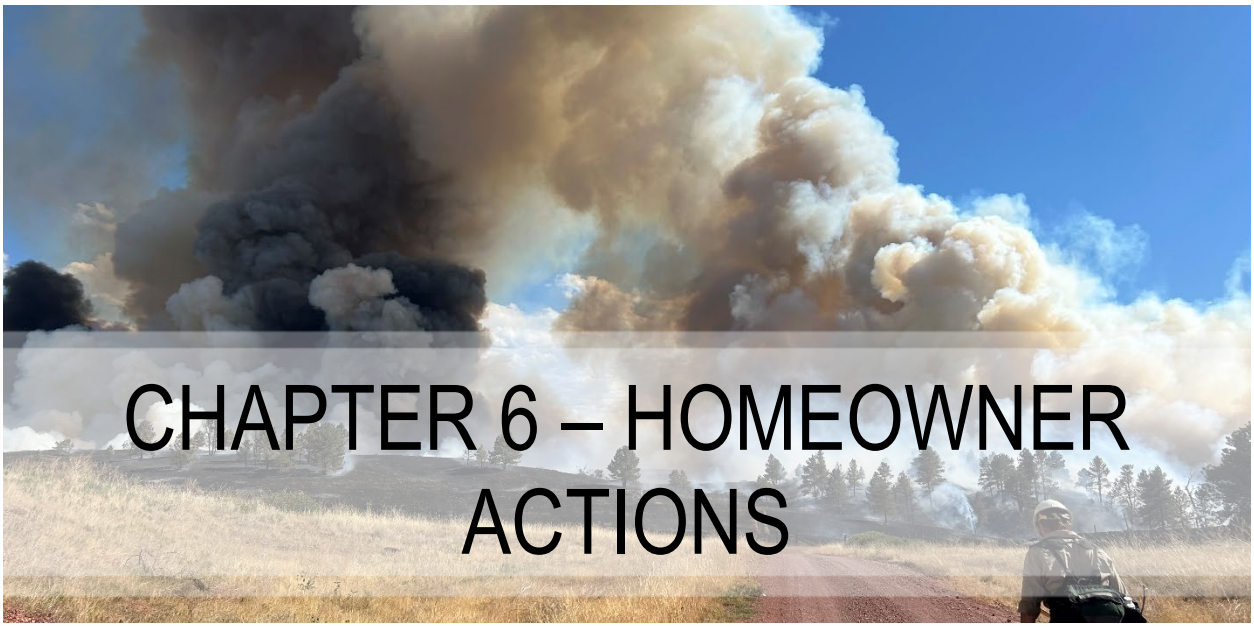
Risk-hazard assessment
- How is the risk-hazard assessment utilized to make decisions about fuel treatment priorities?
- Have there been new wildfire-related regulations?
- Are at-risk communities involved in mitigating wildfire risk?

Hazardous fuels
- How many acres have been treated?
- How many projects are cross-boundary?
- How many residents have participated in creating defensible space?

Structural ignitability
- Have there been updates to fire codes and ordinances?
- How many structures have been lost to wildfire?
- Has the CWPP increased public implementation of structural ignitability and hazard reduction strategies?

Public education and outreach
- Has public awareness of wildfire and mitigation strategies increased?
- Have residents, visitors, and second homeowners been involved in wildfire mitigation activities?
- Has there been public involvement?
- Have vulnerable populations been involved?

Emergency response
- Has the CWPP been integrated into relevant plans (e.g., hazard mitigation or emergency operations)?
- Is the CWPP congruent with other hazard mitigation planning efforts?
- Has availability and capacity of local fire departments changed since the CWPP was developed?
- Have egress routes been publicized and mitigated?



CHAPTER 6 – HOMEOWNER ACTIONS

Community wildfire resilience begins at home, where homeowners and occupants can take proactive steps in safeguarding their properties and protecting the lives of residents, emergency responders, and other valued resources. Homeowners are capable of significantly reducing the risk of wildfire damage through practical measures such as home hardening, which aims to reduce a home's ignitability, and by creating defensible space throughout the property and within the home ignition zone (HIZ), preventing the likelihood of flames and embers reaching and igniting structures.

The following includes comprehensive guidance on creating defensible space, using local, state, and national resources, and preparing the household for potential evacuation. Financial constraints and the complexity of mitigation can often pose significant obstacles for homeowners, so included are several resources and recommendations at varying levels of effort designed to support these actions. By taking these actions, one can not only protect their own property but also contribute to the broader effort of ensuring community safety and resilience in the face of wildfire threats.

Various financial assistance options are available to Treasure County and Montana homeowners, including cost-sharing programs, grants, and technical assistance. These programs are designed to alleviate the financial burden of implementing wildfire mitigation practices, making it more feasible for property owners to take proactive measures.

DEFENSIBLE SPACE

Defensible space is perhaps the fastest, most cost-effective, and most reliable 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.

Effective defensible space consists of creating an essentially fuel-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 connects to wildland areas. 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, reducing fire momentum by maintaining a more natural, historic condition (Figure 6.1).

Defensible space actions are described as general recommendations for homeowners; however, homeowners are encouraged to seek out site-specific recommendations from local wildfire experts. Experts can assess homes on an individual basis to maximize the quantity of native vegetation maintained and preserved in an area while still creating an area of defensible space for fire mitigation.

For a more in-depth description of each HIZ (immediate, intermediate, and extended), including the purpose and treatment recommendations for each HIZ, please refer Table 6.1.

The Casualty Actuarial Society compared the impact of individual and community-level mitigation on individual homeowner risks. They found that "the model indicates that all mitigation measures reduce the individual risk, but individual home mitigation – which individual homeowners' control – can have a bigger impact than any community mitigation alone" (Casual Actuarial Society 2022).

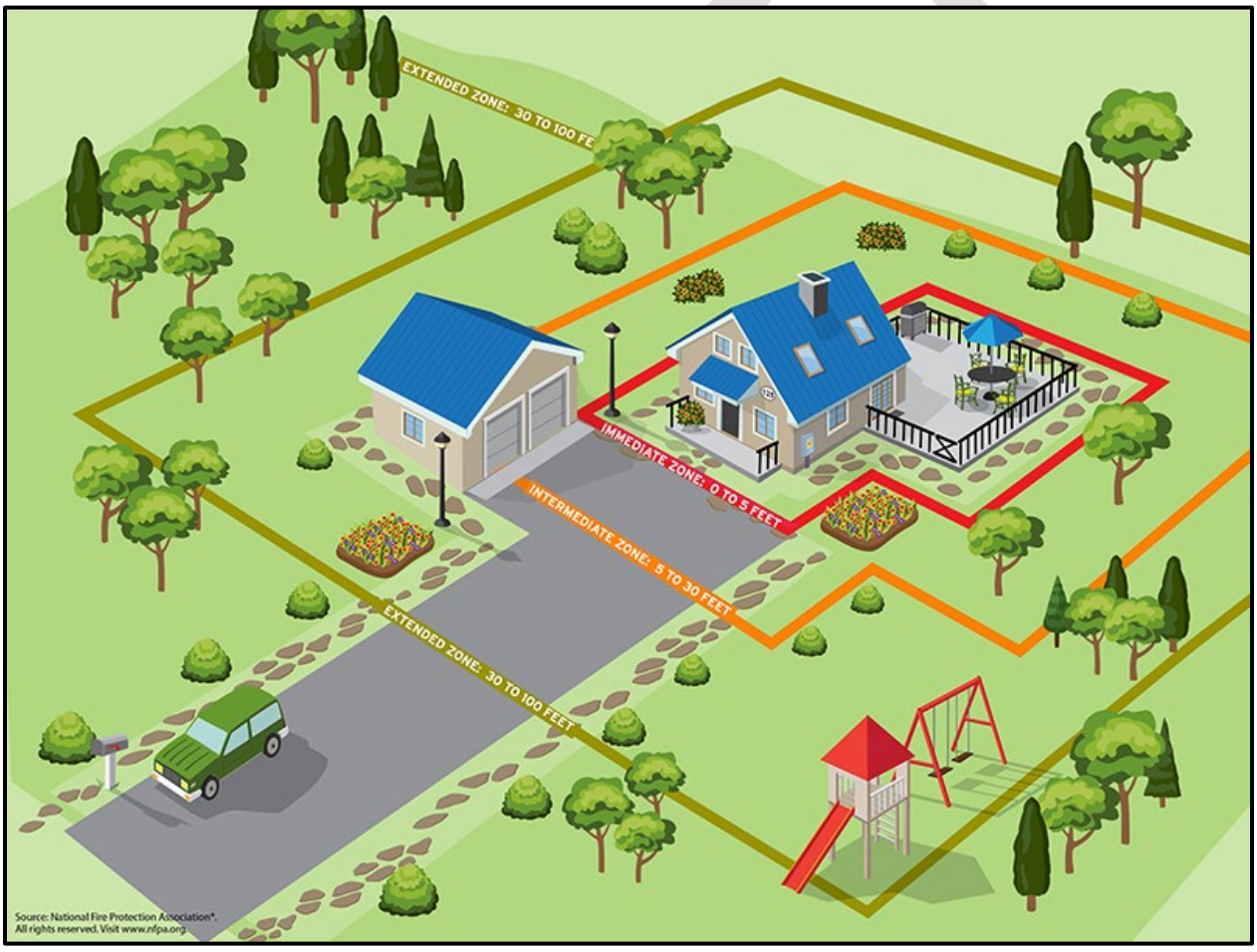


Figure 6.1. Defensible space zones providing clearance between a structure and adjacent woodland or forest fuels.

Source: NFPA (2022).

Table 6.1. Description and Treatment Recommendations for each Home Ignition Zone

Zone	Distance from Structure	Primary Objective	Purpose of Treatment	Key Recommendations
Immediate Zone (Zone 1)	0–5 feet	Prevent direct flames and embers from reaching the home	Minimize the chance of flames or embers igniting the home by reducing all nearby flammable materials	• Use fire-resistant materials like gravel, stone, or concrete in this zone. • Remove all flammable vegetation, mulch, and debris from around the home's perimeter. • Regularly clean pine needles, leaves, and debris from roofs, gutters, and decks. • Store firewood, propane tanks, and other combustibles well outside this area. • Prune tree branches that overhang the roof or are within 10 feet of the chimney.
Intermediate Zone (Zone 2)	5–30 feet	Reduce fire intensity as it approaches the home	Create breaks in vegetation to slow down the fire's spread and reduce its strength before it reaches the house	• Mow grasses to keep them under 4 inches tall. • Thin trees to ensure at least 10 feet of space between their outer branches. • Remove smaller plants beneath trees to prevent fire from spreading upwards into the canopy. • Prune lower branches to 6–10 feet from the ground, or one-third of the tree's height. • Remove dead or dying trees and highly flammable shrubs, like juniper, to prevent them from fueling the fire.
Extended Zone (Zone 3)	30–100 feet	Maintain lower fire intensity and improve forest health	Thin trees and manage forested areas to keep fires from intensifying and promote a healthier, more resilient landscape	• Keep at least 6–10 feet of space between tree crowns to slow the fire's spread. • Prune lower branches and remove ladder fuels to prevent fire from climbing into the treetops. • Use slash treatment methods like piling and burning, mulching, or removing to manage dead vegetation. • Thin trees and vegetation to create natural openings, helping to slow the fire's movement. • Collaborate with neighbors to create defensible space beyond your property line if needed.

HOME HARDENING

To safeguard homes from embers during wildfires, it is crucial to recognize that exterior vegetation is not the sole source of fuel for these embers. Wildfires can spread between structures and wildland vegetation or from structure to structure. Property owners with structures that are close together may find that hardening their home is the most effective option if there aren't options to manage exterior vegetation. Fortifying or retrofitting your home serves as a strong defense against ember intrusion.

To mitigate these risks, land managers and homeowners can implement strategic landscape fuel reduction measures, such as thinning and creating fuel breaks, to reduce firebrand production and spotting distances (Treasure County DES 2021). Home hardening practices, including installing ember-resistant vent covers, clearing gutters, and removing debris from around structures, can further reduce ignition risks (Maranghides and Mell 2013). Raising the relative humidity near structures with sprinkler systems can also help prevent ember ignitions during a wildfire (Nazare et al. 2021).

Beginning protection measures by starting from the house and moving outward is an excellent strategy for maximizing the value of mitigation actions. Use fire-resistant building materials, conduct regular maintenance, and address issues that may ignite the home due to embers to begin effectively mitigating the home from wildfire (Sustainable Defensible Space 2024). Table 6.2 provides examples of different home hardening investments.

For more information and additional components surrounding home hardening activities for increasing wildfire resilience, reducing structural ignitability, and preparing for wildfires, please visit: https://wildfireprepared.org/.

Upgrading Components to Reduce Structural Ignitability

Roof

The roof is identified as the most vulnerable component during wildfires as it is most likely to ignite due to embers. Roofs with complex designs—such as those with multiple ridges, valleys, dormers, or intersecting sections—are particularly exposed to risk due to their increased surface area and numerous Complex roof pockets where embers can accumulate. Evaluating the vulnerability of the roof is important for new homes or remodeling projects and proper maintenance—such as clearing debris from gutters and valleys—further reduces ignition risk (Sustainable Defensible Space 2024).

Upgrading an existing structure's roof with Class A–rated fire-resistant material such as metal is recommended. Blocking spaces between roof decking (Figure 6.2) and covering chimneys with noncombustible screens are good steps to reduce ignitability. Lastly, regular maintenance and professional inspections ensure a home's resilience to ember intrusion and wildfire exposures (Sustainable Defensible Space 2024).

Figure 6.2. Examples of an untreated wood shake roof (Class B) that can accumulate flammable debris (left) and less-ignitable metal roof filled with noncombustible insulation (Class A) (right).
Source: IBHS (2024).

Gutters

Dry debris left in gutters, when ignited by embers, can lead to flames reaching the roof edge and adjacent siding. Installing noncombustible leaf guards over gutters, using noncombustible materials for gutters and downspouts (such as galvanized steel, copper, and aluminum), and incorporating a drip edge are all recommended actions to minimize ignitability (Figure 6.3). The drip edge serves the dual purpose of protecting the roof edge from flaming exposures and minimizing ember entry into roof undersides by blocking gaps between the roof sheathing and the top of the fascia. If upgrades to the gutter system are not possible then cleaning gutters annually is still effective in reducing wildfire ignitions (Sustainable Defensible Space 2024).

Figure 6.3. Examples of an uncovered gutter at risk of ignition (left) due to flammable tree debris, and a less-ignitable gutter (right) with a noncombustible gutter guard.
Source: IBHS (2024).

Vents

Roof vents, vital for attic air circulation and moisture control, are highly vulnerable to flames and embers. While shutters and metal screens help prevent ember entry, they don't fully protect against wildfire-generated hot gases. Additional protection involves considering fire dampers in HVAC ducts, which automatically close in high heat. Addressing vent vulnerabilities is crucial for fire resistance in new construction. For existing construction, reducing vulnerability to wildfires and embers requires retrofitting

the structure with ember-resistant vents (Sustainable Defensible Space 2024). Standard ember-resistant vents are 1/8-inch screens of noncombustible, corrosion-resistant metal (Figure 6.4) (Wildfire Partners 2024).

Figure 6.4. Examples of a bad vent (left) with 1/4-inch mesh that is ineffective at preventing ember incursion, and a good vent (right) that has 1/8-inch mesh to help prevent embers from entering the home.

Source: Wildfire Partners (2024).

Walls, Sidings, and Coatings

Exterior walls are vulnerable to direct flames, conductive heat, and radiant heat. Solid wood and wood-composite wall coverings can ignite, leading to fire potentially spreading to other components and causing substantial damage (Figure 6.5). Windborne embers and firebrands are common ignition sources trapped in wall cracks. Recommended materials include concrete, fiber cement panels, pressure-impregnated fire-retardant treated wood, traditional stucco, masonry, and metals. Materials to avoid are non-treated wood siding and vinyl siding. Creating a 6-inch noncombustible area at the siding base minimizes ignition risk. For upgraded construction, using nonflammable materials to replace current coverings and removing combustible debris in proximity to exterior walls on a regular basis are both recommended (Sustainable Defensible Space 2024).

Figure 6.5. A two-sided wall showing a wood-composite siding material (left side) and a noncombustible fiber cement product (right side). A burning brand was used to ignite both sides; the right side made of noncombustible material did not incur significant damage from the flames.
Source: Quarles et al. (2010).

Windows

Windows, sliding glass doors, and skylights play a crucial role in preventing the ignition of a home's interior due to windborne embers, hot gases, and radiant heat. The recommendations for new constructions include using tempered glass with low-e coatings or proprietary reflective coatings, insulated glazing units (IGU), and solid metal frames. Exterior window shutters are advised for added protection, particularly solid metal shutters. Dome skylights are preferred for low-slope roofs, while flat skylights on steep-slope roofs should feature dual-pane systems. When upgrading existing construction, it is essential to replace susceptible windows, door vision panels sliding glass doors, and skylight with fire-resistant materials in accordance with the previously mentioned recommendations (Sustainable Defensible Space 2024).

Doors

Safeguarding exterior doors, including garage doors, against ember intrusion or radiant heat is crucial in wildfire zones. Fire-rated doors with a solid, noncombustible mineral core are recommended. Installing adjustable weatherstripping and an automatic door bottom or threshold weatherstripping enhances protection. Insulated, metal garage doors with tested weatherstripping and noncombustible exterior trim further fortify the structure (Sustainable Defensible Space 2024).

When upgrading existing construction, reinforcing existing doors, adding weatherstripping, replacing vision panels, upgrading sliding glass doors, and replacing wooden garage doors is recommended to

increase the resilience of the home's openings and reduce heat transmission (Sustainable Defensible Space 2024).

Fences and Decks

Fences and decks pose varying fire risks and play a crucial role due to their proximity to house siding, windows and sliding doors. Wooden fences and decks can ignite and spread fire to the home. A metal plate at the fence-wall connection is suggested, but long-term moisture-related issues may arise. Considerations for increased fire safety include keeping combustible components at a distance and avoiding fences with gaps careful vegetation selection and regular maintenance are emphasized. Additionally, back-to-back fencing should be avoided because it can trap debris and cause embers to ignite both fences, creating a more intense fire if the fuels around them ignite (Figure 6.6). It's also crucial to avoid storing combustible materials beneath the deck. For upgrading construction, ensure that precautions are made following the above recommendations and ensure that materials used adhere to up-to-date building codes (Sustainable Defensible Space 2024).

Figure 6.6. Fuels igniting between and around combustible back-to-back fencing.
Source: IBHS (2024)

While Firewise guidelines provide excellent best practices, specific mitigation actions should be tailored to the hazards immediately surrounding a structure, such as slope steepness, fuel type, and wind exposure. The National Fire Protection Association (NFPA) offers valuable resources, including the free Community Wildfire Risk Assessment Tutorial and the Understanding the Wildfire Threat to Homes online learning module, which provide practical guidance on implementing defensible space measures.

Table 6.2 outlines a range of homeowner actions to reduce structural ignitability, categorized by level of investment. The level of investment and associated costs will vary depending on factors such as location, structure complexity, material choices, local regulations, and individual homeowner preferences.

Table 6.2. Homeowner Actions for Reducing Structural Ignitability

Limited Investment
Check fire extinguishers and have a 100-foot hose ready.
Maintain defensible space; work with neighbors on fuel mitigation.
Ensure house numbers are clearly visible from the street.
Keep wood fences free of combustibles; use noncombustible connectors.
Store propane, grills, and firewood away from structures.
Keep a 5-ft perimeter around the home clear of combustibles.
Remove debris from under decks; enclose when possible.
Stack firewood at least 30 feet from the house.
Prioritize mitigation starting on the windward side of your property.
Keep gutters clear of debris to prevent ember collection.
Maintain and repair roofs to close gaps and replace damaged shingles.
Use a NOAA weather alert radio for fire weather updates.
Moderate Investment
Choose noncombustible landscaping materials and keep flammable plants trimmed and spaced.
Limb trees 6 feet from the ground and maintain 18-foot crown spacing in the home ignition zone (HIZ).
Clear vegetation around sheds, garages, and outbuildings to prevent ignition.
Maintain clear, accessible driveways for evacuation and emergency response.
Add a gravel turnaround for fire response vehicles.
Install a roof irrigation system.
High Investment
Install fire-resistant xeriscaping.
Screen vents with 1/8–1/16-inch noncombustible mesh.
Enclose open spaces under manufactured homes with noncombustible skirting.
Build a noncombustible barrier between the home and wildland fuels.
Install fire-resistant soffits and under-eave vents.
Upgrade exterior windows and skylights to tempered or multi-layered glass.
Replace the roof with Class A fire-resistant materials.
Upgrade exterior walls with fire-resistant materials.
Relocate propane tanks underground.

Note that the level of investment and average costs will vary by action item based on a multitude of factors including location, structure complexity, quality of materials, local building codes and regulations, as well as preferences and scope of work.

LOCAL RESOURCES

REGIONAL CONSERVATION PARTNERSHIP PROGRAM

The Regional Conservation Partnership Program (RCPP) in southeastern Montana aims to preserve and enhance grassland habitats, benefiting declining grassland birds, waterfowl, and upland game birds (USDA 2024a). Through a partnership with organizations like the American Bird Conservancy and Montana Audubon, the project focuses on restoring marginal cropland to higher-quality forage and developing grazing infrastructure on grasslands (USDA 2024a). Key conservation practices, including herbaceous weed control, cover cropping, and upland wildlife habitat management, not only improve habitat quality but also contribute to wildfire mitigation by reducing invasive species and promoting resilient native vegetation. This integrated approach enhances forage availability, habitat connectivity, and overall ecosystem health, aligning wildlife conservation with potential wildfire risk reduction.

For more information on eligible land uses, benefits to the land, and when to apply, please visit: https://www.nrcs.usda.gov/programs-initiatives/rcpp-regional-conservation-partnership-program/montana/northern-great-plains.

MONTANA ENVIRONMENTAL QUALITY INCENTIVES PROGRAM CONSERVATION INCENTIVE CONTRACTS

The NRCS offers Environmental Quality Incentives Program (EQIP) Conservation Incentive Contracts to producers in Montana's designated High Priority Area 1, including parts of Treasure County (USDA 2024b). The Conservation Incentive Contracts provide technical and financial assistance for implementing, adopting, managing, and maintaining conservation practices that address priority resource concerns, including degraded plant conditions, livestock production limitations, and soil quality issues. These 5-year contracts, with a payment limit of $200,000, aim to enhance sustainable management practices across entire agricultural operations. Incentive practices include prescribed burning, grazing management, and habitat restoration, offering higher payment rates for historically underserved producers. Applications are accepted continuously, with specific ranking dates for evaluation and approval. For more information, contact your local NRCS field office.

For additional information on high-priority areas in Montana, priority resource concern categories, and eligibility, please visit: https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives/montana/conservation-incentive-contracts.

LOWER BIGHORN WILDFIRE RISK REDUCTION TARGETED IMPLEMENTATION PLAN

The Lower Bighorn Wildfire Risk Reduction Targeted Implementation Plan (TIP) presents a significant funding opportunity for residents of Treasure County, facilitated by the NRCS. This initiative, part of the Environmental Quality Incentives Program (EQIP), is designed to mitigate wildfire hazards caused by biomass accumulation. Active from fiscal year 2021 through 2025, the TIP employs a variety of conservation practices, including forest stand improvement, woody residue treatment, silvopasture, and brush management (USDA 2024c).

The TIP specifically targets approximately 6,942 acres within Treasure County identified as having moderate to high wildfire potential. By focusing on these areas, the project aims to enhance forest health, protect structures, and improve wildlife habitats. This initiative is a collaborative effort involving multiple local partners, including the DNRC, Treasure County Conservation District, TCRVFD and others. By participating in this TIP, residents of Treasure County can significantly offset their expenses related to wildfire mitigation with up to 75% of the costs covered for treatments, such as thinning overstocked forests and managing woody debris (USDA 2024c).

