LINCOLN COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

September 1, 2019

Prepared for:

Lincoln County
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Carrizozo, NM 88301

Prepared by
The South Central Mountain
Resource Conservation & Development Council, Inc.
August 30, 2019

In Cooperation With:
Lincoln County
The Greater Ruidoso Wildland Urban Interface Working Group
EMNRD – Forestry Division
Lincoln National Forest
The Village of Ruidoso
Village of Capitan
Little Bear Forest Reform Coalition
New Mexico State Land Office
Bureau of Land Management
Bureau of Indian Affairs

LINCOLN COUNTY CWPP
COMMUNITY WILDFIRE PROTECTION PLAN

We the undersigned approve and support the Lincoln County Community Wildfire Protection Plan

Preston Stone, Chairman, Lincoln County Commission — Date: 8-20-19

Dallas Draper, Vice-Chair, Lincoln County Commission — Date: 8-20-19

Tom Stewart, Lincoln County Commission — Date: 8-20-19

Elaine Allen, Lincoln County Commission — Date: 8-20-19

Lynn Willard, Lincoln County Commission — Date: 8-20-19

LINCOLN COUNTY CWPP
COMMUNITY WILDFIRE PROTECTION PLAN

We the undersigned approve and support the Lincoln County Community Wildfire Protection Plan.

Village of Ruidoso

Lynn Crawford, Mayor — Date: 8/13/19

Rafael Salas, Councilor — Date: 8/13/19

Dr. Gary Jackson, Councilor — Date: 8/13/19

Joseph Eby, Councilor — Date: 8/13/19

Tim Coughlin, Councilor — Date: 8/13/19

Susan Lutterman, Councilor — Date: 8/13/19

John Cornelius, Councilor — Date: 8/13/19

SEAL

ATTEST:

Irma Devine, Village Clerk

LINCOLN COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

We the undersigned approve and support the Lincoln County Community Wildfire Protection Plan.

Cooperating Agencies

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Jodie Canfield,
District Ranger, Smokey Bear Ranger District

Nick Smokovich — Date: 8/13/19
Nick Smokovich,
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Joe Kenmore — Date: 8/21/2019
Joe Kenmore, Director
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Dick Cooke — Date: 8-13-2019
Dick Cooke, Chairman
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Cody Thetford — Date: 8/13/19
Cody Thetford, Fire Chief
Village of Ruidoso

Charles W Schmidt — Date: 8/20/19
Charles Schmidt,
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EXECUTIVE SUMMARY

This document serves to provide an update for both the Lincoln County and Greater Ruidoso Area (GRA) Community Wildfire Protection Plans (CWPP). Its goal is to be a useful, living document that can help the communities guide wildfire mitigation efforts and be updated as needed. This protection plan provides a framework to address wildfire risk in Lincoln County. While this CWPP is a stand-alone document, our goal is to encourage and provide communities within the county with the ability develop more specific plans to address localized fire risk.

The Healthy Forests Restoration Act (HFRA) of 2003 provides the impetus for wildfire risk assessment and planning at the county and community level. HFRA refers to this level of planning as a Community Wildfire Protection Plan (CWPP). The CWPP allows a community to evaluate its current situation with regard to wildfire risks and hazards, and devise ways to protect human welfare and important economic or ecological values. The CWPP may address issues such as community wildfire risk, fuel hazard, structure flammability, fuel treatments, non-fuel mitigation, community preparedness, and emergency procedures. A Core Team provides oversight to the development of the CWPP.

This CWPP is not a legal document. There are no legal requirements to implement the recommendations herein. However, treatments on private land may require compliance with county land use codes, building codes, and local covenants; treatments on public lands will be carried out by appropriate agencies and may be subject to federal, state, and county policies and procedures such as adherence to the HFRA and National Environmental Policy Act (NEPA).

The Lincoln County CWPP is countywide with emphasis on the protection of communities and other economic and ecological values. Historic fire occurrence was a major ecological influence in shaping the natural vegetation. The threat of wildfire continues today. However, wildfire risk to human welfare and economic and ecological values is more serious today than in the past because of the buildup of hazardous fuels, communities and other infrastructure in proximity to forests and rangelands, and a lack of public understanding of wildfire.

Nearly 85 percent of wildland fires in the United States are caused by humans. Human-caused fires result from campfires left unattended, the burning of debris, equipment use and malfunctions, negligently discarded cigarettes, and intentional acts of arson. Lightning is one of the two natural causes of fires. In Lincoln County, human-caused ignitions account for 64 percent of wildfires, and their frequency will likely become more numerous as the county's population grows and outdoor recreation increases.

Since the original Greater Ruidoso Area CWPP was written in 2004 and the Lincoln County CWPP was written in 2008 and then updated in 2014, much has changed in the area. Fuel mitigation projects (1,401treatments completed according to NM Vegetation Treatments Map have treated over 78,000 acres on both public and private land) within our Wildland Urban interface (WUI), and there have been several large fires that have burned

homes and drastically changed fuel conditions and community priorities. This document seeks to update certain components of the two CWPPs to reflect changing conditions, additional knowledge, recent community mitigation efforts, and updated priorities. Applicable portions of previous CWPP's have been incorporated into this document as they provide a strong foundation for this current update.

The accumulation of hazardous fuels may set the stage for catastrophic wildfire occurrence, resulting in the loss of economic and ecological values. There are varieties of fuels around communities, ranches, structures, and on public lands that create problems for fire protection. Fuels include grasslands, weedy fields, shrublands, pinion-juniper woodlands, ponderosa pine and mixed conifer forests. Fuels such as dried grass and weeds are highly flammable, burn rapidly, and resist control. A coordinated effort among all fire authorities and private landowners is needed to manage hazardous fuels and reduce the risk of wildfire. The CWPP provides the means to identify wildfire risks and hazards, and prioritize mitigation projects.

Several sources of information were gathered and synthesized to formulate an understanding of wildfire risks and hazards. Sources of information included surveys of communities and vegetation-fuels using a standardized procedure, various maps obtained from state and federal databases, interviews with county fire chiefs and state and federal fire management officers, and community meetings.

As part of the assessment, a concerted effort was made to solicit feedback from the public and local experts on fire and natural resource issues. A Core Team consisting of Bureau of Land Management (BLM), U.S. Forest Service (USFS), New Mexico State Forestry Division (NMSFD), soil and water conservation district (SWCD), and Lincoln County representatives was formed. Core Team Meetings were held on August 28, 2018, October 23, 2018, February 19, 2019 and May 21, 2019. The Rural Community Forester met with the county Fire Chiefs on January 19, 2019. A Community Meeting was held on March 30, 2019, and additional public outreach was conducted at the Ruidoso Home & Garden Show in March 2019 and at Smokey Bear Days in May 2019. The purposes of the community meetings was to introduce CWPP goals and objectives, discuss wildfire risks and hazards, provide an opportunity for the public to participate in the process, and review proposed mitigation possibilities. Participants were asked to fill out the CWPP survey either online or on a paper format.

A survey of Lincoln County was conducted to define wildland-urban interface (WUI) areas. The WUI is an area where communities and other infrastructure intermix with wildland vegetation-fuels. The Core Team also utilized the Communities At Risk Assessment provided by NM State Forestry Division in developing the Community Wildfire Protection Plan.

The National Fire Protection Association (NFPA) Form 1144, *Standard for Protection of Life and Property from Wildfire 2002 Edition,* was used to assess the level of risk and hazard to communities and individual houses. The evaluation consisted of rating attributes such as means of access, surrounding vegetation (fuels), presence of defensible space, topography, roofing and other construction materials, available fire protection, and placement of utilities. Scores were assigned to each element and then totaled to determine

the level of risk. A community was labeled as having low, moderate, high, or extreme risk based on the total score. Community assessments were conducted during the Fall of 2018 and Spring of 2019.

The following actions are proposed to reduce wildfire risks and hazards. Project recommendations are based on interviews with county fire chiefs, municipal fire chiefs, federal and state fire management officers, field observations, and questionnaire responses. Proposed mitigation projects were also presented and discussed at three public meetings.

- Encourage the development of defensible space around structures, utilities stations, communication towers, and other structures at risk to wildfire.
- Grass and weed abatement needs to occur throughout the county. A common fuel hazard is herbaceous weedy vegetation. Native and non-native weedy grasses and forbs become flashy fuels as they dry in the late summer and fall. These fine fuels ignite easily and burn rapidly. Herbaceous fuels are common and widespread in the WUIs. Herbaceous fuels occur among structures, along roads and driveways, and in fallowed fields and abandoned lots.
- Mowing along highways and roads will create fuel breaks. Highways and roads are linear features that provide a break to fuel continuity. Mowing to a minimum distance of 6 feet along each side of highways and roads will enhance their usefulness as fuel breaks, and reduce the chance of fire ignitions from vehicles or discarded smoking materials.
- Salt cedar abatement along Rio Hondo and its tributaries is recommended. Abatement is warranted because of its fuel load, high water use, and limited wildlife habitat value.
- Fuel breaks are recommended along roads for the Alto and Glencoe communities, as appropriate, and along Nogal Canyon Road, and White Oaks Highway. Strategically located fuel breaks are recommended around the communities of Arabela, Corona, Nogal, and White Oaks. Strategically positioned fuel breaks also are recommended along public and private land boundaries, which occur in all WUIs. Priority should be given to Arabela, Lincoln, Fort Stanton, Glencoe, Alto, Nogal, White Oaks and Corona communities.
- Fire regime condition class (FRCC) is a measure of forest and rangeland health. Forests and rangelands classified as FRCC 2 or 3 are considered unhealthy because there have been changes in plant community attributes and/or the fire regime in comparison with vegetation conditions prior to European settlement. Eighty-two percent of the county is classified as FRCC 2 or 3. Vegetation-fuels management plans should consider ways to improve forest and rangeland health, thus reducing vegetation-fuel hazards.
- Community education and public outreach is an effective means to initiate local action to reduce wildfire risks and hazards. Community outreach could occur through each WUI to achieve improved awareness of wildfire issues such as creation of defensible space around structures.

- A recommendation is for the county and incorporated towns and villages to consider adopting the International Wildland-Urban Interface Code (IWUIC). The IWUIC provides a set of codes that, if implemented by communities, may reduce wildfire risks and hazards. Improving the fire-resistant characteristics of structures in the assessment area goes hand-in-hand with the development of defensible space.
- A recommendation is to develop, map, and maintain strategically located water sources throughout each WUI. Dry hydrants, permanent surface water, stock ponds, or irrigation systems may be suitable water sources. Agreements with private landowners need to be negotiated annually for property and water access.
- Training of the County Fire Districts (CFDs) and Municipal Fire Districts (MFDs) is an ongoing need. National Wildfire Coordination Group (NWCG) annual training needs to occur. Nearly all fire districts have wildfire fighters trained at the Firefighter 2 level but there is a need for training at the Firefighter 1 level. Because volunteer firefighters work during the week, training should occur on weekends. The county is fortunate to have the Sierra Blanca Wildland Fire Academy to provide needed training.
- The fire protection authorities include eight CFDs, three MFDs, the USFS, the NMSFD, and the BLM. All agencies need to collaborate to maintain, and in some cases improve, wildfire fighting equipment, engines, and firefighter training.

Implementing and sustaining the CWPP is the key to success. This is the responsibility of the Core Team. Building partnerships among community-based organizations, fire protection authorities, local governments, public land management agencies, and private landowners is necessary in identifying and prioritizing measures to reduce wildfire risk. Maintaining this cooperation is a long-term effort that requires the commitment of all partners involved. The CWPP encourages citizens to take an active role in identifying needs, developing strategies, and implementing solutions to address wildfire risk by assisting with the development of local community wildfire plans and participating in countywide fire prevention activities.

LINCOLN COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

INTRODUCTION

CWPP Purpose

A Community Wildfire Protection Plan (CWPP) is a strategic plan that identifies specific wildland fire risks and hazards facing communities. The CWPP also provides prioritized mitigation recommendations that are designed to reduce wildfire risks and hazards. Once the CWPP is approved, it is the responsibility of Lincoln County Office of Emergency Services and Core Team to move forward and implement the recommended action items. This may require working with federal, state, county and community fire authorities, and private landowners for project-specific planning and implementation, acquisition of funds, or motivating individual homeowners.

Decades of aggressive wildfire suppression practices in fire-adapted ecosystems have removed a critical natural disturbance mechanism from plant community dynamics. Such management tactics have also led to an alteration of plant composition and structure through the invasion of aggressive and highly flammable weeds and grasses. Fire exclusion has reduced forest and rangeland health through an unprecedented buildup of wildland flammable fuels and changes to the natural fire regime. Fires prior to European settlement would reduce the buildup of fuels, which facilitated forest and rangeland health.

At the same time, demographic trends have shifted as families move into forest and rangeland settings away from traditional urban and suburban communities. Areas where structures and communities intermix with forest and rangeland ecosystems are known as the wildland-urban interface (WUI). Because of the accumulation of flammable fuels in many forests and rangelands, the potential for catastrophic wildfire and loss of human values are great. Appropriate action is needed to reduce wildfire risks and hazards in WUIs through fuels management and improved community awareness. Recent large-scale WUI wildfires that have resulted in devastating losses of structures, business, communities, and human life have received U.S. Congressional attention in the pursuit of effective solutions.

Precipitated by over a decade of increasing WUI wildfires, related losses, and spiraling suppression costs, the National Fire Plan was developed by the federal government in 2000. The Healthy Forests Restoration Act (HFRA) of 2003 implements the core components of the National Fire Plan. HFRA provides the impetus for wildfire risk and hazard assessments and strategic mitigation planning at the county and community level. HFRA refers to this level of planning as the CWPP process. A CWPP empowers a community to take advantage of wildland fire and hazardous fuel management opportunities offered under HFRA including a framework for hazard and risk evaluations

and mitigation planning. A CWPP provides prioritized access to federal and state grant funding to support identified risk and hazard reduction projects, and a basis for collaboration with local, state, and federal land management agencies.

Need for a CWPP

The Lincoln County CWPP is countywide with emphasis on the protection of communities and other economic and ecological values. Historic fire occurrence was a major ecological influence in shaping the natural vegetation. The threat of wildfire continues today. However, wildfire risk to human welfare and economic and ecological values is more serious today than in the past because of the buildup of hazardous fuels, communities, and other infrastructure in proximity to forests and rangelands, and a lack of public appreciation of wildfire. Human-caused ignitions are the main cause of wildfires in Lincoln County and their frequency will likely become more numerous as the county's population grows and outdoor recreation increases.

Natural resource management policy and changing ecological conditions have interacted in ways that resulted in hazardous fuel situations throughout the county. These forces include historic fire-suppression policy, juniper and shrub invasion into grasslands, overstocked forests stands, invasive weeds, livestock grazing, land-use changes, and changing climatic patterns.

The accumulation of hazardous fuels sets the stage for catastrophic wildfire occurrence, resulting in the loss of economic and ecological values. This unfortunate situation was realized in 2012 with the Little Bear Fire, and most recently with the 2019 Pine Lodge Fire. There continues to be a variety of fuels around communities, ranches, structures, and on public lands that create problems for fire protection. Fuels include grasslands, shrublands, pinion-juniper woodlands, ponderosa pine and mixed conifer forests, and weedy fields. Fuels such as dried grass and weeds are highly flammable, burn rapidly, and resist control. A coordinated effort among all fire authorities and private landowners is needed to manage hazardous fuels and reduce the risk of wildfire. The CWPP provides the means to identify wildfire risks and hazards, and prioritize mitigation projects.

The CWPP provides a coordinated assessment of wildfire risks and hazards, and recommends specific mitigation treatments designed to make the assessment area a safer place to live, work, and play. Collaboration among federal, state, and county agencies and private landowners is essential to reduce wildfire risks and hazards. This CWPP provides the framework for collaboration.

Policy Framework

This Lincoln County CWPP is not a legal document. There are no legal requirements to implement the recommendations presented herein. Actions on public lands will be subject to federal, state, and county policies and procedures such as adherence to the HFRA, National Environmental Policy Act (NEPA), and New Mexico's smoke management and open burn polices. Actions on private land may require compliance with county land use codes.

Federal legislative acts that set policy and provide guidance to the development of the CWPP include:

- HFRA (2003) – Federal legislation that promotes healthy forest and open space management, hazardous fuels reduction on federal land, community wildfire protection planning, and biomass energy production.
- National Fire Plan and 10-Year Comprehensive Strategy (2001) – Interagency plan that focuses on firefighting coordination, firefighter safety, post-fire rehabilitation, hazardous fuels reduction, community assistance, and accountability.
- Federal Emergency Management Agency (FEMA) Disaster Mitigation Act (2000) – Provides criteria for state and local multiple-hazard and mitigation planning.

The New Mexico State Forestry Division (NMSFD) is a valuable resource that provides education and guidance to communities and individual landowners concerned with the threat of wildfire, as well as forest resource management in the WUI (http://www.emnrd.state.nm.us/fd/index.htm).

CWPP Process and Core Team

The HFRA designed the CWPP to be a flexible process that can accommodate a wide variety of community needs. The Lincoln County CWPP follows the standardized steps as outlined in *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities* (Table 1).

Table 1. CWPP Development Process

Step	Task	Explanation
One	Convene Decision Makers	Form a Core Team made up of representatives from local governments, fire authorities, NMSFD, and interested stakeholders.
Two	Involve Federal Agencies	Engage local representatives of the USFS, BLM, and other land management agencies as appropriate.
Three	Engage Interested Parties	Contact and encourage participation from a broad range of interested organizations and stakeholders.
Four	Establish a Community Base Map	Develop a base map of the district that provides a better understanding of communities, critical infrastructure, and forest/open space at risk.
Five	Develop a Community Risk Assessment	Develop a risk assessment that considers fuel hazards, community and commercial infrastructure, resources, and preparedness capability. Rate the level of risk and incorporate into the base map as appropriate.
Six	Establish Community Priorities and Recommendations	Use the risk assessment and base map to facilitate a collaborative public discussion that prioritizes fuel treatments and non-fuel mitigation practices to reduce fire risk and structural ignitability.
Seven	Develop an Action Plan and Assessment Strategy	Develop a detailed implementation strategy and a monitoring plan that will ensure long-term success.

Eight	Finalize the CWPP	Finalize the CWPP and communicate the results to interested parties and stakeholders.

Source: Society of American Foresters (2004)

The initial step in developing the Lincoln County CWPP was to organize an operating group that serves as the core decision-making team. The Core Team was organized by the South Central Mountain Resource Conservation & Development Council, Inc. (SCM RC&D) with input from the Greater Ruidoso Area WUI Working Group and Lincoln County Emergency Services. The Greater Ruidoso Area Working group is the most active interagency group in Lincoln County concerned with fuels reduction and wildfire risk. The CWPP update was discussed at multiple GRAWUI working group meetings, which are open to the public, and members of the group were asked to participate in the process to update the CWPP.

The Core Team consists of representatives from local government, local fire authorities, and the New Mexico State Forestry Division (NMSFD). In addition, the Core Team includes relevant land management agencies and community stakeholders. (Table 2) Collaboration among agencies and communities is an important CWPP component because it promotes sharing of perspectives, plans, priorities, and other information that is useful to the planning process. Together, these entities guide the development of the CWPP and must mutually agree on the plan's final content.

