March 2020





Grant County
Community Wildfire Protection Plan

SWCA
ENVIRONMENTAL CONSULTANTS

Grant County CWPP- Community at Risk Ratings

For submission to the NM Fire Planning Task Force

The following information is presented in the CWPP in Table 3.3.

The WUI communities are arranged here in order of risk rating. The risk ratings are based upon the National Fire Protection Association, 1144 assessment protocol.

Community	CAR Rating
Fort Bayard	52 Medium
Truck Bypass Rd/American and Peaceful Valley Mobile Home Park	55 Medium
Tyrone Town Site	59 Medium
Silver Acres, Quail Ridge, Ridge Road Mobile Park	59 Medium
Hachita Town Site	60 Medium
Loma Blanca and Loma Blanca 2 Subdivision	64 Medium
Riverside	66 Medium
Cullum Estates Subdivision	66 Medium
Buckhorn	67 Medium
Cliff	69 Medium
Oakwood Estates and Oakwood Estates #2	70 High
Chisholm Ranch Subdivision	71 High
Sunrise Estates	72 High
Table Butte (Greenwood)	73 High
Mangus Terrace/Bellwood Mobile Home Park/ Gensen Mobile Home Park	73 High
Gila	76 High
Old Arenas Valley Road	78 High
Rosedale/West Peterson	79 High
Wind Canyon II and Wind Canyon Estates	81 High

Community	CAR Rating
Wagon Wheel Subdivision	82 High
Flying A Subdivision	82 High
Faywood	83 High
North Swan and Dos Griegos Subdivision	83 High
Mule Creek	84 High
Copper Ridge Subdivision	86 High
Indian Hills Subdivision	87 High
Cottage San Road	89 High
River Glen Subdivision	90 High
East Racetrack/Santa Clara	90 High
East Peterson/West Racetrack	91 High
Mangus Springs	94 High
San Juan	94 High
Lake Roberts	95 High
Pinos Altos	96 High
Lake Roberts Heights (east to Ponderosa)	96 High
Trout Valley	96 High
LS Mesa Area	97 High
Gila Hot Springs/Gila Cliff Dwellings and Visitor Center	101 High
Viva Santa Rita Subdivision	103 High
Cleveland Mine Road/ Pinos Altos Mountain Estates	104 High
Paradise Acres 1	104 High
Paradise Acres II	104 High
Mimbres Hot Springs Ranch	107 High

Community	CAR Rating
Hanover/Fierro/Santa Rita District	108 High
Pine Cienega	112 High
Owens Road	123 High
Feeley Subdivision	127 High

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EXECUTIVE SUMMARY

This Grant County Community Wildfire Protection Plan (GCCWPP) addresses hazards and risks of wildland fire throughout Grant County (hereafter referred to as the County) and makes recommendations for fuel reduction projects, public outreach and education, structural ignitability reduction, and fire response capabilities. The County comprises a diverse landscape and landownership, but a population with one common concern, the need to prepare for wildfire to reduce the risk of loss of life and property.

Community members in the County are familiar with large fires, as several have occurred in recent years. This GCCWPP has been developed to assist the County in ensuring that a catastrophic wildfire will be avoided in the future by assessing areas at risk and recommending measures to decrease that risk.

The purpose of the GCCWPP is to assist in protecting human life and reducing property loss due to wildfire throughout the County. The plan is the result of a community-wide wildland fire protection planning process and the compilation of documents, reports, and data developed by a wide array of contributors. This plan was compiled in 2019/2020 as an update to the 2015 GCCWPP. The original CWPP was developed in 2006 and updated sporadically. All versions of the GCCWPP were developed in response to the federal Healthy Forests Restoration Act (HFRA) of 2003.

The GCCWPP meets the requirements of the HFRA by:

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

A group of multi-jurisdictional agencies (federal, state, and local), organizations, and residents joined together as a Core Team to develop this CWPP Update. Many of these Core Team members had been part of the previous plan updates. Core Team members have also had many years of experience working in fire management in the County.

The planning process has served to identify many physical hazards throughout the County that could increase the threat of wildfire to communities. During development of the 2006 CWPP and subsequent updates, the public helped to identify community values that they would most like to see protected. By incorporating public and Core Team input into the recommendations, treatments are tailored specifically for the County. The GCCWPP emphasizes the importance of collaboration among multi-jurisdictional agencies in order to develop fuels mitigation treatment programs to address wildfire hazards. The County has a committed team of career and volunteer firefighters, who work arduously to protect the life and property of citizens, but without homeowners taking on some of the responsibility of reducing fire hazards in and around their own homes, these resources are severely stretched. A combination of homeowner and community awareness, public education, and agency collaboration and treatments are necessary to fully reduce wildfire risk.

A significant amount of fire mitigation work has been completed by the County and other stakeholders since the 2006 GCCWPP was completed. These actions include but are not limited to- fuel reduction work on the various public lands in the County in order to reduce the potential for catastrophic wildfire; the completion of defensible space treatments in the wildland urban interface to reduce the potential for structural ignitability; expansion of firefighting capability through the procurement of funds to purchase vital firefighting equipment to support the many fire departments throughout the county; and the

development of emergency management plans to support safe and effective evacuation of people and animals in the event of a wildfire or other emergency.

Some of the highest risk areas identified in this GCCWPP are communities located within and adjacent to the National Forest lands and the WUI. Federal and state agencies have been treating many of these areas, utilizing an active prescribed fire program and mechanical treatments. Treatments to fuels in these high hazard areas contribute to decreasing the likelihood of wildfire's negative impacts on communities in the County WUI. Additional and continued preventive activities are needed however to further reduce the negative impacts that wildland fire can have on communities and community members living in the WUI.

Communities located in grassland and shrubland areas of the County also need to prepare for fast paced wildfire spread in these fine fuels. Recommendations for improving wildfire mitigation in these communities may include focusing on actions to reduce the presence of weeds in WUI communities, encouraging residents to mow borders around their property; encouraging residents to harden their homes to potential flame impingement from fast moving grass fires; and, equipping fire departments to respond quickly to these fast-paced wildfire events.

The GCCWPP provides background information, a risk assessment, and recommendations. Unlike the original CWPP and updates, much of this background information is housed in several appendices to the main document to focus the main document on analysis and action items. Chapter 1 provides a general overview of CWPPs and describes actions that have been taken to mitigate wildfire risk since 2012, Chapter 2 presents an overview of the fire environment and specific information about fuel types, Chapter 3 describes the results of the risk assessment and summary of community risk ratings, and Chapter 4 describes the community outreach, Chapter 5 provides recommendations broken down by the 3 main goals of the National Cohesive Wildfire Strategy- Restore and Maintain Landscapes, Create Fire-Adapted Communities and Improve Wildfire Response. Recommendations outlined under each goal include action plans and monitoring strategies for implementing fuels reduction projects, reducing structural ignitability, improving fire response capabilities, and initiating public outreach and education. Chapter 6 describes monitoring strategies and details regarding implementation of actions. The plan does not require implementation of any of the recommendations, however, the message throughout this document is that the greatest fire mitigation could be achieved through the joint actions of individual homeowners and local, state, and federal governments. It is important to stress that this document is an initial step in raising public awareness and treating areas of concern and should serve as a tool in doing so.

The GCCWPP should be treated as a live document to be updated annually or immediately following a significant fire event. The plan should continue to be revised to reflect changes, modifications, or new information. These elements are essential to the success of mitigating wildfire risk throughout Grant County and will be important in maintaining the ideas and priorities of the plan and the communities in the future. Future CWPP updates should continue to engage the local Grant County community, pursuing opportunities for public meetings and community events to gather as much input as possible from those residents who are impacted by wildfire.

PREVIOUS CWPP ACCOMPLISHMENTS

The following table outlines the progress that has been made throughout the County since the 2015 Community Wildfire Protection Plan (CWPP).

Project	Date	Entity	Serves to
Structural Ignitability Projects			
County Chipper Program: working with many communities throughout the County to facilitate defensible space practices in the WUI, by providing a means through which residents can treat and dispose of green-waste. The County chipper has been used for 150 days since 2015.	2015–onward	County	Address hazardous fuels and structural ignitability
Silver City Chipper Program- working with residents to facilitate defensible space practices in the WUI, by providing a means through which residents can treat and dispose of green-waste.	2015–onward	Silver City	Address hazardous fuels and structural ignitability
Fire Response Projects			
Secured funding for communication equipment improvements for emergency response and dispatch (repeaters and radio antennas)	2015–onward	County	Improve emergency communications and enhance fire-fighting response
ISO rating improvements: Tyrone, Ft Bayard, Whiskey Creek, Pinos Altos, and Santa Rita have all improved their ISO ratings since 2015.	2015–onward	County	
The County has been working with ranchers to identify water drafting sites on private lands	2015–current	County and Private Landowners	Enhance fire-fighting capacity and reduce response times.
The County has been working with ranchers to identify strategic grazing practices that will reduce fine fuels and wildfire hazard.	2015–current	County	Reduce hazardous fuel conditions and restore grassland health and resiliency.
State Forestry has been working with private land owners on some pre-planning projects for wildfire mitigation.	2015–current	State Forestry	Reduce wildfire hazards and improve wildfire response on private lands.
Public Education and Outreach Projects			
Firewise Days - Dos Griegos community work day. Wind Canyon holds a community work day every May. A fire service day is also held in May to recognize all fire personal.	2015–current	County, multi-stakeholder, public	Engages the public in fire prevention activities and serves to reduce structural ignitability in the WUI.

Project	Date	Entity	Serves to
Firewise certification- Rocky Creek and Dos Griegos received Firewise certification.	2015–current	Public	Raises the profile of fire prevention activities, provides guidance for homeowners.
The Forest Service host an annual spring work day focused on the Forest Service WUI.	2015–current	U.S. Forest Service	Increase awareness of fire prevention and landowner responsibility for defensible space actions.
Silver City has hosted two State WUI conferences which help to draw agency personnel and specialists to the area and build support for fire prevention activities in the County.	2015–current	Multi-Stakeholder	Raise awareness of Grant County WUI issues and raise profile of WUI hazardous fuels actions in the Gila National Forest region.
Water Improvements- The Upper Mimbres VFD, Hachita VFD, Hanover VFD and Lower Mimbres VFD have all installed water storage tanks at their stations.	2015–current	County	Show actions have been made to enhance fire response capabilities. Reduces risks for residents.
Upper Mimbres Watershed CFRP Project - Wilderness Ranger District of the Gila National Forest and the Gattons Park WUI	2015–current	Multi-Stakeholder	Address hazardous fuels and build collaborative capacity for forest restoration on the Gila National Forest
Completed Fuel Treatments:			
Gila National Forest- various fuels treatments have been completed since 2015 including prescribed fire, managed wildfire for resource benefit, chemical and mechanical treatment. Fuel treatments on the National Forest are guided by the Forest Plan. According to available data, since 2015, 42,615 acres have received treatment, this may include retreatments on the same acres using various methods- i.e. mechanical thinning followed by prescribed fire). (See Chapter 4 of the CWPP for fuel treatment mapping).	2015–current	USFS	Reduce hazardous fuel conditions and restore forest health and resiliency
BLM: various fuel treatments have been completed since 2015 including mechanical, chemical and prescribed fire treatments. According to available data, since 2015, 12,271 acres have been treated. (See Chapter 4 of the CWPP for fuel treatment mapping).	2015–current	BLM	Reduce hazardous fuel conditions and restore forest health and resiliency
NM State Land Office mechanical treatments since 2015 have totaled 138 acres (See Chapter 4 of the CWPP for fuel treatment mapping).	2015–current	NMSLO	Reduce hazardous fuel conditions and restore forest health and resiliency

Project	Date	Entity	Serves to
Private: various fuel treatments have been completed since 2015 mostly focused on mechanical treatment methods. According to available data, since 2015, 4,965 acres have been treated (See Chapter 4 of the CWPP for fuel treatment mapping).	2015–current	Private	Reduce hazardous fuel conditions and restore forest health and resiliency

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ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
BAER	Burned Area Emergency Rehabilitation
BLM	Bureau of Land Management
CAR	community at risk
Cohesive Strategy	National Cohesive Wildland Fire Management Strategy
CVAR	Community Value at Risk
CWPP	Community Wildfire Protection Plan
EMNRD	New Mexico Energy, Minerals, and Natural Resources Department
EQIP	Environmental Quality Incentives Program
FEMA	Federal Emergency Management Agency
FMP	Fire Management Plan
Forest Plan	Gila National Forest Land and Resource Management Plan
FR	Fire Regime
FRI	fire-return interval
GIS	geographic information system
gpm	gallons per minute
GPS	global positioning system
GCCWPP	Grant County Community Wildfire Protection Plan
HFRA	Healthy Forests Restoration Act
HMP	Hazard Mitigation Plan
HIZ	home ignition zone
IBHS	Insurance Institute for Business and Home Safety
ICC	International Code Council
MAA	Mutual Aid Agreements
NEPA	National Environmental Policy Act
NFP	National Fire Plan
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NMSF	New Mexico State Forestry Division
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWCG	National Wildfire Coordinating Group

PPE	personal protective equipment
ROW	right-of-way
SAF	Society for American Foresters
SWCA	SWCA Environmental Consultants
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFS	U.S. Forest Service
VFD	volunteer fire department
WUI	wildland urban interface

CHAPTER 1 – INTRODUCTION

Every year, the U.S. news media report on the tragic impacts of wildfire on local communities. As wildfire severity 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.

In October 2006, Grant County (the County) completed its first CWPP, which was updated in 2009 and again in 2015. The development of the County CWPP has included meaningful collaboration among many local stakeholders including local, state and federal officials, and other interested parties such as non-governmental stakeholders and private citizens. Much of the information brought forward from 2009 and 2015 is still current and reflects the current concerns and issues expressed by the public. In 2014, the Town of Silver City developed the Silver City and Extraterritorial Zone CWPP, which has been adapted since then to focus within the city limits of Silver City. The Silver City CWPP is incorporated into this countywide CWPP be reference, with the long-term goal that the two plans become integrated during the next round of CWPP updates.

This document, hereinafter known as the “2020 Update of the Grant County CWPP” (GCCWPP) reviews, verifies, and/or identifies potential new priority areas where mitigation measures are needed to protect from wildfire the irreplaceable life, property, and critical infrastructure in the County. This 2020 CWPP reviews and presents potential treatments for mitigation of wildfire related risks in the priority areas but 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. With the responsibility for implementing wildfire mitigation treatments being totally at the discretion of the landowner, the 2020 GCCWPP will only identify potential treatments and a suggested priority for these projects. It is the intent of this 2020 GCCWPP to provide a countywide scale of wildfire risk and protection needs and then bring together all of the responsible wildfire management and suppression entities in the County to address the identified needs and to support these entities in planning and implementing the necessary mitigation measures.

This CWPP update 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. This update process identifies the current local wildfire risks and needs that occur in the County. There is a tremendous amount of information available concerning general fire risks throughout the West; therefore, this CWPP recognizes this wealth of information but is focused more toward the conditions and actual on-the-ground situation that occurs in the County.

The plan provides background information, a risk assessment, and recommendations to reduce or mitigate wildfire risk to communities. Chapter 1 provides an overview of CWPPs and describes the need for a plan; Chapter 2 gives an overview of the fire environment; Chapter 3 describes the methodology for the risk assessment and the results in detail; Chapter 4 describes the community outreach undertaken to inform the CWPP; Chapter 5 outlines the mitigation strategies that could be implemented to reduce wildfire risk under the umbrella of the National Cohesive Strategy, including action plans that outline priorities and recommendations for reducing fuels, initiating public education and outreach, reducing structural ignitability, and improving fire response capabilities; and Chapter 6 provides suggested approaches to monitoring actions. The GCCWPP does not require implementation of any of the recommendations; however, these recommendations may be used as guidelines for the implementation process if funding opportunities become available. The recommendations for fuels reduction projects are general in nature; site-specific planning that addresses location, access, land ownership, topography, soils, and fuels would need to be employed upon implementation. Also, it is important to note that the recommendations are specific to wildland urban interface (WUI) areas and are expected to reduce the loss of life and property.

In developing the GCCWPP, a large amount of background information on the County is compiled and analyzed, including location and land use data, climate and weather data, baseline vegetation data, historic conditions, population, and demographics. This information is presented in Appendix A, Community Background.

Additional appendices to this CWPP include maps in Appendix B; the Core Team contact list in Appendix C; community descriptions and hazard ratings in Appendix D; the Wildfire Fire Risk and Hazard Severity Form NFPA 1144 in Appendix E; funding opportunities in Appendix F; a homeowner's guide in Appendix G; and the County Evacuation Plan in Appendix H.

OVERVIEW OF COMMUNITY WILDFIRE PROTECTION PLANS

In response to a landmark fire season in 2000, the National Fire Plan (NFP) was established to develop a collaborative approach among various governmental agencies to actively respond to severe wildland fires and ensure sufficient firefighting capacity for the future. The NFP was followed by a report in 2001, entitled *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-year Comprehensive Strategy*, which was updated in 2002 to include an implementation plan. This plan was updated once more in 2006, with a similar focus on using a collaborative framework for restoring fire-adapted ecosystems, reducing hazardous fuels, mitigating risks to communities, providing economic benefits, and improving fire prevention and suppression strategies. The 2006 implementation plan also emphasizes information sharing and monitoring of accomplishments and forest conditions, a long-term commitment to maintaining the essential resources for implementation, a landscape-level vision for restoration of fire-adapted ecosystems, the importance of using fire as a management tool, and continued improvements to collaboration efforts (Forests and Rangelands 2006). Progress reports and lessons learned reports for community fire prevention are provided annually.

In 2003, the U.S. Congress recognized widespread declining forest health by passing the Healthy Forests Restoration Act (HFRA), and President Bush signed the act into law (Public Law 108–148, 2003). The HFRA was revised in 2009 to address changes to funding and provide a renewed focus on wildfire mitigation (H.R. 4233 - Healthy Forest Restoration Amendments Act of 2009). The HFRA expedites the development and implementation of hazardous fuels reduction projects on federal land and emphasizes the need for federal agencies to work collaboratively with communities. A key component of the HFRA is the development of CWPPs, which facilitates the collaboration between federal agencies and communities in order to develop hazardous fuels reduction projects and place priority on treatment areas identified by communities in a CWPP. A CWPP also allows communities to establish their own definition of the WUI, which is used to delineate priority areas for treatment. In addition, priority is placed upon municipal watersheds, critical wildlife habitat, and areas impacted by wind throw, insects, and disease. Communities with an established CWPP are given priority for funding of hazardous fuels reduction projects carried out in accordance with the HFRA.

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

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

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

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

Like the 2014 national strategy, the NFP, state fire plans, the 10-year comprehensive strategy, and the Federal Emergency Management Agency (FEMA) Disaster Mitigation Act of 2000 all mandate community-based planning efforts with full stakeholder participation, coordination, project identification, prioritization, funding review, and multi-agency cooperation. In compliance with Title 1 of the HFRA, a CWPP must be mutually agreed upon by the local government, local fire departments, and the state agency responsible for forest management (New Mexico State Forestry Division [NMSF]). As outlined in HFRA, this CWPP is developed in consultation with interested parties and the federal agencies managing land surrounding the at-risk communities.

GOAL OF A COMMUNITY WILDFIRE PROTECTION PLAN

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

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

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

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

The GCCWPP addresses all the requirements for completion of a CWPP outlined in the HFRA. In addition to the overarching goals outlined above, the Core Team reviewed the 2015 CWPP goals and revised them to include:

- Prevent loss of life and injury to local citizens, visitors and firefighters.
- Prevent destruction of property.

- Preserve and restore the beneficial functions of the ecosystems and watersheds that make up the County.
- Reduce the risk of future large catastrophic wildfires while providing the conditions where natural fire events can again be part of the landscape.
- Promote the use of forest products and forest related recreation and tourism to enhance the economy of the County.
- Educate citizens and local businesses on the role they can play in making their property safe from wildfire. Identify and recruit communities in high priority areas for certification as Firewise Communities.
- Educate the public of the role wildfire plays in managing the ecosystems and watersheds that make up the County.
- Identify and catalogue funding opportunities to support additional hazardous fuel treatments and other wildfire mitigation actions.
- Seek strategies and methods to enhance recruitment and retention of volunteer and career fire firefighters.
- Seek strategies to address communication issues specifically related to interagency communications during wildfire suppression actions.
- Enhance water infrastructure for fire suppression purposes.
- Enhance wildfire response on private ranchland.

In order to achieve the above goals the following tasks need to be accomplished:

- Identify wildland fire risk and prioritize mitigation treatments in the County using an adaptive management and on-going process.
- Provide for the maintenance of completed projects in order to preserve attained benefits.
- Promote utilization of forest products generated by mitigation treatments to make the various treatments more economically feasible and to aid the local economy.
- Encourage and involve all stakeholders and other interests in the protection and treatment of their lands in order to make their communities a safer place to live and the County's ecosystems and watersheds healthy and providing for the needs of the local citizens.

ALIGNMENT WITH THE NATIONAL COHESIVE STRATEGY

As part of the 2020 update to the CWPP, the plan has been aligned with the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) and its Phase III Western Regional Action Plan by adhering to the nation-wide goal "*To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire*." (National Strategy 2014:3).

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

Restore and maintain landscapes: Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.

Fire-adapted communities: Human populations and infrastructure can withstand a wildfire without loss of life and property.

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/strategy/documents/strategy/CSPhaseIIINationalStrategyApr2014.pdf

Alignment with these Cohesive Strategy goals is described in more detail in Chapter 5, Mitigation Strategies.

PLANNING PROCESS

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

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 Assessment. Work with partners to develop a community risk assessment that considers fuel hazards; risk of wildfire occurrence; homes, businesses, and essential infrastructure at risk; other Community Values at Risk (CVARs); 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 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.

CORE TEAM

In 2006, 2009, and 2015, representatives from various government agencies—along with members of fire departments and local communities—formed a Core Team and participated in decision-making activities that led to the development of the original Grant County CWPP. Some of the members of the original Core Team were joined by new stakeholders and convened to provide input on this 2020 CWPP update. Stakeholder involvement is critical in producing a meaningful document that included all collaborators'

diverse perspectives. The Core Team drives the planning process in its decision making, data sharing, experience, and communication with community members who are not on the Core Team. The group met for the first time on September 12, 2019, and the final meeting was held on January 8, 2020.

Engaging interested parties is critical in the CWPP process because substantive input from the public will ensure that the final document reflects the highest priorities of the local community. Information on public outreach used in the development of the CWPP is provided in Chapter 4, Community Outreach. The Core Team List is provided in Appendix C.

PROJECT AREA

The project area includes all of Grant County as delineated by its geographic and political boundaries. The project boundary encompasses several municipalities. The largest municipal area is the county seat of Silver City. Silver City developed its own CWPP in 2015, which is currently undergoing revision. The Silver City CWPP provides more detailed assessment of the Silver City WUI and fire response capabilities. The areas of highest wildfire risk in Silver City are found on the margins of the City Limits, extending into the Extra-Territorial Zone (ETZ). The Silver City Fire Department provide response within the ETZ. The Silver City CWPP is hereby incorporated by reference. The Core Team would like to integrate the Silver City CWPP into the County CWPP during the next 5-year update.

Other communities in the County include Harden Cienega, Mule Creek, Buckhorn, Cliff, Gila, Little Walnut Village, Pinos Altos, Tyrone, Fort Bayard, Hanover, North Hurley, Hurley, Mimbres, San Lorenzo, and San Juan (Figure 1.1).

LAND OWNERSHIP

Grant County has varied landownership, including large areas of U.S. Forest Service (USFS) Gila National Forest, USFS Wilderness Areas, Bureau of Land Management (BLM), National Park Service (NPS), state, and private land (Figure 1.2).

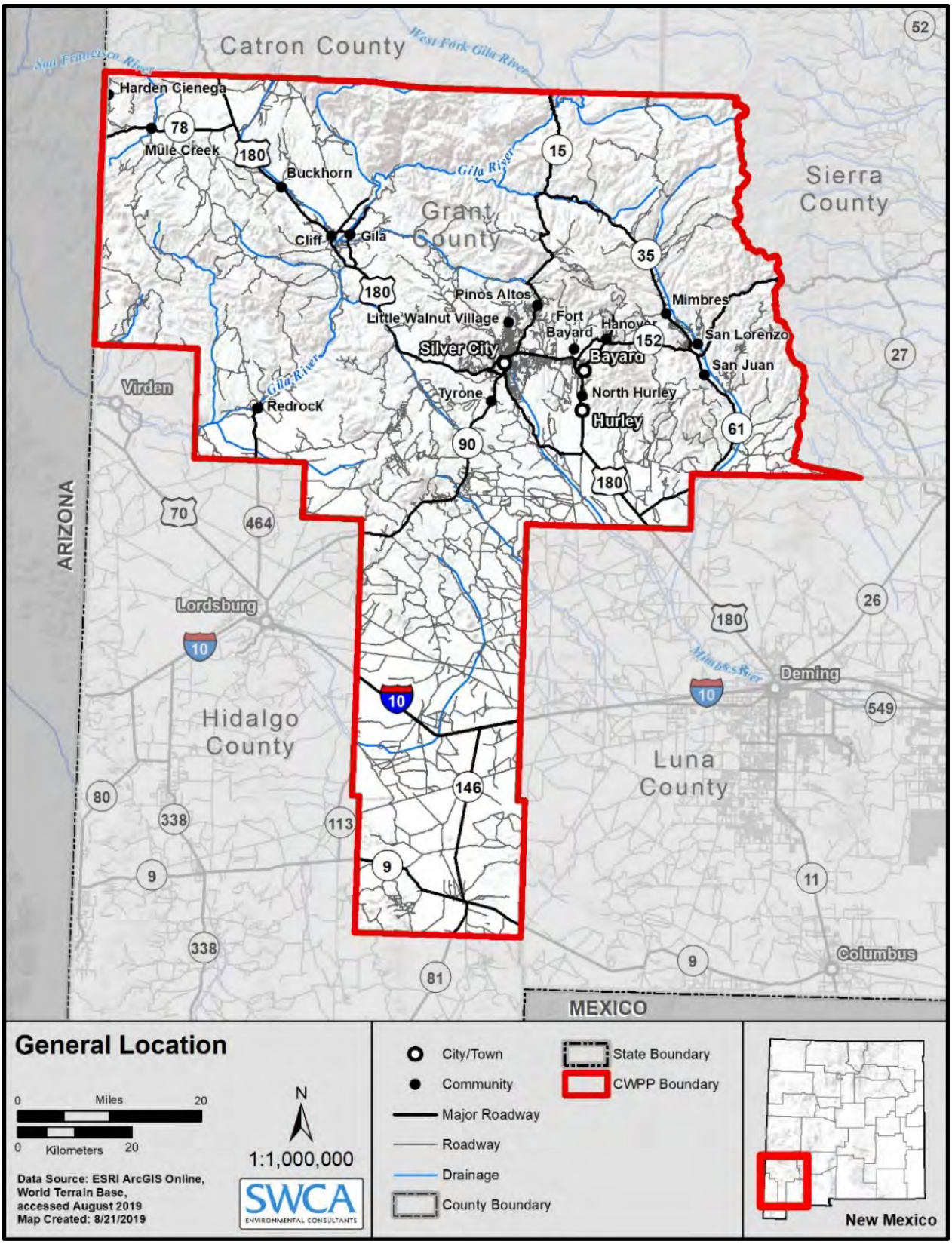

Figure 1.1. Grant County CWPP general location.

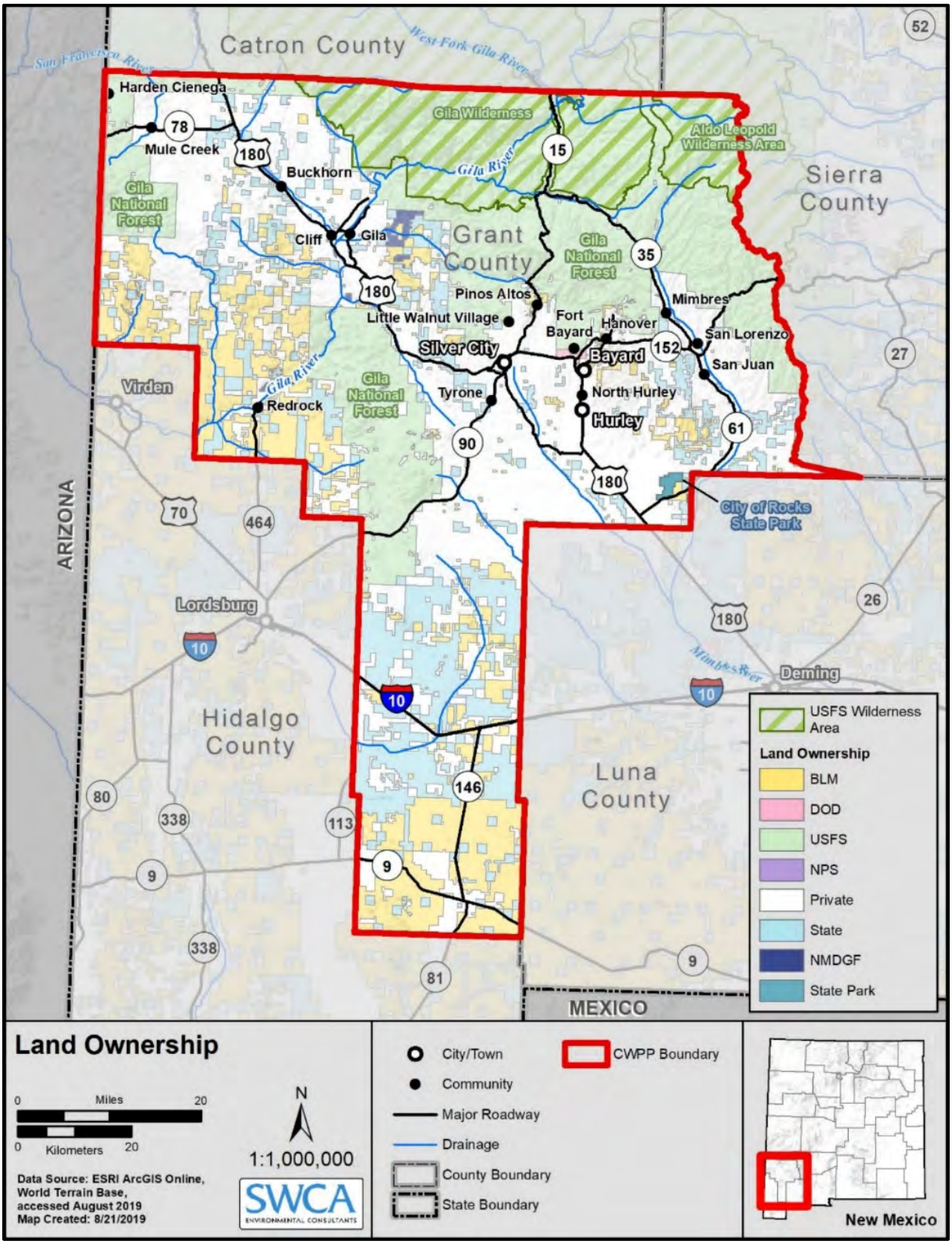

Figure 1.2. Grant County landownership.

PUBLIC INVOLVEMENT

Engaging interested parties is critical in the CWPP process; substantive input from the public will ensure that the final document reflects the highest priorities of the local community. A key element in the CWPP process is the meaningful discussions it generates among community members regarding their priorities for local fire protection and forest management (SAF 2004). Public meetings were convened regularly, during the development of the original CWPP and CWPP updates. Meetings were held around the county between June 1 and June 16, 2005, and again March 28 to April 2, 2009, to collect ideas and suggestions from the public for use in the CWPP. These meetings were to educate the public about the CWPP process and to identify a clear understanding of what the citizens of the County felt was important to be included in the GCCWPP.

Each meeting followed the same outline. A presentation was given to inform the attendees of the purpose of the CWPP. A "Question & Answer" session was conducted, and then the group was asked for their input. This was accomplished through a series of three questions:

- What and where are your interests that would be threatened by a wildfire?
- How would you rate those interests for importance in determining priorities?
- What should be done to reduce or mitigate the wildfire threat to your interests?

The items, ideas, and suggestions collected were rated according to the group's priorities. By studying the data, it was possible to identify the individual projects suggested and recognize the common areas of interest. The top ranked item in 2005 was the support and funding of the local volunteer fire departments (VFDs).

Figure 1.3. Residents meet at Sapillo Creek Fire Department to discuss CWPP priorities in 2005.

Meetings in 2009, which reflected on accomplishments since the CWPP was implemented, reiterated the need for VFD support, and reflected a heightened desire for county and municipal plans and ordinances to include fire protection provisions. Local residents in 2009 again recognized these as the important lines of defense in wildland fire protection and long-term prevention.

Figure 1.4. Tyrone residents rank CWPP priorities in 2009.

In 2020, the public was convened again to solicit their input in the CWPP Update. The meeting was held on January 7 in Silver City, and attendees were invited to share their thoughts and concerns regarding wildfire risk and hazard during that meeting. The 2020 public outreach is discussed in Chapter 4, Community Outreach.

Along with "Wildfire Mitigation," the public has voiced many other concerns dealing with fire prevention and suppression in the County. Some of these key concerns are:

1. VFD support and funding
2. Fireworks and burning on private land
3. Fuel treatment along highway rights-of-way
4. Protecting critical watersheds
5. Protecting critical infrastructure
6. Forest products utilization and marketing
7. Treatment of structural ignitability - building material requirements
8. Fire prevention and safety education and training

While most of these concerns are not tied specifically to WUI areas, they do represent issues that deal with public safety and the general well-being of the public. Most of these concerns have been addressed in the past but still require the attention of the federal, state, or local governments. Some of these concerns may not be best addressed in the County CWPP but are addressed in other federal, state, or county plans.

VFD Support and Funding: It has been acknowledged by the County CWPP Core Team that the public does show significant support for equipping and maintaining the VFDs, and that the public does feel that both the federal and the local governments have a major role in providing for public safety, especially when dealing with any type of fire burning in or near their communities.

Along with the support and funding of the VFDs, some of the items noted from the discussions at the meetings to update the Grant County CWPP are that better communications, hazard awareness, and county-wide emergency preparation planning are considered as key measures necessary for the protection of the public when they are threatened by catastrophic wildfire events. Also, it is noted that while reducing the threat of wildfire and the protection of homes was very important to the public, many

people associated themselves more with fire suppression needs and activities than with fire prevention and mitigation measures. This response from the public should not in any way reduce the efforts to prevent and mitigate wildfire effects in the County.

Protecting Critical Watersheds: This concern, while possibly tied to WUI areas and the reduction of risk of wildfire to communities is something that would be better addressed in landscape scale plans such as the Gila National Forest, Forest Plan or the Las Cruces District of the BLM, Resource Management Plan. Currently there is no avenue to implement a watershed-scale fuels treatment plan on private land without having all landowners involved in the watershed onboard with doing fuel treatment projects on their property.

Protecting Critical Infrastructure: The protection of critical infrastructure such as power lines and communication sites has been addressed in the County CWPP in the past, but this effort only dealt with protection of these critical structures from damage due to wildfire. As the risk to these critical features from terrorism is becoming more evident, the public may be better served if an independent "Critical Infrastructure Protection Plan" that addressed all threats to these critical structures is developed and implemented.

Forest Products Utilization and Marketing: The utilization and marketing of forest (wood) products has been addressed in detail in the County CWPP in the past. While these efforts have had some success in developing a use for the biomass (wood) produced as the result of fuel reduction efforts in the County, there is much more that could be done to make the by-products of fuel reduction projects marketable. A separate "Forest Product Utilization and Marketing Plan" for the Grant County area, which could be funded by various grant funding opportunities should be explored.

Treatment of Structural Ignitability - Building Material Requirements: Structure ignitability and the use of non-combustible building materials is addressed in the "Firewise" program that is currently being used by the federal, state and local agencies to educate and communicate with the public. It is not known how the public in the County would react to attempts to make building with specific non-combustible material mandatory through a county ordinance. Before any such attempt is made, the education of the public concerning the need for non-combustible building materials should be implemented and conducted in a more organized manner. The Forest Service are currently working with home construction professionals to discuss building material options prior to the start of construction. The same is true for subdivision planning.

Fire Prevention and Wildfire Safety Education and Training: Wildfire public education and information sharing was a high priority for the residents of the County in 2005, 2009 and 2015. There have been many efforts to implement and continue public education during the entire time the County CWPP has been in effect. Most of these efforts have been carried out independently by the various federal, state and local agencies and the fire departments. These efforts have been relatively successful but may be made more effective if there is a collaborative effort among all of the agencies and fire departments involved in these kind of efforts.

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CHAPTER 2 – FIRE ENVIRONMENT

WILDLAND URBAN INTERFACE

The 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 [USDI] 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 and consist of less than 50% vegetation. Intermix areas are those areas where structures are scattered throughout a wildland area of greater than 50% continuous vegetation and fuels and meet or exceed a minimum of one house per 40 acres. Depending on the surrounding fuel conditions, topography, and present structures, wildland areas of up to 1.5 miles from structures may be included in the WUI (Stewart et al. 2007).

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 country as a whole, which is having a significant influence on wildland fire management practices. Combined with the collective effects of aggressive suppression policies, resource management practices, land use patterns, climate change, and insect and disease infestations, the expansion of the WUI into areas with high fire risk 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 and Ruth 2005). Mitigation techniques for fuels and fire management can be strategically planned and implemented in WUI areas; for example, with the development of defensible space around homes and structures (Figures 2.1 and 2.2).

Figure 2.1. Example of the WUI in Grant County near Mimbres.

Figure 2.2. Example of the WUI in Grant County north of Silver City.

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

In development of this update, the Core Team reviewed the existing WUI delineation for the County to ensure that the WUI properly represented those communities that interface with wildland fuels. The Core Team determined that the previous WUI delineation did not fully capture those interface areas and therefore decided to re-delineate the WUI based upon a 0.5-mile buffer around communities and Tier 1 roads. The WUI was also expanded to accommodate a WUI area that was delineated as part of the Upper Mimbres EA (Figure 2.3).

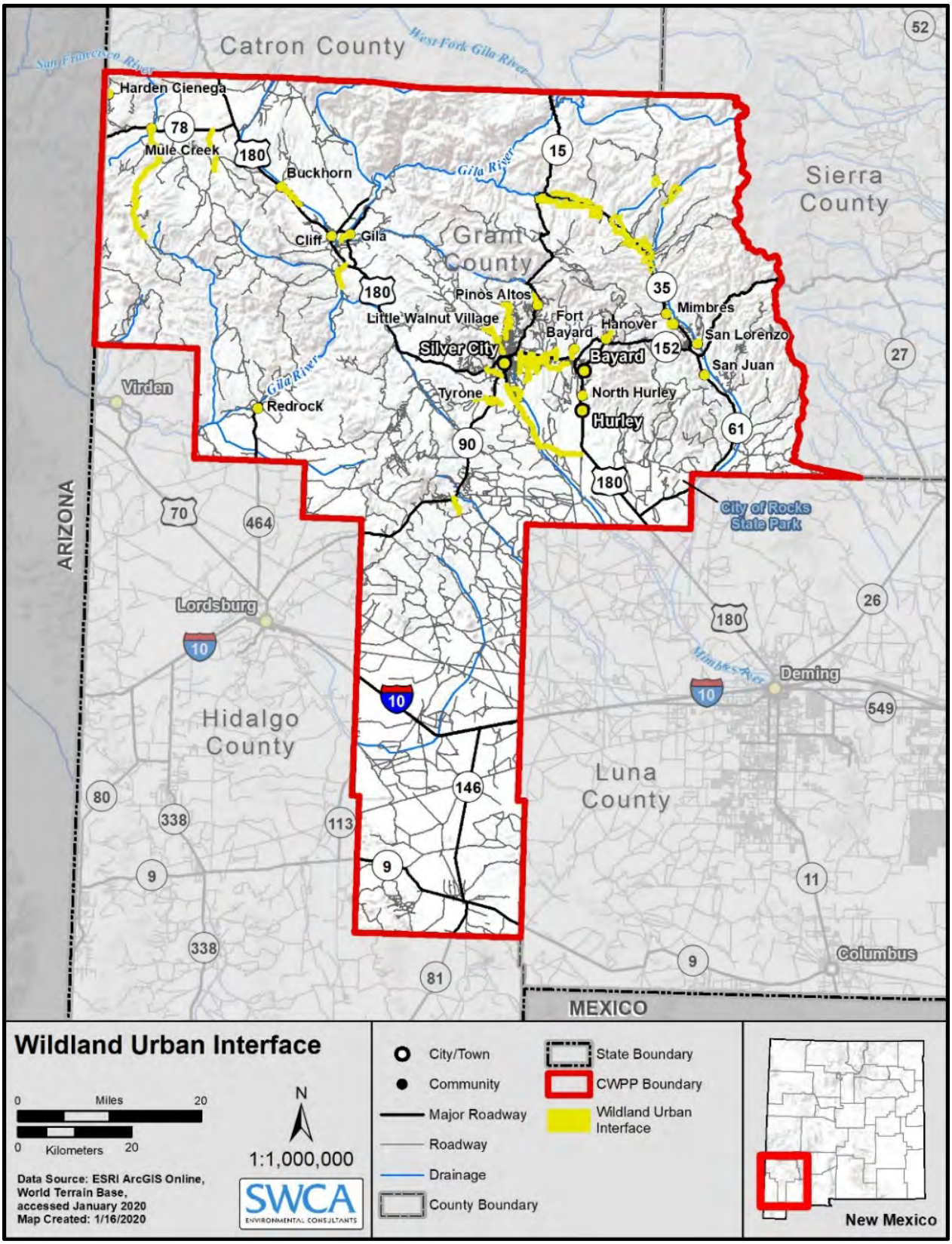

Figure 2.3. WUI delineation for Grant County.

New Mexico State Forestry Division is currently in the process of updating the Forest Action plan (FAP) for the years 2020-2030; to be finalized in the summer of 2020. The FAP WUI layer, and perhaps other layers, should be considered for incorporation into the CWPP and risk assessment during the annual review and subsequent updates. The FAP WUI layer was developed using actual asset locations for risk assessments (buildings, roads, etc.). This layer may also include communication towers (for example in the area of the Burro Mountains), that were identified as a value at risk during the CWPP public review period. All data layers will be available through NM State Forestry.

FIRE HISTORY

Prior to European settlement, Native Americans used fire as a tool to open land for agriculture, hunting, or travel; to drive game for hunting; to promote desirable post-fire herbaceous vegetation; or to manage the land for habitat protection and resource use (Scurlock 1998). As a result, human-caused fires are considered one component of the historical fire regime in the Southwest.

Research has indicated that these burning activities were focused around areas that were inhabited and took place primarily in localized regions during certain time periods across the Southwest; however, the specific influence that Native Americans had on historical fire regimes remains uncertain (Kaye and Swetnam 1999).

PAST FIRE MANAGEMENT POLICIES AND LAND MANAGEMENT ACTIONS

A number of factors have combined over the last 120 years to change forest structure, understory and overstory composition, fuel biomass conditions, and historical fire regimes (Cram et al. 2006). Increased settlement, logging practices and heavy grazing (Baker and Shinneman 2004, Savage and Swetnam 1990) have all been identified as contributing factors (Cram et al. 2006; Kaye and Swetnam 1999). Some species of non-native vegetation were also introduced during that time period and eventually invaded many native landscapes across the West, subsequently altering natural fire-disturbance processes.

Beginning in the early 1900s, the policy for handling wildland fire leaned heavily toward suppression. Over the years other agencies, such as the BLM, the Bureau of Indian Affairs, and the NPS, have followed the lead of the USFS and adopted fire suppression as the proper means for protecting the nation from wildfire. As a result, many areas now have excessive fuel buildups, dense and continuous vegetative cover, and tree and shrub encroachment into open grasslands.

Significant research on forest restoration and historic fire regimes in southwest forest types, has been completed for the region. [1, 2] While much of this literature is applicable across the County, locally derived research should also be utilized by agencies in developing specific prescriptions for the Grant County landscape.

FIRE REGIMES

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

Fire Regime Classifications

A natural, or historical, fire regime is a general classification describing the role fire would play throughout a landscape in the absence of modern human intervention but includes the influence of burning by Native American groups (Agee 1993; Brown 1995; Hann et al. 2008).

[1] https://eri.nau.edu/

[2] https://nmfwri.org/

Fire regime (FR) classes are based on the average number of years between fires (also known as fire frequency or fire return interval) combined with the severity (i.e., the amount of vegetation replacement) of the fire and its effect on the dominant overstory vegetation (Hann et al. 2008).

The five FR classes are:

FR I: Frequency of 0 to 35 years and low (mostly surface fires) to mixed severity (less than 75% of the dominant overstory vegetation is replaced).

FR II: Frequency of 0 to 35 years and high severity (more than 75% of the dominant overstory vegetation is replaced).

FR III: Frequency of 35 to 200+ years and mixed severity (less than 75% of the dominant overstory vegetation is replaced).

FR IV: Frequency of 35 to 200+ years and high severity (more than 75% of the dominant overstory vegetation is replaced).

FR V: Frequency of 200+ years and high severity (more than 75% of the dominant overstory vegetation is replaced).

There are thought to be widespread deviations from the historic fire regime for most vegetation types in the County.

Ponderosa Pine Forest

Early records from the 1800s describe the ponderosa pine–dominated forest as more open, with little downed woody material. Groundcover was a continuous grass savannah, with the grasses stopping active growth and drying out during the dry periods of May and June, which made them more prone to burn. The accumulated leaf biomass of several fire-free years along with the dry grass provided the fine fuels to carry low-intensity ground fires (Figure 2.4) that removed the excess of newly sprouted and young trees while doing little damage to the older, more fire-resistant trees and shrubs. The grasses recovered quickly with the arrival of summer monsoon moisture and would complete their entire growth cycle prior to the colder fall weather.

Figure 2.4. An example of a low-intensity wildfire burning in the ponderosa pine/oak vegetative community.

Tree ring analysis of historic burn scars found in relic old growth trees has been used to estimate fire frequencies within the stands of ponderosa pine in the Southwest. The mean fire-return interval (FRI) for ponderosa pine forest in this area, was 7 to 11 years (USFS 2015) years. Generally, estimates of FRI in ponderosa pine forests range from a minimum of about 2 years to a maximum of nearly 40 years, and many studies agree that fires were frequent and generally of low-severity (Cooper 1960; Covington and Moore 1994). Stand-replacement crown fires were not common and were typically confined to stands of younger age class trees that had not burned when they occurred. Because of these frequent fire events, it is believed that the species of plants and animals within this vegetation type have evolved with fire.

The majority of fires occurred in late spring and early summer, before the onset of the summer monsoons (Hunter et al. 2007). Local deviations from this general rule are also recorded (Hunter et al. 2007), and on a landscape scale a mixture of open woodlands, meadows, and more dense forests are typical of this forest type (Savage 1991). The effects of fire exclusion on forest structure are thought to be most profound in forests that previously sustained frequent, low-intensity surface fires (Westerling et al. 2006), and it is likely that fire exclusion was a primary cause of departure from historical conditions in ponderosa pine forests. For the most part, frequent fire consumed fuels on the ground surface and culled young trees to maintain an uneven age distribution and mosaic pattern throughout the forest (Allen et al. 2002). Frequent fire disturbance maintained an open, park-like forest structure with canopy openings and an abundant herbaceous and shrubby understory (Cooper 1960; Weaver 1947). More than a century of fire suppression has resulted in dense overcrowded forests throughout the region, with ponderosa stands that used to support 50 to 200 trees now a tangle of 2,000 trees per acre (USFS 2015).

Mixed Conifer

Often, forest patches affected by low- and high-severity fire are closely juxtaposed in a transition zone made up of a forest type known as mixed conifer (Fulé et al. 2003). Fire histories in mixed conifer forests vary with forest composition, landscape characteristics, and human intervention, but tend to exhibit mixed-severity fire regimes, with both low-intensity surface fires and patchy crown fires (Touchan et al. 1996). Mixed-severity fire regimes are the most complex fire regimes in the western United States (Agee 1998) because of their extreme variability (Agee 2005).

A mixed-severity fire regime exists where the typical fire, or combination of fires over time, results in a complex mix of patches of different severity, including unburned, low severity, moderate severity, and high severity (Agee 2003).

Ponderosa pine was once co-dominant in many mixed conifer forests with relatively open stand structures, but fire suppression has allowed the development of dense sapling understories, with regeneration dominated by the more fire-sensitive Douglas fir, white fir, and Engelmann spruce. Forest stand inventory data from Arizona and New Mexico show an 81% increase in the area of mixed conifer forests between 1962 and 1986 (Fitzhugh et al. 1987;). Herbaceous understories have been reduced by denser canopies and needle litter, and nutrient cycles have been disrupted. Heavy surface fuels and a vertically continuous ladder of dead branches have developed, resulting in increased risks of crown fires (Touchan et al. 1996).

Subalpine coniferous forests that occur at higher elevations in the County (see Figure A.7 in Appendix A) tend to exhibit high densities, high basal areas, continuous canopy cover, and increased woody debris relative to montane coniferous forest. These forest characteristics naturally support high-intensity and severe stand-replacing fires (Fulé et al. 2003) and an infrequent fire regime. Approximately 80% or more of the aboveground vegetation is either consumed or dies as a result of such fire.

Piñon-Juniper Woodlands

Piñon-juniper woodlands are some of the most poorly understood ecosystems in terms of fire regimes, but recent research suggests that fire may have been a less-common and less-important disturbance agent in piñon-juniper woodlands compared with adjacent ponderosa pine and grassland ecosystems. In a 2007 review of piñon-juniper disturbance regimes, Romme et al. (2007) subdivided the piñon-juniper cover type into three subtypes: areas of potential woodland expansion and contraction, piñon-juniper savannas, and persistent woodlands. These categories are helpful in separating the broad piñon-juniper cover type into distinct communities, which are subject to different climatic, topographic, and disturbance conditions.

Many grasslands in the Southwest have been colonized by trees as a result of a complex interplay of environmental factors. The issue of woodland encroachment into grasslands goes hand in hand with the assessment of historical conditions of the woodlands. Areas of potential expansion and contraction are those zones wherein the boundaries of the piñon-juniper ecotones have shifted. These shifting boundaries have been widely documented (e.g., Gottfried 2004), but the historical condition of the ecosystem may be relative to the time scale of evaluation. Betancourt (1987) has suggested that the changing distribution patterns seen in the last century may be part of larger trends that have occurred over millennia and not the result of land use changes. Overall, it is believed that greater landscape heterogeneity existed previously in many of these areas that are now uniformly covered with relatively young trees (Romme et al. 2007).

Piñon-juniper savannas are found on lower elevation sites with deep soils where most of precipitation comes during the summer monsoon season. Juniper savanna, the most common savanna in New Mexico, consists of widely scattered trees in a grass matrix (Dick-Peddie 1993) (Figure 2.5). Similar to grasslands, the range of savannas has decreased as tree density has increased, but the mechanisms for the tree expansion are complex and the subject of current research. Significant scientific debate currently exists over the natural FRI for savannas, but most experts agree that fire was more frequent in savannas than in persistent woodlands.

Figure 2.5. Juniper communities in Grant County.