For more detailed information on eligibility, application processes, and specific conservation practices offered under the Lower Bighorn Wildfire Risk Reduction TIP, please visit https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives/montana/lower-bighorn-wildfire-risk.

STATE RESOURCES

MONTANA ENVIRONMENTAL QUALITY INCENTIVES PROGRAM

The Environmental Quality Incentives Program (EQIP) in Montana, administered by the NRCS, supports homeowners with financial and technical assistance to mitigate wildfire risks through a “Focused Conservation” strategy (USDA 2024d). This approach utilizes TIPs tailored to local county plans, ensuring effective implementation of conservation practices. Key initiatives include the Conservation Incentive Contracts, Community Agriculture Initiative, Joint Chiefs’ Landscape Restoration Partnership Projects, and various wildlife and water quality improvement projects (USDA 2024d). Homeowners can apply continuously, with specific ranking dates for funding evaluations, to implement practices like creating defensible space and reducing hazardous fuels around their properties.

For additional information on Montana’s programs funded by EQIP and upcoming application dates, please visit: https://www.nrcs.usda.gov/conservation-basics/conservation-by-state/montana/montana-programs-and-application-dates.

MONTANA CONSERVATION STEWARDSHIP PROGRAM

The Conservation Stewardship Program (CSP) in Montana offers valuable resources and financial support to homeowners looking to implement defensible space and HIZ treatments. Administered by the NRCS, CSP helps landowners develop tailored conservation plans that not only enhance property productivity but also contribute to wildfire mitigation efforts. Participants earn CSP payments based on their conservation performance, with higher performance yielding higher payments. Homeowners can select from a list of core climate-smart mitigation activities and supporting enhancements tailored to their specific needs (USDA 2024e)

For more information on eligible practices, enhancements, and applications, please visit: https://www.nrcs.usda.gov/programs-initiatives/csp-conservation-stewardship-program/montana/conservation-stewardship-program.

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION HOME WILDFIRE RISK ASSESSMENT

The Montana Department of Natural Resources and Conservation (DNRC) offers free home wildfire risk assessments to help Montana residents prepare their properties for the threat of wildfires (Figure 6.7). These assessments are conducted by local fire professionals who visit homes to evaluate the immediate surroundings and provide specific recommendations on reducing wildfire risk (DNRC 2024). Homeowners receive actionable advice on creating defensible space, reducing flammable materials, and planning for potential evacuations (DNRC 2024).

To schedule a home wildfire risk assessment, homeowners need to fill out a request form available on the DNRC website. During the visit, the fire professional will address any questions homeowners may have about living with wildfire risks in Montana. Information from these assessments is kept confidential and shared only with the homeowner and emergency responders to ensure privacy and safety (DNRC 2024).

For additional information on the DNRC's free home wildfire risk assessments and request forms, please visit: https://dnrc.mt.gov/Forestry/Resources/request-a-site-visit.

Figure 6.7. A Montana DNRC wildfire specialist conducts a free wildfire risk home assessment for a resident.

NATIONAL RESOURCES

READY, SET, GO!

The Ready, Set, Go! Program, managed by the International Association of Fire Chiefs, was launched in 2011 at the WUI conference. The program seeks to develop and improve the dialogue between fire departments and residents, 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. Treasure County uses the Ready, Set, Go! Program for 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.

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 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

Wildfire Research Center (WiRē) is a nonprofit organization that works with local wildfire services to achieve community-tailored pathways that 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: residents are critical actors in the WUI wildfire problem, action is central to adaptation, people and their decisions are complex, and 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, assessing residents' perceptions about wildfire, wildfire risk, risk mitigation behavior, and their willingness to take action to reduce wildfire risk.

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

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 station with over 2,000 weather stations, which help inform the Predictive Services Group.

The National Wildfire Coordinating Group (NWCG), 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 trainings, the 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 (https://disastersafety.org/wildfire/wildfire-ready/)
- Wildfire Readiness – Business (https://disastersafety.org/wildfire/wildfire-ready-business/)
- Wildfire Readiness – Farm and Ranch (https://disastersafety.org/wildfire/farm-and-ranch-wildfire-guidance/)
- Weekend Wildfire Preparedness (https://disastersafety.org/wildfire/weekend-wildfire-preparedness-projects/)
- What to Do if a Wildfire is Approaching (https://disastersafety.org/wildfire/what-to-do-if-a-wildfire-is-approaching/)
- Wildfire Risk – Community (https://wildfirerisk.org/reduce-risk/)
- Prepare and Protect Your Home (https://www.nifc.gov/fire-information/fire-prevention-education-mitigation/wildfire-mitigation/home)
- Prepare Your Community (https://www.nifc.gov/fire-information/fire-prevention-education-mitigation/wildfire-mitigation/community)
- One Less Spark, One Less Wildfire (https://www.readyforwildfire.org/prevent-wildfire/one-less-spark-campaign/)
- Only You Can Prevent Wildfires (https://smokeybear.com/)

NATIONAL FIRE PROTECTION ASSOCIATION

The NFPA is a global nonprofit 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.

Evacuation Guide for People with Disabilities: https://www.nfpa.org/downloadable-resources/guides-and-manuals/evacuation-guide-pdf.

INSURANCE INSTITUTE FOR BUSINESS AND HOME SAFETY

Protect Your Home

- Critical Home Preparation: https://ibhs.org/wildfireready/.
- Exterior Home Upgrades: https://ibhs.org/wildfireready homeupgrades/.
- Create a Wildfire Resistant Yard: https://ibhs.org/wildfireready homedefensiblespace/.
- Home Preparation Checklist: https://wildfireprepared.org/wp-content/uploads/WPH-How-To-Prepare-My-Home-Checklist.pdf.
- Wildfire Prepared Home (free online assessment): https://wildfireprepared.org/wildfire-prepared-home-base-assessment/.
- Homeowner Articles and Testimonies: https://wildfireprepared.org/homeowner-articles/.
- Applications for Wildfire Prepared Certifications: https://wildfireprepared.org/get-started/.

Preparation for Evacuation

- Prepare Your Home for Evacuation: https://ibhs.org/ibhs-in-the-news/prepare-your-home-for-evacuation-from-wildfire/.
- Home Evacuation Steps: https://ibhs.org/wildfireready homeevacuation/.

MISCELLANEOUS

- Wildfire Evacuation Checklist: https://www.usfa.fema.gov/downloads/pdf/publications/wildfire-evacuation-checklist.pdf.
- 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.
  - USFS Fire Management website: https://www.fs.usda.gov/science-technology/fire.
  - National Fire Protection Association: http://www.nfpa.org.
  - National Interagency Fire Center, Fire Prevention, Education, and Mitigation: https://www.nifc.gov/fire-information/fire-prevention-education-mitigation.

- U.S. Fire Administration: https://www.usfa.fema.gov/index.html.
- Infrastructure Investment and Jobs Act Resources: https://www.gfoa.org/the-infrastructure-investment-and-jobs-act-iija-was.

ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
BAER	Burned Area Emergency Rehabilitation
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CIG	Conservation Innovation Grants
Cohesive Strategy	National Cohesive Wildland Fire Management Strategy
county	Treasure County
CWPP	community wildfire protection plan
DES	Disaster and Emergency Services
DNRC	Montana Department of Natural Resources and Conservation
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
FP&S	Fire Prevention and Safety
GIS	geographic information system
HFRA	Healthy Forests Restoration Act of 2003
HIZ	home ignition zone
HVRA	highly valued resource or asset
IPAWS	Integrated Public Alert and Warning System
MWRA	Montana Wildfire Risk Assessment
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
RAWS	remote automated weather station
SAF	Society of American Foresters
SAFER	Staffing for Adequate Fire and Emergency Response
SDI	Suppression Difficulty Index
SWCA	SWCA Environmental Consultants

TCRVFD	Treasure County Rural Volunteer Fire Department
TIP	Targeted Implementation Plan
Treasure County DES	Treasure County Disaster and Emergency Services
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
WFDSS	Wildland Fire Decision Support System
WUI	wildland-urban interface

GLOSSARY

Aspect: Cardinal direction toward which a slope faces in relation to the sun (NWCG 2024).

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 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 (NWCG 2024).

Biomass: Organic material. Also refers to the weight of organic material (e.g., biomass roots, branches, needles, and leaves) within a given ecosystem (NWCG 2024).

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).

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 (NWCG 2024).

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 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).

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 (NWCG 2024).

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 (NWCG 2024).

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) (NWCG 2024).

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 (NWCG 2024).

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 (NWCG 2024).

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 2021).

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 (NWCG 2024).

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 (NWCG 2024).

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 (NWCG 2024).

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 (NWCG 2024).

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 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 (NWCG 2024).

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 (NWCG 2024).

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 (NWCG 2024).

Forest Fire: Uncontrolled burning of a woodland area (NWCG 2024).

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 2024).

Fuel Complex: The combination of ground, surface, and canopy fuel strata (NWCG 2024).

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 (NWCG 2024).

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 (NWCG 2024).

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 (NWCG 2024).

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%. 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 (NWCG 2024).

Fuel Treatment: 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” (NWCG 2024).

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 Fuels: Fuels that lie beneath surface fuels, such as organic soils, duff, decomposing litter, buried logs, roots, and the below-surface portion of stumps (NWCG 2024).

Hazard: A “hazard” can be defined generally as an event that could cause harm or damage to human health, safety, or property (NWCG 2024).

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 2024).

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 (NWCG 2024).

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 (Interagency Fuel Treatment Decision Support System 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 (NWCG 2024).

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).

Montana Wildfire Risk Assessment (MWRA): Online application providing wildfire risk assessment products for the state of Montana. The MWRA considers several risk components, including wildfire probability, hazard, exposure, and susceptibility. The application also includes county-specific information regarding wildfire risk and hazard (Pyrologix 2020).

Mutual Aid: Assistance in firefighting or investigation by fire agencies, irrespective of jurisdictional boundaries (NWCG 2024).

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 2014).

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 National Environmental Policy Act (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 2024).

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 (NWCG 2024).

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).

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% (NWCG 2024).

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 (NWCG 2024).

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).

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 (NWCG 2024).

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 (NWCG 2024).

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 (NWCG 2024).

Wildfire: A "wildfire" can be generally defined as any unplanned fire in a "wildland" area or in the WUI (NWCG 2024).

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).

Wildland: Those unincorporated areas covered wholly or in part by trees, brush, grass, or other flammable vegetation (NWCG 2024).

Wildland Fire: Fire that occurs in the wildland as the result of an unplanned ignition (NWCG 2024).

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 six 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 six wildland fuel types are (NWCG 2021b):

- 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 WUI as " (I) an area extending ½ mile from the boundary of an at-risk community; (II) an area within 1 ½ miles of the boundary of an at-risk community, including any land that (1) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community; (2) has a geographic feature that aids in creating an effective fire break, such as a

road or ridge top; or (3) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; (III) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuels reduction to provide safer evacuation from the at-risk community." A CWPP offers the opportunity to establish a localized definition and boundary for the WUI (USFA 2021).

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APPENDIX A:

Community Background and Resources

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COUNTY PROFILE

Treasure County, located in east-central Montana, encompasses a predominantly rural area with vast agricultural and ranching communities, small towns, and roadways (Treasure County 2007). The largest town and county seat is Hysham. The county covers approximately 979 square miles, with 91.77% privately owned, 5.86% managed by the State of Montana, and smaller portions held by federal agencies (U.S. Census Bureau 2023a). The topography features rolling hills and river valleys, with the Yellowstone River flowing through the center. Elevations range from 2,576 to 4,262 feet (Treasure County 2007). Key features include the Yellowstone River, Sarpy Creek, and Alkali Creek, with most of the population near the river valley (Treasure County Disaster and Emergency Services [DES] 2021).

POPULATION

The following information is drawn primarily from U.S. Census data (U.S. Census Bureau 2023b). In 2023, the population estimate of Treasure County was 772 persons, an increase of 1.58% over the 2020 census numbers of 760. The county has a population density of 0.78 people per square mile as of 2023. Treasure County is primarily rural with one incorporated town, Hysham, which serves as the county seat. Unincorporated areas of the county include Bighorn, Sanders, and Myers.

RECREATION

Treasure County offers a range of recreational opportunities, primarily centered around the natural beauty of the Yellowstone River and the surrounding rolling hills and rangelands. The Yellowstone River is a major draw for fishing, boating, and agate hunting, attracting both locals and visitors. Popular fish species include the Yellowstone cutthroat trout, mountain whitefish, and other native and nonnative species, providing excellent fishing opportunities (Discovering Montana 2024). Hunting is another key recreational activity, with abundant populations of antelope, deer, pheasants, geese, turkeys, and ducks. This attracts outdoor enthusiasts throughout the year, especially during hunting seasons (Treasure County 2007). The county's wide-open spaces also support hiking, wildlife viewing, and other outdoor activities.

Treasure County is known for its outdoor activities and attracts hundreds of tourists throughout the year. Therefore, recreational activities and associated infrastructure (Figure A.1) 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 A.1. Recreation infrastructure on Howrey Island, Treasure County. Photo Credit: Core Team

THREATENED SPECIES AND ENDANGERED SPECIES

There are no federal or state threatened or endangered species residing in the Treasure County CWPP planning area. The monarch butterfly (*Danaus plexippus*) has been proposed for listing as a threatened species under the Endangered Species Act as of December 2024 by the U.S. Fish and Wildlife Service (USFWS) (2025). While a final decision is pending, the species remains a candidate, and consultation with the USFWS under Section 7 of the Endangered Species Act is not yet required (USFWS 2025).
In Treasure County, the monarch butterfly's presence is primarily associated with grasslands and riparian zones where milkweed (*Asclepias* spp.), the larval host plant, is found. Efforts such as planting native milkweed species, reducing pesticide use, and preserving or enhancing suitable habitats can help conserve this species and support broader ecosystem health (USFWS 2025). These actions are particularly critical as the monarch butterfly continues to face significant threats from habitat loss, climate change, and pesticide exposure (USFWS 2025).

WATERSHED AND WATER RESOURCES

Watersheds are defined as an “area of land that drains water, sediment, and dissolved materials to a common receiving body” (U.S. Environmental Protection Agency [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).

In Treasure County, the primary water supply comes from the Yellowstone and Bighorn Rivers, with several smaller sources from creeks and streams throughout the region (Treasure County DES 2021). The Yellowstone River provides crucial water resources for agricultural and recreational activities. These water bodies support various fish species, including the Yellowstone cutthroat trout and Mountain whitefish, contributing to the county's biodiversity and recreational fishing opportunities (Treasure County DES 2021).

FOREST HEALTH CONSIDERATIONS

Native insect and disease epidemics within plant communities 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 the 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

Insect outbreaks are typically influenced by disturbances in the landscape, such as hailstorms, windthrow, drought, and extreme temperature changes, which can trigger pest outbreaks and lead to tree mortality (Treasure County 2007). Similarly, the absence of natural disturbance can also lead to insect outbreaks, as have been seen in forested areas that have experienced fire suppression and are now overgrown and stressed (Treasure County DES 2021). The underlying stressor is most often moisture availability, causing reduced tree vigor and a decrease in the ability to deter insect outbreaks (Treasure County DES 2021).

In Treasure County, tree mortality is correlated to a decrease in health and vigor of forested land in the county caused by stress due to overcrowding, resulting in slowing growing rates and increased length of time to maturity (USDA 2021). Pre-existing tree stress due to overcrowding is then exacerbated by various insect attacks, such as moderate to severe attacks by western spruce budworm and Douglas-fir tussock moth (USDA 2021). Poor tree vigor provides opportunities for insects such as mountain pine beetle and Douglas-fir beetle to establish and spread (USDA NRCS 2021).

Problematic insects impacting the county’s forest and woodland regions commonly include, but are not limited to (NRCS 2021):

- Douglas-fir Beetle (*Dendroctonus pseudotsugae*)
- Douglas-fir Tussock Mouth (*Orgyia pseudotsugata*)
- Fir Engraver (*Scolytus ventralis*)
- Mountain Pine Beetle (*Dendroctonus ponderosae*)
- Pine Engraver Beetle- Ips (*Ips pini*)

- Red Turpentine Beetle (*Dendroctonus valens*)
- Western spruce budworm (*Choristoneura freemani*)

DISEASES

Diseases of trees, such as parasitic plants, fungi, and bacteria, can also affect forests in the Treasure 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 a similar potential to increase fire hazards. Diseases that are having more significant impacts on the Treasure County planning area's forests (Treasure County DES 2021) 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.

ENVIRONMENTAL CHALLENGES

DROUGHT AND CLIMATE

In the past century Montana has warmed about two degrees (F), with heat waves becoming more common, snow melting earlier, recent drought has contributed to an increasing risk of forest fires as well as enabling outbreaks of forest insects and diseases (EPA 2016). These factors have interacted to increase the risk of uncharacteristically large high-severity fires. Higher temperatures and drought are likely to increase the severity, frequency, and extent of wildfires in the state (EPA 2016).

According to the National Interagency Fire Center (NIFC), the occurrence of catastrophic wildfires in the western 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 Montana have increased by almost 2.5 ºF (NOAA. 2022). The first 21 years of this century have been the warmest period on record for Montana (NOAA 2022). Climate change projections expect this to tend to continue and possibly accelerate, depending on carbon dioxide emission scenarios. Intensity of future drought in Montana is projected to increase, rising temperatures will raise the snow line and result in earlier melting of the snowpack, as well as an increase of winter and spring precipitation (NOAA 2022).

During the summer months Montana experiences frequent thunderstorms, which can produce hail, lightning and strong winds which not only start wildfires but can also cause increased fire behavior in already burning fires (NOAA 2022). Montana is vulnerable to drought. In 2012, the state experienced the driest July through September in historical record, resulting in more than 2,000 wildfires burning more than 1.2 million acres (NOAA 2022). Montana has been no stranger to catastrophic wildfire in recent years. The degradation of Montana's forests and woodlands combined with increased development in the WUI and impacts from climate change suggest that large destructive fires in Montana will become more likely in Montana's future.

It is important to note that fire is a natural part of Montana's diverse landscapes and is essential to many ecosystems across the state. Many of Montana's diverse ecosystems are fire-dependent or fire-adapted. 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 Montana is strongly correlated with a lack of moisture as an underlying stressor to forested landscapes and are subsequently more prone or insect or disease outbreaks (DNRC 2023b). The 2021 heat wave, combined with prolonged drought, triggered noticeable tree mortality across the region that continued into 2023 (DNRC 2023b). 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 2019a). 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).

Treasure County experiences tree mortality primarily driven by drought, insect infestations, and the accumulation of hazardous fuels due to long-term fire suppression (Treasure County DES 2021). The county's forests, dominated by ponderosa pine and Rocky Mountain juniper, have been particularly affected by pine beetle outbreaks, which have led to widespread tree death (NRCS 2021). These infestations, combined with the physiological stress caused by prolonged drought, have made the forests more vulnerable to both disease and fire (Treasure County DES 2021).

ECOSYSTEM SERVICES

Ecosystem services are the benefits humans derive from natural resources. Treasure 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 ecotourism while controlling forest insects and diseases such as dwarf mistletoe and spruce budworm (BLM 2023).

Treasure County's ponderosa pine forests, grasslands, and riparian environments provide essential ecosystem services that support the local economy and quality of life for residents and visitors (Treasure County DES 2021). Agriculture, livestock grazing, and hunting form the economic backbone of the county, with tourism from elk and deer hunting providing additional income (NRCS 2021). These ecosystems also contribute to carbon sequestration, provide clean water to downstream areas, and maintain air quality. Uncharacteristic wildfires pose threats to these crucial services, impacting quality of life and the county's economy (Headwaters Economics 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 PROTECTION CAPABILITIES

LOCAL RESPONSE

Fire Chief (Treasure County Rural Volunteer Fire Department)

Treasure County is served primarily by the Treasure County Rural Volunteer Fire Department (TCRVFD), an all-volunteer department with 30 firefighters. The TCRVFD operates under an inter-local agreement with the Town of Hysham, providing basic structural fire protection, wildfire suppression, and emergency response services (Table A.1). However, its resources and equipment are limited, posing challenges in addressing larger or more complex fire incidents (Treasure County DES 2021). To enhance capacity, Treasure County collaborates with neighboring fire districts under Montana’s mutual aid provisions (Figure A.2). Additionally, the TCRVFD partners with local ranches, such as PV Ranch and Redlands, which maintain private firefighting vehicles and motor graders. These assets are staged strategically across the landscape, improving wildfire response in remote or under-resourced areas (Treasure County 2007; Treasure County DES 2021).

Water for suppression is primarily drawn from the Hysham fire station, with supplemental sources such as the Yellowstone River and portable reservoirs used during drought conditions (Treasure County DES 2021).

Fire protection districts bordering Treasure County include:

- Rosebud County Fire Department
- Bighorn County Volunteer Department
- Musselshell County Rural Fire Council

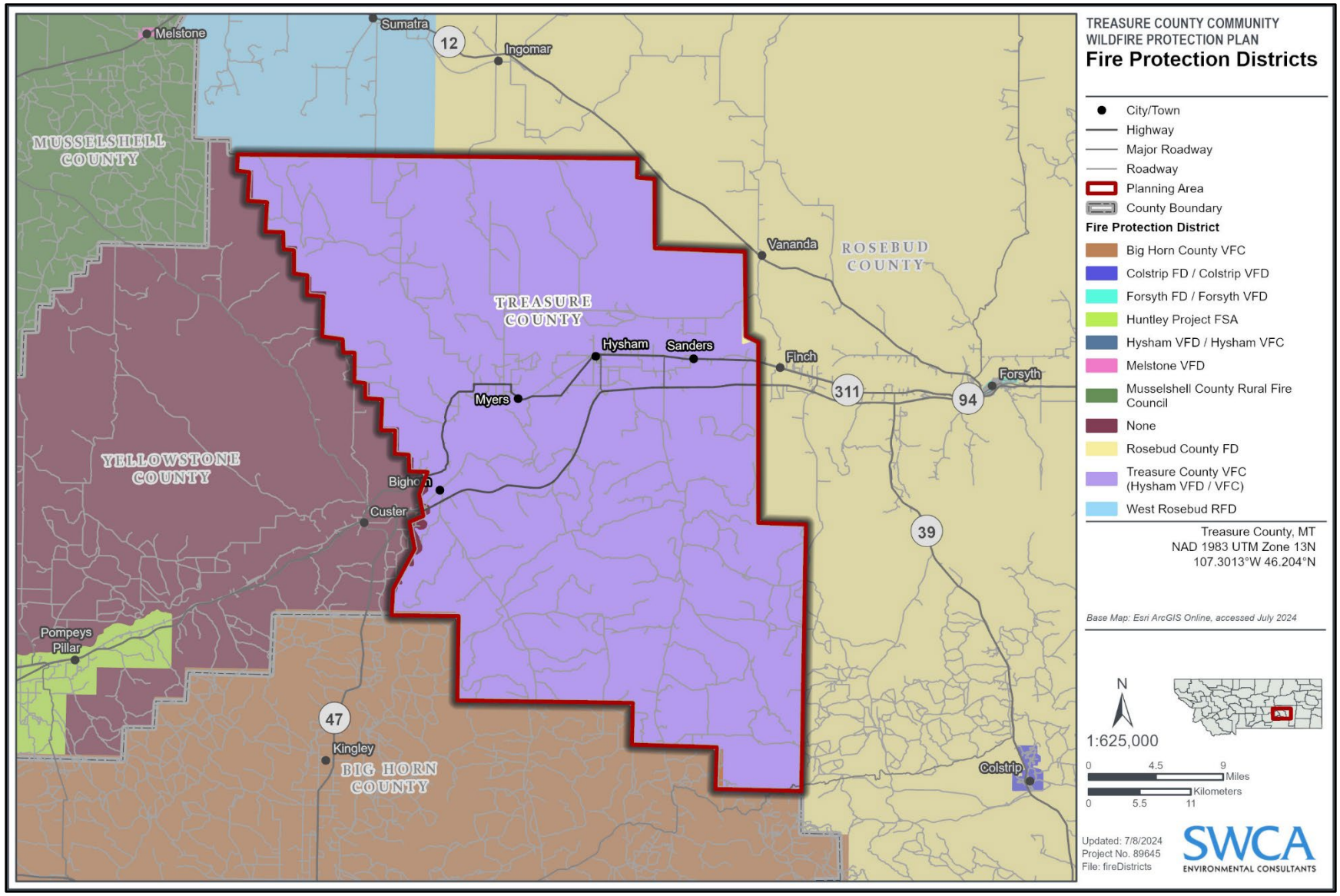

Figure A.2. Fire protection districts within and bordering Treasure County.