Table 2. Lincoln County CWPP Core Team Members

Team Member	Organization	Telephone	E-mail
Rick Merrick	SCM RC&D	575-937-1789	rmerrick@scmrcd.org
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Nick Smokovich	NMSFD Capitan District Forester	575-354-2231	Nick.smokovich@state.nm.us
Frank Silva	NMSFD Capitan District, Timber Mgmt Officer	575-354-2231	Frank.Silva@state.nm.us
Anthony Sanchez	USFS Smokey Bear District, Fire Mgmt Officer	575-257-4095	amsanchez@fs.fed.us
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Adrian Padilla	USFS Mountainair District Ranger		
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Joe Kenmore	Lincoln County Emergency Services	575-808-1381	JKenmore@lincolncountynm.gov

As a strategic plan, the success of the CWPP hinges on effective and long-term implementation of the identified objectives. The CWPP planning and development process must include efforts to build a stakeholder group that serves as an implementation team and will oversee the execution of prioritized recommendations and maintain the plan as the characteristics of the WUI change over time. Specific projects may be undertaken by individual communities, while large-scale fuel treatments will require collaboration among local government and public land management agencies. The Core Team may assist in the implementation of the CWPP action plan in cooperating with communities and private landowners. Public meetings targeted at specific WUIs are recommended as a means to generate additional support and maintain momentum.

CWPP fuel treatment recommendations derived from this analysis are prioritized through an open and collaborative effort with the Core Team and stakeholders. Prioritized treatments target wildfire hazard reduction in the WUI communities, including structural ignitability and critical supporting infrastructure. An action plan guides treatment implementation for high-priority projects over the span of several years. In addition to the CWPP, many members of the Core Team helped to develop the Northern Sacramento Mountains Forest and Watershed Rehabilitation plan that incorporates many of the Lincoln County CWPP principles and priority areas.

The finalized CWPP represents a strategic plan with Core Team consensus that provides prioritized vegetation-fuels treatment projects, non-fuels mitigation recommendations, maps of the assessment area, defensible space recommendations, and other information relevant to the scope of the project.

Lincoln County CWPP Goals and Objectives

The Goals of the 2019 Lincoln County Community Wildfire protection plan are to reduce the risk of wildfires to the residents, firefighters, property, and natural resources of Lincoln County. The document represents a collaborative effort of multiple agencies groups, and stakeholders who have a shared responsibility to reduce the wildfire hazard in our community. This update will take previous assessments and build on those to develop a document that will guide future community protection and mitigation efforts. The document provides a framework for the community to show how we have addressed wildfire risk and what still needs to be accomplished. Communities and subdivisions were invited to provide more detailed input on specific initiatives and projects at a local level. The objectives of the Lincoln County Community Wildfire Protection Plan are;

- To educate residents regarding wildfire risk and shared responsibility.
- To reduce fuel loading around our homes, infrastructure, communities, and forests.
- To decrease structural ignitibility of our homes, business and buildings.
- To manage forested areas to promote forest health and foster resilience.

- To identify areas where landowners and land management agencies can work collaboratively.

Wildland Fire Management Primer

Wildland fire is defined as any fire burning wildland fuels; it includes prescribed fire, wildland fire use, and wildfire. Prescribed fires are planned fires ignited by land managers to accomplish specific natural resource improvement objectives. Fires that occur from natural causes, such as lightning, that are then used to achieve management purposes under carefully controlled conditions with minimal suppression costs are known as wildland fire use (WFU). Wildfires are unwanted and unplanned fires that result from natural ignition, unauthorized human-caused fire, escaped WFU, or escaped prescribed fire.

County fire districts (CFD), municipal fire districts (MFD), NMSFD, U.S. Forest Service (USFS), and Bureau of Land Management (BLM) suppress wildfires in the assessment area according to their operational procedures. The Interagency Joint Powers Agreement (IJPA) calls for the closest force to provide initial attack (IA) on wildfires. The IA responding force may choose to call for additional support as required.

The approach to wildfire suppression depends on landownership policy. Wildland fires on New Mexico State lands are suppressed immediately. BLM and USFS lands operate on a modified fire suppression policy. This means that fires may be allowed to burn under careful observation to a strategic point to improve the likelihood of suppression and minimize costs. Wildfire suppression on private lands is at the discretion of the landowner unless fires threaten public lands or communities.

Wildland fires may be further classified as ground, surface, or crown fires. Ground fire refers to burning or smoldering materials including duff, tree or shrub roots, punchy wood, peat, and sawdust that normally support a glowing combustion without flame. Surface fire refers to loose fuels burning on the surface of the ground such as leaves, needles, and small branches, as well as grasses, forbs, low and medium shrubs, tree seedlings, fallen branches, downed timber, and slash. Crown fire is a wildfire that moves rapidly through the crowns of trees or shrubs independently of a surface fire.

Wildland Fire Behavior

Fire behavior is a description of the manner in which a fire reacts to the influences of fuel, weather, and topography. Fire behavior is observed and assessed at the flaming front of the fire and described most simply in terms of fire intensity (in feet of flame length) and in rate of forward spread (Table 4). The implications of observed or expected fire behavior are important components of suppression strategies and tactics, particularly in terms of the difficulty of control and effectiveness of various suppression resources. Fire risk is the probability that wildfire will start from natural or human-caused ignitions. Fire hazard is the presence of ignitable fuel coupled with the influences of topography and weather, and is directly related to fire behavior. Fire severity, on the other hand, refers to the immediate effect a fire has on vegetation and soils.

Table 3. Fire Behavior Ratings

Rating	Flame Length (feet)	Implication
Low	0 - 1	Fire will burn and spread; however, it presents very little resistance to control and direct attack by firefighters is possible.
Moderate	1 - 3	Fire spreads rapidly presenting moderate resistance to control but can be countered with direct attack by firefighters.
Active	3 - 7	Fire spreads very rapidly presenting substantial resistance to control. Direct attack by firefighters must be supplemented with equipment and/or air support.
Very Active	7 - 15	Fire spreads very rapidly presenting extreme resistance to control. Indirect attack may be effective. Safety of firefighters in the area becomes a concern.
Extreme	> 15	Fire spreads very rapidly presenting extreme resistance to control. Any form of attack will probably not be effective. Safety of firefighters in the area is of critical concern.

Source: Stubbs (2005)

The nature of fuels, topography, and weather conditions combine to dictate fire behavior, rate of spread, and intensity. Wildland fuel attributes refer to both dead and live vegetation and include such factors as density, bed depth, continuity, vertical arrangement, and moisture content. Structures with flammable materials are also considered a fuel source.

When fire burns in the forest understory or through grass, it is a surface fire. When fire burns through the canopy of shrubs and trees, it is considered a crown fire. Ladder fuel is the vegetation that spans the gap between the forest floor and tree crowns and can conduct a surface fire to become a crown fire.

For fire to spread, potential fuels such as trees, shrubs, or structures in the flame front must meet the conditions of ignitability. The conditions needed are the presence of oxygen, flammable fuel, and heat. Oxygen and heat are implicitly available in a wildland fire; however, if the potential fuels do not meet combustion conditions, the fire will not ignite. This explains why some trees, patches of vegetation, or structures may survive a wildfire, while others in the near vicinity are completely burned.

Weather conditions such as high ambient temperatures, low relative humidity, and windy conditions favor fire ignition and high-intensity fire behavior. Under no-wind conditions, fire burns more rapidly and intensely upslope than on level terrain. However, wind tends to be the driving force in fire behavior in the WUI.

History of Wildfire

Lightning-induced fire is a natural component of forest and rangeland ecosystems in Lincoln County, and its occurrence is important to maintaining the health of forest and rangeland ecosystems. Native Americans used fire as a tool for hunting, improving wildlife habitat, and land clearing. As such, many of the plant species and communities are adapted to recurring fire through phenological, physiological, or anatomical

attributes. Some plants, such as ponderosa pine and western wheatgrass, are fire adapted and may require recurring fire to maintain viable populations.

European settlers, land use policy, and changing ecosystems have altered fire behavior and fuels accumulation from their historic setting. Euro-American settlers in Lincoln County changed the natural fire regime in several interrelated ways. The nature of vegetation-fuel changed because of land use practices such as homesteading, livestock grazing, agriculture, water development, and road construction. Livestock grazing reduced the amount of fine fuels such as grasses and forbs, which carried low-intensity fire across the landscape. Continuous stretches of forest and rangeland vegetation-fuels were broken up by land-clearing activities. The removal of the natural vegetation facilitated the invasion of non-native grasses and forbs, some of which create more flammable fuel beds than their native predecessors.

Prescribed Fire

Prescribed fire occurs throughout the county as field burns, ditch fires, rangeland improvement, weed abatement, burn piles, wildlife habitat improvement, and fuels management. Prescribed fire may be used as a resource management tool under carefully controlled conditions. This includes pre-treatment of the fuel load and close monitoring of weather and other factors. Prescribed fire ultimately improves wildlife habitat, helps abate invasive vegetation, reduces excess fuel loads, and lowers the risk of future, severe wildfires in the assessment area. These and other fuel management techniques are employed to protect human life, economic values, and ecological values. The use of prescribed fire in the WUI is carefully planned, enacted only under favorable weather conditions, and must meet smoke management requirements of the New Mexico Environment Department, Air Quality Bureau.

Prescribed fire may be conducted either in a defined area, as a broadcast burn, or in localized burn piles. Broadcast burns are used to mimic naturally occurring wildfire, but only under specific weather conditions and fuel loads, and with expert supervision. Burn piles are utilized to dispose of excess woody material after thinning if other means of disposal are not available or cost-prohibitive. Prescribed fire must be conducted in accordance with Lincoln County fire ordinance, which consists of a burn permit issued by the Office of Emergency Services, and adherence to New Mexico smoke management policy.

Overview of Wildland-Urban Interface

A WUI involves areas where communities and a wildland fuel intermix. Every fire season, catastrophic losses occur as a result of wildfire in WUI areas throughout the western United States. Homes are lost, businesses are destroyed, community infrastructure is damaged, and most tragically, sometimes lives are lost. Precautionary action taken before a wildfire strikes often makes the difference between saving and losing a home. Creating a defensible space around homes, businesses, and other structures is an important component in wildfire hazard reduction. Providing an effective defensible space can be as basic as pruning trees, planting low-flammability vegetation, and cleaning up surface fuels and other hazards near a home. These efforts are typically concentrated within 30 feet of a home to increase the chance for structure survival and to create an area for firefighters to work. In addition to direct flames, embers can rain down on

a home like a hail storm. If these embers become lodged in something receptive to fire like wood shingles, skylights, vents, woodpiles, decking or outdoor furniture, the home will be in jeopardy of burning. Embers can be carried more than a mile ahead of the fire, so homes located blocks away from the actual flame front are vulnerable to ignition unless homeowners reduce structural ignitability as well as maintaining Defensible Space.

Lincoln County has several communities who have been rated as FireWise and recognized nationally for their work. Efforts to make more communities FireWise continue and encouraged.

WUI studies suggest that the intense radiant heat of a wildfire is unlikely to ignite a structure that is more than 30 feet away as long as there is no direct flame impingement. Studies of home survivability indicate that homes with noncombustible roofs and a minimum of 30 feet of defensible space have an 85-percent survival rate (Cohen 2000). Conversely, homes with wood shake roofs and less than 30 feet of defensible space have a 15-percent survival rate. In addition to publications provided by the partners describing steps homeowner can take, WUI assessment are available free of charge by members of the Core Team.

Hazardous Fuels Mitigation

Wildfire behavior and severity are dictated by fuel type, weather conditions, and topography. Because fuel is the only variable of these three that can be practically managed, it is the focus of many mitigation efforts. The objectives of fuels management may include reducing surface fire intensity, reducing the likelihood of crown fire initiation, reducing the likelihood of crown fire propagation, and improving forest and rangeland health. These objectives may be accomplished by reducing surface fuels, limbing branches to raise canopy base height, thinning trees to decrease crown density, and/or retaining larger, fire-resistant trees.

By breaking up vertical and horizontal fuel continuity in a strategic manner, fire suppression resources are afforded better opportunities to control fire rate of spread and to contain wildfires before they become catastrophic. In addition to the creation of defensible space, fuel breaks may be utilized to this end. Fuel breaks are strategically located areas where fuels have been reduced in a prescribed manner, often along roads. Fuel breaks may be strategically placed with other fuel breaks or with larger-area treatments. When defensible space, fuel breaks, and area treatments are coordinated, a community and the adjacent natural resources are afforded an enhanced level of protection from wildfire.

LINCOLN COUNTY CWPP ASSESSMENT AREA PROFILE

County Setting

The Lincoln County CWPP assessment area is countywide (Map 1). Land ownership within the assessment area is divided among federal, state and private at 1,094,936, 297,843, and 1,696,570 acres, respectively. Lincoln County is located in south-central New Mexico with Otero and Chaves counties on its southern border. De Baca and Chaves counties are located to the east. Torrance and Guadalupe counties form its northern boundary. Socorro County is on the western boundary.

The county has an area of 4,831 square miles with a population of 20,497 (2010 census). Much of Lincoln County is a high desert, with the White and Sacramento mountains encompassing the southern portion of the county. This CWPP includes the entire county with an emphasis on areas prone to high wildfire risk and WUI communities including the mountainous areas which contain a mix of private, public and wilderness areas.

Important economic values in Lincoln County are year-round recreational resort facilities, tourism, historical communities and buildings, site seeing, and retirement communities. Ecological values include watersheds, wildlife and aquatic habitats, rangeland grazing, forest products, and view sheds. The Bonito and other watersheds are water sources for communities inside and outside of the county. The importance of these watersheds was seen when the Little Bear Fire raged over six different watersheds. Bonito Lake was lost as a water supply for Alamogordo. Efforts continue today to bring this asset back into play as both a water supply and a recreational destination. Important infrastructure includes such things as U.S. Highways (54, 70, 285, and 380), county roads, a railroad, communication towers, communities, watersheds, ski area, and historical communities.

Vegetation and fuels in Lincoln County vary widely and are largely dependent on elevation. Grasslands and desert scrub exist at lower elevations, pinon juniper woodlands and pine forests exist at mid elevations and mixed conifer forests exist at high elevation. Lincoln County was first settled by Europeans in the late 1800's with residents engaging in ranching and agriculture. The mountainous areas around Ruidoso area became a tourist destination in the early 1900's and Ruidoso continues to be one of the most visited areas in the state of New Mexico.

The present population of 20,497 represents a growth rate of 5.6% from the 2000 census. The county's three largest municipalities Ruidoso, Ruidoso Downs, and Capitan, have a full time population of 8,005, 2,739, and 1,470 respectively. The majority of the population lives in the high elevation portions of the county, in and around Ruidoso. The Greater Ruidoso area is a popular tourist destination and during summer weekends the population can swell to 40,000 people. The population as a whole is growing slowly, with an influx of retirees and transplants from out of the area, and while development slowed after the 2008 real estate crash, development continues. The majority of the building occurs around Ruidoso and Alto.

Wildland fire protection in the assessment areas are provided by eight CFDs, three MFDs, the NMSFD, the USFS, and the BLM. The CFDs and MFDs have responsibility for structure and wildfire suppression within their respective districts. The NMSFD has wildland fire management responsibilities on state and private lands. The USFS and the BLM have authority for wildfire suppression and fuels management on their respective lands.

Lincoln County Wildland-Urban Interface

The WUI involves areas where communities and wildland fuels intermix and is the focus of this CWPP. There are multiple definitions of the Wildland Urban Interface (WUI). Per the National Fire Protection Agency, the WUI is "a set of conditions that can exist in any community, determined by the combustibility of structures and their proximity to vegetation

and other structures, the type and distribution of vegetation, climate and weather patterns, fire history, topography and other landscape features, access, and more."

The Ready, Set Go Program defines it as: "areas where homes are built near or among lands prone to wildland fire."

Federal Register/Vo l. 66, No. 3/Thursday, January 4, 2001/Notices; and "Fire in the West, The Wildland/Urban Interface Fire Problem", in the "A Report for the Western States Fire Managers", September 18, 2000: "The Urban Wildland Interface community exists where humans and their development meet or intermix with wildland fuel."

The Southwest Forest Alliance defines it as: "areas where urban fuels directly meet forest fuels. This is primarily within 20-60 meters of houses, where fire most directly threatens the house, and where a defensible zone can be developed."

All of the definitions target the areas where people intermingle with the forest. It is ultimately up to the communities where WUI areas exist to decide what the final definition is. Lincoln County has a large amount of WUI within its borders but how to define it is up to debate. The County has explored several WUI definitions and has had extensive discussions about how to define our Wildland Urban Interface. The Lincoln National Forest surrounds several communities, and numerous private holdings, and recently defined the entire ranger district as WUI with the exception of the White Mountain and Capitan Wilderness Areas. In addition to recreation, and hunting, much of the forest is leased to grazing permit holders, and management of these lands directly affects the livelihood of county residents.

The CWPP core team determined that the WUI is composed of both interface and intermix communities, and is defined as a group of areas where human habitation and development meet or intermix with wildland fuels. Interface areas include housing developments that meet or are within 1.5 miles of continuous vegetation. Intermix areas are those where structures are scattered throughout a wildland area. 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. Also included, but not limited to, are important community water sources and other infrastructures such as electronic sites, mountain top repeaters, towers, pipelines, cultural resources, reservoirs, dams, treatment plants, bridges, roads, lift stations, hospitals, and other critical infrastructures.

WUI areas will be expanded in areas of greater risk and will be based on community and Core Team input. The WUI creates an environment in which fire can move readily between structural and vegetative fuels, increasing the potential for wildfire ignitions and the corresponding potential loss of life, livelihood, and property.

Climate

The climate of Lincoln County is moderate (Table 5). Summertime high temperatures range in the 80s Fahrenheit (°F) with lows in the 40s and 50s °F. Winter temperatures vary from highs in the upper 40s and 50s °F; lows in the 20s °F. The assessment area has over 300 days of sunshine per year. Average annual precipitation is 22 inches around Ruidoso and 15 inches around Corona. **The majority of precipitation is received**

during summer months. Snowfall in Ruidoso and Corona is 38 and 44 inches, respectively, while the higher peaks around Sierra Blanca receive over 100 inches of snowfall annually.

Table 4. Average Monthly Climate Summary for the Villages of Ruidoso and Corona

(January 1914–June 2006)

Climate Attribute	Month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Ruidoso													
High Temperature (°F)	49	52	57	65	74	82	81	79	75	67	57	50	66
Low Temperature (°F)	19	20	24	29	35	43	48	48	41	32	23	19	32
Average Total Precipitation (inches)	1.1	1.1	1.1	0.7	0.9	1.02	3.8	4.2	2.5	1.6	0.9	0.6	21.5
Corona													
High Temperature (°F)	42	48	55	64	70	81	82	79	73	65	52	45	63
Low Temperature (°F)	18	21	26	32	40	50	54	54	48	36	27	19	35
Average Total Precipitation (inches)	0.8	0.8	0.7	0.4	1.3	1.1	1.9	2.6	1.8	1.2	1.0	1.2	14.8

Source: www.wrcc.dri.edu

Terrain

Terrain, elevation, and aspect play an important role in determining vegetation-fuels and wildland fire behavior. Different vegetation-fuel types occur with various combinations of terrain, elevation, and aspect. Terrain affects fire behavior because the rate of fire spread and flame length are greater on steep slopes than on level ground. Elevation is important because of differences in precipitation and temperatures. At higher elevations, precipitation is usually greater, and temperatures are usually lower than at lower elevations. Aspect is the orientation of the terrain to sun light. This means that south facing slopes are usually drier and warmer than north facing slopes.