Persistent woodlands, characteristic of rugged upland sites with shallow, coarse soils tend to have older and denser trees. Herbaceous vegetation within this community is typically sparse, even in the absence of heavy livestock grazing. Research from persistent woodlands provides strong evidence to support the theory that the natural fire regime of piñon-juniper woodlands was dominated by infrequent but high-severity fires and that FRIs may have been on the order of 400 years (Baker and Shinneman 2004; Romme et al. 2007). These findings are in stark contrast to previous estimates of piñon-juniper FRIs of 30 to 40 years (Schmidt et al. 2002;). The short FRI estimates were mostly inferred from FRIs of adjacent ponderosa pine ecosystems due to the scarcity of fire-scarred trees in these ecosystems.

In contrast to ponderosa pine, piñon pines and junipers produce relatively small volumes of litter. Understory fuels, either living or dead, must be sufficiently contiguous to carry a low-intensity surface fire. In the absence of fine surface fuels, fires that spread beyond individual trees were most likely wind driven and spread from crown to crown (Romme et al. 2007). Fire extent was greatest in higher-density woodlands and was limited by both fuels and topography in sparse, low-productivity stands on rocky terrain. Most scientists agree that fire was more common in savannas and areas of expansion and contraction than it was in persistent woodlands, but debate remains on the exact range of fire frequency. Overall, frequent low-intensity surface fires were not the predominant fire regime in piñon-juniper woodlands. Therefore, fire exclusion may not have altered forest structure as dramatically in this forest type.

Chihuahuan Desert Scrub and Desert Grassland

Many authors have suggested that the historical fire-return intervals for grasslands throughout the seventeenth to early nineteenth centuries are thought to have been every 5 to 10 years (Leopold 1924; McPherson 1995; Swetnam et al. 1992). These historic grassland and shrub fires would have occurred at the beginning of the summer monsoon season when vegetation was dry and receptive to lightning starts. Once the summer monsoon rains began and substantial rains occurred, the moisture content in the grass and shrub plants increased to the point that these plants will no longer carry fire. This natural chain of events most likely limited the duration and size of historic grassland and shrub fires in the past.

Like forested areas, fire-suppression policies may have contributed to declining fire frequency in this cover type as well, but other interacting factors, including grazing policies, may have contributed as well. Woodland encroachment, increased tree density, and altered fire behavior characterize many former grasslands of the Southwest. Once woody plants become dominant, their long-life spans and their ability to extract both shallow and deep soil moisture can maintain a woodland condition indefinitely (Burgess 1995). Frequent fire plays a significant role in grassland nutrient cycling and successional processes, and

long-term exclusion may produce irreversible changes in ecosystem structure and function (McPherson 1995).

A precedent setting event occurred in March 2011, which changed some of the previous beliefs and priorities dealing with “Wildfire Risk” in the County. On March 7, 2011, the Quail Ridge wildfire destroyed 12 homes in the Silver Acres portion of Silver City. While no lives were lost and no major injuries were reported, this wildfire set a new paradigm for addressing the risk of wildfire in and around the communities located in Grant County. Previous to the Quail Ridge wildfire, almost all of the attention and efforts directed toward treating fuels and reducing wildfire risk were concentrated in the piñon-juniper woodland and ponderosa pine vegetative communities and little attention was paid to the grassland and shrub communities that are located in the lower, less mountainous portions of the county.

“Grassland” and “brush” wildfires have always occurred in the County, and prior to the Quail Ridge wildfire, suppressing these flashy, short-duration wildfire events was considered a yearly routine for the fire fighting forces in the County. Not until the Quail Ridge wildfire did it become a reality these flashy, fine fuel wildfires were just as apt to destroy residential structures as fires burning in the heavier fuels located in the mountainous, woodland, and forested areas of the county.

RECENT FIRE OCCURRENCE IN THE COUNTY

Fire occurrence in the County has varied over the last 50 years (Figure 2.6), with a decline in fire frequency over the last decade; fire size and intensity may have increased during this period. Lightning ignitions are historically the most common cause of fires within the County (Figure 2.7). Lightning is widespread throughout monsoon season, which usually takes place from June through August (Figures 2.7 and 2.8). Most fires are detected early and suppressed before they gain acreage (Figure 2.9); however, given the right conditions, some fires may grow large and become difficult to suppress, as was observed with the Silver Fire in 2013, which burned over 138,000 acres (Figure 2.10 and 2.11). Figure 2.12 shows the fire history across the County since 1970.

A concern of residents in the WUI is the number of human ignitions, particularly with the development and improvement of roads, residences, and recreational opportunities in wildland areas. Human-caused fires account for approximately 8% of the wildfires recorded for the County since 1970. Although the majority of fires take place during the summer months, human-caused ignitions increase the potential for wildfires throughout the year.

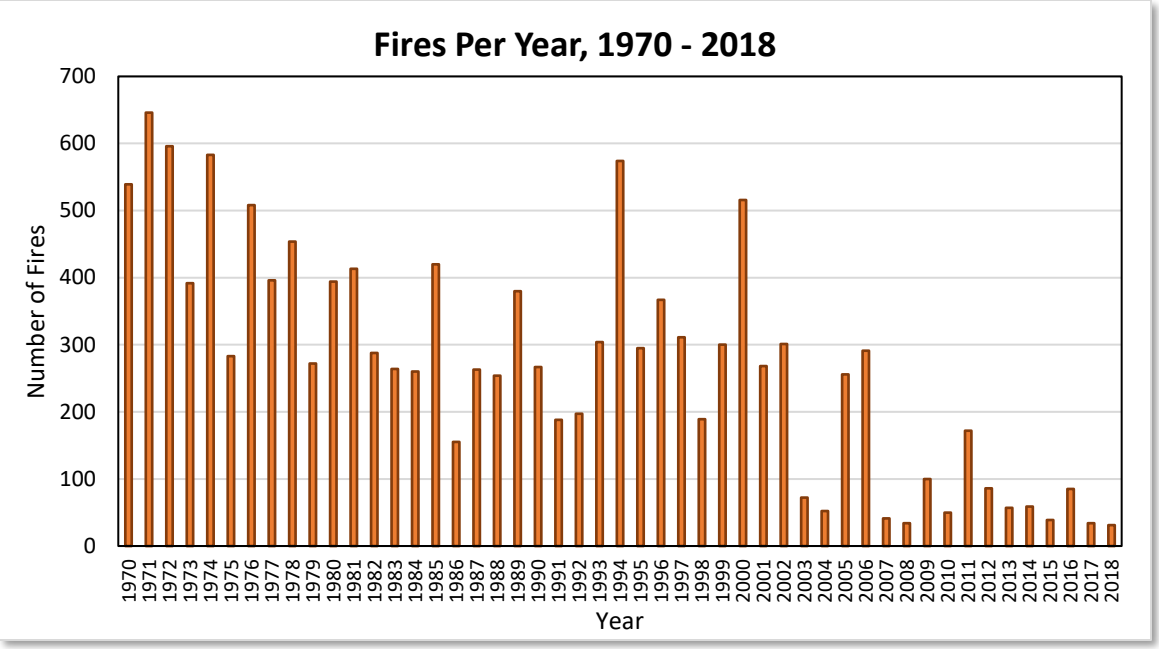

Figure 2.6. Annual wildfire frequency in Grant County from 1970 to 2018.

Source: USFS/NMSF.

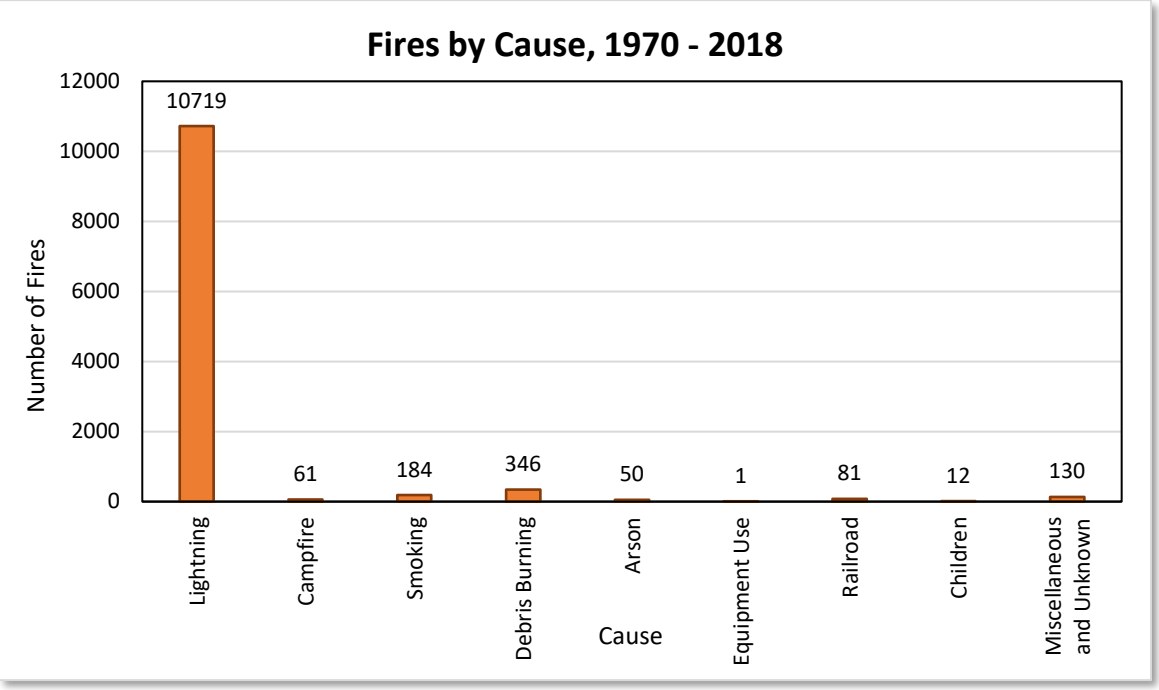

Figure 2.7. Fire causes for Grant County from 1970 to 2018.

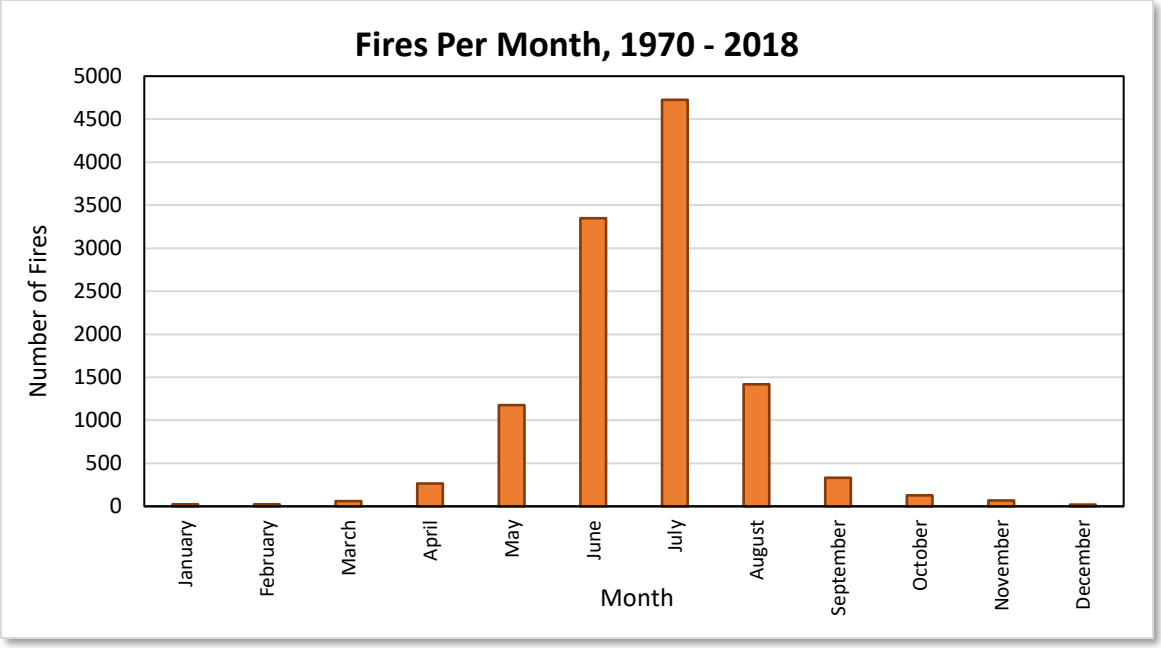

Figure 2.8. Monthly fire frequency in Grant County, based on data from 1970 to 2018.

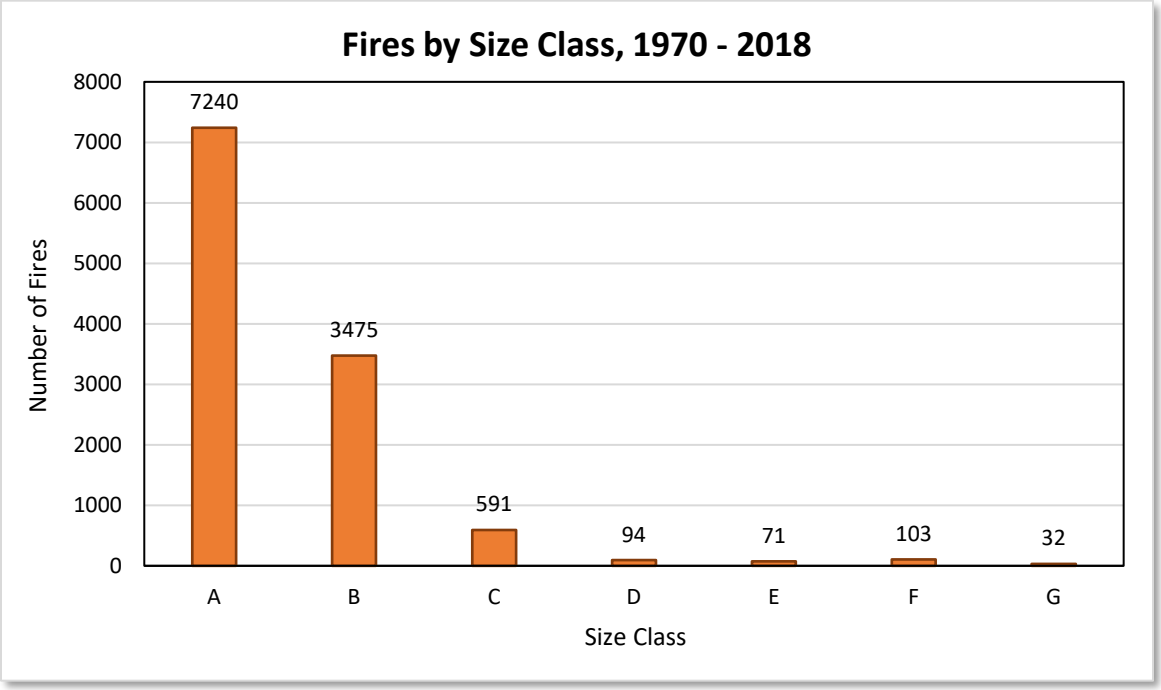

Figure 2.9. Fire size statistics for Grant County based on fire history data from 1970 to 2018.

Size Class: A = 0.25 acre or less; B = greater than 0.25 to 10 acres; C = 10 to 100 acres; D = 100 to 300 acres; E = 300 to 1,000 acres; F = 1,000-5,000 acres; and G = 5,000 acres or more.

Figure 2.10. Silver Fire as seen from the Incident Command Post on June 17, 2013. This fire demonstrates the potential for large fire growth throughout the County.

Source: Wildfire Today.

Figure 2.11. Silver Fire public information sign.

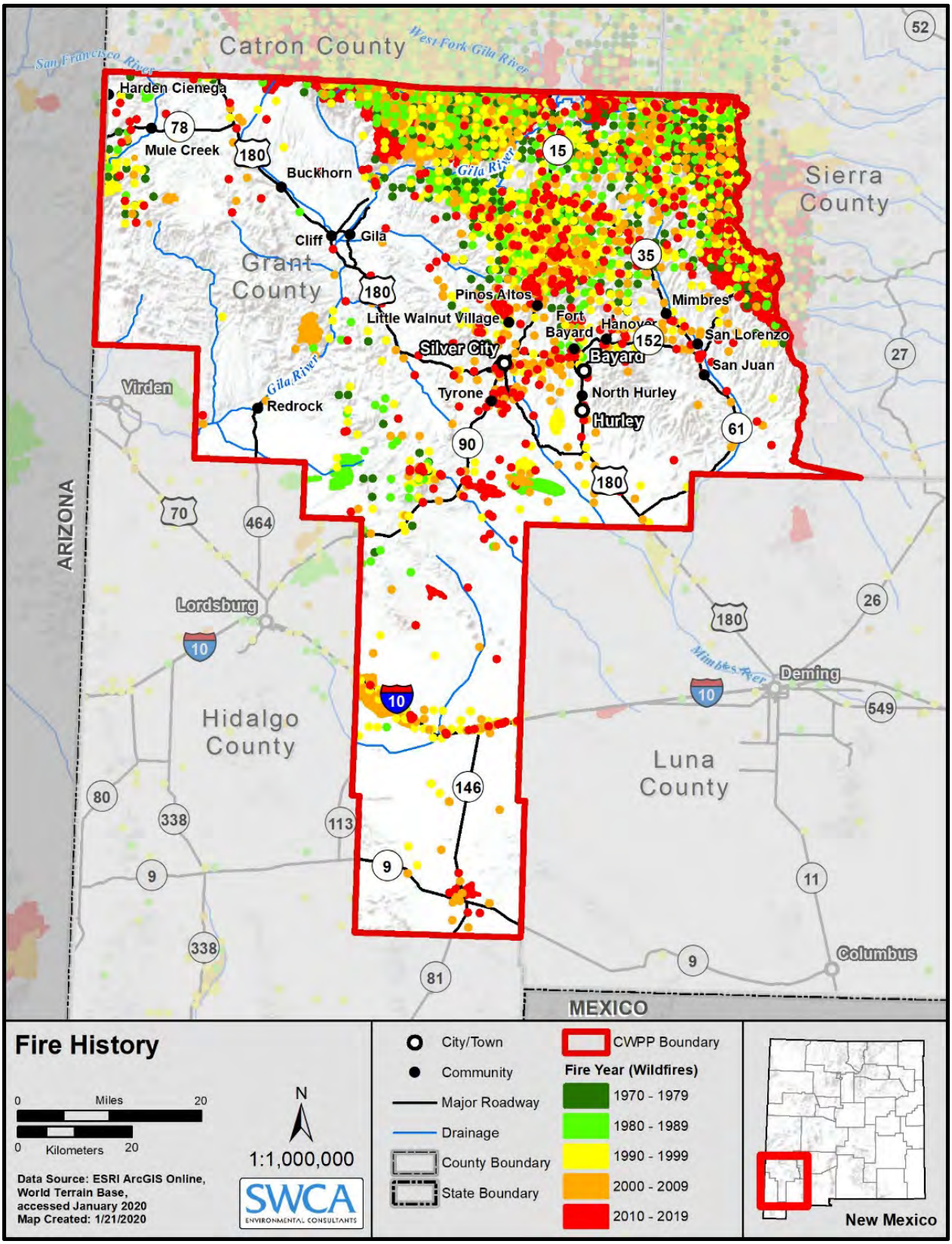

Figure 2.12. Fire History for Grant County from 1970 to 2019.

Future Challenges

The long periods of drought that have been observed throughout the Southwest, in combination with altered forest management practices and fire exclusion policies over the last century, have resulted in frequent landscape-level, high-severity fires that are beyond the range of natural variability (Allen et al. 2002; Covington and Moore 1994). In the past few years, fires have grown to record sizes and are burning earlier, longer, hotter, and more intensely than they have in the past (Loehman et al. 2018; Westerling et al. 2006; Westerling 2016) (Figure 2.13). According to the National Interagency Fire Center (NIFC), occurrence of catastrophic wildfires has greatly increased over the last 20 years. Westerling et al. (2006) claim that a study of large (>1,000 acres) wildfires throughout the western United States for the period 1970 to 2003 saw a pronounced increase in frequency of fire since the mid-1980s (1987–2003 fires were four times more frequent than the 1970–1986 average). The length of the fire season was also observed to increase by 78 days, comparing 1970–1986 to 1987–2003. An update to Westerling et al's. 2006 work found that the frequency of large wildfires has continued to increase with each decade since 1970 (Westerling 2016). Within just the last 10 years, a record number of acreages have burned, and numbers are continually getting larger (NIFC 2019). In 2018, 58,083 fires were reported nationwide, burning 8,767,492 acres (NIFC 2019). With increased fires comes increased suppression costs; 2018 beat all previous records, with federal firefighting costs hitting $3,143,256,000.

Figure 2.13. Burn scar from the 2013 Silver Fire in Grant County.

Changes in relative humidity are blamed for many of these conditions, as increased drying over much of the Southwest has led to an increase in days with high fire danger (Brown et al. 2004). Advanced computer models are now making national-scale simulations of ecosystems, providing predictions of how fire regimes will change in the twenty-first century (Neilson 2004). Western grasslands are predicted to undergo increased woody expansion of piñon-juniper associated with increased precipitation during typical wet seasons. Summer months are predicted to be hotter and longer contributing to increased fire risk (Neilson 2004). Gutzler (2013), in an article that explores regional climate considerations in the U.S./Mexico borderlands, describes the climate variability that the Southwest is prone to and the resultant regional swings that occur between severe drought and pluvial periods. It has become well understood that long-term episodic droughts have been endemic in the Southwest for centuries (Gutzler 2013). He suggests that the border region is strongly affected by ongoing and projected century-scale climate change, and he reports on a strong regional warming trend in recent temperature data that modifies natural drought/pluvial precipitation fluctuations by enhancing evaporative losses and decreasing snowpack in mountainous regions to the north (Brown and Mote 2009). The periodic drought and intense rainfall patterns that Gutzler (2013) and others (Alexander et al. 2006; Gutzler and Robbins 2011; Hurd and Coonrod 2008) project for the region are expected to result in significantly diminished stream flow

and drier surface conditions (Seager et al. 2008), shifting the Southwest climate further toward aridity. Under these greater climatic extremes, fire behavior is expected to become more erratic, with larger flame lengths, increased torching and crowning, and more rapid runs and blowups associated with extremely dry conditions (Brown et al. 2004).

Although fire suppression is still aggressively practiced, fire management techniques are continually adapting and improving and management of fire for resource objectives is an option for land managers in the County. Due to scattered human developments (homes, ranches, and farms) and values (residential and commercial structures, historic and natural values) throughout the WUI, suppression in WUI areas will always have to be a priority. However, combining prescribed fire and managing wildland fire for resource objectives with effective fuels management and restoration techniques have been proven to help re-establish natural fire regimes and reduce the potential for catastrophic wildfires on public lands. The use of prescribed fire on private land is a decision to be made by the landowner, and it is acknowledged that given the prevailing drought such a management technique may not always be feasible in the County.

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 where federal lands interface with private property. 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.

LAWS, ORDINANCES, STANDARDS, AND CODES FOR WILDFIRE PREVENTION

There are currently no ordinances, laws, codes or standards in Grant County for WUI fire prevention. There are a number of existing models used in other communities in New Mexico and in other states with which Grant County could develop a WUI code if desired. Two national organizations, the International Code Council (ICC) and the National Fire Protection Association (NFPA), have developed model WUI wildfire protection codes as standards for states and local governments to adopt. A core concept in these model codes and the resulting wildfire mitigation ordinances is that of structure protection through the creation of defensible space (Haines et al. 2005).

Grant County has a fire code ordinance that outlines restrictions on open burning and other potential ignitions during periods of high fire hazard.[3] The County also has an ordinance regulating the sale, possession and discharge of fireworks.[4]

FIRE PLANNING

There are limited existing documents relating to fire management in Grant County, the main fire management document being the Gila National Forest Fire Management Plan (FMP), which provides more detailed information regarding operational procedures relating to wildfire on National Forest lands. The current version of the FMP is now housed within the Wildland Fire Decision Support System, which is a system to assist fire managers and analysts in making strategic and tactical decisions for fire incidents. This CWPP is meant to supplement and not replace the FMP or any other existing plans.

[3] Fire Code Ordinance: http://grantcountynm.com/documents/resolutions/Ordinance%20O-11-01.pdf

[4] Firework Ordinance: http://grantcountynm.com/documents/resolutions/1118213320.pdf

EMERGENCY MANAGEMENT PLANNING

Grant County is currently in the process of updating their County Hazard Mitigation Plan (HMP). This CWPP should dovetail with the wildfire section of the HMP. In the future, the County should consider integrating the County CWPP and HMP, in order to get both plans on the same update cycle.

LAND MANAGEMENT STRATEGIES

In 2014, New Mexico launched a Watershed Restoration Initiative with a $6.2 million appropriation for severance tax dollars to treat priority watersheds on public land. Restoration projects under the initiative are planned and implemented with collaboration between the New Mexico State Forestry Division and partnering organizations, including state, federal, tribal and private partners (New Mexico Energy, Minerals, and Natural Resources Department [EMNRD] 2016). In 2018, EMNRD reported that $13.3 million dollars in state funding for watershed restoration has been spent on public land in New Mexico as a result of the initiative (EMNRD 2018).

The Forestry Division's Forest and Watershed Health Office has been concentrating on three work areas related to forest and watershed health: 1) Supporting collaborations that expand the State's capacity to get more work done on the ground; 2) implementing the National Cohesive Strategy in New Mexico; and 3) using science, policy and legislation to facilitate the Forestry Division mission.

Forest managers in the region are addressing land management objectives through the use of prescribed fire, mechanical and manual treatments to promote more resilient forest lands. Private, state, and federal lands are interspersed creating a matrix of land ownership, which is often a hurdle to implementation of landscape level treatments. By working with private landowners, forest managers are enhancing landscape-scale efforts to create more resilient forest communities.

FIRE AND RESPONSE CAPABILITIES

Grant County is served by multiple firefighting jurisdictions. A number of established municipal fire stations and rural volunteer departments are within the County boundary (see Appendix 2- Map 7):

- Municipal Fire Departments
  - Silver City Fire Department
  - Bayard Fire Department
  - Hurley Fire Department
  - Santa Clara Fire Department
- Rural Grant County Volunteer Fire Departments
  - Cliff-Gila Volunteer Fire Department
  - Fort Bayard Volunteer Fire Department
  - Lower Mimbres Volunteer Fire Department
  - Pinos Altos Volunteer Fire Department
  - Santa Rita Volunteer Fire Department
  - Sapillo Creek Volunteer Fire Department
  - Upper Mimbres Volunteer Fire Department
  - Whiskey Creek Volunteer Fire Department

Each Department has its own response area shown in Map 7- Appendix 2. Stations are manned by volunteer firefighters and may have varying capabilities.

The Grant County VFDs are made up of 300 members. The department chiefs are united under the Rural Fire Chiefs Association, which meets monthly.

Gila National Forest

The Gila National Forest provides fire response on forest service lands in the County. Fire management and suppression protocols are directed by the Forest Plan and the FMP. Available fire suppression resources will vary seasonally.

On USFS land, initial attack response will be conducted by USFS whenever possible. The USFS maintains Mutual Aid Agreements (MAA) with the NMSF, the County, and the NPS. Under the MAA, agency personnel almost always respond to incidents outside their agency boundaries.

The management of wildfire ignitions for multiple resource objectives (using naturally-burning fires in designated, remote sections of forests as a tool for helping to restore forest health and mitigating the escalating costs of fire suppression) is practiced on federal lands but depends upon a thorough assessment of risk to values at risk in the WUI. Depending on the location and nature of a wildfire, USFS policies outline appropriate management responses to guide district personnel in the application of specific suppression techniques.

In wilderness areas, the Gila National Forest supervisor must approve the use of helicopters, portable pumps, and chainsaws, as well as the construction of helispots. The Southwestern Regional Forester must approve the use of motorized vehicles and bulldozer line construction. Fire strategies call for:

- restoring fire to the ecosystem;
- using prescribed fire to reduce hazards;
- managing wildland fires so that air quality issues are compatible with local, state, and federal laws; and
- minimizing suppression impacts to wilderness as well as impacts to the surrounding area.

New Mexico State Forestry Resources

The Socorro District of NMSF has primary responsibility for non-federal, non-municipal, non-tribal, and non-pueblo lands within the GCCWPP area. In the event of a wildfire on state land, local fire departments or other resources may be used for initial attack under the New Mexico Joint Powers Agreements (State of New Mexico 2003).

National Park Service

NPS policy states that all wildland fires will be effectively managed considering resource values to be protected, considering firefighter and public safety, and using the full range of strategic and tactical operations as described in an approved FMP (NPS 2005)[5]. The primary goals of the wildland fire management program at Gila Cliff Dwellings National Monument, as stated in the FMP, are to protect human health and safety, property, and natural and cultural resources; diminish risk and consequences of severe wildland fires; and, to the extent possible, increase the health of the ecosystem. The ultimate goal of fire management in the NPS is to restore fire to park ecosystems where possible through Fire Use. Human-caused wildland fires will still be appropriately managed (NPS 2005).

Fire management at the National Monument is administered jointly by the NPS and USFS under a cooperative agreement. Fire management direction, as encompassed in WFDSS, allows for fire use and various fuels reduction activities within the monument as appropriate, using the existing Gila National Forest Approved FMP and the interagency Wildland and Prescribed Fire Management Policy – Implementation Procedures Reference Guide (1998)

[5] Gila Cliff Dwellings National Monument, Fire Management Plan (2005): https://www.nps.gov/gicl/learn/management/upload/GILAFMPfinal.pdf

http://www.fs.fed.us/fire/fireuse/wildland_fire_use/ref_guide/index.html as a guide for wildland fire use decisions. Mechanical treatment will be allowed. The plan focuses on the areas that are highest priority for fuels reduction, and provides for monitoring of results, in accordance with the 10-year strategy.

BUREAU OF LAND MANAGEMENT LAND

The BLM operates a State Fire and Aviation Management office in Santa Fe and three District Fire Programs located in Albuquerque, Farmington, and Las Cruces. The County falls within the management area of the Las Cruces Field Office. The local field office has initial attack responsibility and provides mutual aid assistance for wildland fire activities on BLM-administered public lands. Through the Joint Powers Agreements, the BLM also maintains initial attack fire response responsibilities for designated state and private lands.

Each field office in New Mexico has a Resource Management Plan, which provides management direction for all BLM resources. FMPs are supplements to the Resource Management Plans and are more detailed, site-specific plans. FMPs establish fire and fuels objectives and implementation strategies, and they serve as a reference for on-the-ground decisions in fire and fuels management. Each field office has an approved FMP. These plans are periodically reviewed and updated as needed.

The single overriding priority in BLM fire management is to protect human life, of both the public and firefighters. In addition, agency policies aim to protect human communities, their infrastructure, and the natural resources on which they depend. Other property and improvements will be protected. Where possible on BLM land, wildland fire is allowed to function as an essential ecological process and agent of natural change in fire-dependent ecosystems. Management actions also focus on the improvement or maintenance of ecosystem health and wildlife habitat and the protection of high-value cultural, historical, and paleontological resources.

MUTUAL AID

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

EVACUATION RESOURCES

As part of emergency management protocols, Grant County has an approved evacuation plan that outlines objectives, authority, evacuation stages and implementation procedures. That plan is included here in Appendix H.

Road Systems

Much of Grant County is accessible via surfaced roads and highways; however, some communities are accessed only via unsurfaced roads (Figure 2.14), which are often narrow and windy with many dead-end roads (Figure 2.15). These routes may prove hazardous during emergency evacuation, especially where they are adjacent to forested land with vegetation close to or overhanging the road. Fuel treatment may be needed along some roads where vegetation is overhanging and could prevent safe evacuation of residents or safe access by emergency responders. Some rural roads also have narrow bridges with weight limits (Figure 2.15) that may impact access with large emergency apparatus.

Figure 2.14. Example of unsurfaced and rutted roads that would impede or slow travel by emergency responders and residents evacuating the fire.

Figure 2.15. One of many dead-end roads in the County that may impede ingress and egress.

Horses, Livestock, and Animals

Many rural homes also have horses and other large animals and livestock, and pets are common in homes throughout the county. In the event of a wildfire, it is important that residents and fire responders have a plan for evacuation of pets and livestock. Evacuation planning often neglects to describe how animals will be evacuated and where they will be taken. The loading of horses, for example, during a fire and smoke situation, and transport of stock vehicles down narrow roads under stressful situations, can be very difficult. Public education could emphasize the need to practice loading horses quickly, for example.

The Humane Society has a pet evacuation plan that could be utilized in the event of a mandatory evacuation during a wildfire event. The Humane Society can also provide a pet evacuation trailer to respond to pet displacement. The Gila Backcountry Horsemen have a working document for large animal evacuation.

Livestock evacuation and shelter is also described in the County Emergency Management Plan and in the evacuation plan in Appendix H.

WATER AVAILABILITY AND SUPPLY

Water supply is variable around the County and may be provided by hydrants, wells, cisterns, and ponds. Many rural and unincorporated communities have a lack of water for fire suppression. There have been upgrades at fire stations implemented in some communities, including installation of above and below ground water tanks (Figure 2.16); for example, the Upper Mimbres VFD has a new 40,000-gallon tank. Additional storage is still needed in many areas; however, according to Core Team discussions, fire responders in the County estimate that a 300-acre fire may require 15,000 gallons of water to suppress, so current water storage capacity may be stretched. Strategic positioning of water storage tanks may help alleviate shortage in some areas.

Water is available in some areas from neighborhood water associations. The Lake Roberts Water Association, for example, has a 14,000-gallon tank and two wells. It also maintains, in coordination with the Sapillo Creek VFD, a 3,000-gallon water tank for fire-fighting purposes on Association property (Appendix D).

Ponds and rivers could also provide alternative sources for suppression, and many stations have the capability and equipment to draft but suitable drafting sources are not always known. The County has been working with local ranchers to identify potential drafting sites throughout the County; these sites need to be mapped.

Limited water supply can impact ISO ratings for fire departments, so improvements to water infrastructure have been identified as a priority for this CWPP update.

Figure 2.16. Water storage tanks at the Sapillo Creek VFD.

PUBLIC EDUCATION AND OUTREACH PROGRAMS

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

Local and State Programs

Grant County

The County and VFDs have held community outreach events and community workdays throughout the County to raise awareness of fire prevention. The County utilizes Firewise and Ready, Set, Go literature to support these education efforts.

New Mexico State Forestry Division

The State Forestry Division employs several fire prevention programs to educate residents and visitors. According to the EMNRD 2018 Annual Report, the Forestry Division has helped facilitate various educational programs including Ready, Set, Go! (RSG), Fire Adapted Communities (FAC), and Firewise USA™. In 2018, a total of 25 communities throughout the State remain dedicated to the Firewise USA™ program. Numerous other communities are in the process of applying (EMNRD 2018).There are currently two communities in Grant County that are certified Firewise.

Additional wildfire prevention efforts include the Living with Fire Guide for the Homeowner, New Mexico. This publication has been updated for 2018 incorporating the Fire Adapted Community Concept in partnership with the University of Nevada Extension, Bureau of Land Management, USFS, Department of Homeland Security, Bureau of Indian Affairs, and the National Parks Service (EMNRD 2018).

Gila National Forest

The Gila National Forest has an active fire prevention program, led by the Forest's Fire Prevention Specialist. The Forest holds public education and outreach workshops and programs directed at wildfire mitigation, utilizing literature from many of the National Programs described below.

Silver City has hosted a State WUI conference twice over the last decade. This focus helps to draw agency personnel and specialists to the area and build support for fire prevention activities within the County. The Gila National Forest with Grant County assistance, also held a free Grant County All-Risk Mitigation event. The three-day event was open to the public and provided information on wildfire mitigation and preparedness. The event was attended by approximately 1,500 people.

National Programs

Ready, Set, Go!

The Ready, Set, Go! Program, which is managed by the International Association of Fire Chiefs, was launched in 2011 at the WUI Conference. The program seeks to develop and improve the dialogue between fire departments and residents, providing teaching tools for residents who live in high-risk wildfire areas—and the WUI—on how to best prepare themselves and their properties against fire threats (Ready, Set, Go! 2016).

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 make sure all those residing within the home know the plan of action.
>
> **Set –** Pack your emergency items. Stay aware of the latest news and information on the fire from local media, your local fire department, and public safety.
>
> **Go –** Follow your personal wildland fire action plan. Doing so will not only support your safety but will allow firefighters to best maneuver resources to combat the fire.

National Fire Protection Association

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

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

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

Insurance Institute for Business and Home Safety

The Insurance Institute for Business and Home Safety (IBHS) is an independent, non-profit, scientific research and communications organization supported solely by property insurers and reinsurers. The IBHS's building safety research leads to real-world solutions for home and business owners, helping to create more resilient communities. Its mission is to conduct objective, scientific research to identify and promote the most effective ways to strengthen homes, businesses, and communities against natural disasters and other causes of loss.

The IBHS conducts laboratory and field experiments in structural ignitability and has helped develop new guidelines for defensible space zones to emphasize ember resistance and a "home ignition zone" (Figure 2.17).

Figure 2.17. Defensible space standards from the IBHS.

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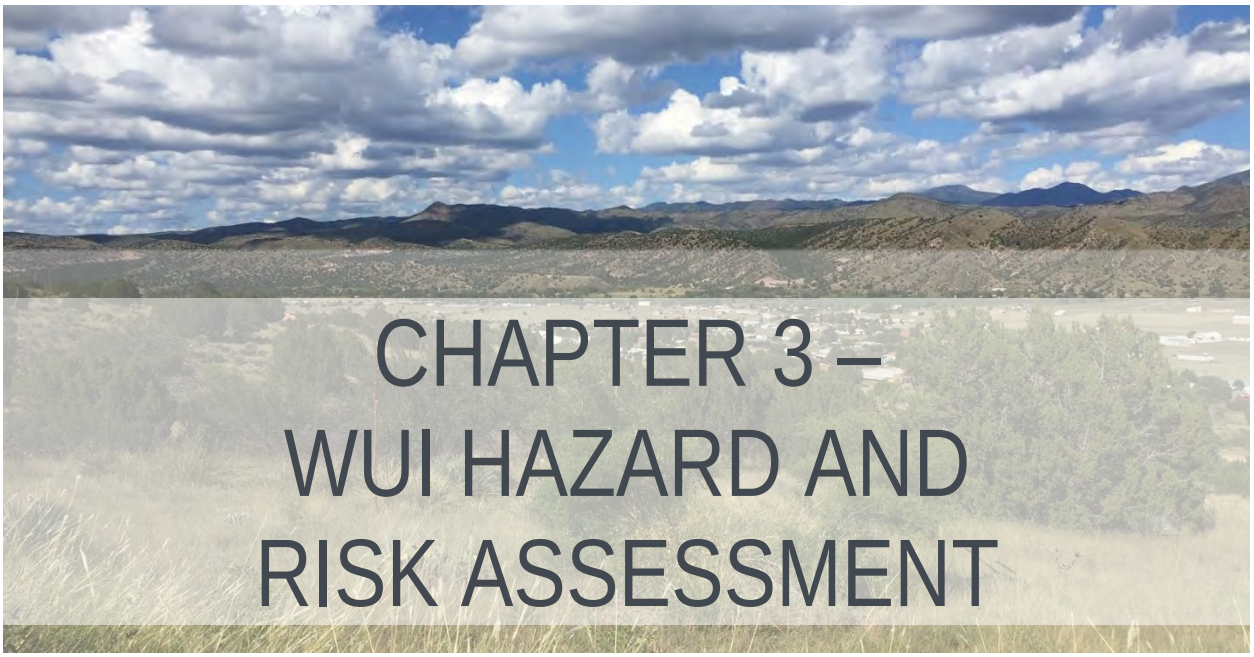

CHAPTER 3 – WUI HAZARD AND RISK ASSESSMENT

PURPOSE

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

> ***Hazard*** is a fuel complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition and resistance to control.
>
> ***Risk*** is defined as the chance of a fire starting as determined by the presence and activity of causative agents (National Wildfire Coordinating Group [NWCG] 1998).

The risk assessment is twofold and combines a geographic information system (GIS) model of hazard based on fire behavior and fuels modeling technology (Composite Risk/Hazard Assessment) and a Core Team generated assessment of on-the-ground community hazards and values at risk.

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

FIRE BEHAVIOR MODEL

OVERVIEW

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

level of risk for those residing in the WUI is heightened. Fire spreads in three ways: 1) surface fire spread—the flaming front remains on the ground surface (in grasses, shrubs, small trees, etc.) and resistance to control is comparatively low; 2) crown fire—the surface fire "ladders" up into the upper levels of the forest canopy and spreads through the tops (or crowns) independent of or along with the surface fire, and when sustained is often beyond the capabilities of suppression resources; and 3) spotting—embers are lifted and carried with the wind ahead of the main fire and ignite in receptive fuels; if embers are plentiful and/or long range (>0.5 mile), resistance to control can be very high. Crown fire and spotting activity has been a concern for fire managers particularly under extreme weather conditions. In areas where homes are situated close to timber fuels and/or denser shrubs and trees, potential spotting from woody fuels to adjacent fuels should always be acknowledged.

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

FIRE BEHAVIOR MODEL COMPONENTS

For this plan, an assessment of fire behavior has been carried out using well-established fire behavior models: FARSITE, FlamMap, BehavePlus, and FireFamily Plus housed within the Interagency Fuel Treatment Decision Support System (IFTDSS), as well as ArcGIS Desktop Spatial Analyst tools. Data used in the Composite Risk/Hazard Assessment is largely obtained from LANDFIRE.

LANDFIRE

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

FARSITE

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

FlamMap

Like FARSITE, FlamMap uses a spatial component for its inputs but only provides fire behavior predictions for a single set of weather inputs. In essence, FlamMap gives fire behavior predictions across a landscape for a snapshot of time; however, FlamMap does not predict fire spread across the landscape. FlamMap has been used for the GCCWPP to predict fire behavior across the landscape under extreme (97% worst case) weather scenarios.

BehavePlus

Also using Rothermel's (1983) equations, BehavePlus is a multifaceted fire behavior model and has been used to determine fuel moisture in this process.

FIRE BEHAVIOR MODEL INPUTS

Fuels

The fuels in the planning area are classified using Scott and Burgan's (2005) Standard Fire Behavior Fuel Model classification system. This classification system is based on the Rothermel surface fire spread equations, and each vegetation and litter type is broken down into 40 fuel models.

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

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

Table 3.1 provides a description of each fuel type.

Table 3.1. Fuel Model Classification for GCCWPP Planning Area

1.	**Nearly pure grass and/or forb type (Grass)**
i.	**GR1:** Grass is short, patchy, and possibly heavily grazed. Spread rate is moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (0.40 ton/acre).
ii.	**GR2:** Moderately coarse continuous grass, average depth about 1 foot. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (1.10 tons/acre).
iii.	**GR3:** Very coarse grass, average depth 2 feet. Spread rate high (20-50 chains/hour); flame length moderate (4-8 feet).
iv.	**GR4:** Moderately coarse continuous grass, average depth 2 feet. Spread rate very high (50–150 chains/hour); flame length high (8–12 feet).
2.	**Mixture of grass and shrub, up to about 50% shrub cover (Grass-Shrub)**
i.	**GS1:** Shrubs are about 1 foot high, low grass load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (1.35 tons/acre).
ii.	**GS2:** Shrubs are 1–3 feet high, moderate grass load. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (2.1 tons/acre).
3.	**Shrubs cover at least 50% of the site; grass sparse to non-existent (Shrub)**
i.	**SH1:** Low fuel load, depth about 1 foot, some grass fuels present. Spread rate very low (0–2 chains/hour); flame length very low (0–1 feet).
ii.	**SH2:** Moderate fuel load (higher than SH1), depth about 1 foot, no grass fuels present. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (5.2 tons/acre).
iii.	**SH5:** Heavy shrub load. Fuel bed depth 4–6 feet. Spread rate very high (50–150 chains/hour), flame length very high (12–25 feet).
iv.	**SH7:** Very heavy shrub load, possibly with pine overstory. Fuel bed depth 4–6 feet. Spread rate high (20–50 chains/hour); flame length very high (12–25 feet).
4.	**Grass or shrubs mixed with litter from forest canopy (Timber-Understory)**
i.	**TU1:** Fuel bed is low load of grass and/or shrub with litter. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (1.3 tons/acre).
ii.	**TU5:** Fuel bed high load conifer with shrub understory. Spread rate moderate (5–20 chains/hour); flame length moderate (4-8 feet).

5.	**Dead and downed woody fuel (litter) beneath a forest canopy (Timber Litter)**
i.	**TL1:** Low to moderate load, fuels 1–2 inches deep. Spread rate very low (0–2 chains/hour); flame length very low (0–1 foot).
ii.	**TL2:** Low load, compact. Spread rate very low (0–2 chains/hour); flame length very low (0–1 foot).
iii.	**TL3:** Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 foot); fine fuel load (0.5 ton/acre).
iv.	**TL4:** Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 foot).
v.	**TL5:** High load conifer litter. Spread rate slow (2–5 chains/hour); flame length low (1–4 foot).
vi.	**TL6:** Moderate load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 foot).
vii.	**TL7: Heavy load.** Spread rate low (2–5 chains/hour); flame length low (1–4 feet).
viii.	**TL8:** Long needle litter; long needle fuel. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet).
6.	**Insufficient wildland fuel to carry wildland fire under any condition (Non-burnable)**
i.	**NB1:** Urban or suburban development; insufficient wildland fuel to carry wildland fire.
ii.	**NB3:** Agricultural field, maintained in non-burnable condition.
iii.	**NB8:** Open water.

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

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

Topography

Topography is important in determining fire behavior. Steepness of slope, aspect (direction the slope faces), elevation, and landscape features can all affect fuels, local weather (by channeling winds and affecting local temperatures), and rate of spread of wildfire. There are some steep slopes in Grant County that would influence fire behavior and spread.

Weather

Of the three fire behavior components, weather is the most likely to fluctuate. Accurately predicting fire weather remains a challenge for forecasters. As winds and rising temperatures dry fuels in the spring and summer, conditions can deteriorate rapidly, creating an environment that is susceptible to wildland fire. Fine fuels (grass and leaf litter) can cure rapidly, making them highly flammable in as little as 1 hour following light precipitation. Low live fuel moistures of shrubs and trees can significantly contribute to fire behavior in the form of crowning and torching. With a high wind, grass fires can spread rapidly, engulfing communities, often with limited warning for evacuation. The creation of defensible space is of vital importance in protecting communities from this type of fire. For instance, a carefully constructed fuel break placed in an appropriate location could protect homes or possibly an entire community from fire. This type of defensible space can also provide safer conditions for firefighters, improving their ability to suppress fire and protect life and property.

One of the critical inputs for FlamMap is fuel moisture files. For this purpose, weather data have been obtained from FAMWEB (NWCG 2012), a fire weather database maintained by the NWCG. A remote automated weather station was selected (Burro Mountain 292504), and data were downloaded from the website.

Using an additional fire program (FireFamily Plus) with the remote automated weather station data, weather files that included prevailing wind direction (Table 3.2, Figure 3.1) and 20-foot wind speed were created. Fuel moisture files were then developed for downed (1-hour, 10-hour, and 100-hour) and live

herbaceous and live woody fuels. These files represent weather inputs in FlamMap; 95 to 100 percentile weather is used to predict the most extreme scenarios for fire behavior.

Table 3.2. Weather Parameters Used in the Fire Behavior Model

Parameter	Low	Moderate	High	Extreme
Percentile range	0–15	16–85	86–94	95–100
1-hour fuel moisture	8.26	3.49	1.56	0.99
10-hour fuel moisture	9.40	4.01	1.99	1.45
100-hour fuel moisture	13.96	6.10	3.69	3.28
Herbaceous fuel moisture	47.88	19.62	20.25	25.15
Woody fuel moisture	114.08	60.91	60.00	60.00
1,000-hour fuel moisture	14.52	6.73	5.53	4.96
20-foot wind speed	8.10	13.27	12.60	11.67

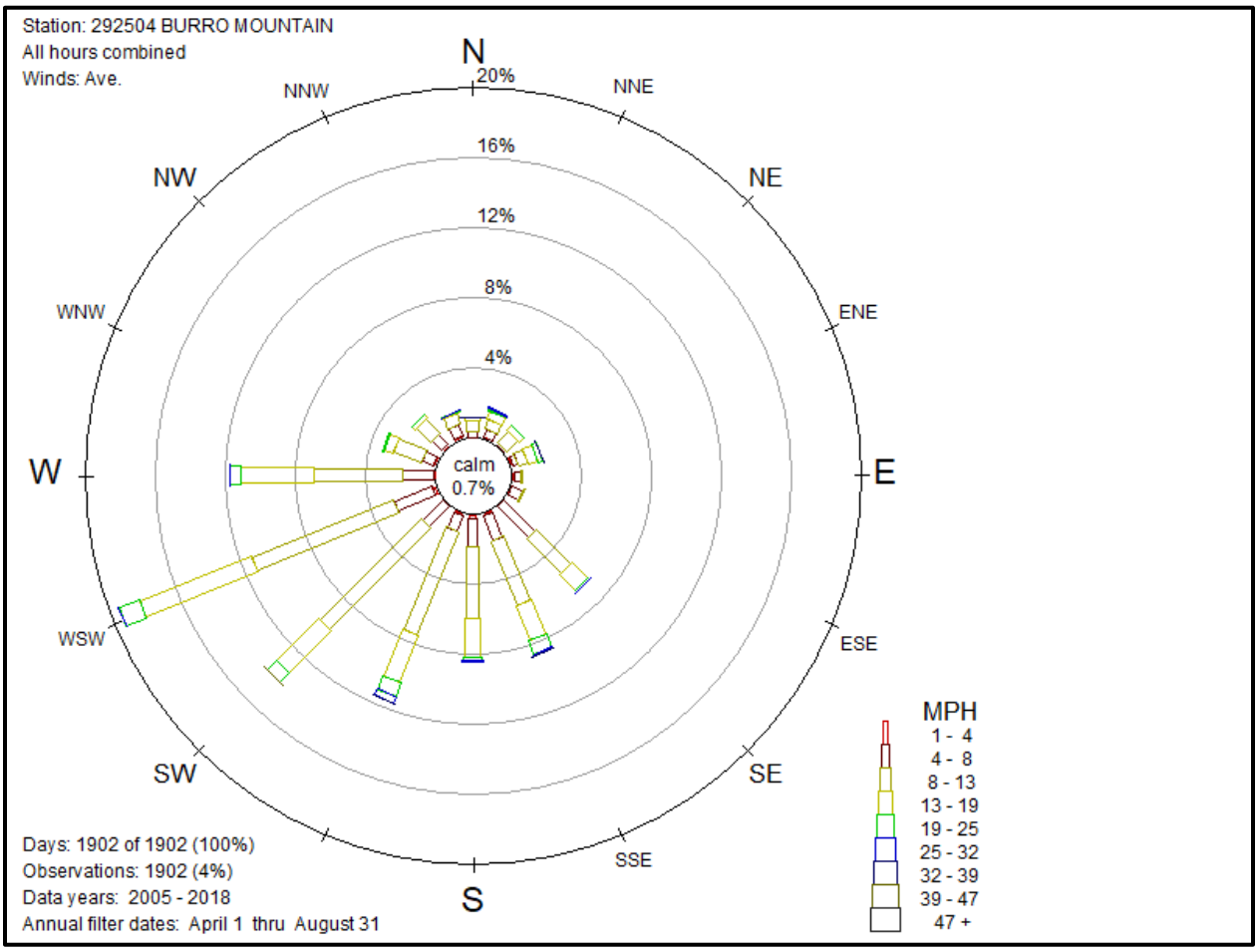

Figure 3.1. Wind Rose used in the fire behavior modelling in FlamMap.