Fire Warden

In Montana, the County Fire Warden holds primary responsibility for wildland fire suppression on state and private lands outside established fire protection districts. The Fire Warden serves as the key liaison among local, state, and federal agencies, coordinating:

- Wildfire prevention and detection
- Training for wildland fire response
- Suppression and investigation efforts
- Mitigation planning and project implementation

The County Sheriff is not directly responsible for wildfire suppression, but plays a crucial role in coordinating evacuations and managing law enforcement support during wildfire emergencies.

To ensure the safety of the watershed areas and to address perceived inequities in the current fire protection system, county FPDs should explore the opportunity for increased intergovernmental cooperation. Table A.1 lists the local county fire response department statistics.

Treasure County Rural Volunteer Fire Department

Table A.1. Fire Department Resource Statistics for TCRVFD

Treasure County Rural Volunteer Fire Department Statistics:			
Fire Protection District: Treasure County RVFD			
Communities Served: Hysham, Bighorn, and Sanders			
Full-time Firefighters: 0	**Red-Carded Firefighters:** 0		**Volunteer Firefighters:** 30
ISO Rating: N/A			
NWCG Qualification			
Firefighter Type 1: 15	**Incident Commanders**		
Certified Sawyers (FAL 1, 2, 3): 2	Type 1-3: 5 Type 4-5: 5		
Port-A-Tanks: 2	**Portable Pumps:** 2		**Fire Shelters:** 25
Water Tender:		**Wildland Engines**	
Type 1: 0	**Total Number**:	4WD/AWD:	Brush Breaker:
Type 2: 2	Type 3: 2		
Type 3: 1	Type 4: 0		
Structure Engines:	Type 5: 0		
Type 1: 2	Type 6: 5		
Type 2: 1	Type 7: 0		

Members of the local fire protection districts are required to undergo rigorous training for wildfire response. For fires on private land, resources used for fire mitigation efforts must meet the qualification standards set by local agencies. Personnel assigned to fires on federal land must have completed National Wildfire Coordinating Group (NWCG) Wildland Fire Qualifications and be "red carded," meaning they have also completed a fitness test before engaging in fire suppression activities.

Treasure County Sheriff's Office

The Treasure County Sheriff's Office plays a critical role in wildfire response and public safety in the county. Responsibilities include maintaining operational communication networks during wildfire events, facilitating emergency response coordination, and ensuring public safety through evacuation and information dissemination (Treasure County DES 2021). The Sheriff's Office enforces evacuations, ensures compliance, and communicates with the public through door-to-door notifications, public address systems installed in vehicles, and other communication tools (Treasure County DES 2021). Staffed by the sheriff, an undersheriff, and reserve officers, the sheriff's office works in conjunction with the TCRVFD, Treasure County DES, DNRC, and federal agencies like the BLM to ensure a coordinated response in Treasure County. These partnerships are critical for maintaining situational awareness and resource allocation during wildfire events (Treasure County DES 2021).

STATE RESPONSE

Montana Department of Natural Resources and Conservation

The DNRC, as the lead state agency for fire management in Montana, has a mission to "provide for the protection of natural resources and human lives through fire prevention, preparedness, suppression, and other fire management activities." The Forestry Division is responsible for wildland fire management on state and private lands and aids in the coordination of wildfire management across local, state, and federal agencies (DNRC 2022b).

On non-federal lands, wildfire management follows a hierarchy of local jurisdiction, to County Fire Warden, and finally to the State of Montana. The chief of a local fire protection district is responsible for fires that occur within the boundaries of their district. If a fire exceeds the chief's ability to manage, it is then the duty of the County Fire Warden to coordinate fire suppression efforts and request assistance from the DNRC. The County Fire Warden is also responsible for coordinating fire suppression efforts in unincorporated areas of the county.

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

Montana falls in the Northern Rockies Coordination Group (NRCG) area. The Northern Rockies Coordination Center (NRCC) is responsible for dispatching the initial attack resources of state responsibility areas in Montana (DNRC 2022b). Treasure County falls into the DNRC Billings Unit out of the Southern Land Office (SLO) (see Table A.2).

In Montana, the state can either provide assistance for fighting fires or can be responsible for fighting fires. State assistance and responsibility for fires can provide the following management resources and operational aid.

State assistance for fire management can be initiated under (DNRC 2022b):

- **Rapid Initial Attack:** DNRC supports rapid initial attack actions to minimize the size, duration, costs, and impacts of wildfires. This includes providing personnel and resources to assist local agencies.
- **Personnel Support**: Additional personnel are provided to enable local agencies to respond to subsequent incidents and allow volunteer firefighters to return to their regular jobs.
- **Funding and Resources:** Available for local and county responsibility fires, even if the fire does not exceed the capacity of the fire department or county. This includes funding and reimbursement for aviation and hand crew resources during the initial attack phase of fires on non-federal lands. Resources are allocated based on the “Closest Forces” concept, regardless of whether they are state or federal agency resources, to reduce response times.
- **Resource Support:** Includes DNRC engines, modules, overhead resources, and technical assistance from DNRC Fire Management staff.

State responsibilities for wildfire can be initiated under (DNRC 2022b):

- **County Request:** The county requests assistance from the DNRC.
- **Capacity Assessment:** An assessment by the DNRC and the County Fire Warden determines that the county's capacity has been exceeded.
- **Director Approval:** The DNRC Director approves the state's responsibility based on the assessment of capacity and availability of funds.
- **State Management:** If approved for state responsibility, DNRC assumes cost and management responsibility, with ongoing involvement from local and county partners.

Montana Department of Natural Resources and Conservation Billings Unit (SLO)

Table A.2. Fire Department Resource Statistics for DNRC Billings Unit Southern Land Office

DNRC Billings Unit Southern Land Office Fire Department Statistics:			
Fire Protection District: DNRC Billings Unit			
Communities Served: Hysham and Treasure County			
Full-time Firefighters: 11	**Red-Carded Firefighters:** 11		**Volunteer Firefighters:** N/A
ISO Rating: N/A			
NWCG Qualification			
Firefighter Type 1: 11	**Incident Commanders**		
Certified Sawyers (FAL 1,2,3): 8	Type 1-3: 3 Type 4-5: 4		
Port-A-Tanks: 1	**Portable Pumps:** 3		**Fire Shelters:** 30
Water Tender:		**Wildland Engines**	
Type 1: N/A	**Total Number**:	4WD/AWD:	Brush Breaker:
Type 2: N/A	Type 3: N/A		
Type 3: N/A	Type 4: N/A		
Structure Engines:	Type 5: N/A		
Type 1: N/A	Type 6: N/A		
Type 2: N/A	Type 7: N/A		

FEDERAL RESPONSE

Bureau of Land Management (BLM) – Billings/Miles City Field Office

Treasure County has a limited amount of federal land under the jurisdiction of the BLM. These lands fall within the Miles City Field Office's jurisdiction, which oversees the “Mixed-Grasses Prairie-Sagebrush” Fire Management Unit as part of the Billings Field Office’s larger coordination efforts (Treasure County 2007). The BLM’s primary fire management objective in this region is to suppress all wildfires using appropriate response methods to minimize the loss of natural resources, prevent the spread of fire onto private property, and reduce suppression costs (BLM 2024). In addition to wildfire suppression, the BLM prioritizes protecting cultural and historic resources and maintaining recreational and scenic values. For example, Howrey Island, located within Treasure County, is designated as an area of critical environmental concern (ACEC) (Treasure County 2007). Special management practices on Howrey Island prohibit earth-moving equipment, road grading, or unnecessary cutting and burning to protect its ecological and recreational value.

Initial fire attack on BLM-managed lands in Treasure County is dispatched from the Billings Field Office and the Miles City Field Office, which coordinate the use of resources across eastern Montana (BLM 2024). These resources include equipment and personnel stationed to respond to fires across the region (see Table A.3). The BLM also works closely with local responders, including the TCRVFD and the

DNRC, to coordinate fire response efforts on adjacent public and private lands (Treasure County 2007). This collaboration is vital in a rural area like Treasure County, where federal lands are interspersed with ranches and privately held properties.

BLM Billings/Miles City Field Office

Table A.3. Fire Department Resource Statistics for the BLM Billings/Miles City Field Office

BLM Billings/Miles City Field Office Statistics:			
Fire Protection District: BLM Billings/Miles City Field Office			
Communities Served: BLM Lands in a 7-county area around Yellowstone County			
Full-time Firefighters: 20	**Red-Carded Firefighters:** 50		**Volunteer Firefighters:** 30
ISO Rating: N/A			
NWCG Qualification			
Firefighter Type 1: 25	**Incident Commanders**		
Certified Sawyers (FAL 1,2,3): 50	Type 1-3: 3 Type 4-5: 10-15		
Port-A-Tanks: 0	**Portable Pumps:** 0		**Fire Shelters:** 100
Water Tender:		**Wildland Engines**	
Type 1: N/A	**Total Number**:	4WD/AWD:	Brush Breaker:
Type 2: N/A	Type 3: 0		
Type 3: N/A	Type 4: 0		
Structure Engines:	Type 5: 1	1	1
Type 1: 1	Type 6: 2		
Type 2: 0	Type 7: 0		

The Bureau of Indian Affairs

The Bureau of Indian Affairs (BIA) manages over 10,000 acres of land within Treasure County and plays a critical role in wildland fire management on Tribal lands, specifically those associated with the Crow Tribe. The BIA's Crow Agency oversees a range of programs, including Wildland Fire Preparedness and Suppression, to protect over 2.2 million acres of land within the Crow Indian Reservation (BIA 2025). In collaboration with the BIA, the Crow Tribe developed the Crow Indian Reservation Fire Management Plan 2010–2024, which outlines strategies for wildfire prevention, preparedness, response, and recovery (BIA 2024).

The BIA's Division of Wildland Fire Management provides comprehensive wildfire response services across the Crow Reservation. Local operations are supported by two fire stations located in Crow Agency and Pryor, staffed with trained initial attack forces (BIA 2025). These teams utilize both aerial and ground resources to ensure effective wildfire suppression.

MUTUAL AID

A critical component of Montana's wildfire response is the mutual aid agreements among fire response agencies. These agreements enable seamless cooperation and resource sharing across different jurisdictions, regardless of land ownership (MT DES 2022). This collaborative approach ensures that all available resources are used effectively, enhancing the state's ability to manage wildfires and minimize their impact to communities and natural resources. By leveraging mutual aid agreements, Montana can deploy firefighting resources quickly and efficiently, providing a robust response to wildfire emergencies (MT DES 2022). Treasure County has agreements with Yellowstone, Big Horn, Musselshell, and Rosebud Counties, the DNRC, and the BLM. Law enforcement can also request support from neighboring areas and the Montana Highway Patrol (Treasure County 2007).

The Stafford Act significantly influences wildfire response in Montana by providing the legal framework for federal disaster and emergency assistance. When state and local resources are insufficient to manage a major wildfire, the Stafford Act allows the state to request federal support. This support, coordinated through the Federal Emergency Management Agency (FEMA), includes additional personnel, equipment, and funding to bolster state and local efforts (DNRC 2022b). The Stafford Act ensures that Montana can access necessary federal resources during large-scale wildfire incidents, facilitating a comprehensive and effective response. This federal assistance is crucial for "mitigating the impacts of severe wildfires, protecting lives, property, and natural resources, and ensuring that state and local agencies have the support they need to manage and recover from wildfire disasters" (DNRC 2022b).

EVACUATION RESOURCES

Evacuation planning and execution in Treasure County rely on collaborative efforts between local, state, and federal agencies, as well as the preparedness of residents. Treasure County Disaster and Emergency Services (DES), supported by Montana DES, lead coordination efforts, leveraging guidance from the 2021 Treasure County Emergency Operations Plan and the Montana Hazard Mitigation Plan.

Treasure County 2021 Multi-Hazard Mitigation Plan:
Available upon request to Treasure County DES.

Montana 2023 Multi-Hazard Mitigation Plan:
https://des.mt.gov/Mitigation/FINAL_2023_MT_MHMP_20231003.pdf

Montana Eastern Region 2024 Multi-Hazard Mitigation Plan: https://des.mt.gov/Mitigation/Eastern-Montana-Regional-Hazard-Mitigation-Plan-2024-2029.pdf

The Treasure County DES has a Disaster and Emergency page with local resources and contacts here: https://www.treasurecountymt.gov/treasure-des

The public should follow the latest guidance from trusted sources, such as official government agencies, regarding evacuation orders. Additionally, if residents feel unsafe they should evacuate immediately even if they have not received an emergency alert. Individuals who need extra time to mobilize should leave when they receive an evacuation warning. Current evacuation orders should always be adhered to and supersede all information presented in the Treasure County CWPP.

Emergency Notification Methods

Treasure County uses an emergency alert system and statewide Integrated Public Alert and Warning System (IPAWS) to provide essential information quickly during an emergency. The IPAWS sends wireless emergency alerts to all enabled cell phones within a specific geographic area, ensuring that both residents and visitors receive important alerts (DNRC 2022b). The Treasure County Sheriff's Office Facebook page also provides forest-wide and wildfire information updates here: https://www.facebook.com/TCSO33

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

- Emergency Alert System
- Wireless Emergency Alerts
- Visit the Emergency Alerts page on the Ready.gov website to learn more: https://www.ready.gov/alerts

Visit the Montana Travel Information website provided by the Montana Department of Transportation to find travel alerts and road conditions: https://www.mdt.mt.gov/travinfo/alerts.aspx.

Visit the National Weather Service Radio Station provided by 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 Treasure County, word of mouth also plays a role in emergency notification, especially in more rural areas where residents may not be subscribers to Emergency Alert System 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 aware of all available emergency notification resources. It is recommended Treasure County work with short-term rental owners and hotels to ensure visitors have access to relevant emergency preparedness information, including local evacuation routes and additional alert systems beyond IPAWS.

Road Systems

In Treasure County, road systems play a critical role in wildfire evacuation and emergency response. However, the county faces significant challenges due to its rural layout and limited access routes, which can impede both the safe evacuation of residents and the efficient response of firefighting resources (Treasure County 2007). Many residential areas in Treasure County have only one way in and one way out, posing a significant risk during wildfires, as these roads can become blocked or unsafe for travel, hindering both evacuation and emergency response efforts (Montana Fire 2024).

The primary transportation corridors in Treasure County include Interstate 94 (I-94) and U.S. Highway 12 (U.S. 12), which serve as critical east-west routes for travel and emergency response. I-94 runs through Hysham and connects the county to larger regional centers. U.S. 12 provides additional connectivity, but

due to the county's vast rural landscape, many communities still rely on smaller county roads and private driveways for access. These secondary roads, often unpaved or minimally maintained, can be vulnerable to washouts, fire damage, or obstruction from debris, further complicating evacuation efforts (Figures A.3 and A.4).

Figure A.3. Example of an unpaved road in the planning area.
Source: Nicole Stephenson

Figure A.4. Example of an unpaved road in the planning area.
Source: Nicole Stephenson

High fuel loads along roadways leading to and from residential areas are common in Treasure County, increasing the risk of intense fires that can compromise evacuation routes (Treasure County 2007). Concerted efforts are needed to reduce these fuel loads to maintain safe evacuation corridors and ensure that emergency responders can access these areas without delay.

Animals and Livestock

In the event of a wildfire, it is important that residents and fire responders within Treasure County have a plan for evacuation of pets and livestock. 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. Ensuring the safety of animals requires advance planning and coordination among residents, emergency services, and supporting agencies.

Residents are encouraged to have an evacuation plan for their pets and livestock. This includes knowing how to quickly and safely transport animals, having necessary supplies ready, and identifying shelters or locations where animals can be taken during an evacuation. For livestock, this may involve coordinating with neighbors or local facilities that can accommodate animals during emergencies.

The Montana Department of Livestock assists with the evacuation and traffic control of impacted areas in coordination with local authorities. The department also provides for road closures as needed during emergency operations, which is essential for facilitating the safe movement of livestock and other large animals.

The Montana State University Extension provides resources on livestock evacuation, which can be accessed here: https://apps.msuextension.org/publications/pub.html?sku=4448-1.

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.

WATER AVAILABILITY AND SUPPLY

Water availability for wildfire suppression varies significantly across Treasure County. To assess local fire response challenges and resource availability, the Treasure County CWPP fire protection district survey was distributed to fire response agencies within the county. A total of four responses were received, providing insights into water sources, infrastructure, and suppression challenges.

Within municipal areas like Hysham, fire hydrants provide a relatively consistent water source. However, survey responses indicate that hydrant maintenance is a concern, and additional hydrants are not being installed. In more rural areas, fire response personnel rely on drafting from rivers, creeks, stock tanks, and ponds, but access to these resources can be inconsistent. Water tenders play a crucial role in mobile water supply, as there are limited fixed water sources.

The surveyed fire protection districts rated their water source availability (on a scale from 1 to 5) from 2 to 4 stars, with an average rating of approximately 2.75 out of 5. Respondents noted that water can be difficult to locate, and in some cases, finding a property owner to allow access is an additional challenge. Drafting from the Yellowstone River and other available water bodies remains a key strategy, though seasonal fluctuations in water levels can impact accessibility.

It is recommended that fire response personnel clean fire apparatus and take several precautions when utilizing water delivery systems to ensure it remains that way. When using water for firefighting, engines

should be filled with 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 power washing, sun drying, or using chemical disinfectants. Spare clean equipment can be carried out for replacement when decontamination is not practical (NWCG 2017).

PUBLIC EDUCATION AND OUTREACH PROGRAMS

Public education and outreach programs are a common factor in virtually every agency and organization involved with wildfire.

LOCAL AND STATE PROGRAMS

FireSafe Montana

FireSafe Montana is a private, nonprofit organization dedicated to reducing wildfire risks and impacts through public education and outreach. The organization coordinates a statewide coalition of diverse stakeholders to promote fire safety in homes, neighborhoods, and communities across Montana. The organization supports the formation of local fire safe councils, which play a key role in raising awareness and providing resources for wildfire prevention and preparedness.

- **Ignition Resistant Construction Guide:** A guide on building practices to make structures more resistant to fire.
- **Living with Fire**: Educational material on how to coexist safely with wildfire risks.
- **Citizen Evacuation Guide:** Instructions for safely evacuating during a wildfire.
- **Enough is Enough Campaign:** Editorials, public service announcements, and news articles focusing on wildland fire issues in the urban interface.
- **Fire Prevention and Preparedness Programs:** Initiatives aimed at reducing human-caused wildfires and educating homeowners on protecting their properties.
- **Partnerships with Fire Safety Campaigns:** Collaborations with initiatives like Keep Montana Green, Firewise Communities, and Ready, Set, Go! to promote wildfire safety practices.

To view FireSafe Montana's online resources, please visit: https://firesafemt.org/home-and-landowners.

Fire Adapted Montana

Fire Adapted Montana is a collaborative network committed to bolstering the resilience of communities against wildfires. Their primary mission is to connect and support individuals and communities across Montana in living more safely with the constant threat of wildfires. By promoting collaboration, sharing innovative strategies, and developing new ideas, they work tirelessly to foster the creation of fire-adapted communities. Fire Adapted Montana offers a wide array of invaluable resources aimed at improving wildfire preparedness and response. Their comprehensive website serves as a hub for information on wildfire restrictions, current wildfire conditions, preparedness tips, guides, and prevention strategies.

To view Fire Adapted Montana's Resource Library, please visit: https://fireadaptedmontana.org/resources.

Montana Department of Natural Resources

The Montana Department of Natural Resources and Conservation (DNRC) is essential for wildfire protection, forest management, and enhancing community resilience in Montana. By partnering with local governments, federal agencies, and various stakeholders, the DNRC implements comprehensive programs to manage wildfire risks, promote sustainable forestry practices, and support urban forestry initiatives. The DNRC provides critical resources, funding, and technical assistance to ensure effective local fire response and forest management, aiming to protect Montana's vast natural landscapes and communities.

- **County Cooperative Program:** Ensures wildland fire protection for over 55 million acres through cooperative agreements with all 56 counties. Local fire forces handle initial attacks, with DNRC providing technical assistance, equipment, and training, and mobilizing additional resources when needed. To learn more, please visit: https://dnrc.mt.gov/Forestry/Community-Local-Government/county-coop-program.
- **Good Neighbor Authority (GNA):** Partners with the USFS and BLM to enhance forest health and reduce wildfire threats. Uses state procedures and personnel to manage federal lands, with revenue from timber sales reinvested into future projects. To learn more, please visit: https://dnrc.mt.gov/Forestry/Forest-Management/good-neighbor-authority.
- **Urban and Community Forestry Program:** Supports the development and maintenance of urban forestry programs. Provides technical and financial assistance, public education, and volunteer coordination, along with grants to improve urban forests and Tribal community projects. To learn more, please visit: https://dnrc.mt.gov/Forestry/Community-Local-Government/urban-and-community-forestry.
- **Forest Stewardship Program:** Assists private forest landowners in managing nearly 25% of Montana's forested areas. Offers resources for sustainable forest management, local partner programs, grant funding, and educational opportunities through workshops and webinars. To learn more, please visit: https://dnrc.mt.gov/Forestry/Resources/forest-stewardship.
- **Fire Protection Assessments:** Montana law requires landowners to provide adequate fire protection for their land. The DNRC offers this service at a minimal charge, ensuring that landowners receive protection without additional costs unless due to negligence. To learn more, please visit: https://dnrc.mt.gov/Forestry/Resources/fire-protection-assessments.

Treasure County Rural Volunteer Fire Department

The Treasure County Rural Volunteer Fire Department (TCRVFD) serves as Treasure County's primary fire protection resource, operating under an inter-local agreement with the Town of Hysham. Composed entirely of 30 volunteer firefighters, the department provides fire services to the entire county (Treasure County DES 2021). Training and equipment are limited, offering only basic structural fire protection. The department's water resources are replenished at the Hysham fire station, with additional water drawn from the Yellowstone River or reservoirs during drought conditions (Treasure County 2007).

The TCRVFD also engages the community through public education efforts aimed at improving fire safety and preparedness. These efforts include:

- Encouraging defensible space practices and vegetation management to reduce wildfire risks.
- Educating residents on fire response procedures and the importance of emergency planning.
- Participating in local events to raise awareness about fire safety, including tips for rural residents and those with limited mobility.

NATIONAL PROGRAMS AND RESOURCES

Ready, Set, Go!

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

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

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

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

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

Federal Emergency Management Agency

FEMA provides a number of educational resources, funding programs, research, and other tools to help communities understand wildfire better and increase actions that improve resilience. Resources are categorized into before, during, and after an event and include information on evacuation preparations, insurance, alerts, warnings, sheltering, post-burn flooding, debris flow, and recovery first steps. Available funding programs are related to both preparations and recovery. To view all FEMA resources, please follow the link: https://community.fema.gov/ProtectiveActions/s/article/Wildfire.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) maintains wildfire resources that can help communities better prepare for and recover from a disaster. The EPA is a particularly good resource for research and guidance related to smoke and air quality. The agency manages a local air quality search tool, has guides on dealing with wildfire smoke, and information on the health effects of smoke. A full list of EPA resources and research is available at the agency website link: https://www.epa.gov/natural-disasters/wildfires.

Ready.Gov

Ready.Gov is a program developed by the Department of Homeland Security intended to provide disaster and emergency information and preparation resources. Similar to FEMA resources, documents and information are organized into three phases: before, during, and after an emergency. The site offers guides, educational documents, and other resources to help citizens harden their homes and foster defensible space, plan for a wildfire, stay safe during an event, and safely return home or rebuild following a wildfire. The full list of resources is available here: https://www.ready.gov/wildfires.