The terrain in Lincoln County varies from relatively flat prairie lands and rolling foothills to high mountain peaks. In the north, northeast, northwest, and central portions of the county, slopes vary from 0 to 8 percent with elevations of 4,000 to 6,000 feet. The terrain in the southeast has slopes of 3 to 15 percent with elevations of 6,300 to 7,000 feet. Valley bottoms, ridge slopes, ridges, and mountain peaks occur in the southwest to west-central portions of the county. Slopes depend on terrain position and range from 0 to 45 percent with elevations from 5,500 to 11,981 feet.

Wildland Vegetation and Fuels

The plant species composition of Lincoln County is diverse because there is a mixing of vegetation from the Chihuahuan Desert, Sonora-Mohave, the Western Great Plains, and the Madrean vegetation provenances (Map 2). Also, plant communities vary from desert scrub and grasslands to alpine vegetation due to elevation diversity. The unique mix of vegetation in Lincoln County needs protection from catastrophic wildfire.

Wildland vegetation-fuels include grass, leaves, twigs, ground litter, weeds, shrubs, and trees. Structures in the WUI are also a fuel source. Vegetation-fuels throughout Lincoln County are varied and include grasslands, desert scrub, pinion-juniper woodlands, ponderosa pine and mixed-conifer forests. Grasslands and desert scrub occur at the lower elevations, pinion-juniper woodlands occur at mid-elevations, and ponderosa pine and mixed conifer dominate at the higher elevations. Short- and mid-grass prairie is widespread in the northeastern, eastern, southeastern, northwestern, western, and central portions of the county on relatively flat terrain. In some areas, juniper or ponderosa pine trees are encroaching into grasslands. Pinion-juniper woodlands occur in the northwestern, north-central and southeastern parts of the county on rolling foothills. Ponderosa pine and mixed conifer forests are located in the southwestern and northwestern sections of the county in mountainous terrain. Bosque (riparian) vegetation occurs along arroyos and stream banks. Each type of vegetation-fuel presents unique challenges to reduce fuel hazards.

Understanding the fire behavior characteristics of different vegetation-fuel types facilitates effective fuel-management and wildfire suppression strategies (Table 6). Classifications of vegetation-fuel types are known as fire behavior fuel model (FBFM). The value of FBFMs is that fire behavior within grasses, shrubs, and timber vegetation groups can be predicted. Map 5 illustrates the spatial orientation of FBFMs within the county.

Table 5. Lincoln County Fire Behavior Fuel Models

Fire Behavior Fuel Model	Percent of County	Description
FBFM 1	56	**Grass Group** – Fire spread is determined by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. These surface fires move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally less than one-third of the cover of the area. Annual and perennial grasses occur in this model. Fire rate of spread is fast at 5,148 feet per hour with flame lengths greater than 4 feet.
FBFM 2	7	**Grass Group** – Fire spread occurs through cured dead herbaceous fuels. These are surface fires where downed woody debris from the shrub and tree component adds to fire intensity. Open shrublands, pine stands, or oakbrush stands that cover from one-third to two-thirds of the area generally fit this model. Fire rate of spread is rapid at 3,210 feet per hour with flame lengths of 6 feet.

FBFM 4	< 1	**Shrub Group** – Fire intensity and fast-spreading fires involve the foliage and live and dead fine woody material in the crowns of a nearly continuous secondary overstory. Stands of mature shrubs, 6 or more feet tall, such as mesquite, cat's claw, and oak. Besides flammable foliage, dead woody material in the stands significantly contributes to the fire intensity. Height of stands qualifying for this model depends on local conditions. A deep litter layer may also hamper suppression efforts. Fire rate of spread is 4,950 feet per hour with flame length of 19 feet.
FBFM 5	5	**Shrub Group** – Fire is generally carried in the surface fuels that are made up of litter cast by the shrubs and the grasses or forbs in the understory. The fires are generally not very intense because surface fuel loads are light, the shrubs are young with little dead material, and the foliage contains little volatile material. Usually shrubs are short and almost totally cover the area. Young, green stands with no dead wood would qualify: young mesquite, catclaw, oak and creosote would qualify. Fire rate of spread is 1,188 feet per hour and flame length is 4 feet.
FBFM 6	6	**Shrub Group** – Fire spreads though the shrub layer with flammable foliage but requires moderate winds to maintain the foliage fire. Fire will drop to the ground in low-wind situations. Shrubs are mature with heights less than 6 feet. These stands include oak, creosote and mesquite less than 6 feet tall. Fire rate of spread is fairly fast at 2,110 feet per hours with flame lengths of 6 feet.
FBFM 8	19	**Timber Group** – These are slow-burning ground fires with low flame lengths, although the fire may encounter an occasional "jackpot" of heavy fuel concentration that can flare up. Only under severe weather conditions involving high temperature, low humidity, and high winds do the fuels pose fire hazards. Closed canopy stands of short-needle conifers or hardwoods that have leafed out support fire in the compact litter layer. This layer is mainly needles, leaves, and occasionally twigs because little undergrowth is present in the stand. Representative conifer types are pinion pine and mixed-conifer. Aspen stands also qualify. Fire rate of spread is slow at 132 feet per hour with a flame length of 1 foot.
FBFM 9	2	**Timber Group** – Fires in this FBFM run through the surface litter faster than model 8 and have longer flame height. Long-needle conifer stands such as ponderosa pine are typical. Closed stands of long-needled pine, e.g., ponderosa, are grouped in this model. Concentrations of dead-down woody material will contribute to possible torching of trees, spotting, and crowning. Fire rate of spread is slow at 528 feet per hour with a flame length of 3 feet.
FBFM 10	2	**Timber Group** – These fires burn in surface and ground fuels with greater fire intensity than the timber litter models. Dead-down fuels include greater quantities of 3-inch or larger limb wood resulting from over maturity or natural events that create a large load of dead material on the forest floor. Crowning out, spotting, and torching of individual trees are more frequent in this fuel situation, leading to potential fire-control difficulties. Any forest type may be considered if heavy down material is present (examples are insect fested or diseased, wind thrown, overmature, or partial-cut slash stands; ponderosa pine and mixed conifer). Fire rate of spread is slow at 528 feet per hour with a flame length of 5 feet.
FBFM 12	< 1	**Logging Slash Group** – This model supports rapidly spreading fires with high intensities capable of generating firebrands. When fire starts, it is generally sustained until a fuel break or change in fuel is encountered. The fuel is dominated by slash with much of it less than 3 inches in diameter. Heavily thinned conifer stands, clear cuts, and medium or heavy partial cuts are examples. Fire rate of spread is slow at 858 feet per hour with a flame length of 11 feet.

Source: Anderson (1982)

FBFMs 1 and 2 account for 63 percent of wildland fuels in Lincoln County where the dominant surface fuels are grasses with a mixture of woody vegetation (Map 5). FBFMs 1 and 2 occur throughout the county. The timber FBFMs account for approximately 23 percent of the county. These vegetation-fuel types are found in mountainous areas.

Grass fuels are especially dangerous when they dry in the fall and winter because they ignite easily, resist suppression, and burn rapidly. A wind-driven fire will move rapidly through dry grasslands. Vegetation-fuels management, such as mowing along roads, livestock grazing, and judicial use of herbicides, is warranted. A rapid response to grass fires is needed in the WUI to protect structures and other values. Homeowners need to create defensible space to protect structures and be prepared for rapid evacuation.

Water Resources

All of the fire districts (FDs) have access to water through hydrants or wells within the respective communities that they service. However, there is a scarcity of water available for nearly all FDs. Surface water includes the Rio Ruidoso, Rio Hondo, Alto Lake, Eagle Lake, Grindstone Lake, Alto County Club Lake, Kokepelli Lake, Rainmaker Lake, Copper Ridge Lake, Bonito Lake, Alto Reservoir, Silver Pond, and other streams and ponds. Tender access for water drafting and helicopter dipping to fill water buckets are available at the Alto Lake, Eagle Lake, Grindstone Lake, Alto County Club Lake, Kokopelli Lake, Rainmaker Lake, Copper Ridge Lake, Bonito Lake, and Alto Reservoir. There are also stock ponds and irrigation systems available on private lands, but availability depends on precipitation and landowner permission.

Wildfire Protection Resources

Lincoln County has multiple land management agencies and fire departments that respond to emergency incidents. Incidents are managed by different agencies depending on the jurisdiction. If additional resources are needed for a wildfire resources from multiple agencies are called in for assistance. Under certain circumstances joint command or incident management teams are used to manage wildfire incidents. Large incidents will require more resources, but the local resources listed below can respond quickly to wildfires in Lincoln County.

Table 6. Wildfire Protection Resources

DEPT	NUMBER OF FIREFIGHTERS	CLASS	TYPE	DRIVE	PUMP	WATER	EXTRAS
ARABELA	**21**						
AFD		Structure Engine	1		1250	1250	Foam
AFD		Structure Engine	2		500	500	
AFD		Brush Engine	6	4x4	125	300	
AFD		Brush Engine	6	4X4	250	450	Foam
AFD		Water Tender	4			1800	
AFD		Brush Engine	6	4X4	125	250	
AFD		Water Tender	1		500	4000	
AFD		Brush Engine	6	4x4	125	260	Foam
AFD		Polaris	7	6x6	50	70	Foam
BLM ROSWELL							
ROD		Engine	4	4X4	150	850	

DEPT	NUMBER OF FIREFIGHTERS	CLASS	TYPE	DRIVE	PUMP	WATER	EXTRAS
ROD		Engine	4	4X4	150	850	
ROD		Engine	6	4X4	50	280	
Roswell Air Tanker Base		Tanker Base	SEAT, LAT, VLAT				
BONITO	**21**						
BFD		Interface Engine	2	4X4	1000	750	Foam
BFD		Pumper/Tender	2		750	3000	Foam
BFD		Interface Engine	2		750	500	Foam
BFD		Structure Engine	1		1250	500	CAFS
BFD		Attack Engine	5	4x4	250	300	Foam
BFD		Attack Engine	5	4x4	250	300	Foam
BFD		Attack Engine	5	4x4	250	300	Foam
BFD		Water Tender	2		500	1865	
BFD		Water Tender	2		500	2000	
BFD		Brush Engine	6	4x4	200	300	Foam
BFD		Rescue		4x4			extrication
BFD		Command		4x4			rescue
BFD		Brush Engine	6	4x4	125	250	
OES		Command Unit		4x4			
OES		Polaris Ranger	7	6x6	50	70	foam
CAPITAN	**20**						
		Brush Engine	6				
		Brush Engine	6				
		Brush Engine	6				
		Water Tender	2				
		Structure Engine	1				
		Structure Engine	2				
		Structure Engine	1				
CARRIZOZO MFD							
		Structure	1				
		Structure	1				
		Bush	6				
		Brush	5				
		Brush	6				
		Brush	5				
CORONA							
		Brush	E-6		125	200	
		Brush	E-6		250	200	
		Rescue	E-6		250	250	
		Tanker					
		Engine	ST1/S-3		1250	1500	
		Engine	ST1/S-3		1000	1000	
COPPER RIDGE	**3**						
FT. STANTON		Maverick	1		1500	1500	

DEPT	NUMBER OF FIREFIGHTERS	CLASS	TYPE	DRIVE	PUMP	WATER	EXTRAS
GLENCOE	**23**						
GFD		Interface Engine	2/4	4x4	1250	1250	Foam
GFD		Structure Engine	1		1500	1000	CAFS
GFD		Interface Engine	2/4		1000	750	Foam
GFD		Brush Engine	6	4x4	250	250	
GFD		Brush Engine	5		250	400	
GFD		Water Tender	1		500	4000	
GFD		Water Tender	1			3000	
GFD		Brush Engine	6	4x4	220	250	Foam
GFD		Command Unit		4x4			
HONDO	**17**						
HFD		Command Unit		4x4			
HFD		Structure Engine	2		750	500	
HFD		Attack Engine	5	4x4	150	350	Foam
HFD		Brush Engine	6	4x4	125	250	
HFD		Brush Engine	6	4x4	125	200	
HFD		Brush Engine	6	4x4	125	250	
HFD		Water Tender	4		500	1800	
HFD		Interface Engine	1	4x4	1250	1000	Foam
HFD		Polaris	7	6x6	50	70	Foam
LINCOLN COUNTY OES							
OES		Command Unit		4x4			
OES		Command Unit		4x4			
OES		Polaris Ranger	7	6x6	50	70	foam
OES		Amphibious ATV		8x8			Rescue
OES		Mobile Air Trailer					Air
OES		Mobile Command	2/3			Mobile Communications	
OES		Rescue Trailer				Specialized Rescue	
OES		Hazmat Trailer				Hazmat	
OES		Camper Trailer			29 foot	Deployment Quarters	
OES		Fuel Truck		4x4		Fuel/Service Truck	
LINCOLN	**18**						
LFD		Structure Engine	1		1250	1000	Foam
LFD		Structure Engine	1		1250	1500	
LFD		Structure Engine	2		750	500	
LFD		Attack Engine	6	4x4	250	250	
LFD		Brush Engine	6	4x4	250	350	
LFD		Structure Engine	1		1500	1000	CAFS
LFD		Brush Engine	6	4x4	250	250	
LINCOLN NF SMOKEY BEAR RANGER DISTRICT	**22**						
D1		Engine	6				

DEPT	NUMBER OF FIREFIGHTERS	CLASS	TYPE	DRIVE	PUMP	WATER	EXTRAS
D1							
D1		Engine	6				
D1		Engine	3				
NM STATE FORESTRY							
N5S		Engine	6	**4x4**	**125**	**350**	**Foam**
N5S		Engine	6	**4x4**	**125**	**350**	**Foam**
N5S		UTV		**4x4**	**50**	**50**	
NOGAL	**16**						
NFD		Brush Engine	6	4x4	125	350	Foam
NFD		Pumper/Tender	2		500	2000	
NFD		Structure Engine	1		1250	1250	Foam
NFD		Attack Engine	6	4x4	250	300	
NFD		Rescue Command		4x4			
WHITE OAKS	**18**						
WOFD		Pumper Tender	2		1000	2000	Foam
WOFD		Structure Engine	1		1500	1000	
WOFD		Brush Engine	6	4x4	125	250	
WOFD		Brush Engine	6	4X4		400	
WOFD		Water Tender	3		325	1200	
RUIDOSO MFD		Structure Engine	1		1500	1000	
RFD		Structure Engine	1		1500	1000	
RFD		Interface Engine	6	4X4	1000	300	
RFD		Brush Engine	6	4X4	200	400	
RFD		Brush Engine	6	4X4	200	400	
RFD		Brush Engine	6	4X4	200	400	
RFD		Brush Engine	6	4X4	200	300	
RUIDOSO DOWNS MFD		Structure Engine	1				
RDFD		Structure Engine	1				
RDFD		Brush Engine	6				
RDFD		Brush Engine	6				
RDFD		Water Tender					

Values at Risk

Human welfare receives priority protection in the event of a wildfire. Economic and ecological values are secondary to human welfare, but they can also receive proper protection through collaborative planning. Economic values are agriculture, communities, homes, and businesses. Ecological values include wildlife and aquatic resources, recreation and tourism, and watersheds for municipal water supplies. Examples of values at risk in the assessment area include:

- Human welfare
- Homes
- Businesses
- Local economies
- Municipal water supply
- Community infrastructure
- Communication towers
- Major highways and railroads
- County and state parks
- Agricultural lands
- Wildlife and aquatic habitats
- Watersheds
- Water quality
- Air quality
- Natural vegetation
- Viewsheds
- Recreation and tourism

Wildfire could occur in all portions of the county and would have a severe and long-term impact on economic and ecological values. The actions recommended in this CWPP are targeted at lowering wildfire risks and hazards to communities and other economic and ecological resources.

WILDFIRE RISK AND HAZARD ASSESSMENTS

Wildfire risk is the probability that a wildfire will ignite from lightning or human causes. Wildfire hazard refers to vegetation-fuel attributes that may be conducive to propagate and carry a fire.

Approach to Wildfire Risk and Hazard Assessments

Several sources of information were gathered and synthesized to formulate an understanding of wildfire risks and hazards. Sources for information included WUI/community and vegetation-fuel surveys, various maps, interviews with county fire authorities, and community meetings.

County fire chiefs, municipal fire chiefs, and federal and state fire management officers were interviewed to obtain information on firefighting engines available for their respective authority, number of trained wildland firefighters, vegetation-fuels management needs, equipment and resource needs, and training needs. This information is important to determine and prioritize non-fuels mitigation needs to improve wildfire fighting capability and capacity.

As part of the assessment, a concerted effort was made to solicit feedback from the public and local experts on fire and natural resource issues. A Core Team consisting of Bureau of Land Management (BLM), U.S. Forest Service (USFS), New Mexico State Forestry Division (NMSFD), soil and water conservation district (SWCD), and Lincoln County representatives was formed. Core Team Meetings were held on August 28, 2018, October 23, 2018, February 19, 2019 and May 21, 2019. The Rural Community Forester met with the county Fire Chiefs on January 19, 2019. A Community Meeting was held on March 30, 2019, and additional public outreach was conducted at the Ruidoso Home & Garden Show in March 2019 and at Smokey Bear Days in May 2019. The purposes of the community meetings was to introduce CWPP goals and objectives, discuss wildfire risks and hazards, provide an opportunity for the public to participate in the process, and review proposed mitigation possibilities. Participants were asked to fill out the CWPP survey either online or on a paper format.

A survey of Lincoln County was conducted to define wildland-urban interface (WUI) areas. The WUI is an area where communities and other infrastructure intermix with wildland vegetation-fuels. The Core Team also utilized the Communities At Risk Assessment provided by NM State Forestry Division in developing the Community Wildfire Protection Plan.

The National Fire Protection Association (NFPA) Form 1144, *Standard for Protection of Life and Property from Wildfire 2002 Edition,* was used to assess the level of risk and hazard to communities and individual houses. The evaluation consisted of rating

attributes such as means of access, surrounding vegetation (fuels), presence of defensible space, topography, roofing and other construction materials, available fire protection, and placement of utilities. Scores were assigned to each element and then totaled to determine the level of risk. A community was labeled as having low, moderate, high, or extreme risk based on the total score. Community assessments were conducted during the Fall and Spring of 2019.

Historic Wildfire Regime

Historic reference wildfire regimes are the kind of fires that occurred in Lincoln County prior to European settlement (Map 6). Lightning and Native Americans were the causes for these fires. The historic fire regime is composed of the average return interval for wildfire and its severity. The average return interval is the number of years between wildfires. Fire severity is the amount of vegetation top-kill. Low-severity, mixed-severity, and stand-replacement fires are those resulting in less than 25, 25 to 75, and greater than 75 percent top-kill, respectively. Understanding the historic fire regime is important to understanding the present risk of wildfire.