FIRE BEHAVIOR MODEL OUTPUTS

The following is a discussion of the fire behavior outputs from FlamMap.

Flame Length

Map 2 in Appendix B illustrates the flame length classifications for the planning area. Flame lengths are determined by fuels, weather, and topography. Flame length is a particularly important component of the risk assessment because it relates to potential crown fire (particularly important in timber areas) and suppression tactics. Direct attack by hand lines is usually limited to flame lengths less than 4 feet. In excess of 4 feet, indirect suppression is the dominant tactic. Suppression using engines and heavy equipment will move from direct to indirect with flame lengths in excess of 8 feet.

Flame lengths across the planning area range from 0 to more than 11 feet.

Fireline Intensity

Map 3 in Appendix B illustrates the predicted fireline intensity throughout the planning area. Fireline intensity describes the rate of energy released by the flaming front and is measured in British thermal units per foot, per second (Btu/ft/sec). This is a good measure of intensity and is used for planning suppression activities. The expected fireline intensity throughout the planning area is similar in pattern to predicted flame length, as fireline intensity is a function of flame length. The pattern for fireline intensity is similar to flame length in that intensities range from low (less than 100 Btu/ft/sec) through moderate (100–500 Btu/ft/sec) high and extreme intensity (greater than 500 Btu/ft/sec), which tend to be associated with areas dominated by tall shrub and timber fuel loads.

Rate of Spread

Map 4 in Appendix B illustrates the rate of spread classifications for the planning area. The rates of spread in the project area range from 0 to 5 chains/hour up to 50 chains/hour. Low rates of spread are associated with timber dominated areas, while moderate and high rates of spread are associated with grass and shrub fuels. Agricultural areas are modelled with low rate of spread; however, these fuel types can also pose a severe hazard during certain times of the year (prior to harvest or following harvest when residual materials remain) and are often areas of ignition through human activity such as agricultural burning practices.

Crown Fire Potential

Map 5 in Appendix B illustrates the range of crown fire activity from surface fire (in grass dominated areas) to passive and active crown fire (in timber dominated fuels).

Fire Occurrence/Density of Starts

Map 6 in Appendix B illustrates the fire occurrence density for the planning area. Fire occurrence density has been determined by performing a density analysis on fire start locations with ArcGIS Desktop Spatial Analyst. These locations have been provided by the USFS, NMSF, and fire departments in Grant County, and when combined the points show the location of fire starts within the planning area from 1970 to 2018. The density analysis has been performed as a kernel density, using a 2,500-meter search radius.
The density of previous fire starts is used to determine the risk of ignition of a fire. Map 6 in Appendix B reveals a cluster pattern of fires in the north east corner of the County, associated with forested areas and USFS land. Some fire occurrence clusters at intersections and along highways.

The fire occurrence maps are used to provide information on areas where human-ignited fires are prevalent and hence could be more prone to fire in the future and where there are a higher density of lightning ignitions due to topographic conditions and receptive forest fuels.

COMPOSITE RISK/HAZARD ASSESSMENT

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

All fire parameter datasets have been converted to a raster format (a common GIS data format comprising a grid of cells or pixels, with each pixel containing a single value). The cell size for the data is 30 × 30 meters (98 × 98 feet). Each of the original cell values have been reclassified with a new value between 1 and 4, based on the significance of the data (1 = lowest, 4 = highest). Prior to running the models on the reclassified datasets, each of the input parameters have been weighted; that is, they are assigned a percentage value reflecting that parameter's importance in the model. The parameters were then placed into a Weighted Sum Model, which "stacks" each geographically aligned dataset and evaluates an output value derived from each cell value of the overlaid dataset in combination with the weighted assessment. In a Weighted Sum Model, the weighted values of each pixel from each parameter dataset are added together so that the resulting dataset contains pixels with summed values of all the parameters. This method ensures that the model resolution is maintained in the results and thus provides finer detail and range of values for denoting fire risk. Figure 3.2 illustrates the individual datasets and the relative weights assigned within the modeling framework.

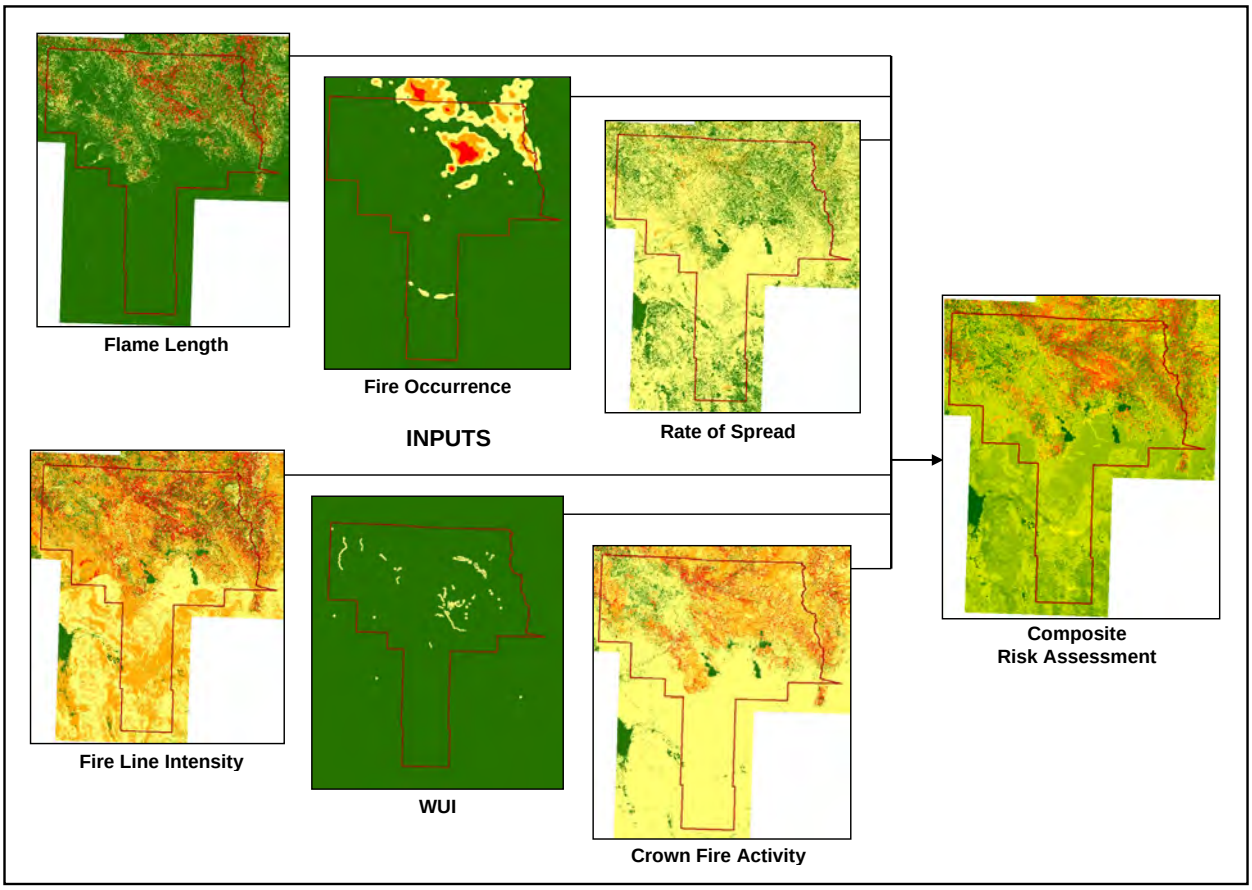

Figure 3.2. Composite risk/hazard overlay process.

Figure 3.3 is the risk assessment for the planning area; it combines all the fire behavior parameters described above. The risk assessment classifies the planning area into low, medium and high-risk categories.

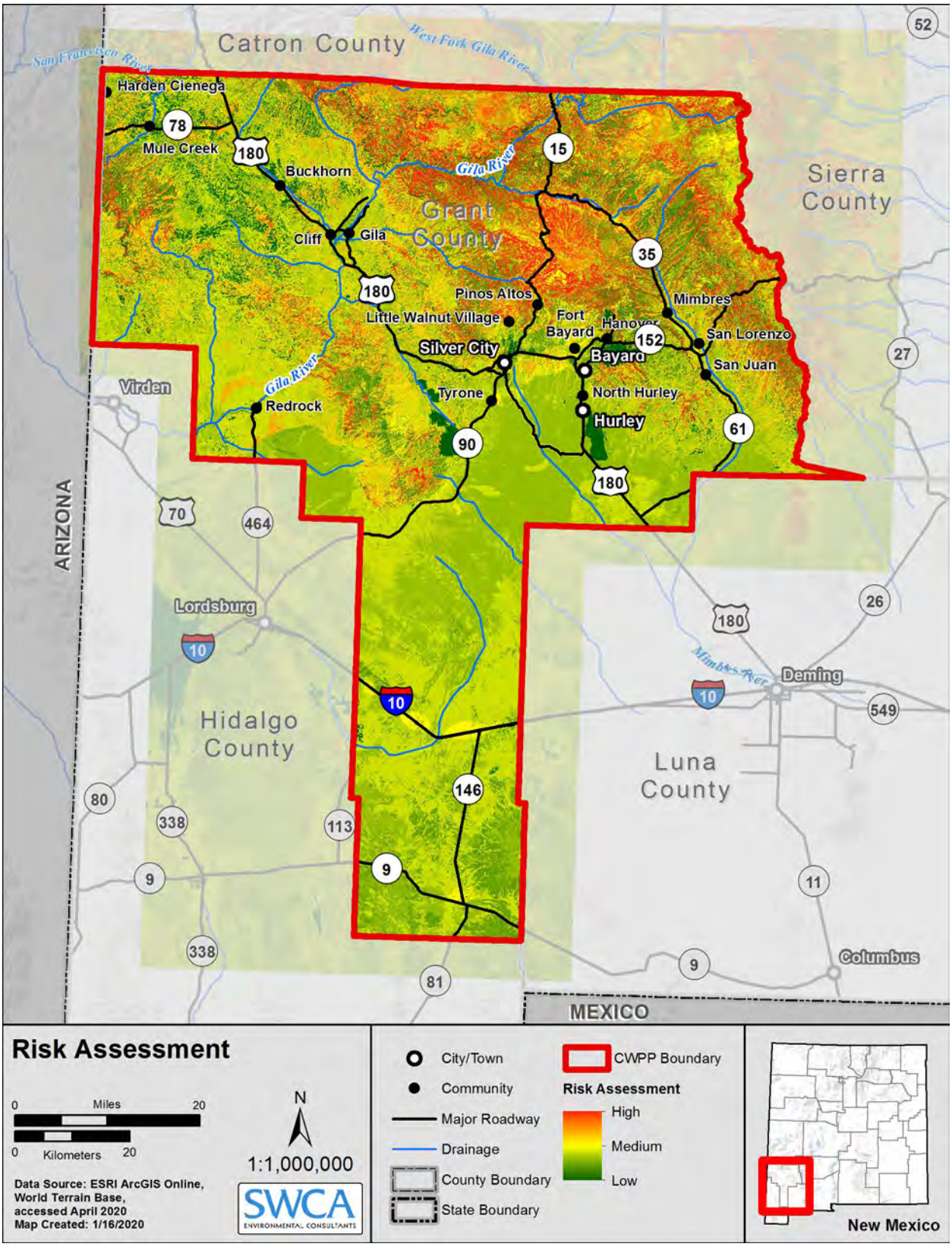

Figure 3.3. Composite risk/hazard assessment overlay.

COMMUNITY HAZARD ASSESSMENTS

As part of the planning process, the Core Team identified several areas within Grant County that are considered at the greatest risk from wildfire. In order to properly assess the hazards in and around these communities, a field day was implemented to carry out community assessments.

The assessment was conducted in Fall 2019 using the NFPA Wildland Fire Risk and Hazard Severity Form 1144 (Appendix E). This form is based on the NFPA Standard for Reducing Structure Ignition Hazards from Wildland Fire 2013 Edition, which was in turn developed by the Technical Committee on Forest and Rural Fire Protection and originally issued by the Standards Council on June 4, 2007. The NFPA standard focuses on individual structure hazards and requires a spatial approach to assessing and mitigating wildfire hazards around existing structures. It also includes ignition-resistant requirements for new construction and is used by planners and developers in areas that are threatened by wildfire and is commonly applied in the development of Firewise Communities (for more information, see www.firewise.org).

Each area was rated based on conditions within the community and immediately surrounding structures, including access, adjacent vegetation (fuels), defensible space, adjacent topography, roof and building characteristics, available fire protection, and placement of utilities. Where a range of conditions was less easily parsed out, a range of values was assigned on a single assessment form. Each score was given a corresponding adjective rating of low, medium and high. An example of the assessment form used in this plan is in Appendix E. The purpose of the community WUI assessment and subsequent hazard ratings is to identify fire hazard and risks and prioritize areas requiring mitigation and more detailed planning. These assessments should not be seen as tactical pre-suppression or triage plans. The community assessment helps to drive the recommendations for mitigation of structural ignitability, community preparedness, and public education. The assessment also helps to prioritize areas for fuels treatment based on the hazard rating. **The NFPA ratings serve as the community at risk (CAR) ratings required by the New Mexico Fire Planning Task Force (NM-FPTF).**

The Community at Risk hazard ratings from the community assessment and the GIS hazard/risk assessment are provided in Table 3.3. This table also includes a summary of the positive and negative attributes of a community as they relate to wildfire risk. Full CAR descriptions are provided in Appendix D.

Table 3.3. Community At Risk List with Assessment Summary

Community	CAR Rating (based on NFPA 1144)	GIS Risk Rating	Positive	Negative
Buckhorn	67 Medium	Medium	• Access- Good via Hwy 180 • Fuels- sparse • CVAR- low population density	• Access- some narrow driveways • Structural- combustible buildings • Water- drafting needed
Cliff	69 Medium	Medium	• Fire Response- FD in town • Fuels- sparse-though riparian fuels may exhibit intense fire behavior • Access- most driveways have good access, good highway access • Water- tanks available	• Topography (topo)- varied topo may influence fire behavior • Structural- combustible buildings, limited separation • CVAR- higher relative population density, commercial business
Gila	76 High	Medium	• Fire Response- FD in town • Fuels- sparse-though riparian fuels may exhibit intense fire behavior • Access- most driveways have good access, good highway access • Water – tanks available	• Topo- varied topo may influence fire behavior • Structural- combustible buildings, limited separation • CVAR- higher relative population density, commercial business
Mangus Springs	94 High	Medium	• Fuels- sparse, though riparian fuels may exhibit intense fire behavior • CVAR- low population density	• Access- poor ingress-egress, narrow roads • Fire Response- 12 miles from nearest FD. • Water- drafting needed
Mule Creek	84 High	Medium	• Fuels- sparse- though riparian fuels may exhibit intense fire behavior • CVAR- low population density	• Access- poor road conditions- narrow and rough surface • Topo- varied topo may influence fire behavior • Water- drafting needed • Fire Response- 27 miles from nearest FD
Pine Cienega	112 High	Medium	• CVAR- low population density	• Fuels- brushy and continuous • Access- narrow driveways, adjacent fuels • Fire Response- 37 miles from nearest FD • Topo- varied topo may influence fire behavior • Water- drafting needed • Structural- limited defensible space

Community	CAR Rating (based on NFPA 1144)	GIS Risk Rating	Positive	Negative
Riverside	66 Medium	Medium	• Access- via surface Hwy 180, good access to homes • Fuels- sparse • CVAR- low population density	• Fuels- some brush fuels. • Structural- combustible buildings
Table Butte (Greenwood)	73 High	Medium	• Access- via surface Hwy 180, good access to homes • Fuels- sparse • CVAR- low population density	• Access- some narrow driveways • Structural- combustible buildings • Water- drafting needed • Fire Response- 10 miles from nearest FD
Fort Bayard	52 Medium	Low	• Topo- flat-rolling • Access- driveway access is good • Water- hydrants • Fuels - sparse	• CVAR- high relative population density • CVAR- medical center, cultural – evac concerns
Faywood	83 High	Medium	• Water- Storage tanks available • Fire response- FD in town • CVAR- low population density • Structural- good defensible space around homes on Dwyer Lane.	• Access- some narrow driveways • Structural- combustible buildings • Fuels- some homes back to thicker riparian fuels
Mimbres Hot Springs Ranch	107 High	High	• CVAR- low population density • Fire Response- FD within 6 miles, but roads and access may impede response times.	• Topo- varied topo may influence fire behavior • Access- bridges with weight limits, poor rough roads. • Water- 6 miles away at FD • Structural- limited defensible space
San Juan	94 High	High	• Fuels- sparse • CVAR- low population density • Fire Response- 2 miles • Water- storage tank available	• Topo- varied topo may influence fire behavior • Access- narrow driveways • Structural- combustible buildings
Feeley Subdivision	127 High	High	• Water- storage tanks available • Fire Response – Pinos Altos • CVAR- low population density • The Silver City District of the FS have completed mechanical thinning behind the subdivision.	• Access- narrow, dead-end roads and limited escape routes • Fuels- heavy brush and timber fuels • Structural- limited defensible space around some homes

Community	CAR Rating (based on NFPA 1144)	GIS Risk Rating	Positive	Negative
Owens Road	123 High	High	• Water- storage tanks available • Fire response- 1 mile from FD • CVAR- low population density	• Access- narrow, dead-end roads and limited escape routes • Fuels- heavy brush and timber fuels • Structural- limited defensible space around some homes
Pinos Altos	96 High	High	• Water- hydrants, but some varying supply • Fire Response- FD in town • Access- some good roads, but quality varies • Structure- Some homes have maintained defensible space. • Fuels- active fuels management in the vicinity	• CVAR: commercial and dense residential • Access- some narrow driveways • Topo- varied topo may influence fire behavior • Fuels- surrounded by thick and continuous timber fuels • Structural- compact community with limited structure separation
Wagon Wheel Subdivision	82 High	High	• Fire Response- FD in community • Water- storage tanks available • Structural- some well-maintained defensible space • Access- good roads throughout • Structural- good structure separation	• Fuels- continuous timber/woodland fuels • Topo- varied topo may influence fire behavior • Access- some long narrow driveways
Cottage San Road	89 High	Medium	• Fire Response- FD in community • Water- hydrant and water storage tanks available • Fuels- patchy close to homes	• Access- narrow driveways, low water crossings, limited ingress-egress • Topo- varied topo may influence fire behavior • CVAR- high population density • Structure- combustible buildings
North Swan and Dos Griegos Subdivision	83 High	Medium	• Access- main highway access is good • Water- hydrants • Fire Response- FD in community • Structural- Defensible space	• CVAR- high population density • Structure- combustible buildings • Topo- varied topo may influence fire behavior • Fuels- relatively continuous fuels in vicinity • Continued growth of population

Community	CAR Rating (based on NFPA 1144)	GIS Risk Rating	Positive	Negative
LS Mesa Area	97 High	High	• Structural- defensible space • Water- storage tanks staged close by • Access- roads and good to fair • CVAR- low population density	• CVAR- grazing and recreational uses • Access- some long, steep driveways and locked gates • Access: some roads are not well maintained • Fire Response- Seasonal staged equipment but slow response at other times
Cleveland Mine Road/ Pinos Altos Mountain Estates	104 High	High	• CVAR- low population density • Access- some roads are good, but grade to poor in undeveloped areas • Fire Response- FD about 2 miles from community	• Topo- varied topo may influence fire behavior • Access- is highly variable. • Fuels- thick and continuous • Lots are currently for sale with some infrastructure, but road does not currently meet standards for emergency access. • Heavily used by residents for recreation- potential for increased ignitions.
Copper Ridge Subdivision	86 High	High	• Water- hydrants • Access- roads in good condition • Fire response- FD is 4 miles from community	• CVAR- high population density • Access- population road network • Access- some long steep driveways • Fuels- continuous fuels in vicinity • Topo- varied topo may influence fire behavior • Fire Response- overhead powerlines are a hazard to responders
Indian Hills Subdivision	87 High	High	• Water- hydrants • Access- roads in good condition • Fire response- FD is 5 miles from community • Some homes have good defensible space	• CVAR- high population density • Access- complicated road network • Access- some long steep driveways • Fuels- continuous fuels in vicinity • Topo- varied topo may influence fire behavior
Hanover/Fierro/Santa Rita District	108 High	Medium	• Water- hydrants • Fire Response- 5 miles from nearest FD	• Fuels- abandoned and derelict properties • CVAR- historic structures, mine infrastructure • Access- some poor road conditions • Topo- varied topo may influence fire behavior

Community	CAR Rating (based on NFPA 1144)	GIS Risk Rating	Positive	Negative
Viva Santa Rita Subdivision	103 High	Medium	• Fuels- patchy • Water- storage tanks available • Fire response- less than 1 mile to FD	• CVAR- relatively high population density • Structure- combustible buildings • Fuels- poor defensible space and continuous fuels in vicinity • Access- some narrow and rough driveways
Gila Hot Springs/Gila Cliff Dwellings and Visitor Center	101 High	High	• Access- Highway 15 provides direct access • CVAR- low population density • Fuels- sparse, though riparian fuels may exhibit intense fire behavior	• Access- narrow driveways • Water- drafting needed • Fire Response- slow- over 15 mils from nearest FD over slow, steep terrain • Topo- varied topo may influence fire behavior • CVAR- cliff dwellings, visitor center
Lake Roberts	95 High	High	• Fire Response- FD in the community • Access- highway access good • Water- VFD storage and neighborhood water association	• CVAR- business, recreational resources, emergency response infrastructure, lake and Sapillo creek. • Many seasonal residents • Access- short but narrow driveways • Fuels- some dense patches
Lake Roberts Heights (east to Ponderosa)	96 High	High	• Water- dry hydrant • Fire Response- 2 miles from location	• CVAR- recreational resources, relatively high population density • Water- drafting needed • Access- short but narrow driveways • Fuels- some dense patches
Trout Valley	96 High	High	• Fire Response- 1.5 miles from nearest FD • Water- storage tanks available • Access- fair road conditions	• Fire response - Some poor signposting and house numbers • Topo- varied topo may influence fire behavior • Structural- Many homes of limited defensible space

Community	CAR Rating (based on NFPA 1144)	GIS Risk Rating	Positive	Negative
Paradise Acres 1	104 High	High	• Fire Response- FD in community • Water – storage tanks available • Fuels- sparse and patchy	• CVAR- commercial and increasing residential population • Access- narrow driveways • Access- roads unpaved and steep in places • Topo- varied topo may influence fire behavior
Paradise Acres II	104 High	High	• Fire Response- FD in community • Water – storage tanks available • Fuels- sparse and patchy	• CVAR- commercial and increasing residential population • Access- narrow driveways • Access- roads unpaved and steep in places • Topo- varied topo may influence fire behavior
River Glen Subdivision	90 High	Medium	• Fire Response- close to FD • Water- storage tanks available • Fuels- sparse-though riparian fuels may exhibit intense fire behavior	• Access- narrow and rough roads and driveways • Access- some river crossings
East Peterson/West Racetrack	91 High	Medium	• Fire Response- FD close to community • Fuels- sparse • Access- Highway access is good	• Structural- combustible buildings • CVAR- commercial business, dense population • Access- road conditions poor • Access- missing street signs, poor house numbering
East Racetrack/Santa Clara	90 High	Medium	• Fire Response- FD close to community • Fuels- sparse • Access- Highway access is good • Good owner management	• CVAR- commercial business, dense population • Access- road conditions poor • Access- missing street signs, poor house numbering • Increasing population
Old Arenas Valley Road	78 High	Medium	• Fire Response- FD close to community • Fuels- sparse • Access- Highway access is good • Compact community	• CVAR- commercial business, dense population • Access- road conditions poor • Access- missing street signs, poor house numbering • Increasing population

Community	CAR Rating (based on NFPA 1144)	GIS Risk Rating	Positive	Negative
Rosedale/West Peterson	79 High	High	• Fuels- sparse • Access- main highway access good • Fire Response- FD close to community • Water available	• Access: complicated road network • CVAR- dense population • Topo- varied topo may influence fire behavior • Access- road conditions poor • Access- missing street signs, poor house numbering
Sunrise Estates	72 High	Medium	• Fuels- sparse but some clumps close to homes • Access- main highway access good • Fire Response- FD close to community • Water- storage tanks available	• Access: some driveways are narrow • Topo- varied topo may influence fire behavior • Access- road conditions poor
Oakwood Estates and Oakwood Estates #2	70 High	Medium	• Topography- flat lands • Access- paved and surfaced-gravel roads. • Water- fire hydrants available.	• Fuels- adjacent to USFS land. • Structural- combustible buildings, including manufactured and mobile homes.
Chisholm Ranch Subdivision	71 High	Medium	• Access- roads fair to good • Fire Response- FD close to community • Water- Storage tanks available	• Access- some narrow driveways and spur roads • Fuels- patchy and continuous in vicinity
Loma Blanca and Loma Blanca 2 Subdivision	64 Medium	Medium	• Access- Highway. Roads in good condition. • Fire Response- FD close to community • Water- storage tanks available	• Structural- combustible buildings • Topography- rolling hills • CVAR- the community is still developing.
Cullum Estates Subdivision	66 Medium	Medium	• Fire Response- FD within community • Water- storage tanks available • Access- road conditions are good • CVAR – low population density • Fuels- sparse	• Structural- combustible buildings • Some limited defensible space
Flying A Subdivision	82 High	High	• Fire Response- FD within community • Water- storage tanks available • Access- road conditions fair. Roads are paved or in the process of being paved.	• Topo- varied topo may influence fire behavior • Structural- combustible buildings • Fuels- some continuous fuels close to homes

Community	CAR Rating (based on NFPA 1144)	GIS Risk Rating	Positive	Negative
Tyrone Town Site	59 Medium	Medium	• Access- roads and driveways are good • Water- hydrants • Fire Response- FD within community • Fuels- sparse	• CVAR- high population density • CVAR- commercial businesses • Topography- rolling hills
Silver Acres, Quail Ridge, Ridge Road Mobile Park	59 Medium	Medium	• Access- paved and dirt roads, county maintained. • Water- hydrants available • Fuels- light	• Structural- combustible buildings. • Access- bridge and water crossings • Water- hydrants have slow flow rates
Truck Bypass Rd/American and Peaceful Valley Mobile Home Park	55 Medium	Medium	• Water- hydrants and water storage tanks available • Access- roads are good • Fire Response- FD close to community	• Structural- combustible buildings • Fuels- some denser patches of riparian fuels that may burn with intense fire behavior • Topo- varied topo may influence fire behavior • CVAR- relatively high population density
Mangus Terrace/Bellwood Mobile Home Park/ Gensen Mobile Home Park	73 High	Medium	• Access- roads are dirt but in fair condition • Fuels- sparse • CVAR- low population density • Topography- flat lands	• Structural- combustible buildings • Fuels- derelict buildings, junk piles, propane tanks • Fire Response- at least 10 miles away • Water- needs to be transported from FD
Wind Canyon II and Wind Canyon Estates	81 High	High	• Structural- good structure separation • Water- hydrants and storage tanks available • Fire Response- less than 1 mile to nearest FD • Structural- defensible space is good on some properties	• Fuels – surrounded by public lands • Topo- varied topo may influence fire behavior • Access- steep roads and spur roads • Access- limited turnarounds, narrow driveways
Hachita Town Site	60 Medium	Low	• Structural- compact community • Fuels- sparse • Access- roads are paved and good access to highway • Fire Response- FD in community • Topo- flat	• Water – limited • Structural- limited structure separation

COMMUNITY VALUES AT RISK

Earlier compilation of the critical infrastructure in the planning area, coupled with the community assessments, public outreach, and Core Team input, has helped in the development of a list of Community Values at Risk (CVARs) from wildland fire. The public was encouraged to provide additional CVAR during the public outreach effort.

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

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

NATURAL CVARS

The CWPP planning area has a variety of natural resources of particular concern to land managers, such as rare habitats and listed plant and wildlife species. The public outreach has emphasized the importance of natural/ecological values to the general public. Examples of natural values identified by the public and the Core Team include:

- Public lands
- Hunting areas
- Trail systems
- Agricultural land
- Wildlife habitat and game species (Figure 3.4)
- Watersheds and water quality

Figure 3.4. Wildlife and game species are highly valued by the Grant County community.

SOCIOECONOMIC CVARS

Social values include population, recreation, infrastructure, agriculture, and the built environment. Much of the built environment in the planning area falls within the WUI zones. Examples include the following:

- Schools
- Fire departments (Figure 3.5)
- Highways
- Churches
- Care homes, senior housing, day care, and other group homes
- Water storage
- Recreation sites

Figure 3.5. The network of VFDs throughout the County provide critical emergency response to residents.

CULTURAL CVARS

Many historical landmarks are scattered throughout Grant County. Particular CVARs that have been identified by the Core Team and the public in the CWPP planning area are:

- Churches
- Barns
- Historic houses
- Agricultural infrastructure

Historic barns and homes are commonplace throughout Grant County and are valued by the community for the ranching heritage that they represent.

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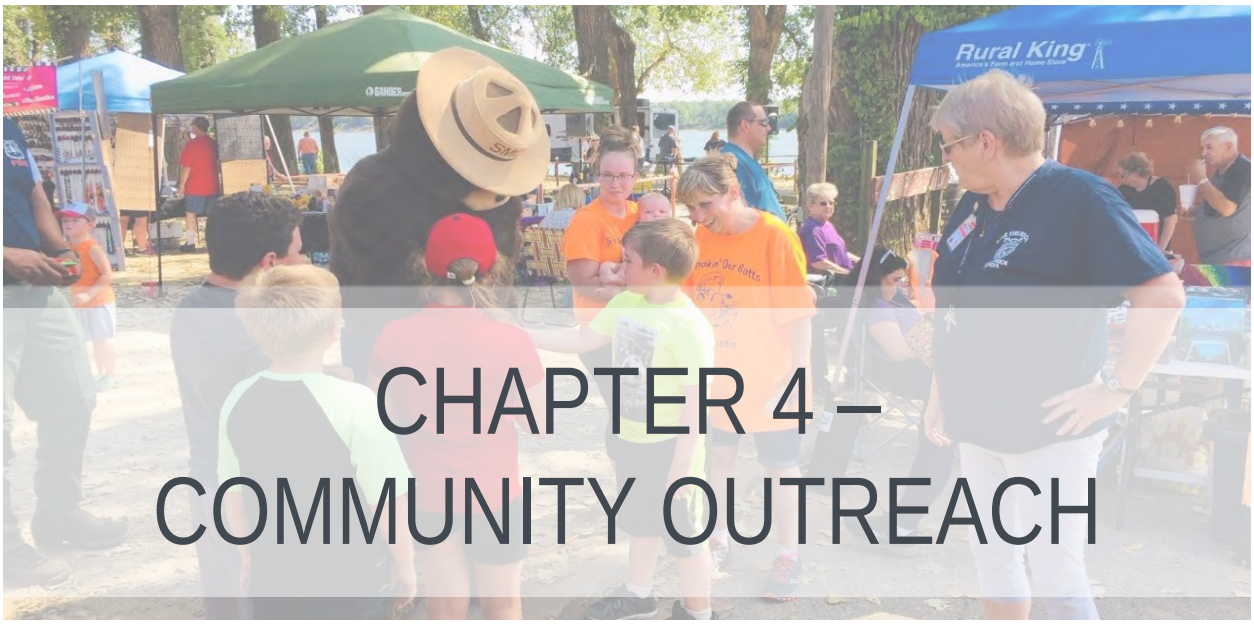


CHAPTER 4 – COMMUNITY OUTREACH

SOCIAL MEDIA

A Facebook page was developed for the project in order to provide an alternative forum through which to reach community members. The page was used to post announcements about the project. The profile page can be found at https://www.facebook.com/GrantCountyCWPP/.

PUBLIC OUTREACH EVENT

The CWPP contractor (SWCA) facilitated a public outreach meeting in Silver City on January 7, 2020. The meeting was advertised in local media and on the Grant County Business and Convention Center Calendar. The meeting was attended by over 30 residents. During the event, the public was asked to review the risk assessment map, community descriptions with hazard ratings and provide additional comments regarding concerns for wildfire risk and hazard in Grant County. Several agency representatives were present at the meeting and provided additional context regarding wildfire risk and prevention in the County. The public were encouraged to pick-up literature regarding wildfire prevention, defensible space and home hardening.

PUBLIC REVIEW OF THE DRAFT DOCUMENT

Grant County residents were invited to review a copy of the draft document during a two-week public review period that ran from March 2nd, 2020 to March 16th, 2020. The review period was announced in local media and on the County website. Comments were solicited via social media and other forms. Public comments were reviewed and edits were made to the document where appropriate.

Figure 4.1. Public meeting in Silver City, January 7, 2020.

FINDINGS OF PUBLIC OUTREACH

The outreach event provided a wealth of information that can be used to develop recommendations for fire prevention and preparedness in the County.

Some of the main themes that arose from the meeting included:

- Although residents support prescribed fire, continued outreach ahead of burns to alert vulnerable residents (e.g., residents with respiratory health conditions) is needed.
- There is a lack of labor resources for thinning work in the County but interest from residents in treating private land and creating defensible space. Residents were seeking assistance to complete this work. County personnel discussed the availability of a County chipper that can be provided to communities for a small fee (Figure 4.2). Silver City also provides a Chipper to subdivisions located with the city limit.
- The community is interested in seeking additional Firewise community status. These communities can be of any size but require an organized group who will seek certification and ensure maintenance requirements are met.
- Residents were concerned about livestock evacuation and shelter, particularly on large cattle ranches. These concerns are addressed in the County Emergency Management plan and are incorporated by reference in this document (Appendix H).
- Residents are concerned about procedures for animal rescue in the event of an evacuation. This information is also included in the Emergency Management plan.
- Many residents raised concerns regarding limited ingress-egress, which would impede evacuation and limit access by emergency responders. There are many dead-end roads or areas with limited turnaround space (Figure 4.3). This is a concern that should be addressed through projects under the fire response section of the plan.

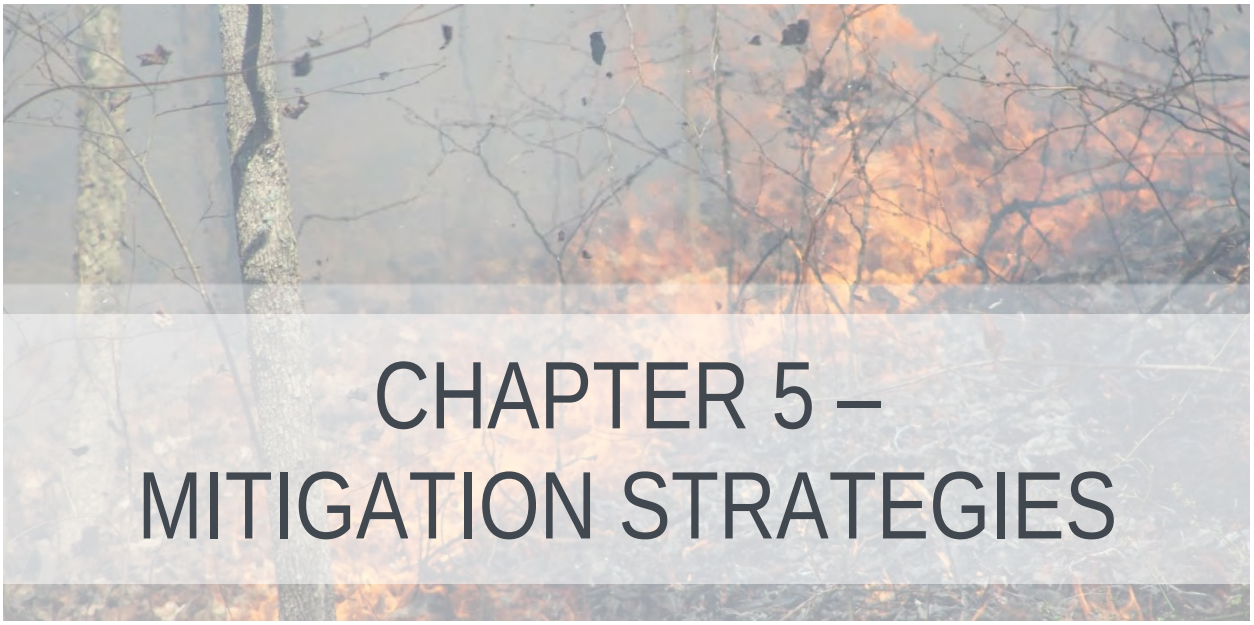
Figure 4.2. Chippers provide a means through which slash from thinning treatments can be removed and disposed of, as seen in this picture of workers using a chipper to treat branches removed during a WUI treatment in the County.

Figure 4.3. There are numerous dead-end roads within the Grant County WUI.

- Some residents acknowledged that address markers are insufficient and may impact fire response. The County has a rural addressing ordinance requiring residents to use address markers for their driveways, but the ordinance is not actively enforced. There is also a concern by emergency responders that markers are often not maintained, and they have very little enforcement powers to ensure this maintenance is carried out. Greater outreach is needed to inform residents that markers are available.
- Residents were encouraged to consider ways to prevent structural ignitability of their home. Many residents were already aware of and/or implementing defensible space guidelines around their properties, but many had not made progress in “home hardening,” which includes considering the impact of fine embers entering the home through a vent or other opening. The USFS provided

literature on home hardening practices and the public were encouraged to share these resources with neighbors.

- One resident raised the possibility of developing ordinances for defensible space in order to provide greater enforcement for fire prevention throughout the County. In general, new ordinances are not well received by the Grant County community.
- A business owner raised concerns regarding the protection of communication sites used for emergency communications. They noted that some communication sites are surrounded by thick and continuous forest, which appears to be a hazard to the security of that infrastructure. This can be addressed through fuel treatment recommendations included in this document, but the infrastructure owner is responsible for the protection of their equipment.
- Specific actions are needed by seasonal residents to address Firewise structural ignitability and lack of maintenance over extended periods.
- Some neighborhood association bylaws forbid tree removal and trimming within the neighborhood, for example in Lake Roberts. This is a concern for residents who would like to mitigate hazardous fuels around their properties.
- This CWPP update was focused on restructuring the CWPP format and content. Future CWPP updates should focus on increasing community engagement and input through increased public meetings and community events.



CHAPTER 5 – MITIGATION STRATEGIES

As part of the 2020 CWPP update, this plan has been aligned with the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) and its Phase III Western Regional Action Plan by adhering to the nation-wide goal "*To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire*." (National Strategy 2014:3).

In order to do this, the CWPP recommendations have been structured around the three main goals of the Cohesive Strategy: Restoring and Maintaining Landscapes, Fire-adapted Communities, and Wildfire Response.

This chapter provides guidance for implementing recommendations under each Cohesive Strategy goal. Many of these community-specific recommendations can be implemented at the homeowner or community level. Projects requiring large-scale support can be prioritized based on the Community Hazard/Risk Assessments and Composite Risk Assessments.

COHESIVE STRATEGY GOAL 1: RESTORE AND MAINTAIN LANDSCAPES

Goal 1 of the Cohesive Strategy and the Western Regional Action Plan is: Restore and Maintain Landscapes: Landscapes across all jurisdictions are resilient to fire and other disturbances in accordance with management objectives.

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

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

RECOMMENDATIONS FOR HAZARDOUS FUEL REDUCTION

Fuels management of public and private land in the WUI is key to the survival of homes during a wildfire event, as well as the means to meet the criteria of Goal 1. The importance of fuels management is reflected in forest policy at the federal level, with the HFRA requiring that federal land management agencies spend at least 50% of their fuels reduction funds on projects in the WUI. Cross-boundary management of hazardous fuels is increasingly pursued by state and federal partners, utilizing programs like the Collaborative Forest Restoration Program and Good-Neighbor Authority.

Fuels should be modified with a strategic approach across Grant County to reduce the threat that high-intensity wildfires pose to lives, property, and other values. Pursuant to these objectives, recommendations have been developed in the context of existing and planned fuels management projects. These recommendations initially focus on areas adjacent to structures (defensible space), then near community boundaries (fuel breaks, cleanup of adjacent open spaces), and finally in the wildlands beyond community boundaries (larger-scale forest health and restoration treatments).

While not necessarily at odds with one another, the emphasis of each of these treatment types is different. Proximate to structures, the recommendations focus on reducing fire intensity consistent with Firewise and International Fire Code standards. Further into open space areas, treatments will tend to emphasize the restoration of historic conditions and general forest health. Cooperators in fuels management should include federal, state, and local agencies as well as interested members of the public.

Table 5.1 summarizes the types of treatments recommended throughout the planning area. The majority of the treatments are focused on higher risk areas, as defined by the Composite Risk/Hazard Assessment, Core Team collaboration, and public input. Many of these treatment recommendations are general across the communities because similar conditions and concerns were raised for all communities that border wildland areas. Table 5.1 also addresses the requirement for an action plan and assessment strategy by providing monitoring guidelines and a timeline for implementation. This timeline is obviously dependent on available funding and resources, as well as National Environmental Policy Act (NEPA) protocols for treatments on public land.

The treatment list is by no means exhaustive and should be considered purely a sample of required projects for the future management of the planning area. Many projects may be eligible for grant funds available from federal and/or state sources. A key source of funding for implementing hazardous fuel reduction are funds available through WRAP, which is the reason this CWPP tiers to those goals. For an additional list of funding sources, please refer to Appendix F.

Each land management agency has a different set of policies governing the planning and implementation of fuels reduction projects; for example, treatments on federal land require intensive NEPA analysis, and many treatments may have a forest health and/or wildlife habitat objectives as a primary goal. Because of the complex nature of large treatments on public land, it is the responsibility of local governments, with input from affected stakeholders, to determine which method(s) will safely accomplish the fuels management objectives for a given area. A thorough assessment of current fuel loading is an important prerequisite for any fuels prescription, and all treatment recommendations should be based on the best possible science. When possible, simultaneously planning for the management of multiple resources while reducing fuels will ensure that the land remains viable for multiple uses in the long term.
The effectiveness of any fuels reduction treatment depends on the degree of maintenance and monitoring that is employed. Monitoring will also ensure that objectives are being met in a cost-effective manner.

Fire management cannot be a one-size-fits-all endeavor; this plan is designed to be flexible. Treatment approaches and methods will be site-specific and should be adapted to best meet the needs of the landowner and the resources available. Moreover, each treatment recommendation should address protection of CVARs, particularly the protection of threatened and endangered species.

Table 5.1. Fuel Treatment Recommendations

Project Description	Location	Land Ownership	Method and Goal	Timeline	Resources/Funding	Priority
Purchase additional chippers and/or a mobile incinerator	Could be located at the Silver City dump	County/Private	• Sufficient facilities and mechanisms for slash disposal is limiting clean-up on private lands. Making more chippers available would facilitate removal of brush and hazardous fuels on private properties. • Based on feedback at the public meeting, greater education and outreach is needed to inform the public about the availability of chippers. • Anti-donation clause requires that a nominal fee is including for rental of the chipper from the County.	Fall 2020	• FEMA- Pre-disaster mitigation funding • National Fire Plan cost-share funding • State Fire Assistance WUI grants.	High
Advance existing programs for hazardous fuel reduction on larger private units	Private land over 50 acres.	Private	• Grant County Soil and Water Conservation District has had difficulty recruiting landowners with more than 50 acres to participate in WUI fuel treatment projects due to the mandatory 50:50 cost share. They are looking for large landowners to recruit to the program. • Need to increase local capacity for fuel treatment work. Explore whether existing Southwest Fire Fighter (SWFF) emergency on-call fire crews could be used for local thinning projects. • Consider development of a youth corps to support fuel treatment projects on private land. • Explore the potential to use VFDs to support fuel treatment projects. Need to consider anti-donation clause.	Winter 2020	• The Conservation District is looking into providing a 70:30% match. Typically match requirement is 50%. • Leverage other WUI grant funds, for example NM Water Trust Board Funds, Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) funds. • Use labor as an in-kind match. • Use successful models as a go-by i.e., Claunch-Pinto SWCD projects.	High

Project Description	Location	Land Ownership	Method and Goal	Timeline	Resources/Funding	Priority
Seek local grant writing expertise	County	County, Private	• The County is looking for more sophisticated grant writing resources to assist with grant application for state and federal funds.	Summer 2020	• County funding	High
Roadside thinning along access roads and evacuation routes with scheduled maintenance to improve sustainability	All communities where appropriate. High-risk communities to be prioritized.	Private, New Mexico Department of Transportation and USFS land	• Reduce fuel loading along roadways in order to mitigate potential ignitions from the highway, but also provide safe clearance to facilitate evacuation and emergency access. • Mechanical treatment: tree removal, mowing. • Herbicide treatment as needed or appropriate. • Added benefit of improving road safety related to vehicle-wildlife collisions. • Design maintenance schedule depending upon vegetation type. Goal is to maintain clearance during fire season.	Implement and maintain annually or as outlined in maintenance schedule.	• National Fire Plan Rural Fire Assistance • FEMA Hazard Mitigation Grant funding • FEMA Pre-disaster Mitigation funding • USFS Hazard Fuels grants	High
Maintain utility line ROW	PNM (Public Service Company of NM) ROW	PNM	• Utility line ROWs need more regular maintenance to ensure clearance with heavy fuels, especially across forested property. • PNM to increase maintenance cycles.	Implement and maintain annually or as outlined in maintenance schedule.	• PNM	High

Project Description	Location	Land Ownership	Method and Goal	Timeline	Resources/Funding	Priority
Promote increased use of prescribed fire on private forest land to promote landscape-scale restoration	Countywide.	All jurisdictions	• Continue existing collaboration to build better cross-border collaboration for landscape-level prescribed fire treatments. • Seek additional funding to support. • Pursue grants that would allow continued monitoring and maintenance burns. • Maintenance cycles for treatments: o Repeat treatment 2–5 years for prescribed fire. o Invasive species treatment: annual return to start and then maintenance. o 2–4 entries and then back off (timber). o Grassland and shrubs: 2-year cycle. o Thinning treatments follow up with fire every 2–5 years; 10–15 years thinning again.	Ongoing.	• NRCS Regional Conservation Partnership Program- https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/rcpp/ • Utilize the latest relevant scientific literature to support approach, including information generated by the various southwest forest restoration institutes.	High

Project Description	Location	Land Ownership	Method and Goal	Timeline	Resources/Funding	Priority
Build additional landscape-level treatments (mechanical and prescribed fire) for forest restoration and landscape resiliency (Figure 5.1). Utilize cross-boundary restoration approaches wherever possible, using federal, state and private partnerships.	Countywide	All jurisdictions	• Utilize Gila Landscape Collaborative (or similar working group) to provide detailed action plan and strategy for landscape treatment on all jurisdictions. • Continue current initiatives to increase collaboration across boundaries. • Integrate with fuels strategies on public lands, for example the Gila National Forest D7 Strategy (currently under development) • Work from existing and planned treatment data (Figure 5.1) and the risk assessment, to develop conceptual treatment plans that are highest priority for treatment. • Appoint a chair and a representative responsible for seeking grant opportunities. • Encourage cooperation by private landowners to expand prescribed fire on private land. • Build upon existing monitoring efforts on USFS land and expand monitoring to all jurisdictions (including private land) in order to contribute to adaptive management. Consider the impacts that treatments may have on altering the fuel complex, for example, introducing more flashy fine fuels. • Consider the use of a citizen science program to engage Grant County citizens, schools and/or interested citizens in monitoring of forest treatments.	Quarterly meeting of working group.	• National Fire Plan Rural Fire Assistance • FEMA Hazard Mitigation Grant funding • FEMA Pre-disaster Mitigation funding • USFS Hazard Fuels grants • Utilize the latest relevant scientific literature to support approach, including information generated by the various southwest forest restoration institutes.	High

Project Description	Location	Land Ownership	Method and Goal	Timeline	Resources/Funding	Priority
Forest Products Utilization and Marketing Plan	Countywide	Public Lands	• The utilization and marketing of forest (wood) products has been addressed in detail in the Grant County CWPP in the past. While these efforts have had some success in developing a use for the biomass (wood) produced as the result of fuel reduction efforts in Grant County, there is much more that could be done to make the by-products of fuel reduction projects marketable. A separate "Forest Product Utilization and Marketing Plan" for the Grant County area, which could be funded by various grant funding opportunities should be explored. • Work with stakeholders to review current firewood collection practices, to encourage collection in more interior areas, as opposed to low hanging fruit along treatment margins. Consider "chunking out" treatments to improve public access to collection areas. • Adhere to Forest Plan direction for firewood collection.	Long-term goal- over the next 5 years.	• USFS Wood Innovations Program: https://www.fs.fed.us/science-technology/energy-forest-products/wood-innovations-grants • Utilize the latest relevant scientific literature to support approach, including information generated by the various southwest forest restoration institutes.	Moderate

Project Description	Location	Land Ownership	Method and Goal	Timeline	Resources/Funding	Priority
Ranch FMPs	Private land	Private land	• FMPs have been developed for private ranchland in the County and could be used as a template for other private ranches. • Provide countywide strategic grazing plan to help reduce fine fuels during fire season. • Identify mitigation actions that ranch managers could take to reduce fine fuels- i.e. mowing fence lines, rotational grazing. • Introduce prescribed fire into grassland communities that are fire adapted in order to improve overall grassland health and resiliency.	Fall 2022	• NRCS EQIP funding • Rural Fire Assistance	Moderate

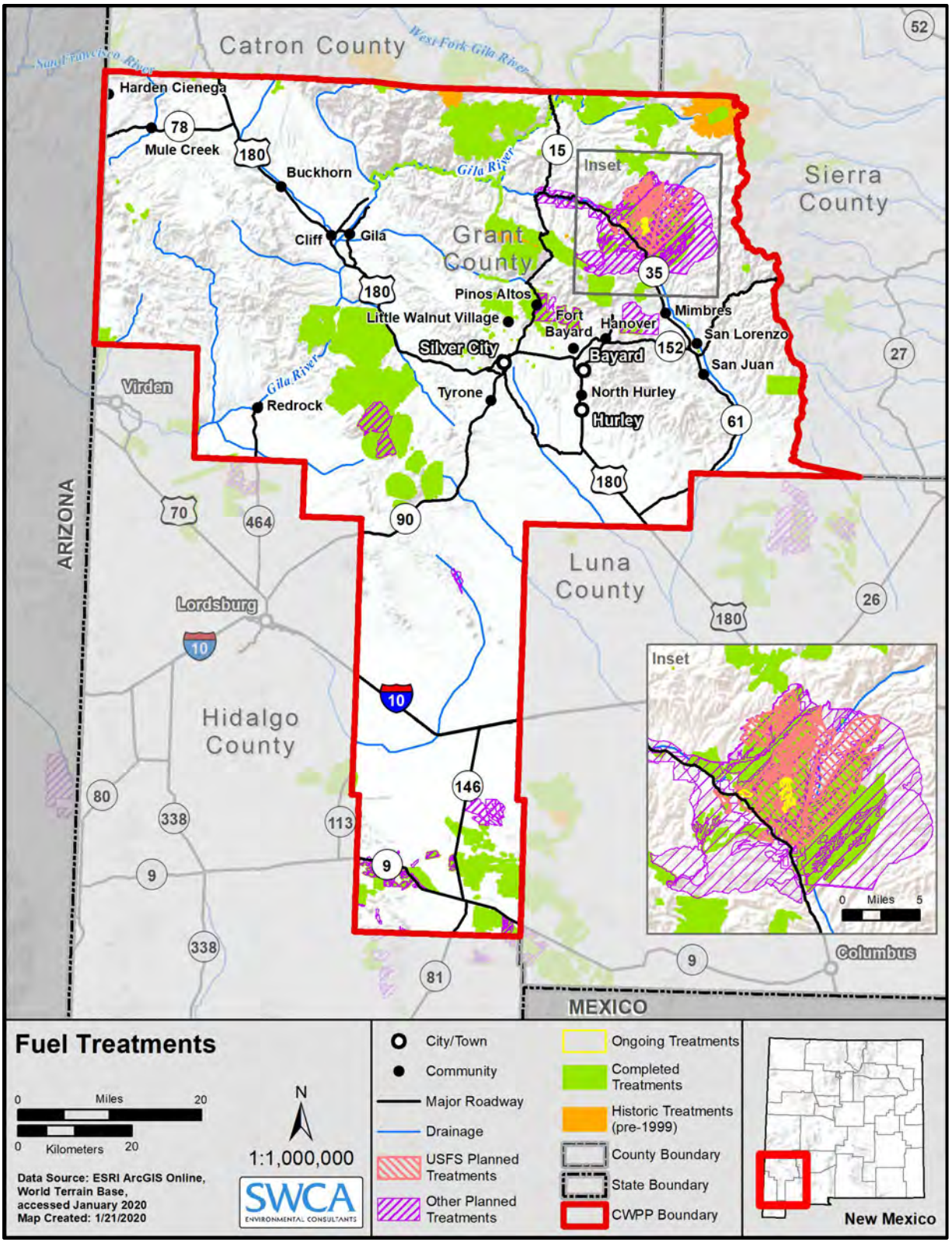


Figure 5.1. Existing and planned fuel treatments across all jurisdictions. Table 5.1 includes a recommendation that existing treatments be expanded to generate landscape-level treatment polygons across all high-risk areas. This would provide for greater resiliency to wildfire risk as well as other disturbances. Other planned treatments are multi-jurisdictional planned projects.