National Fire Protection Association Firewise USA

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

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 USA program (www.firewise.org) encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks.

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

Evacuation Guide for People with Disabilities: https://www.nfpa.org/downloadable-resources/guides-and-manuals/evacuation-guide-pdf.

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 (NWCG), 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 trainings, the 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. The USFA's WUI toolkit consists of websites and other information regarding risk assessments, public outreach, and community training. Find the toolkit here: https://www.usfa.fema.gov/wui/.

Wildfire Research Center (WiRē)

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

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

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

Community Navigators

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

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

American Red Cross

The American Red Cross is a leading disaster response and recovery agency primed to provide disaster relief. Additionally, the Red Cross provides a number of preparation guides and resources for individuals and families and empowers community members to assist in relief and recovery efforts. For the full list of

Red Cross resources and trainings, follow the link: https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/wildfire.html.

MISCELLANEOUS RESOURCES

Fire Adapted Communities Pathways Interactive Tool

This tool helps community members properly identify the most beneficial adaptation methods for their local environment: https://facpath.fireadaptednetwork.org/.

Climate Mapping for Resilience and Adaptation Portal

Provides a live dashboard to inform communities about extreme weather and other hazards from climate change: https://resilience.climate.gov/#real-time-data.

Community Planning for Wildfire Assistance Program

Assists communities with wildfire risk reduction communications, increasing land use planning capacity and collaborating with agencies to identify overlap in scopes of work: https://cpaw.headwaterseconomics.org/

APPENDIX B:

Planning and Policy Background

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PLANNING PROCESS

The Society of American Foresters (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 Treasure 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; 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

Subdivision Regulations

In 2018, Treasure County revised its subdivision regulations to align with state law and ensure comprehensive hazard assessments for new developments. These regulations, also adopted by the town of Hysham, require consideration of potential risks such as high-voltage lines, gas lines, highways, railroads, and nearby industrial activities. The review process evaluates public health and safety hazards, including fire risks, flood zones, and stormwater runoff, especially in wildland-urban interfaces. Subdivisions with identified hazards are not recommended for approval unless mitigated through design and construction. The regulations mandate adequate water supply for firefighting, structure placement to minimize fire spread, creation of defensible space, and multiple access points for subdivisions to address wildfire threats (Treasure County DES 2021).

Building Code

In Montana, cities and counties can adopt and enforce building codes approved by the Montana Department of Labor and Industry, including the Uniform Building Code, International Building Code, International Residential Code, and the WUI Code. The WUI Code focuses on fire-resistant construction materials and includes guidelines on vegetation management and land use practices. Where local building codes are not adopted, DLI oversees building codes for commercial structures, plumbing and electrical permits, and construction standards for residential buildings with five or more units. However, DLI does not regulate fire-related construction for single-family homes, which comprise much of the development in the WUI. Treasure County and the town of Hysham do not have local building departments to enforce building codes, though, new commercial or multi-family structures must comply with state inspections.

More information regarding the Montana DLI and its adopted codes can be found on the following webpage: https://bsd.dli.mt.gov/building-codes-permits/current-codes

Growth Policy

Treasure County's Growth Policy, updated in 2015 and 2024, provides development recommendations and hazard mitigation strategies for both the county and the Town of Hysham. The policy emphasizes collaboration with local fire departments to ensure adequate fire suppression for new developments and aims to maintain public health and safety along rivers by addressing flood hazards and promoting sustainable surface water and groundwater management (Treasure County DES 2021). In 2024, the Town of Hysham was awarded a $21,648 grant through the Montana Community Reinvestment Planning Grant Program to support an update to its Growth Policy. The update is expected to continue focusing on wildfire resilience, land use planning, and infrastructure improvements, reflecting the community's commitment to proactive hazard mitigation and sustainable development (Montana Department of Commerce 2024).

State Direction

State Fire Policy (76-13-115): The Montana State Fire Policy prioritizes public and firefighter safety in wildfire suppression, emphasizing aggressive initial attacks to minimize property loss and taxpayer

expenses. The policy promotes interagency cooperation and highlight fire prevention, hazard reduction, and loss mitigation. All property in Montana must have wildfire protection, with property owners and land management agencies responsible for fire prevention. The policy underscores the benefits of sound forest management and the need for fire protection guidelines in wildland-urban interface areas to enhance safety and reduce risks. It also warns that inadequate federal land management could jeopardize the right to a clean and healthful environment (Montana State Legislature 2023a).

Duty of Landowner to Protect Against Fire (76-13-212): Landowners in the state of Montana are required to protect their land from the start or spread of fire and must suppress any existing fires, following the rules and standards set by the department. Fore land classifies as forest land within a wildland fire protection district, specific provisions apply. If a landowner does not provide adequate fire protection and suppression, they may request the department to provide these services (Montana State Legislature 2023b).

Fire Suppression Account Fund Transfer (HB 883): House Bill 883 revises state finance regulations concerning the Fire Suppression Account in Montana. allowing for the transfer of funds from other accounts to support fire suppression, fuel reduction, forest restoration, fire suppression equipment grants, forest management projects on federal land, and fire preparedness. The bill also establishes reporting requirements for the DNRC, mandating annual reports on expenditures. Additionally, it includes provisions for transferring surplus general fund money to the Fire Suppression Account under specific conditions (Montana State Legislature 2023c)

Wildfire Suppression Law Revisions (SB 219): Senate Bill 219 revises several wildfire suppression laws, incorporating definitions related to unmanned aerial vehicles and their use in wildfire suppression activities. It amended sections of the Montana Code Annotated to redefine terms such as "wildfire," "wildland," and "wildfire season," and established penalties for obstructing aerial wildfire suppression efforts, including specific provisions for UAVs. The bill aims to enhance the efficiency of wildfire suppression by clarifying legal definitions and updating penalties for interference (Montana State Legislature 2023d).

Insurance Refusals and Wildfire Risks (Section 33-18-210(7)): Section 33-18-210(7) prohibits insurers from unfairly discriminating between individuals or risk of the same class by refusing to issue, renew, cancel, or limit insurance coverage based on geographic location unless it is for a valid business reason or required by law. This ensures that property and casualty insurance decision are made fairly and based on actual risk rather than pretext.

Montana Local County Weed Act (ORDINANCE NO. 216): The Montana Local County Weed Act of 2013 establishes a framework for managing noxious weeds within the state counties. Each county much form a weed management district, governed by a district weed board appointed by the county commissioners. The act defines noxious weeds as exotic plants species that threaten agriculture, forestry, livestock, or native plant communities and mandate that landowners must not allow these weeds to propagate (Montana DOA 2013).

Federal Direction

The National Fire Plan was established after the 2000 fire season to foster collaboration between state, federal, and Tribal agencies, ensuring preparedness for severe wildland fires. It was followed by a 2001 report, and was updated in 2002 and 2006, which emphasized restoring fire-adapted ecosystems, reducing hazardous fuels, and improving fire prevention. The 2006 update introduced a landscape-level vision for restoration, continued improvements in collaboration, and the importance of using fire as a

management tool. Annual reports track progress in community fire prevention efforts (Forests and Rangelands 2006).

In 2003, the Healthy Forests Restoration Act (HFRA) was enacted to expedite hazardous fuels reduction on federal lands, encouraging collaboration between agencies and communities. Revised in 2009, it introduced new funding provisions and refocused on wildfire mitigation. A key feature of the HFRA is the development of CWPPs, which allow communities to define their WUI and prioritize treatment areas for funding and hazard reduction projects (H.R. 4233 - Healthy Forest Restoration Amendments Act of 2009).

In 2023, the Wildfire Leadership Council updated the National Cohesive Wildland Fire Management Strategy through an Addendum Update. This update highlighted new emphasis areas, including climate change, workforce capacity, community resilience, and environmental justice. The updated strategy also outlined management options and addressed challenges faced by the 2014 framework (Forests and Rangelands 2023).

PLANNING EFFORTS

Local

Treasure County Multi-Hazard Mitigation Plan 2021 Update: The Multi-Hazard Mitigation Plan for Treasure County was updated in November 2021. It includes detailed assessments of risks from hazards such as flooding, wildfires, and severe weather, and outlines strategies for mitigation. Wildfire is given the highest Calculated Priority Risk Index out of any hazard identified within the plan due to its high probability and critical impact to economic resources. The plan was developed through a collaborative effort involving local government agencies, businesses, and the community. It emphasizes the importance of public involvement and outlines a series of goals and objectives to enhance the county's resilience to disasters, including specific mitigation actions and strategies to be integrated into existing planning frameworks (Treasure County DES 2021).

Treasure County-Lower Bighorn Wildfire Risk Reduction Targeted Implementation Plan: This plan outlines a strategy for reducing wildfire hazards in Treasure County's Lower Bighorn Drainage area from 2021 through 2025. It highlights the risks posed by ponderosa pine and rocky mountain juniper due to fire suppression and conifer encroachment. Emphasized with the plan is the importance of collaboration among the NRCS, local working groups, and other partners to proactively address wildfire risks and enhance forest resiliency. It aims to protect agricultural lands, ranches, and residences, which are vital to the county's economy, from catastrophic wildfire events (USDA 2021).

2007 Treasure County CWPP (Previous CWPP): The 2007 Treasure County CWPP focuses on identifying and mitigating wildfire risks in Treasure County, emphasizing the vulnerability of the WUI. The plan identifies high hazard WUI areas, such as Tullock and Sarpy Creek, and suggests mitigation strategies, including engaging landowners in fire preparedness, familiarizing them with firefighting systems, and promoting fuel reduction projects. It highlights the importance of defensible space around structures, the economic impacts of wildfires on agriculture, and the need for comprehensive planning and public education to mitigate wildfire threats effectively.

State

Montana Forest Action Plan: Updated in 2020, the Montana Forest Action Plan aims to address significant forest health issues and wildfire risks across the state. Convened by the DNRC, the plan emphasizes collaborative cross-boundary forest management and restoration efforts, involving agencies,

Tribal nations, and various partners. It identifies priority areas needing attention using geospatial data, highlights key findings on forest health and wildfire risks, and recommends goals and strategies to improve resilience, reduce wildfire risks, support biodiversity, and enhance human and community health. The plan also focuses on fostering fire-adapted communities and promoting sustainable forest economies while acknowledging the historical and ongoing contributions of indigenous people to forest stewardship (DNRC 2020a).

Sustainable Forest Lands Management Plan: The Sustainable Forest Lands Management Plan outlines strategies for managing Montana's state forest lands to balance ecological, economic, and social objectives. The plan emphasizes sustainable timber harvesting, biodiversity conservation, and habitat protection, particularly for threatened and endangered species. It incorporates public input and scientific research to guide decision-making, aiming to maintain healthy forest ecosystems while generating revenue for trust beneficiaries (DNRC 1996).

Administrative Rules for Forest Management: The 2021 Administrative Rules for Forest Management outline policies and procedures for managing Montana's state trust forest lands, focusing on sustainable practices and biodiversity conservation. The rules establish guidelines for accountable parties, road management, watershed protection, and silvicultural systems. They emphasize the use of best management practices to minimize environmental impacts, promote biodiversity through coarse and fine filter approaches, and manage specific habitats, such as those for grizzly bears and Canada lynx. The document also details procedures for timber harvesting, old-growth management, and habitat conservation while ensuring compliance with environmental regulations and fiduciary responsibilities (DNRC 2021).

Montana Habitat Conservation Plan: The 2010 Habitat Conservation Plan by the DNRC outlines strategies to manage state trust lands in compliance with the Endangered Species Act. The HCP details conservation commitments, including habitat protection and restoration measures, and incorporates monitoring and adaptive management strategies. It also establishes a framework for obtaining an incidental take permit, allowing the DNRC to continue lawful activities while ensuring the protection of listed species. The plan emphasizes the balance between conservation goals and the DNRC's fiduciary responsibilities to generate revenue from trust lands (DNRC 2010).

Federal

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).

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).

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 2014).

PUBLIC LAND MANAGEMENT

LAND MANAGEMENT STRATEGIES

Local and State Land

Since 2015, Montana has established significant funding and resources for wildfire mitigation through initiatives like the Forest Action Plan. Treasure County's NRCS-supported fuels reduction projects and Targeted Implementation Plans (TIPs) aim to reduce the threat of catastrophic wildfires, focusing on areas like southern Treasure County, known for its dense ponderosa pine forests, which pose a significant fire risk (NRCS 2021).

Montana has invested over $145 million into wildfire mitigation and restoration efforts across the state, addressing the increasing threat of wildfires to rural and agricultural areas like Treasure County. Additionally, the federal government has invested $185 million in national wildfire mitigation efforts through the Bipartisan Infrastructure Law, with $8.4 million going directly to Montana in 2023 to support wildland fire management (U.S. Department of the Interior 2023). These funds are being utilized to support collaborative projects across Montana, including efforts in Treasure County focused on reducing hazardous fuels, protecting grazing lands, and enhancing the resilience of rural communities against wildfires (U.S. Department of the Interior 2023).

The DNRC prepares an annual Wildfire Preparedness Plan which considers drought conditions and weather forecasts to estimate wildfire risks (Montana DES 2024). This plan also coordinates the allocation of firefighting resources, including aerial firefighting units, engines, and hand crews, ensuring that the state is prepared for high fire activity (DNRC 2022b).

Federal Land

Custer Gallatin National Forest

The Custer Gallatin National Forest spans over a diverse landscape, primarily located in the southeastern part of Montana. In Treasure County, this national forest plays a critical role in the area's land management and ecological processes (USDA 2020). Covering thousands of acres, it consists of various forest types, including ponderosa pine woodlands and mixed-conifer systems (USDA 2020). Fire is an essential ecological process in the Custer Gallatin National Forest, shaping these ecosystems for millennia, but the exclusion of fire over the last century has created a fire deficit, increasing the risk of high-intensity wildfires (USDA 2020).

The Custer Gallatin's fire management strategy emphasizes a balance between restoring the natural role of fire and minimizing impacts on human life, property, and key ecological values, particularly within the WUI (USDA 2020). Prescribed fires, broadcast burns, and mechanical thinning are common tools used to manage fuels and restore fire-adapted ecosystems (USDA 2020). The forest also engages in

collaboration with state and local agencies to coordinate fire suppression efforts and supports the use of planned and unplanned ignitions to meet resource management goals (USDA 2020).

STEWARDSHIP AGREEMENTS

For all wildfire hazards that are, or may become, declared emergencies or major disasters under the Stafford Act, the state of Montana (specifically the DNRC) 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 "Montana Master Cooperative Wildland Fire Management and Stafford Act Response Agreement."

In addition, Montana implements the Shared Stewardship Strategy, first launched in 2018 by the USFS (Montana DES 2022). This strategy's primary goals are to identify management needs at the state level, ensure active land management in priority areas, and use available tools to reduce wildfire risk and enhance forest health (Montana DES 2022). The Shared Stewardship Agreement was formalized in Montana in 2019, with the DNRC and federal agencies working together to target high-risk areas, such as the WUI, where human habitation and forest lands intersect, increasing wildfire risks (DNRC 2020). These efforts are designed to improve cross-boundary collaboration and ensure that the most critical landscapes are prioritized for fuel reduction treatments, prescribed burns, and community protection efforts (DNRC 2020)

Good Neighbor Authority

The Good Neighbor Authority (GNA) allows the DNRC to collaborate with the USFS to carry out forest, rangeland, and watershed restoration projects on federal lands (DNRC 2020). Authorized under the 2014 Farm Bill, GNA enables state agencies to use their personnel, procedures, and contracts to perform activities such as hazardous fuel reduction, timber harvesting, and habitat improvements on federal lands (Montana DES 2024). A key benefit of GNA is that revenue generated from timber sales on federal lands is reinvested into additional forest management and restoration efforts, making the program self-sustaining (DNRC 2020a). In Treasure County, these efforts are particularly important for maintaining forest health in the Lolo National Forest and mitigating wildfire risks in the WUI, where communities are most vulnerable to wildfire (DES 2024).

As of 2023, GNA projects in Montana have treated over 54,558 acres, conducted 58 timber sales, and generated $16.6 million in revenue, all of which has been reinvested into further restoration work and wildfire risk reduction projects (DNRC 2024a). This partnership enhances the ability to reduce wildfire risks, restore ecosystems, and support local economies through sustainable timber management.

For additional information please visit DNRC's Good Neighbor Authority page.

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APPENDIX C:

Fire Behavior Modeling/GIS Background and Methodology

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FIRE BEHAVIOR MODELING AND METHODOLOGY

MONTANA WILDFIRE RISK ASSESSMENT

The fire behavior models for the Montana Wildfire Risk Assessment (MWRA) were developed using methodologies consistent with national standards and informed by local conditions. The MWRA framework builds on the established methods of wildfire risk analysis by utilizing the Fire Simulation (FSim) system and custom tools like Flame-Length Exceedance Probability Generator (FLEP-Gen) to assess wildfire likelihood and intensity across Montana. The MWRA was initiated by the DNRC in 2019 and was completed in 2020, with contributions from Pyrologix LLC (Pyrologix 2020). The assessment incorporates a collaboratively defined set of highly valued resources and assets (HVRAs) and applies standardized quantitative modeling to enhance local land management strategies (Pyrologix 2020).

The MWRA improves upon earlier assessments by refining the burnable fuel classifications and calibrating fire behavior models to Montana's specific fire environment. Significant updates include recalibrating agricultural and developed land fuels to ensure accurate representation of fire spread across landscapes previously categorized as non-burnable. Both stochastic and deterministic models are applied to model fire behavior and predict burn probabilities and integrated hazards. Stochastic simulations, such as those run by FSim, utilize multiple simulated fire events to estimate burn probabilities, while deterministic models like FLEP-Gen generate fire intensity outputs under a set range of weather conditions.

CONDITIONAL VS. PROBABILISTIC OUTPUTS

The MWRA incorporates conditional and probabilistic outputs, providing users with data on modeled fire behavior under specific conditions and estimated wildfire risk over time. Conditional outputs assume that any location on the landscape could burn and show potential fire behavior based on modeled conditions. These outputs are particularly useful for fire operations and incident response. In contrast, probabilistic outputs combine conditional results with historical burn probabilities to offer a more comprehensive view of wildfire risk, useful for planning and mitigation efforts. Each 30-meter grid cell (0.22 acre in area) in the MWRA landscape is evaluated for potential fire behavior, suppression difficulty, and risk to structures, creating a detailed risk profile across the state.

FIRE BEHAVIOR MODELS

FSim

FSim (Large Fire Simulator) is the primary tool used in the MWRA for estimating burn probability and fire intensity. Developed by the USFS Fire Sciences Laboratory, FSim runs thousands of stochastic simulations to predict the likelihood and extent of large wildfire events under various conditions. The MWRA used FSim to produce a spatially explicit representation of burn probability across the landscape, enabling detailed risk assessments for both assets and resources (Pyrologix 2020).

FLEP-Gen

Recognizing the limitations of stochastic models in areas with low fire occurrence, Pyrologix developed the FLEP-Gen (Fireline Exceedance Probability Generation) model to provide more accurate fire intensity estimates. FLEP-Gen uses a deterministic approach, evaluating multiple weather scenarios to calculate flame lengths and fireline intensity. This model is especially useful in areas like western Montana, where wildfire events are less frequent but still pose significant risk (Pyrologix 2020).

BURN PROBABILTY

Burn probability (Figure C.1) was estimated using the FSim large-fire simulator, which accounts for wildfire occurrence and growth patterns under various weather conditions. Burn probability is the likelihood of a fire starting and spreading at a specific location. FSim modeled thousands fires under the range of climatic conditions to estimate the probability of large fires across the landscape. Burn probability was then spatially resolved at a 120-meter pixel scale and downscaled to 30 meters (0.22 acre in area) for more refined analysis. This allowed land and fire managers to assess which areas are more likely to experience wildfires, guiding prevention and mitigation strategies (Pyrologix 2020).

FIRE BEHAVIOR MODEL INPUTS

FUEL MODELS (LANDFIRE)

LANDFIRE is a nationally recognized database providing critical inputs for wildfire modeling, including fuel types, topography, and canopy characteristics. For the MWRA, the 2016 LANDFIRE remap served as the foundation for the statewide fuelscape. Pyrologix made additional adjustments to ensure the fuelscape accurately represented Montana's diverse fire environments. This included updating non-burnable areas, such as urban and agricultural lands, and recalibrating canopy characteristics in areas affected by insect and disease disturbances (Pyrologix 2020).

Satellite imagery from 2021 was also used to further refine vegetation cover and height classifications. Continuous updates to the fuelscape are essential for maintaining the accuracy of fire behavior predictions, and the MWRA emphasizes the need for ongoing monitoring and recalibration (Pyrologix 2020).

An in-depth overview of the MWRA's methodologies can be found in the project's final report.

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

- Surface Fuel Model (FM40)
- Canopy Cover (CC)
- Canopy Height (CH)
- Canopy Bulk Density (CBD)
- Canopy Base Height (CBH)
- Topography characteristics (slope, aspect, elevation)

TOPOGRAPHY

Topography plays a crucial role in determining wildfire behavior and is an essential input for fire behavior models like FSim and FLEP-Gen. The steepness of slopes, aspect (the direction a slope faces), elevation, and other landscape features influence the distribution of fuels and local weather, which, in turn, impact fire behavior. The rugged terrain in Treasure County, with its canyons, rolling hills and contoured regions to the north and south of the County, can alter wind dynamics and affect local temperatures, intensifying wildfire behavior. South-to-north or north-to-south weather patterns in the county further drive the direction of fire spread, often pushing fires out of canyons.

More detailed information regarding topography in the planning area can be found in Chapter 2.

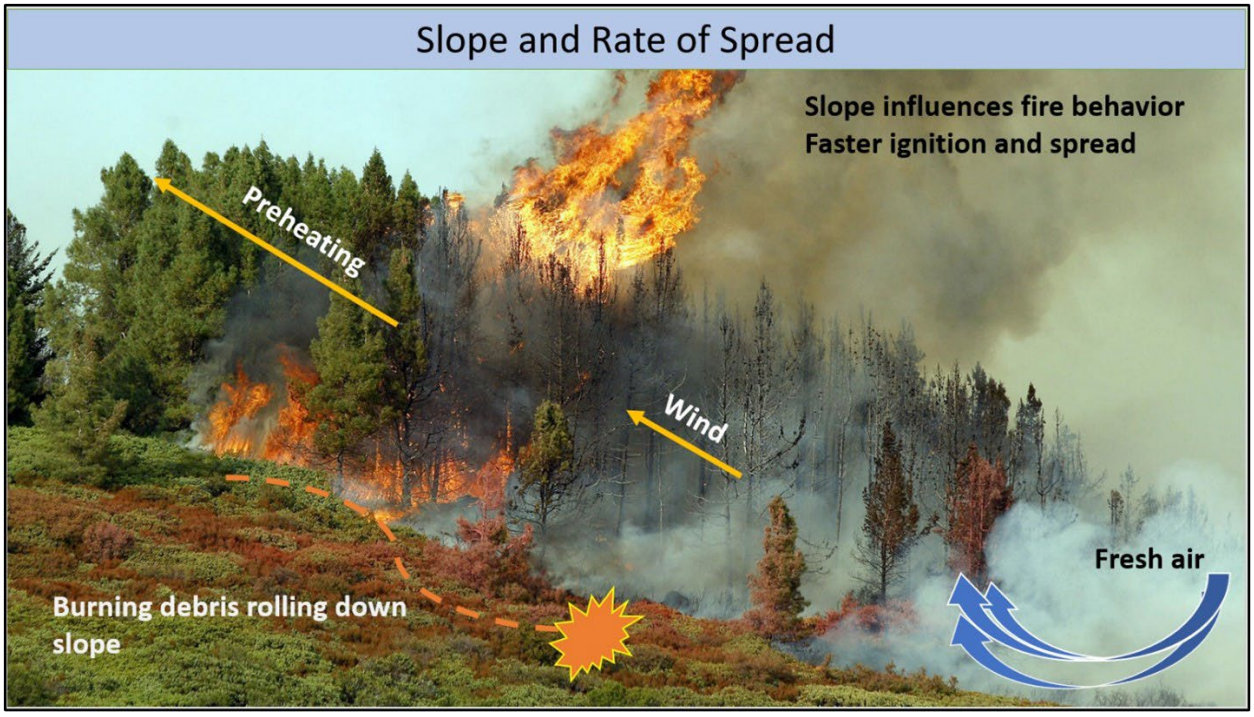

Figure C.1. Effect of topography on fire behavior.