There are five different historic reference fire regimes within Lincoln County. The dominant historic fire regime was less than 35 years return interval with replacement severity. This means that severe wildfires burned over 82 percent of the county approximately every 35 years.

Recent Wildfire History

Wildfire occurrence in Lincoln County is common (Map 7). Fires were especially common in the Nogal-Alto-Lincoln WUI. Another dominant pattern of fire occurrence is along U.S. Highways 54, 70, 285, and 380.

The fire regimes in Lincoln County are largely dependent on forest type. Before human settlement, Pinon Juniper woodlands and mixed conifer forests experienced infrequent high intensity stand replacing fires, while Ponderosa Pine forests experienced more frequent lower intensity fires. Fires have been suppressed for about 100 years, since communities in this area have had the capacity to do so. Human efforts combined with climactic conditions have altered fire regimes and fuel conditions. The county has recently experienced several large wildfires costing millions of dollars in property damage and suppression costs.

In June of 2012, the Little Bear Fire burned approximately 35,300 acres of National Forest System (NFS) Lands on the Smokey Bear Ranger District of the Lincoln National Forest, with a total burn area of 44,330 acres. The fire started in the White Mountain Wilderness and ran north east across six watersheds, including the Rio Bonito, in the mountains directly adjacent to Ruidoso, Alto, and Angus, New Mexico. The burn severity was high to moderate throughout 53% of the fire. There was extensive loss of property with over 240 structures lost.

Fire intensity and size have been increasing due to the increase of fuels, tree density, large areas of continuous fuels and a dry weather cycle. Wildfires have occurred in almost every vegetation type within the county, including grasslands, pinon juniper forests, ponderosa pine forests, and mixed conifer forests. Fires have been started by both human and natural

causes close to homes and roads, as well as isolated undeveloped areas. Most wildfires have been suppressed while still small, but several have grown into large fires. The table below lists the large wildfires (>1,000 acres) that Lincoln County has experienced since the year 2000. The attached map shows these fires and additional fires the county has experienced in the last 50 years.

Table 7. Lincoln County Large Fire History

Lincoln County Large Fire History – Since 2000

Name	Date	Size (acres)	Structures lost
Cree	May, 2000	6,500	3
Kokopelli	March, 2002	1,000	29
Lookout	May, 2004	5,280	5
Peppin	June 2004	64,000	12
Donaldson	June, 2011	101,563	1
White	April, 2011	10,341	12
Little Bear	June, 2012	44,330	250
Pine Lodge	June, 2019	15,045	3

Wildfire Ignition Risk Potential

Wildfire ignition risk potential (IRP) is a measure for the probability of fire occurrence. The IRP is a landscape spatial analysis of the 1987 to 2007 wildfire data presented in Map 7. IRP illustrates the patterns of fires in the various WUIs. IRP is defined as the number of fires per 1,000 acres for the years 1987 to 2007. No fires occurred in the low-risk areas. One fire occurred in the moderate-risk areas. Two or more fires occurred in the high-risk areas. The low-risk lands occupied 69 percent of Lincoln County, and fires generally occurred in areas away from communities and roads (Map 8). Seventeen percent of the county was classified as high-risk, and fires occurred near communities, roads, agricultural lands, and the railroad corridor. The moderate-risk areas accounted for 14 percent, and they occurred on lands between the high- and low-risk areas. IRP was used to determine the level of wildfire risk in the WUIs and to communities.

Vegetation-Fuel Hazards

Fire Regime Condition Class (FRCC) is a measure of the degree of departure from a reference condition, which is determined by comparing the existing fire regime and vegetation-fuels situation with the historic fire regime and natural vegetation, respectively (Table 11). The degree of departure may result from differences in the historical fire regime (i.e., fire return frequency and severity) and/or vegetation composition. According to HFRA, FRCC is the accepted tool for assessing forest or rangeland health. FRCC classification is necessary to support federal vegetation-fuel management in the WUI. Because, many times, changes in natural vegetation composition and structure (i.e., the presence of invasive weeds or overstocked forest stands) include changes in vegetation-fuel attributes (i.e., fuel continuity and load), FRCC may serve as a surrogate to judge the degree of fuels hazard. FRCC 1, FRCC 2, and FRCC 3 may be viewed as low-, moderate-, and high-hazard fuel conditions, respectively.

All three classes occur in the assessment area (Map 9). FRCC 1 is the least common, as it occupies approximately 16 percent of the county (Table 11). FRCC 2 and 3 occupy 36 and 46 percent, respectively. FRCC 1 vegetation occurs mainly in the west-central, southeastern, and south-central parts of the county. FRCC 2 vegetation is located in the southwestern, northwestern, central, and eastern portions. FRCC 3 is located mainly in the northeastern and central part of the county. All three classes occur within different vegetation types. FRCC information was used to help define vegetation-fuel hazard in the WUIs and possible fuels management projects.

Table 8. Fire Regime Condition Class

Fire Regime Condition Class	Percent of County	Description
1	16	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g., native species, large trees, and soil) is low.
2	36	Fire behavior, effects, and other associated disturbances show moderate departure from the natural or historical conditions (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate. Risk of loss of key ecosystem components is moderate.
3	46	Fire behavior, effects, and other associated disturbances show a high departure from natural or historic conditions (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components is high.

Source: http://www.frcc.gov

Current Conditions

The majority of Lincoln County is dominated by a high desert, with grasslands, pinon juniper forests, ponderosa pine forests, and dry mixed conifer forests occurring at progressively higher elevations. Currently, forests are too dense with most stands in the County being overstocked, contributing to a high degree of departure from its historic range of variability (land fire dataset).

Lincoln County's wildland urban interface and areas of high fire risk are a mix of pinon juniper, ponderosa pine, and mixed conifer forest types. Limited amounts of riparian forests exist along waterways. Stand densities in untreated forest are higher than historical norms. As of 2014, beetle and insect damage are at epidemic proportions. This combination of insects, disease, drought, and fire caused stress are responsible for significant mortality in some stands/hillsides, and is expected to continue. This mortality increases fire risk while dead trees hold needles, and will contribute to increased fuel loading as dead trees fall to the forest floor. Treated areas (public and private land) have generally fared better then untreated land but are not immune to insects, disease, or drought. Current conditions around communities have improved largely due to thinning efforts, but much work remains to be

completed. Vegetation on treated properties quickly grows back underscoring the need for continued maintenance.

Desired Conditions

Much of the county has been treated to reduce hazardous fuel. Strategically located public land has been treated by government agencies, and private land has been treated by landowners often with the assistance of government grant programs. The desired conditions around structures include defensible space with a minimum cleared area extending 30 feet from the structure. Additional clearance is desirable if appropriate. A variety of fuel treatment strategies are needed to reach the desired conditions. Treatment types include mechanical removal, mastication, bulldozer pushes, piling, hand work and prescribed burns. All efforts are coordinated with members of the GRA WUI Working Group.

In open areas away from structures, the silvicultural prescriptions that guide fuel treatments are generally designed to improve forest health, reduce fire risk, and improve forest resiliency. Specific objectives vary based on the location of the treatment and jurisdiction, but generally will reduce basal area and increase crown spacing with removal desirable. The Village of Ruidoso has adopted a fuels ordinance which requires defensible space, the removal of ladder fuels, and raking pine needles to reduce the risk of catastrophic wildfire. A copy of the 2013 ordinance is included in the appendix. Treating unincorporated property outside the village is voluntary, and most treatments on private land outside of the village of Ruidoso are implemented with financial and or technical assistance from NM State Forestry. Treatments are focused on implementing defensible space around structures, and improving forest health and reduction of fire risk in and around communities.

USFS treatments take a holistic approach and focus on resiliency. Silvicultural prescriptions incorporate grazing, wildlife management, and utilization objectives. The USFS prescriptions will often incorporate burning during second or third entries and commit staff time and resources for burning operations to further reduce fuel loading. One of the more recent guidelines the USFS uses to guide restoration efforts is “Restoring Composition and Structure in Southwestern Frequent-Fire Forests: A science-based framework for improving ecosystem resiliency”. These guidelines can be applied to the forested areas found in Lincoln County.
Prescriptions for fuel treatments are variable and largely based on forest type and specific treatment objectives. Further, prescriptions are site specific, based on access, site index, slope, aspect, and hydrology, proximity to structures, communities, and jurisdiction. For this reason this CWPP update will not provide specific prescriptions for individual treatments.

Community Wildfire Hazard Risk Assessment

This CWPP update chose to update the community wildfire hazard risk assessment provided in the Lincoln County 2008 CWPP. Though mitigation efforts have been implemented, the group agreed that the overall risk and contributing factors have not changed significantly enough to warrant a change in overall community risk. The following information was pulled from the previous document with information about Ruidoso, Ruidoso Downs and multiple additional subdivisions added to the assessment list. A map of the risk assessment areas is in the appendix.

Table 9. Community Wildfire Hazard Risk Assessment

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Alto					
(Includes Legacy,	Homes	High	High	Non-surfaced, steep roads	Bonito VFD
Outlaw, Bald Eagle	Businesses			Heavy vegetation-fuel loads	Ruidoso and Monjeau fire lookout towers
& Bald Eagle II)	Recreation			Lack of defensible space around structures	Hydrants
	Tourism			Terrain conducive to unfavorable fire behavior	
	Communication towers			Lack of structure sprinkler system	
	Church camp			Utilities above ground	
	Watershed quality				
	Wildlife habitat				
	Aquatic habitat				
	Aesthetics				
	Air quality				
	Soil stability				
Ancho					
	Homes	High	High	Moderate fuel loads	Corona VFD with extended response time
	Wildlife habitat			Defensible space less than 30 feet around structures	Water is an issue
	Rangeland			Terrain conducive to	
				unfavorable fire behavior	
	Aesthetics			Lack of structure sprinkler system	
	Air quality			Utilities above ground	
	Soil stability				
Arabela					
	Homes	Moderate	High	Limited ingress/egress	Arabela VFD
	Wildlife Habitat			Heavy vegetation-fuel loads	
	Aesthetics			Lack of defensible space	
				around structures	
	Air quality			Terrain conducive to	
				unfavorable fire behavior	
	Soil stability			Lack of structure sprinkler system	
				Utilities above ground	

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Capitan					
	Homes	High	Low	Light fuel loads	Capitan VFD
	Businesses				
	Tourism			Electrical utilities above ground	Hydrants
	Agriculture land			Lack of structure sprinkler system	
	Watershed quality				
	Wildlife habitat				
	Aquatic habitat				
	Rangeland				
	Aesthetics				
	Air quality				
	Soil stability				
Carrizozo					
	Homes	High	Low	Light fuel loads	Carrizozo VFD
	Businesses			Electrical utilities above ground	Hydrants
	Tourism			Lack of structure sprinkler system	
	Agriculture land				
	Railroad				
	Watershed quality				
	Wildlife habitat				
	Rangeland				
	Aesthetics				
	Air quality				
	Soil stability				

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Copper Ridge					
	Homes	High	High	Gated Community	Bonito VFD
	Watershed quality			One way in/one way out	
	Wildlife Habitat			Paved Roads	
	Aesthetics			Heavy flashy Fuels	
	Air quality			Underground Utilities	
	Soil stability			Good turn around for trucks	
				Good fire resistant building materials	
				No fire hydrants	
				No water storage	
				Topography conducive to active wildfire	
Copper Ridge II					
	Homes	High	High	Paved Roads	Bonito VFD
	Watershed quality			Below ground utilities	
	Aesthetics			One way in/one way out	
	Air quality			No hydrants	
	Soil Quality			Flashy fuel loads	
	Wildlife Habitat			Topography conducive to active wildfire	
				Gated ingress/egress	
				Good turn around for trucks	
Corona					
	Homes	High	High	Medium fuel loads	Corona VFD
	Businesses			Defensible space 30 to 70 feet around structures	Hydrants
	Railroad			Terrain conducive to unfavorable fire behavior	
	Watershed quality			Combustible decks and porches	
	Wildlife habitat			Electrical utilities above ground	
	Rangeland			Lack of structure sprinkler system	
	Aesthetics				
	Air quality				
	Soil stability				

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Enchanted Forest					
	Homes	High	High	Gravel/paved Roads	Bonito VFD
	Watershed quality			No turn around	
	Wildlife Habitat			Severe Fire Potential	
	Aesthetics			No hydrants	
	Air Quality			No sprinklers	
	Soil Stability			Heavy fuel loads	
				Less than 30 feet defensible space around structures	
				Street signs	
Eagle Creek					
	Homes	High	High	Heavy fuel loads behind homes	Bonito VFD
	Watershed quality			Topography conducive to active wildfire	
	Wildlife habitat			No turnarounds	
	Aesthetics			Road signs	
	Air quality			No sprinklers	
	Soil Stability				
Eagle Creek II					
	Homes	High	High	Limited ingress/egress	Bonito VFD
	Watershed quality			No hydrants	
	Wildlife habitat			Paved roads	
	Aesthetics			Heavy fuel loads	
	Air quality			Topography conducive to active wildfire	
	Soil stability			30-70 feet defensible space around homes	
				Above ground utilities	

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Fawn Ridge					
	Homes	High	High	Above ground utilities	Bonito VFD
	Watershed quality			Paved Roads/Gravel Roads	
	Aesthetics			Houses close together	
	Air quality			Defensible space less than 30 ft. next to homes	
	Soil Quality			Moderate ingress/egress	
	Wildlife Habitat			Combustible decks and porches	
				No turn around for trucks	
				Topography conducive to active wildfire	
Fort Stanton					
	Historic buildings	High	Low	Medium vegetation-fuel loads	Fort Stanton VFD
	Hospital			Defensible space 30-70 feet from structures	Hydrants
	Correctional institution			Structures with combustible sidings, porches, and decks	
	Tourism				
	Wildlife habitat				
	Aquatic habitat				
	Aesthetics				
	Air quality				
	Soil stability				
Gavilan Hills					
	Homes	High	High	Gravel roads	Bonito VFD
	Watershed quality			No turn around	
	Aesthetics			Bad ingress/egress	
	Air quality			No fire hydrants	
	Soil Quality			Topography conducive to active wildfire	
	Wildlife habitat			Less than 30 feet defensible space around structures	
				Heavy fuel loads	
				Above ground utilities	
				Combustible decks and porches	
				Combustible house construction	

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Glencoe					
	Homes	High	High	Non-surface road	Glencoe VFD
	Historic buildings			Medium fuel loads	Hydrants
	Businesses			Defensible space less than 25 feet around structures	
	Tourism			Terrain conducive to unfavorable fire behavior	
	Recreation			Combustible decks and porches	
	Major highway			Lack of fixed sprinkler system in structures	
	Watershed quality			Utilities above ground	
	Wildlife habitat				
	Aquatic habitat				
	Rangeland				
	Aesthetics				
	Air quality				
	Soil stability				
Homestead					
	Homes	High	High	Heavy fuel loads	Bonito VFD
	Watershed quality			Below ground utilities	
	Aesthetics			Paved roads	
	Wildlife habitat			Loop Road	
	Air quality			Defensible space less than 30 ft. next to homes	
	Soil Quality			No fire resistant house materials	
				Topography conducive to active wildfire	
				Combustible decks and porches	

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Hondo-Tinnie					
	Homes	High	Moderate	Light fuel loads	Hondo VFD
	Businesses			Defensible space less than 70 feet around structures	Hydrants
	Major highway			Terrain conducive to unfavorable fire behavior	
	Agriculture land			Combustible porches and decks	
	Watershed quality			Lack of fixed sprinkler system in structures	
	Wildlife habitat			Utilities above ground	
	Aquatic habitat				
	Aesthetics				
	Air quality				
	Soil stability				
Lincoln					
	Homes	High	High	Medium fuel loads	Lincoln VFD
	Historic buildings			Defensible space less than 70 feet around structures	Hydrants
	Businesses			Terrain conducive to unfavorable fire behavior	
	Tourism			Closeness of structures can contribute to fire spread	
	Recreation			Lack of structure sprinkler system	
	Agriculture land			Electrical utilities above ground	
	Major highway				
	Watershed quality				
	Wildlife habitat				
	Aquatic habitat				
	Aesthetics				
	Air quality				
	Soil stability				

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Loma Grande					
	Homes	High	High	Heavy fuel load	Nogal VFD
	Watershed Quality			Road sign reflective	
	Wildlife Habitat			30/70 defensible space around structures	
	Aesthetics			Utilities below ground	
	Air Quality			No sprinklers	
	Soil Stability				
Nogal					
	Homes	High	High	Nogal Canyon limited ingress/egress with narrow road	Nogal VFD
	Businesses			Limited fire service access	Hydrants
	Tourism			Moderate to heavy fuel loads	
	Recreation			Lack of defensible space around structures	
	Watershed quality			Combustible structure siding, porches, and decks	
	Wildlife habitat			Terrain conducive to unfavorable fire behavior	
	Aquatic habitat			Utilities above ground	
	Aesthetics				
	Air quality				
	Soil stability				
Outlaw					
	Homes	High	High	Moderate ingress/egress	Bonito VFD
	Golf Course			Power under ground	
	Watershed quality			Fire Hydrant	
	Aesthetics			Topography conducive to wildfire	
	Air quality			Moderate/heavy fuel loads	
	Soil quality			Defensible space 30/70 feet around homes	
	Wildlife habitat			Homes are generally constructed from fire resistant materials	
				No sprinkler systems	

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Rainmakers					
	Homes	High	Moderate	Paved Roads	Bonito VFD
	Golf Course			Fire Hydrants	
	Watershed quality			Turn arounds	
	Aesthetics			Underground utilities	
	Air quality			Good ingress/egress	
	Soil Quality			Moderate/heavy fuel loads	
	Wildlife habitat			Fire resistant home construction	
Ranches of Ruidoso					
	Homes	High	Moderate	Light Fuel Loads	Bonito VFD
	Watershed Quality			Limited ingress/egress	Hydrants
	Wildlife Habitat			Road sign reflective	
	Aesthetics			30/70 defensible space around structures	
	Air Quality			Utilities below ground	
	Soil Stability			No sprinklers	
Ranches of Sonterra					
(includes	Homes	High	High	Paved Roads	Bonito VFD
Little Creek)	Watershed Quality			Turn arounds farther than 300 feet	
	Aesthetic			No Fire Hydrants	
	Air Quality			One way in/one way out	
	Soil Quality			Topography conducive for wildfire	
	Wildlife Habitat			Heavy Fuel Loads	
				Utilities Above Ground	

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Ruidoso					
	Homes	High	High	Heavy Vegetation fuel loads	Ruidoso Fire Department
	Businesses			Defensible space less than 30 feet around structures	Hydrants
	Tourism			Terrain conducive to unfavorable fire behavior	
	Historic buildings			Lack of structure sprinkler system	
	Recreation			Utilities above ground	
	Watershed quality			Limited ingress/egress	
	Aquatic habitat				
	Aesthetics				
	Air quality				
	Soil stability				
Ruidoso Downs					
	Homes	High	High	Heavy Vegetation fuel loads	Ruidoso Downs Fire Department
	Businesses			Defensible space less than 30 feet around structures	Hydrants
	Tourism			Terrain conducive to unfavorable fire behavior	
	Historic buildings			Lack of structure sprinkler system	
	Recreation			Utilities above ground	
	Watershed quality				
	Aquatic Habitat				
	Aesthetics				
	Air quality				
	Soil stability				

Community	Assets at Risk	Wildfire Risk of Occurrence	NFPA 1144 Hazard Rating	Contributing Factors to NFPA 1144 Ratings	Firefighting Capacity
Sun Valley (Includes					
Sun Valley,	Homes	High	High	Gravel/paved roads	Bonito VFD
La Junta,	Watershed quality			No turn around	
Fox Run)	Wildlife habitat			Severe fire potential	
	Aesthetics			No hydrants	
	Air Quality			Utilities above ground	
	Soil Stability			No sprinklers	
				Heavy fuel loads	
				Less than 30/70 feet defensible space around structures	
				Street signs	
White Oaks					
	Homes	High	High	Medium fuel loads	Hydrants
	Historic buildings			Defensible space less than 25 feet around structures	
	Businesses			Terrain conducive to unfavorable fire behavior	
	Tourism			Closeness of structures can contribute to fire spread	
	Recreation			Combustible sidings, porches, and decks	
	Railroad			Structures lack fixed sprinkler system	
	Watershed quality			Utilities above ground	
	Wildlife habitat				
	Rangeland				
	Aesthetics				
	Air quality				
	Soil stability				

WILDFIRE MITIGATION PLAN

Wildfire mitigation involves actions taken to reduce the likelihood of wildfire loss. Effective mitigation can be accomplished through a variety of methods including managing wildland vegetation-fuels, creating strategic fuel breaks, utilizing fire-resistant building materials and defensible space landscaping, improving emergency preparedness and response capabilities, upgrading current infrastructure, and developing programs that foster community awareness and action. Unincorporated communities may choose to petition Lincoln County to consider the implementation of the International Wildland-Urban Interface Code (IWUIC). Incorporated towns and villages should also consider adopting the IWUIC. Map 10 illustrates recommended fuels management projects.