It is the intent of this plan to be an evolving document that will incorporate additional areas of the GCCWPP planning area as they change in risk category over time. During future reviews of the CWPP, the Core Team should consider incorporating elements of the New Mexico Forest Action plan (FAP), which is scheduled to be finalized in summer 2020. The FAP WUI layer should be reviewed with the Core Team and considered for incorporation in the CWPP risk assessment.

Fuels Treatment Scales

Defensible Space

Defensible space is perhaps the fastest, most cost-effective, and most efficacious means of reducing the risk of loss of life and property. Although fire agencies can be valuable in providing guidance and assistance, creating defensible space is the responsibility of the individual homeowner (Figure 5.2).

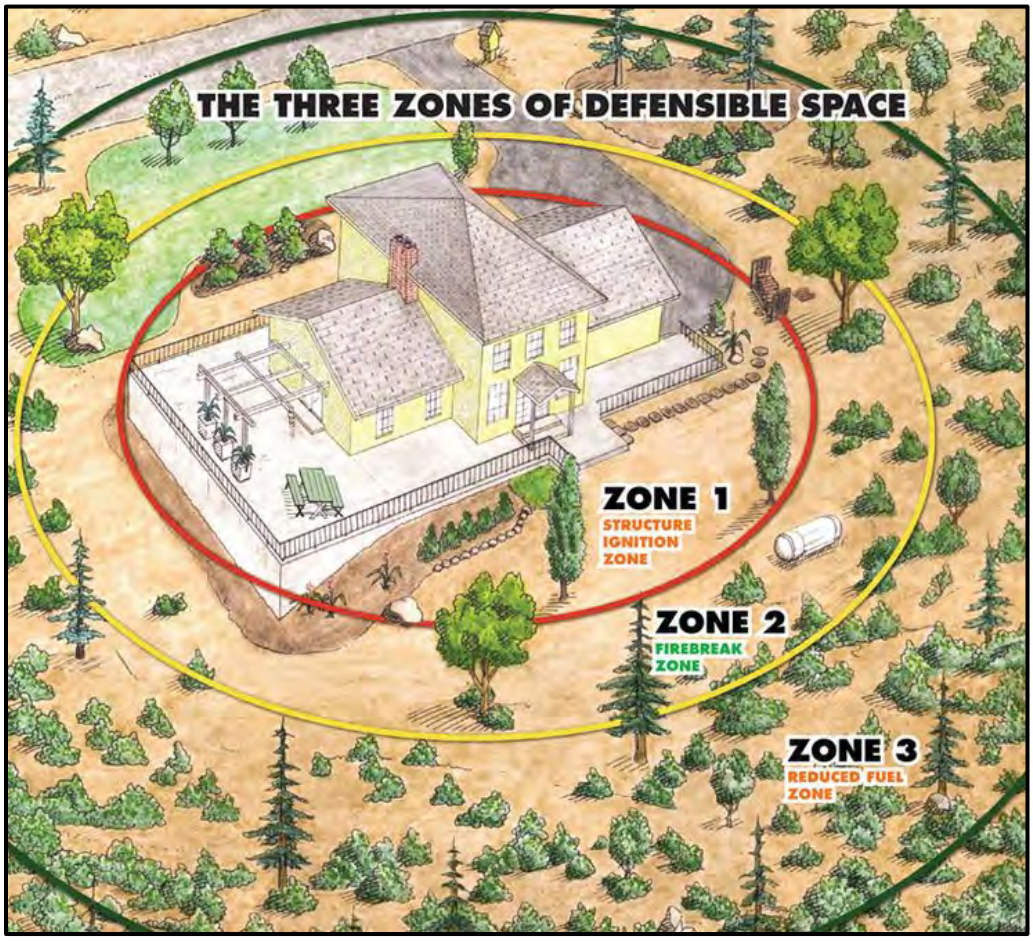


Figure 5.2. Defensible space providing clearance between a structure and adjacent woodland or forest fuels. Source: Firewise.org.

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. 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 (Figures 5.2 and 5.3).

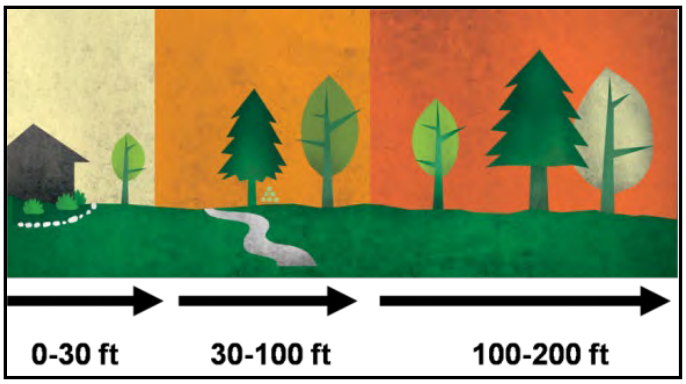


Figure 5.3. Defensible space zones.
Source: www.firewise.org.

It should be emphasized that defensible space is just that—an area that allows firefighters to work effectively and with some degree of safety to defend structures. While defensible space may increase a home's chance of surviving a fire on its own, a structure's survival is not guaranteed, with or without firefighter protection. Nevertheless, when these principles are consistently applied across a neighborhood, everybody benefits.

Specific recommendations should be based on the particular hazards adjacent to a structure such as slope steepness and fuel type. Local fire authorities or a state forester should be contacted if a professional assessment seems warranted. Homeowners can invite fire department and agency staff to carry out an assessment on their home to provide specific actions they can take for wildfire mitigation. Firewise guidelines and the Homeowners Guide (Appendix G) are excellent resources, but creating defensible space does not have to be an overwhelming process. Assisting neighbors may be essential in many cases. Homeowners should consider assisting the elderly, sharing ladders for gutter cleaning, and assisting neighbors with large thinning needs. Adopting a phased approach can make the process more manageable and encourage maintenance (Table 5.2).

Table 5.2. Example of a Phased Approach to Mitigating Home Ignitability

Year	Project	Actions
1	Basic yard cleanup (annual)	Dispose of clutter in the yard and under porches. Remove dead branches from yard. Mow and rake. Clean off roofs and gutters. Remove combustible vegetation near structures. Coordinate disposal as a neighborhood or community. Post 4-inch reflective address numbers visible from road.
2	Understory thinning near structures	Repeat basic yard cleanup. Limb trees up to 6–10 feet. Trim branches back 15 feet from chimneys. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.

Year	Project	Actions
3	Understory thinning on private property along roads and drainages	Limb trees up to 6–10 feet. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
4	Overstory treatments on private property	Evaluate the need to thin mature or diseased trees. Prioritize and coordinate tree removal within neighborhoods to increase cost effectiveness.
5	Restart defensible space treatment cycle	Continue the annual basic yard cleanup. Evaluate need to revisit past efforts or catch those that were bypassed.

Fuel Breaks and Open Space Cleanup

The next location priority for fuels treatments should be where the community meets the 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, and dead branches, leaves or downed logs) has been modified or reduced to limit the fires ability to spread rapidly. Fuel breaks should not be confused with firebreaks which are areas where vegetation and organic matter is removed down to mineral soil. Shaded fuel breaks may be created to provide options for suppression resources or to provide opportunities to introduce prescribed fire. In many cases, shaded fuel breaks may be created by thinning along roads. This provides access for mitigation resources and firefighters, as well as enhancing the safety of evacuation routes.

Some areas adjacent to communities require fuel reduction to mitigate a hazardous condition, although are not suitable for fuel breaks.

Larger-scale Treatments

Farther away from WUI communities, the emphasis of treatments often becomes broader. While reducing the buildup of hazardous fuels remains important, other objectives are often included, such as restoration of historic conditions and forest health. Wildfires frequently burn across jurisdictional boundaries, sometimes on landscape scales. As such, these larger treatments need to be coordinated on a strategic level. This requires coordination between projects and jurisdictions, as is currently occurring. Land managers have carried out numerous forest restoration projects across Grant County and the Gila region and have ongoing projects planned on public land that are designed to reduce hazardous fuels to protect communities and resources, while restoring fire adapted communities (see Figure 6.1).

Fuel Treatment Methods

Since specifics of the treatments are not provided in detail in Table 5.1, different fuels reduction methods are outlined in the following narrative.

Several treatment methods are commonly used, including manual treatments, mechanized treatments, and prescribed fire (Table 5.3). This brief synopsis of treatment options is provided for general knowledge; specific projects will require further planning. The appropriate treatment method and cost will vary depending on factors such as the following:

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

It is imperative that long-term monitoring and maintenance of all treatments is implemented. Post-treatment rehabilitation such as seeding with native plants and erosion control may be necessary.

Table 5.3. Summary of Fuels Treatment Methods

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

Manual Treatment

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

Strategic timing and placement of fuels treatments is critical for effective fuels management practices and should be prescribed based on the conditions of each particular treatment area. Some examples of this would be to place fuel breaks in areas where the fuels are heavier and in the path of prevailing winds and to mow grasses just before they cure and become flammable. Also, burning during the hotter end of the prescription is important since hotter fires are typically more effective at reducing heavy fuels and shrub growth. In areas where the vegetation is sparse and not continuous, fuels treatments may not be necessary to create a defensible area where firefighters can work. In this situation, where the amount of fuel to carry a fire is minimal, it is best to leave the site in its current condition to avoid the introduction of exotic species.

Mechanized Treatments

Mechanized treatments include mowing, mastication (ground-up timber into small pieces) and whole tree felling. These treatments allow for more precision than prescribed fire and are often more cost-effective than manual treatment (Figures 5.4–5.9).

Figure 5.4. Ponderosa pine forest, pre-mechanical thinning treatment in the Grant County WUI.

Credit: New Mexico State Forestry.

Figure 5.5. Ponderosa pine forest, post-mechanical thinning treatment in the Grant County WUI, removing small diameter understory vegetation.

Credit: New Mexico State Forestry.

Figure 5.6. Pinyon-juniper/ponderosa pine intermix, pre-mechanical treatment in the Grant County WUI.

Credit: New Mexico State Forestry.

Figure 5.7. Pinyon-juniper/ponderosa pine intermix, post-mechanical treatment in the Grant County WUI.

Credit: New Mexico State Forestry.

Figure 5.8. Oak woodland pre-mechanical treatment in the Grant County WUI.

Credit: New Mexico State Forestry.

Figure 5.9. Oak woodland post-mechanical treatment in the Grant County WUI.

Credit: New Mexico State Forestry.

Mowing, including ATV and tractor-pulled mower decks, can effectively reduce grass fuels adjacent to structures and along highway rights-of-way (Figure 5.10) and fence lines. For heavier fuels, a number of different masticating machines can be used, including drum- or blade-type masticating heads mounted on machines and ranging in size from a small skid-steer to large front-end loaders. Some masticators are capable of grinding standing timber up to 10 inches in diameter. Other masticators are more effective for use in brush or surface fuels. Mowing and mastication do not actually reduce the amount of on-site biomass but alter the fuel arrangement to a less combustible profile.

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

Mechanical shears mounted on feller bunchers are used for whole tree removal (Figure 5.11). The stems are typically hauled off-site for utilization while the limbs are discarded. The discarded material may be masticated, chipped, or burned in order to reduce the wildfire hazard and to speed the recycling of nutrients.

Figure 5.10. Mowed rights-of-way help to prevent fire spread from highway ignitions.

Figure 5.11. Log deck located along a road in Grant County.

Prescribed Burning

Prescribed burning is also a useful tool to reduce the threat of extreme fire behavior by removing excessive standing plant material, litter, and woody debris while limiting the encroachment of shrubby vegetation. Where possible, prescribed fire could occur on public lands since fire is ecologically beneficial to this fire-adapted vegetation community and wildlife habitat. Land managers are already cooperating to implement prescribed burning in Grant County.

All prescribed fire operations will be conducted in accordance with federal and state laws and regulations. Public safety would be the primary consideration in the design of any prescribed burn plan so as to not negatively impact the WUI. The areas to be burned would occur within fuel breaks or appropriate fire lines (USFS 2015). Agency use of prescribed fire on public lands would be carried out within the confines of the agency's fire management planning documents and would require individual prescribed burn plans that are developed for specific burn units and consider smoke management concerns and sensitive receptors within the WUI. Smoke monitors could be placed in areas where smoke concerns have been raised in the past.

Following any type of fuels reduction treatment, post-treatment monitoring should continue to ensure that management actions continue to be effective throughout the fire season. The vegetation within this ecosystem can change rapidly in response to drought or moisture from year to year and during the course of the season, so fuels treatments should be adjusted accordingly.

Several re-entries may be needed to meet full resource management objectives in this vegetation type, so a solid maintenance plan and is needed to ensure success.

Impacts of Prescribed Fire on Communities

Managing smoke from prescribed fires is becoming an important part of planning for prescribed burning. The New Mexico Environment Department, Air Quality Bureau has developed smoke management guidelines to protect the health and welfare of New Mexicans from the impacts of smoke (NMED 2005). Smoke from burning vegetation produces air pollutants that are regulated by both the U.S Environmental Protection Agency (EPA) and the state of New Mexico.[6]

[6] https://www.env.nm.gov/wp-content/uploads/sites/2/2018/03/SMP_Guidance_052505.pdf

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 rare 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 visible gases such as carbon monoxide, carbon dioxide, hydrocarbons, and small quantities of nitrogen oxides. Oxides of nitrogen are usually produced at temperatures only reached in piled or windrowed slash or in very intense wildfires that are uncommon in the region. In general, prescribed fires produce inconsequential amounts of these gases.

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 project area consistently work with concerned citizens regarding smoke management and attempt to provide solutions such as the placement of smoke monitors at sensitive sites.

Thinning and Prescribed Fire Combined

Combining thinning and prescribed fire can be the most effective treatment (Graham et al. 2004). In forests where fire exclusion or disease has created a buildup of hazardous fuels, prescribed fire cannot be safely applied and pre-burn thinning is required. The subsequent use of fire can further reduce residual fuels and reintroduce this ecologically imperative process.

Management of Non-native Plants

The USDA maintains a list of noxious weeds rated from A to C based on the current degree of infestation of the species and the potential for eradication (USDA 2010). Fuel treatment approaches should always consider the potential for introduction or proliferation of invasive non-native species as a result of management actions.

Fuel Breaks

Fire behavior in the CWPP planning area has been modeled using FlamMap. This assessment provides estimates of flame length and rate of spread; the information should be used by land managers when prescribing treatments. Land managers are cautioned, however, that fuel breaks will not always stop a fire under extreme fire behavior or strong winds; these should only be seen as a mitigating measure and not a fail-safe method for fire containment. Furthermore, fuel break utility is contingent upon regular maintenance, as regrowth in a fuel break can quickly reduce its effectiveness and vegetation in this ecosystem is known to quickly re-sprout and reestablish. Maintenance of existing breaks could be more cost efficient than installation of new features.

It is not possible to provide a standard treatment prescription for the entire landscape because fuel break dimensions should be based on the local fuel conditions and prevailing weather patterns. For example, in some areas, clearing an area too wide could open the landscape to strong winds that could generate more intense fire behavior and/or create wind throw.

Because of the dominant wind patterns in Grant County (i.e., out of the west-southwest), fuel breaks are recommended on the west sides of communities.

Strategic placement of fuel breaks is critical to prevent fire from moving from wildland fuels into adjacent neighborhoods. For effective management of most fuels, fuel breaks should be prescribed based on the

conditions in each particular treatment area. Some examples of this would be to place fuel breaks in areas where fuels are heavier or in areas with easy access for fire crews. In areas where the vegetation is discontinuous, fuel treatments may not be necessary. In this situation it is best to leave the site in its current condition to avoid the introduction of more flammable, exotic species which may respond readily following disturbance.

Well-managed fuels reduction projects often result in ecological benefits to wildlife and watershed health. Simultaneously, planning and resource management efforts should occur when possible while reducing fuels to ensure that the land remains viable for multiple uses in the long term. The effectiveness of any fuels reduction treatment will increase over time with a maintenance and monitoring plan. Monitoring will also ensure that objectives are being met in a cost-effective manner.

COHESIVE STRATEGY GOAL 2: FIRE-ADAPTED COMMUNITIES

Goal 2 of the Cohesive Strategy/Western Regional Action Plan is: Fire-Adapted Communities: Human populations and infrastructure can withstand a wildfire without loss of life and property. The basic premise of this goal is:

> *"Preventing or minimizing the loss of life and property due to wildfire requires a combination of thorough pre-fire planning and action, followed by prudent and immediate response during a wildfire event. Post-fire activities can also speed community recovery efforts and help limit the long-term effects and costs of wildfire. CWPPs should identify high-risk areas and actions residents can take to reduce their risk. Fuels treatments in and near communities can provide buffer zones to protect structures, important community values and evacuation routes. Collaboration, self-sufficiency, acceptance of the risks and consequences of actions (or non-action), assisting those who need assistance (such as the elderly), and encouraging cultural and behavioral changes regarding fire and fire protection are important concepts. Attention will be paid to values to be protected in the middle ground (lands between the community and the forest) including: watersheds, viewsheds, utility and transportation corridors, cultural and historic values, etc.". Western Regional Action Plan (2013), page 15.*

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

RECOMMENDATIONS FOR PUBLIC EDUCATION AND OUTREACH

Just as environmental hazards need to be mitigated to reduce the risk of fire loss, so do the human hazards. Lack of knowledge, lack of positive actions, and negative actions all contribute to increased risk of loss in the WUI.

Many Grant County residents understand the risk that wildfire poses to their communities, however, it is important to continually raise awareness of fire risk and improve fire education particularly since the county is composed of such a vast area of forested public land that historically would have undergone more frequent wildfire (Winter and Fried 2000; McCaffrey 2004). Table 6.4 lists recommendations for improving public education and outreach.

While there are already a couple of certified Firewise Communities in the County (Figure 5.12), many residents could still benefit from greater exposure to the Firewise Communities[7], Fire Adapted Communities[8] and Ready, Set, Go! Programs. Workshops demonstrating and explaining Firewise Communities principles have been suggested to increase homeowner understanding of home protection from wildfire. Information about the programs are available at http://www.firewise.org/usa/index.htm and

[7] Firewise Communities- A Model of Local Initiative and Cooperation: www.firewise.org

[8] Fire Adapted Communities Coalition: http://www.fireadapted.org/resources/meet-the-coalition.aspx

http://www.wildlandfirersg.org/. Greater participation in these programs could improve local understanding of wildfire and, in turn, improve protection and preparedness.

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

Figure 5.12. Dos Griegos is one of the certified Firewise Communities in Grant County, where residents are collaborating to maintain Firewise standards to help mitigate wildfire risk and hazard.

Table 5.4 lists public education and outreach projects recommended for implementation in the county. Many of these projects are designed to also raise the profile of the CWPP and encourage more engagement during subsequent CWPP updates.

Table 5.4. Public Outreach and Education Recommendations

Project	Description	Presented By	Target Date	Resources Needed	Serves to…	Priority
Collaborative wildfire education campaign	Wildfire public education and information sharing was a high priority for the residents of Grant County in 2005, 2009 and 2015. There have been many efforts to implement and continue public education during the entire time the Grant County CWPP has been in effect. Most of these efforts have been carried out independently by the various federal, state and local agencies and the fire departments. These efforts have been relatively successful but may be made more effective with a collaborative effort among all of the agencies and fire departments involved in these kind of efforts: a united front. Would include joint workshops and events focused on wildfire risk assessment, Firewise practices, home hardening, and fire prevention. Would include joint distribution of literature.	• All agencies-county, state and federal	Fall 2021	• Workshop locations • Marketing and publicize • Utilize the latest relevant scientific literature to support approach, including information generated by the various southwest forest restoration institutes and Fire-Adapted Communities.	Provide a consistent public education message and reduce confusion. Reduces redundancy and offers cost-sharing amongst agencies.	High

Project	Description	Presented By	Target Date	Resources Needed	Serves to…	Priority
Firewise – Train-the Trainer workshops	Provide a Firewise assessor or "Home Ignition Zone" workshop focused on training individuals in Firewise assessment protcols that they could use within their community for home hazard assessments. Use grant funding to attract private citizen or fire department personnel to attend the class, an approximately 2-day class. A representative from Firewise would do the training.	• Firewise • Agency Fire Prevention Specialists • County	Fall 2021	• http://www.firewise.org • RC&D fiscal agent	Build capacity of local citizens to contribute to the fire prevention message. Locals respond well to the message coming from their neighbors, or trusted members of their community (fire personnel).	High
Increase the number of Firewise Communities in the County	The Core Team and the public are interested in increasing the number of Firewise communities certified in the County. Communities that already have Firewise status need to continue upkeep and maintenance to retain status.	• County	2023	• http://www.firewise.org	Increase education and outreach as well as public ownership in the fire mitigation efforts in the WUI.	High
Public Awareness Campaign for recreational use areas.	Increase awareness of fire potential in recreation areas, including campsites, trails and areas used for events.	• USFS • County	Summer/ Fall 2021	• Update and expand existing signage and posting sites. • Replace, or augment any existing Smokey Bear signs with electronic Fire Danger Warning Signs that are solar powered, LED displays (visible day and night), and accessible and programmable through an internet website. • Utilize local media.	Protect communities and infrastructure by raising awareness of local citizens and those traveling in the area about actions that can prevent fire.	High

Project	Description	Presented By	Target Date	Resources Needed	Serves to…	Priority
Utilize social media to provide a consistent message and outlet for wildfire education.	Develop a Gila Region Facebook page with consistent messaging for Grant County and surrounding counties.	• County	Summer/ Fall 2021	• Staff time for hosting and updating the Facebook page.	Educate and inform local residents across the region of ongoing activities related to wildfire risk and fire prevention, as well as engage local residents in mitigating wildfire risk and working with land managers and fire responders.	High
Integrate CWPP with a Countywide Hazard Mitigation Plan	Utilize the CWPP as the fire chapter of the HMP for the county. Ensure the county is eligible for FEMA funding for pre-disaster hazardous fuels projects or post-fire rehabilitation. Engage the public in the development of the HMP.	• County Emergency Management	Next round of HMP updates ~2025	• FEMA HMP funding: https://www.fema.gov/hazard-mitigation-grant-program	Integrate wildfire hazard into a larger hazard assessment so that the county can be eligible to apply for pre-disaster mitigation grant funding under FEMA to implement hazardous fuels projects and emergency response projects.	High
Emergency preparedness meetings	Use American Red Cross volunteers and other preparedness experts. Attend community functions and hold special meetings to provide guidance for creating household emergency plans. Specific effort to be focused at seasonal residents.	• County Emergency Management • American Red Cross • Town, county, state personnel • VFDs.	Ongoing	• Written materials.	Improve preparedness by facilitating the communication between family members and neighbors about what procedures to follow in the event of a wildfire.	High

Project	Description	Presented By	Target Date	Resources Needed	Serves to…	Priority
Fire department open invitation days	Raise awareness of the municipal and VFD departments within Grant County through open house and tours of equipment. Recruitment drive for volunteers.	• County Fire	Annually; pre-fire season would be advised.	• Advertising. • Refreshments. • Handouts.	Protect communities and infrastructure by potentially increasing recruitment and financial support for the fire service. Address concerns regarding a small and declining volunteer firefighting force	High
Neighbors for defensible space	Organize a community group made up of residents and agency personnel to develop materials and communicate relevant defensible space messages. Could coordinate with fire departments or USFS. Possibility to coordinate actual implementation of defensible space and slash clear-up with community groups/scouting organizations/ youth groups/ churches/ schools. Specific effort to be focused at seasonal residents.	• Fire departments County	Spring 2021	• Funding to help cover costs of materials (green waste removal or chipper) and participation. • People trained in defensible space practices. • Able-bodied crews of volunteers.	Engage diverse stakeholders in reaching out to community members and encourage defensible space practices. Empower homeowners to make affordable and effective changes to reduce the vulnerability of individual homes. Help protect vulnerable populations (elderly, disabled residents).	High
Media involvement	Develop a local newspaper column that provides fire safety information, promotional information for VFDs, fire announcements, and emergency planning. Focus efforts during the pre-fire season. Existing efforts have included a Spring work-day focused on the WUI between USFS and private land.	• Agency Public Information Officers. • County Emergency Management	Monthly column year-round	• Columns • Information and articles to be provided by fire departments, towns, county, agency representatives.	Protect communities and infrastructure through increasing public awareness and providing a channel for information regarding emergency fire response.	Moderate

Project	Description	Presented By	Target Date	Resources Needed	Serves to…	Priority
Raise awareness of fire prevention at a young age	Introduce wildfire prevention into school curriculum. Work with fire departments, school board and Public Information Officers to organize “kid-focused” travelling workshops. Move beyond the existing focus on structural fire, to incorporate education to children on wildfire prevention. The USFS would provide support. Currently wildfire prevention is focused on 4th graders. Build upon an existing program with the Aldo Leopold Charter School- Internships for students on wildfire and forestry with the FS. This could be expanded to incorporate the local fire dept for that school and talk about the role of the fire department in wildfire suppression.	• School District • County • VFDs	Spring 2021	• Firewise materials. • Smokey Bear literature. • Presenters.	Protect communities and infrastructure through increased awareness.	Moderate
Improve outreach regarding burn permitting requirements	The County has burning protocol documents, that could be included as an appendix to the CWPP. Further education on safe burning protocols and red-flag warnings would help address any public confusion.	• County	Summer 2020	• Appendix to CWPP. Flyers and mailings.	Address confusion regarding permit requirements within Silver City limits and County land. The County has no permitting requirements for burning; they request the public contacts dispatch prior to ignition. Silver City requires a burn permit for burning.	Moderate

RECOMMENDATIONS FOR REDUCING STRUCTURAL IGNITABILITY

Table 5.5 provides a list of community-based recommendations to reduce structural ignitability that should be implemented throughout the GCCWPP 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 can be found below. Carrying out fuels reduction treatments on public land may only be effective in reducing fire risk to some communities; however, 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. Studies have shown that burning vegetation beyond 120 feet of a structure is unlikely to ignite that property through radiant heat (Cohen and Butler 1996), but fire brands that travel independently of the flaming front have been known to destroy houses that had not been impacted by direct flame impingement. Hardening the home to ignition from embers, including maintaining vent coverings and other openings are also strongly advised as measures to protect a home from structural ignitability. Education about managing the landscape around a structure, such as 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. Educating people about the benefits of proper maintenance of their property that includes pruning and trimming trees and shrubs and, where warranted, the removal of trees and other vegetation, and using Firewise Communities landscaping methods on their property is also essential for successful household protection.

It is important to note that no two properties are the same. Homeowners and communities are encouraged to research which treatments would have the most effect for their properties. Owners of properties on steep slopes, for example, should be aware that when constructing defensible space they have to factor in slope and topography, which would require extensions to the conventional 30-foot recommendations. A number of educational programs are now available to homeowners through programs like Ready, Set, Go! (http://www.wildlandfirersg.org) and Firewise (www.firewise.org). More detailed information on reducing structural ignitability can also be found in Appendix G (Homeowner's Guide).

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 5.5. Recommendations for Reducing Structural Ignitability

Project	Private Lands/Homeowners	Programs Available	Description	Resources/Funding	Timeline	Priority
Offer fire protection workshops.	All residents would be encouraged to participate. Specific effort to be focused at seasonal residents. Led by fire departments in conjunction with the USFS and County; see Collaborative Wildfire Education Campaign Item in Table 5.4.	Agency outreach personnel Firewise Ready, Set, Go!	Offer hands-on workshops to highlight individual home vulnerabilities and teach how-to techniques to reduce ignitability of common structural elements. Examples include: • Installing metal flashing between houses and fences or decks. • Installing wire mesh over eaves, vents, and under decks.	• www.firewise.org, www.nfpa.org, www.wildlandfirersg.org. • https://www.fema.gov/hazard-mitigation-grant-program.	Summer 2021	High
Individual home hazard assessments.	All residents would be encouraged to participate. Specific effort to be focused at seasonal residents. Fire department- See Firewise Train-the-Trainer item in Table 5.4.	Firewise Assessing Hazards in the Home Ignition Zone. NFPA 1144 structural assessment.	Utilize a “Train the Trainer” model- develop or train a team of citizens that could perform home assessments. Seek funding to pay VFDs to assist with assessments.	• www.firewise.org, www.nfpa.org, www.wildlandfirersg.org. • https://www.fema.gov/hazard-mitigation-grant-program. • Ready-Set-Go grants • Fire Prevention and Safety grants • SAFER grants	Summer 2021	High
Implement spring community yard clean-up days and provide chipper and/or other green waste disposal opportunities to residents.	All residents would be encouraged to participate in each community. Specific effort to be focused at seasonal residents.	County chipper program	A community-led day of yard clean-up with fire mitigation in mind would encourage large numbers within the community to carry-out mitigation measures and implementation of defensible space. The event could be promoted by Grant County. Residents could assist elderly or infirm neighbors.	• Grant County • Municipalities	Fall 2020	High

Project	Private Lands/Homeowners	Programs Available	Description	Resources/Funding	Timeline	Priority
Assess and improve accessibility to property	All residents would be encouraged to participate. Specific effort to be focused at seasonal residents.	Fire department driven	Weekend program to inform homeowners about the importance of keeping driveways accessible to fire trucks and emergency responders.	• Fire departments	Fall 2021	Moderate
Provide printed list of mitigation measures to homeowners with different scales of actions.	All residents would be encouraged to participate. Specific effort to be focused at seasonal residents.	Fire departments Firewise Communities Academic and peer-reviewed literature	List of action items broken down by cost: • Low or no cost – ensure house numbers are easily viewed from the street. • Medium cost – annual clearance and thinning of trees and shrubs along driveways to facilitate save access by emergency vehicles.	• Ready-Set-Go grants • Fire Prevention and Safety grants • SAFER grants	Fall 2021	Moderate
Critical Infrastructure Protection Plan	County	FEMA HMP	The protection of critical infrastructure such as power lines and communication sites has been addressed in the Grant County CWPP in the past, but this effort only dealt with protection of these critical structures from damage due to wildfire. As the risk to these critical features from terrorism is becoming more evident, the public may be better served if an independent “Critical Infrastructure Protection Plan” that addressed all threats to these critical structures is developed and implemented. The best way to address this would be integrate this project into the HMP in order to leverage FEMA funding that is meant to identify all hazards within the community.	• FEMA Hazard Mitigation Grants.	Fall 2021	High

Action Items for Homeowners to Reduce Structural Ignitability

Low or No Cost Investment (<$50)	Regularly check fire extinguishers and have a 100-foot hose available to wet perimeter.
	Maintain defensible space for 30 feet around home. Work with neighbors to provide adequate fuels mitigation in the event of overlapping property boundaries.
	Make every effort to keep lawn mowed and green during fire season.
	Screen vents with non-combustible meshing with mesh opening not to exceed nominal ¼-inch size.
	Ensure that house numbers are easily viewed from the street.
	Keep wooden fence perimeters free of dry leaves and combustible materials. If possible, non-combustible material should link the house and the fence.
	Keep gutters free of vegetative litter. Gutters can act as collecting points for fire brands and ashes.
	Store combustible materials (firewood, propane tanks, grills) away from the house; in shed, if available.
	Clear out materials from under decks and/or stacked against the structure. Stack firewood at least 30 feet from the home, if possible.
	Reduce your workload by considering local weather patterns. Because prevailing winds in the area are often from the west-southwest, consider mitigating hazards on the west corner of your property first, then work around to cover the entire area.
	Seal up any gaps in roofing material and enclose gaps that could allow fire brands to enter under the roof tiles or shingles.
	Remove flammable materials from around propane tanks.

Minimal Investment (<$250)	When landscaping in the home ignition zone (HIZ) (approximately 30 feet around the property), select non-combustible plants, lawn furniture, and landscaping material. Combustible plant material like junipers and ornamental conifers should be pruned and kept away from siding. If possible, trees should be planted in islands and no closer than 10 feet to the house. Tree crowns should have a spacing of at least 18 feet when within the HIZ. Vegetation at the greatest distance from the structure and closest to wildland fuels should be carefully trimmed and pruned to reduce ladder fuels, and density should be reduced with approximately 6-foot spacing between trees crowns.
	Box in eaves, attic ventilation, and crawl spaces with non-combustible material.
	Work on mitigating hazards on adjoining structures. Sheds, garages, barns, etc., can act as ignition points to your home.
	Enclose open space underneath permanently located manufactured homes using non-combustible skirting.
	Clear and thin vegetation along driveways and access roads so they can act as a safe evacuation route and allow emergency responders to access the home.
	Purchase or use a National Oceanic and Atmospheric Administration weather alert radio to hear fire weather announcements.
Moderate to High Investment (>$250)	Construct a non-combustible wall or barrier between your property and wildland fuels. This could be particularly effective at mitigating the effect of radiant heat and fire spread where 30 feet of defensible space is not available around the structure.
	Construct or retrofit overhanging projections with heavy timber that is less combustible.
	Replace exterior windows and skylights with tempered glass or multilayered glazed panels.
	Invest in updating your roof to non-combustible construction. Look for materials that have been treated and given a fire-resistant roof classification of Class A. Wood materials are highly combustible unless they have gone through a pressure-impregnation fire-retardant process.
	Construct a gravel turnaround in your driveway to improve access and mobilization of fire responders.
	Treat construction materials with fire-retardant chemicals.
	Install a roof irrigation system.
	Replace wood or vinyl siding with nonflammable materials.
	Relocate propane tanks underground.

COHESIVE STRATEGY GOAL 3: WILDFIRE RESPONSE

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

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

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

RECOMMENDATIONS FOR IMPROVING FIRE RESPONSE CAPABILITIES

Educating the public so they can reduce its dependence on fire departments is essential because these resources are often stretched thin due to limited personnel.

Table 5.6 provides recommendations for improving firefighting capabilities. Many of these recommendations are general in nature.

Table 5.6. Fire Response Capability Recommendations

Project	Fire Department	Description	Timeline	Contact/Funding	Priority
Improve road signposting and driveways markers	County/fire departments	The County has reflective signs that residents can obtain and erect. Need better outreach to inform residents of this availability. Need outreach to residents to encourage upkeep and maintenance of address markers.	Spring 2021	• County	High
Improve water supply	All departments and agencies	Despite some recent upgrades for water storage, many communities have a lack of water for fire suppression. Funding needed to procure and install water storage tanks at fire departments throughout the County. Strategic positioning of water storage tanks may alleviate shortage in some areas. The County has been working with local ranchers to identify suitable drafting sites. These areas need to be mapped and provided to the fire departments. ISO rating can be improved through improved water supply infrastructure.	Fall 2021	• Fire Prevention and Safety grants • SAFER grants	High
Improve mapping of roads on private lands to support fire response	All departments	Private roads, especially on large ranches, are not well mapped or not readily available to responders. Mapping of these roads would facilitate emergency response and reduce response times. This project has been ongoing between the County and some private ranch owners, but continued dialogue is recommended. Ranch FMPs would be the suggested mechanism to facilitate this project.	Fall 2021	• Fire Prevention and Safety grants • SAFER grants	High
Fund and erect a new cell phone tower	Cell phone providers	Cellular communications are poor in the county. A new cell tower is needed to support emergency communications. Cell phone providers need to determine this need and fund tower construction. This would need to occur in response to public demand for service.	Spring 2022	• Cell phone providers. Expansion of existing networks. This may occur based on public demand.	Moderate

Project	Fire Department	Description	Timeline	Contact/Funding	Priority
Develop a strategic dispatch and communication plan Purchase updated dispatch/communication equipment	County/dispatch/sheriffs department	Radio communications have been poor due to response agencies using multiple different radio channels. The Gila Zone Board have been trying to address this by adding new groups to radios to serve multi-agency situations. Having one channel for multi-agency traffic may be difficult as too many users talk at once. A better solution during wildfire incidents may be to have one person assigned to coordinate communications between agencies. Update communications equipment and planning, coordinate agency communications through collaborative meetings with key agency staff. Programming needed for all responders' handheld radios so they have the frequency group. Seek funding to support Computer Aided Dispatch. Equipment would enhance emergency communications and response ~$186,000.	Fall 2020	• Fire Prevention and Safety grants • SAFER grants • NM Homeland Security	High
Provide minimum wildland personal protective equipment (PPE) for all firefighters in Grant County	All fire departments	Seek grant money to be spent on acquisition of PPE. Task a member of each department to inventory PPE and investigate grant sources. Develop a schedule of equipment replacement to allow for allocation of funds and seeking of grants.	• Monthly review of grant opportunities • Annual audit of PPE	• Review NFPA Standard 1977 • SAFER grants • FEMA Assistance to Firefighters Grant Program, Fire Prevention and Safety. • Federal Excess Program	High

Project	Fire Department	Description	Timeline	Contact/Funding	Priority
Increase the number of "red-carded" individuals in the fire departments	All fire departments	Offer NWCG Basic Wildland Fire Fighting and Fire Behavior, S-130/S-190 classes to VFDs every Fall with an option to attend on weekends. Possible incentives needed to encourage attendance. State Forestry could provide training. Work with federal agencies to develop evening and weekend courses for volunteers. Pursue online training programs and have trainees work with an in-house trained mentor to complete training. Facilitate Annual refresher participation by having in-house refreshers available or convene agencies to have a Grant County wide refresher. Consider moderate versus arduous pack-test options, which would allow VFD members to participate in prescribed fire as a prescribed burn crew member. Grant County and the Gila NF should work together to develop and then sign a blanket agreement to utilize VFDs on prescribed fires to increase wildland fire experience and ultimately increase capacity for response to wildfires. Utilize the State Forestry Resource Mobilization Plan, which provides a pool of qualified wildland fire resources within the structural fire service of New Mexico so they may be mobilized to assist in the suppression of wildfires and WUI fire incidents. Through this program, VFDs can be reimbursed for wildfire assignments.	Annually, or following recruitment drives	• State Forestry • County • USFS • Fire Prevention and Safety grants • SAFER grants	High
Carry out detailed pre-incident planning for remote communities that may be subject to slow response times	All fire departments	The CWPP identifies areas of high risk and hazard that is largely due to their remote location and slow response times. Pre-planning in these areas may help identify actions that could be taken to mitigate response times or better prepare the community. Work with private landowners to identify and document available water supply for drafting. Also consider pre-fire planning to accommodate potential "fire use" in areas outside of the WUI/where appropriate.	Annually during winter months	• All fire departments	High

Project	Fire Department	Description	Timeline	Contact/Funding	Priority
Increase VFD recruitment (diversify age classes)	All fire departments	Target fire education at school to encourage younger generations to become interested in firefighting. Carry out recruitment drives through open house and mailings. Provide training incentives for VFD firefighters.	Annually	• School • All fire departments • Fire Prevention and Safety grants • SAFER grants	High
Increase funds for VFDs	All fire departments	Maintain contact with State Forestry and regularly seek grant money. Implement regular evaluations of resource needs for each VFD and make available to public to raise awareness of shortages. Maintain updated list of fire call-outs and provide to State Forestry/USFS. Use local media to inform public of fire resources situation. Work with local newspaper editor to have a year-round column that documents fire department activities. Apply for rural fire assistance program grants. Improve International Standards Organization ratings.	Monthly review of grant opportunities	• State and county • FEMA Assistance to Firefighters Grant Program, Fire Prevention and Safety. • Rural Fire Assistance • SAFER • VFD assistance	High
Improved communication between agencies, fire departments, and dispatch.	All fire departments USFS State	Convening pre-fire planning meetings with all partners to determine roles and responsibilities and revisit mutual aid agreements. Institute an annual meeting of cooperators to review status of Memorandum of Understanding (MOUs) and review previous fire season ”lessons learned”. Convene the CWPP Core Team twice annually to review the CWPP project list and build coordination.	Spring 2020 and then annual	• All fire departments • USFS • State Forestry	High
Map restricted bridges and roads	Dispatch All fire departments	Dispatchers could direct the responders based on apparatus and weight limits.	Spring 2021	• County	Moderate

Project	Fire Department	Description	Timeline	Contact/Funding	Priority
Map and test hydrants and dry hydrant systems. Improve visibility of existing hydrants.	All fire departments	Locate existing dry hydrants and map locations. Test functionality. Provide to fire departments and/or install new dry hydrants in areas with minimal water supply for suppression. This data could be added to dispatch computer data to facilitate fire response. Add hydrant markers to reduce obscurity by vegetation.	Spring 2021	• NRCS • Environmental Quality Incentives Program (EQIP) • USFS • State Forestry	High

POST-FIRE RESPONSE AND REHABILITATION

An often-overlooked component of wildfire response is the response needed following a wildfire. The complexities of post-fire response were made evident following the 2013 Silver Fire, which burned more than 138,000 acres. Following the fire, the Mimbres River and its tributaries suffered degraded water quality due to increased sediment and ash flows. The watershed condition and hydrologic function of the river are expected to take up to 25 years to stabilize (USFS 2015) and vegetation management and restoration treatments have been necessary to mitigate further degradation.

Having a plan that outlines steps for agencies, municipalities, and the county to follow would streamline post- fire recovery efforts and reduce the inherent stress to the community.

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, 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.

Recovery of the vegetated landscape is often more straightforward then recovery of the human environment. Assessments of the burned landscape are often well coordinated through the use of inter-agency crews who are mobilized immediately after a fire to assess the post- fire environment and make recommendations for rehabilitation efforts.

For the community impacted by fire, however, there is often very little planning at the local level to guide their return after the fire. Residents impacted by the fire need assistance making insurance claims; finding temporary accommodation for themselves, pets, and livestock; rebuilding or repairing damaged property; removing debris and burned trees; stabilizing the land for construction; mitigating potential flood damage; repairing infrastructure; reconnecting to utilities; and mitigating impacts to health. Often the physical impacts can be mitigated over time but the emotional impacts of the loss and change to their surroundings are longer lasting and require support and compassion from the community.

AFTER THE FIRE

The following outlines actions for homeowners to follow after a fire.

Returning Home

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

Even if the fire did not damage your house, do not expect to return to business as usual immediately. Expect that utility infrastructure may have been damaged and repairs may be necessary. When you return to your home, check for hazards, such as gas or water leaks and electrical shorts. Turn off damaged utilities if you did not do so previously. Have the fire department or utility companies turn the utilities back on once the area is secured.

Insurance Claims

Your insurance agent is your best source of information as to the actions you must take in order to submit a claim. Here are some things to keep in mind. Your insurance claim process will be much easier if you photographed your home and valuable possessions before the fire and kept the photographs in a safe place away from your home. Most if not all of the expenses incurred during the time you are forced to live outside your home could be reimbursable. These could include, for instance, mileage driven, lodging, and meals. Keep all records and receipts. Do not start any repairs or rebuilding without the approval of your claims adjuster. Beware of predatory contractors looking to take advantage of anxious homeowners wanting to rebuild as quickly as possible. Consider all contracts very carefully, take your time to decide, and contact your insurance agent with any questions.

Post-fire Rehabilitation

Homes that may have been saved in the fire may still be at risk from flooding and debris flows. Burned Area Emergency Rehabilitation (BAER) teams are inter-disciplinary teams of professionals who work to mitigate the effects of post-fire flooding and erosion. Volunteers can assist BAER team members by planting seeds or trees, hand mulching, or helping to construct straw-bale check dams in small drainages. Volunteers can help protect roads and culverts by conducting storm patrols during storm events. These efforts dramatically reduce the costs of such work as installing trash racks, removing culverts, and rerouting roads.

There are many resources available to residents to help navigate the post-fire environment. NM Fire Information provides links to relevant websites.[9,10]

[9] http://www.afterwildfirenm.org/

[10] https://nmfireinfo.com/information/after-a-wildfire/

CHAPTER 6 – MONITORING AND EVALUATION STRATEGY

Developing an action plan and an assessment strategy that identifies roles and responsibilities, funding needs, and timetables for completing highest-priority projects is an important step in organizing the implementation of the GCCWPP. Table 5.1 in the previous section identifies tentative timelines and monitoring protocols for fuels reduction treatments, the details of which are outlined below.

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

This section will present a suite of recommended CWPP monitoring strategies intended to help track progress, evaluate work accomplished, and assist planners in adaptive management.

Strategies outlined in this section take into account 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? We may be concerned about soil movement and/or invasive species encroachment post-treatment. Relatively cost-effective monitoring may help clarify changes.
- Vegetation will grow back. Thus fuel break maintenance and fuels modification in both the home ignition zone and at the landscape scale require periodic assessment. Monitoring these changes can help decision-makers identify appropriate treatment intervals.

As the CWPP evolves over time, there may be a need to track changes in policy, requirements, stakeholder changes, and levels of preparedness. These can be significant for any future revisions and/or addendums to the CWPP.

Table 6.1 identifies recommended monitoring strategies, both quantifiable and non-quantifiable, for assessing the progress of the CWPP. It must be emphasized that these strategies are 1) not

exhaustive (new strategies and protocols can evolve with new CWPP action items) and 2) dependent on available funds and personnel to implement them. Furthermore, there are many resources for designing and implementing community based, multi-party monitoring that could support and further inform a monitoring program for the CWPP (NPS, 2003; Egan, 2013).[11,12,13.]

Table 6.1. 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 global positioning system (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 home ignition zones/defensible space treated to reduce structural ignitability	GPS	Homeowner	Structure protection
Number of residents/citizens participating in any CWPP projects and events	Meetings, media interviews, articles	Core Team member	Evaluate culture change objective
Number of homeowner contacts (brochures, flyers, posters, etc.)	Visits, phone	Agency representative	Evaluate objective
Number of jobs created	Contracts and grants	Core Team member	Evaluate local job growth
Education outreach: number, kinds of involvement	Workshops, classes, field trips, signage	Core Team member	Evaluate objectives
Emergency management: changes in agency response capacity	*Collaboration*	Agency representative	Evaluate mutual aid
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 average

An often overlooked but critical component of fuel treatment is monitoring. It is important to evaluate whether fuel treatments have accomplished their defined objectives and whether any unexpected outcomes have occurred. In addition to monitoring mechanical treatments, it is important to carry out comprehensive monitoring of burned areas to establish the success of 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 fuel's reduction project would be site-specific, and decisions regarding the timeline for monitoring and the type of monitoring to be used would be determined by project. Monitoring

[11] https://nmfwri.org/restoration-information/cfrp/restoration-papers/restoration-papers-resources/wp5_-draft_2.pdf/view

[12] https://cdm17192.contentdm.oclc.org/digital/collection/p17192coll1/id/609/rec/6

[13] https://nmfwri.org/restoration-information/cfrp/cfrp-resources/CFRP_MonitoringShortGuide.pdf

and reporting contribute to the long-term evaluation of changes in ecosystems, as well as the knowledge base about how natural resource management decisions affect both the environment and the people who live in it.

The most important part of choosing a monitoring program is selecting a method appropriate to the people, place, and available time. 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, global positioning system (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.

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.

IDENTIFY TIMELINE FOR UPDATING THE CWPP

The HFRA allows for maximum flexibility in the CWPP planning process, permitting the Core Team to determine the timeframe for updating the CWPP; it is suggested that a formal revision be made on the fifth anniversary of signing and every 5 years following. The Core Team members are encouraged to meet on an annual basis to review the project list, discuss project successes, and strategize regarding project implementation funding.

IMPLEMENTATION

The GCCWPP makes recommendations for prioritized fuels reduction projects and measures to reduce structural ignitability and carry out public education and outreach. Implementation of fuels reduction projects need to be tailored to the specific project and will be unique to the location depending on available resources and regulations. On-the-ground implementation of the recommendations in the GCCWPP 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 F.

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APPENDIX A:

Community Background Information

LOCATION AND GEOGRAPHY

The landscape of Grant County ranges from flat desert and open grasslands with scattered rolling hills in the southern portions of the county to high-elevation forested mountains in the northern portions of the county. The county receives on average (depending on elevation) 16 inches of rainfall annually, with as low as 12 inches per year in the lower southern portion (Lordsburg, New Mexico) to as much as 20 inches per year in the higher northern portions (Gila Cliff Dwellings).

The county has a total area of 3,968 square miles (Figure A.1). Adjacent counties include Catron, Sierra, Luna, Hidalgo counties in New Mexico, and Greenlee County in Arizona.

Figure A.1. Typical landscape in Grant County, showing grassland areas, interfacing with woodland, hills and mesas.

POPULATION

2018 population estimates for Grant County suggest a population decline of 7.3%, from 29,514 people in 2010 to 27,346 people in 2018. The population is split between 11,879 households, with a population density of 7.4 persons/square mile. Silver City is the County seat and, its population has also declined, from 10,315 people in 2010 to an estimated 9,529 in 2018. This population decline follows a long period of population growth that peaked in the late 1990s according to census data (U.S Census Bureau 2015). While some areas are declining in population, some new subdivisions continue to expand, raising concerns for emergency responders regarding ingress and egress issues and fire response capacity in the WUI (Figure A.2).

Figure A.2. Some subdivisions, like this one in Dos Griegos, are continuing to expand, increasing the numbers of residents and CVARs that are interfacing with wildland areas.

RECREATION

Outdoor recreation is extremely popular in the County, with the Gila National Forest, Gila Cliff Dwellings National Monument, the Gila River drawing most tourists to the area. Camping is very popular on both public and private land (Figure A.3). Also, trail use for hiking, biking and motorized travel is popular, and places many people in the back country.

During peak seasons and large events, a significant number of people can congregate in a relatively small space, which constitutes a large population to evacuate.

Figure A.3. Lake Roberts is a recreational area utilized by residents.

PUBLIC LAND MANAGEMENT

GILA NATIONAL FOREST

The Gila National Forest Land and Resource Management Plan (Forest Plan) is the guiding policy document for forest and fire management on the forest. The Forest is currently revising their Forest Plan, with a decision document expected in May 2020. The Gila National Forest has an active prescribed fire program (Figure A.4) as well as an active mechanical thinning program and a very progressive natural fire management program, historically. The three districts with land in Grant County have continuously focused on WUI fuel reduction projects.