HISTORICAL WILDFIRE OCCURRENCE

Historical wildfire occurrence data from 1992 to 2017 was used to develop model inputs and ignition density grids. These inputs were incorporated into FSim, to inform burn probability and risk assessments (Pyrologix 2020).

Fire Occurrence Density

FSim uses a geospatial layer, the Ignition Density Grid (IDG), to account for the spatial variability of historical large-fire occurrences across the landscape. During simulations, FSim stochastically places fires based on this density grid, with more ignitions occurring in areas previously prone to large-fire development. The IDG is generated using a combination of the Kernel Density and Point Density tools in ArcGIS, incorporating fires larger than 247 acres. It is refined to exclude non-burnable areas, such as

urban zones and small patches under 50 acres. This grid allows FSim to simulate large-fire patterns consistent with historical data.

HISTORICAL WEATHER

Weather is one of the most variable and influential factors affecting fire behavior. The fire models incorporate weather inputs—such as wind speed, direction, live and dead fuel moisture, and the Energy Release Component (ERC)—to predict fire behavior and burn probabilities. FSim relies on two primary data sources for these inputs. Wind data are gathered from remote automatic weather stations (RAWS), with a preference for stations that have long-term, consistent records and moderate wind activity to ensure reliable simulations. ERC values are drawn from Dr. Matt Jolly's gridded dataset, covering 1992-2017, which ensures accuracy even during periods when RAWS stations were inactive. Local fire experts reviewed the selected RAWS stations and ERC sample sites during a fuel calibration workshop in 2019 (Pyrologix 2020). Additionally, Pyrologix utilized FSim to generate stochastic fire ignitions based on historical relationships between large fires and ERC. This was then used to determine burn probabilities.

FIRE BEHAVIOR MODEL OUTPUTS

EFFECTS ANALYSIS RESULTS

Risk to Assets (Total Expected Net Value Change)

In the Montana Wildfire Risk Assessment (MWRA), the concept of "Risk to Assets" is derived from the Expected Net Value Change (eNVC) metric. This metric evaluates the potential impact of wildfire across various HVRAs. The MWRA uses fire behavior models and burn probability calculations to quantify risk. The Conditional Net Value Change (cNVC) is first calculated by combining fire intensity measures (such as flame length probabilities from the FSim model) with HVRA response functions and their relative importance per pixel (RIPP). This value represents the potential impact of a fire, should it occur.

Total Conditional Net Value Change (TcNVC) is then calculated by summing cNVC values across the landscape for each HVRA. The Expected Net Value Change (eNVC), representing the "Risk to Assets," is derived by multiplying the TcNVC with the probability of a wildfire occurring in each area. The result is a comprehensive assessment of wildfire risk that integrates fire behavior, burn probability, and the importance of each asset (Figure C.2).

Risk to Potential Structures

The Risk to Potential Structures dataset (Figure C.3) integrates wildfire likelihood and intensity with generalized consequences to a hypothetical home anywhere on the landscape. It helps answer the question, "What would be the relative risk to a house if one existed here?", regardless of whether a home currently exists at that location. This allows for comparing risk in existing and potential new construction areas within and between communities across the state. Developed using methods similar to the People and Property HVRA, the Risk to Potential Structures dataset incorporates response functions by modeled wildfire intensity and is weighted by wildfire likelihood. Unlike the People and Property HVRA, Risk to Potential Structures does not map the current location or importance of structures; it only considers the likelihood and intensity of simulated wildfire. Risk to Potential Structures assumes that all homes encountering wildfire will be damaged, with the degree of damage directly related to wildfire intensity and

does not account for localized fuel reduction efforts or the susceptibility of homes based on construction materials and design. Note that currently developed areas may show up as no risk since the fire models only evaluate fire spread in wildland fuels and not home to home ignitions or urban conflagrations.

Suppression Difficulty Index

In the Montana Wildfire Risk Assessment (MWRA), the Suppression Difficulty Index (SDI) (Figure C.4) provides a key measure of how challenging it would be to manage or suppress a wildfire, especially under severe fire weather conditions. This metric evaluates suppression difficulty based on several factors, including flame length, terrain/topography, fireline production rates, and the proximity to access routes such as roads and trails. The SDI does not account for burn probability but instead focuses on how challenging it would be for firefighting resources to respond to a fire in specific areas of the landscape.

The SDI is most useful for identifying areas where fires may be particularly difficult to contain or suppress due to environmental factors. It should not be used to directly assess the risk to structures but rather to understand areas where fire control efforts may face significant challenges. This tool helps inform fire management strategies and allocate resources effectively during wildfire events.

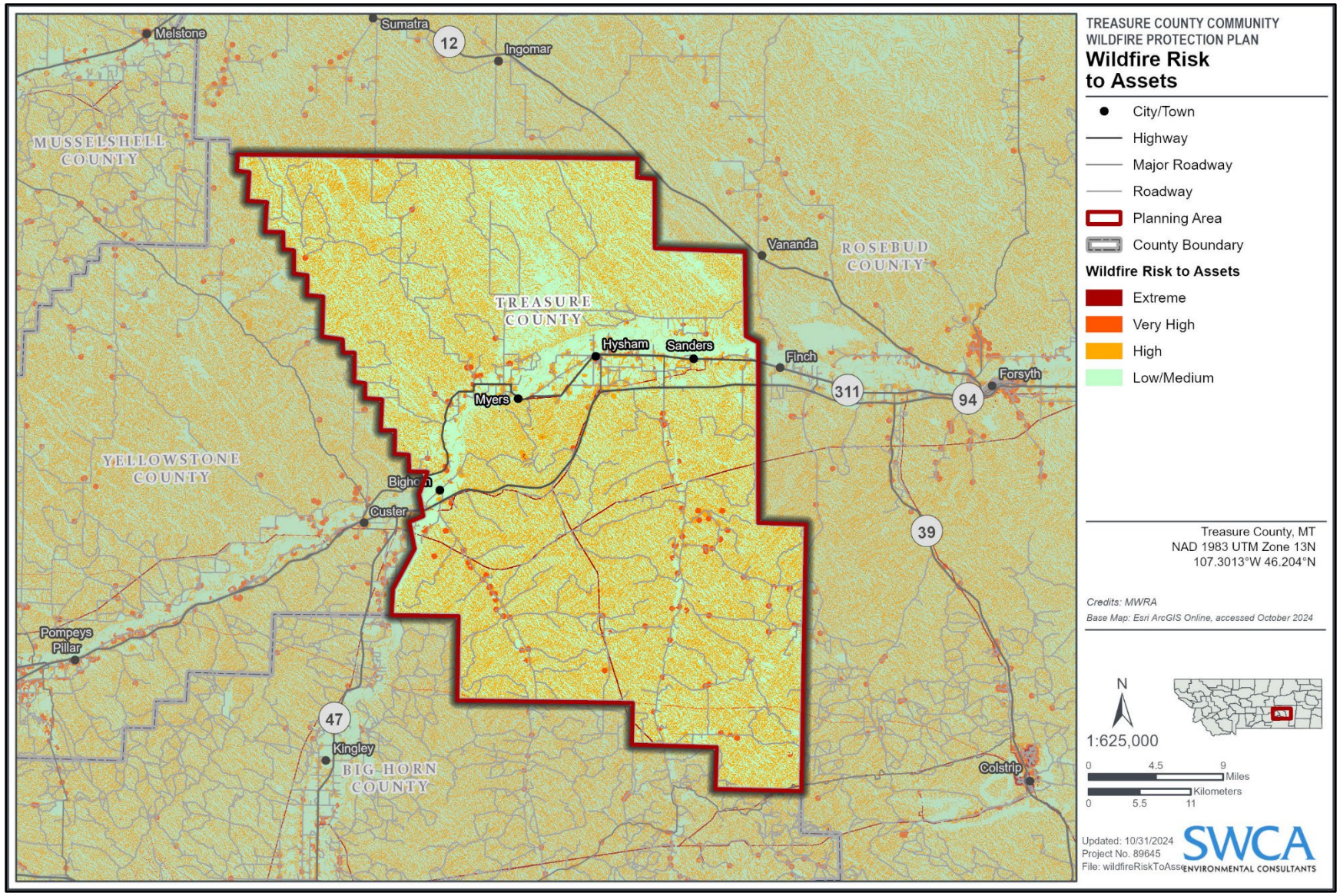

Figure C.2. Wildfire risk to assets sourced from the MWRA.

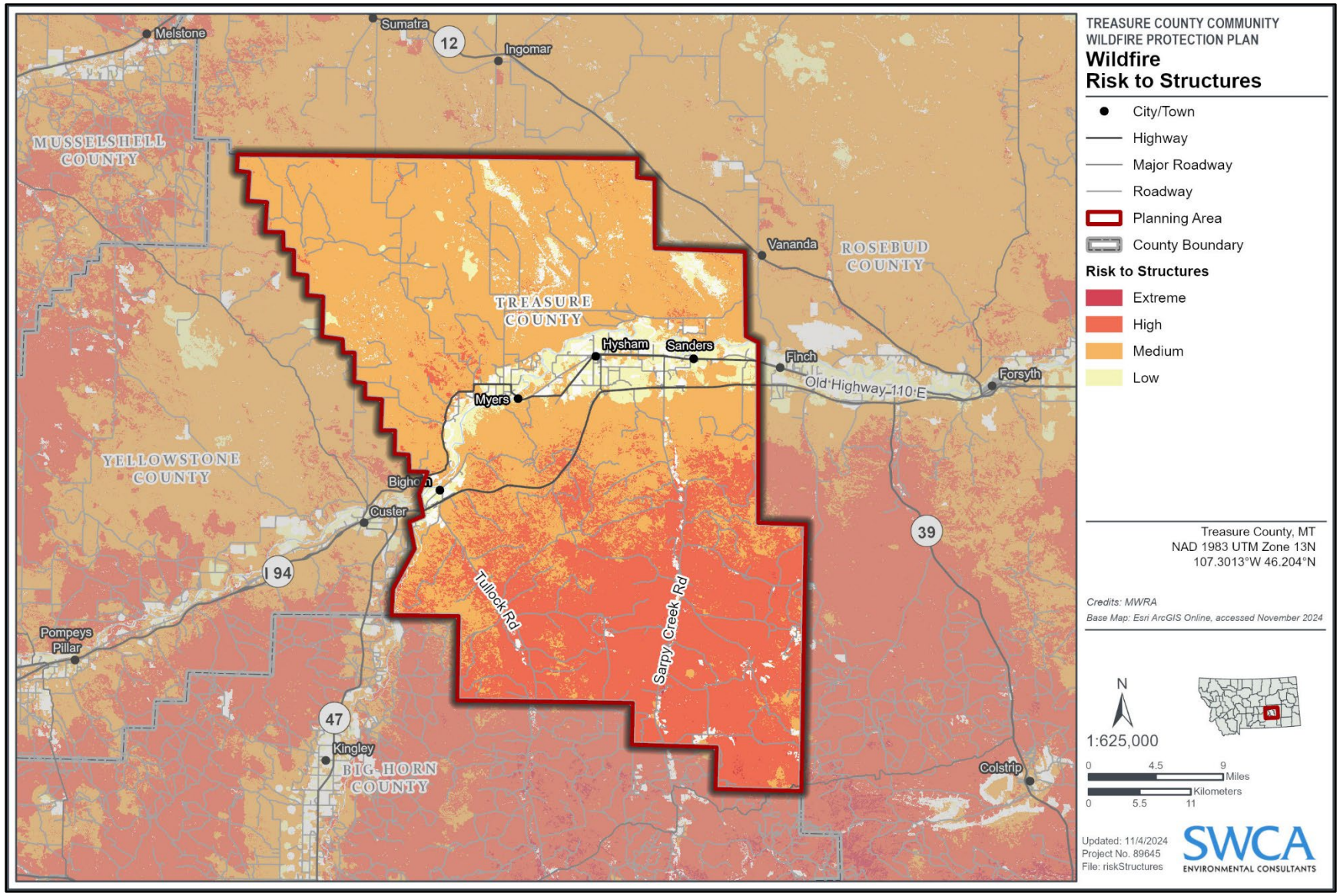

Figure C.3. Modeled risk to structures on a 4-point low-to-extreme scale for the planning area.

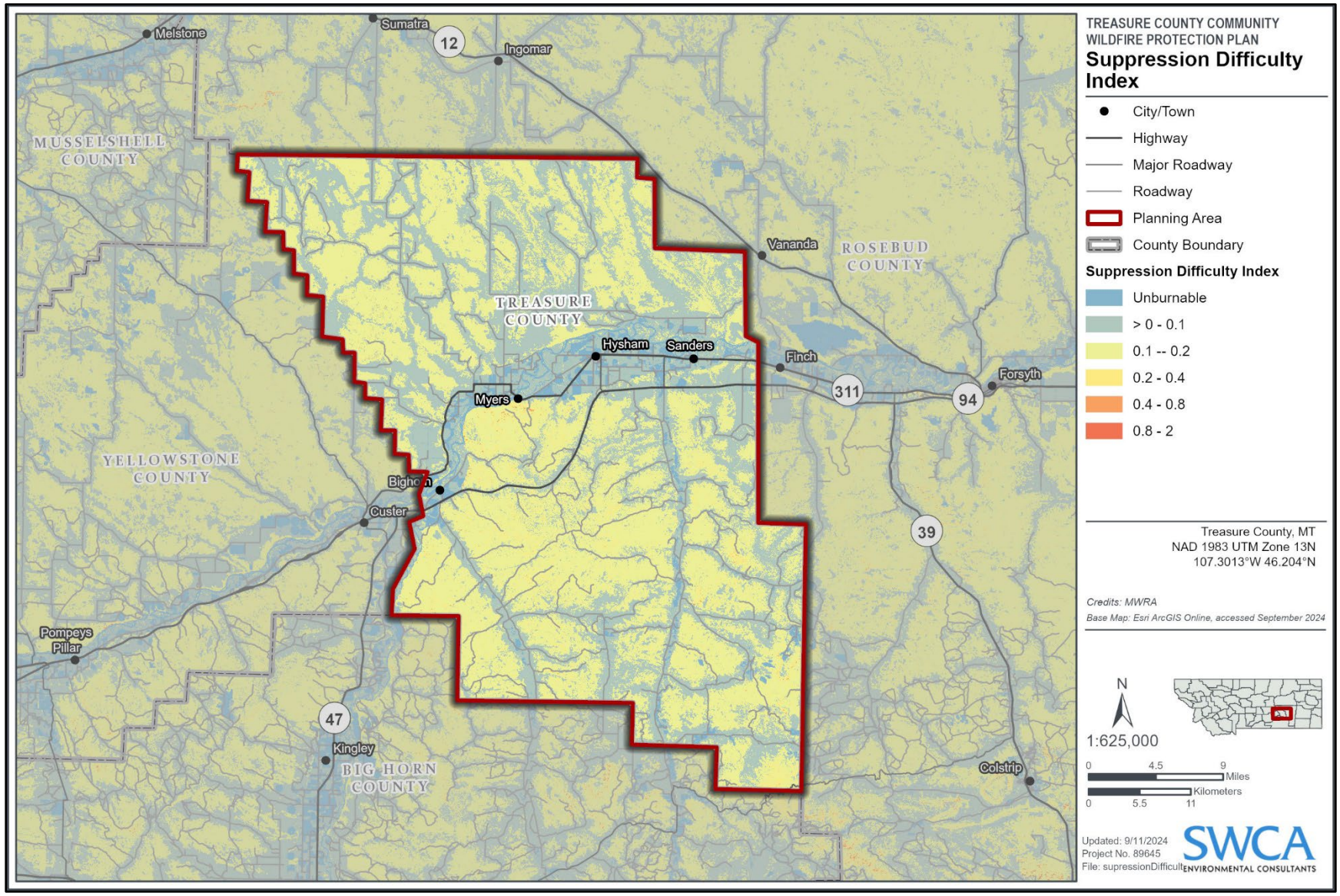

Figure C.4. Modeled SDI on a 6-point scale from unburnable to little to extreme difficulty for the planning area.

APPENDIX D:

Fuel Treatment Types and Methods

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FUELS TREATMENT

This appendix focuses first on treatments that can be performed in the home ignition zone (HIZ) and then describes the importance of and considerations for treatments beyond structures. After these discussions, additional information is provided regarding individual methods for fuel treatment types that can be applied across the landscape.

DEFENSIBLE SPACE

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

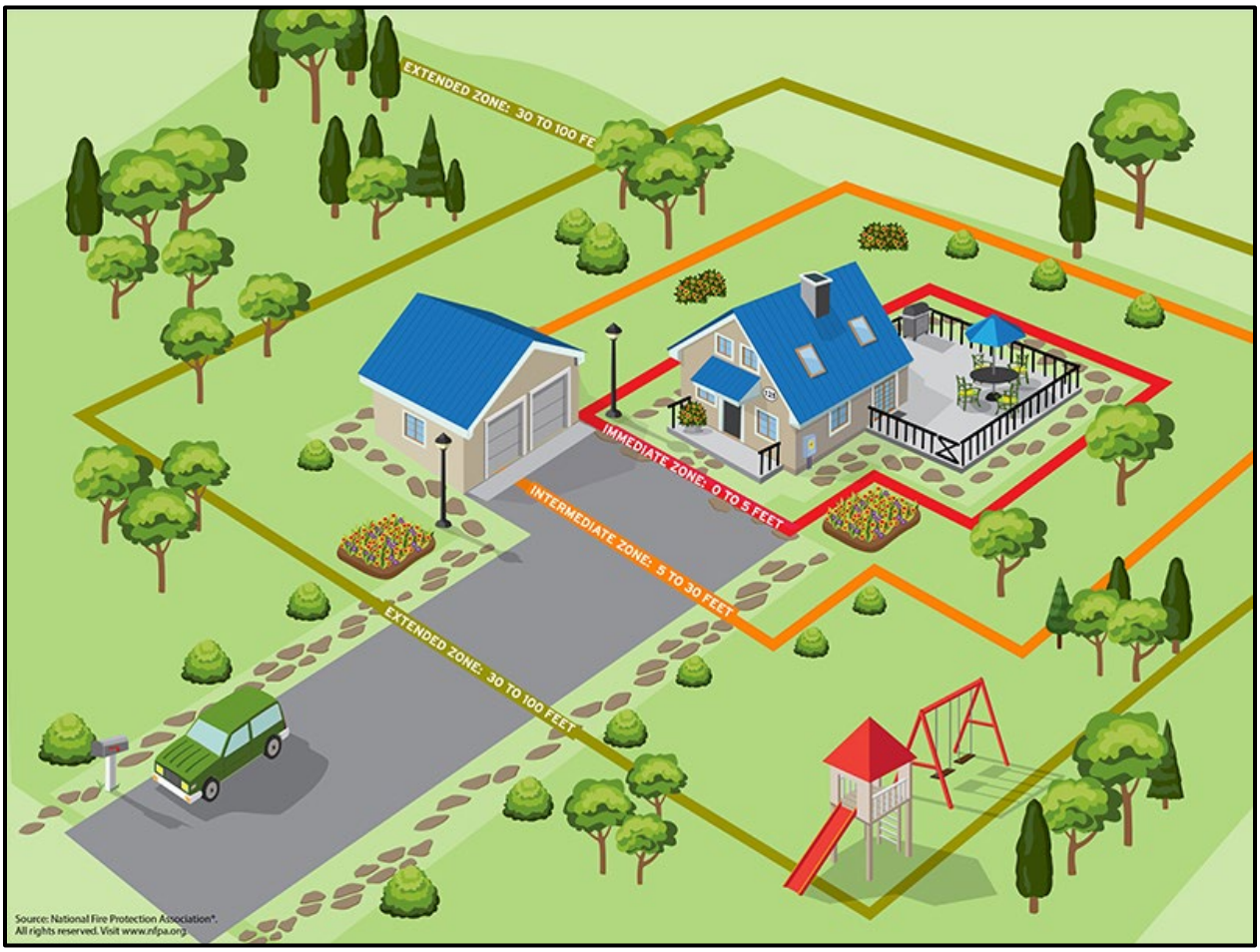

Figure D.1. HIZs providing clearance between a structure and adjacent woodland or forest fuels.
Source: NFPA (2022)

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 (see Figure D.1 and Figure D.2). 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 D.1). The Home Ignition Zones and appropriate treatment for each associated zone are described below in Table D.1.

Table D.1. Key Focus of Each Home Ignition Zone

Zone	Distance from Structure	Key Focus
Immediate Zone (Zone 1)	0–5 feet	Remove all flammable materials; use fire-resistant materials; clean roofs, gutters, and decks.
Intermediate Zone (Zone 2)	5–30 feet	Thin vegetation, prune trees, and remove ladder fuels to reduce fire intensity before it reaches the home.
Extended Zone (Zone 3)	30–100 feet	Manage forested areas to reduce fire spread, create natural openings, and promote forest health.

Source: NFPA (2022)

Figure D.2. Before and after images of actions taken to reduce hazardous fuels in the HIZ surrounding structures.

Source: Boulder County (2024).

Please see the figures below for a visual representation of the recommended tree spacing (Figure D.3), minimum vertical clearance (Figure D.4), as well as spacing on slopes (Figure D.5).