Recommended Vegetation-Fuels Mitigation

Table 13 presents proposed priority fuels treatments and responsible organizations for implementing the various projects. Hazardous fuels reduction actions include such things as defensible space implementation around homes, mowing along highways and roads, weed abatement, fuel breaks, and improving FRCC 2/3 vegetation to FRCC 1 (Map 10). Those communities with a high wildfire hazard and IRP are those with an excellent chance to reduce fire danger.

Defensible Space

An action that can immediately improve community wildfire risks and hazards is the implementation of defensible space. It is recommended that defensible space be created for homes in all WUI areas following NMSFD guidelines (www.emnrd.state.nm.us/fd/index.htm). Homeowners need to evaluate their own situations to determine needed actions. NMSFD and SWCD staff is available to help homeowners determine the best actions to protect structures. Also, considerable information is available through the Firewise program (www.firewise.org). Firewise is an interagency effort to supply information and training to communities and homeowners on ways to reduce wildfire risks and hazards.

The defensible space concept can also be applied to such things as utility stations, communication towers, recreation facilities, and other important structures. Defensible space is an important practice for reducing wildfire risks and hazards to structures. Defensible space is part of the IWUIC and it is recommended by NMSFD.

When defensible space is combined with fire-resistant construction, the risk of structure loss is greatly reduced. When these principals are consistently applied across a neighborhood, everybody benefits. Additionally, in the event of a wildfire, homes and neighborhoods with defensible space are much more likely to be assigned structure defense crews than those without. Defensible space provides room for firefighters to protect structures. There are normally three components to a defensible space (Figure 1):

- Zone 1 is the area of maximum modification and treatment. It consists of the home and any attachments (fences, decks, etc.) and an area 30 feet around the structure where all flammable vegetation is removed. Remaining vegetation is pruned, mowed, and watered.

- Zone 2 is an area of fuel reduction that extends from Zone 1 up to a distance of 125 feet depending on slope. Stressed, diseased, dead, or dying trees and shrubs are removed. The remaining large trees and shrubs are trimmed and pruned to eliminate horizontal and vertical fuel continuity while enhancing home-site safety and aesthetics.
- Zone 3 is an area of management for landowner objectives and is of no particular size. It extends from the edge of Zone 2 to the property boundary. The exception to this is in high density subdivision where proximity of surrounding structures demands that adjoining owners coordinate thinning treatment to maximize fire protection.

Figure 1. NMSFD Defensible Space Guidelines and Standards (Dennis, not dated)

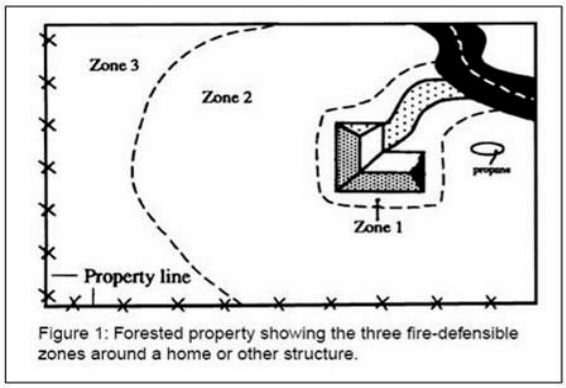


Figure 1: Forested property showing the three fire-defensible zones around a home or other structure.

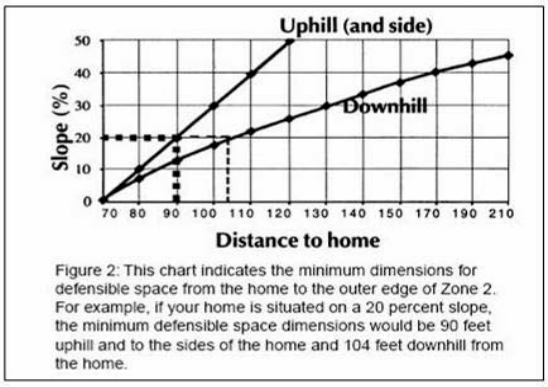


Figure 2: This chart indicates the minimum dimensions for defensible space from the home to the outer edge of Zone 2. For example, if your home is situated on a 20 percent slope, the minimum defensible space dimensions would be 90 feet uphill and to the sides of the home and 104 feet downhill from the home.

Defensible space efforts can be encouraged and coordinated annually through community meetings, planned spring cleanups, and organized disposal efforts. Although most of the work can be accomplished by individual homeowners in a phased approach over time, neighborhood cooperation and support is essential to help those who are unable, and to provide access to critical hazardous areas. Table 14 outlines a manageable phased implementation schedule.

Table 10. Proposed Defensible Space Schedule for Homeowners and Communities

Year	Project	Actions
1	Annual spring outreach	▪ Contact and/or organize homeowners
	Annual spring mitigation (defensible space)	▪ Clean roofs and gutters ▪ Trim and thin trees and bushes in Zone 1 ▪ Rake and remove fine fuels from Zones 1 and 2 ▪ Relocate firewood from Zone 1 to Zone 2 ▪ Help a neighbor ▪ Organize debris disposal
2	Annual spring outreach	▪ Contact and/or organize homeowners
	Annual spring mitigation (defensible space)	▪ Trim and thin trees and bushes in Zone 2 ▪ Repeat basic yard cleanup in Zones 1 and 2 ▪ Help a neighbor ▪ Organize woody debris disposal

3	Annual spring outreach	▪ Contact and/or organize homeowners ▪ Advise individual homeowners on needed improvements to construction features
	Annual spring mitigation (defensible space)	▪ If necessary, coordinate defensible space efforts between homeowner groups who have created defensible space and adjacent open space land managers ▪ Work with NMSFD to improve forest or rangeland health in Zone 3 ▪ Repeat basic yard cleanup in Zones 1 and 2
4	Annual spring outreach	▪ Contact and/or organize homeowners ▪ Follow up on construction feature recommendations
	Annual spring mitigation (defensible space)	▪ Complete any outstanding projects from previous years ▪ Continue maintenance phase ▪ Initiate construction feature improvements

Grass and Weed Abatement

A common fuel hazard is herbaceous weedy vegetation. Native and non-native weedy grasses and forbs become flashy fuels as they dry in the late summer and fall. These fine fuels ignite easily and burn rapidly. Herbaceous fuels are common and widespread in the WUIs. Herbaceous fuels occur among structures, along roads and driveways, in fallowed fields and abandoned lots, and in the railroad right-of-way.

Grass and weedy fuel abatement is important and must occur annually in order to be effective. Mechanical methods, manual methods, herbicide, prescribed fire, and livestock grazing can all be used to control grasses and weeds. The approach for grass and weed abatement depends on locations and land area. Sometimes a combination of methods is best. The key to successful herbaceous vegetation-fuel control is persistence, as it may take several years to achieve desired abatement. Mowing around structures and along roads and driveways is one way to reduce fuel load. Abatement can also occur with the limited use of herbicides by trained and certified applicators. Prescribed fire can be effective and safe when used in appropriate locations away from structures. Livestock grazing can be effective in reducing herbaceous fuel loads. The IWUIC provides guidance on a weed abatement ordinance. Communities and private landowners should work with the county extension office to determine methods for weed abatement.

Mowing along Roads

Vegetation-fuel throughout Lincoln County is generally continuous. Highways and roads are features that provide a break to fuel continuity. Mowing to a minimum distance of 6 feet along highways and roads will enhance their usefulness as fuel breaks and reduce the chances of fire ignitions from vehicles or discarded smoking materials. The mowing along highways and roads should occur once in mid-summer and again in the fall depending on precipitation and subsequent herbaceous plant growth. New Mexico State Department of Transportation is responsible for mowing along state highways. Lincoln County is responsible for mowing along county roads. The BLM and USFS are responsible for their road systems. Private landowners should survey their roads and driveways to determine the need for mowing.

Fuel Breaks

A fuel break is an area of land in which fuel continuity and load is reduced to improve wildfire control opportunities. Fuel breaks provide areas where firefighters may have

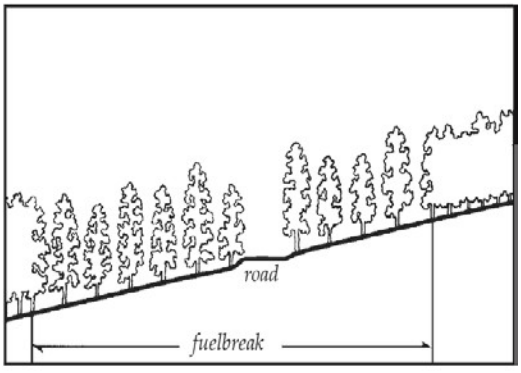
opportunities to suppress fire. The width and length of the fuel break depends on terrain, wind patterns, and values to be protected. Strategically placed fuel breaks reduce horizontal and vertical fuel continuity.

Fuel breaks do not require that all vegetation be removed to bare soil or rock (Figure 2). They can be aesthetically pleasing and improve wildfire habitat. Typically, trees are thinned to a spacing of 10 to 15 feet among tree canopies. Dead and diseased trees are removed. The lower tree limbs are pruned 6 to 10 feet from the ground depending on tree size. Ladder fuels are removed. Ladder fuels are the majority of small trees and large shrubs that may conduct fire in tree canopies. When thinning trees, it is important to leave trees of various sizes to create diversity. Herbaceous vegetation may be mowed or grazed to reduce its fuel load. Mechanical equipment and/or prescribed fire are used to create shaded fuel breaks. Prescribed fire may be useful in reducing shrub and herbaceous fuel loads. Areas with extensive vegetation removal because of dense tree and shrub growth may have to be reseeded with native grasses and forbs to reduce soil erosion and enhance wildfire habitat.

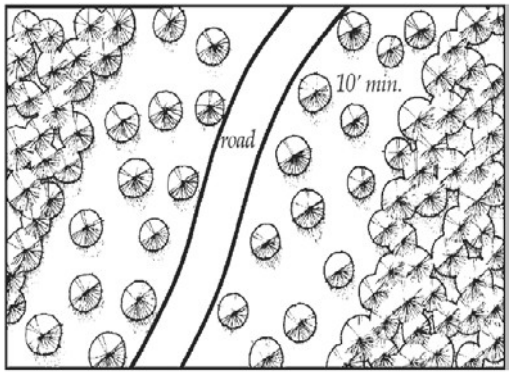
The woody debris harvested from the treated area will need to be disposed. Ideally, the woody debris will be utilized in a post-harvest economic manner. Information for post-harvest economic development opportunities can be obtained from the New Mexico Forest Industry Association (www.nmfia.org). The harvested limbs and trees can be made available to individuals for free firewood. The last option is to burn the woody debris in burn piles.

Fuel breaks are recommended for the Alto and Glencoe communities' roads, as appropriate, Nogal Canyon road, and White Oaks highway. Strategically located fuel breaks are recommended around the communities of Arabela, Corona, Nogal, and White Oaks. Strategically positioned fuel breaks also are recommended along public and private land boundaries. Such boundaries occur in all of the WUIs. Priority should be given to Arabela, Lincoln, Fort Stanton, Glencoe, Alto, Nogal, White Oaks and Corona communities.

Figure 2. Fuel Break along a Road (Dennis, not dated)



Cross-section of a typical fuelbreak built in conjunction with a road.



Plan view of fuelbreak showing minimum distance between tree crowns.

Salt Cedar Abatement

Salt cedar is a noxious, invasive shrub that grows along Rio Hondo. Salt Cedar is ranked by New Mexico State as a Class C noxious weed. Class C weeds are widespread species with management decisions determined by local authorities based on feasibility of control and level of infestation (http://weeds.nmsu.edu/). Pertinent information on salt cedar ecology and reclamation methods has been compiled by New Mexico State University weed management specialists and can be found on their website at http://agesvr1.nmsu.edu/saltcedar/.

Salt cedar abatement is warranted because of its fuel load, high water use, and limited value as wildlife habitat. Priority treatment areas would be those with moderate to heavy fuel loads in proximity to communities, structures, and other values. Salt cedar is a flashy fuel that burns rapidly because of its fine foliage and essential oils. Salt cedar abatement can occur through mechanical harvest, herbicide, or prescribed fire. Usually, a combination of treatments is necessary for eradication because the shrub will readily root sprout. Mechanical harvest followed with painting the stumps with herbicide is an effective treatment. Treated areas should be re-planted with desirable vegetation such as willows or cottonwood trees.

Railroad Corridor Weed Control

Trains can be a significant source for fire ignitions because of sparks generated from such things as hot brakes or car couplers. Fires have occurred along the railroad corridor that passes through the Carrizozo, Ancho, and Corona WUIs. Vegetation-fuel management is needed along the corridor to reduce wildfire hazards. Appropriate action would be similar for grass and weed abatement as presented in Section 5.1.2.

FRCC Vegetation Management

FRCC is a measure of forest and rangeland health. Forests and rangelands classified as FRCC 2 or 3 are considered unhealthy because there have been changes in plant community attributes and/or the fire regime in comparison with conditions prior to European settlement. Eighty-two percent of the county is classified as FRCC 2 or 3.

Vegetation-fuels management plans should consider ways to improve forest and rangeland health. Prescribed fire, mechanical methods, and herbicide treatments can be used to remove unwanted plants and decrease woody plant density to improve plant community composition and structure in accordance with historic vegetation characteristics. Federal, state, and private landowners need to collaborate to improve FRCC. The BLM and USFS fuel treatments that are planned for the years 2008 through 2010 will improve FRCC at these sites (Map 10). Both agencies have in past years conducted extensive vegetation-fuels management in the assessment area to reduce vegetation-fuel hazards and improve forest and rangeland health.

The BLM Roswell Field Office has defined 33 vegetation-fuels treatments in the assessment area (Map 10). Areas treated will vary from 20 to 1,710 acres for a total of 5,212 acres. Treatments will be implemented during the years 2008 through 2010. Most of the treatments will occur on BLM land in the Fort Stanton WUI. Vegetation-fuel

management will occur by mechanical tree/shrub thinning, burn-pile and broadcast prescribed fire, and herbicide application. Management objectives are to reduce fuel loads, improve wildlife habitat, and improve rangeland health.

The USFS Smokey Bear Ranger District has instigated vegetation-fuels management in the Turkey-Gavilan Fuels/Watershed Planning Area, Perk-Grindstone Fuels/Watershed Planning Area, and Eagle Fuels/Watershed Planning Area (Map 10). These large planning areas are located in the southern and southwestern portions of Lincoln County on USFS lands. The District has completed vegetation-fuels management projects in these planning areas in recent years to reduce the risk of wildfire and improve forest health. Additional vegetation-fuels management projects will occur in future years. However, specific projects have not yet been fully conceptualized. The purposes of the projects will be to increase fire suppression capabilities, minimize wildfire impacts, improve firefighter safety, improve forest health, and manage vegetation associations rated as FRCC 2/3 to FRCC 1. Prescribed fire and mechanical treatments will be used to achieve vegetation-fuels management objectives.

Treatment Options and Costs

Reducing vegetation-fuel continuity and load in Lincoln County will require a combination of treatment methods as described in the above sections and collaboration among agency and private landowners. Each of the recommended fuel mitigation projects can be achieved by a variety of methods (Table 15). Selecting the most appropriate, cost-effective option is an important planning step. This brief synopsis of treatment options and cost estimates is provided to assist in this process. Cost estimates for treatments are relative and should be considered as general guidelines. Fuel treatment costs can vary tremendously based on vegetation-fuel attributes, pre-project preparations,acres to be treated, slope, proximity to structures, access, erosion control and surface water protection, and transportation costs.

It is imperative that implementers plan for long-term monitoring and maintenance of all treatments. Costs should also consider post-treatment rehabilitation needs including seeding with native plants, weed abatement, and soil erosion control.

Table 11. Treatment Methods

Treatment	Estimated Cost	Comments
Machine Mowing	$90–$200 per acre	▪ Appropriate for large, flat grassy areas on relatively flat topography
Prescribed Fire	$100–$125 per acre	▪ Can be cost effective ▪ Ecologically beneficial ▪ Can be used as training opportunities for firefighters ▪ Cost varies with complexity ▪ Carries risk of escape, which may be unacceptable in some WUI areas ▪ Unreliable scheduling due to weather and smoke management constraints
Brush Mastication	$300–$500 per acre	▪ Brush species (Gamble oak in particular) tend to re-sprout vigorously after mechanical treatment ▪ Follow-up treatments with herbicides, fire, grazing, or further mechanical treatments are typically necessary ▪ Mastication tends to be less expensive than manual treatment and eliminates disposal issues

Timber Mastication	$300–$1,200 per acre	▪ Materials up to 10 inches in diameter and slopes up to 30 percent can be treated ▪ Eliminates disposal issues ▪ Environmental impacts of residue being left on site are still under study as the mulch may inhibit seed germination
Manual Treatment with Chipping or Pile Burning	$300–$1,200 per acre	▪ Allows for removal of merchantable materials or firewood in timber ▪ Requires chipping, hauling, and pile burning of slash
Feller Buncher	$750–$900 per acre	▪ Mechanical treatment on slopes over 30 percent or of materials over 10 inches in diameter may require a feller buncher rather than a masticator ▪ Costs tend to be considerably higher than mastication ▪ May allow for removal of merchantable material
Herbicide	$15–$65 per gallon	▪ Application can be species- or area-specific ▪ Cost per acre will vary depending on application rates and target species ▪ Easy to apply on steep slopes and other rough terrain ▪ Costs may be lower than mechanical methods ▪ Dead woody material may need to be removed ▪ Applicator license required

Community Accomplishments & Wildfire Mitigation Efforts

The stakeholders in Lincoln County have been working with one another for over 10 years. Over this time, great strides have been made in reducing the wildfire risk around the community. Ruidoso became a Firewise community in 2001 and surrounding subdivisions and communities are currently implementing similar strategies. The Sierra Blanca Wildfire Training Academy has been training local and regional firefighters and provides a variety of NWCG classes for municipal, volunteer, state and federal agency firefighters. The Greater Ruidoso Area working group provides a forum for agency representatives to plan and develop new projects. Local fire departments are implementing interagency cooperative burns.