Figure A.4. The Gila National Forest has a very active prescribed burning program.

Source: NM Fire Info.

The Silver City Ranger District is developing a Fuels Management Strategy (D7 Fuels Strategy) in order to prioritize vegetation treatment needs for hazardous fuel reduction and forest restoration. The strategy will be finalized in 2020 and will use a risk/opportunity-based approach to fuels management treatment in order to create resilient landscapes and protect private and government property. This approach identifies three key factors in determining the work program:

1. The nature and extent of the risk of wildfire to critical values, including WUI, wildlife, watershed, range, cultural resources, and recreation.
2. The potential benefit of prescribed fire or mechanical treatments dependent on prioritized values, fuel type, funding sources, and partnerships.
3. Alignment with Gila National Forest, regional, and national priorities.

STATE LAND

The New Mexico State Forestry Division (NMSF) has statutory responsibilities for cooperation with federal, state, and local agencies in the development of systems and methods for the prevention, control, suppression, and use of prescribed fires on rural lands and within rural communities on all non-federal

and non-municipal lands in the state (New Mexico Statutes Annotated 1978, Section 68-2-8). As a result, the NMSF is involved in the CWPP planning process. The New Mexico Fire Planning Task Force (NM-FPTF) was created in 2003 by the New Mexico legislature to identify the WUI areas (CARs) in the state that were most vulnerable to wildland fire danger. The NM-FPTF updates its CARs list annually, reviews completed CWPPs, and approves CWPPs that are compliant with the HFRA.

The Gila National Forest, the Las Cruces District of the BLM, and the New Mexico State Forestry-Socorro District are currently involved with multiple wildfire mitigation planning and project implementation efforts in Grant County. These planning and risk mitigation efforts are (or as developed in the future will be) considered mitigation plans and projects supported in the GCCWPP.

CLIMATE AND WEATHER PATTERNS

Grant County receives much of its yearly precipitation as summer monsoon rains. As is common throughout the West, lightning is frequent during the summer monsoon rainstorms between the months of July and September (Figure A.5). Grant County has a high level of lightning activity each summer, which starts numerous fires especially in the mountainous portions of the county. Grant County often experiences a “Fire Season” that runs from March until September while temperatures are at the highest (Figure A.6). This long period of risk for wildfire makes fire prevention and suppression a major component of the local government and land management agencies’ activities.

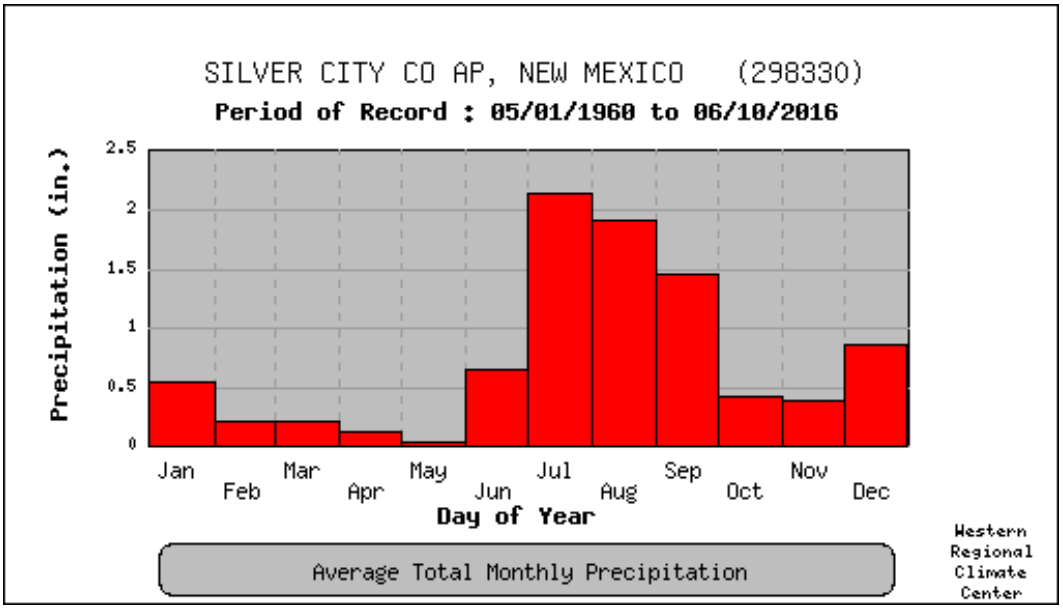


Figure A.5. Monthly average total precipitation in Silver City for period of record.

Source: Western Regional Climate Center 2020

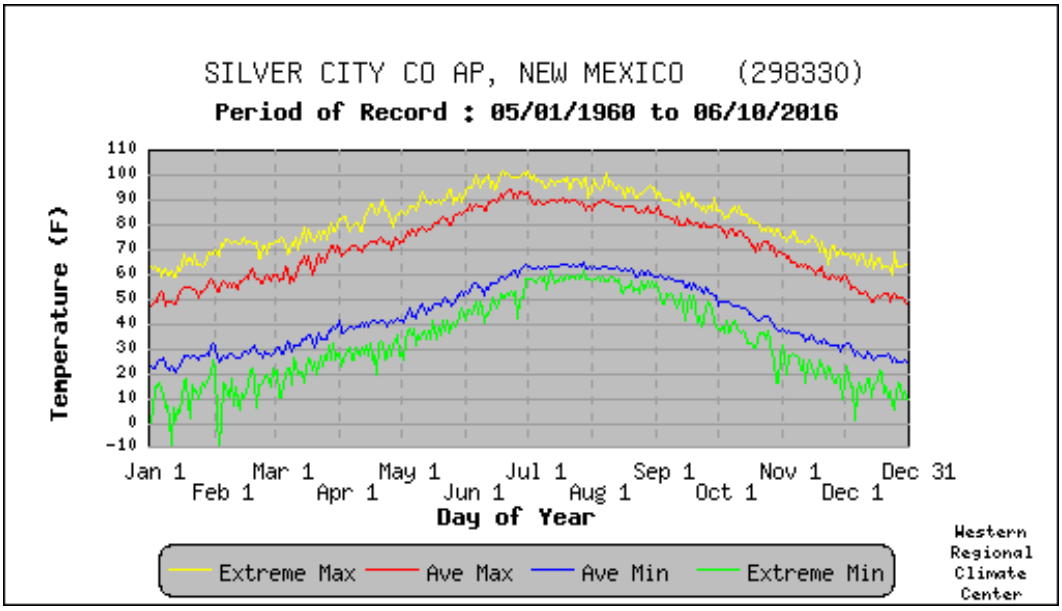


Figure A.6. Daily temperature averages and extremes in Silver City for period of record.

Source: Western Regional Climate Center 2020.

VEGETATION AND LAND COVER

The landscape of the County ranges from flat desert and open grasslands with scattered rolling hills in the southern portions of the County to high elevation forested mountains in the northern portions of the County. The County receives on average (depending on elevation) 16 inches of rainfall annually, with as low as 12 inches per year in the lower southern portion (Lordsburg, New Mexico) to as much as 20 inches per year in the higher northern portions (Gila Cliff Dwellings).

The vegetative communities that are found occupying the 4,000 square miles that make up Grant County consist of Chihuahuan desert scrub and desert grasslands in the south; to mostly coniferous and mixed woodlands in the mid and northwest portions; to montane coniferous forest (mostly ponderosa pine) in the northeast (Dick-Peddie 1993) (Figure A.7).

CHIHUAHUAN DESERT SCRUB AND DESERT GRASSLANDS

Almost 43.3% of the County is classified as Chihuahuan Desert (Griffith et al. 2006)—which is further broken down into Desert Grasslands (38.6% or 982,099 acres), comprising black grama (*Bouteloua eriopoda*) at lower elevations, blue grama (*B. gracilis*) at higher elevations, and dropseeds (*Sporobolus* spp.) and threeawn (*Aristida* spp.) grasses across elevational ranges—and Chihuahuan Desert Scrub (4.7% or 119,228 acres), which consists of creosote bush (*Larrea tridentata*), deciduous honey mesquite (*Prosopis glandulosa*), broom snakeweed (*Gutierrezia sarothrae*), fourwing saltbush (*Atriplex canescens*), soaptree yucca (*Yucca elata*), and widely scattered threeawn, dropseed, and prickly pear cacti (*Opuntia* spp.). Some basin floor areas are dominated by tarbush (*Flourensia cernua*), burrograss (*Scleropogon brevifolius*), tobosagrass (*Pleuraphis mutica*), and alkali sacaton (*Sporobolus airoides*) (Dick-Peddie 1993).

In these Chihuahuan Desert regions, the basic fine fuel is grass. During drought years, grass fuels are reduced and give way to desert species that limit the transmission of fire. When rainfall replenishes the grassland, however, the fine fuel mass becomes more continuous across the landscape and risk of fire increases.

PIÑON-JUNIPER WOODLANDS

Piñon-juniper woodlands are commonly associated with the low mountains and plateau regions in the County and comprise just over 40% of the vegetation cover, or 1,026,534 acres. Severe climatic events occurring during the growing season, such as drought and frost, are thought to limit the upper and lower ranges of this cover type. The canopy is dominated by piñon pine (*Pinus edulis*), alligator juniper (*Juniperus deppeana*), Rocky Mountain juniper (*J. scopulorum*) and one-seed juniper (*Juniperus monosperma*). The understory associated with this land cover type is variable and may be dominated by shrubs or grasses or may be absent. Common midstory shrubs in this ecosystem include sagebrush, mountain mahogany (*Cercocarpus montanus*), and scrub/Gambel oak (*Quercus gambelii*). Common understory herbaceous species are blue grama, Arizona fescue (*Festuca arizonica*), and James' galleta grass.

MONTANE CONIFEROUS FOREST

This very widespread ecological system is most common throughout the Rocky Mountains. It makes up 12% of the county's vegetation cover. This woodland ecosystem occurs at the ecotone between grasslands or shrublands and more mesic coniferous forests. This ecosystem can be found on all slopes and aspects; however, it is most common on moderately steep to very steep slopes and ridge tops. Ponderosa pine (*Pinus ponderosa*) is the predominant conifer. Douglas fir (*Pseudotsuga menziesii*), piñon pine, and juniper species may also be present in the canopy. Many dense even-aged stands reflect a history of heavy logging in this cover type, which increases the potential for stand replacing fire in this area, due to overlapping crowns increasing crown fire potential.

The understory shrubs, although somewhat limited due to the ever-increasing canopy cover, consist of big sagebrush (*Artemisia tridentata*), mountain mahogany, antelope bitterbrush (*Purshia tridentata*), scrub oak, western snowberry (*Symphoricarpos occidentalis*), Wood's rose (*Rosa woodsii*), and kinnikinnick (*Arctostaphylos uva-ursi*). Common herbaceous understory components include species of needle and thread (*Hesperostipa comata*), fescue (*Festuca* spp.), muhly (*Muhlenbergia capillaries*), and grama (*Bouteloua* spp.).

HIGH MONTANE MIXED CONIFER

This high elevation environment is located mostly above 9,000 feet but also occurs on steeper north-facing slopes as low as 7,500 feet and consists primarily of Rocky Mountain mixed conifer forest and woodland and Southern Rocky Mountain montane/subalpine grassland vegetative communities. Montane scrub comprises 2.9% of the vegetation cover in the County, while subalpine coniferous forest comprises just under 1% of cover.

Because this habitat type occurs over such a wide elevation range, this ecological association is highly variable, depending especially upon temperature and moisture relationships. At the lower end of the elevation range, the mixed conifer forest and woodland is found on the steep, cool, north-facing slopes, while in the upper elevations, it occurs on both north- and south-facing slopes. Douglas fir and white fir (*Abies concolor*) are the most common canopy dominants, but blue spruce (*Picea pungens*), Engelmann spruce (*Picea engelmannii*), and ponderosa pine may also be present. This ecosystem includes patches of mixed conifer and aspen (*Populus tremuloides*) stands. Many cold-deciduous shrub species are common in the understory, including kinnikinnick, Oregon grape (*Mahonia repens*), snowberry (*Symphiocarpus* spp.), Gambel oak, Oregon boxleaf (*Paxistima myrsinites*), and common juniper (*Juniperus communis*). Herbaceous species may include Arizona fescue (*Festuca arizonica*), sedges (*Carex* spp.), bluebunch wheatgrass (*Pseudoroegneria spicata*), and meadow rue (*Thalictrum spp*.). Naturally occurring fires are of variable return intervals but are typically infrequent due to cool moist conditions of this habitat type.

RIPARIAN

The bosque and lowland regions in the County are where much of the developed and agricultural land occurs.

Riparian vegetation makes up 0.3% of the total land cover in the County, or 7,589 acres. Dominant native woody vegetation includes Rio Grande cottonwood (*Populus deltoides* var. *wislizeni*), coyote willow (*Salix exigua*), and Goodding's willow (*S. gooddingii*). Invasive species such as saltcedar (*Tamarix* spp.), Russian olive (*Elaeagnus angustifolia*), and Siberian elm (*Ulmus pumila*) also exist within large stands along the bosque ecosystem. Herbaceous plant species commonly associated with the bosque understory include a variety of wheatgrass (*Pascopyrum* spp.), ryegrass (*Elymus* spp.), dropseed and sacaton, and inland saltgrass (*Distichlis stricta*). Near the river or floodplain, the dominant native shrub species are coyote willow, arrowweed (*Pluchea sericea*), willow baccharis (*Baccharis salicina*), three-leaf sumac (*Rhus trilobata*), Torrey's wolfberry (*Lycium torreyi*), and screwbean mesquite (*Prosopis pubescens*) (Sivinski 2007).

AGRICULTURAL AND DEVELOPED LAND, AND OPEN WATER

Agricultural and developed land, and open water accounts for only 0.5% of the total land cover in the County, or 11,630 acres. Agricultural areas are typically areas that have vegetation planted for livestock grazing and/or are used for hay or seed crops, areas being used for cropland production, or land that is actively tilled. Developed land include all locales that contain human developments.

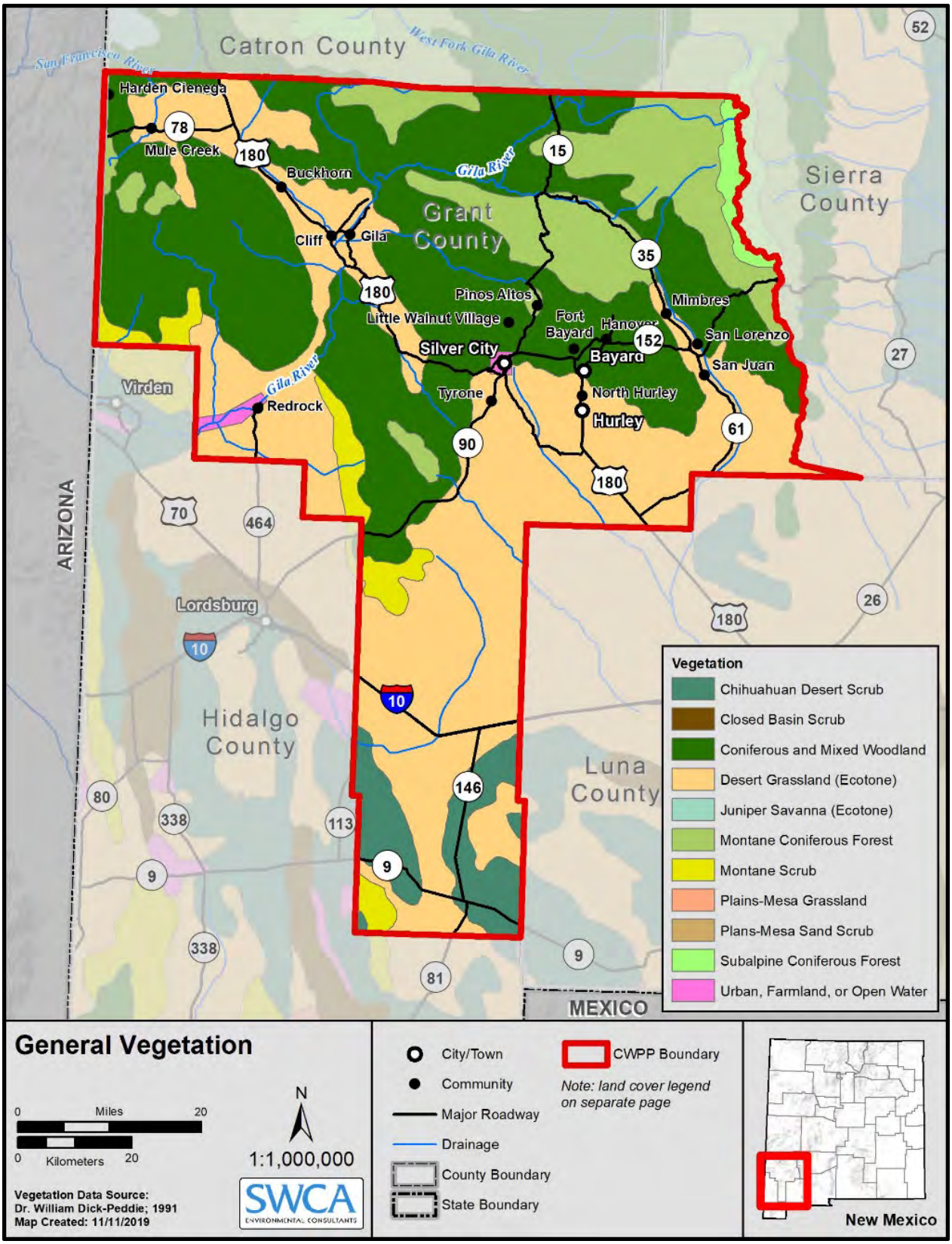


Figure A.7. Grant County existing vegetation cover.

FOREST HEALTH CONSIDERATIONS

Insects

Native insect epidemics within plant communities are usually part of a natural disturbance cycle similar to wildfire. They are often cyclic in nature and are usually followed by the natural succession of vegetation over time. Of primary interest are those that attack tree species because of the implications for fire management.

Present-day insect epidemics in forests are more extensive than they have been in the past (Kurz et al. 2008). This may be a result of drought-related stress and/or to faster completion of insect life cycles due to warmer climate regimes. Stands of trees that have been killed by insects have varying degrees of fire danger associated with them depending on the time lapse following an insect attack and structure of the dead fuels that remain. However, forests with a large degree of mortality following an insect attack may have the potential to experience extremely high fire danger, especially if a large degree of needle cover remains in the canopy.

Insects that have infested or have the potential to infect the forests within and around the GCCWPP planning area are discussed below.

For the past two decades, Southwest forests and woodlands have been subjected to increased drought, insect infestation, and disease, which have resulted in a decline in forest health (Clifford et al. 2008; Shaw 2008). Mortality from drought and bark beetle infestation of ponderosa pine, piñon/juniper, and other forest and woodland species throughout the Southwest region increased dramatically between 2000 and 2003 (Zausen et al. 2005). Piñon pine was especially affected, with over 1.9 million acres (774,771 hectares) of piñon across New Mexico and Arizona showing evidence of bark beetle attack by 2003. Some areas experienced greater than 90% piñon mortality (Gaylord et al. 2013), while juniper mortality was significantly lower. Piñon mortality was largely a result of the piñon ips bark beetle (*Ips confuses*), which generally attacks water-stressed or recently dead trees (Raffa et al. 2008; Rogers 1995).
A plethora of recent research has focused on the effects that restoration treatments have on the species resistance/susceptibility to bark beetles in ponderosa pine forests (Gaylord 2014).

Bark Beetles (Ips Beetles) (*Ips* spp. and *Dendroctonus* spp.). Ips beetles, also called engraver beetles, are native insects to North American forests. They attack ponderosa and piñon pines as well as other conifers and are responsible for piñon die-off in the region over the last several years. *Dendroctonus* beetles attack medium to large ponderosa pines, blue spruce, Engelmann spruce, and Douglas firs. Each of these species creates egg galleries, which are distinct to that species in form and shape, which eventually girdle the infected tree. The natural defense of a healthy, rigorous tree is to *pitch out*, or excrete sap into the beetle entrance holes, covering it with sap and killing the invader. Trees are most likely to be successful at this strategy when they are not stressed by competition as a result of high tree density or drought. Once a tree has been colonized, it cannot be stopped.

Twig Beetle (*Pityophthorus* spp.). Twig beetles frequently attack piñon pines, as well as other conifers and occasionally spruce. High populations of this poorly understood native beetle develop in drought-stressed and otherwise injured trees. Breeding is restricted to twigs and small branches. Fading branches throughout the crown and tan sawdust around the attack site can identify trees attacked by the twig beetle. Hand pruning and vigorous watering can sometimes control attacks.

Piñon Needle Scale (Scale) (*Matsucoccus acalyptus*). Scale is a native insect that has the appearance of small black, bean-shaped spots on the piñon pine needles during outbreaks. Scale feeds on the sap of piñon pine needles, damaging cells and leading to decreased vigor, needle drop and dieback, and increased susceptibility to other insects or disease. Sometimes small trees are killed by repeated attacks, and larger trees are weakened to such an extent that they fall victim to attack by bark beetles. Repeated, heavy scale infestations leave trees with only a few needles alive at the tips of the branches. Destroying the eggs before they hatch can greatly reduce potential damage.

Piñon Spindle Gall Midge (Midge) (*Pinyonia edulicola*). Midges produce a spindle-shaped swelling from the needle base that is about 0.5 inch long. This insect is a common parasitic insect that rarely causes serious damage. Control is usually not necessary.

Piñon Needle Miners (Needle Miners) (*Coleotechnites edulicola*, *C. ponderosae*). Needle miners are locally common on piñon and ponderosa pines. The various species resemble one another in appearance and damage but have different life cycles. Damage first becomes evident as foliage browns. Closer examination reveals hollowed-out needles. Early needle drop, reduced growth, and tree mortality can result from needle miner infestation. Trees normally recover from needle miner damage without suffering serious injury, but the current drought may alter this.

Roundheaded and Flatheaded Wood Borers (Family *Cerambycidae* and Family *Buprestidae*). Roundheaded and flatheaded wood borers attack recently cut, dead, or dying trees and often create complex tunnel systems. Roundheaded borers are the most destructive and tunnel deep into the wood. Freshly cut logs in the woods or firewood stored at a home are common infestation sources. These borers are most prominent after a wildfire. They may also spread into vigas in homes.

Juniper Borers (*Callidium* spp.). Several juniper borers aggressively attack drought-stressed junipers throughout their range. Damage can be extensive before symptoms are apparent. Usually a large portion of the tree or the entire tree dies before the insects' exit holes are noticed. Larvae bore beneath the bark, making galleries and tunneling deep into the wood to complete their life cycle over the course of the winter.

Tiger Moth (*Halisidota argentata*). Tiger moth caterpillars are one of the most common defoliators throughout the West. The species typically selects only a few host trees within an area, and the impacts are thus generally limited. Tiger moth caterpillars defoliate host trees, and while the appearance may seem severe, the damage is generally nonlethal. Host species for tiger moth caterpillars include Douglas fir, true fir, spruce, and pine, all of which exist in the higher plateau and mountain range elevations surrounding the planning area.

Diseases

Diseases of trees, such as parasitic plants, fungi, and bacteria, can also affect forests in the GCCWPP planning area. These diseases impact forest systems by degrading the productivity and health of the forest. Some of the more common forest diseases that are found in the County are described below. Trees that are killed by disease have the similar potential to increase fire hazards.

Mistletoe (*Arceuthobium* spp., *Phoradendron* spp.). Both dwarf and true mistletoe are common in the project area. Mistletoes are parasitic plants that gradually degrade tree vigor and may eventually kill their hosts over a long period of time following further infestation. Essential water and nutrients within the host are used by the mistletoe, thus depriving the host of needed food. Dwarf mistletoe is found on juniper, piñon pine, ponderosa pines, and firs. It is host-specific (i.e., the species that infects piñon does not infect other trees). True mistletoe is common on junipers in the Southwest. Both types of mistletoe spread from tree to tree and are difficult to control. Dwarf mistletoe spreads its seed by shooting berries; true mistletoe seeds are spread by birds. In residential areas, pruning can sometimes be effective on smaller trees. Heavy infestations in large trees can be controlled only by cutting down the trees and removing them to stop the spread of the mistletoe to other trees nearby.

Fir Broom Rust (*Melampsorella caryophyllacearum*). Fir broom rust is a species of fungus that has a broom appearance in the tree canopy. Fir broom rust is primarily a forest problem on white firs at higher elevations. A species also infects Engelmann spruce, but it is less common. These infections cause growth loss, top kill, and eventually tree mortality. Both species require alternate hosts to complete their life cycle. No chemical or biological control exists for fir broom rusts.

Needle Cast (*Elytroderma deformans*). Needle cast affects piñon and ponderosa pines. This disease can be damaging because it invades twigs and needles and persists for several years. Symptoms appear in the spring when all the year-old needles turn brown 6 to 12 mm from the needle base.

White Pine Blister Rust *(Cronartium ribicola).* White pine blister rust is a non-native disease caused by a fungus that first arrived in America in the early twentieth century from Asia and Europe. The complex life history of the fungus ultimately results in a lethal infestation of the host tree. The branch and stem canker that result from infestation can result in top kill, branch die-back, and eventually tree mortality.

WILDLIFE

Vegetation management treatments are commonly applied throughout the County to benefit habitat for general wildlife species or game habitat. Most native wildlife species found in the region evolved with a frequent fire regime.

Threatened and Endangered Species

The County is home to several sensitive and threatened and endangered species, including Mexican spotted owl, Chiricahua leopard frog, Gila Trout, Loach Minnow, Spike Dace and Mexican gray wolf. Threatened and endangered plant species in the County include, slender spider flower (*Cleome multicaulis*), giant yellow Hardy ladyslipper orchid (*Cypripedium parviflorum var pubescens*), Wilcox's pincushion cactus (*Mammillaria wrightii var. wilcoxii*), night-blooming cereus (*Peniocereus gregii*), and Parish's alkali grass (*Puccinellia parishii*).

Treatments on federal lands would be subject to NEPA and associated analysis of impacts to these species. Treatments in areas that may impact T&E species would require application of certain mitigation measures to prevent loss of individuals and /or degradation to habitat.[14,15.]

ROADS AND TRANSPORTATION

There are several transport routes throughout the County that connect communities within the WUI. U.S. Route 180 passes from the north west corner of the County from adjacent Catron County, southeast thru Silver City and into adjacent Luna County towards Deming. New Mexico State Highway 90 leads southwest from Silver City into Hidalgo County and to Lordsburg and Interstate 10. Interstate 10 traverses the southern portion of the County on its way east to Deming. State Highway 15 leads from Silver City north into the Gila Wilderness. State Highways 61 and 35 traverse the eastern edge of the County, serving the communities of Mimbres, San Lorenzo and San Juan. State Highway 78 serves the community of Mule Creek in the north west corner of the County.

In addition to the surfaced highways, numerous smaller roads and forest roads traverse the County, with variable road conditions. Some steep grades and gravel road surfaces may impede travel in the event of a wildfire evacuation or emergency response (Figure 2.20).

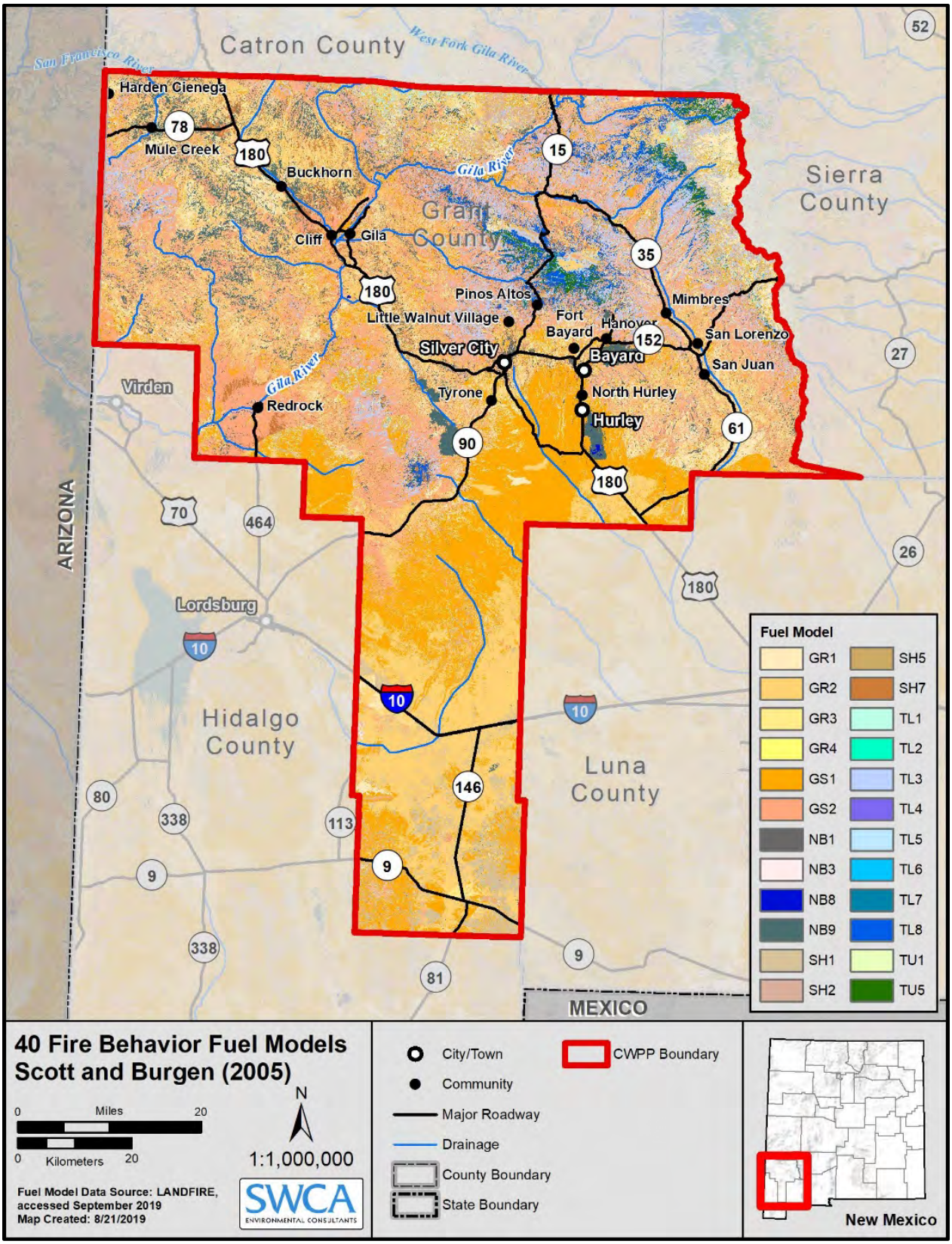
[14] https://www.fws.gov/southwest/ES/Documents/R2ES/MSO_Recovery_Plan_First_Revision_Dec2012.pdf

[15] https://cdm17192.contentdm.oclc.org/digital/collection/p17192coll1/id/415/rec/36

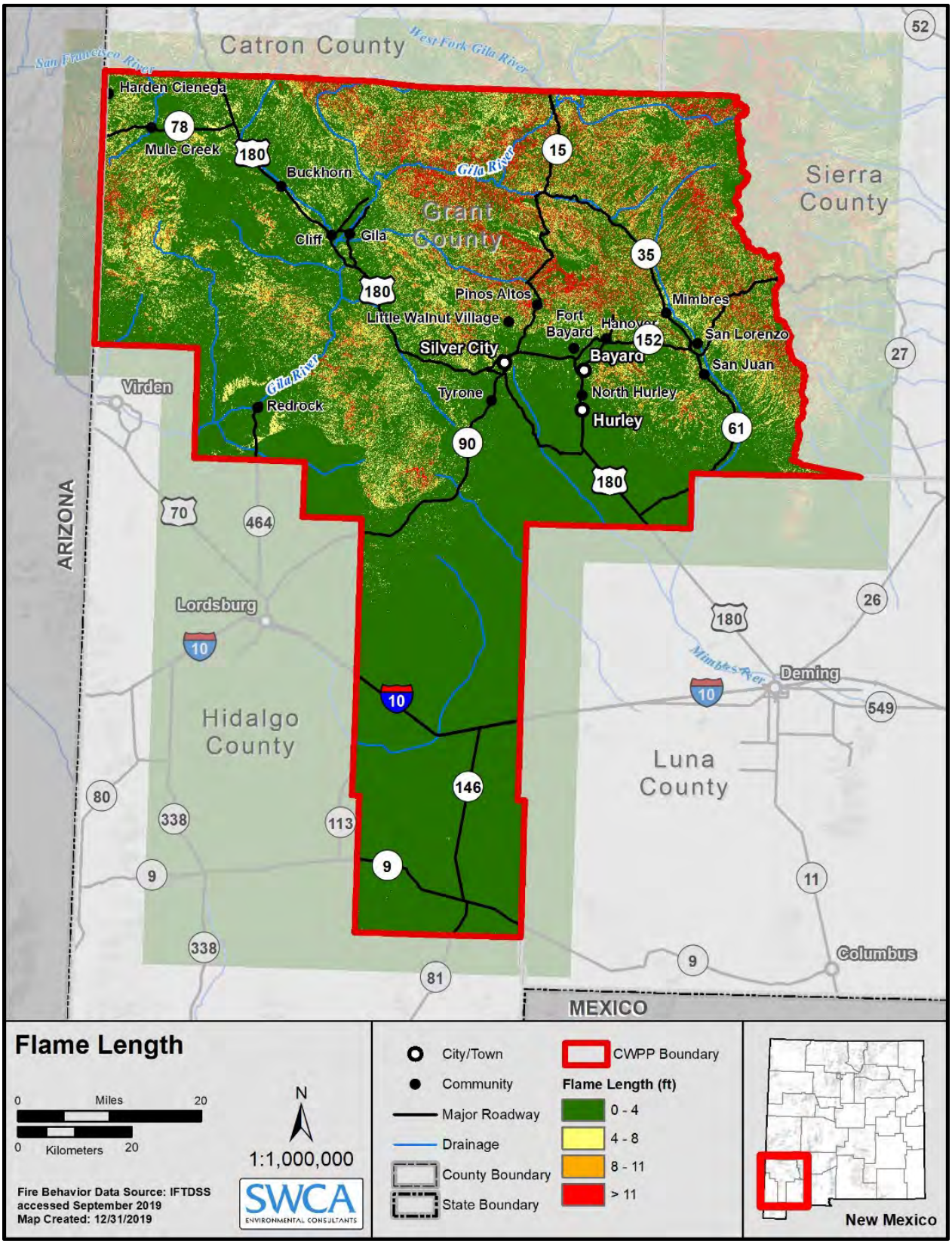
Figure A.8. Photograph showing the steep grade and unsurfaced road surface of a WUI community near Mimbres.

APPENDIX B:

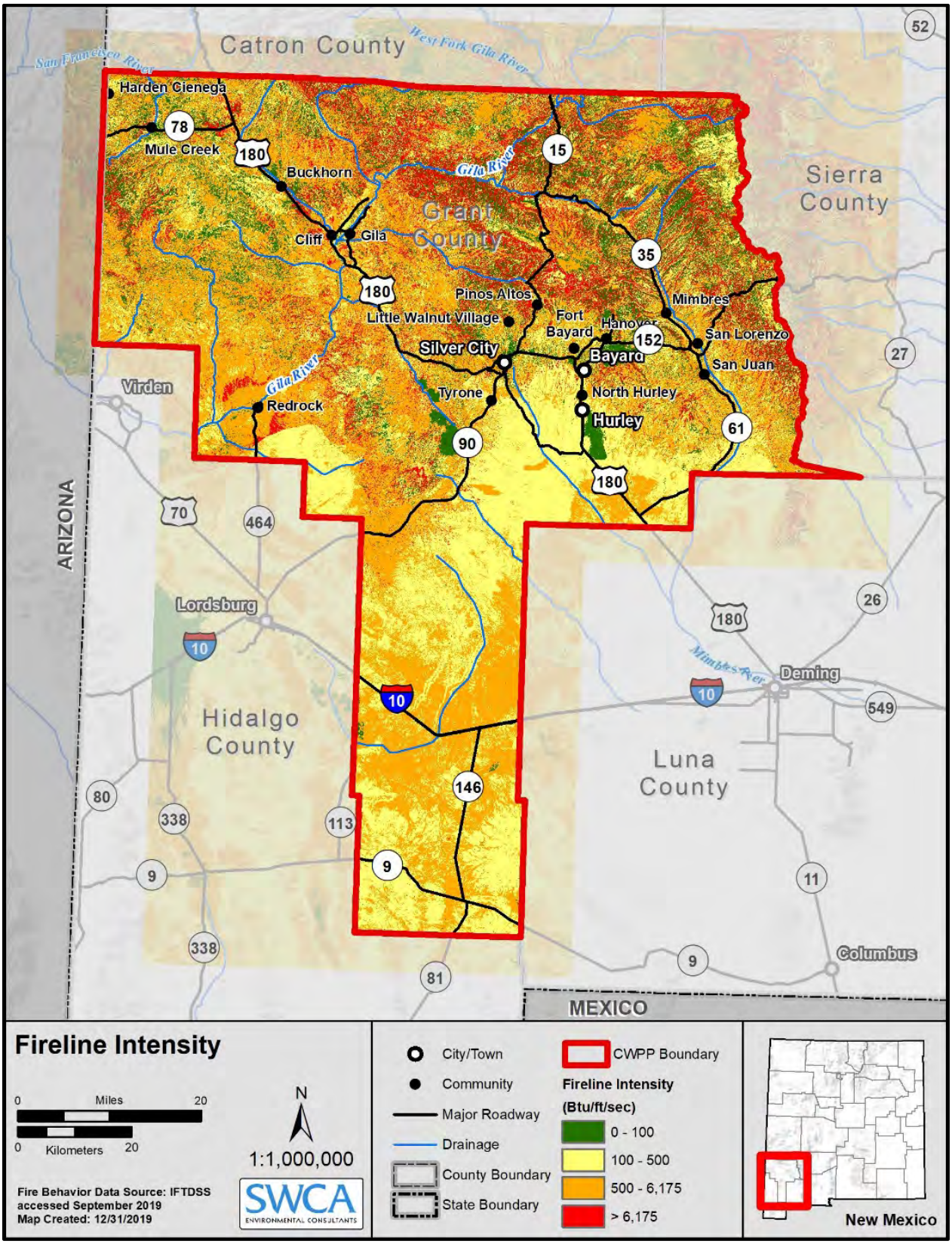
Maps



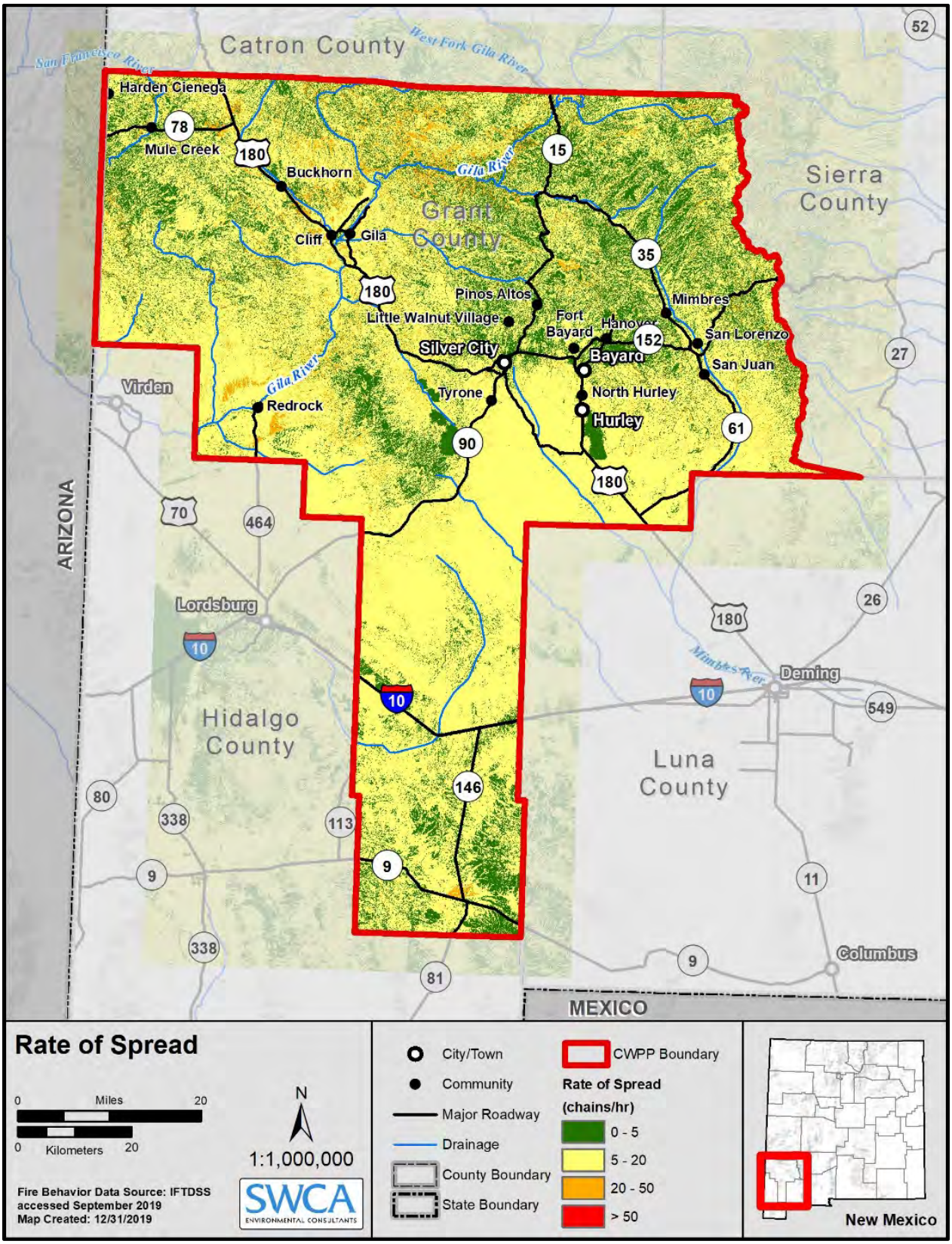
Map 1. Scott and Burgan 40 Fire Behavior Fuel Models.



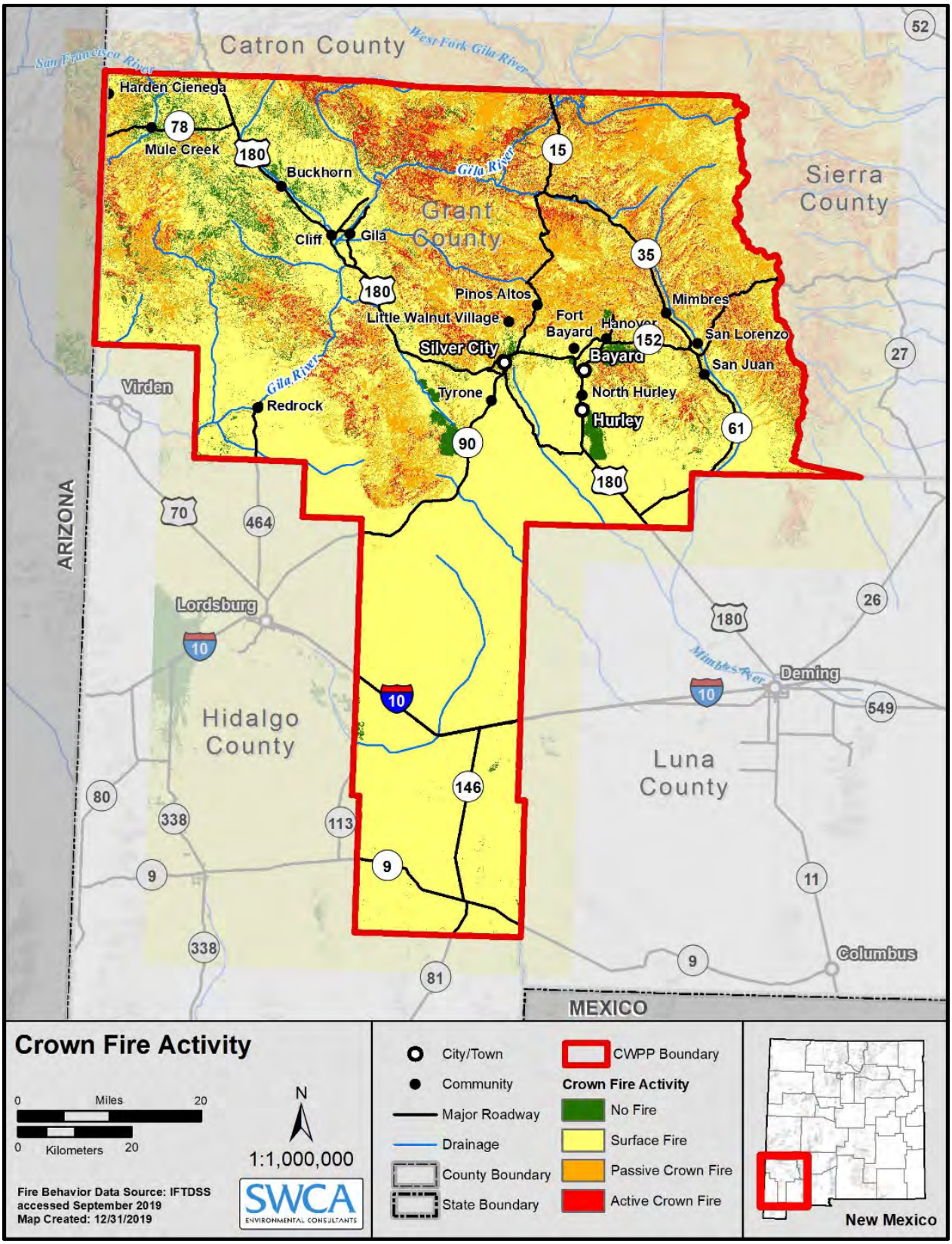
Map 2. Risk assessment inputs: flame length.



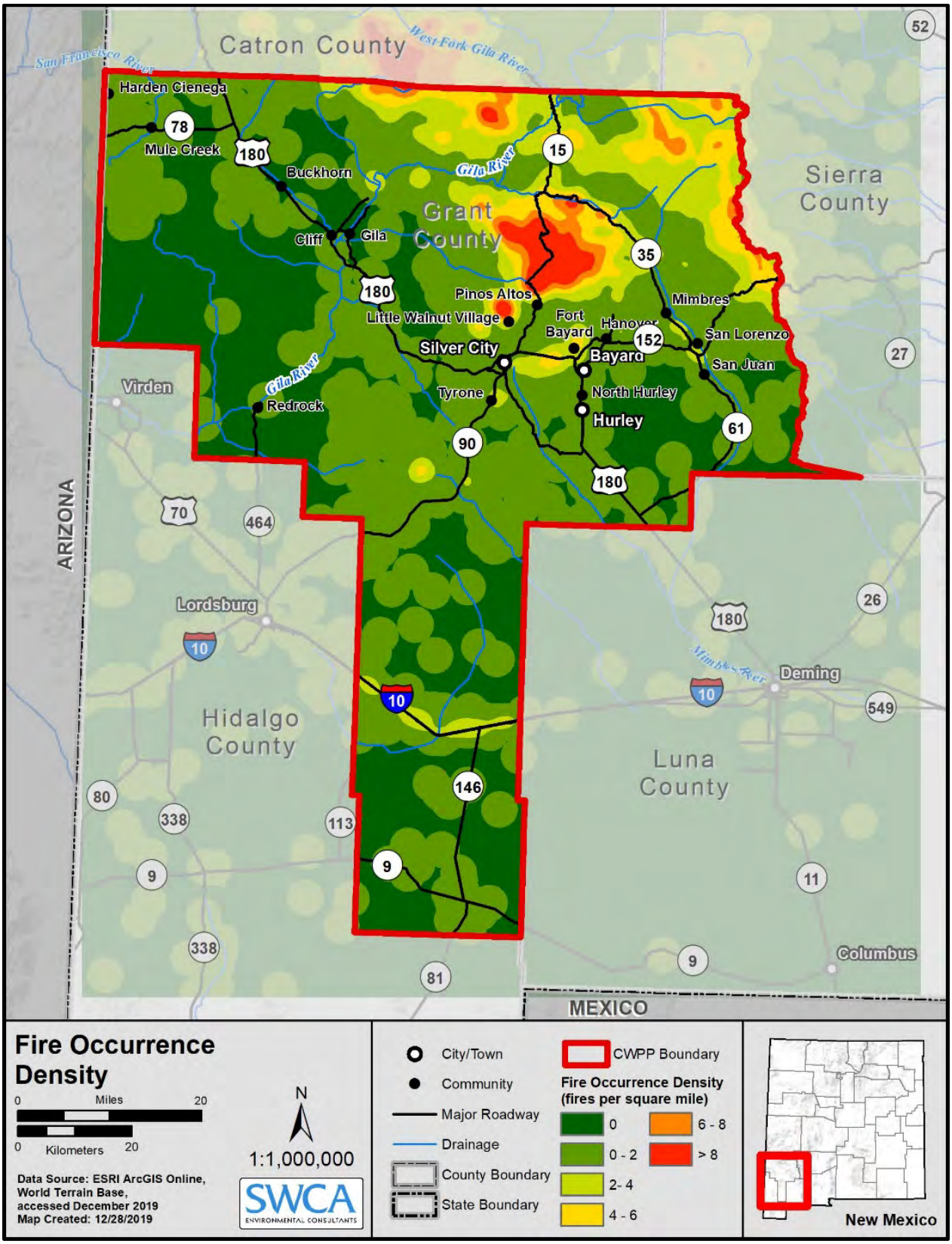
Map 3. Risk assessment inputs: fireline intensity.