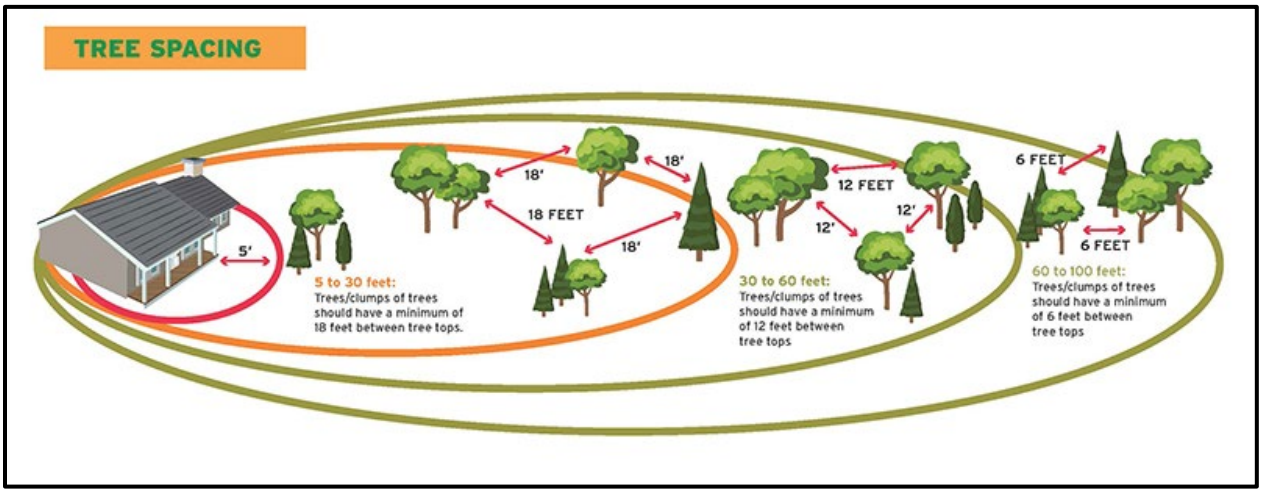

Figure D.3. Recommended tree spacing.
Source: NFPA (2022)

Figure D.4. Recommended minimal vertical clearance.
Source: CAL FIRE (2022)

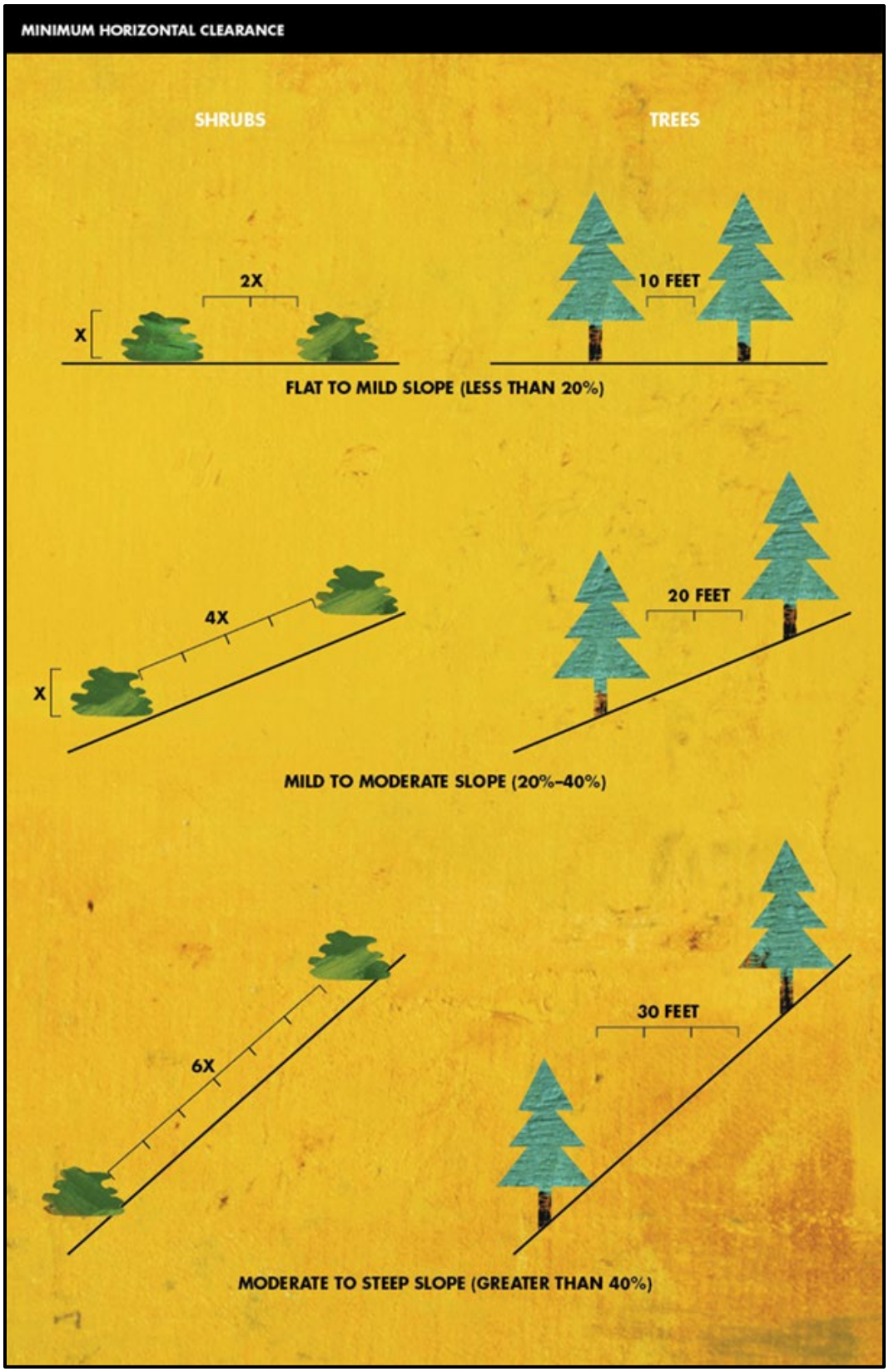

Figure D.5. Recommended minimal horizontal clearance.
Source: CAL FIRE (2022)

FireSafe Montana's *Living with Fire: Homeowner's Firesafe Guide for Montana* (FireSafe Montana 2009) and *Ignition Resistant Construction Guide* (FireSafe Montana 2017) serve as additional essential resources for homeowners seeking to protect their properties:

- Living With Fire: Homeowner's Firesafe Guide for Montana: https://firesafemt.org/img/LivingwFireFSM20091.pdf
- Ignition Resistant Construction Guide: https://firesafemt.org/img/Ignition-Resistant-Construction-Guide-FINAL.pdf

Assisting neighbors may be essential in many cases. Homeowners should consider assisting the elderly, sharing ladders for gutter cleaning, and assisting neighbors with large fuels thinning needs. Homeowner actions have also been found to motivate neighbors to act, increasing the scope of the wildfire mitigation across a community (Evans et al. 2015).

For additional information on defensible space, upgrading components to reduce structural ignitability, homeowner actions, as well as local, state, and national resources available to Treasure County Residents to provide technical assistance and alleviate the costs associated with fuels treatments and wildfire mitigation, please refer to Chapter 6 Homeowner Actions.

FUEL BREAKS AND OPEN SPACE TREATMENTS

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, grasses, dead branches, leaves, or downed logs) has been modified or reduced to limit the fire's ability to spread rapidly (Figure D.6). 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 enhance prescribed fire opportunities and provide access for mitigation resources and firefighters, as well as enhancing the safety of evacuation routes.

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. Farther away from WUI communities, the emphasis of treatments often becomes broader recognizing the unique challenges posed by the open landscapes. While reducing the buildup of hazardous fuels remains important, other objectives are often included, such as promoting ecosystem health, enhancing resiliency to catastrophic wildfires, and addressing the impacts of climate change.

Monitoring early-season moisture levels is also vital, and incorporating mid- to late-summer grazing can help reduce vegetation biomass, decreasing potential fuel loads as fall approaches (Clark et al. 2023). Additionally, reestablishing native vegetation in these areas offers long-term benefits, as native plants generally retain higher moisture content during the hotter, drier months of August and September, thereby reducing fire risk. Incorporating low-growing native vegetation in buffer zones can further enhance the effectiveness of fuel breaks, creating a more resilient landscape that supports both wildfire mitigation and ecological health.

Figure D.6. Defensible space and fuel breaks can be effective in protecting a structure from wildfire.

Source: Carmen Borchelt.

FUEL TREATMENT METHODS

Several treatment methods are commonly used for hazardous fuels reduction, including manual treatments, mechanized treatments, prescribed fire, and grazing (Table D.2). Due to the variability of the planning area's topography, vegetation type, and distribution, certain treatments will be appropriate for specific landscapes. 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:

- Average size/diameter class of material
- Proximity to structures
- Project objectives
- Scale of the treatment project (number of acres, stand maturity, fuel loading)
- Wildfire mitigation goals (fuel break, fire break, reduced fuel loading)
- Alignment with nearby fuel treatment efforts and future planned treatments
- Ecological restoration goals
- Availability of resources and personnel
- Transportation fuel costs
- Steepness of slope
- Access for product transportation
- Volume of biomass

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 cleanup is a must as neglected piles of vegetation may result in increased fire risk.

Table D.2. Summary of Fuels Treatment Methods

Treatment	Comments
Machine mowing	Appropriate for large, flat, grassy areas on relatively flat terrain.
Manual treatment with chipping or pile burning	Requires chipping, hauling, and pile burning of slash in cases where lop and scatter is inappropriate. Slash tree limbs to 6 feet from the ground or a maximum of 1/3 of tree's height Remove ladder fuels below/near trees. Pile burning must comply with smoke management policy. Permits are administered by Treasure County.
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	Effective on materials up to 6 inches in diameter, slopes up to 30%, and in combination with tree thinning treatments. Removing smaller-diameter trees that act as ladder fuels enhances the effectiveness of mastication. Mastication of treetops and slash can significantly reduce fuel loads. Reduces disposal issues of smaller-diameter fuels. Environmental impact of residue being left on-site is still being studied.
Prescribed fire	Can be very cost effective for public land, with location considerations and constraints. 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.
Mechanical	Mechanical treatments using feller bunchers, skidgines, and cut-to-length hot saw machines can be conducted on slopes less than 40%. Steeper slopes require tracked machines, while more gradual inclines can be operated on with wheeled machines. Slopes greater than 40% require arial logging operations such as a skyline.
Grazing	Can be cost effective depending on species utilized. 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 and other hand tools. 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, as shown in Figures D.7 and D.8. Care should be exercised to not increase the fire hazard by failing to

remove or treat discarded material in a site-appropriate manner. Additional information on specific manual fuel treatments is included below.

Figure D.7. Manual cut/pile fuels reduction project removing small-diameter material.
Source: BCPOS.

Hand Felling and Piling

Hand felling is generally used for smaller-diameter trees and understory ladder fuels (shrubs, low limbs downed branches). This method is appropriate on smaller sites or where precise thinning is needed such as near homes and structures and in environmentally sensitive areas. Vegetation that is removed by hand is then piled in mounds to be dried and burned during cold, moist months.

Hand Felling and Lop and Scatter

Similar to hand felling with piling, felling and lop and scatter is an appropriate treatment method for smaller treatment areas and where it may not be feasible to burn piles later or when trying to improve soil organic matter content. With this treatment method, small trees, shrubs, and ladder fuels are cut by hand then masticated to reduce their size. The slashed material is then spread across the forest floor to reduce fuel volume and height. Care should be taken when utilizing this method near homes to ensure defensible space zone standards are maintained.

Figure D.8. Slash pile burning post thinning.
Source: BCPOS (2023).

Mosaic Thinning

Mosaic thinning may be a cost-intensive method for treating forested lands. With this treatment, selective thinning with chainsaws and hand tools occurs under the guidance of a forester or mitigation expert. Exact treatment intensity and methodology will vary from site to site depending on need and present species.

Pruning and Limbing

With this treatment method, branches are removed from mature trees to reduce ladder fuels and potential fire intensity. Trees are treated based on branch height and distance from neighboring trees. This method is most effective for maintaining defensible space as outlined above.

MECHANIZED TREATMENTS

Mechanized treatments include mowing, mastication (shredding timber), and whole tree felling (Figure D.9), and mechanized cut-to-length logging, offer a powerful tool for managing large, high-fuel-load areas efficiently. These methods are especially well-suited to landscapes where rapid fuel reduction is necessary across expansive tracts of land (USFS 2024a). While mechanized methods can significantly reduce fire risk, their true value lies in pairing them with complementary treatments. When integrated with prescribed fire, post-treatment monitoring, and ecological restoration practices, mechanized treatments help to create a balanced approach to land management that supports both wildfire mitigation and long-term forest health (USFS 2024a). They are often used in combination with other methods to achieve

specific goals—whether reducing ladder fuels, creating fire breaks, or improving habitat conditions. The flexibility of mechanized treatments also makes them adaptable to a variety of terrain types, especially when paired with aerial systems for difficult-to-reach areas.

Each treatment project requires a tailored approach, and mechanized treatments should be part of a larger, holistic strategy that addresses not only immediate fuel reduction but also long-term sustainability, biodiversity, and resource management.

Figure D.9. Example of mechanical thinning.
Source: Carmen Borchelt.

Mowing

Mowing can effectively reduce grass and brush fuels adjacent to structures and along highway rights-of-way and fence lines. For heavier fuels, several different masticating machines can be used, including drum- or blade-type masticating heads mounted on machines and ranging in size from a small skid-steer to large front-end loaders. Mowing and mastication do not reduce the amount of on-site biomass but alter the fuel arrangement to a less combustible profile.

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 tree branches should be pruned 5 to 6 feet from the ground and with space between the trees. Specific height and spacing recommendations can be found in Wildfire Partners guides, including information on Wildfire Partners program, Ready, Set, Mow.

Mastication

Mastication, also known as mulching, is the process of chopping, grinding, or shredding woody biomass to decrease fuel volume on a site and reducing vertical fuel. The process involves utilizing an attachment

on a tractor or heavy machinery that chips shrubs and trees without manually felling trees. The wood is spread across the forest floor, which reduces crown fire potential and fireline intensity.

Mechanical feller buncher/processors are used for whole tree removal and processing. The processed logs are typically utilized for a variety of low-value products, while the slash (tops and limbs) is of negative value and disposed of by chipping, grinding, or burning on-site.

Chipping

Chipping is an effective way to reduce large woody slash that is collected from manual mitigation efforts. It involves using a chipping machine that shreds the large wood into 3-inch or smaller chips that can be spread across the forest floor, used as mulch or disposed of (Figure D.10). Wildfire Partners manages an annual chipping program where county residents can sign up to have a chipper brought to their neighborhood or house; the wood chips are then donated to local farms.

Figure D.10. Hand thinning and chipping branches around a mountain home.
Source: Cliff Grassmick/Staff Photographer

GRAZING

Grazing can be an effective and beneficial fuel treatment method to reduce the risk of severe wildfires while enhancing habitat for numerous native grassland plants and animals and reducing invasive plant species (DNRC 2020a). By strategically managing livestock to consume and modify vegetation, grazing can be used to reduce the amount, height, and continuity of vegetation (DNRC 2020a). Grazing is a dynamic fuel management tool and its success relies on a sufficient understanding of critical control points such as the species of livestock being grazed (cattle tend to herd around water sources), goat (goat saliva contains compounds which allow them to consume tannins within plants, damaging to other

animals), sheep, or horses (Figure D.11). Other important factors include the targeted plant species (annual vs perennial), the time of year (varying plant nutrition content), animal grazing concentration (intensity), the duration of grazing, plant palatability, and animal age and nutritional needs (Surviving Wildfire 2020).

For more information on the BLM Montana and Dakotas Grazing Standards and Guidelines visit: https://www.blm.gov/sites/blm.gov/files/Lewistown%20MT%20standards%20for%20rangeland%20health%20and%20guidelines%20for%20grazing.pdf.

Figure D.11. Horses graze in open rangeland within Treasure County, utilizing grazing treatments.
Source: Treasure County Core Team

PRESCRIBED BURNING

Prescribed burning an important tool for reducing the risk extreme fire behavior by removing excessive standing plant material, litter, and woody debris while limiting the encroachment of shrubby vegetation (Davis et al. 2024) (Table D.3; Figure D.12). All prescribed fire operations should be conducted in accordance with federal and state laws and regulations.

Table D.3. Types of Prescribed Fire Treatments

Treatment	Comments
Broadcast Burning	Consists of burning larger areas of land that have been prepped for prescribed burning operations. Preparation includes fuel reduction, fuel rearrangement, containment line construction, smoke abatement, and contingency planning. Broadcast burns can be implemented in various fire-adapted fuel types such as lodgepole pine, ponderosa pine, and annual grasslands. Monitoring of broadcast burn units is important for achieving desired results and mitigating ecological consequences such as high tree mortality.
Ditch Burning	Consists of burning built up fuels along and in irrigation ditches. Burning is contained to the ditch and area immediately surrounding the ditch. Due available moisture, vegetation within the ditch can grow quickly but can also be efficiently managed with fire.
Pile Burning	Consists of burning piles of cut, gathered, and stacked vegetation. Pile burning is often simpler to implement than broadcast burning and can be conducted in the winter when wildfire risk is low. Pile burning is effective in removing fuels from a landscape but can have consequences to soil health due to the intense heat of piles scorching the ground.
Agricultural Burning	Consists of burning agricultural lands such as hay fields and wheat stubble to remove vegetation, improve soil health, increase productivity, and reduce wildfire risk. Agricultural burning is conducted during key times of the year that are conducive to the growing season of desired crops.
Cultural Burning	See “Cultural Burning” below to learn more.

Figure D.12. Prescribed broadcast forest burn at Heil Valley Ranch (Source: Treasure County Core Team)

Public safety is the primary consideration in the design of any prescribed burn plan. Use of prescribed fire on public land should be carried out within the confines of the agency’s fire management planning documents and requires individual prescribed burn plans that are developed for specific burn units and consider smoke management concerns and sensitive receptors within the WUI. Smoke monitors should 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/.

> According to Frank Kanawha Lake, a research ecologist with the USFS and a wildland firefighter of Karuk descent, "[Cultural burning] links back to the tribal philosophy of fire as medicine. When you prescribe it, you're getting the right dose to maintain the abundance of productivity of all ecosystem services to support the ecology in your culture" (Roos et al. 2021).

The Montana Department of Environmental Quality provides resources with safety tips and instructions for burning. It is also recommended that residents and land managers consider reasonable alternatives to burning if the primary purpose is material disposal. Several burns may be needed to meet full resource management objectives, so a maintenance plan is needed to ensure success.

For more information on restrictions and requirements for burning, please visit: https://deq.mt.gov/News/pressrelease-folder/news-article108#:~:text=Follow%20these%20steps%20to%20burn%20September%20through%20November%3A,your%20burn%2C%20activate%20your%20county%20permit.%20More%20items.

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

Cultural Burning

Across the American West, fire has historically been a means of forest management and restoration by Indigenous communities for thousands of years (Carter et al. 2021; Roos et al. 2021). Research shows 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). In many areas, cultural burning took a hiatus during the era of fire suppression in the twentieth century due to land management agencies' enforcement of differing practices. However, this has been changing over the past few decades, and cultural burning is again becoming an accepted practice for land management in some areas.

Utilizing traditional indigenous wildfire management practices can help create and maintain fire resilient WUI communities. Integrating cultural practices into prescribed burning also broadens participation and can increase support for burning activities. Tribally led prescribed burns highlight the historical use of fire on the landscape and can initiate conversations and educational opportunities around the role and history of fire on the landscape.

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

> 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

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, plan 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).

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. In general, prescribed fires produce inconsequential amounts of these gases compared to wildfires.

Effective smoke management is a vital component of planning and conducting prescribed fires as smoke has the potential to exceed air quality and pollution standards regulated by the EPA and the state of Montana (Montana Department of Environmental Quality [DEQ] 2024). It is important to note the differences in air quality effects produced by a large wildfire versus a controlled prescribed fire (see Figures D.13). The Montana Department of Environmental Quality has smoke management guidelines that protect the health and welfare of Montana residents from the impacts of smoke. To view Montana DEQ's smoke management guidelines, please visit: https://deq.mt.gov/air/Programs/planandrule.

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/publications/pms420-3.

Figure D.13. Upper: example of the light dispersed smoke released during a Montana Fish, Wildlife and Parks prescribed burn in Sun River Wildlife Management Area (WMA) west of Augusta. Middle and lower: example of the darker and more concentrated smoke that can be released during wildfires and cover large areas such as Roaring Lion fire and the Lolo Peak and Rice Ridge fires in 2017.

Source: Upper: Rocky Mountain Elk Foundation [RMEF] (2023). Middle and lower: *Missoulian*.

The 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.

Prescribed fire is a key action to reduce hazardous fuels in the county and across the broader landscape (Figure D.14). Current fuel loads far exceed healthy levels and are unable to be addressed solely with hand and mechanical treatments. Public acceptance and support are critical to implementing prescribed burning projects. As such, federal, state, and county representatives must coordinate education efforts related to burning activities to reduce resistance to planned actions. This can include information on the rationale for the prescribed fire, precautions, and resources related to smoke, and risk information to ease homeowner concerns.

Figure D.14. Prescribed fire being conducted in a ponderosa pine woodland in Treasure County, Montana.

Source: Treasure County Core Team.

Thinning and Prescribed Fire Combined

Combining thinning and prescribed fire can be the most effective treatment (Graham et al. 2004). In ecosystems 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. The National Association of Forest Service Retirees (NAFSR) published a paper on "America's Forest Management Crisis – A National Catastrophe" (NAFSR 2021) where they observed the effectiveness of pairing thinning treatments with prescribed fire (Figure D.15).

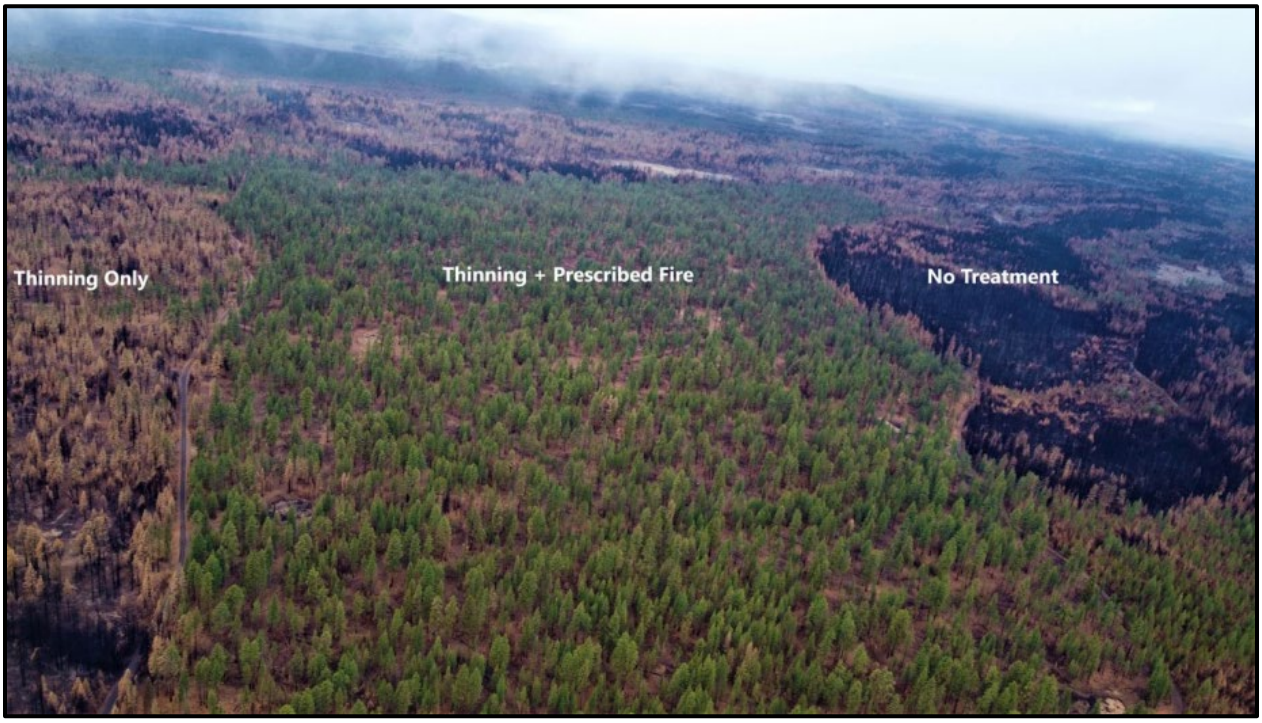

Figure D.15. Photograph taken after the 2021 Bootleg Fire in Oregon highlighting the effectiveness of forest thinning and prescribed fire compared to just thinning treatments or no treatment.
Source: NAFSR (2021).

MANAGEMENT OF NONNATIVE PLANTS

The USDA maintains a list of introduced, invasive, and noxious plants by state (USDA 2022). In Treasure County, Russian olive (*Elaeagnus angustifolia*) is a known invasive species that poses unique wildfire risks, particularly in riparian areas (Montana Field Guide 2025). While not typically associated with fire-prone invasive grasses, Russian olive contributes to hazardous fuel conditions in different ways and should be considered in wildfire mitigation efforts (USFS 2024b). Once established, Russian olive forms dense stands that alter fuel continuity, increasing the likelihood of high-intensity fires in areas that historically had lower wildfire risk (Montana Field Guide 2025). The tree's heavy accumulation of dry leaf litter and woody debris creates a persistent fuel bed that can sustain fire even in areas where native vegetation would typically slow fire spread (Montana Field Guide 2025). These dense thickets also create obstacles for fire crews, restricting access to water sources that are critical for suppression operations (Montana Field Guide 2025; USFS 2024b).

Fuel treatment approaches should always consider the potential for the introduction or proliferation of invasive nonnative species as a result of management actions. Invasive species, particularly winter annual invasive grasses, have been shown to increase fire frequency, temperature, flame length, and rate of spread. Targeted removal and restoration efforts not only decrease fire hazards but also contribute to overall ecosystem resilience. By incorporating invasive species management into wildfire mitigation strategies, Treasure County can reduce hazardous fuel buildup, improve emergency response capabilities, and restore native plant communities that are better suited to withstand and recover from wildfires.