Various entities in Lincoln County have conducted hazardous fuel reduction projects and have treated Fuel mitigation projects (1,401treatments completed according to NM Vegetation Treatments Map have treated over 78,000 acres on both public and private land since 2008. Treatments have occurred on National forest System lands, BLM lands, State trust lands, Municipal lands, and private property.

After the Little Bear Fire the Ranches of Sontera formed a Firewise committee and in 2014 they become a nationally recognized Firewise community. They continue to have an annual Firewise event. In 2016 they added evacuation signage to the subdivision and continue to encourage homeowners to accept their responsibilities. The POA has expended much labor and monies to clear 2 parks.

The Village of Ruidoso also hit a Firewise milestone in 2018 by being recognized for 15 years of participation in the Firewise community program.

Lincoln County Office of Emergency Services (OES) has instituted an Open Burning Ordinance in 2011 that sets guidelines for the proper notification and safe handling of fire

and the procedure for declaring extreme fir danger when open burning is prohibited.
OES has also been promoting the Code RED Mobile Alert app to notify the community of fire evacuations and other emergencies.

Interagency Fuels Treatment Basemap

The agencies participating in the Greater Ruidoso Area Working group have been using the group as a forum to plan and design projects. Working on adjacent land across jurisdictional boundaries has greater impacts on reducing landscape scale fire risk then smaller disjointed projects. The agencies (USFS, VOR, State Forestry, BLM, Mescalero BIA, have shared their fuel treatment data with one another and have submitted GIS files to be aggregated into an interagency fuels treatment GIS database on a yearly basis. The Community fuels treatment basemap shows land jurisdictions and where fuel treatments and fires have occurred. This map is updated and is used as a planning tool to help track accomplishments, identify areas of concern, and help plan future projects. These maps are used internally, during interagency coordination efforts, and during public meetings so agencies and the public can see where work has been done and where additional work needs to occur.

Ruidoso Area Efforts

The Village of Ruidoso has accomplished a great deal since the 2014 CWPP and fuels mitigation plan was initiated. The Village of Ruidoso is at high risk for a catastrophic wildfire. The Village of Ruidoso is also a high priority area for watershed restoration work as set forth in the North Sacramento Mountains Watershed and Forest Restoration Strategy plan.

There are approximately 13,500 acres within the Village limits and another 1,500 acres at the Sierra Blanca Regional Airport. Most of the Village owned property is heavily timbered and adjacent to schools, subdivisions, water tanks and other critical areas. There are about 580 acres of timbered village owned property at the Airport that haven't been treated and are a threat to the investments at the airport.

In 2002 the Village became a Firewise community and initiated a planned progression of fuels reduction projects on both public and private property within the Village boundaries. Ordinances were passed requiring fuels reduction on all properties within the Village boundaries Since then, the Village has systematically progressed through the Village subdivision by subdivision, requiring landowners to thin their properties to reduce fuel concentrations. In 2017 the first cycle of thinning was complete. We are now in the 2nd year of the 2nd cycle. Approximately 90% of the properties within the Village boundaries have been thinned to meet Ordinance thinning requirements. The Forestry department has established a 10 year rotational certification process to ensure compliance with the fuels management ordinances on all properties within the Village.

From 2012 to present there has been a major bark-beetle infestation in the village that has killed thousands of trees. Due to the mortality from the bark-beetle and the natural reproduction of conifers and sprouting of alligator juniper, properties must be maintained to keep up with the natural fuels accumulation. The graph found in Appendix C details the achievements since the 2014 CWPP was approved and the planned accomplishments to be

made during the next five years.

Greater Ruidoso Area WUI Working Group

The Greater Ruidoso area WUI Working Group was formed in 2001 and brings together local state, and federal agencies in Lincoln County. The group meets bi-monthly and meetings are open to the public. Current efforts and initiatives are discussed and the group represents the collaborative effort for fuels planning in the County. Agency representatives use the group to report on current projects and plan future projects. By making others aware of agency efforts, initiatives, and opportunities the group increases the scale of local mitigation. The working group has an assessment and outreach subcommittee that reviews completed projects and helps coordinate public outreach events respectively.

Grants

Mitigating wildfire risk in the community is a large and often expensive undertaking. The area uses state and federal grants to acquire financial and technical assistance in order to implement a variety of projects. Funding comes from a variety of sources and often has different requirements depending on the specific opportunity and funding agency. In addition to agency funding, members of the GRA WUI working group continue to seek out sources for additional funding and work collaboratively on applications. The table below identifies some of the grants the community has utilized to mitigate wildfire risk across the landscape.

Grant Name	Funding Agency	Applicant	Frequency	Approx Funding
WUI Cost share	Western Governors Association	County/ SWCD/ VOR	Yearly	$250,000
Non Federal Land	USFS Regional/ State Forestry	County/ SWCD/ VOR	Yearly	$250,000
RAC	USFS	SCM RC&D	Yearly	$72,000
Collaborative Forest Restoration Program	USFS Regional/ State Forestry	SCM RC&D	3 Year	$350,000
CWPP update	NMAC	SCM RC&D	1 Year	$15,000
Wildfire Outreach	NMAC	SCM RC&D	1 Year	$50,000

Sierra Blanca Wildland Fire Training Academy

The Sierra Blanca Wildland Fire Academy is a collaborative effort between local fire managers and has been training regional firefighters since 2001. The academy was set up to provide a low cost option to train firefighters. Structure firefighters can cross train in wildland fire, and volunteer departments can receive NWCG training opportunities without having to travel far. The academy is organized locally by members of the USFS, BLM, municipal, and county fire departments and helps to make sure firefighters receive the proper training. This interagency collaboration during training also improves coordination during wildfire incidents.

Slash Disposal

Slash disposal is often the most expensive part of reducing the fuel load on a piece of ground. The community has been developing small scale utilization and some of the removed material has found its way to local sawmills, bear carvers, fuel woodcutters, and composters, however the current market for biomass cannot support the supply creating a bottle neck and expense for county and village residents. This disconnect means slash disposal is often expensive, which has resulted in higher costs for mitigation efforts, less material being removed from treatment areas, and in some cases, illegal dumping. Village of Ruidoso residents have a grapple truck service for curbside pickup which has increased the ease of mitigating fire risk. There is limited slash pick up in the County. Most residents must dispose of the material themselves or hire a contractor which has its own set of difficulties. Members of the working group are working on producing pile burning guidelines for the public to safely burn slash as an additional option for disposal. The South Central Mountain Resource Conservation & Development Council has purchased an Air Curtain Incinerator and they make the unit available to municipalities and large property owners for use in disposing of slash.

Sustainable Forestry Funding

The wildfire problem the area faces is only going to get worse as our communities grow and the fuel loads in our forests increase. Mitigation efforts are targeted and can protect communities and infrastructure but as a whole the problem continues to get worse. Most mitigation funding comes from the federal government and as a result funding levels are uncertain from year to year and based on national economic conditions. Several communities across the western United States with similar wildfire hazard issues have recently looked to more local, consistent, and sustainable funding options to secure the money required to address the wildfire problem. Santa Fe has implemented a fee on resident's water bills which goes to reduce fuel load in the watershed. Flagstaff passed a long term bond to secure millions of dollars in funding. Assessing a fee locally, while unpopular, may work for Lincoln County and would provide increased and more certain funding for mitigation efforts. This certainty of future funding would encourage private investment, and utilization and should reduce the cost of these efforts. A sales tax charge may be the best sources for funding in Lincoln County because the burden is largely carried by tourists who spend money during visits.

RECOMMENDED NON-FUELS MITIGATION

Public Outreach and Education

An effective means to initiate local action is through community education and public outreach. Community outreach could occur in each WUI. Examples of the purposes of public outreach include:

- Initiate creation of a WUI or community oversight group to support CWPP implementation and seek grant funding;
- Introduce and discuss the benefits of IWUIC defensible space and construction principals;

- Promote and collaborate on developing defensible spaces around structures;
- Increase awareness for the need to improve forest and rangeland health to reduce wildfire risk; and
- Identify and map evacuation routes.

Annual WUI or community meetings in the spring can spur action on the part of neighborhoods and individuals. This can be a forum for presentations by firewise experts and allow for coordination of cleanup efforts within the community. Firewise materials and postings should be made available at fire stations, post offices, and schools on a regular basis. The scheduling of an annual "Defensible Space Week" would remind residents of the need to maintain their property. A WUI or community would hire a contractor to remove harvested plant materials along roads. Each residence would pay for the provided service.

Lincoln County, land management agencies, community groups, and the local university cooperate with one another on education and outreach through the Greater Ruidoso Working group and its outreach committee. This is a coordinated approach to educate residents and visitors about forest health and wildfire risk. The outreach plan involves several methods to reach the widest audience possible and includes, living in the WUI speaker series, student art contests, defensible space volunteer days, radio spots, news articles and opinion pieces, community workshops, and displays and presentations at community events such as the home and garden, motorcycle, and gun shows. The components of the outreach plan are flexible as members of the working group take advantage of outreach opportunities as they arise. Successful events are repeated, and new opportunities are explored. The outreach and community education efforts pull from national resources, including Firewise, Ready Set Go, and other local resource specialists. Outreach promotes a variety of wildfire risk related topics, including defensible space concepts, what to do in an emergency, forest health, insect epidemics, drought and watersheds, prescribed fire use, and utilization and disposal of cut material. The efforts and contributions from multiple agencies and stakeholders form a coordinated and well-rounded approach and will continue outreach activities with oversight from the GRA working group.

Reducing Structural Ignitability

Structural ignition during wildfire incidents leads to the loss of structures including residential homes, and commercial buildings. The concept of the home ignition zone, which includes the home itself and the area immediately surrounding it (approximately 100 feet) are largely responsible for whether or not the home is ignited. Homes are often ignited by the ember wash and not the flame front of the fire itself. Embers and burning debris find their way to pile of dried grass under a deck, or into the attic through a hole in the homes eaves, smolder for up to 24 hours, and then ignite the home. Much research has been conducted to understand the science behind home ignitions, and much can be done to reduce the probability of home ignitions. The national Firewise program, recommends a variety of building materials, techniques and landscaping that can reduce the probability of structural ignition. Additionally, the International Wildland-Urban Interface Code (IWUIC) provides a set of building codes that may reduce structural ignitions from wildfire risk. Neither, Lincoln County or the village of Ruidoso has adopted the IWUIC but do promote voluntary programs

like Firewise to reduce the risk of structural ignition. Adapting components of the IWUC would further reduce the likelihood of structural ignitions during wildfire incidents. The CWPP core team recommends the continued promotion of Firewise principals and would support the adoption of IWUIC building codes by the county and its municipalities.

Improving the fire-resistant characteristics of structures in the assessment area goes hand-in-hand with the development of defensible space. An important improvement that can be made for many structures is replacing roofs with low flammable materials. Screening gutters, roof vents, and deck or porch openings is recommended. Embers from a wildfire can become windborne and travel long distances before settling on structure roofs and in crevices that could result in fire. Common structural fuel hazards associated with homes in the assessment area include:

- Combustible roofs and siding materials;
- Decks or porches with exposed undersides;
- Open attic vents;
- Propane tanks adjacent or downhill from home; and
- Combustible fences attached to structures.

A recommendation is for Lincoln County and the incorporated cities and villages to consider the adoption of the IWUIC, which will ensure that new construction and remodels will be fire-resistant. The objective of the IWUIC is to establish minimum regulations consistent with nationally recognized good practices for safeguarding life and property. Regulations in the code are intended to mitigate wildfire risks and hazards and to prevent fire from spreading from structure to structure in the WUI. The codes also help ensure that there is access and water supply for fire suppression. The following items are examples of issues covered by the code:

- Ignition-resistant building materials on new construction, additions, and remodels;
- Ignition-resistant building techniques (such as covering eaves, no openings under houses, decks or porches) on new construction, additions, and remodels;
- Driveway access for fire apparatus;
- Vegetation plans for new structures and subdivisions that meet defensible space requirements;
- Vegetation and weed control codes;
- Water supply requirements to ensure continuous water supply during a fire; and
- Structure-address marking and road marking.

Information on IWUIC fee-based training and the purchase of the code manual may occur at http://www.iccsafe.org. A source of free information for reducing structure flammability and community hazard is the interagency Firewise program (www.firewise.com). WUIs and/or communities may want to consider becoming Firewise certified communities.

Incident Management Team

Following the Little Bear Fire in June of 2012, Lincoln County saw the need to develop and put in place their own Incident Management Team structure. Most communities are not familiar with the Incident Command system, and when a disaster strikes, they are unprepared for what must happen immediately. After the Little Bear Fire, the county decided to be proactive and developed their own Incident Management Team to address any future disasters. They assigned team members and scheduled trainings to better prepare for any future incidents.

Community Priorities

The Village of Ruidoso, Lincoln County, NM State forestry, the USFS, the BLM, and private individuals have been implementing fuel reduction projects for over a decade but the risk is inherent. Despite these treatments the county continues to experience large wildfires. Areas close to homes and communities, and areas within critical watersheds are especially important to protect. While the dominant fire spread direction comes from the southwest there is much variation, and several of the large fires have had fire heads which have moved south and or west. Members of the GRAWUI working group and representatives from land management agencies met in throughout 2018 and 2019 to discuss the local fuel treatment priorities. While every piece of ground is important and could potentially burn, priority areas have been selected by the core team and include:

- Incorporated and unincorporated communities in the county: Some communities have been identified by New Mexico State Forestry as Communities at Risk, although additional communities and subdivisions exist. Treatments should focus on the south and west sides of communities, although treatments on the north and east side are also priorities.
- Areas identified in the USFS 5 year plan including Perk, Grindstone, Eagle Creek, Turkey, and Gavilan which are WUI NEPA cleared planning areas.
- Tribal land South and West of Ruidoso.
- Large private properties (greater than 10 acres).
- Remaining implementation zones within the Village of Ruidoso to include second entries in some areas.
- Current or planned USFS and State Forestry projects near Ruidoso, Capitan, White Oaks, Alto, and Highway 70 corridor.
- Areas identified by Lincoln County Hazard Mitigation Grant.
- Areas of untreated land adjacent to previous treatments.
- Areas within and adjacent to highways, roads, evacuation routes, and utility right of ways.
- Untreated State Trust land with environmental clearance.
- Areas deemed as strategic locations to protect infrastructure and values at risk including; utilities, wells, schools, radio towers, wildlife habitat, and areas of commercial value.

- Maintenance of areas that have previously been treated to reduce hazardous fuels.
- Impaired and or critical watersheds.
- Highly populated areas.
- Protection for repeater sight which would be vegetation treatment and solar panels and battery back-up
- BLM will continue to plan and treat hazardous fuels on their areas of responsibility

Community Involvement

Each of the communities in Lincoln County will be encouraged to develop their own specific mitigation plans. As development continues, local planning and zoning committees will encourage developers to provide subdivision specific CWPPs as part of their planning process.

As part of the CWPP process, we developed a survey to assess the needs of Lincoln County residents – both real and perceived. We reached out to people at events like the Lincoln County Home & Garden Show. Respondents could fill out the survey there, or go to SurveyMonkey.com and answer the questions on line. A copy of survey is included in the appendix.

The survey results showed that area residents feel that their properties are prepared for a wildfire, but they are very concerned about the surrounding properties. With 75% of the residents in the area being out-of-town, there is a serious problem with absentee owners not taking responsibility for the overgrown condition of their properties. This presents a real problem for year 'round residents.

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. A key element in the CWPP process is the meaningful discussion that community members engaged in regarding their priorities for local fire protection and forest management.

The public involvement process involved a public meeting held at ENMU Ruidoso and at the Ruidoso Convention Center and Smokey Bear Days where a booth was set up to engage the public in discussion of the CWPP. These meeting introduced a survey targeted at members of the community. Public comments addressed included:

- A need for increase water supply and water storage
- Clean up by individual property owners
- Improvement of ingress and egress in sub-divisions
- Better firefighting equipment
- All wildfires extinguished immediately
- More funding for tree thinning
- Funding for Firewise programs
- Fuel treatment on public lands
- More active participation and coordination with Federal agencies, especially USFS

- Utilization of bio-mass
- Home fire hazard assessment
- Education on forest health and what can be done
- Yard waste disposal
- Development of better escape routes

RECOMMENDATIONS

The following actions are proposed to reduce wildfire risks and hazards. Project recommendations are based on interviews with county fire chiefs, municipal fire chiefs, federal and state fire management officers, field observations, questionnaire responses, and three public meetings:

- Encourage the development of defensible space around structures, utilities stations, communication towers and other structures at risk to wildfire.

- Grass and weed abatement needs to occur throughout the county. A common fuel hazard is herbaceous weedy vegetation. Native and non-native weedy grasses and forbs become flashy fuels as they dry in the late summer and fall. Also as the drought persist these conditions also present high fire danger in early spring. These fine fuels ignite easily and burn rapidly. Herbaceous fuels are common and widespread in the WUIs. Herbaceous fuels occur among structures, along roads and driveways, and in fallowed fields and abandoned lots.

- Mowing along powerline ROWs, highways and roads will create fuel breaks. Highway and roads are linear features that provide a break to fuel continuity. Mowing to a minimum distance of 6 feet along each side of highways and roads will enhance their usefulness as fuel breaks, and reduce the chance of fire ignitions from vehicles or discarded smoking material. All communities have expressed a high concern of this situation. They would also recommend that a public outreach program addressing this issue be implemented.

- Fuel breaks are recommended along roads for the Alto and Glencoe communities, as appropriate, and along Nogal Canyon Road, and White Oaks Highway. Strategically located fuel breaks are recommended around the communities of Arabela, Corona, Nogal and White Oaks. Strategically positioned fuel breaks also are recommended along public and private land boundaries, which occur in all WUIs. Priority should be given to Arabela, Lincoln, Fort Stanton, Glencoe, Alto, Nogal, White Oaks, Corona and all sub-divisions identified as high fire danger.

- Community education and public outreach is an effective means to initiate local action to reduce wildfire risks and hazards. Community outreach could occur through

each WUI to achieve improved awareness of wildfire issues such as creation of defensible space around structures.