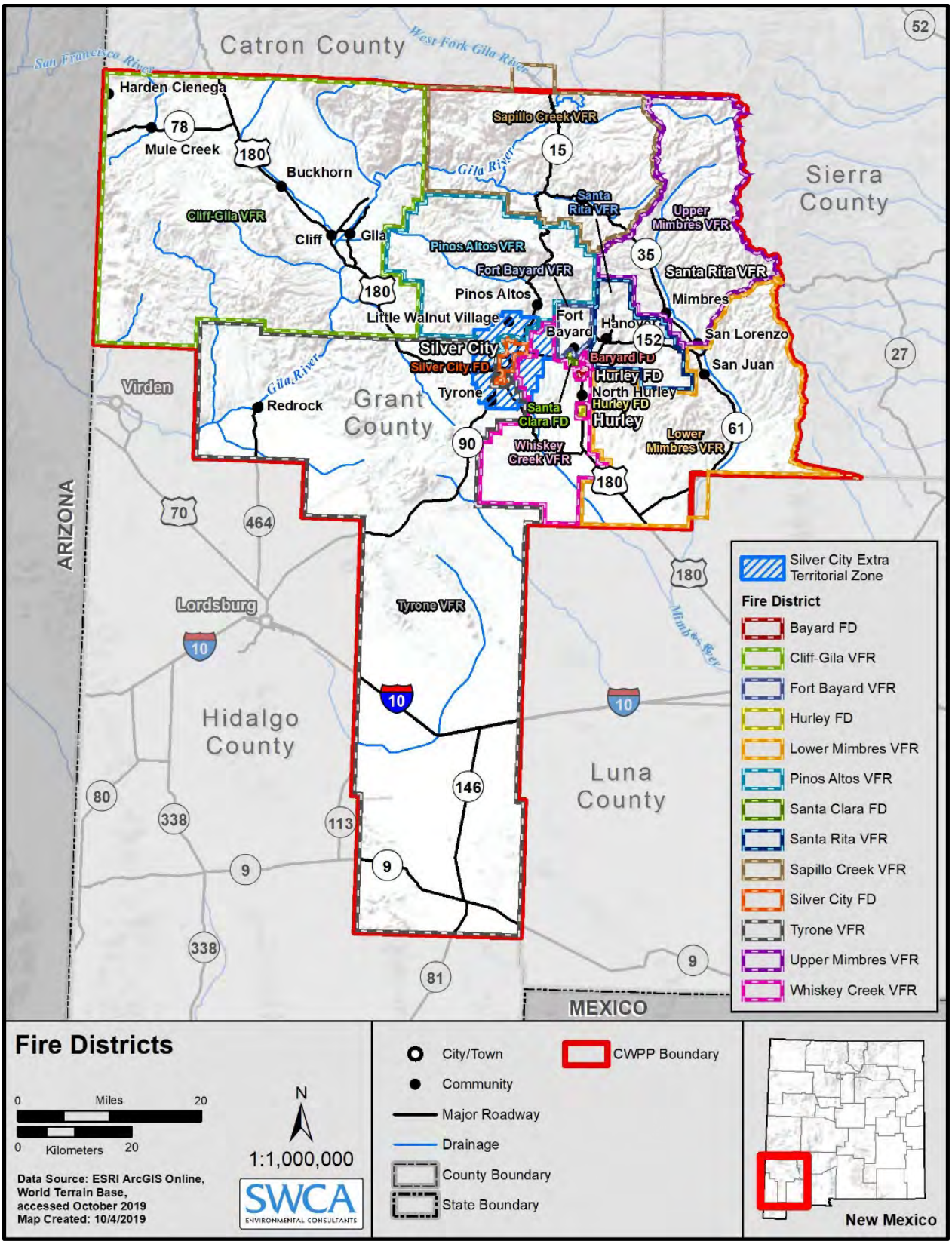
Map 4. Risk assessment inputs: rate of spread.



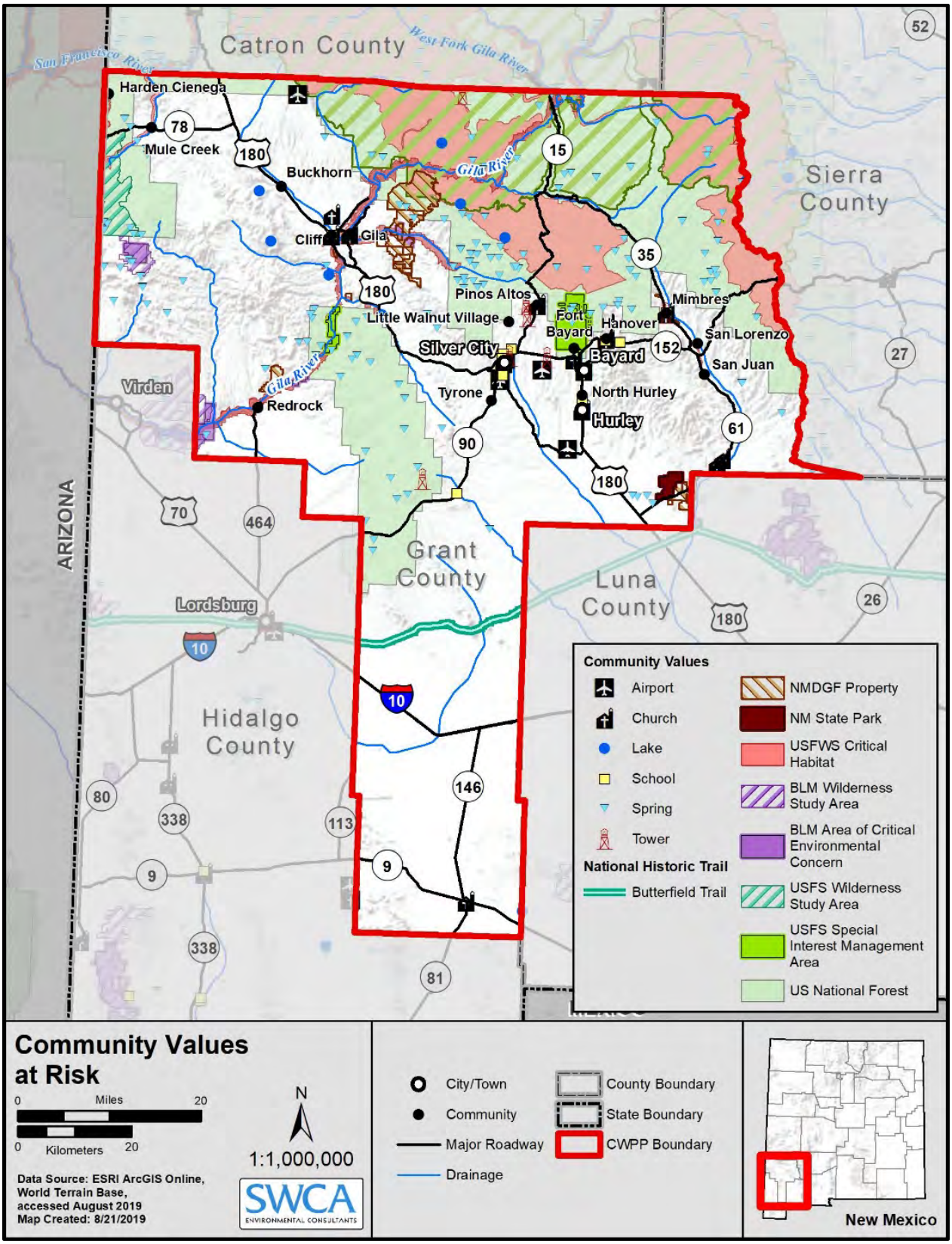
Map 5. Risk assessment inputs: Crown Fire activity.



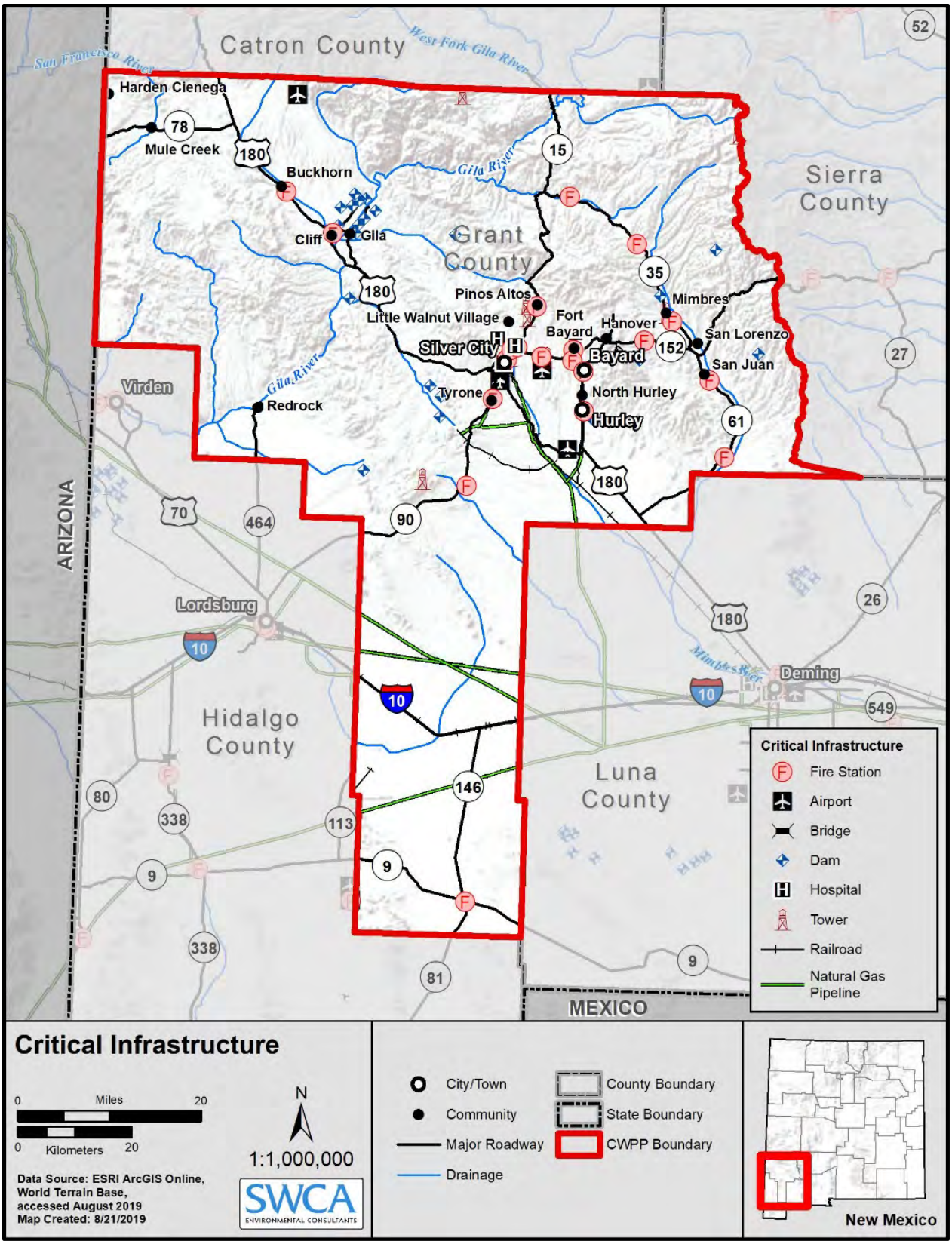
Map 6. Risk assessment inputs: fire occurrence density.



Map 7. Fire district boundaries.



Map 8. Community Values at Risk.



Map 9. Critical infrastructure.

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APPENDIX C:

Core Team List

Name	Organization
Michael Larisch	Grant County
Randy Villa	Grant County
Gilbert Helton	Grant County
Joe Chavez	Grant County Fire Department
Jeff Fell	Silver City Fire Department
Brad Malone	Cliff- Gila Fire Department
Bobby Terrazas	Hurley Fire Department
Mike Vaughan	Lower Mimbres Fire Department
Larry Ruben	Pinos Altos Fire Department
Lucy Whitmarsh	Pinos Altos Fire Department
Kathy London	Santa Rita Fire Department
George Martin	Sapillo Fire Department
Roger Groves	Trout Valley Fire Department
Ken Goddard	Tyrone Fire Department
Ed Powers	Upper Mimbres Fire Department
Scott Kieffer	Upper Mimbres Fire Department
Daniel Salaiz	Whiskey Creek Fire Department
Martha Cooper	The Nature Conservancy
Jack Dickey	NM State Forestry
Russell Thrun	NM State Forestry
Tom Zegler	NM State Forestry
Diego Villalba	NM State Land Office
Jason Butler	U.S Forest Service
Beth Ihle	U.S. Forest Service
Ellen Brown	U.S. Forest Service
Marcus Cornwell	U.S. Forest Service
Daniel London	U.S. Forest Service
Leo Trujillo	U.S. Forest Service
Liz Carver	U.S. Forest Service
Pedro Valenzuela	U.S. Forest Service
Mark Bernal	BLM

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APPENDIX D:

Community Descriptions and Hazard Ratings

WILDLAND URBAN INTERFACE COMMUNITY DESCRIPTIONS

Contents

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

CLIFF / GILA FIRE DISTRICT

Buckhorn

LEGAL: T14S, R18W, Sec 33; T15S, R18W, Sec 3, 4, 11

DESCRIPTIVE LOCATION: 38 miles west and north of Silver City on Hwy 180 N

VEGETATION FUELS: grass, brush (mesquite), cottonwood, and willow along Duck Creek

ESTIMATED DENSITY (population per square mile): 50

NUMBER OF LOTS: 100

TOTAL ACRES: 175

CONSTRUCTION MATERIALS: various

ROOF: various

TERRAIN: flat **SLOPE**: 0%–5% **ASPECT**: E to NE

ACCESS: Hwy 180 N

ROADS: Hwy 180; Duck Creek Road north of Duck Creek mostly county maintained; non-county maintained roads are narrow

BRIDGES: Christian Center Road Bridge over Duck Creek is adequate for emergency vehicles.

DRIVEWAYS: Driveways are dirt and some are narrow.

WATER AVAILABILITY: Pump behind Buckhorn Post Office with overhead fill; Brown Fish Ponds; Holliman Pond

CLOSEST FIRE DEPARTMENT: (in miles): Cliff-Gila VFD - 8 miles

CVAR: Buckhorn Post Office, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 67- Medium

GIS HAZARD/RISK RATING: Medium

Figure D.1. Google Earth imagery showing the community of Buckhorn. Note the light and patchy grass-scrub fuels and proximity to Highway 180 to facilitate access.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

CLIFF / GILA FIRE DISTRICT

Cliff

LEGAL: T15S, R17W, Sec 28, 29, 33

DESCRIPTIVE LOCATION: 30 miles northwest of Silver City on US 180 N

VEGETATION FUELS: grass, mesquite, cottonwood, Gila River and Duck Creek riparian vegetation

ESTIMATED DENSITY (population per square mile): 40

NUMBER OF LOTS: 175

TOTAL ACRES: 700

CONSTRUCTION MATERIALS: Various

ROOF: Various

TERRAIN: Flat w/some hills **SLOPE**: 0%–20% **ASPECT**: south, mostly

ACCESS: US Hwy 180 or Hwy 211 from Gila

ROADS: US 180, Hwy 211, Box Canyon Road: all state maintained; some county-maintained dirt roads

BRIDGES: Hwy 180 bridge over Gila River; Hwy 211 bridge over Gila River

DRIVEWAYS: Most driveways are adequate for emergency vehicles.

WATER AVAILABILITY: Cliff/Gila FD 13,000 gal; Wayne Dickerson on Hwy 180, mile marker 83 100-gpm pump

CLOSEST FIRE DEPARTMENT: (in miles): Cliff/Gila VFD in center of village

CVAR: Grant County Fair Grounds (possible livestock evacuation), commercial business, Fire Department, communication infrastructure, emergency infrastructure.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 69 - Medium

GIS HAZARD/RISK RATING: Medium

Figure D.2. Google Earth imagery showing the community of Cliff. Note the two main access routes (Highway 180 and Highway 211) facilitating ingress-egress, and the varied topography that may influence fire behavior.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

CLIFF / GILA FIRE DISTRICT

Gila

LEGAL: T15S, R17W, Sec 23, 26, 27, 34, 35

DESCRIPTIVE LOCATION: 30 miles northwest of Silver City on Hwy 211 (off Hwy 180 N)

VEGETATION FUELS: grass, brush (mesquite), Gila River 1 mile west with riparian area (cottonwood, box elder)

ESTIMATED DENSITY (population per square mile): very dense around Gila Post Office; 250 population

NUMBER OF LOTS: 200

TOTAL ACRES: 350

CONSTRUCTION MATERIALS: Not provided

ROOF: Not provided **SIDING**: Not provided **DECKS**: Not provided

TERRAIN: mostly flat, rolling hills **SLOPE**: 0%–10% **ASPECT**: west

ACCESS: Highway 211 from US 180 N

ROADS: Hwy 211 is paved; Turkey Creek Road is paved; numerous dirt roads--most are county maintained

BRIDGES: one on Hwy 211 crossing the Gila; some wooden bridges over irrigation ditches; most are adequate for VFD trucks

DRIVEWAYS: most driveways are adequate to narrow; Stailey Road is very narrow with 90 degree turns

WATER AVAILABILITY: Fort West Irrigation Ditch runs north to south thru Gila. Cliff/Gila Fire Dept. has 13,000 gal and 100 gpm pump at Dickerson

CLOSEST FIRE DEPARTMENT: (in miles): Cliff/Gila FD is 4 miles west

CVAR- Cliff High School, Cliff-Gila Community Health, Gila Post Office, churches, communication infrastructure, emergency infrastructure.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 76 - High

GIS HAZARD/RISK RATING: Medium

Figure D.3. Google Earth imagery showing the Gila community relative to main access routes-Highway 293 and 211. Note the varied vegetation composition and proximity to riparian areas. Some structures have limited separation, which may facilitate fire spread.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

CLIFF / GILA FIRE DISTRICT

Mangus Springs (Valley)

LEGAL: T17S, R16W, Sec 8

DESCRIPTIVE LOCATION: mile marker 96 on Hwy 180

VEGETATION FUELS: grass, brush (mesquite), piñon-juniper to the west, cottonwood along Mangus Creek

ESTIMATED DENSITY (population per square mile): 25

NUMBER OF LOTS: 12

TOTAL ACRES: 200

CONSTRUCTION MATERIALS: various

ROOF: various

TERRAIN: flat to hilly **SLOPE**: 0%–45% **ASPECT**: south

ACCESS: Hwy 180

ROADS: narrow; all but two dwellings are on the west side of Mangus Creek with low water crossings

BRIDGES: one cattle guard bridge over ditch is barely adequate for C-GVFD tanker

DRIVEWAYS: narrow but open

WATER AVAILABILITY: stock tank on Greenwood divide (1.5 miles west on Hwy 180; Mangus Creek; Cliff/Gila Fire Dept.

CLOSEST FIRE DEPARTMENT: (in miles): Cliff/Gila VFD 12 miles northwest on Hwy 180

CVAR: Agricultural land, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 94 - High

GIS HAZARD/RISK RATING: High

Figure D.4. Google Earth imagery showing the small community of Mangas Springs. Note there is only one road in and out of the community and many side roads are narrow and dead-end.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

CLIFF / GILA FIRE DISTRICT

Mule Creek

LEGAL: T13S, R20W, Sec 31; T13S, R21W, Sec 36; T14S, R20W, Sec 6; T14S, R21W Sec 1

DESCRIPTIVE LOCATION: 27 miles northwest of Cliff on Hwy 78

VEGETATION FUELS: grass, brush (oak), piñon-juniper, cottonwood along creek

ESTIMATED DENSITY (population per square mile): 60

NUMBER OF LOTS: 30

TOTAL ACRES: 110

CONSTRUCTION MATERIALS: various

ROOF: various

TERRAIN: rolling hills **SLOPE**: 5%–35% **ASPECT**: north

ACCESS: Hwy 78, 9 miles west of Hwy 180

ROADS: Hwy 78 is paved; Goats Pass Rd and Brushy Mt Rd are dirt roads—county maintained

BRIDGES: none; low water crossing on Hwy 78 over Mule Creek and two other drainages

DRIVEWAYS: narrow 10–15 feet wide; some rough

WATER AVAILABILITY: Mule Creek (most of the time); ponds behind post office

CLOSEST FIRE DEPARTMENT: (in miles): Cliff/Gila VFD 27 miles

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 84 - High

GIS HAZARD/RISK RATING: High

Figure D.5. Google Earth imagery showing the community of Mule Creek. Note homes located close to riparian stringers and some long and narrow driveways that may impede emergency access.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

CLIFF / GILA FIRE DISTRICT

Pine Cienega

LEGAL: T15S, R21W, parts of Sec 1, 11, 12, 14

DESCRIPTIVE LOCATION: 10 miles south of Mule Creek on Brushy Mt Rd

VEGETATION FUELS: grass, brush, piñon-juniper, ponderosa pine

ESTIMATED DENSITY (population per square mile): 27

NUMBER OF LOTS: 20

TOTAL ACRES: 250

CONSTRUCTION MATERIALS: various

ROOF: various

TERRAIN: brushy, rough **SLOPE**: 10%–50% **ASPECT**: west and east

ACCESS: Brushy Mt Rd

ROADS: Brushy Mt Rd

BRIDGES: none

DRIVEWAYS: narrow to very narrow (less than 8 feet) with trees bordering

WATER AVAILABILITY: Mule Creek on Hwy 78 year-round; some stock water tanks between Pine Cienega and Mule Creek are iffy

CLOSEST FIRE DEPARTMENT (in miles): Cliff/Gila VFD 37 miles

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 112 - High

GIS HAZARD/RISK RATING: High

Figure D.6. Google Earth imagery showing Pine Cienega located along Brushy Mountain Road. Note homes located within and adjacent to brushy fuels along narrow and dead-end spur roads.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

CLIFF / GILA FIRE DISTRICT

Riverside

LEGAL: T16S, R17W, Sec 9

DESCRIPTIVE LOCATION: 26 miles northwest of Silver City on Hwy 180; 4 miles southeast of Cliff

VEGETATION FUELS: grass, brush (mesquite), riparian vegetation along Gila River

ESTIMATED DENSITY (population per square mile): 50

NUMBER OF LOTS: 35

TOTAL ACRES: 170

CONSTRUCTION MATERIALS: various

ROOF: various

TERRAIN: flat, some rolling hills **SLOPE**: 0 - 15% **ASPECT**: southwest

ACCESS: Hwy 180; Airport Mesa Rd

ROADS: Hwy 180; Airport Mesa Rd

BRIDGES: Bridge across Gila on Hwy 180

DRIVEWAYS: most are accessed off Hwy 180

WATER AVAILABILITY: Cliff/Gila Fire Dept; Gila River near bridge

CLOSEST FIRE DEPARTMENT: (in miles): Cliff/Gila VFD 4 miles

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 66 - High

GIS HAZARD/RISK RATING: Medium

NOTES: There is active fuels reduction planned for the public land adjacent to private property, FAA towers on Brushy Mountain. Treatments include mechanical thinning and prescribed fire.

Figure D.7. Google Earth imagery showing the community of Riverside adjacent to Highway 180. Note the light and patchy fuels and close access to homes via Highway 180.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

CLIFF / GILA FIRE DISTRICT

Table Butte (Greenwood)

LEGAL: T16S, R16W, parts of Sec 29, 32

DESCRIPTIVE LOCATION: mile marker 94 on Hwy 180

VEGETATION FUELS: grass, brush (Mesquite), piñon-juniper

ESTIMATED DENSITY (population per square mile): 20

NUMBER OF LOTS: 15

TOTAL ACRES: 100

CONSTRUCTION MATERIALS: various

ROOF: various

TERRAIN: rolling hills **SLOPE**: 10%–30% **ASPECT**: northeast

ACCESS: Table Butte Rd and Quail Canyon Rd off Hwy 180

ROADS: Table Butte is county maintained. Quail Canyon is a private road and not county maintained.

BRIDGES: none

DRIVEWAYS: good to narrow

WATER AVAILABILITY: 0.5 mile south stock tank on Hwy 180; Cliff/Gila Fire Dept 10 miles north

CLOSEST FIRE DEPARTMENT: (in miles): Cliff/Gila VFD 10 miles

CVAR: Cell tower and outbuildings located via Quail Canyon Road (private), other communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 73 - High

GIS HAZARD/RISK RATING: Medium

Figure D.8. Google Earth imagery showing the small community of Table Butte. Note the light and patchy fuels.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

FORT BAYARD FIRE DISTRICT

Fort Bayard

LEGAL: T17S, R13W, Sec 26

DESCRIPTIVE LOCATION: Hwy 180, North of Santa Clara at the stoplight

VEGETATION FUELS: grass, brush, cottonwood and piñon-juniper

ESTIMATED DENSITY (population per square mile): 400

NUMBER OF LOTS: 30

TOTAL ACRES: 300

CONSTRUCTION MATERIALS: wood frame and stone construction

ROOF: primarily metal roofs

TERRAIN: open with some man-made obstructions

SLOPE: flat to slightly rolling

ASPECT: all

ACCESS: one way in and out on a good paved road

ROADS: paved roads, wide easy access

BRIDGES: none

DRIVEWAYS: short and accessible

WATER AVAILABILITY: site has 25 hydrants on a 500,000 gallon supply

CLOSEST FIRE DEPARTMENT: Fort Bayard VFD

CVAR: Medical Center, Museum, Historic District, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 52 - Medium

GIS HAZARD/RISK RATING: Low

COMMENTS: Easy access. On-site hospital will present evacuation problems and firefighting challenges.

Figure D.9. Google Earth imagery showing Fort Bayard and the Medical Center. Note good road access and light fuels.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

LOWER MIMBRES FIRE DISTRICT

Faywood

LEGAL: T20S, R11W, Sec 21

DESCRIPTIVE LOCATION: 11 miles NE of Hwy 180 on Hwy 61

VEGETATION FUELS: grasses, forbs, and bosque

ESTIMATED DENSITY (population per square mile): 40

NUMBER OF LOTS: 20

TOTAL ACRES: 320

CONSTRUCTION MATERIALS: from mobile homes to adobe

ROOF: mostly metal or composition

TERRAIN: rolls and dips **SLOPE**: flat to 5% **ASPECT**: all

ACCESS: State Highway 61

ROADS: fair; Dwyer Lane is a county maintained road

BRIDGES: none

DRIVEWAYS: mostly short and narrow

WATER AVAILABILITY AND APPARATUS:

Faywood sub-station:

40,000 gallon water tank with hydrant.

Tender	20	2,000 gallons.
Class A	16	1,500 gallons.
Brush Truck	21	400 gallons.
Brush Truck	22	400 gallons.

Sherman main station:

One 8,000-gallonwWater tank.

One 1,500-gallon water tank.

Tender	10	2,000 gallons.

Class A	15	1,500 gallons.
Class A	25	1,500 gallons.
Brush Truck	11	400 gallons.

CLOSEST FIRE DEPARTMENT: Lower Mimbres

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 83 - High

GIS HAZARD/RISK RATING: Medium

Figure D.10. Google Earth imagery showing the small community of Faywood. Note most homes are located along Dwyer Lane surrounded by light fuels, but homes on the east side of the road back to riparian areas with thicker fuels in proximity to homes.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

LOWER MIMBRES FIRE DISTRICT

Mimbres Hot Springs Ranch

LEGAL: T18S, R10W, Sec 14

DESCRIPTIVE LOCATION: 2.5 miles east of Hwy 61 on Royal John Mine Road/Hot Springs Canyon Road

VEGETATION FUELS: piñon-juniper, ponderosa pine

ESTIMATED DENSITY (population per square mile): 40

NUMBER OF LOTS: 20

TOTAL ACRES: 330 acres

CONSTRUCTION MATERIALS: Various, wood frame and unconventional

ROOF: Mostly composition tile and dirt.

TERRAIN: Rough mountain terrain

ROADS: Poor, rough, not maintained, and narrow.

BRIDGES: At least 3; some limited to 5 tons or less. Royal John Mine Road (1), Hot Springs Rd (2).

DRIVEWAYS: Narrow, rough, locked gates, intruders unwelcome. Closed to the public.

WATER AVAILABILITY: 6 miles to station supply, 10,000-gal pond at Hot Springs Ranch (spring fed) with bank sump pump and 1.5-inch outlet. GPS coordinates- N 32 degrees 44. 815'; W 107 degrees 50.223'.

CLOSEST FIRE DEPARTMENT: Lower Mimbres

SLOPE: 20%–30% and steeper in places

ASPECT: south to southwest

ACCESS: Royal John Mine Road is a county maintained road in fair condition. Hot Springs Canyon Road is mostly unsurfaced.

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 107 – High

GIS HAZARD/RISK RATING: High

Figure D.11. Google Earth imagery showing the location of Mimbres Hot Springs Ranch. Note narrow, unsurfaced roads are used to access the community, and the surrounding terrain is steep and variable, which may influence fire behavior.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

LOWER MIMBRES FIRE DISTRICT

San Juan

LEGAL: T18S, R10W, Sec 8

DESCRIPTIVE LOCATION: 2.5 miles south of Hwy 152 on Hwy 61

VEGETATION FUELS: Grasses, forbs and bosque

ESTIMATED DENSITY (population per square mile): 100

NUMBER OF LOTS: 30

TOTAL ACRES: 600

CONSTRUCTION MATERIALS: Manufactured homes to adobe

ROOF: Mostly composition and metal

TERRAIN: river bottom **SLOPE**: flat to 10% **ASPECT**: all

ACCESS: State Highway 61

ROADS: Poor to fair, narrow

BRIDGES: None

DRIVEWAYS: Narrow, 2 track, no markings

WATER AVAILABILITY: 2 miles at main station 15,000-gal. storage tank; sometimes water in river

CLOSEST FIRE DEPARTMENT: Lower Mimbres

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 94 - High

GIS HAZARD/RISK RATING: High

NOTES: New development-manufactured homes along Hot Springs Canyon Road/ Mimbres Mountain Ranch.

Figure D.12. Google Earth imagery showing the small community of San Juan, located on Highway 61. Note the topography adjacent to homes and the thicker riparian fuels on the east side of the community.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

Feeley Subdivision

LEGAL: T16S, R14W, Sec 31, 32

DESCRIPTIVE LOCATION: Approximately 7 miles from the Silver City limit at the end of Little Walnut Road where FS506 becomes FS799. Most lots are 10 acres. The Gila National Forest surrounds the entire community.

VEGETATION FUELS: Grasses, forbs and scrub oak are intermixed with ponderosa forests and piñon-juniper forests. There is a riparian area through the middle of the subdivision.

ESTIMATED DENSITY (population per square mile): 70

NUMBER OF LOTS: 20

TOTAL ACRES: 164

CONSTRUCTION MATERIALS: From log homes to rock construction.

ROOF: Predominantly metal with some composition shingle.

TERRAIN: Steep, rocky, and heavily wooded. **SLOPE**: 5%–45%

ASPECT: Mostly north or south; the area is located in an east-to-west valley.

ACCESS: Poor; the road to the area is a narrow USFS Road (maintained by the county), which gets much worse upon entering the subdivision.

ROADS: Bad; part of the road through the subdivision is the creek bed. It is very

rough at best and is impassable at times due to water flow in the creek.

BRIDGES: No bridges but there are two cattle guards on FS506.

DRIVEWAYS: Various, mostly narrow

WATER AVAILABILITY: Some residents have aboveground domestic water supplies of various sizes.

CLOSEST FIRE DEPARTMENT: Pinos Altos Station Two on Wagon Wheel Lane

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 127 - High

GIS HAZARD/RISK RATING: High

COMMENTS: The neighborhood is becoming aware of the hazards, and residents are beginning mitigation work. The narrow access road, surrounding heavy fuels, and only one escape route poses an extreme risk to responding fighters.

Figure D.13. Google Earth imagery showing the Feeley subdivision. Note the community is surrounded by USFS land and homes are located along many dead-end spur roads.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

Owens Road Subdivision

LEGAL: T16S, R14W, Sec 35, T17S, R14W, Sec 2

DESCRIPTIVE LOCATION: Approximately 3.5 miles from the Silver City limits via Little Walnut Road, also known as FS506. Most lots average 9 acres. A few are in the 35 to 75 acre range. The Gila National Forest borders the community on the north side. The other three sides are abutted with private property.

VEGETATION FUELS: Grasses, forbs, and scrub oak are intermixed with ponderosa forests and piñon–Juniper forests

ESTIMATED DENSITY (population per square mile): 14

NUMBER OF LOTS: 45 **TOTAL ACRES**: 803

CONSTRUCTION MATERIALS: From log homes to frame construction with wooden or stucco siding and adobe construction.

ROOF: Predominantly metal with some composition shingle.

TERRAIN: Steep, rocky, and heavily wooded. **SLOPE**: 5%–45%

ASPECT: All aspects.

ACCESS: Fair; the USFS road is maintained moderately but it is narrow and steep in some places.

ROADS: Fair; the county maintains the road through the area.

BRIDGES: No bridges; one cattle guard on FS506 and one on Joseph Blane.

DRIVEWAYS: Various, mostly narrow, some are steep.

WATER AVAILABILITY: The monastery on Joseph Blane Road has installed a 70,000-gallon water tank. Some residents have aboveground domestic water tanks of various sizes.

CLOSEST FIRE DEPARTMENT: Pinos Altos Station Two on Wagon Wheel Lane is located about 1 mile away.

CVAR: Monastery, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 123 - High.

GIS HAZARD/RISK RATING: High.

COMMENTS: Few homeowners have taken precautions to provide defensible space.

Figure D.14. Google Earth imagery showing Owens Road and surrounding properties. Note the heavy vegetation surrounding the community.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

Pinos Altos

LEGAL: T16S, R13W, Sec 5, 6.

DESCRIPTIVE LOCATION: Approximately 6 miles north of Silver City on State Hwy 15; most lots are less than 1 acre, but the outlying areas may have up to 10-acre sites. The area is surrounded by BLM land to the east and west with the Gila National Forest to the north and private forest land to the south.

VEGETATION FUELS: Grasses, forbs, and scrub oak are intermixed with ponderosa forests and piñon-juniper forests. There is a riparian area (Bear Creek) through the middle of the town site.

ESTIMATED DENSITY (population acre): 82.

NUMBER OF LOTS: 187 **TOTAL ACRES**: 244.

CONSTRUCTION MATERIALS: Various including conventional, straw bail and adobe.

ROOF: Composition shingle and metal.

TERRAIN: Steep, rocky, and heavily wooded. **SLOPE**: 5%–45%

ASPECT: All aspects present.

ACCESS: Fair to poor; a state highway runs through town but side streets are predominantly dirt roads.

ROADS: Fair to poor; close to the center of town the roads are good but the outlying areas have some very narrow and rough sections.

BRIDGES: One on Bear Creek Road; It has a 20,000 pound load limit.

DRIVEWAYS: Fair to poor; some are very narrow and rough.

WATER AVAILABILITY: The Pinos Altos Water Association has 14 hydrants located around town, including one located at the PA Station. The water system provides minimum fire flow in the heart of town and even less on the extreme ends of the system due to shrinking water main sizes.

CLOSEST FIRE DEPARTMENT: Pinos Altos has a VFD located on the south edge of town on Highway 15.

CVAR: commercial business, fire department, historic properties, communication infrastructure, emergency infrastructure.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 96 - High

GIS HAZARD/RISK RATING: High

COMMENTS: The area has a lot of old construction and is surrounded by heavy forest fuel loads.

Figure D.15. Google Earth imagery of Pinos Altos showing the communitiy's compact location, surrounded entirely by forest fuels.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

Wagon Wheel Lane Subdivision

LEGAL: T16S, R14W, Sec 33, 34; T17S, R14W, Sec 3

DESCRIPTIVE LOCATION: Approximately 4.5 miles from the Silver City limits via Little Walnut Road, also known as FS506. Most lots average 7 acres. A few are in the 60 to 100 acre range. The Gila National Forest borders the community on three sides. The east side is abutted with private property.

VEGETATION FUELS: Grasses, forbs, and scrub oak are intermixed with ponderosa forests and piñon-juniper forests

ESTIMATED DENSITY (population per square mile): 82

NUMBER OF LOTS: 65 **TOTAL ACRES**: 421

CONSTRUCTION MATERIALS: From log homes to frame construction with wooden or stucco siding; one straw bale home is located in the area.

ROOF: Predominantly metal with some composition shingle.

TERRAIN: Steep, rocky, and heavily wooded. **SLOPE**: 5%–45%

ASPECT: All aspects.

ACCESS: Fair; the USFS road is moderately maintained, but it is narrow and steep in some places.

ROADS: Good; the road through the subdivision is in excellent condition. (The Homeowners Association maintains it.).

BRIDGES: No bridges; one cattle guard on FS506.

DRIVEWAYS: Various, mostly narrow, some are very long and steep.

WATER AVAILABILITY: A 25,000-gallon tank is located near the entrance to the subdivision. A 10,000-gallon tank is located beside the WWL Fire Station. Some residents have aboveground domestic water supplies of various sizes. The monastery also has a large capacity tank.

CLOSEST FIRE DEPARTMENT: Pinos Altos Station Two on Wagon Wheel Lane is located in the subdivision.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 82 - High

GIS HAZARD/RISK RATING: High

COMMENTS: Many homeowners have taken precautions and provided defensible space.

Figure D.16. Google Earth imagery of the Wagon Wheel Lane subdivision. Note some thick woodland fuels in very close proximity to homes.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

Cottage San Road District

LEGAL: T17S, R14W, Sec 28 NW¼, Sec 21 SW¼, Sec 20 N½, private land in Section 17 (160 acres)

DESCRIPTIVE LOCATION: The Cottage San Road fire district begins at the Silver City town limit (Hester Drive). Lots average from less than 0.25 acre to 10 acres. A few are in the 20- to 100-acre range. The district is bordered by a mixture of USFS, BLM, and State Land Office land and private property. Much of adjoining USFS land is also in the Pinos Altos district.

VEGETATION FUELS: Grasses, forbs, and scrub oak are intermixed with ponderosa pine and piñon-juniper forests

ESTIMATED DENSITY (population per square mile): ranges from 5 to 20

NUMBER OF LOTS: Approximately 277 and 3 trailer parks with a minimum of 20 trailers per park.

TOTAL ACRES: 800

CONSTRUCTION MATERIALS: From log homes to frame and masonry construction with wooden, aluminum, vinyl, and stucco siding, including manufactured homes.

ROOF: Predominantly composition shingle with some metal.

TERRAIN: Steep in places, rocky, and heavily wooded in places; a few neighborhoods are more urban.

SLOPE: 5%–45% **ASPECT**: all aspects

ACCESS: Fair; Cottage San Road (CSR) is the only ingress-egress. It is paved and maintained by the county. All other roads are either county maintained or maintained by homeowners, 95% of which are one way in and out.

ROADS: Fair to moderately good; a seasonally active creek that crosses CSR in several places, with under-road culverts and over-road crossings. Side roads branching off CSR are dirt or gravel and privately maintained. These 95% roads also have creek crossings that flood and are impassable at times during the rainy season.

BRIDGES: No bridges but there are under-road, as well as over-road, crossings in several places.

DRIVEWAYS: Various, mostly narrow; some are very long and steep; most are single access.

WATER AVAILABILITY: There are 27 hydrants serving the area, all on the same water main. A 25,000-gallon tank accessed by a hydrant is located at the CSR Fire Station, approximately 2.5 miles north of the town limit. Some residents have aboveground domestic water supplies of various sizes.

CLOSEST FIRE DEPARTMENT AND APPARATUS: The Cottage San Road Station at 2234 Cottage San Road is located in the subdivision. Equipment is one brush truck, one engine, and one tender.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 89 - High

GIS HAZARD/RISK RATING: Medium

COMMENTS: Some homeowners have taken precautions and created defensible space. Much of the area is used for cattle grazing and wildlife recreation.

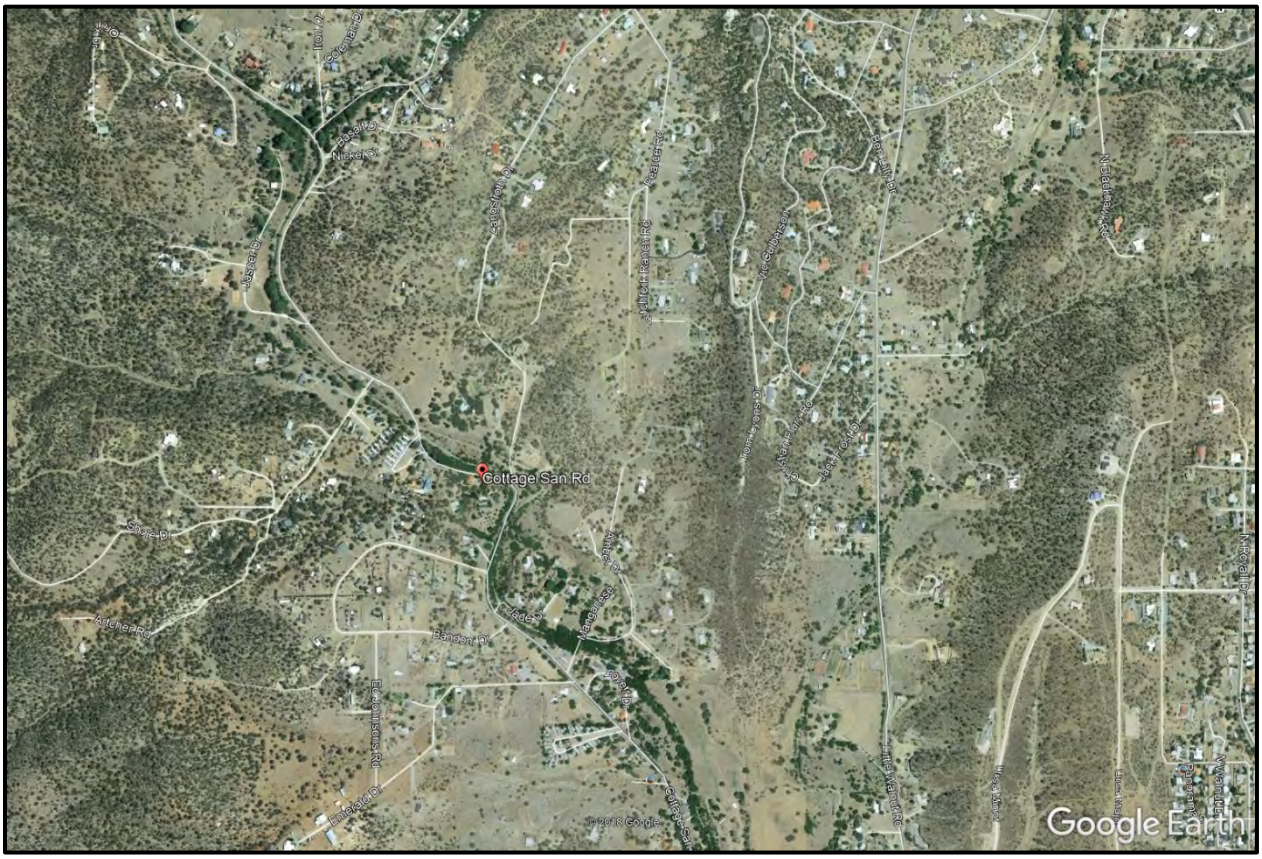

Figure D.17. Google Earth imagery showing the Cottage San Road area. Note the light and patchy vegetation and some homes located with minimal defensible space.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

North Swan, Rocky Creek, Machete Peak and Dos Griegos Subdivision

LEGAL: T17S, R14W, Sec 11, 12 SW¼, 14 N¼

DESCRIPTIVE LOCATION: From the Silver City limit to the end of North Swan Street and side streets. Most lots average 4 to 5 acres on North Swan Street and 1 to 2 acres in the Dos Griegos subdivision, with large shared open space acres in and around the subdivision. The PA Ranch subdivision borders the community to the north.

VEGETATION FUELS: Grasses, forbs and scrub oak are intermixed with piñon and juniper trees.

ESTIMATED DENSITY (population per square mile): 7.

NUMBER OF LOTS: 444.

TOTAL ACRES: 1,911.

CONSTRUCTION MATERIALS: Frame construction with wooden or stucco siding and manufactured housing.

ROOF: Predominantly metal and cement tile with some composition shingle.

TERRAIN: Steep, rocky, and heavily wooded.

SLOPE: 5%–45%.

ASPECT: All aspects

ACCESS: Fair to good; Swan Street and all of Dos Griegos are county-maintained paved roads. Numerous private and county-maintained dirt roads lead east and west off of Swan Street, and are narrow and steep in some places.

ROADS: Primary roads are good; the roads through the Dos-Griegos subdivision are paved.

BRIDGES: No bridges and numerous culverts.

DRIVEWAYS: Various, some paved, some narrow on the side dirt roads.

WATER AVAILABILITY: All of Dos Griegos, Rocky Creek, and Machete Peak subdivisions have hydrants. All other properties are on wells, and some residents have aboveground domestic water supplies of various sizes.

CLOSEST FIRE DEPARTMENT: Silver City Station 2.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 83 - High

GIS HAZARD/RISK RATING: Medium

COMMENTS: Many homeowners have taken precautions and created defensible space. Rocky Creek and Dos Griegos are designated as Firewise Communities.

Figure 18. Google Earth imagery showing the North Swan subdivision. Note the arrangement of homes and evidence of defensible space and thinning around some homes.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

LS Mesa Area

LEGAL: Western half of R15W in T16S

DESCRIPTIVE LOCATION: Approximately 11 to 16 miles from the Silver City limit via Cottage San Road to Bear Mountain Road (FS 853). The properties range from 20 to 400 acres. The Gila National Forest borders the area on east side. The area includes considerable BLM and state land parcels.

VEGETATION FUELS: Grasses, forbs, bear grass, and scrub oak are intermixed with piñon-juniper woodland areas and some ponderosa pine in the drainages.

ESTIMATED POPULATION: 43 full time and 5 part residences.

NUMBER OF STRUCTURES: 60 (houses, garages, casitas, barns).

TOTAL ACRES: 30 sections estimated (19,200 acres).

CONSTRUCTION MATERIALS: From log homes to frame construction with wooden or stucco siding.

ROOF: Predominantly metal, some flat built-up roofs.

TERRAIN: Flat to steep, rocky and grassy open areas to moderately wooded.

SLOPE: 1%–45%.

ASPECT: All aspects.

ACCESS: Fair to poor/impassable (if wet); FS 853 road is maintained by the county three or four times per year. FS 172 is maintained periodically by USFS. Private roads are maintained periodically by landowners.

ROADS: Poor to fair; occasionally closed during rains/snow.

BRIDGES: No bridges, but there are several cattle guards.

DRIVEWAYS: Various, some narrow, some are long and steep, some locked gates.

WATER AVAILABILITY: There are two 20,000-gallon tanks located at the LS Mesa Station. The water supply is accessed by a hydrant. A 6,000-gallon tank is located west of FS 172. A 10,000-gallon tank and 2,500-gallon tank are located at Greenwood Canyon. A 5,000-gallon tank is located near mile post 11.5 of FS 853. A 6,000-gallon tank is located near mile post 13.5 of FS 853. Some residents have aboveground domestic water supplies of various sizes ranging from 2,000 to 4,000 gallons.

CLOSEST FIRE DEPARTMENT AND APPRATUS: The LS Mesa Fire Station is located at 769 Bear Mountain Road. Equipment is one engine (1,000-gallon capacity), one brush truck (250-gallon capacity), one tender (2,000-gallon capacity) and one UTV (160-gallon capacity). All units except the tender are equipped with foam.

CVAR: Seasonal cabins, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 97 - High

GIS HAZARD/RISK RATING: High

COMMENTS: Many homeowners have taken precautions and created defensible space. Much of the area is used for cattle grazing and wildlife recreation.

Figure D.19. Google Earth imagery showing the remote location of LS Mesa, accessed via Bear Mountain Road. Note the varied topography of the area, which could influence fire behavior.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

Cleveland Mine Road/ Pinos Altos Mountain Estates Subdivision

LEGAL: T17S, R14W, Sec 1, 2

DESCRIPTIVE LOCATION: Approximately 4.0 miles from the Silver City town limit via Little Walnut Road (FR 506). Cleveland Mine Road (FR 804) has developed lots, while the Pinos Altos Mountain Estates is comprised of 12-acre empty lots. Private property borders the community on all sides with some BLM land adjacent.

VEGETATION FUELS: Grasses, forbs, and scrub oak are intermixed with dense piñon-juniper forest.

ESTIMATED DENSITY (population per square mile): 6

NUMBER OF LOTS: 51

TOTAL ACRES: 822

CONSTRUCTION MATERIALS: Site built homes with stucco and wood siding.

ROOF: Metal and composition shingle.

TERRAIN: Steep, rocky, and heavily wooded.

SLOPE: 15%–45%.

ASPECT: Southwest.

ACCESS: Fair; Cleveland Mine Road (FR 804)/Darling Bell Road provide the only access. These roads are steep and rough. Darling Bell has a gate into the development. PAVFR/WWL Station has a key for the gate if it is locked. Access to the subdivision from the east side is blocked by the private property owner.

ROADS: Steep, narrow, and rough.

BRIDGES: None. One cattle guard on FS506.

DRIVEWAYS: Some are long, especially access into the Pinos Altos Estates.

WATER AVAILABILITY: A 10,000-gallon tank is located beside the WWL Fire Station.

CLOSEST FIRE DEPARTMENT: Pinos Altos Station Two on Wagon Wheel Lane is approximately 2.3 miles from the entrance of the subdivision.

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 104 - High

GIS HAZARD/RISK RATING: High

COMMENTS: The Pinos Altos Estates subdivision is currently being developed. This subdivision presents an extreme risk to responding firefighters because of its terrain fuels and questionable road access.

Figure D.20. Google Earth imagery showing the area of Pinos Altos Mountain Estates, accessed via Cleveland Mine Road.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

Copper Ridge Subdivision

LEGAL: A portion of the north half of T17S, R14W, Sec 22

DESCRIPTIVE LOCATION: Approximately 1 mile from the Silver City limits via Little Walnut Road, also known as FS506. Most lots average 1 acre. Bordered on the south by Tanglewood Circle, and on the North by Whispering Hills Rd

VEGETATION FUELS: Grasses, forbs, and scrub oak are intermixed with piñon-juniper

ESTIMATED DENSITY (population per square mile): 1,187 (Note this subdivision encompasses only 0.032 square mile)

NUMBER OF LOTS: 20 **TOTAL ACRES**: 20

CONSTRUCTION MATERIALS: Frame construction with wooden or stucco siding

ROOF: Predominantly metal with some composition shingle

TERRAIN: Steep **SLOPE**: 5%–45%

ASPECT: All aspects

ACCESS: Good; paved roads provide multiple routes of ingress and egress. The roads are narrow and steep in some places.

ROADS: The road condition is good

BRIDGES: No bridges

DRIVEWAYS: Various, mostly narrow, some are steep and long

WATER AVAILABILITY: Hydrants are available throughout this area

CLOSEST FIRE DEPARTMENT: Pinos Altos Station Two on Wagon Wheel Lane is located about 4 miles away.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 86 - High

GIS HAZARD/RISK RATING: High

COMMENTS: Structures in close proximity to wildland and each other make this an area especially prone to fire spread. Steep terrain contributes to the problem. In some areas, the multiple overhead power lines pose an additional hazard to firefighters.

Figure D.21. Google Earth imagery showing Copper Ridge subdivision. Note the population density in the community and the network of roads that may need to be navigated by emergency responders or during evacuation.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

PINOS ALTOS FIRE DISTRICT

Indian Hills Subdivision

LEGAL: A portion of T17S, R14W, Sec 22, 23, 27

DESCRIPTIVE LOCATION: Just north of the Silver City limits via Little Walnut Road, also known as FS506. It is bordered on the south by Kiva Place, on the north by Copper ridge Drive and Grandview Road, on the east by Swan Street, and on the west by Little Walnut Road.

VEGETATION FUELS: Grasses, forbs, and scrub oak are intermixed with piñon-juniper. Some arroyos have especially dense fuel loads

ESTIMATED DENSITY (population per square mile): 700

NUMBER OF LOTS: 457 **TOTAL ACRES**: 566

CONSTRUCTION MATERIALS: Frame construction with wooden or stucco siding.

ROOF: Predominantly metal with some composition shingle.

TERRAIN: Steep, with some north–south arroyos **SLOPE**: 5%–45%

ASPECT: All aspects

ACCESS: Generally good; paved roads provide multiple routes of ingress and egress. The roads are narrow and steep in some places.

ROADS: The road condition is good.

BRIDGES: No bridges. Many driveways pass over drainage culverts.

DRIVEWAYS: Various, mostly narrow, some are steep and long

WATER AVAILABILITY: Hydrants are available throughout this area.

CLOSEST FIRE DEPARTMENT: Silver City Station 2 about 3 miles away, and Pinos Altos Station Two on Wagon Wheel Lane is located about 5 miles away.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 87 - High

GIS HAZARD/RISK RATING: High

COMMENTS: Structures in close proximity to forested areas and each other make this area especially prone to fire spread. Steep terrain contributes to the problem. Some homes have good defensible space.