For more resources on nonnative plant identification, visit: https://fieldguide.mt.gov/displayInv.aspx?id=NOX.

APPENDIX E:

Post-Fire Recovery and Restoration

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POST-FIRE RESPONSE AND REHABILITATION

The increase in severe wildfires across Montana has emphasized the complexities of post-fire response. High-severity burn areas in Montana can produce erosion and runoff rates 5 to 10 times higher than those from moderate-severity burns (USFS 2021a). After a wildfire, heavy rains may lead to flash floods that carry sediment, debris, and even large trees and rocks downstream, potentially causing damage to communities, farmlands, and critical infrastructure, particularly in rural areas like Treasure County. Waterways, such as the Yellowstone River and its tributaries, face a high risk of contamination from post-fire debris, ash, and sediment, which can harm aquatic ecosystems and water processing facilities (USFS 2021a). The most recent severe fire occurrence in Treasure County was the Busma Road Fire, which burned more than 12,000 acres between August 4 and 5, 2022 (KRTV 2022). The fire primarily impacted grasslands and timber, showing extreme fire behavior fueled by strong winds, low humidity, and dry conditions. The fire's rapid growth prompted the involvement of several fire agencies, including state, federal, and neighboring county crews, as well as air support from heavy tankers and helicopters (KRTV 2022).

Treasure County's fire-prone environment can experience fire incidents that burn at high severities, destabilize slopes, and cause debris flows on the steep terrain adjacent to local roadways, infrastructure, or other valued resources. This presents a risk to rural and agricultural communities, who depend on stable, accessible routes for transportation and emergency services. Further, many residents in the county depend on single roads for exiting their neighborhood during emergencies. Landslides and debris flows, while less common in the more arid regions of the county, are still recognized as critical hazards post-fire (DNRC 2020c).

The USFS's post-fire emergency stabilization program is called the Burned Area Emergency Response (BAER) program (USFS 2021b). 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 (InciWeb 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 (InciWeb 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 intro 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 DNRC provide science-based frameworks to guide post-fire restoration efforts in State Forest lands of Montana. This guidance outlines methods of ecological management and a step-by-step framework for agencies to follow in post-fire planning (NRCS 2025). A list of resources to guide post-wildfire rehabilitation is available at: https://www.nrcs.usda.gov/resources/guides-and-instructions/fire-recovery-montana-resources.

COMMUNITY RESPONSE AND RECOVERY

Assessments of the burned landscape are often well-coordinated using interagency crews who are mobilized immediately after a fire to assess the post-fire environment and make recommendations for rehabilitation efforts. For the communities affected by fire, returning home and recovering from a wildfire can be a fragmented and challenging process unless pre-fire planning is thorough, and the responsibilities of various entities are clearly defined (Centers for Disease Control and Prevention [CDC] 2024). 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 a supportive community network (CDC 2024).

After the Flames

Rebuilding and recovery from wildfire can vary greatly across income levels and demographics. Therefore, many of these areas take more time to recover than those with greater access to resources. According to After the Flames, “counties, tribes, municipalities, and water providers are typically the entities most directly and immediately impacted by wildfire and port-erosion flooding” (After the Flames 2021). Recovery can take anywhere from months to several years to complete rebuilding and restoration efforts. It is important to note that the impact of disaster events and recovery efforts differs between various communities and organizations. 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 these circumstances, many of these areas take more time to recover than those with greater access to resources.

Returning Home

Returning home after a fire can be a daunting and emotional experience for residents and may pose hazard threats depending on the impact of the fire. Residents should follow the advice and recommendations of emergency management agencies, fire departments, utility companies, and local aid organizations regarding activities following the wildfire. Evacuate your home as early as possible and do not linger once evacuation orders have been given. The more quickly neighborhoods can evacuate, the sooner wildfire response and emergency resources can ingress to begin suppression activities (NFPA 2023). Additionally, to ensure personal safety, 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 rock that may have been weakened or loosened by the fire. Be aware of any damage or debris on roads and driveways. Use extreme caution around trees, power poles, and any other tall objects that may have been weakened by the fire (CDC 2024).

Even if the fire did not damage your house, do not anticipate an immediate return to normal routine. Instead, look for damaged utility infrastructure and necessary repairs. When you return home, check for hazards, such as gas, 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. Once at home (CDC 2024):

- Check the roof and exterior areas for sparks or embers.
- Check grounds for hot spots, smoldering stumps, and vegetation.
- Check for fire damage to your home, turn off all appliances, and ensure the meter is not damaged before turning on the main circuit breaker.
- Check the attic and throughout your house for any hidden burning sparks or embers.
- Do not drink water from the faucet until emergency officials say it is okay, water supply systems can be damaged and become polluted during wildfires.
- Discard any food that has been exposed to heat, smoke, flood water, or soot.
- If you have a propane tank or natural gas, leave valves closed until the supplier or utilities can inspect your system.
- If you have a solar electrical system, this system should be inspected by a licensed technician to verify that the solar panels and electrical wiring are safe for continued operation.
- Consult local experts on the best way to restore and plant your land with fire-safe landscaping.
- Contact 911 if any danger is perceived.
- Ash contains toxic substances and may be irritating to the eyes, nose, throat, and skin. Ash is harmful to inhale and may trigger asthma attacks. Follow these tips to reduce your exposure to ash:
    - Do not allow children to play in the ash and sanitize children’s toys before they are played with.
    - Immediately wash any part of your body that touches ash to avoid irritation.
    - Wash fruits and vegetables from your garden thoroughly before eating them.

- Keep pets out of ashy areas.
- Frequently clean indoor surfaces by wet mopping.
- Wear protective clothing and a respirator when working outside.

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 of an emergency. Keep the photos in a safe place as this will make the insurance claim process easier. Most expenses incurred during the time you are 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. Montana homeowners should review their insurance policies annually to ensure they have adequate coverage, especially for wildfire risks. Understanding your "loss of use" provision is crucial, as this section of your policy typically covers living expenses when your home becomes uninhabitable due to fire or smoke. For any questions or guidance, Montana residents can contact the Office of the Montana State Auditor for further assistance in dealing with insurers and the claims process (Montana Commissioner of Securities and Insurance 2023).

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.

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 (Montana DES 2022).

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 (DNRC 2023a).

The recovery coordinator should become familiar with representatives from local, state, and government agencies that will be helping with coordination or funding of post-fire recovery. Any large wildfire will also involve an Incident Command System, an appropriately sized team assigned to aid in post-fire recovery.

To learn more, visit: 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 (Montana DES 2022). Applying the following steps can aid in successful communication (Western Fire Chief's Association 2024):

- **Communicate through familiar and trusted messengers.** If recipients are to be receptive and take risk communication seriously, then the information must come from a credible source. Risk communicators must be viewed as legitimate and trustworthy sources of information.
- **Provide clear, actionable information.** Risk communicators should create messages that are designed and tested to ensure they are clear, consistent, and comprehensible. Messages should include actionable guidance, so people know exactly how to appropriately respond.
- **Tailor messages and information pathways for target audiences.** Know your audience. A one-size-fits-all risk communication approach will be ineffective because communities are all different. Some populations will require variations in the way information is received.

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 to 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 (National Weather Service 2024). 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 (National Weather Service 2024). The Western Fire Chiefs Associations lists the following tips for staying safe from debris flow and flooding (WFCA 2024):

- **Stay Informed:** tune into local radio, news, and phone notifications. Watch weather forecasts and be aware of flood warnings.
- **Travel Cautiously:** Assume roads and highways on the downhill side of recently burned slopes are at risk and avoid taking those routes when possible.
- **Stay out of Floodwater:** do not walk, bike or drive in flooded areas. Water may be contaminated and even on foot of water can generate enough power to move a car.
- **Watch for Changes in Water Level:** watch for sudden increases or decreases in flow or sudden discoloration as this may indicate incoming flooding or debris movement.
- **Find High Ground:** If you are caught in an unsafe situation, seek high ground immediately to avoid being trapped or caught in flows.

POST-FIRE REHABILITATION AND RESOURCES

Wildfires that cause extensive damage necessitate dedicated efforts to avert long-term landscape degradation. 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 many years after a fire deepening on the need and difficulty of revegetation. For the most part, rehabilitation efforts focus on the lands not likely to recover naturally from wildfire damage (USFS 2006).

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, gulleys, and ephemeral stream channels, ultimately damaging communities and critical infrastructure.

Soil cover is dramatically reduced in areas with moderate soil burn severity with minimal surface litter retained and some topsoil present. The loss of vegetative soil support will lead to decreased soil stability and higher erosion rates. By contrast, soil cover is nearly non-existent in areas experiencing high soil burn severity as the surface soil has been burned to a fine, hydrophobic powder. Exposed, granular mineral soil is readily transported during rain events resulting in elevated soil erosion and surface runoff which creates sediment loading in streams, creeks, and rivers (InciWeb 2022).

Burned Area Emergency Response Program

Following a wildfire which impacts National Forest lands and other federally managed land, Burned Area Emergency Response (BAER) teams will be deployed if the fire is over 500 acres or poses a threat to human life and property or critical resources. BAER teams are composed of experts in hydrology, engineering, vegetation, fire ecology, and other specializations. They are deployed to assess the immediate impact on the land and determine if emergency rehabilitation actions are warranted. If fire severity warrants emergency action, BAER teams will work to implement emergency actions such as channel stabilization, seeding and mulching, erosion and water control structures, blockading recovery areas, and other actions to address immediate post-fire watershed hazards. These actions are not intended to provide long-term fixes but rather bridge the gap between emergency safety concerns and long-term recovery (NIFC 2024).

Emergency Watershed Protection Program

As another example, the Natural Resource Conservation Service's (NRCS's) Emergency Watershed Protection (EWP) program provides technical and financial services for watershed repair on public (state and local) and private land. The goal is to reduce flood risk through funding and expert advice on land treatments. The EWP program can provide up to 75% of funds and remaining funds are often paid with in-kind volunteer labor (NRCS 2023). 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 (Long 2014):

- Hillside stabilization (for example, placing bundles of straw parallel to the slope to slow erosion)
- Hazard tree cutting/ salvage logging
- 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

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).

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 (Montana State University 2019).

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 safe conditions for those conducting the replanting efforts, as unstable soils, post-fire hazards, or ongoing suppression activities may pose risks (Montana State University 2019).

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 (Montana State University 2019). 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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APPENDIX F:

Public Outreach

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COMMUNITY OUTREACH

Table F.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 F.1 through F.7 show examples of materials distributed, media posted, and public forums, with community survey results summarized below.

Table F.1. Public Outreach Resources

Resource Description	Location	URL	Date
Yellowstone Public Radio news article highlighting the 2025 Treasure County CWPP Update	Yellowstone Public Radio	https://www.ypradio.org/regional-news/2023-04-13/montana-working-with-communities-regional-hazard-plans	April 13, 2023
Treasure County community public survey (Figure F.3)	Distributed via multiple sources	https://forms.office.com/Pages/ResponsePage.aspx?id=9rCYT_sm0EGp-Jso45xj3jc07BV17hhGj6qL59nVst5UNEw5TUpZWUdKVTg2S1g2QjE5QTZaVkJFRy4u	June 21, 2024
Treasure County CWPP public flyer with a QR code for the public survey (Figure F.3)	Treasure County CWPP flyer	QR code	June 21, 2024
Public event to increase public engagement in the development of the Treasure County CWPP	Hysham High School multipurpose room	In-person forum	November 6, 2024

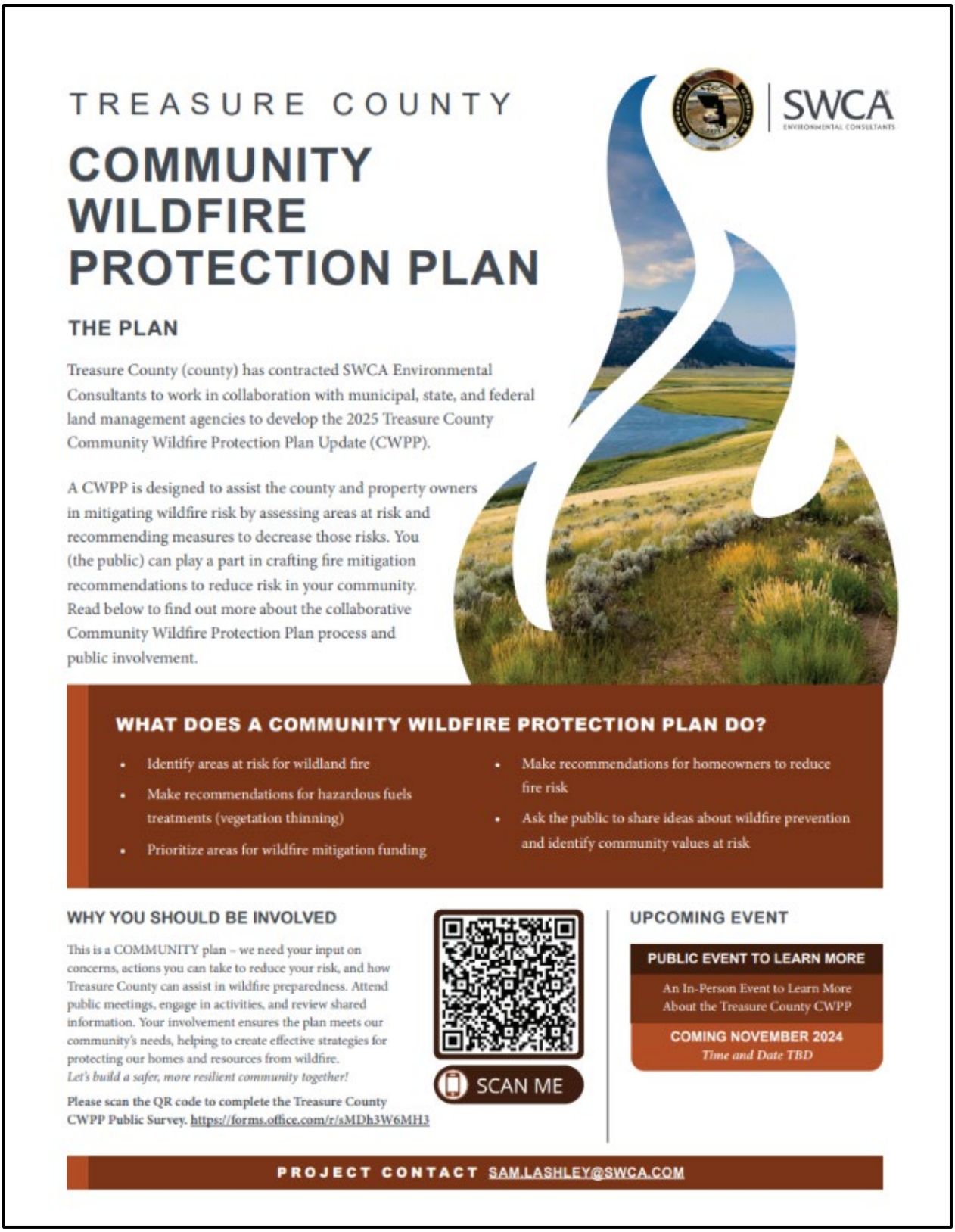

Figure F.1. CWPP flyer, page 1.

ORIGIN OF COMMUNITY WILDFIRE PROTECTION PLANS

CWPPs came out of the Healthy Forests Restoration Act (HFRA) of 2003. This Act provided 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 the means through which public citizens can provide their voices in fuels management and fire protection planning for their communities. This 2024 CWPP will identify fire hazards and community values at risk within Treasure County and provide recommendations to reduce the threat of wildfire to life and property.

The Goals and Objectives of the Treasure County CWPP Are:

1. **Wildfire Resilience**: Improve wildfire resilience and adaptation of the County.
2. **Public and Stakeholder Input**: Develop a CWPP update with broad public and stakeholder input and support.
3. **Grant Opportunities**: Develop a CWPP update that will serve as a source and guide for accessing grant opportunities and funding.
4. **Risk Mitigation**: Collaboratively develop a prioritized action plan to mitigate risks to people and property.
5. **Fuel Mitigation Resources**: Provide resources, information, and actionable planning for conducting fuel mitigation on private and public lands.
6. **Project Tracking**: Implement a process to implement and track project progress in an accessible and easy to understand format.

PROJECT CONTACT SAM.LASHLEY@SWCA.COM

Figure F.2. CWPP flyer, page 2.

Figure F.3. QR code linking community members to a survey about the upcoming CWPP.

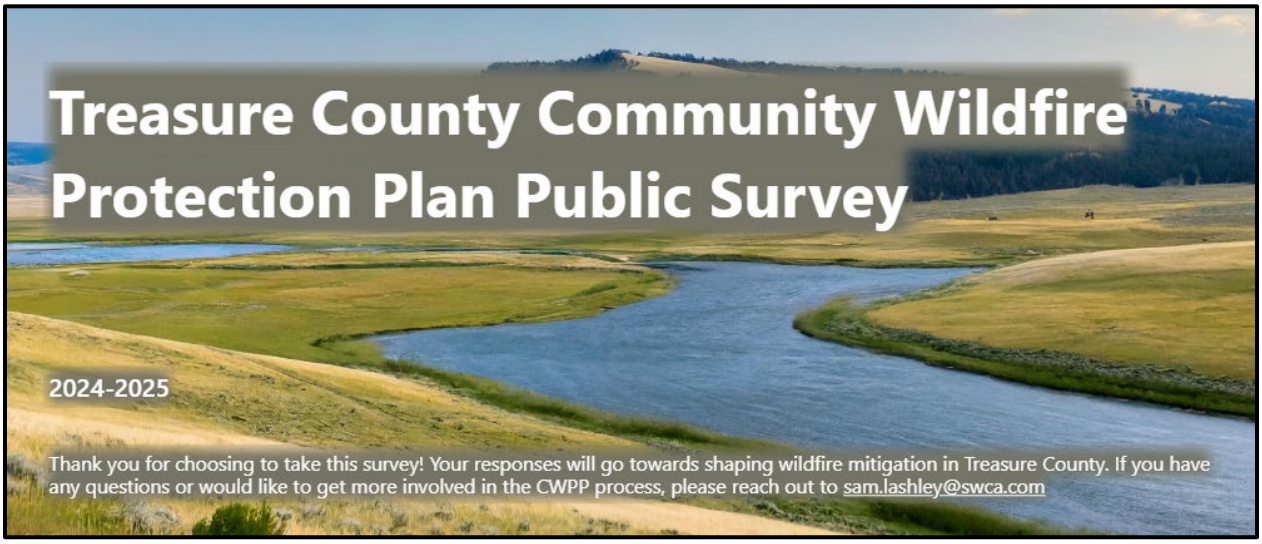

Figure F.4. Screen shot of the introductory text to the community survey.

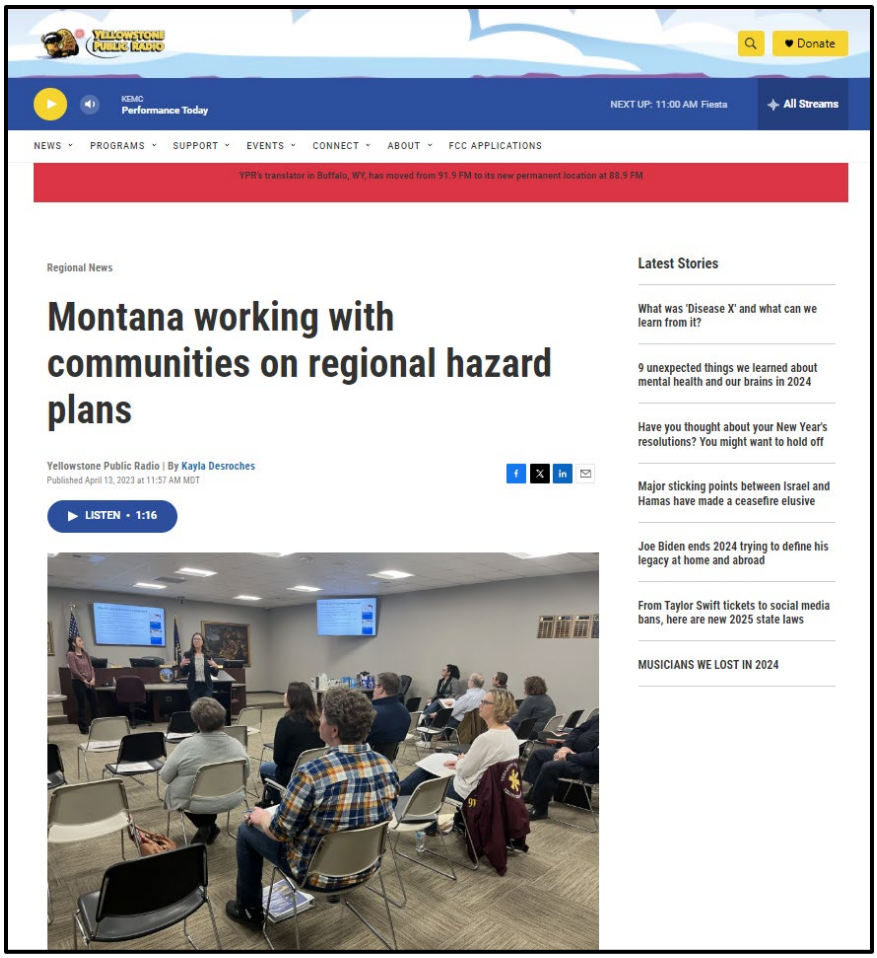

Figure F.5. Screenshot of a Yellowstone Public Radio news article highlighting the 2025 Treasure County CWPP.

JON TESTER

ABOUT JON SERVING YOU NEWSROOM ISSUES CONTACT GET UPDATES

Newsroom · Press Releases

03.21.2023

TESTER SECURES $117,648 FOR WILDFIRE PREVENTION IN TREASURE COUNTY

FUNDING WILL COME FROM THE SENATOR'S INFRASTRUCTURE INVESTMENT AND JOBS ACT

U.S. Senator Jon Tester today announced that he secured $117,648 in U.S. Forest Service (USFS) Community Wildfire Defense Grants from his bipartisan *Infrastructure Investment and Jobs Act (IIJA)* to mitigate wildfire risk in Treasure County. The funding awarded to the Department of Natural resources and Conservation, Treasure County Community Wildfire Protection Plan Update and Modernization will be used to update and modernize Treasure County's Community Wildfire Protection Plan by identifying specific, prioritized projects to promote wildfire-resilient landscapes, fostering fire adapted communities, and assisting with safe an effective wildfire response.

Tester worked across the aisle for months to negotiate IIJA with a group of five Republicans, four Democrats, and the White House, and he was the only member of Montana's congressional delegation to vote for it.

"As a third-generation farmer, I know that wildfire season creates real challenges for rural communities like Potomac," Tester said. **"Too many folks in Washington don't understand the challenges we face in Montana. That's why I fought to secure the necessary resources in my Bipartisan Infrastructure Law for the Community Wildfire Defense Grant Program, which will make sure that local Montana communities have the tools they need to prevent and prepare for fires before they wreak havoc on our land and livelihoods."**

Figure F.6. Screenshot of a press release describing Senator Jon Tester acquiring funding to modernize and update Treasure County's CWPP.

Figure F.7. Photo from the Treasure County CWPP public event on November 6, 2024, at the Hysham High School multipurpose room.

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 21, 2024, to May 19, 2025, and SWCA received 16 total responses. Toward the end of the CWPP planning process, concerns raised during feedback will be addressed through diligent adaptations, edits, and additions to the plan's content and mitigative project recommendations.

In the tables below, response percentages represent the proportion of total responses that selected each option.

1. Where do you live?

Answer	Number of Respondents	Percentage
North of Yellowstone River	4	24%
South of Yellowstone River	12	71%
Within Hysham City Limits	1	6%
Other	0	0%
Total	**16**	**100%**

2. Do you rent or own the place where you live/operate your business in Treasure County?

Of the respondents, 62% own the place where they live, while 14% rent their residence. Additionally, 14% own their business location(s), and 10% rent their business location. No respondents selected "Other." Respondents were allowed to select more than one option, suggesting that some individuals may own their residence and also own or rent their business location(s).