- Training of the County Fire Districts (CFDs) and Municipal Fire Districts (MFDs) is an ongoing need. National Wildfire Coordination Group (NWCG) annual training need to occur. Nearly all fire districts have wildfire fighters trained at the Firefighter 2 level but there is a need for training at the Firefighter 1 and Engine Boss level. Because volunteer firefighters work during the week, training should occur on weekends. The county is fortunate to have the Sierra Blanca Fire Academy to provide needed training.

- High priority for all fire departments is to develop additional water storage for fighting wild fires, fire hydrants, maps, and maintain strategically located water sources throughout each WUI. Dry hydrants, permanent surface water, stock ponds, or irrigation systems may be suitable water sources. Agreements with private landowners need to be negotiated annually for property and water access. Protection of all water sheds was also identified as a priority.

- Improve communications and interoperability throughout Lincoln County.

- The fire protection authorities include eight CFDs, three MFDs, the USFS, the NMSFD, and the BLM. All agencies need to collaborate to maintain, and in some cases improve, wildfire fighting equipment, buildings, engines, and firefighting training.

- Reopen the road north to Pine Lodge so that the Arabela community has an alternative escape route.

We will continue to target WUI properties in the Urban Interface of Lincoln County as well as larger tracts of land that improve forest and watershed health and better protect communities and homes from the effects of wildfire.

Priorities include:

- Acres that tie into previously treated acres (whether private, state or federal)

- Acres on the southwest side of communities or homes

- Acres that are downslope of communities or homes

- Acres that protect watersheds and improve forest health

IMPLEMENTATION OF MITIGATION RECOMMENDATIONS

Project Support

Grant funding support is often a necessary component of a fuels treatment project and can facilitate recommended mitigation on both private and public lands. In addition to opportunities that may be available through NMSFD or New Mexico Associations of Counties, an excellent resource for researching available public funding sources is grants.gov and other grant consolidation websites.

The CWPP development process is designed to facilitate collaboration with federal and state agencies on public and private wildfire and fuels management strategies. As the CWPP strategic plan is implemented, dialogue and collaboration needs to be maintained with these agencies in order to coordinate strategies and treatments, and make adjustments if necessary. Annual meetings are necessary to discuss completed projects, the status of multi-year projects, and future projects. The CWPP should be adjusted according to accomplishments and future needs.

One of the major issues confronting defensible space and vegetation-fuels mitigation is the need for continual maintenance. Defensible spaces around structures require annual maintenance to remove fine fuels, which accumulate during the year. Herbaceous fuels along roads and in fields need annual mowing or grazing as appropriate. Shaded fuel breaks and prescribed fire may have an effective life span of 10 to 15 years before trees and shrubs once again become hazardous fuels. Federal, state, and private landowners will need to evaluate fuel treatments on their lands to determine the need for maintenance. Also, as areas are developed with new housing and communities, vegetation-fuels management will need to occur on an individual basis. However, with adoption of the IWUIC, existing and new communities will have guidance on landscaping and construction standards.

Vegetation-Fuels Mitigation Schedule

Table 17 recommends a general schedule for vegetation-fuels mitigation projects throughout the assessment area. A five-year timeframe is proposed to accomplish all vegetation-fuels projects. A schedule for defensible space installment is presented in Table 14. Projects such as mowing along roads need to occur on an annual basis or perhaps more often depending on herbaceous plant growth in response to precipitation. Fuel break development along roads, wildlife areas, and federal lands will depend on resources available including money and availability of fuel-management crews. National Environmental Policy Act (NEPA) requirements and other agency-specific necessities need to be satisfied before fuel treatments occur on federal lands. Forest and rangeland health management (i.e., FRCC classification) should occur annually because improving plant community health needs to be considered as a part of all projects.

EMERGENCY OPERATIONS

Fire Authority Response

Wildfire suppression in Lincoln County is provided by CFDs, MFDs, NMSFD, USFS, and BLM. Each fire authority has its own operational procedures. However, the IJPA provides for mutual aid and support for wildfire incidents. IA on a wildfire is the first

responding force to a wildfire. The closest fire authority to a wildfire is usually the IA force. An extended attack (EA) occurs when fire escapes IA and additional forces are needed for suppression or the fire threatens important values such a structures.

The risk of large-scale wildfire exists in all seven WUIs (Map 4). But wildfire may occur at any season throughout the county. The potential for wildfire rate of spread and severity to exceed the IA suppression capability is great because of fuel continuity and load. This is especially true where the surrounding terrain is difficult to access. The maintenance of training, apparatus, and equipment is essential for rapid response. Extended wildfire incidents in the assessment area could become very complex management challenges. The development and annual review of pre-attack plans for specific locations and scenarios in coordination with likely cooperators would provide tactical and strategic guidelines in the event of an actual wildfire.

Family Emergency Preparedness

The time to plan for an emergency evacuation is before the incident occurs. Family members should understand what actions are needed in the event of a wildfire incident. Information on preparing for a wildfire evacuation is presented at Firewise (www.firewise.org).

Families can take several steps to prepare for a wildfire event to improve safety and FD response. A defensible space should be developed around homes and other structures. Families should have emergency numbers readily available. Private roads and driveways should be at least 12-feet wide with a 15-foot vertical clearance for family egress and emergency vehicle access. House numbers and street signs should be readily visible. Hand tools such as rakes and shovels are valuable for fighting spot fires and debris cleanup. A fully charged hose that reaches around the house should also be available for firefighter use. Families should have known meeting locations and phone numbers to call in case family members are separated.

In the event that New Mexico State Police orders a community to evacuate because of threatening wildfire, residents should leave in an orderly manner. The State Police would proclaim the preferred evacuation routes and evacuation centers. However, the need for evacuation can occur without notice when conditions for wildfire are favorable. Homeowners should be prepared to evacuate without formal notice. Wildfires can occur unexpectedly even in the low-risk WUIs.

Before residents leave, they should take every precaution to reduce the chance of structure loss as time allows. Human safety is the number one concern in an evacuation. Actions could include removing all debris from rain gutters and the roof; ensuring all flammable materials such as woodpiles, leaves, debris, and patio furniture are at least 30 feet from the house; and cleaning leaves and twigs from underneath decks and porches.

Windows and doors should be closed but not locked. Other openings should be covered. A ladder should be placed for roof access by firefighters, and porch lights left on to allow firefighters to find homes at night. Families should take important papers, documents, pets, food, water, medicines, and other essential items with them.

The exterior of structures should be monitored for smoke for several days after return as embers may lodge in small cracks and crevices and smolder before flaming.

Evacuation routes vary according to WUI (Table18). The appropriate FD should ensure that residents have the opportunity to become familiar with these procedures. Evacuation plans should outline routes and available evacuation centers. These procedures should be addressed in community meetings, newspaper releases, and distributed door-to-door.

Table 12. Evacuation Routes for Lincoln County Communities

Community	Primary Evacuation Route	Secondary Evacuation Route
Alto	State Highway 48	State Highway 532
Ancho	Ancho Highway	Ancho Road
Arabela	State Highway 368	County Road BO31
Capitan	U.S. Highway 380	State Highways 48 and 246
Carrizozo	U.S. Highway 380, 285	Water Canyon
Corona	State Highway 247, US Highway 54	County Line Road
Fort Stanton	State Road 214	State Highway 220
Glencoe	U.S. Highway 70	Coe Canyon Road
Hondo-Tinnie	U.S. Highway 70, 380	Alamo Canyon Road, Picacho Road
Lincoln	U.S. Highway 380	Las Pasadas
Nogal	State Highway 37	Ranchmans Camp Road
White Oaks	State Highway 349	White Oaks Highway

The main evacuation routes for all communities are paved and maintained by federal, state, or county agencies. Because there are small, isolated residences throughout the county, evacuation routes should be identified that would be suitable for these communities. Families away from communities need to determine primary and secondary evacuation routes that would be suitable for their situations. All county residents should have information on primary and secondary evacuation routes.

LINCOLN COUNTY CWPP MONITORING AND EVALUATION

CWPP Plan Adoption

Interagency collaboration, public meetings, and public comment opportunities were incorporated into the CWPP process to provide the opportunity for widespread participation and input. Comments and input were solicited from federal, state, and local agencies, and stakeholders. The CWPP was formally adopted by the Core Team, comprised of representatives from the federal, state, and local agencies.

The HFRA authority for CWPP requires adoption of this plan, as does the FEMA Disaster Mitigation Act of 2000. With formal adoption by the Core Team, participating agencies and WUI communities will be competitive for available hazardous fuels and non-fuels mitigation funding that may assist with plan implementation. Furthermore, adoption of this plan highlights a collaborative planning and development process among federal, state, and county agencies, WUI communities, and private landowners.

Sustaining CWPP Efforts

A CWPP can serve as the foundation for a safer and healthier Lincoln County through strategic planning, focusing on the threat of wildfire. The mitigation strategies outlined in this report will greatly reduce risk, but only if implemented. Converting strategy into action is the key to achieving the goals and objectives of the planning process.

The CWPP process encourages private landowners to take an active role as fuel treatment strategies are developed and prioritized. Ownership of CWPP implementation at the WUI level is the most effective means to achieving effective results and sustaining the effort from year to year. WUIs may choose to develop their own CWPP specific to their needs.

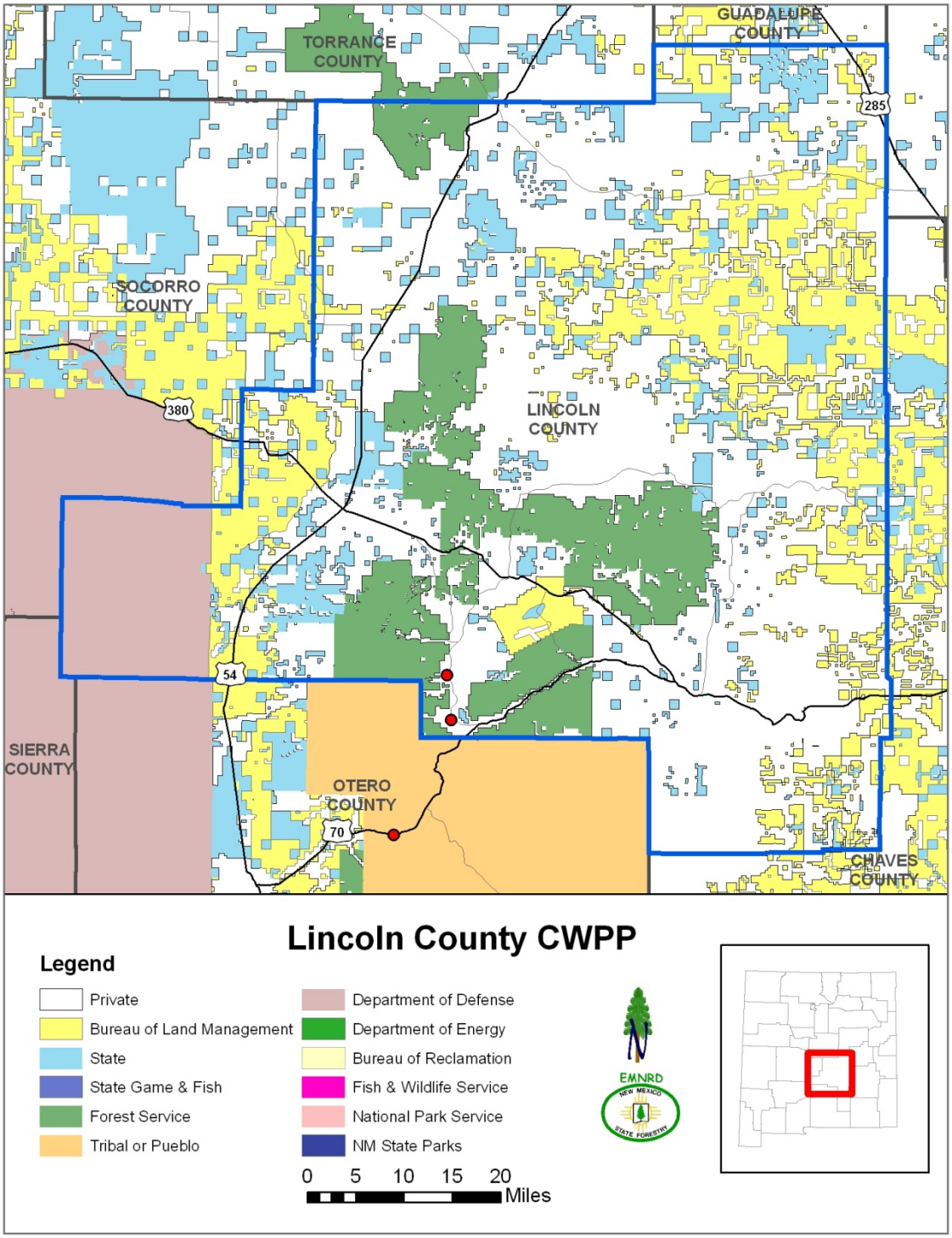
Proactive communities can seek support and guidance through a variety of state and local resources including NMSFD, Lincoln County Emergency Services, and local FDs. The Firewise program is an excellent source for information on ways to help communities reduce wildfire risks and hazards (www.firewise.org).

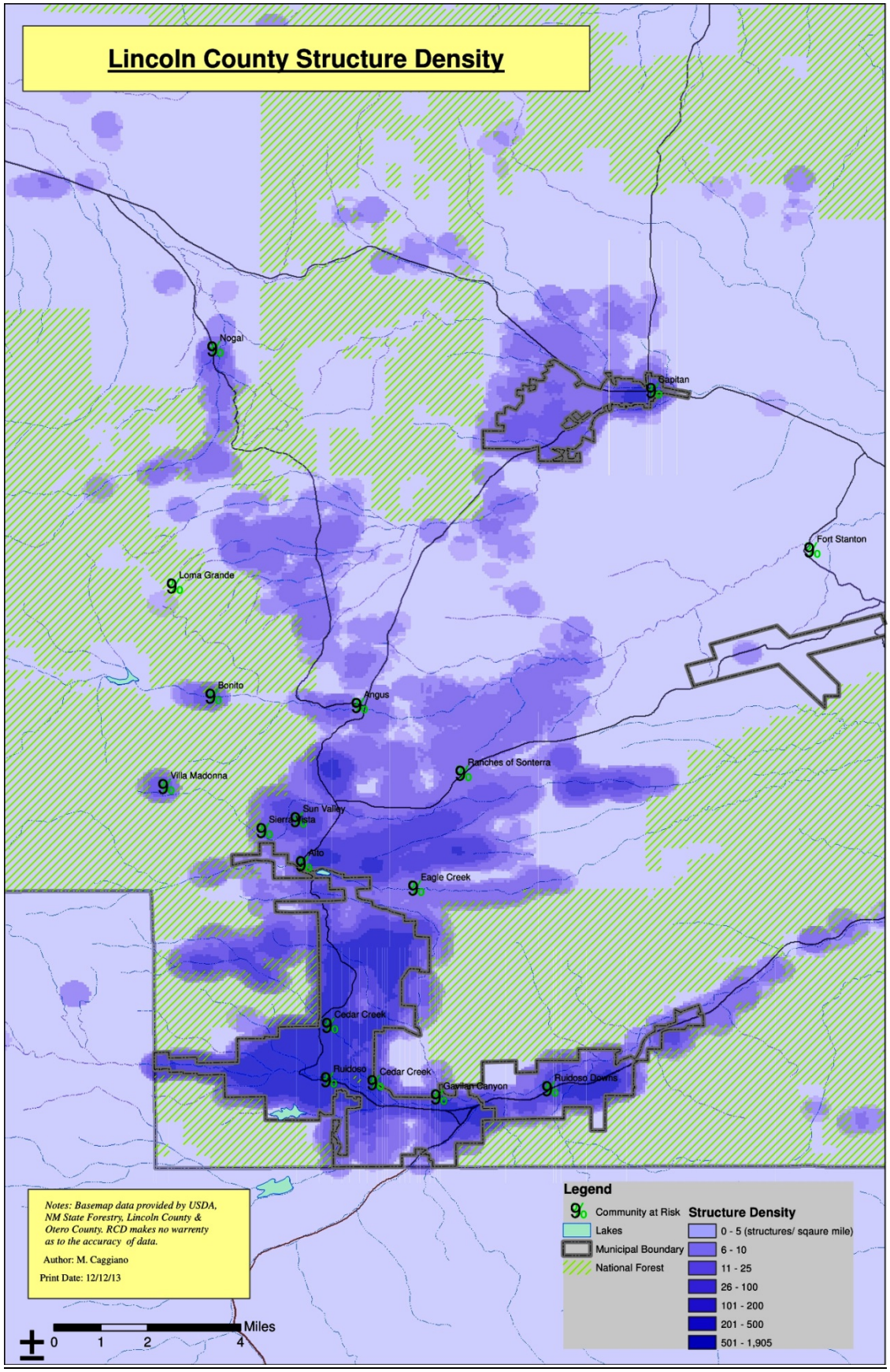
CWPP Oversight, Monitoring, and Evaluation

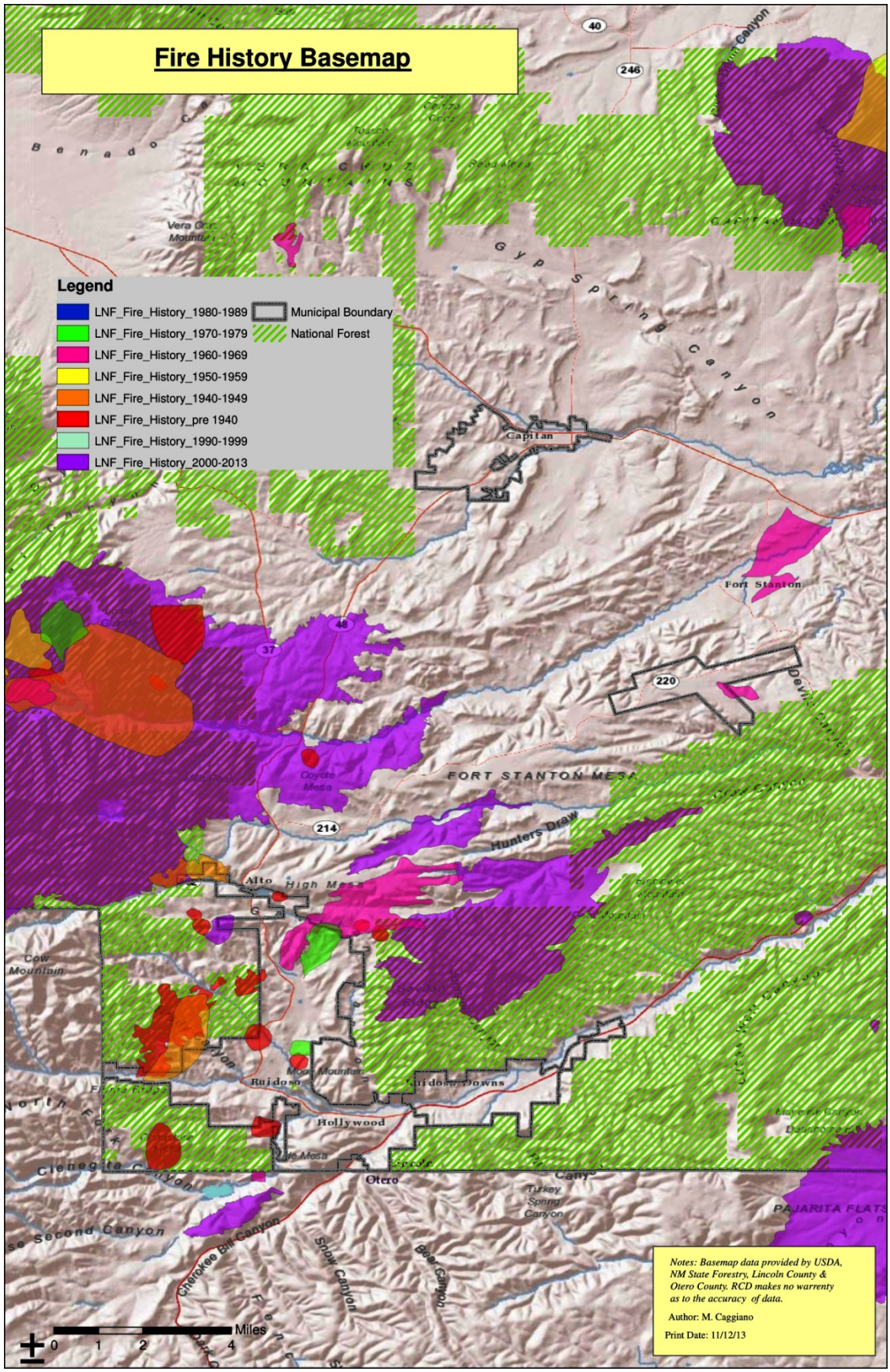
As wildfire hazard reduction efforts are implemented over time and the characteristics of the WUI change, the County may wish to reassess particular areas and update the CWPP. A WUI may want to develop a CWPP specific to their vegetation-fuels management needs.