Figure D.22. Google Earth Imagery showing the Indian Hills subdivision. Note the clusters of homes with some limited separation.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

SANTA RITA FIRE DISTRICT

Hanover/Fierro / Santa Rita District

LEGAL: T17S, R12W, Sec 21; T165S, Sec 3, 4, 9, 10, 15, 16

DESCRIPTIVE LOCATION: Area around Junction NM 356 and north on Fierro Road, Highway 152 mile markers 2 to 14, includes federal, state, county, and private land.

VEGETATION FUELS: Japanese elm, piñon-juniper, scrub oak, brush, and grass; riparian along Hanover Creek and southwestern railroad tracks.

ESTIMATED DENSITY (population per square mile): Approx. 66, total approx. 263.

NUMBER OF LOTS: Approx. 105. **TOTAL ACRES**: Approx. 59,520 acres.

CONSTRUCTION MATERIALS: wood frame, adobe, and manufactured homes.

ROOF: Composition and metal. **SIDING**: Frame, some adobe. **DECKS**: Few of wood.

TERRAIN: Flat to steep slopes. **SLOPE**: 5% to over 100%. **ASPECT**: All

ACCESS: Paved state and county-maintained roads, unpaved and narrow access roads to home sites, many unnumbered.

ROADS: Paved and unpaved; three roads cross Hanover Creek becoming impassable with heavy monsoon rains.

BRIDGES: One well-constructed concrete bridge.

DRIVEWAYS: Narrow, unpaved, and mostly unmarked.

WATER AVAILABILITY: three fire hydrants plus 2.5-inch stand pipe located in Hanover.

CLOSEST FIRE DEPARTMENT AND APPARATUS: Hanover Station SRVFD. A Brush Truck with 300-gallon tank with CAFS. A water tender with 2,000 gallon tank. A Class A pumper with 1,000-gallon tank with CAFS. Three fire hydrants and several 2.5 stand pipes.

CVAR: working mines, infrastructure, historic structures, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 108 - High

GIS HAZARD/RISK RATING: Medium

COMMENTS: Fuel complexity, many abandoned shacks, sheds, and houses. Access is difficult off Fierro Road; heavily forested canyon sides.

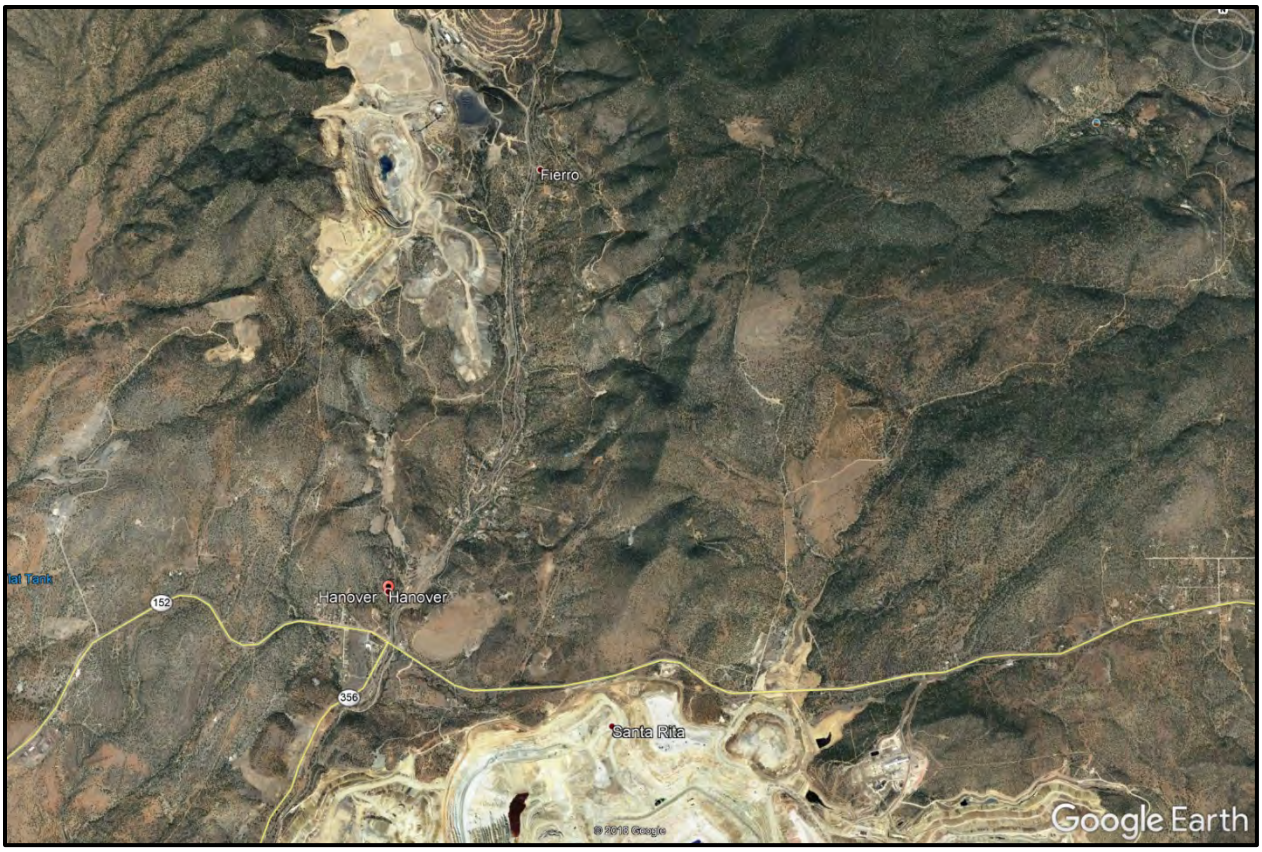

Figure D.23. Google Earth imagery showing the Hanover, Santa Rita, and Fierro areas. Note the steep grades and varying topography, particularly around Fierro.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

SANTA RITA FIRE DISTRICT

Viva Santa Rita Subdivision

LEGAL: T17S, R11W, Sec 19

DESCRIPTIVE LOCATION: Entrance on Muleshoe Road, mile marker 8.25 on Hwy 152; also Miners Legend Road, mile marker 9 on Hwy 152; most lots are 2.5 to 3 acres.

VEGETATION FUELS: Piñon-juniper, scrub oak, brush, and grass

ESTIMATED DENSITY (population per square mile): Approx. 105

NUMBER OF LOTS: Approx. 30

TOTAL ACRES: 67.5

CONSTRUCTION MATERIALS: 90% of houses are single or doublewide mobile homes.

ROOF: composition and metal. **SIDING**: frame metal. **DECKS**: wooden.

TERRAIN: gentle slope. **SLOPE**: 5%–20%. **ASPECT**: all slope positions.

ACCESS: two unpaved, county-maintained roads.

ROADS: unpaved with good street signs, although the numbers are hit and miss

BRIDGES: none

DRIVEWAYS: adequate, with a few too narrow and very rocky

WATER AVAILABILITY: 32,000 storage at station and FMI well off Georgetown Road approximately 3 miles from subdivision

CLOSEST FIRE DEPARTMENT AND APPARATUS: SRVFD Ivanhoe Station. A brush truck with 400-gallon tank and CAFS. A water tender with 2,000-gallon tank. A Class A pumper with 1,000-gallon tank and CAFS.

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 103 - High

GIS HAZARD/RISK RATING: Medium

COMMENTS: Wildland fire danger backs up to BLM land. Only 25% of houses have adequate defensible space.

Figure D.24. Google Earth imagery showing the location of the Viva Santa Rita subdivision, accessed from Mule Shoe Road or Miners Legend Road. Note that homes are located within a woodland mix, with vegetation in direct contact with some structures.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

SAPILLO FIRE DISTRICT

Gila Hot Springs and Gila Cliff Dwellings and Visitor Center

LEGAL: T12S, R13W, Sec 5

DESCRIPTIVE LOCATION: Approximately mile marker 37 on State Highway 15

VEGETATION FUELS: piñon–juniper and some ponderosa pine

ESTIMATED DENSITY (population per square mile): 80

NUMBER OF LOTS: 70

TOTAL ACRES: 200

CONSTRUCTION MATERIALS: mostly wood frame with some log and adobe construction

ROOF: composition shingle, some metal

TERRAIN: stream bottom to steep rough hills

SLOPE: flat to 30% or greater

ASPECT: mostly east and west

ACCESS: State Highway 15

ROADS: dirt roads in poor shape; narrow, steep, and rough

BRIDGES: none, except on State Highway 15

DRIVEWAYS: short; fair shape

WATER AVAILABILITY: The Gila River flows through the area and is used for water supply.

CLOSEST FIRE DEPARTMENT: Sapillo is 15 road miles away over a steep mountain highway

CVAR: Hot springs, commercial business, Gila Cliff Dwellings, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 101 - High.

GIS HAZARD/RISK RATING: Medium

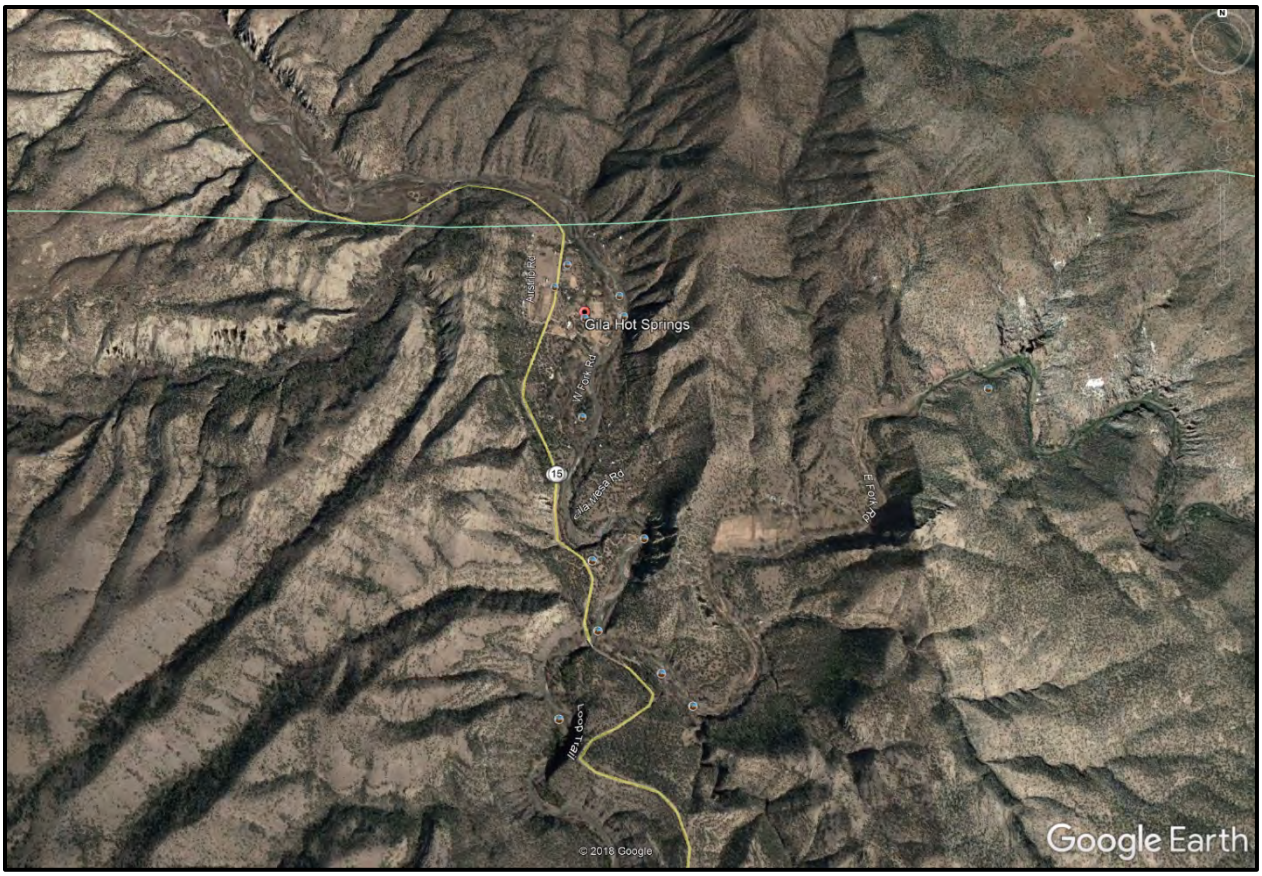

Figure D.25. Google Earth imagery of Gila Hot Springs. Note the highly variable topography that may influence fire behavior. The community and facilities are very remote and a long distance from available emergency response.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

SAPILLO FIRE DISTRICT

Lake Roberts

LEGAL: T15S, R13W, Sec 3

DESCRIPTIVE LOCATION: State Highway 35 at the west end of Lake Roberts

VEGETATION FUELS: piñon–juniper and some ponderosa pine

ESTIMATED DENSITY (population per square mile): 130

NUMBER OF LOTS: 62, including those along Highway 35 to the east end of Trout Valley.

TOTAL ACRES: 80

CONSTRUCTION MATERIALS: mostly wood frame

ROOF: various; mostly composition shingle

TERRAIN: stream bottom to steep rough hills

SLOPE: flat to 45%

ASPECT: Mostly north

ACCESS: State Highway 35

ROADS: dirt and gravel roads in fair shape; mostly marked and numbered

BRIDGES: Two, are sturdy enough to carry local eight-ton water tender

DRIVEWAYS: short, narrow

WATER AVAILABILITY: Sapillo Creek runs through Lake Roberts, 42,000 gallons in tanks at fire station 0.2 mile away, and dry hydrant at Lake Roberts 3 miles away. The Lake Roberts Neighborhood Water Association has a 14,000-gallon water tank and two wells. It also maintains, in coordination with the Sapillo Creek VFD, a 3,000-gallon water tank for fire-fighting purposes on Association property on Forest Drive

CLOSEST FIRE DEPARTMENT: Sapillo is at this location.

CVAR: local businesses (general store/cabins, motel), fire station, public wells and pump houses, local telephone company (WNMC) building, the lake and Sapillo Creek (post-fire sediment concerns).

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 95 - High

GIS HAZARD/RISK RATING: High

Figure D.26. Google Earth imagery showing Lake Roberts and surrounding homes. Note some homes have minimal defensible space between the structure and wildlands.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

SAPILLO FIRE DISTRICT

Lake Roberts Heights east to Ponderosa and GOS communities

LEGAL: T15S, R13W, Sec 1

DESCRIPTIVE LOCATION: State Highway 35 approximately 0.5 mile east of the upper end of Lake Roberts

VEGETATION FUELS: piñon-juniper and some ponderosa pine

ESTIMATED DENSITY (population per square mile): 50

NUMBER OF LOTS: 45

TOTAL ACRES: 80

CONSTRUCTION MATERIALS: mostly wood frame

ROOF: composition shingle; a couple of metal

TERRAIN: stream bottom to steep rough hills

SLOPE: flat to 20%

ASPECT: mostly north

ACCESS: State Highway 35

ROADS: dirt roads in poor shape, poorly marked

BRIDGES: none

DRIVEWAYS: short, narrow

WATER AVAILABILITY: 0.5 mile to dry hydrant on Lake Roberts

CLOSEST FIRE DEPARTMENT: Sapillo is 2 road miles away.

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 96 - High

GIS HAZARD/RISK RATING: High

Figure D.27. Google Earth imagery showing Lake Roberts Heights homes located in the river bottom and surrounding hillside. Note the thick fuels on the hillside adjacent to homes.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

SAPILLO FIRE DISTRICT

Trout Valley

LEGAL: T14S, R13W, Sec 33

DESCRIPTIVE LOCATION: 1.5 miles west of Lake Roberts on Hwy 35

VEGETATION FUELS: piñon-juniper and ponderosa pine

ESTIMATED DENSITY (population per square mile): 45

NUMBER OF LOTS: 38, including lots west to Highway 15 and along Highway 35.

TOTAL ACRES: 60

CONSTRUCTION MATERIALS: wood frame with some log construction

ROOF: composition shingle, some metal and at least one wood shake

TERRAIN: stream bottom to steep rough hills

SLOPE: flat to 30% or greater

ASPECT: mostly south

ACCESS: State Highway 35

ROADS: dirt roads in fair shape; most signs are present

BRIDGES: none

DRIVEWAYS: short but narrow, some numbers missing

WATER AVAILABILITY: Sapillo Creek runs through Trout Valley. In addition 42,000 gallons in tanks at fire station 1.5 miles away and dry hydrant at Lake Roberts 3 miles away. Neighborhood water association water is also available.

CLOSEST FIRE DEPARTMENT: Sapillo is 1.5 road miles away.

CVAR: Communication infrastructure, emergency infrastructure.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 96 - High

GIS HAZARD/RISK RATING: High

Figure D.28. Google Earth imagery showing the Trout Valley area. Note the very varied topography in the area that may influence fire behavior. Many homes have very minimal defensible space.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

UPPER MIMBRES FIRE DISTRICT

Paradise Acres No. I

LEGAL: SW¼, Sec 10, T17S, R11W

DESCRIPTION LOCATION: west on Highway 35, mile marker 3.5-4

VEGETATION FUELS: Scrub oak, grass, piñon-juniper, borders forest on the west side

ESTIMATED DENSITY (population per square mile): 70

NUMBER OF LOTS: 100

TOTAL ACRES: 160

CONSTRUCTION MATERIALS: frame and mobile homes

ROOF: composition, metal **SIDING**: wood panel, metal and stucco

TERRAIN: gentle to very steep **SLOPE**: 5%–50%

ASPECT: most slope positions

ACCESS: access is a major problem on rough and steep roads, narrow driveways

ROADS: unpaved, narrow, and some addresses missing

BRIDGES: none

DRIVEWAYS: narrow gates; thick with brush on both sides of road

WATER AVAILABILITY: Main station has a 2,000-gallon overhead drop tank; Casas Adobes subdivision has a 10,000-gallon overhead drop tank, and T-Bird station has 10,000-gallon overhead drop tank. Both stations hope to have 40,000-gallon tanks available by early 2021.

CLOSEST FIRE DEPARTMENT: Upper Mimbres Volunteer Fire/Rescue

CVAR: RV park, commercial business, communication infrastructure, emergency infrastructure.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 104 – High

GIS HAZARD/RISK RATING: High

COMMENTS: access, water, fuel complexity, increasing population

Figure D.29. Google Earth imagery showing the location of the Paradise Acres subdivision. Note the access via Highway 35 but the many spur roads and long driveways to access homes.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

UPPER MIMBRES FIRE DISTRICT

Paradise Acres No. II

LEGAL: SE¼ Sec 10, T17S, R11W

DESCRIPTIVE LOCATION: west off Highway 35, mile markers 4 to 4.5

VEGETATION FUELS: Scrub oak, grass, piñon-juniper

ESTIMATED DENSITY (population per square mile): 90

NUMBER OF LOTS: 82

TOTAL ACRES: 150

CONSTRUCTION MATERIALS: frame, mobile homes

ROOF: composition, metal **SIDING**: wood panel, metal, and stucco

TERRAIN: flat to gently sloping **SLOPE**: 0%–10% **ASPECT**: mostly level

ACCESS: access is very good

ROADS: unpaved, narrow, some addresses missing

BRIDGES: none

DRIVEWAYS: narrow gates; thick brush

WATER AVAILABILITY: Main station has a 2,000-gallon overhead drop tank; Casas Adobes subdivision has a 10,000-gallon overhead drop tank, and T-Bird station has 10,000-gallon overhead drop tank

CLOSEST FIRE DEPARTMENT: Upper Mimbres Volunteer Fire/Rescue

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 104 - High

GIS HAZARD/RISK RATING: High

COMMENTS: access, water, fuel, complexity, increasing population

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITY

UPPER MIMBRES FIRE DISTRICT

River Glen Subdivision

LEGAL: SE¼ Section 31, T15S, R11W

DESCRIPTIVE LOCATION: Highway 35, mile markers 12 to 13

VEGETATION FUELS: piñon-juniper, pine, tall grass, and brush

ESTIMATED DENSITY (population per square mile): 60

NUMBER OF LOTS: 22

TOTAL ACRES: 76

CONSTRUCTION MATERIALS: frame, log, mobile homes

ROOF: composition, metal **SIDING**: wood panel, log and stucco

TERRAIN: from gentle slopes to steep inclines

SLOPE: 0%–20% **ASPECT**: most slope positions **ACCESS**: access is poor

ROADS: unpaved, narrow; fire response time can be 25 minutes

BRIDGES: none--do have river crossings

DRIVEWAYS: narrow gates, some with large trees on either side

WATER AVAILABILITY: Main station has a 2,000-gallon overhead drop tank, 3 Circle Tank has 20,000 gallons that we can be drafted and/or gravity filled, and T-Bird station has a 10,000-overhead drop tank. Both stations hope to have 40,000-gallon tanks available by early 2021.

CLOSEST FIRE DEPARTMENT: Upper Mimbres Volunteer Fire/Rescue

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 90 - High

GIS HAZARD/RISK RATING: Medium

COMMENTS: access, water, fuel density, and increasing population

Figure D.30. Google Earth imagery showing the River Glen subdivision area along Highway 35. Note many homes have insufficient defensible space between structures and fuels.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

WHISKEY CREEK FIRE DISTRICT

East Peterson/West Racetrack

LEGAL: T17S, R13W, Sec 31, 32; T18S, R13W, Sec 5, 6, 7, 8, 17, 18

DESCRIPTIVE LOCATION: east of Peterson, west of Racetrack, south of Hwy 180 East

VEGETATION FUELS: piñon-juniper, scrub oak, bear grass, sparse grass, and sparse brush

ESTIMATED DENSITY (population per square mile): 8 square miles; 154 per square mile

NUMBER OF LOTS: 308 **TOTAL ACRES**: 1,200

CONSTRUCTION MATERIALS: frame, brick **ROOF**: composition, metal

SIDING: stucco, log, wood panels, metals

DECKS: wooden, some on stilts, concrete

TERRAIN: from flat to steep sloping **SLOPE**: 5%–50% **ASPECT**: all slope positions

ACCESS: main access road good; driveways and county roads rough and difficult in adverse weather; some roads may be flooded; lots of tight places and turnarounds limited

ROADS: missing street signs; unmarked roads; numerous mailboxes; main road paved; unpaved and washed out roads; some roads and driveways through creek beds

BRIDGES: only on some driveways, questionable for emergency vehicles to cross

DRIVEWAYS: paved, washed-out, dirt, narrow, winding, through creek beds, very rough

WATER AVAILABILITY: Acorn and Loma Verde, Flury Lane and Morales, Flury Lane and Racetrack, Peterson and Hood, Peterson and Hwy 180 East, Hwy 180 East at Glad Tidings Church, Kirkland and Hwy 180 East, Kirkland and Sunset, Kirkland and Loma Verde, Across from # 25 Kirkland, behind Whiskey Creek Fire Station on Kirkland

CLOSEST FIRE DEPARTMENT: Whiskey Creek Volunteer Fire Dept.

CVAR: commercial businesses, churches, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 91 - High

GIS HAZARD/RISK RATING: Medium

COMMENTS: increasing population; good owner-management

Figure D.31. Google Earth imagery showing the area between Peterson Drive and Racetrack Road. Note the high population density and grid of roads.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

WHISKEY CREEK FIRE DISTRICT

East Racetrack/Santa Clara

LEGAL: T17S, R13W, Sec 32, 33, 34; T18S, R13W, Sec 2, 3, 4, 9, 10, 11, 13, 14, 15, 16, 21, 22, 23

DESCRIPTIVE LOCATION: east of Racetrack, west of Santa Clara city limits, south of Hwy 180 East

VEGETATION FUELS: piñon-juniper, scrub oak, bear grass, brush

ESTIMATED DENSITY (population per square mile): 16 square miles, 64 per square mile

NUMBER OF LOTS: 256 **TOTAL ACRES**: 1,200

CONSTRUCTION MATERIALS: frame, brick **ROOF**: composition, metal

SIDING: stucco, log, wood panels, metals **DECKS**: wooden, some on stilts, concrete

TERRAIN: from flat to steep sloping **SLOPE**: 5%–50%

ASPECT: all slope positions

ACCESS: main access road good; driveways and county roads rough and difficult in adverse weather; some roads may be flooded; lots of tight places and turnarounds limited

ROADS: missing street signs; unmarked roads; numerous mailboxes; main road paved; unpaved and washed out roads; some roads and driveways through creek beds

BRIDGES: only on some driveways; questionable for emergency vehicles to cross

DRIVEWAYS: paved, washed out, dirt, narrow, winding, through creek beds, very rough

WATER AVAILABILITY: After # 31 Racetrack Rd, #'s 11 & 37 & 43 & 379 Racetrack Rd, Hermana St and Twin Sisters, on south side of Hwy 180 East, Yucca Valley Drive and Hwy 180 East, Rio De Arenas at B, D, F, H St's, Flury and Racetrack, on Racetrack by Humphrey's Enterprise, James and New St, Yucca Valley Drive across from the VFW

CLOSEST FIRE DEPARTMENT: Whiskey Creek VFD and Santa Clara Fire

CVAR: commercial business, churches, school, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 90 - High

GIS HAZARD/RISK RATING: High

COMMENTS: increasing population; good owner-management

Figure D.32. Google Earth imagery showing the areas from Racetrack Road to Santa Clara. Notice the large open space area west of the community of Santa Clara. Prevailing winds may result in fire spread from the southwest.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

WHISKEY CREEK FIRE DISTRICT

Old Arenas Valley Road

LEGAL: T17S, R13W, Sec 16, 17, 20, 21, 28, 29, 32, 33

DESCRIPTIVE LOCATION: east of Casa Loma, west of Santa Clara City limits, north of Hwy 180 East

VEGETATION FUELS: piñon-juniper, scrub oak, bear grass, sparse grass, and sparse brush

ESTIMATED DENSITY (population per square mile): 8 square miles; population 94 per square mile

NUMBER OF LOTS: 188

TOTAL ACRES: 500

CONSTRUCTION MATERIALS: frame, brick **ROOF**: composition, metal

SIDING: stucco, log, wood panels, metals **DECKS**: wooden, some on stilts, concrete

TERRAIN: from flat to steep sloping **SLOPE**: 5%–50% **ASPECT**: all slope positions

ACCESS: main access road good; driveways and county roads rough and difficult in adverse weather; some roads may be flooded; lots of tight places and turnarounds limited

ROADS: missing street signs; unmarked roads; numerous mailboxes; main road paved; unpaved and washed out roads; some roads and driveways through creek beds

BRIDGES: only on some driveways; questionable for emergency vehicles to cross

DRIVEWAYS: paved, washed out, dirt, narrow, winding, through creek beds, very rough

WATER AVAILABILITY: Hwy 180 East and Old Arenas Valley Rd on Frontage Rd at west entrance, #133 & #200 Old Arenas Valley Rd, Elias Rd and Old Arenas Valley Rd, Old Arenas Valley Rd at east entrance, Monte St and Hwy 180 East

CLOSEST FIRE DEPARTMENT: Whiskey Creek VFD

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 78 - High

GIS HAZARD/RISK RATING: Medium

COMMENTS: increasing population; good owner-management

Figure D.33. Google Earth imagery showing the Old Arenas Valley Road area. Note the light fuels in the vicinity of the community.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

WHISKEY CREEK FIRE DISTRICT

Rosedale/West Peterson

LEGAL: T17S, R14W, Sec 36; T18S, R14W, Sec 1, 12, 13, 24; T17S, R13W, Sec 31; T18S, R13W, Sec 6, 7, 18

DESCRIPTIVE LOCATION: south of Hwy 180 East, east of Mountain View Rd., west of Peterson Rd, also known as Maude's Canyon. Most lots are 5, 10, and 15 acres.

VEGETATION FUELS: piñon-juniper, scrub oak, bear grass, sparse grass, and sparse brush

ESTIMATED DENSITY (population per square mile): 9 square miles; 137 per square mile

NUMBER OF LOTS: 308

TOTAL ACRES: 1,200

CONSTRUCTION MATERIALS: frame, brick

ROOF: composition, metal

SIDING: stucco, log, wood panels, metals

DECKS: wooden, some on stilts, concrete

TERRAIN: from flat to steep sloping

SLOPE: 5%–50%

ASPECT: all slope positions

ACCESS: main access road good; driveways and county roads rough and difficult in adverse weather; some roads may be flooded; lots of tight places and turnarounds limited

ROADS: missing street signs; unmarked roads; numerous mailboxes; main road paved; unpaved and washed out roads; some roads and driveways through creek beds

BRIDGES: only on some driveways; questionable for emergency vehicles to cross

DRIVEWAYS: paved, washed out, dirt, narrow, winding, through creek beds, very rough

WATER AVAILABILITY: Hydrant corner of Mahogany and Rosedale Rd, Hydrant corner of Piñon Lane and Shasta, Hydrant at Whiskey Creek VFD on Rosedale, Albertsons parking lot, #11 Shasta, Indian Hills Baptist Church, Peterson Rd and Hwy 180 East, Peterson and Hood, Peterson and Pike, Hwy 180 East at the Holiday Inn

CLOSEST FIRE DEPARTMENT: Whiskey Creek VFD; Silver City Fire Dept.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 79 - High

GIS HAZARD/RISK RATING: High

COMMENTS: increasing population; good owner-management

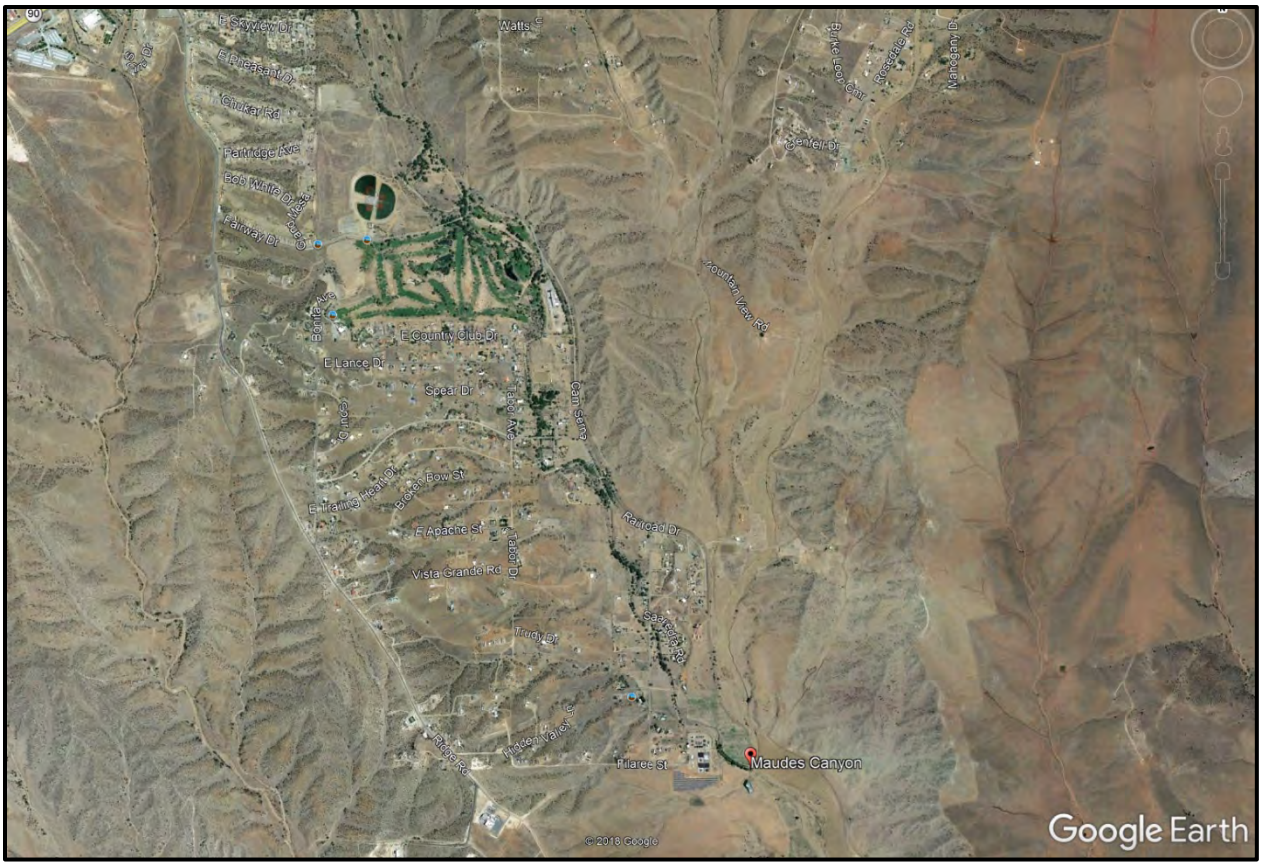

Figure D.34. Google Earth imagery showing the Maude Canyon Area south of Silver City. Note the complicated road network in the area.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

WHISKEY CREEK FIRE DISTRICT

Sunrise Estates

LEGAL: T17S, R13W, Sec 31; T17S, R14W, Sec 36

DESCRIPTIVE LOCATION: north of Hwy 180 east, east of 32 Bypass Rd, west of Casa Loma Rd.

VEGETATION FUELS: piñon-juniper, scrub oak, bear grass, sparse grass, and sparse brush

ESTIMATED DENSITY (population per square mile): 2 square miles; population 282 per square mile

NUMBER OF LOTS: 141

TOTAL ACRES: 300

CONSTRUCTION MATERIALS: frame, brick

ROOF: composition, metal

SIDING: stucco, log, wood panels, metals

DECKS: wooden, some on stilts, concrete

TERRAIN: from flat to steep sloping

SLOPE: 5%–50%

ASPECT: all slope positions

ACCESS: main access roads good, difficult in adverse weather; lots of tight places and turnarounds limited

ROADS: missing street signs; unmarked roads; numerous mailboxes; main road paved; most roads are paved

BRIDGES: no known bridges

DRIVEWAYS: most driveways are in good condition, some are very tight; questionable emergency capable

WATER AVAILABILITY: behind Baca's Funeral Home, corner of Sycamore and Delk one on right and one on left, across from 2100 Delk, corner Delk and Johnson, Fir and Johnson, Johnson and Pinon St., Johnson and Ponderosa, Pinon St. and Ponderosa, 2312 Johnson, 2305 Johnson, 2213 Pinon St., two at end of Johnson

CLOSEST FIRE DEPARTMENT: Whiskey Creek VFD

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 72 - High

GIS HAZARD/RISK RATING: Medium

COMMENTS: increasing population; good owner-management

Figure D.35. Google Earth imagery of the Sunrise Estates subdivision.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Oakwood Estates and Oakwood Estates #2

LEGAL: Portions of T18S, R14W, Section 4.

DESCRIPTIVE LOCATION: Communities bordering forest lands WNMU property off Highway 180, mile markers 110 and 111.

VEGETATION FUELS: Grassland, bear grass, oak brush, and piñon-juniper.

ESTIMATED DENSITY (population per square mile): 70 people/square mile.

NUMBER OF LOTS: 83.

TOTAL ACRES: 320 acres.

CONSTRUCTION MATERIALS: Mixture of site built and manufactured and mobile homes using various building materials.

TERRAIN: Flat valley surrounded by hills.

SLOPE: Generally <15%; localized slopes ~30%.

ASPECT: Southwest and south.

ACCESS: Off U.S. Highway 180, with county streets and private driveways.

ROADS: Paved, gravel and dirt; good to fair condition.

BRIDGES: N/A.

DRIVEWAYS: Paved, gravel and dirt; good to fair condition.

WATER AVAILABILITY: Fire hydrants TOSC water system; TVFD Station 5 #8 Truck Bypass Road, 1,800-gallon water tender and hydrant.

CLOSEST FIRE DEPARTMENT: TVFD Station 5 (3 miles away), SCFD (4 miles). TVFD Station 1 (8 miles).

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 70 - High

GIS HAZARD/RISK RATING: High

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Chisholm Ranch Subdivision

LEGAL: T20S, R15W

DESCRIPTIVE LOCATION: Approximately 16 miles south of Silver City on Highway 90 south

VEGETATION FUELS: Scrub oak, piñon-juniper, bear grass, and regular grasslands

ESTIMATED DENSITY (population per square mile): 70

NUMBER OF LOTS: 63 – Note – this will vary as some people own more than the minimum 5 acres

TOTAL ACRES: 300

CONSTRUCTION MATERIALS: Wood frame and brick.

ROOF: Metal and composition shingle.

TERRAIN: Rolling hills. **SLOPE**: less than 10%. **ASPECT**: East–west.

ACCESS: Highway 90 South.

ROADS: Dirt and in good condition; most should be county maintained.

BRIDGES: None except those on Highway 90 South.

DRIVEWAYS: Variable.

WATER AVAILABILITY: 38,000-gallon storage tanks. 2,000-gallon water tender at TVFR Station 2 at 64 Cullum Road. Fire hydrant at FMI Tyrone Mine.

CLOSEST FIRE DEPARTMENT: TVFR Station 2 - generally less than 1 mile away. TVFR Station 6 (13 miles), TVFR Station 1 (16 miles).

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 71 - High

GIS HAZARD/RISK RATING: High

Figure D.36. Google Earth imagery showing the Chisholm Ranch subdivision. Note the many spur roads and long driveways.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Loma Blanca and Loma Blanca 2 Subdivision

LEGAL: T20S, R14W, Sec 19, 20

DESCRIPTIVE LOCATION: Approximately 18 miles south of Silver City on Highway 90 South.

VEGETATION FUELS: Scrub oak, bear grass and regular grasslands

ESTIMATED DENSITY (population per square mile): 70

NUMBER OF LOTS: 41 – Note – this will vary as many people have purchased 20 or more acres and will sell off some of the property later. Minimum lot size is 5 acres.

TOTAL ACRES: 400

CONSTRUCTION MATERIALS: Wood frame and brick.

ROOF: Metal and composition shingle.

TERRAIN: Rolling hills. **SLOPE**: less than 10%. **ASPECT**: East–west.

ACCESS: Highway 90 South.

ROADS: Dirt and in good condition; county maintained.

BRIDGES: None except those on Highway 90 South.

DRIVEWAYS: Variable.

WATER AVAILABILITY: 38,000-gallon storage tanks. 2,000-gallon water tender at TVFR Station 2, at 64 Cullum Road. Fire hydrant at FMI Tyrone Mine.

CLOSEST FIRE DEPARTMENT: TVFR Station 2 - generally less than 1 mile away. TVFR Station 6 (13 miles), TVFR Station 1 (16 miles).

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 64 - Medium

GIS HAZARD/RISK RATING: Medium

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Cullum Estates Subdivision

LEGAL: T20S, R14W, Sec 19, 20

DESCRIPTIVE LOCATION: Approximately 14 miles south of Silver City on Highway 90 south

VEGETATION FUELS: mainly scrub oak and bear grass along with regular grasslands

ESTIMATED DENSITY (population per square mile): 70

NUMBER OF LOTS: 30; Note – This will vary as many people have purchased 20 or more acres and will sell off some of the property later. Minimum lot size is 5 acres.

TOTAL ACRES: 400

CONSTRUCTION MATERIALS: wood frame and brick

ROOF: metal and composition shingle

TERRAIN: rolling hills **SLOPE**: 10% maximum **ASPECT**: east–west

ACCESS: Highway 90 South

ROADS: dirt and in good condition; county maintained

BRIDGES: none other than on Highway 90 South

DRIVEWAYS: various

WATER AVAILABILITY: 3,500-gallon water tower (with well) and 2,000-gallon tender at White Signal station; water is also available from a hydrant at the Tyrone mine that is supplied by a 30,000-gallon storage tank.

CLOSEST FIRE DEPARTMENT: Tyrone Fire – White Signal Station on Cullum Road within the subdivision

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 66 - Medium

GIS HAZARD/RISK RATING: Medium

Figure D.37. Google Earth imagery showing the Cullum Estates subdivision. Note the low population density and sparse fuels.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Flying A Subdivision

LEGAL: T18S, R16W, Sec 35

DESCRIPTIVE LOCATION: about 4 miles south of Mangus Road on Red Rock Road; Mangus may be accessed from either Highway 180 West or Highway 90 South

VEGETATION FUELS: piñon-juniper, scrub oak, bear grass, and normal grasslands; some ponderosa pine on the south end of the subdivision

ESTIMATED DENSITY (population per square mile): 70

NUMBER OF LOTS: 30

TOTAL ACRES: 300; Note – this will vary as some own more than the minimum 5 acres.

CONSTRUCTION MATERIALS: wood frame and brick

ROOF: metal and composition shingle

TERRAIN: mostly rolling hills; there is one large and steep canyon on the west side of the subdivision

SLOPE: generally less than 10% **ASPECT**: north–south

ACCESS: via Mangus Road and then Red Rock Road

ROADS: Mangus is partially paved on the west and east ends. Red Rock Road is in the process of being paved via a government grant and is largely dirt but county maintained. The roads in the subdivision are dirt but county maintained.

BRIDGES: none

DRIVEWAYS: variable

WATER AVAILABILITY: 8,000-gallon water tank (with well) at the Tyrone Flying A substation; the 1,800-gallon water tender from White Signal is automatically dispatched to this area; the 1,800-gallon water tender from Wind Canyon can also be dispatched; additional is available from a well owned by FMI on Mangus Road.

CLOSEST FIRE DEPARTMENT: Tyrone Flying A Substation; most residents have defensible space

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 82 - High

GIS HAZARD/RISK RATING: High

Figure D.28. Google Earth imagery showing the Flying A subdivision accessed via Red Rock Road. Notice the remote location of the community and varied topography in the vicinity.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Tyrone Town Site

LEGAL: T18S, R14W, Sec 28, 29

DESCRIPTIVE LOCATION: Approximately 5 miles south of Silver City on Hwy 90 South

VEGETATION FUELS: mainly scrub oak and bear grass along with regular grasslands; fuel break around 85% of the parameter of the community

ESTIMATED DENSITY (population per square mile): 1,050

NUMBER OF LOTS: 325, 321 homes

TOTAL ACRES: 200

CONSTRUCTION MATERIALS: 90% of the homes are of brick construction; the remainder are wood frame with brick facing.

ROOF: Composition shingle with some metal roofs.

TERRAIN: Rolling hills. **SLOPE**: 10% maximum. **ASPECT**: East–west.

ACCESS: Highway 90 South.

ROADS: Paved and county maintained

BRIDGES: Two on Highway 90 South at the entrances to the town site; 3 within the subdivision

DRIVEWAYS: Concrete and no more than 20 feet long

WATER AVAILABILITY: Fire hydrants every 400 feet (often they are closer), supplied by a 200,000-gallon water storage tank.

CLOSEST FIRE DEPARTMENT: Tyrone VFR- Station 1 is within the community. TVFR station 5 (5 miles). Silver City FD (7 miles).

CVAR: commercial business, mine, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 59 - Medium

GIS HAZARD/RISK RATING: Medium

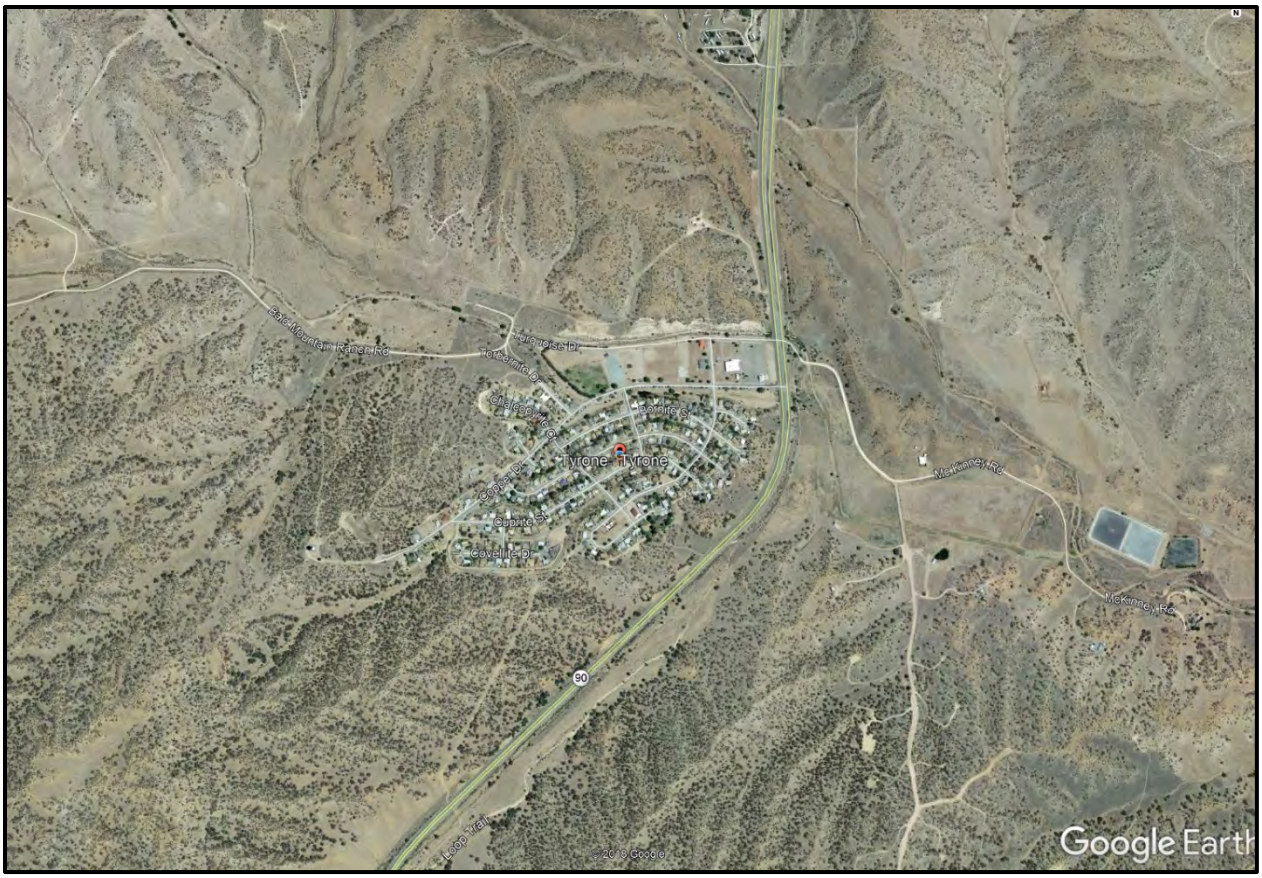

Figure D.39. Google Earth imagery of the Tyrone town site. Note the sparse vegetation surrounding the community and the compact configuration of the town.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Silver Acres, Quail Ridge, Ridge Road Mobile Park

LEGAL: T18S, R14W, Sec 10,15, 22, 23.

DESCRIPTIVE LOCATION: Approximately 1 mile south of Silver City on Hwy 90 South.

VEGETATION FUELS: Mainly native grasses, bear grass, and yuccas along with scattered pockets of scrub oak and larger cottonwoods along San Vicente Creek.

ESTIMATED DENSITY (population per square mile): 1,050.

NUMBER OF LOTS: 203.

TOTAL ACRES: 300–400.

CONSTRUCTION MATERIALS: Homes are of brick, wood construction, some stucco, wood frame. Some manufactured and mobile homes.

ROOF: Composition shingle with some metal roofs.

TERRAIN: Rolling hills. **SLOPE**: 10%–20% maximum. **ASPECT**: West–east.

ACCESS: Highway 90 South to Ridge Road.

ROADS: Paved and dirt, county maintained.

BRIDGES: 1 bridge, 2 slab high water crossings.

DRIVEWAYS: Concrete, asphalt and dirt.

WATER AVAILABILITY: Fire hydrants in most areas or close by, they are on TOSC water system, many are lower flow rates.

CLOSEST FIRE DEPARTMENT: TVFR Station 1 and 5: (3–5 miles), SCFD (3–5 miles).

CVAR: Communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 59 - Medium

GIS HAZARD/RISK RATING: Medium

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Truck Bypass Road Communities including American and Peaceful Valley Mobile Home Parks

LEGAL: portions of T18S, R14W, Sec 8, 9, 10

DESCRIPTIVE LOCATION: communities bordering north and south of Truck Bypass Road, about 1–2 miles southwest of Silver City; bordered by Boston Hill (Silver City); open space to the northeast

VEGETATION FUELS: Grassland, bear grass, sotol, oak brush, and piñon-juniper

ESTIMATED DENSITY (population per square mile): ~720 persons/square mile

NUMBER OF LOTS: 118

TOTAL ACRES: ~320 acres

CONSTRUCTION MATERIALS: Mixture of site built, manufactured, and mobile homes using various building materials

TERRAIN: Gentle rolling hills on the southwest flank of Boston Hill

SLOPE: Generally <15%; localized slopes to ~30% **ASPECT**: southwest to south

ACCESS: Off U.S. Hwy 180 and US Hwy 90 via Truck Bypass and Western Drive and private driveways; off Truck Bypass Road via Western Drive, Faith, Lomita, and private driveways

ROADS: Paved, gravel, and dirt; good to fair condition

BRIDGES: N/A

DRIVEWAYS: Paved, gravel, and dirt; good to fair condition

WATER AVAILABILITY: 5 hydrants along Truck Bypass and Western Drive; TVFD Wind Canyon Station #8 Truck Bypass Road 1,800-gal water tender: TVFD White Signal Station 2,000-gal water tender, 14 miles distant; TVFD Flying A Station 1,800-gal water tender 20+ miles away

CLOSEST FIRE DEPARTMENT: TVFD Wind Canyon Station, # 8 Truck Bypass Road

CVAR: Commercial business, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: Medium

GIS HAZARD/RISK RATING: Medium

COMMENTS: H&S Feed Store and Calvary Baptist Church are near the intersection of Truck Bypass Road and Hwy 90.

Figure D.40. Google Earth imagery showing the Truck Bypass and Boston Hill Open Space area. Note the sparse fuels but potential topographic influence on fire behavior.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Mangus Vista: Mangus Terrace/Bellwood Mobile Home Park – Gensen Mobile Home Park

LEGAL: portion of T18S, R16W, Sec 1

DESCRIPTIVE LOCATION: South of U.S Hwy 180 just west of mile marker 102; bordered on the east and south by state lands; USFSlands are nearby to the southwest.

VEGETATION FUELS: Grassland, bear grass, sotol, and scrub oak.

ESTIMATED DENSITY (population per square mile): ~800 persons/square mile.

NUMBER OF LOTS: 28

TOTAL ACRES: 76 acres.

CONSTRUCTION MATERIALS: Mixture of site built, manufactured housing, and mobile homes.

ROOF: Metal and composition. **SIDING**: Stucco and plywood.

DECKS/FENCING: Few decks, most non-combustible; some wood fencing materials close to houses.

TERRAIN: Gentle rolling hills.

SLOPE: Flat. **ASPECT**: Flat.

ACCESS: South from U.S. Hwy 180 via Coloradas, U-T and driveways.

ROADS: Dirt in fair condition.

BRIDGES: N/A

DRIVEWAYS: Dirt in fair condition; some narrow.

WATER AVAILABILITY: 1,800-gal water tender from TVFR Station 3 (9.8 mi); 1,800-gal water tender from TVFR station 5 (approx. 11 mi); fire hydrant 11 miles on Highway 180 and Truck Bypass Road; additional water is available from a well owned by FMI on Mangus Road (approx. 10 miles); unknown local sources.

CLOSEST FIRE DEPARTMENT: TVFR Station 3 (9.8 mi) and TVFR Station 5 (11 mi); TVFR Station 1 (13.3 mi).