3. How would you describe your residence or business in Treasure County?

Answer	Number of Respondents	Percentage
Single-family home	15	79%
Multi-family dwelling	0	0%
Standalone business structure	2	11%
Multi-business structure	1	5%
Other	1	5%
Total	**19**	**100%**

4. What is your residency status in Treasure County?

Among the respondents, 15 individuals (68%) identified as full-time residents. Seven respondents (32%) also identified as business owners. None of the respondents indicated being seasonal residents, non-residents, short-term rental owners, long-term rental owners, or owners of undeveloped lots. Multiple responses were allowed, suggesting overlapping roles in the community.

5. How long have you lived in or owned a business in Treasure County?

Answer	Number of Respondents	Percentage
Less than 2 years	0	0%
More than 2 years to less than 5 years	2	13%
More than 5 years to less than 10 years	4	25%
More than 10 years	10	63%
Total	**16**	**100%**

6. Please read each statement and select the degree to which you agree or disagree with it.

Questions	Strongly Agree	Agree	Disagree	Strongly Disagree
I understand the degree to which our County is at risk from wildfires.	66.7%	33.3%	0%	0%
I know steps I can take to reduce wildfire hazards on and around my home/business / property.	53.3%	46.7%	0%	0%
I would consider cutting trees for wildland fire protection on my own property.	60%	26.7%	13.3%	0%
I support the cutting of trees for wildland fire protection on open spaces across the County.	71.4%	21.4%	7.1%	0%
I support cutting trees along roads to enhance the safety of roads in case of an evacuation.	73.3%	26.7%	0%	0%
I support land managers such as the U.S. Forest Service cutting trees to mitigate wildfire risk on public land around the County/VFD.	60%	33.3%	6.7%	0%
I support pile burning to eliminate woody material created by fire mitigation actions.	68.8%	25%	6.3%	0%
I support prescribed (controlled) burning to reduce wildfire risk in open spaces around or adjacent to the community.	68.8%	25%	6.3%	0%

7. How concerned are you about the following issues if a wildfire were to occur in this community?

Questions	Not Concerned	Only Slightly Concerned	Moderately Concerned	Very Concerned
Receiving timely and accurate information about the incident	13.3%	20%	6.7%	60%
Evacuating safely and promptly	18.8%	18.8%	18.8%	43.8%
Damage to my home/business/property	12.5%	12.5%	25%	50%
Loss of life	18.8%	18.8%	12.5%	50%
Impacts on my livelihood	25%	6.3%	12.5%	56.3%
Damage to wildlife habitat	25%	25%	18.8%	31.3%
Loss of recreational opportunities	31.3%	18.8%	18.8%	31.3%
Decreased beauty of my property and open spaces across the community	25%	18.8%	25%	31.3%
Loss of insurance coverage due to wildfire risk	18.8%	25%	0%	56.3%
Reduced air quality due to smoke	18.8%	25%	25%	31.3%
Post-fire erosion and flooding	12.5%	31.3%	18.8%	37.5%

8. Do you have any additional concerns in the case that a wildfire was to occur in Treasure County?

Two respondents shared additional concerns. One highlighted a lack of local firefighters, while the other noted confidence in the local volunteer fire department, stating it reduces their concerns about wildfires.

9. I have completed the following work to my home/business/property to lessen the risk of wildfire and prepare for potential evacuations: Check all that apply.

Answer	Number of Respondents	Percentage
Cutting trees or removing low limbs on trees near my home/business	1	4%
Annually removing debris (dead vegetation, pine needles) from my gutter and roof	5	21%
Annually removing debris (dead vegetation, pine needles, mulch) from under my balcony, deck, or porch	4	17%
Removing all burnable fuel (mulch, grass, flammable furniture) from within 5 feet around the base of my home	5	21%
Moving firewood away from my home/business and not storing it under my balcony, deck, or porch	4	17%
Repairing or installing screens to block embers from entering vents, eaves, gutters, or crawlspace	2	8%
Replacing my roof with less flammable materials	2	8%
Widening my driveway so fire engines could access my property	0	0%
Local ordinances and regulations that prohibit certain modifications to homes/ businesses and surrounding property	1	4%
Keeping a Go Bag with important documents, survival gear, medications, etc. at the ready in case of an evacuation	5	7%
Other	1	4%
Total	**16**	**100%**

10. Which of the following factors keep you from undertaking actions to reduce the wildfire risk on your property? Check all that apply.

Answer	Number of Respondents	Percentage
Lack of knowledge about effective methods to reduce hazards	1	4%
Lack of financial resources	5	21%
Specific information about what needs to be done	4	17%
Lack of tools to complete the work	5	21%
Lack of time to complete the work	4	17%
Physical inability to complete the work	2	8%
Limited means to dispose of downed trees, limbs, and other slash material	2	8%
Desire to keep trees near homes/businesses for aesthetic reasons, shading, or privacy	0	0%

Answer	Number of Respondents	Percentage
Local ordinances and regulations that prohibit certain modifications to homes/ businesses and surrounding property	1	4%
Other	1	4%
Total	**16**	**100%**

11. Which of the following would encourage and enable you to reduce the wildfire risk on your property? Check all that apply.

Answer	Number of Respondents	Percentage
Financial assistance	6	22%
Access to inexpensive/easy means of disposing vegetation from mitigation work	4	15%
Specific information about what needs to be done	4	15%
Information on the effectiveness of different strategies to reduce the wildfire risk	6	22%
Help doing the work (e.g., someone to thin trees and vegetation and/or remove debris)	6	22%
A list of recommended contractors that could be hired to do the work	0	0%
None of the above--I am not interested in these actions	1	4%
Other	0	0%
Total	**16**	**100%**

12. Does your family have an evacuation plan for if a wildfire were to occur in the community?

Answer	Number of Respondents	Percentage
Yes, for people in my household	2	13%
Yes, for people and pets in my household	4	27%
Yes, for people, pets, and livestock in my household and on my property	4	27%
No	5	33%
Total	**15**	**100%**

13. If there were an evacuation in the community because of wildfire, how concerned are you about the following issues?

Questions	Not Concerned	Only Slightly Concerned	Moderately Concerned	Very Concerned
I or my family members have physical limitations that would make it difficult for us to evacuate promptly	50%	18.8%	25%	6.3%
My neighbors have physical limitations that would make it difficult for them to evacuate promptly	43.8%	6.3%	37.5%	12.5%

Questions	Not Concerned	Only Slightly Concerned	Moderately Concerned	Very Concerned
I have children that might be home alone when an evacuation occurs	68.8%	18.8%	12.5%	0%
My neighbors have children that might be home alone when an evacuation occurs	53.3%	20%	20%	6.7%
My community does not have enough roads to handle evacuation traffic	68.8%	25%	6.3%	0%
I do not know where to go if asked to evacuate	56.3%	313%	6.3%	6.3%
I might not receive timely information about the need for evacuation	18.8%	12.5%	31.3%	37.5%
It would take me over 20 minutes to gather my personal belongings and pets to evacuate	13.3%	40%	26.7%	20%

14. If you have received information about wildfire issues facing this area, who has provided this information to you? Check all that apply.

Answer	Number of Respondents	Percentage
Local State Forest Service	1	1%
Local Conservation District	2	9%
Your HOA/POA	0	0%
Local Fire Protection District	3	14%
Local Watershed Coalition	0	0%
Your insurance agency	1	5%
Your neighbors	6	27%
I have never received information about wildfire issues in this area	3	14%
Other	6	27%
Total	**16**	**100%**

15. What methods are best to communicate with you? Check all that apply.

Answer	Number of Respondents	Percentage
Email	8	24%
Paper mail	9	26%
Flyers and ads in and around town	3	9%
Facebook/social media	9	26%
Newspapers	1	3%
Next Door	1	3%
Other	3	9%
Total	**16**	**100%**

16. Do you have any other thoughts or concerns relating to wildfire hazards and community preparedness?

Respondents shared various perspectives on wildfire hazards and preparedness. One emphasized the need for controlled burns to manage fuel buildup, while another stressed the importance of training younger generations for the local fire department. Concerns about thinning pine forests to reduce wildfire risk were noted, with one respondent describing it as a "colossal task." Others highlighted the value of regular fire department updates and training. Two respondents stated they had no additional concerns.

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APPENDIX G:

Funding Sources

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FUNDING SOURCES

The following section provides information on federal, state, and local funding opportunities for conducting wildfire mitigation, community education, and emergency response improvement projects. The priorities and application requirements of individual funding programs often change from year to year. Please follow the links provided to find the most up-to-date information on each funding opportunity. It should be noted that matched funding can be an excellent funding strategy, when possible.

FEDERAL FUNDING INFORMATION

Source: **2022 Infrastructure Investments and Jobs Act**

Agency: **Multiple**

Website: https://www.congress.gov/bill/117th-congress/house-bill/3684

Description: The Infrastructure Investments and Jobs act allocated funding through various departments for infrastructure projects including, but not limited to roads, bridges, and major projects; passenger and freight rail; highway and pedestrian safety; public transit; broadband; ports and waterways; airports; water infrastructure; power and grid reliability and resiliency; resiliency, including funding for coastal resiliency, ecosystem restoration, and weatherization; clean school buses and ferries; electric vehicle charging; addressing legacy pollution by cleaning up Brownfield and Superfund sites and reclaiming abandoned mines; and Western Water Infrastructure.

Specifically, the Community Wildfire Defense Grant Program is a $1 billion program where the Department of Agriculture will provide grants to communities at risk from wildfire to develop or revise their Community Wildfire Protection Plans (CWPPs) and carry out projects described within those plans. 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 Community Wildfire Defense Grant, please visit: https://www.fs.usda.gov/managing-land/fire/grants.

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 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 USFS to support priority forest landscapes at a high wildfire risk. You can find more information about this grant here: https://www.firstnations.org/grantmaking/#grant-opps.

Source: **Building Resilient Infrastructure and Communities (BRIC) Grant Program**

Agency: Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA)

Website: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

Description: BRIC will support states, local communities, Tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. You can find more information on the BRIC program here: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities/about.

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: **Fire Management Assistance Grant (FMAG)**

Agency: FEMA

Website: https://www.fema.gov/assistance/public/fire-management-assistance

Description: The Fire Management Assistance Grant (FMAG) Program provides financial aid to states, local, and Tribal governments for mitigating, managing, and controlling fires on public or private forests and grasslands that pose a threat of major disaster. The program covers 75% of the actual costs, with the state responsible for the remaining 25%. The declaration process is rapid, with FEMA responding within hours once a state requests assistance and demonstrates that fire costs meet or exceed specific thresholds.

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: **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: **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: **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

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.

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) provides financial assistance to non-industrial private forest owners to help restore forest health after natural disasters. The program supports activities such as debris removal, tree planting, erosion control, and repairs to forest roads, fire breaks, and other critical infrastructure. To qualify, land must have had tree cover prior to the disaster and be privately owned by individuals, groups, or entities without commercial forestry operations. EFRP can cover up to 75% of restoration costs, with funding decisions managed by local FSA offices and larger projects requiring state or national approval. Landowners should contact their local FSA office for application details following a disaster.

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 Emergency Watershed Protection (EWP) Program, managed by NRCS, provides technical and financial assistance to help communities address immediate threats to life and property caused by natural disasters such as floods, wildfires, and windstorms. Assistance can be initiated without a federal or state disaster declaration if the NRCS State Conservationist identifies an emergency. Eligible sponsors include local governments, conservation districts, and federally recognized Tribes, while public and private landowners can apply through these sponsors. EWP-funded projects may involve removing debris from waterways, stabilizing eroded streambanks, repairing drainage infrastructure, restoring vegetation on damaged lands, and fixing levees or conservation structures.

Source: **Conservation Innovation Grants (CIG)**

Agency: National Resource Conservation Service

Website: https://www.nrcs.usda.gov/programs-initiatives/cig-conservation-innovation-grants

Description: The Conservation Innovation Grants (CIG) program provides competitive funding to support the development and implementation of innovative conservation practices, technologies, and approaches on agricultural and private lands. Administered by the NRCS, CIG aims to address key natural resource concerns such as soil health, water quality, wildlife habitat, and climate resilience. The program encourages creative solutions that can improve environmental outcomes while supporting agricultural productivity. Eligible applicants include non-federal entities like nonprofits, Tribes, local governments, and academic institutions. Projects funded through CIG are intended to be scalable, with the potential to benefit conservation efforts beyond the initial project site.

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: U.S. 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: U.S. 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: **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: USFS 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: **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 catalog 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
- Public Assistance Grant Program: https://www.fema.gov/assistance/public
- Hazard Mitigation Grant: https://www.fema.gov/grants/mitigation/hazard-mitigation

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 noncombustible 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**

Agency: U.S. Department of Interior and USDA

Website: http://www.forestsandrangelands.gov/

Description: Many states are using the National Fire Plan 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: **GSA-Federal Excess Personal Property**

Agency: USFS

Website: https://www.gsa.gov/

Description: The Federal Excess Personal Property (FEPP) program refers to USFS-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 USFS, 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 USFS have mutually participated in the FEPP program since 1956.

Source: **Wildland Urban Interface Grant Program**

Agency: Council of Western State Foresters/USFS

Website: https://www.westernforesters.org/wui-grants

Description: The Wildland Urban Interface (WUI) Grant Program funds state and Pacific Island government agencies/organizations to mitigate wildfire hazards in areas where wildlands meet human development. Eligible projects include fuel reduction and vegetation treatments such as fuel breaks, thinning, and prescribed burning to reduce wildfire threats to communities. These treatments can cross jurisdictional boundaries and include private lands, aiming to enhance public and firefighter safety and protect property. Additionally, the program supports prevention and education initiatives like Firewise programs, fire safety codes, and community fire safe councils. Applicants must submit proposals through their state or Pacific Island government agencies, addressing all necessary permits and success measures for implementation.

Source: **Action, Implementation, & Mitigation (AIM) Grant**

Agency: Coalitions and Collaboratives/USFS

Website: https://co-co.org/get-involved/grants/aim-grant/

Description: The AIM Program by Coalitions and Collaboratives Inc. (COCO) funds fire adaptation and wildfire risk reduction projects across the U.S., aiming to enhance community resilience and restore fire-adapted ecosystems. Grants range from $10,000 to $75,000 for one-year projects, requiring a 100% match (cash or in-kind). Eligible applicants include 501(c)(3) nonprofits, conservation districts, fire councils, fire departments, Tribal authorities, and local governments. Projects must fit into broader community wildfire strategies and coordinate with federal partners.

Source: **U.S. Endowment for Forestry and Communities**

Agency: U.S. Environmental Protection Agency, Natural Resources Conservation Service (NRCS), USFS, U.S. Department of Defense, U.S. Economic Development Agency

Website: https://www.usendowment.org/

Description: The Action, Implementation, and Mitigation (AIM) initiative funds efforts to enhance fire adaptation and reduce wildfire risk across the U.S., with grants ranging from $10,000 to $75,000 for one-year projects requiring a 100% match (cash or in-kind). Eligible applicants include nonprofits, conservation districts, fire councils, fire departments, Tribal authorities, and local governments, focusing on high-risk communities near public lands and pre-fire mitigation activities. Proposals must align with community wildfire strategies and coordinate with federal partners. Applications must be invited or submitted via Requests for Proposals (RFPs).

LOCAL AND STATE FUNDING INFORMATION

Source: **Community Catalyst Fund**

Agency: Montana Watershed Coordination Council

Website: https://www.mtwatersheds.org/funding-opportunity/community-catalyst-fund/

Description: The Community Catalyst Fund offers $335,000 in grant opportunities to advance conservation and land stewardship efforts. Supported by the Doris Duke and William and Flora Hewlett Foundations, the program is designed to strengthen partnerships rooted in community collaboration, with

an emphasis on elevating Indigenous voices. Organizations eligible to apply include Tribal governments, local agencies, conservation groups, nonprofits, fire-related entities, and academic institutions focused on supporting underserved populations and promoting climate resilience. Grant recipients will also engage in a two-year collaborative learning initiative to exchange ideas and build on project successes.

Source: **Various Funding Sources**

Agency: Montana Department of Agriculture

Website: https://agr.mt.gov/Noxious-Weeds

Description: The Montana Department of Agriculture offers several programs to combat the spread of noxious weeds, which threaten the state's ecosystems by displacing native species, increasing soil erosion, and diminishing wildlife habitats. These programs include:

- **The Noxious Weed Trust Fund Grant:** https://agr.mt.gov/News/NWTF-Grant-Applications-Now-Available-FY2024
- **Early Detection Rapid Response:** https://agr.mt.gov/Noxious-Weed-Task-Force-Program

Source: **Forest Pest Management**

Agency: Montana Department of Natural Resources and Conservation (DNRC)

Website: https://dnrc.mt.gov/Forestry/Grants/OtherGrants/Forest-Pest-Management

Description: The DNRC's Forest Pest Management Program provides sub-awards from the USFS's Western Bark Beetle Initiative to support forest treatments that reduce susceptibility to bark beetle infestations. Eligible applicants include non-federal public lands, city and county governments, and state agencies. Funded projects typically involve thinning and slash treatment to improve forest health and resilience. Funding amounts vary, with awards often around $150,000. For more information, interested parties should contact the DNRC Conservation Specialist.

Source: **Conservation District Grants**

Agency: Montana Department of Natural Resources and Conservation (DNRC)

Website: https://dnrc.mt.gov/Conservation/Grant-and-Loan-Programs/Conservation-District-Grants

Description: The DNRC offers state-funded grants to support the state's 58 conservation districts in their efforts to manage natural resources through locally led initiatives. These grants can be utilized for implementing on-the-ground conservation projects, delivering educational programs to both youth and adults, assisting landowners with innovative conservation practices, and supporting district operations. To be eligible, conservation districts must levy the maximum county mills allowed for the current fiscal year, demonstrate a need for additional funds, and engage in conservation activities identified in an annual work plan, watershed restoration plan, or district strategic plan.

Source: **Volunteer Fire Capacity (VFC) Program**

Agency: Montana Department of Natural Resources and Conservation (DNRC)

Website: https://dnrc.mt.gov/Forestry/Grants/FireGrants/Volunteer-Fire-Assistance

Description: The Volunteer Fire Capacity (VFC) Program, administered by the DNRC and funded by the USFS, offers cost-share grants to rural volunteer fire departments. These grants aim to improve training, acquire wildland personal protective equipment, enhance radio communications, and support the establishment of new fire districts. To be eligible, departments must serve communities with populations

under 10,000 and consist of at least 80% volunteer personnel. The program provides a 50% cost-share, requiring recipients to match the remaining 50% with non-federal funds.

Source: **Cooperative Fire Protection Capacity Grants**

Agency: Montana Department of Natural Resources and Conservation (DNRC)

Website: https://dnrc.mt.gov/Forestry/Grants/FireGrants/Cooperative-Fire-Protection-Capacity-Grant

Description: The DNRC offers Cooperative Fire Protection Capacity Grants to bolster the fire suppression capabilities of local governments. These grants aim to empower local firefighters to effectively manage initial wildland fire attacks, thereby reducing the necessity for extensive state or federal intervention. Eligible applicants are Montana counties that have an active Cooperative Fire Protection Agreement with the state, as specified in MCA 7-33-2202 (4b). Grant awards typically range from $10,000 to $30,000 per fiscal year, with the option for multi-year applications up to two years, contingent upon funding availability and the quality of submissions.

Source: **Montana Energy Infrastructure Resilience Grant Program**

Agency: Montana Department of Environmental Quality (MT DEQ)

Website: https://www.deq.mt.gov/energy/Programs/grid

Description: The Montana Energy Infrastructure Resilience Grant Program, administered by the Montana Department of Environmental Quality (DEQ), offers annual grants from 2022 to 2026 to strengthen the state's electrical grid against disruptions. Funded by the Bipartisan Infrastructure Law, the program supports projects aimed at reducing wildfire risks and enhancing grid reliability. Eligible initiatives include implementing fire-resistant technologies, installing fire prevention systems, undergrounding electrical equipment, managing utility poles, conducting vegetation and fuel-load management, and deploying adaptive protection technologies. Sub-grants are available to qualified entities, requiring a cost share based on electricity sales and a 15% match of the federal award.

Source: **Montana Association of Conservation Districts (MACD) Communications Assistance**

Agency: Montana Department of Natural Resources and Conservation (DNRC)

Website: https://macdnet.org/programs/communications-assistance/

Description: The Montana Association of Conservation Districts (MACD), in collaboration with the DNRC, offers a Communications Assistance Program to support the state's conservation districts. This program provides affordable website management through a multisite network and offers support for districts outside this network. Additionally, MACD's communications team delivers professional design services for various materials and assists with technological needs, including cloud storage, email, and document sharing solutions. A range of communication resources, developed in partnership with the MACD communications committee and other collaborators, is also available to enhance local outreach efforts.

Source: **The Urban Land Institute (ULI)**

Website: http://www.uli.org

Description: The Urban Land Institute (ULI) is a global, member-supported nonprofit organization dedicated to providing leadership in the responsible use of land and in creating and sustaining thriving communities worldwide. ULI offers Community Action Grants to support local initiatives that align with its

mission, such as promoting sustainable land use and enhancing urban development. These grants are available to ULI members and District Councils. For application details and to identify your local District Council, please contact or visit the ULI website.

Source: **National Forest Foundation; Innovative Finance for National Forests (IFNF) Grant Program**

Website: https://www.nationalforests.org/grant-programs/innovative-finance-for-national-forests-grant-program

Description: The Innovative Finance for National Forests (IFNF) Grant Program, a collaboration between the USFS and the U.S. Endowment for Forestry and Communities, supports the creation of novel financial models to enhance the resilience of national forests. By attracting private and public capital beyond traditional federal funding, the program aims to address challenges such as wildfire resilience, sustainable recreation infrastructure, and watershed health. Projects may include pilot initiatives, scaling of successful models, and research endeavors, all designed to deliver measurable ecological, social, and financial benefits.

Source: **Matching Awards Program**

Agency: National Forest Foundation (NFF)

Website: https://www.nationalforests.org/grant-programs/map

Description: The Matching Awards Program, managed by the National Forest Foundation (NFF), offers funding to support hands-on projects that enhance the health and sustainability of America's National Forests and Grasslands. This program operates by matching federal funds, provided through a partnership with the USFS, with non-federal contributions secured by grant recipients. Through this matching structure, MAP effectively amplifies financial resources, enabling a greater impact on stewardship and conservation efforts within the National Forest System.

Source: **U.S. Endowment for Forestry and Communities**

Agency: U.S. Environmental Protection Agency, Natural Resources Conservation Service (NRCS), USFS, U.S. Department of Defense, U.S. Economic Development Agency

Website: https://www.usendowment.org/

Description: The U.S. Endowment for Forestry and Communities provides funding to support initiatives that promote the sustainability and productivity of working forests across the nation. As a major public charity, the Endowment focuses on leveraging market-driven solutions to enhance forest health and strengthen the economic resilience of forest-dependent communities. Their funding supports projects that drive systemic, long-term change, fostering innovation in forest management, conservation practices, and community development tied to forest resources.

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: **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: **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.

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

Signature

Nicole Stephenson

Name (printed)

6/11/2025

Date

DES

Agency/Position (printed)

Signature

David E. Rickett Jr

Name (printed)

06/12/2025

Date

Fire warden

Agency/Position (printed)

Signature

Bill Hutchison

Name (printed)

6/12/2025

Date

Fire Chief

Agency/Position (printed)

Signature

Cole Stumpf

Name (printed)

13 June 2025

Date

USDA - NRCS

Agency/Position (printed)

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

Signature

Kipp J. Schwarzrock

Name (printed)

6/25/25

Date

President

Agency/Position (printed)

Signature

Mark Moehn

Name (printed)

Date

Treasure County COMMD

Agency/Position (printed)

Signature

Will Seestrom

Name (printed)

6-26-25

Date

TCSO - Sheriff - Coroner

Agency/Position (printed)

Signature

Joe Holzwarth

Name (printed)

6/24/25

Date

DNRC - Area Manager

Agency/Position (printed)