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 73 - High

GIS HAZARD/RISK RATING: Medium

COMMENTS: Underground utilities; many sheds, abandoned vehicles, and junk piles; propane tanks close to residences.

Figure D.41. Google Earth imagery of the Manus Terrace/Bellwood Mobile Home Park. Note the sparse fuels surrounding the community and the access via Highway 180.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Wind Canyon II and Wind Canyon Estates

LEGAL: T18S, R14W, T17S, R15W, T18S, R15W.

DESCRIPTIVE LOCATION: North of U.S. Hwy 180 between mile markers 107 and 110; the subdivision area is bordered on the north by the USFS land and on the west and southwest by state land.

VEGETATION FUELS: Grassland, bear grass, oak brush, and piñon/juniper

ESTIMATED DENSITY (population per square mile): 40 persons/square mile

NUMBER OF LOTS: 70

TOTAL ACRES: 3,260

CONSTRUCTION MATERIALS:

STRUCTURE: mostly frame **ROOF**: mostly metal or tile

SIDING: mostly stucco **DECKS**: concrete slab, some wood or Trex

TERRAIN: From moderate to steep slopes with canyons and ridges oriented north-northeast on the southwest flank of the Silver City Range; most houses are located on ridges.

SLOPE: Overall slope varies from 6% in the southwest to 16% in the north; many localized slopes exceed 30%.

ASPECT: Overall southwest to south

ACCESS: Access is primarily from U.S. Hwy 180 to the north via Fleming Tank Road (dead end), Wind Canyon Road, Rogers Road (dead end), and Camino de Viento.

ROADS: Subdivision roads are gravel or dirt and in fair to good condition; width is generally 28 feet with periodic turnarounds.

BRIDGES: N/A

DRIVEWAYS: Generally gravel or dirt; a few are paved with asphalt, 12 feet wide; many exceed 300 feet in length and/or are steeper than 12%; some driveways lack adequate turnarounds.

WATER AVAILABILITY: Hydrant at # 8 Truck Bypass Road near Hwy 180, 0.6 mile from southeast corner of subdivision; many properties have aboveground or belowground cisterns with capacities varying from 1,200 to 5,000 gal.

CLOSEST FIRE DEPARTMENT: TVFR Station 5 (0.6 mile), TVFR Station 1 and Silver City Fire Department are both 7–8 miles from the subdivision.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 81 - High

GIS HAZARD/RISK RATING: High

COMMENTS: Firewise adapted community. Defensive space has been created for many of the properties.

Figure D.42. Google Earth imagery showing the Wind Canyon subdivision. Note the steep grades and scattered homes.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Hachita Town Site

LEGAL: T27S, R15W, Sec 36

DESCRIPTIVE LOCATION: Approximately 45 miles southeast of Lordsburg, New Mexico, via Interstate 10 and State Hwy 146. At the junction of State Hwy 9, State Hwy 146, and State Hwy 81.

VEGETATION FUELS: Chihuahuan desert scrub and Chihuahuan desert grassland

ESTIMATED DENSITY (population per square mile): Less than 100.

NUMBER OF LOTS: 31

TOTAL ACRES:

CONSTRUCTION MATERIALS: Wood frame, brick, adobe, mobile homes.

ROOF: Composite shingle, metal/tin.

TERRAIN: Flat to gentle slopes **SLOPE**: 0%–10% **ASPECT** North and south

ACCESS: From Lordsburg, Interstate 10 east 25 miles, then south on State Hwy 146 20 miles to junction of State Hwy 9.

ROADS: Paved.

BRIDGES: None.

DRIVEWAYS: Dirt.

WATER AVAILABILITY: Hachita fire hydrants water system and water tower.

CLOSEST FIRE DEPARTMENT: TVFR Station 4 in subdivision; Playas VFR (21 miles), Lordsburg and Hidalgo FD (47 miles).

CVAR: historic structures, churches, commercial business, communication infrastructure, emergency infrastructure

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 60 - Medium

GIS HAZARD/RISK RATING: Low

Figure D.43. Google Earth imagery showing the Hachita town site. Note the close proximity to Highways 9 and 81 and the sparse fuels in the vicinity of the community.

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

Interstate 10 corridor within Grant County

LEGAL: Various sections in T24S, R14W, R15W, and R16W.

DESCRIPTIVE LOCATION: Mile markers 34 to 54;

VEGETATION FUELS: Chihuahuan desert scrub and Chihuahuan desert grassland

ESTIMATED DENSITY (population per square mile): Heavily traveled area of interstate.

NUMBER OF LOTS: N/A

TOTAL ACRES: N/A

CONSTRUCTION MATERIALS: Cars, commercial trucks, and natural vegetation

ROOF: N/A

TERRAIN: Flat **SLOPE**: 0% **ASPECT** None

ACCESS: From Lordsburg, Interstate 10 east approximately 10 miles

ROADS: Paved

BRIDGES:

DRIVEWAYS: N/A

WATER AVAILABILITY: By water tenders.

CLOSEST FIRE DEPARTMENT: Lordsburg Hidalgo County VFR (12 miles), TVFR Station 4 (20 miles), Deming FD (15 miles).

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 25 - Low

GIS HAZARD/RISK RATING: Medium

GRANT COUNTY
WILDLAND URBAN INTERFACE COMMUNITIES

TYRONE FIRE DISTRICT

State Highways 9, 146, and 81 within 5 miles of Hachita, New Mexico

LEGAL: Various sections in T27S and T28S, R14W and R15W.

DESCRIPTIVE LOCATION:

Highway 9, mile markers 31 to 50;

Highway 146, mile markers 1 to 19

Highway 81, mile markers 41 to 45

VEGETATION FUELS: Chihuahuan desert scrub and Chihuahuan desert grassland

ESTIMATED DENSITY (population per square mile): Heavily traveled area

NUMBER OF LOTS: N/A

TOTAL ACRES: N/A

CONSTRUCTION MATERIALS: Cars, commercial trucks, and natural vegetation

ROOF: N/A

TERRAIN: Flat **SLOPE**: 0% **ASPECT** None

ACCESS: From Lordsburg, Interstate 10, 28 mile east to Highway 146.

ROADS: Paved

BRIDGES:

DRIVEWAYS: N/A

WATER AVAILABILITY: TVFR Water Tender, Hachita hydrants and water system.

CLOSEST FIRE DEPARTMENT: TVFR Station 4 in Hachita.

CAR RATING- BASED ON THE NFPA 1144 PROTOCOL: 24 – Low.

GIS HAZARD/RISK RATING: Medium

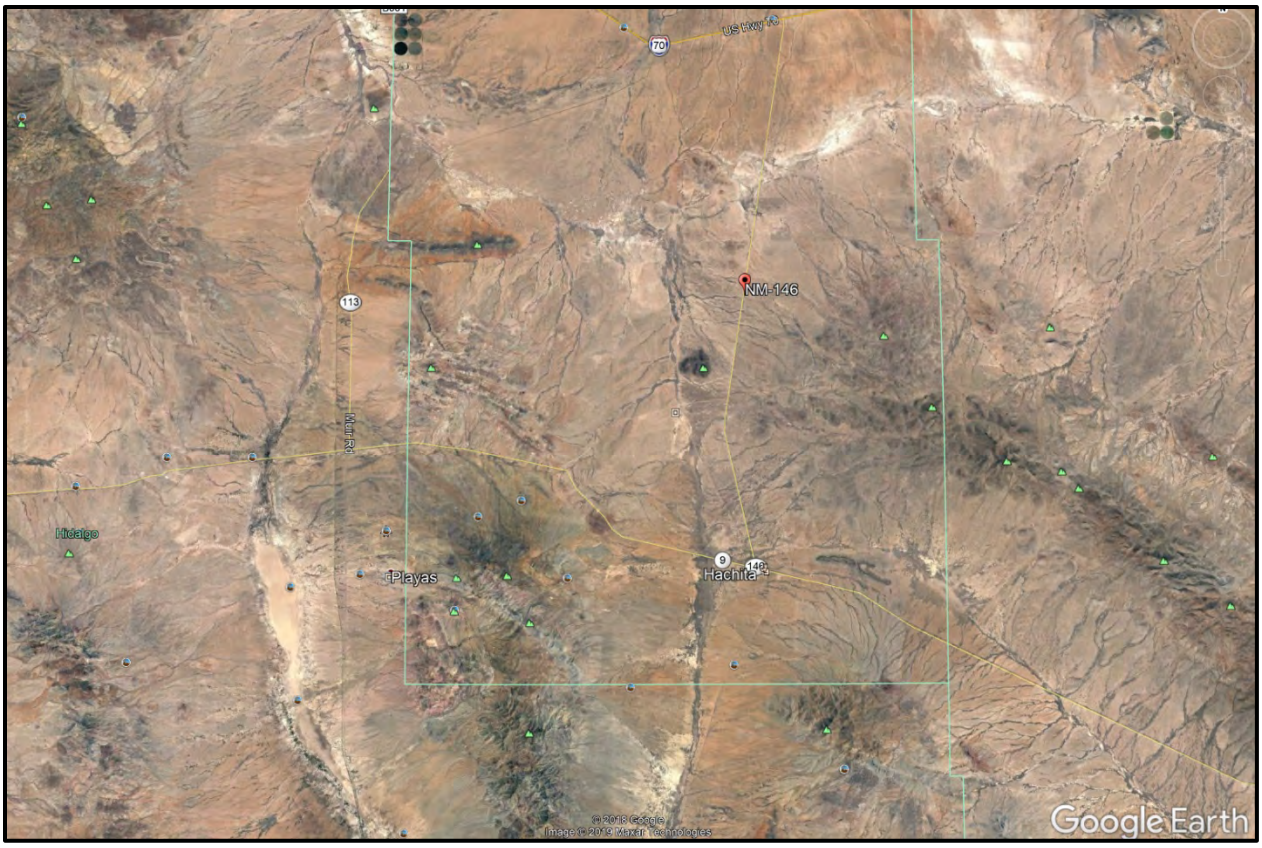

Figure D.44. Google Earth imagery of highways surrounding Hachita. Note the sparse vegetation and lack of residential properties along the highway.

			Tyrone Fire & Rescue Vehicle Inventory			
Station	**Unit #**	**Plate #**	**Gallon/ equip**	**Max occupancy of firefighters**	**Make/Model**	**Year**
Station 1	Brush 11	G-63738	500 gal foam tools 2 SCBA	5	Ford/Blanchet F-550 1FDAW5HY3AEA49871	2009
Station 1	Engine 11	G-99429	850 gal foam ladders extrication tools 4 SCBA	6	HME Model 18 44KFT4280GWZ22880	2016
Station 1	Mini 11	G-70848	300 gal tools 2 SCBA	3	Ford / E-One F-550 1FDAF57P83ED07839	2004
Station 2	Mini 21	G-01756	400 gal foam 2 SCBA tools	5	Ford/ F-550 Blanchet 1FDOW5HT2HED80138	2017
Station 2	Engine 21	G-64339	1000 gal & foam ladders extrication tools 4 SCBA'S	3	Freightliner/E-One 1FVACYCS74HN21199	2004
Station 2	Tender21	G-68406	2000 gal LADDERS SCBA'S drop tank	3	Freightliner/ Central States 1FVCDYDJ07HX84612	2007
Station 3	Engine 31	G-70256	1000 gal Ladders tools 4 SCBA'S	3	Freightliner/E-One 1FVACYDJ77HY77355	2007
Station 3	Brush 31	G-74018	400 tools 2 SCBA's	3	Ford E One F-550	2005

					1FDAF57P64EC35624	
Station 3	Tender 31	G-92355	1800 Gal SCBA'S drop tank	3	ROSENBUAER 1FVACYBS4CDBN1355	2012
Station 4	Engine 41	G-72680	1000 gal SCBA'S	3	Freightliner E-One 1FVACYDJ47H77345-	2007
Station 4	Mini 41	G-73407	300 Gal	3	Ford F-450 1FDXF47F2YED06397	2000
Station 5	Mini 51	G-64181	300 gal tools	3	Ford F-450 1FDK38G5MKB36107	1991
Station 5	Brush 51	G-57012	300 GAL 2 SCBA' hand tools	3	FordF-550 1FDAF57P24EB872659	2004
Station 5	Engine 51	G-57318	1000 gal LADDERS EXTRICATION SCBA'S	3	Freightliner/ E-One 1FVACYCS04HM74890	2004
Station 5	Tender 51	G-83025	1800 gal LADDERS 2 SCBA	3	Freightliner 1FVACBSXBDA95730	2011
Station 6	Mini 61	G-51386	300 gal tools 2 SCBA'S	3	Ford/Becker 1FDHF38F7VEB21907	1997
[redacted]						
[redacted]						

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APPENDIX E:

NFPA 1144 Form

Means of Access						
Ingress and Egress	**Points**					
Two or more roads in and out	0					
One road in and out	7					
Road Width						
>24 feet	0					
>20 feet, <24 feet	2					
<20 feet	4					
Road Conditions						
Surfaced road, grade <5%	0					
Surfaced road, grade >5%	2					
Nonsurfaced road, grade <5%	2					
Nonsurfaced road, grade >5%	5					
Other than all season	7					
Fire Access						
<300 feet with turnaround	0					
>300 feet with turnaround	2					
<300 feet with no turnaround	4					
>300 feet with no turnaround	5					
Street Signs						
Present–reflective	0					
Present–nonreflective	2					
Not present	5					
Vegetation (fuel models)						
Predominant veg						
Light–1,2,3	5					
Medium–5,6,7,8,9	10					
Heavy–4,10	20					
Slash–11,12,13	25					
Defensible Space						
>100 feet around structure	1					
>70 feet, <100 feet around structure	3					
>30 feet, <70 feet around structure	10					
<30 feet around structure	25					
Topography within 300 Feet of Structures						
Slope						
<9%	1					
10% to 20%	4					
21% to 30%	7					

Means of Access						
31% to 40%	8					
>41%	10					
Additional Rating Factors (rate all that apply)						
Additional Factors						
Topographic features	0–5					
History of high fire occurrence	0–5					
Severe fire weather potential	0–5					
Separation of adjacent structures	0–5					
Roofing Assembly						
Roofing						
Class A	0					
Class B	3					
Class C	15					
Unrated	25					
Building Construction						
Materials (predominant)						
Non-combustible siding, eaves, deck	0					
Non-combustible siding/combustible desk	5					
Combustible siding and deck	10					
Building Set-back						
>30 feet to slope	1					
<30 feet to slope	5					
Available Fire Protection						
Water Sources						
Hydrants 500 gpm, <1,000 feet apart	0					
Hydrants 250 gpm, <1,000 feet apart	1					
Nonpressurized, >250 gpm/2 hours	3					
Nonpressurized, <250 gpm/2 hours	5					
Water unavailable	10					
Organized Response						
Station <5 miles from structure	1					
Station >5 miles from structure	3					
Fixed Fire Protection						
NFPA sprinkler system	0					
None	5					
Placement of Gas and Electric Utilities						
Utilities						
Both underground	0					
One above, one below	3					

Means of Access						
Both aboveground	5					
Totals for Home or Subdivision						
Hazard Rating Scale	**<40 Low**	**>40 Medium**	**>70 High**			

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APPENDIX F:

Funding Sources

FUNDING RESOURCES

The following section provides information on federal, state, and private funding opportunities for conducting wildfire mitigation projects.

I. **Federal Funding Information**

Source: Pre-disaster Mitigation Grant Program

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

Website: http://www.fema.gov/government/grant/pdm/index.shtm

Description: The DHS includes FEMA and the U.S. Fire Administration. FEMA's Federal Mitigation and Insurance Administration is responsible for promoting predisaster activities that can reduce the likelihood or magnitude of loss of life and property from multiple hazards, including wildfire. The Disaster Mitigation Act of 2000 created a requirement for states and communities to develop predisaster mitigation plans and established funding to support the development of the plans and to implement actions identified in the plans. This competitive grant program, known as PDM, has funds available to state entities, tribes, and local governments to help develop multihazard mitigation plans and to implement projects identified in those plans.

Source: Section 319 Base Grant to State Entities and Indian Tribes

Agency: Environmental Protection Agency (EPA)

New Mexico State 319 Coordinator
David Hogge
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502
Phone: (505) 827-2981
Fax: (505) 827-0160
david_hogge@nmenv.state.nm.us

Website: http://www.epa.gov

Description: Funding under this program is often used for reduction of nonpoint-source pollution; however, one community successfully used the grant to obtain funding to reduce hazardous fuels to protect the municipal watershed. For additional information on this success story, visit http://www.santafewatershed.com. To learn about obtaining this type of funding for your community, contact New Mexico's 319 Grant Coordinator, Dave Hogge, New Mexico Environmental Department at (505) 827-2981.

This funding opportunity is a Request for Proposals from state entities and Indian tribes for competitive grants under section 319 of the Clean Water Act (CWA). The purpose of this grant program is to provide funding to implement nonpoint-source management programs developed pursuant to CWA section 319(b). The primary goal of this management program is to control nonpoint-source pollution. This is done through implementation of management measures and

practices to reduce pollutant loadings resulting from each category or subcategory of nonpoint-source identified in the grant recipient's nonpoint-source assessment report, which should be developed pursuant to CWA section 319(a). The EPA has set aside a portion of Ssection 319 funds appropriated by Congress for competitive grant awards to tribes for the purpose of funding the development and implementation of watershed-based plans and other on-the-ground watershed projects that result in a significant step toward solving nonpoint-source impairments on a watershed-wide basis. Please note that the funding opportunity described here is found in Section B of the full announcement. (Section A includes the EPA's national guidelines, which govern the process for awarding noncompetitive base grants to all eligible tribes.)

Source: Funding for Fire Departments and First Responders

Agency: DHS, U.S. Fire Administration

Website: http://www.usfa.dhs.gov/fireservice/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: Conservation Innovation Grants (CIG)

Agency: National Resource Conservation Service

Website: http://www.nm.nrcs.usda.gov/programs/cig/cig.html

Description: CIG State Component. CIG is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. Under CIG, Environmental Quality Incentives Program (EQIP) funds are used to award competitive grants to non-federal governmental or nongovernmental organizations, tribes, or individuals. CIG enables the Natural Resources Conservation Service (NRCS) to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with federal, state, and local regulations. The NRCS administers the CIG program. The CIG requires a 50/50 match between the agency and the applicant. The CIG has two funding components: national and state. Funding sources are available for water resources, soil resources, atmospheric resources, and grazing land and forest health.

Source: Volunteer Fire Assistance

Agency: U.S. Forest Service

Website: http://www.fs.fed.us/fire/partners/vfa/

Description: U.S. Forest Service funding will provide assistance, through the states, to volunteer fire departments to improve communication capabilities, increase wildland fire management training, and purchase protective fire clothing and firefighting equipment. For more

information, contact your state representative; contact information can be found on the National Association of State Foresters website.

Source: Economic Action Programs

Agency: U.S. Forest Service

Website: http://www.fs.fed.us/spf/coop/programs/eap/index.html

Description: U.S. Forest Service funding will provide for Economic Action Programs that work with local communities to identify, develop, and expand economic opportunities related to traditionally under-utilized wood products and to expand the utilization of wood removed through hazardous fuel reduction treatments. Information, demonstrations, application development, and training will be made available to participating communities. For more information, contact a Forest Service Regional Representative.

Source: Collaborative Forest Restoration Program (CFRP)

Agency: U.S. Forest Service

Website: http://www.fs.fed.us/r3/spf/cfrp/index.shtml

Description: The Community Forest Restoration Act of 2000 (Title VI, Public Law 106–393) established a cooperative forest restoration program in New Mexico to provide cost-share grants to stakeholders for forest restoration projects on public land to be designed through a collaborative process (the CFRP). Projects must include a diversity of stakeholders in their design and implementation and should address specified objectives including: wildfire threat reduction; ecosystem restoration, including non-native tree species reduction; reestablishment of historic fire regimes; reforestation; preservation of old and large trees; increased utilization of small-diameter trees; and the creation of forest-related local employment. The act limits projects to four years and sets forth cost limits and provisions respecting collaborative project review and selection, joint monitoring and evaluation, and reporting. The act authorizes appropriations of up to $5 million annually and directs the Secretary to convene a technical advisory panel to evaluate proposals that may receive funding through the CFRP.

Source: Catalog of Federal Funding Sources for Watershed Protection

Agency: N/A

Website: http://cfpub.epa.gov/fedfund/

Examples of the types of grants found at this site are:

- Native Plant Conservation Initiative: http://www.nfwf.org/AM/Template.cfm?Section=Browse_All_Programs&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=3966
- Targeted Watershed Grants Program, http://www.epa.gov/owow/watershed/initiative/
- Predisaster Mitigation Program, http://www.fema.gov/government/grant/pdm/index.shtm
- Environmental Education Grants, http://www.epa.gov/enviroed/grants_contacts.html

Source: Firewise Communities

Agency: Multiple

Website: http://www.firewise.org

Description: The Wildland/Urban Interface Working Team (WUIWT) of the National Wildfire Coordinating Group is a consortium of wildland fire organizations and federal agencies responsible for wildland fire management in the United States. The WUIWT includes the U.S. Forest Service, Bureau of Indian Affairs, BLM, U.S. Fish and Wildlife Service, National Park Service, FEMA, U.S. Fire Administration, International Association of Fire Chiefs, National Association of State Fire Marshals, National Association of State Foresters, National Emergency Management Association, and National Fire Protection Association. Many different Firewise Communities activities are available 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 Firewise Communities recognition program page (http://www.firewise.org/usa) provides a number of excellent examples of these kinds of projects and programs.

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 individuals and neighborhoods can undertake, the following actions often benefit from some kind of seed funding or additional assistance from an outside source:

- Thinning/pruning/tree removal/clearing on private property—particularly on very large, densely wooded properties
- Retrofit of home roofing or siding to non-combustible materials
- Managing private forest
- Community slash pickup or chipping
- Creation or improvement of access/egress roads
- Improvement of water supply for firefighting
- Public education activities throughout the community or region

Some additional examples of what communities, counties, and states have done can be found in the National Database of State and Local Wildfire Hazard Mitigation Programs at http://www.wildfireprograms.usda.gov. You can search this database by keyword, state, jurisdiction, or program type to find information about wildfire mitigation education programs, grant programs, ordinances, and more. The database includes links to local websites and e-mail contacts.

Source: The National Fire Plan (NFP)

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

Description: Many states are using funds from the NFP to provide funds through a cost-share with residents to help them reduce the wildfire risk to their private property. These actions are usually in the form of thinning or pruning trees, shrubs, and other vegetation and/or clearing the slash and debris from this kind of work. Opportunities are available for rural, state, and volunteer fire assistance.

Source: Staffing for Adequate Fire and Emergency Response (SAFER)

Agency: DHS

Website: http://www.firegrantsupport.com/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. SAFER is part of the Assistance to Firefighters Grants and is under the purview of the Office of Grants and Training of the DHS.

Source: The Fire Prevention and Safety Grants (FP&S)

Agency: DHS

Website: http://www.firegrantsupport.com/fps/

Description: The FP&S are part of the Assistance to Firefighters Grants and are under the purview of the Office of Grants and Training in the DHS. 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: Rural Fire Assistance (RFA)

Agency: USDI – U.S. Fish and Wildlife Service

Website: http://www.nifc.gov/rfa.

Description: The RFA program provides funds for RFDs that Protect rural, wildland-urban interface communities; play a substantial cooperative role in the protection of federal lands; are cooperators with the Department of the Interior (USDI) managed lands through cooperative agreements with the USDI, or their respective state, tribe or equivalent; are less than 10,000 in population. The required cost share amount for the recipient RFD will not exceed 10 percent of the amount awarded. The RFD must demonstrate the capability to meet cost share requirements Cooperator contribution may be contributed as in-kind services. Cooperator contribution may exceed, but not amount to less than 10 percent. Examples of in-kind services may include but are not limited to: facility use incurred by and RFD for hosting training courses, travel and per diem costs incurred by an RFD when personnel attend training courses, and administration costs related to purchasing RFA equipment and supplies. Finding or in-kind resources may not be derived from other federal finding programs.

Source: Federal Excess Personal Property

Agency: USFS

Website: http://www.fs.fed.us/fire/partners/fepp/

Description: The Federal Excess Personal Property (FEPP) program refers to Forest Service-owned property that is on loan to State Foresters for the purpose of wildland and rural firefighting.

Most of the property originally belonged to the Department of Defense (DoD). Once acquired by the Forest Service, it is loaned to State Cooperators for firefighting purposes. The property is then loaned to the State Forester, who may then place it with local departments to improve local fire programs. State Foresters and the USDA Forest Service have mutually participated in the FEPP program since 1956.

II. **State Funding Information**

Source: State and Private Forestry Programs

Agency: National Association of State Foresters

Website: http://www.stateforesters.org/S&PF/coop_fire.html

Description: The National Association of State Foresters recommends that funds become available through a competitive grant process on Wildland Urban Interface hazard mitigation projects. State fire managers see opportunities to use both the State Fire Assistance Program and the Volunteer Fire Assistance Program to improve the safety and effectiveness of firefighters in the interface, as well as in other wildland fire situations. To ensure firefighter safety, minimize property and resource loss, and reduce suppression costs, land management agencies, property owners, local leaders, and fire protection agencies must work cooperatively to mitigate interface fire risks, as well as to ensure that wildland firefighters receive the training, information, and equipment necessary to safely carry out their responsibilities.

Source: New Mexico Association of Counties: Wildfire Risk Reduction Program

Agency: New Mexico Association of Counties

Website: http://www.nmcounties.org/wildfire.html

Description: This program targets at-risk communities by offering seed money to help defray the costs of community wildfire protection projects. During the past two years, the Wildfire Risk Reduction Grant Program has primarily funded projects for the development of Community Wildfire Protection Plans (CWPPs), a prerequisite to all other activities. In 2007, priority was given to projects that requested funding for hazardous fuel reduction, wildfire prevention, and community outreach activities that were identified in completed CWPPs.

III. **Private Funding Information**

Source: The Urban Land Institute (ULI)

Website: http://www.uli.org

Description: ULI is a 501(c)(3) nonprofit research and education organization supported by its members. The institute has more than 22,000 members worldwide, representing the entire spectrum of land use and real estate development disciplines, working in private enterprise and public service. The mission of the ULI is to provide responsible leadership in the use of land to enhance the total environment. ULI and the ULI Foundation have instituted Community Action Grants (http://www.uli.org/Content/NavigationMenu/MyCommunity/CommunityActionGrants/Community_Action_Gr.htm) that could be used for Firewise Communities activities. Applicants must be ULI members or part of a ULI District Council. Contact actiongrants@uli.org or review the web page to find your District Council and the application information.

Source: Environmental Systems Research Institute (ESRI)

Website: http://www.esri.com/grants

Description: ESRI is a privately held firm and the world's largest research and development organization dedicated to geographic information systems. ESRI provides free software, hardware, and training bundles under ESRI-sponsored Grants that include such activities as conservation, education, and sustainable development, and posts related non-ESRI grant opportunities under such categories as agriculture, education, environment, fire, public safety, and more. You can register on the website to receive updates on grant opportunities.

Source: StEPP Foundation

Website: http://www.steppfoundation.org/default.htm

Description: StEPP is a 501(c)(3) organization dedicated to helping organizations realize their vision of a clean and safe environment by matching projects with funders nationwide. The StEPP Foundation provides project oversight to enhance the success of projects, increasing the number of energy efficiency, clean energy, and pollution prevention projects implemented at the local, state, and national levels for the benefit of the public. The website includes an online project submittal system and a Request for Proposals page.

Source: The Public Entity Risk Institute (PERI)

Website: http://www.riskinstitute.org

Description: PERI is a not for profit, tax-exempt organization. Its mission is to serve public, private, and nonprofit organizations as a dynamic, forward-thinking resource for the practical enhancement of risk management. With its growing array of programs and projects, along with its grant funding, PERI's focus includes supporting the development and delivery of education and training on all aspects of risk management for public, nonprofit, and small business entities, and serving as a resource center and clearinghouse for all areas of risk management.

IV. Other Funding Information

The following resources may also provide helpful information for funding opportunities:

- National Agricultural Library Rural Information Center: http://www.nal.usda.gov/ric/ricpubs/fire_department_resources.htm
- Forest Service Fire Management website: http://www.fs.fed.us/fire/
- Insurance Services Office Mitigation Online (town fire ratings): http://www.isomitigation.com/
- National Fire Protection Association: http://www.nfpa.org
- National Interagency Fire Center, Wildland Fire Prevention/Education: http://www.nifc.gov/preved/rams.htm
- Department of Homeland Security U.S. Fire Administration: http://www.usfa.dhs.gov/fireservice/grants/rfff/

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APPENDIX G:

Homeowner Guide

GRANT COUNTY CWPP

HOMEOWNERS GUIDE

This guide has been developed to address site-specific information on wildfire for the Grant County communities. This guide 1) suggests specific measures that can be taken by homeowners to reduce structure ignitability and 2) enhances overall preparedness in the planning area by consolidating preparedness information from several local agencies and departments.

BEFORE THE FIRE—PROTECTION AND PREVENTION

REDUCING STRUCTURE IGNITABILITY

Structural Materials

Roofing—The more fire-resistant the roofing material, the better. The roof is the portion of the house that is most vulnerable to ignition by falling embers, known as firebrands. Metal roofs afford the best protection against ignition from falling embers. Slate or tile roofs are also non-combustible, and Class-A asphalt shingles are recommended as well. The most dangerous type of roofing material is wood shingles. Removing debris from roof gutters and downspouts at least twice a year will help to prevent fire, along with keeping them functioning properly.

Siding—Non-combustible materials are ideal for the home exterior. Preferred materials include stucco, cement, block, brick, and masonry.

Windows—Double-pane windows are most resistant to heat and flames. Smaller windows tend to hold up better within their frames than larger windows. Tempered glass is best, particularly for skylights, because it will not melt as plastic will.

Fencing and trellises—Any structure attached to the house should be considered part of the house. A wood fence or trellis can carry fire to your home siding or roof. Consider using nonflammable materials or use a protective barrier such as metal or masonry between the fence and the house.

If you are designing a new home or remodeling your existing one, do it with fire safety as a primary concern. Use nonflammable or fire resistant materials and have the exterior wood treated with UL-approved fire-retardant chemicals. More information on fire-resistant construction can be found at http://www.firewise.org.

SCREEN OFF THE AREA BENEATH DECKS AND PORCHES

The area below an aboveground deck or porch can become a trap for burning embers or debris, increasing the chances of the fire transferring to your home. Screen off the area using screening with openings no larger than one-half inch. Keep the area behind the screen free of all leaves and debris.

FIREWOOD, KINDLING, AND OTHER FLAMMABLES

Although convenient, stacked firewood on or below a wooden deck adds fuel that can feed a fire close to your home. Be sure to move all wood away from the home during fire season. Stack all firewood uphill, at least 30 feet and preferably 100 feet from your home.

When storing flammable materials such as paint, solvents, or gasoline, always store them in approved safety containers away from any sources of ignition such as hot water tanks or furnaces. The fumes from

highly volatile liquids can travel a great distance after they turn into a gas. If possible, store the containers in a safe, separate location away from the main house.

CHIMNEYS AND FIREPLACE FLUES

Inspect your chimney and damper at least twice a year and have the chimney cleaned every year before first use. Have the spark arrestor inspected and confirm that it meets the latest safety code. Your local fire department will have the latest edition of National Fire Prevention Code 211 covering spark arrestors. Make sure to clear away dead limbs from within 15 feet of chimneys and stovepipes

FIREPLACE AND WOODSTOVE ASHES

Never take ashes from the fireplace and put them into the garbage or dump them on the ground. Even in winter, one hot ember can quickly start a grass fire. Instead, place ashes in a metal container, and as an extra precaution, soak them with water. Cover the container with its metal cover and place it in a safe location for a couple of days. Then either dispose of the cold ash with other garbage or bury the ash residue in the earth and cover it with at least 6 inches of mineral soil.

PROPANE TANKS

Your propane tank has many hundreds of gallons of highly flammable liquid that could become an explosive incendiary source in the event of a fire. The propane tank should be located at least 30 feet from any structure. Keep all flammables at least 10 feet from your tank. Learn how to turn the tank off and on. In the event of a fire, you should turn the gas off at the tank before evacuating, if safety and time allow.

SMOKE ALARMS

A functioning smoke alarm can help warn you of a fire in or around your home. Install smoke alarms on every level of your residence. Test and clean smoke alarms once a month and replace batteries at least once a year. Replace smoke alarms once every 10 years.

FIRE-SAFE BEHAVIOR

- If you smoke, always use an ashtray in your car and at home.
- Store and use flammable liquids properly.
- Keep doors and windows clear as escape routes in each room.

DEFENSIBLE SPACE

The removal of dense, flammable foliage from the area immediately surrounding the house reduces the risk of structure ignition and allows firefighters access to protect the home. The pruning and limbing of trees along with the selective removal of trees and shrubs is recommended to create a minimum defensible space area of 30 feet. Steep slopes require increased defensible space because fire can travel quickly uphill.

Within the minimum 30-foot safety zone, plants should be limited to fire-resistant trees and shrubs. Focus on fuel breaks such as concrete patios, walkways, rock gardens, and irrigated garden or grass areas within this zone. Use mulch sparingly within the safety zone, and focus use in areas that will be watered regularly. In areas such as turnarounds and driveways, nonflammable materials such as gravel are much better than wood chips or pine needles.

Vegetative debris such as dead grasses or leaves provide important erosion protection for soil but also may carry a surface fire. It is simply not feasible to remove all the vegetative debris from around your property. However, it is a good idea to remove any accumulations within the safety zone and extending out as far as possible. This is particularly important if leaves tend to build up alongside your house or outbuildings. Removing dead vegetation and leaves and exposing bare mineral soil are recommended in a 2-foot-wide perimeter along the foundation of the house. Also, be sure to regularly remove all dead vegetative matter including grasses, flowers, and leaf litter surrounding your home and any debris from gutters, especially during summer months. Mow the lawn regularly and promptly dispose of the cuttings properly. If possible, maintain a green lawn for 30 feet around your home.

All trees within the safety zone should have lower limbs removed to a height of 6–10 feet. Remove any branches within 15 feet of your chimney or overhanging any part of your roof. Ladder fuels are short shrubs or trees growing under the eaves of the house or under larger trees. Ladder fuels carry fire from the ground level onto the house or into the tree canopy. Be sure to remove all ladder fuels within the safety zone first. The removal of ladder fuels within about 100 feet of the house will help to limit the risk of crown fire around your home. More information about defensible space is provided at http://www.firewise.org.

FIRE RETARDANTS

For homeowners who would like home protection beyond defensible space and fire-resistant structural materials, fire-retardant gels and foams are available. These materials are sold with various types of equipment for applying the material to the home. They are similar to the substances applied by firefighters in advance of wildfire to prevent ignition of homes. Different products have different timelines for application and effectiveness. The amount of product needed is based on the size of the home, and prices may vary based on the application tools. Prices range from a few hundred to a few thousand dollars. An online search for "fire blocking gel" or "home firefighting" will provide a list of product vendors. Residents should research and consider environmental impacts of chemicals.

ADDRESS POSTING

Locating individual homes is one of the most difficult tasks facing emergency responders. Every home should have the address clearly posted with numbers at least three inches high. The colors of the address posting should be contrasting or reflective. The address should be posted so that it is visible to cars approaching from either direction.

ACCESS

Unfortunately, limited access may prevent firefighters from reaching many homes in the planning area. Many of the access problems occur at the property line and can be improved by homeowners. First, make sure that emergency responders can get in your gate. This may be important not only during a fire but also to allow access during any other type of emergency response. If you will be gone for long periods during fire season, make sure a neighbor has access, and ask them to leave your gate open in the event of a wildfire in the area.

Ideally, gates should swing inward. A chain or padlock can be easily cut with large bolt cutters, but large automatic gates can prevent entry. Special emergency access red boxes with keys are sold by many gate companies but are actually not recommended by emergency services. The keys are difficult to keep track of and may not be available to the specific personnel that arrive at your home. An alternative offered by some manufacturers is a device that opens the gate in response to sirens. This option is preferred by firefighters but may be difficult or expensive to obtain.

Beyond your gate, make sure your driveway is uncluttered and at least 12 feet wide. The slope should be less than 10%. Trim any overhanging branches to allow at least 13.5 feet of overhead clearance. Also

make sure that any overhead lines are at least 14 feet above the ground. If any lines are hanging too low, contact the appropriate phone, cable, or power company to find out how to address the situation.

If possible, consider a turnaround within your property at least 45 feet wide. This is especially important if your driveway is more than 300 feet in length. Even small fire engines have a hard time turning around and cannot safely enter areas where the only means of escape is by backing out. Any bridges must be designed with the capacity to hold the weight of a fire engine.

NEIGHBORHOOD COMMUNICATION

It is important to talk to your neighbors about the possibility of wildfire in your community. Assume that you will not be able to return home when a fire breaks out and may have to rely on your neighbors for information and assistance. Unfortunately, it sometimes takes tragedy to get people talking to each other. Don't wait for disaster to strike. Strong communication can improve the response and safety of every member of the community.

PHONE TREES

Many neighborhoods use phone trees to keep each other informed of emergencies within and around the community. The primary criticism is that the failure to reach one person high on the tree can cause a breakdown of the system. However, if you have willing and able neighbors, particularly those that are at home during the day, the creation of a well-planned phone tree can often alert residents to the occurrence of a wildfire more quickly than media channels. Talk to your neighborhood association about the possibility of designing an effective phone tree.

NEIGHBORS IN NEED OF ASSISTANCE

Ask mobility-impaired neighbors if they have notified emergency responders of their specific needs. It is also a good idea for willing neighbors to commit to evacuating a mobility-impaired resident in the event of an emergency. Make sure that a line of communication is in place to verify the evacuation.

ABSENTEE OWNERS

Absentee owners are often not in communication with their neighbors. If a home near you is unoccupied for large portions of the year, try to get contact information for the owners from other neighbors or your neighborhood association. Your neighbors would probably appreciate notification in the event of an emergency. Also, you may want to contact them to suggest that they move their woodpile or make sure that the propane line to the house is turned off.

HOUSEHOLD EMERGENCY PLAN

A household emergency plan does not take much time to develop and will be invaluable in helping your family deal with an emergency safely and calmly. One of the fundamental issues in the event of any type of emergency is communication. Be sure to keep the phone numbers of neighbors with you rather than at home.

It is a good idea to have an out of state contact, such as a family member. When disaster strikes locally, it is often easier to make outgoing calls to a different area code than local calls. Make sure everyone in the family has the contact phone number and understands why they need to check in with that person in the event of an emergency. Also, designate a meeting place for your family. Having an established meeting site helps to ensure that family members know where to go, even if they can't communicate by phone.

CHILDREN

Local schools have policies for evacuation of students during school hours. Contact the school to get information on how the process would take place and where the children would likely go.

The time between when the children arrive home from school and when you return home from work is the most important timeframe that you must address. Fire officials must clear residential areas of occupants to protect lives and to allow access for fire engines and water drops from airplanes or helicopters. If your area is evacuated, blockades may prevent you from returning home to collect your children. It is crucial to have a plan with a neighbor for them to pick up your children if evacuation is necessary.

PETS AND LIVESTOCK

Some basic questions about pets and livestock involve whether you have the ability to evacuate the animals yourself and where you would take them. Planning for the worst-case scenario may save your animals. An estimated 90% of pets left behind in an emergency do not survive. Don't expect emergency service personnel to prioritize your pets in an emergency. Put plans in place to protect your furry family members.

PETS

Assemble a pet disaster supply kit and keep it handy. The kit should contain a three-day supply of food and water, bowls, a litter box for cats, and a manual can opener if necessary. It is also important to have extra medication and medical records for each pet. The kit should contain a leash for each dog and a carrier for each cat. Carriers of some kind should be ready for birds and exotic pets. In case your pet must be left at a kennel or with a friend, also include an information packet that describes medical conditions, feeding instructions, and behavioral problems. A photo of each pet will help to put the right instructions with the right pet.

In the event of a wildfire you may be prevented from returning home for your animals. Talk to your neighbors and develop a buddy system in case you or your neighbors are not home when fire threatens. Make sure your neighbor has a key and understands what to do with your pets should they need to be evacuated.

If you and your pets were evacuated, where would you go? Contact friends and family in advance to ask whether they would be willing to care for your pets. Contact hotels and motels in the area to find out which ones accept pets. Boarding kennels may also be an option. Make sure your pets' vaccinations are up-to-date if you plan to board them.

Once you have evacuated your pets, continue to provide for their safety by keeping them cool and hydrated. Try to get your pets to an indoor location rather than leaving them in the car. Do not leave your pets in your vehicle without providing shade and water. It is not necessary to give your pets water while you are driving, but be sure to offer water as soon as you reach your destination.

LIVESTOCK

Getting livestock out of harm's way during a wildfire is not easy. You may not be able or allowed to return home to rescue your stock during a wildfire evacuation. Talk to your neighbors about how you intend to deal with an evacuation. If livestock are encountered by emergency responders, they will be released and allowed to escape the fire on their own. Make sure your livestock have some sort of identification. Ideally, your contact information should be included on a halter tag or ear tag so that you could be reached if your animal is encountered.

If you plan to evacuate your livestock, have a plan in place for a destination. Talk to other livestock owners in the area to find out whether they would be willing to board your stock in the event of an emergency. Often in large-scale emergencies, special accommodations can be made at fair and rodeo grounds, but personal arrangements may allow you to respond more quickly and efficiently.

If you do not own a trailer for your horses or other livestock, talk to a neighbor who does. Find out whether they would be willing to assist in the evacuation of your animals. If you do own a trailer, make sure it is in working condition with good, inflated tires and functioning signal lights. Keep in mind that even horses that are accustomed to a trailer may be difficult to load during an emergency. Practicing may be a good idea to make sure your animals are as comfortable as possible when being loaded into the trailer.

HOUSE AND PROPERTY

Insurance companies suggest that you make a video that scans each room of your house to help document and recall all items within your home. This video can make replacement of your property much easier in the unfortunate event of a large insurance claim. See more information on insurance claims in the "After the Fire" section below.

PERSONAL ITEMS

During fire season, items you would want to take with you during an evacuation should be kept in one readily accessible location. As an extra precaution, it may be a good idea to store irreplaceable mementos or heirlooms away from your home during fire season.

It is important to make copies of all important paperwork, such as birth certificates, titles, and so forth, and store them somewhere away from your home, such as in a safe deposit box. Important documents can also be protected in a designated firesafe storage box within your home.

IN THE EVENT OF A FIRE

NOTIFICATION

In the event of a wildfire, announcements from the local Emergency Management office will be broadcast over local radio and television stations. Media notification may be in the form of news reports or the Emergency Alert System (EAS). On television, the emergency management message will scroll across the top of the screen on local channels. The notice is not broadcast on non-local satellite and cable channels.

One good way to stay informed about wildfire is to use a National Oceanic and Atmospheric Administration weather alert radio. The radios can be purchased at most stores that carry small appliances, such as Target, Sears, or Radio Shack. The radio comes with instructions for the required programming to tune the radio to your local frequency. The programming also determines the types of events for which you want to be alerted. The weather alert radio can be used for any type of large incident (weather, wildfire, hazardous materials, etc.), depending on how it is programmed. Local fire personnel can assist with programming if needed.

WHEN FIRE THREATENS

Before an evacuation order is given for your community, there are several steps you can take to make your escape easier and to provide for protection of your home. When evaluating what to do as fire threatens, the most important guideline is: DO NOT JEOPARDIZE YOUR LIFE.

Back your car into the garage or park it in an open space facing the direction of escape. Shut the car doors and roll up the windows. Place all valuables that you want to take with you in the vehicle. Leave the keys in the ignition or in another easily accessible location. Open your gate.

Close all windows, doors, and vents, including your garage door. Disconnect automatic garage openers and leave exterior doors unlocked. Close all interior doors as well.

Move furniture away from windows and sliding glass doors. If you have lightweight curtains, remove them. Heavy curtains, drapes, and blinds should be closed. Leave a light on in each room.

Turn off the propane tank or shut off gas at the meter. Turn off pilot lights on appliances and furnaces.

Move firewood and flammable patio furniture away from the house or into the garage.

Connect garden hoses to all available outdoor faucets and make sure they are in a conspicuous place. Turn the water on to "charge," or fill your hoses and then shut off the water. Place a ladder up against the side of the home, opposite the direction of the approaching fire, to allow firefighters easy access to your roof.

EVACUATION

When evacuation is ordered, you need to go ***immediately***. Evacuation not only protects lives, it also helps to protect property. Some roads are too narrow for two-way traffic, especially with fire engines. Fire trucks often can't get into an area until the residents are out. Also, arguably the most important tool in the WUI toolbox is aerial attack. Airplanes and helicopters can be used to drop water or retardant to help limit the spread of the fire, but these resources cannot be used until the area has been cleared of civilians.

Expect emergency managers to designate a check-out location for evacuees. This process helps to ensure that everyone is accounted for and informs emergency personnel as to who may be remaining in the community. Every resident should check out at the designated location before proceeding to any established family meeting spot.

A light-colored sheet closed in the front door serves as a signal to emergency responders that your family has safely left. This signal saves firefighters precious time, as it takes 12–15 minutes per house to knock on each door and inform residents of the evacuation.

AFTER THE FIRE

RETURNING HOME

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

Even if the fire did not damage your house, do not expect to return to business as usual immediately. Expect that utility infrastructure may have been damaged and repairs may be necessary. When you return to your home, check for hazards, such as gas or water leaks and electrical shorts. Turn off damaged utilities if you did not do so previously. Have the fire department or utility companies turn the utilities back on once the area is secured.

INSURANCE CLAIMS

Your insurance agent is your best source of information as to the actions you must take in order to submit a claim. Here are some things to keep in mind. Your insurance claim process will be much easier if you photographed your home and valuable possessions before the fire and kept the photographs in a safe

place away from your home. Most if not all of the expenses incurred during the time you are forced to live outside your home could be reimbursable. These could include, for instance, mileage driven, lodging, and meals. Keep all records and receipts. Don't start any repairs or rebuilding without the approval of your claims adjuster. Beware of predatory contractors looking to take advantage of anxious homeowners wanting to rebuild as quickly as possible. Consider all contracts very carefully, take your time to decide, and contact your insurance agent with any questions. If it appears to be a large loss, consider whether you should hire a public adjuster that is licensed by the state department of insurance who will represent and advocate for you as the policyholder in appraising and negotiating the claimant's insurance claim to ensure you get the best outcome and recovery from your insurance company. Most public adjusters charge a small percentage of the settlement that is set by the state and primarily they appraise the damage, prepare an estimate and other claim documentation, read the policy of insurance to determine coverages, and negotiate with the insurance company's claims handler.

POST-FIRE REHABILITATION

Homes that may have been saved in the fire may still be at risk from flooding and debris flows. Burned Area Emergency Rehabilitation (BAER) teams are inter-disciplinary teams of professionals who work to mitigate the effects of post-fire flooding and erosion. These teams often work with limited budgets and manpower. Homeowners can assist the process by implementing treatments on their own properties as well as volunteering on burned public lands to help reduce the threat to valuable resources. Volunteers can assist BAER team members by planting seeds or trees, hand mulching, or helping to construct straw-bale check dams in small drainages.

Volunteers can help protect roads and culverts by conducting storm patrols during storm events. These efforts dramatically reduce the costs of such work as installing trash racks, removing culverts, and re-routing roads.

Community volunteers can also help scientists to better understand the dynamics of the burned area by monitoring rain gauges and monitoring the efficacy of the installed BAER treatments.

APPENDIX H:

Evacuation Plan

GRANT COUNTY WILDFIRE EVACUATION PLAN

I. Objectives:

- To provide guidelines to assist in a safe and orderly evacuation
- To identify special concerns that will assist agencies and responding units; Including persons requiring extraordinary care; livestock; and other property requiring specialized handling
- To identify the resources necessary to accomplish a timely, safe, and orderly evacuation

II. Authority:

- **Authority** for ordering an evacuation during a wildfire incident in the county rests with the chairman of the Grant County Commission, or the sheriff of Grant County. This authority is based on state statutes: the State Civil Emergency Preparedness Act, the Emergency Management Act; State Executive Order and existing multiagency Joint Powers Agreements, and local Memorandums of Understanding.
- **Responsibility** for planning, implementing, and managing an evacuation rests with NM DPS State Police. In the event the State Police is unable to respond, the Emergency Operations Center Law Enforcement Staff (Grant County Sheriff's Department) will manage evacuation operations.
- **The Incident Commander of a wildfire incident** is authorized to order an evacuation if conditions immediately threaten the health, safety, or welfare of citizens, and the Emergency Operations Center is not operational, nor are County Commission members available.

III. Evacuation Stages (Levels of Response):

Stage 1: **Notification and briefings** of persons within the affected areas. This stage will be implemented when ***fire has a high potential of reaching structures in the area within 24 to 36 hours.***

Stage 2: **Warnings of potential evacuation** will be announced if there is a good probability of a need to evacuate. Warnings will include the recommended movement of persons requiring special needs or care, livestock, and large mobile property. This stage will be implemented when ***fire has a high potential of reaching structures within the area in 16 hours.***

Stage 3: **Evacuation Requested** when the ***fire has a high potential of reaching structures within the area in 6 hours***. Residents will be asked to leave within a specified time period by an announced route and assemble at predesignated locations. These locations are listed on the next page.

Stage 4: **Evacuation Ordered** when **a *fire has a high potential of reaching structures within the area in 2 hours or less,*** *and a* disaster or emergency proclamation has been issued by the CEO of the jurisdiction affected by the incident. Access to the affected area is prohibited to anyone not authorized by the Incident Commander or his designee.

Stage 5: **Perimeter Roadblocks and Patrols:** Once an evacuation has been ordered, perimeter roadblocks will be set up and maintained and the evacuated area patrolled 24 hours a day. Regular status briefings will be provided to evacuees at the predesignated assembly locations and shelters established by the American Red Cross.

Stage 6: **Return of Residents to their Homes:** Once the incident is declared under control and safe for entry by the Incident Commander evacuees will be allowed to return. Evacuation teams will re-contact residents to evaluate hardships and special needs.

IV. Implementation Procedures

- In the event that an evacuation is requested or ordered by the CEO of the jurisdiction affected and given to the Incident Commander for implementation, the **State Police will coordinate the evacuation**, through officer(s) assigned to the Emergency Operations Center.
- In the event of **non-compliance by residents** ordered to evacuate, the State Police will coordinate all efforts to re-contact the person(s) and stress the immediacy of the threats and need for evacuation.
- **Evacuation routes and roadblock locations** will be determined by the Incident Commander, specific to each incident. He will provide this information to the State Police and the Emergency Operations Center staff.
- **Assembly locations for residents being evacuated** are listed below:

AREA:	**REPORT TO:**
Pinos Altos Area	Silver High School Parking Lot
Little Walnut, Cottage San, Bear Mountain	WNMU Fine Arts Auditorium Parking Lot
Mining District	Cobre High School Parking Lot
Hanover-Fierro Canyon	Cobre High School Parking Lot
Mimbres Valley Area	San Lorenzo Elementary School
Sapillo-Gila Hot Springs	Junction of Hwy 15 and 35
White Signal	White Signal Community Center
Cliff-Gila	Cliff High School Parking Lot
Mule Creek	Buckhorn RV Park
Red Rock	Junction of Hwy 464 and FS Road 851
Tyrone	Tyrone Mercantile Parking Lot

NOTE: *additional assembly locations or re-routing may be identified during incident*