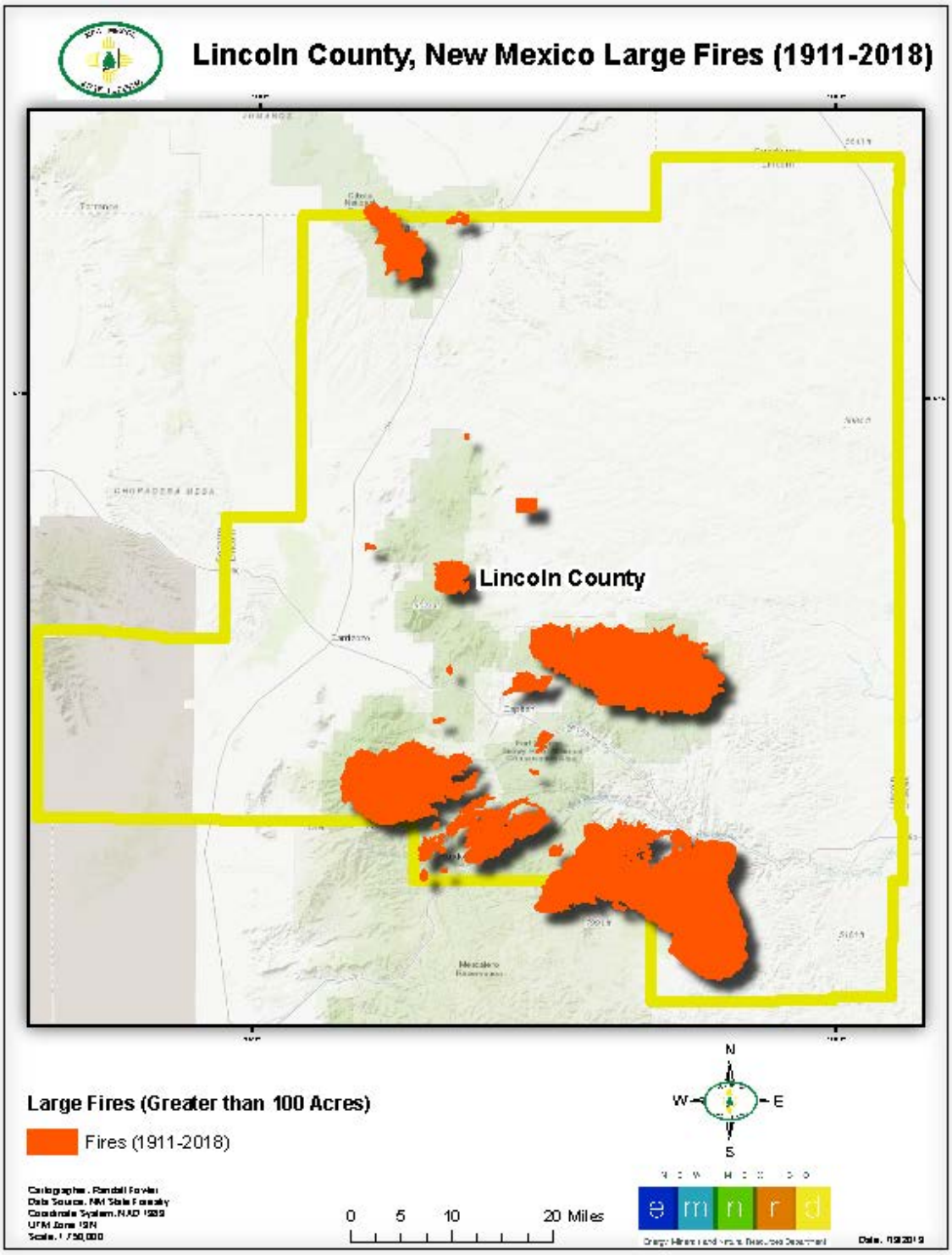
Monitoring the progress of project implementation and evaluating the effectiveness of treatments is an important component of CWPP oversight and maintenance. The assessment methodology utilized in this report is a standardized, well-documented hazard and risk survey approach that is designed to provide a benchmark against which future assessments may be compared. Successes, challenges, and new concerns should be noted and guide any modifications to the CWPP that better accommodate changing communities needs.

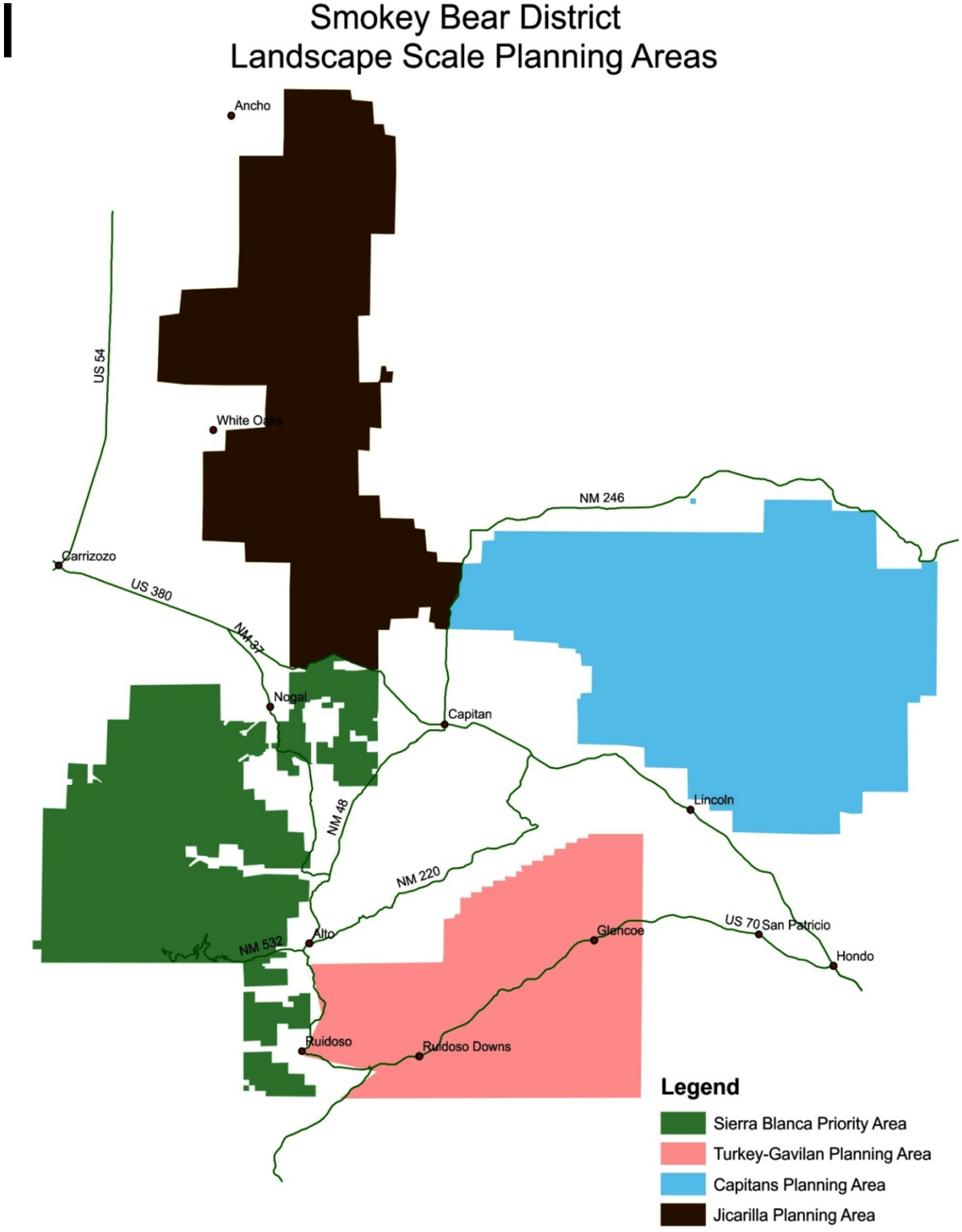
APPENDIX A - MAPS

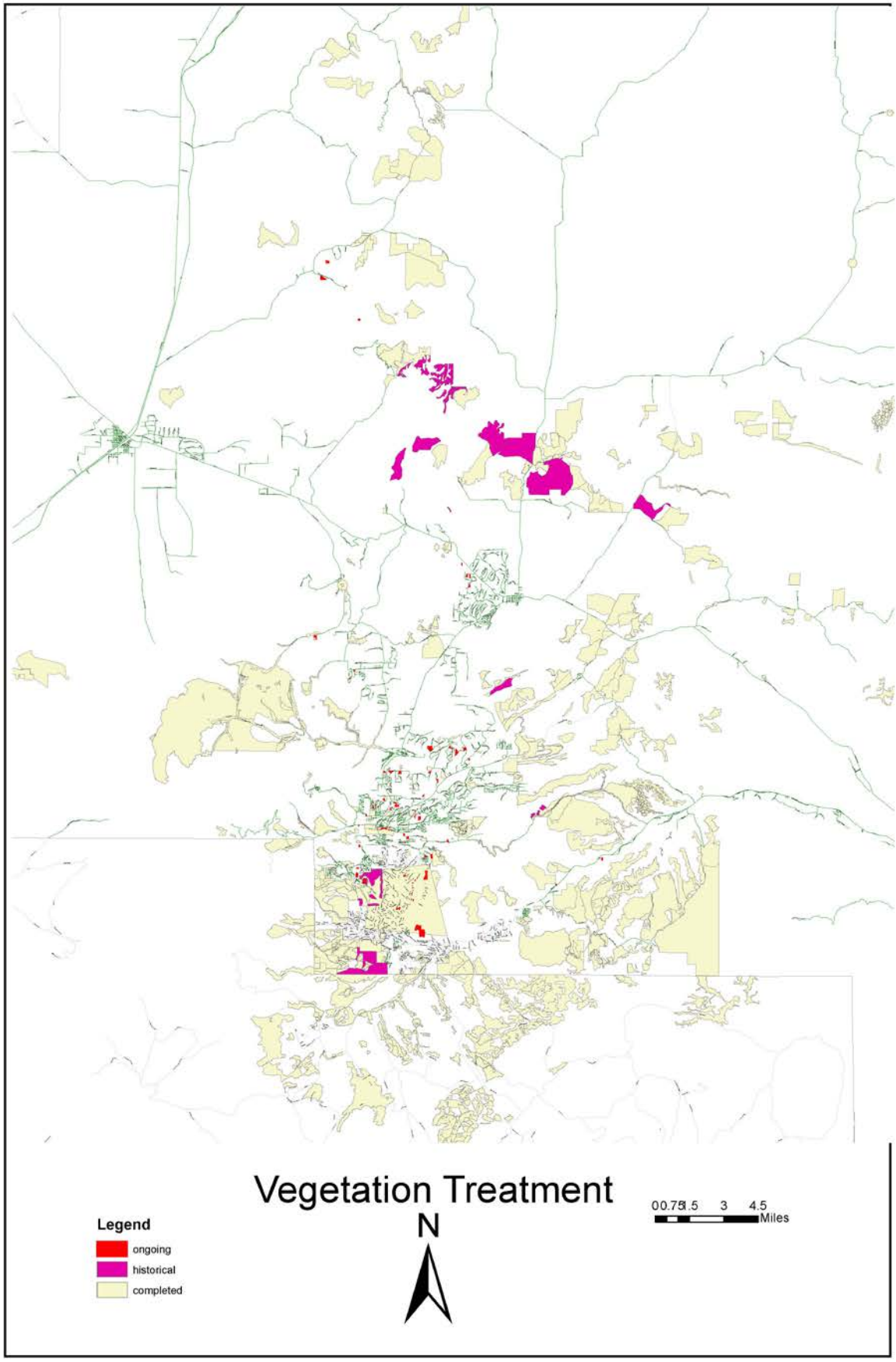


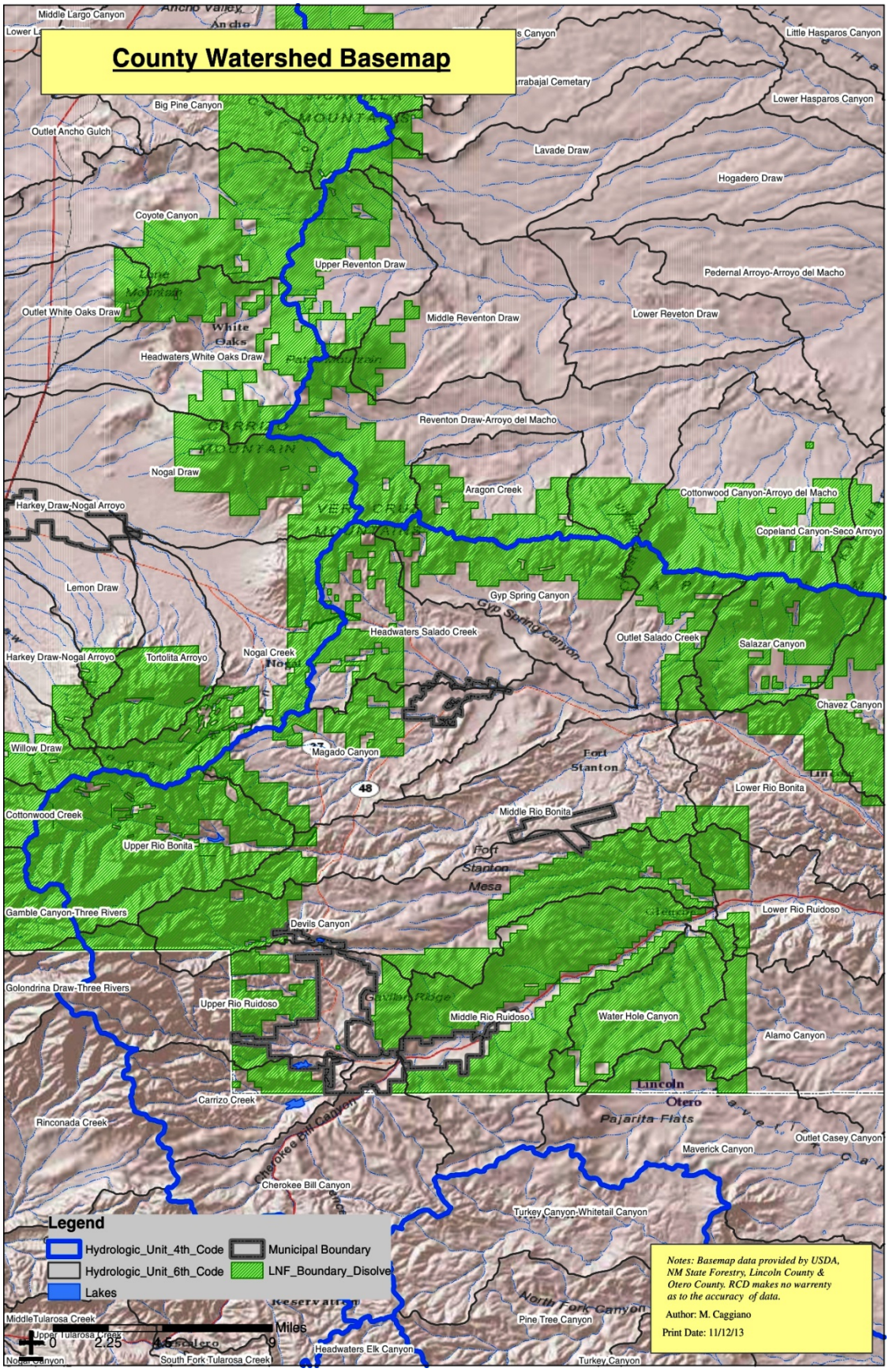

Lincoln County Structure Density
Nogal
Capitan
Fort Stanton
Loma Grande
Bonito
Angus
Villa Madonna
Ranches of Sonterra
Sun Valley
Sierra Vista
Alto
Eagle Creek
Cedar Creek
Ruidoso
Cedar Creek
Gavilan Canyon
Ruidoso Downs
Notes: Basemap data provided by USDA, NM State Forestry, Lincoln County & Otero County. RCD makes no warrenty as to the accuracy of data.
Author: M. Caggiano
Print Date: 12/12/13
Miles
0 1 2 4
Legend
Community at Risk
Lakes
Municipal Boundary
National Forest
Structure Density
0 - 5 (structures/ sqaure mile)
6 - 10
11 - 25
26 - 100
101 - 200
201 - 500
501 - 1,905


Fire History Basemap
Legend
LNF_Fire_History_1980-1989
LNF_Fire_History_1970-1979
LNF_Fire_History_1960-1969
LNF_Fire_History_1950-1959
LNF_Fire_History_1940-1949
LNF_Fire_History_pre 1940
LNF_Fire_History_1990-1999
LNF_Fire_History_2000-2013
Municipal Boundary
National Forest
Capitan
Fort Stanton
FORT STANTON MESA
Hunters Draw
Alto
High Mesa
Cow Mountain
Ruidoso
Ruidoso Downs
Hollywood
Otero
Turkey Spring Canyon
Cienegita Canyon
Second Canyon
Cherokee Bill Canyon
Snow Canyon
Bear Canyon
PAJARITA FLATS
Coyote Mesa
Gyp Spring Canyon
Notes: Basemap data provided by USDA, NM State Forestry, Lincoln County & Otero County. RCD makes no warrenty as to the accuracy of data.
Author: M. Caggiano
Print Date: 11/12/13
Miles
0
1
2
4

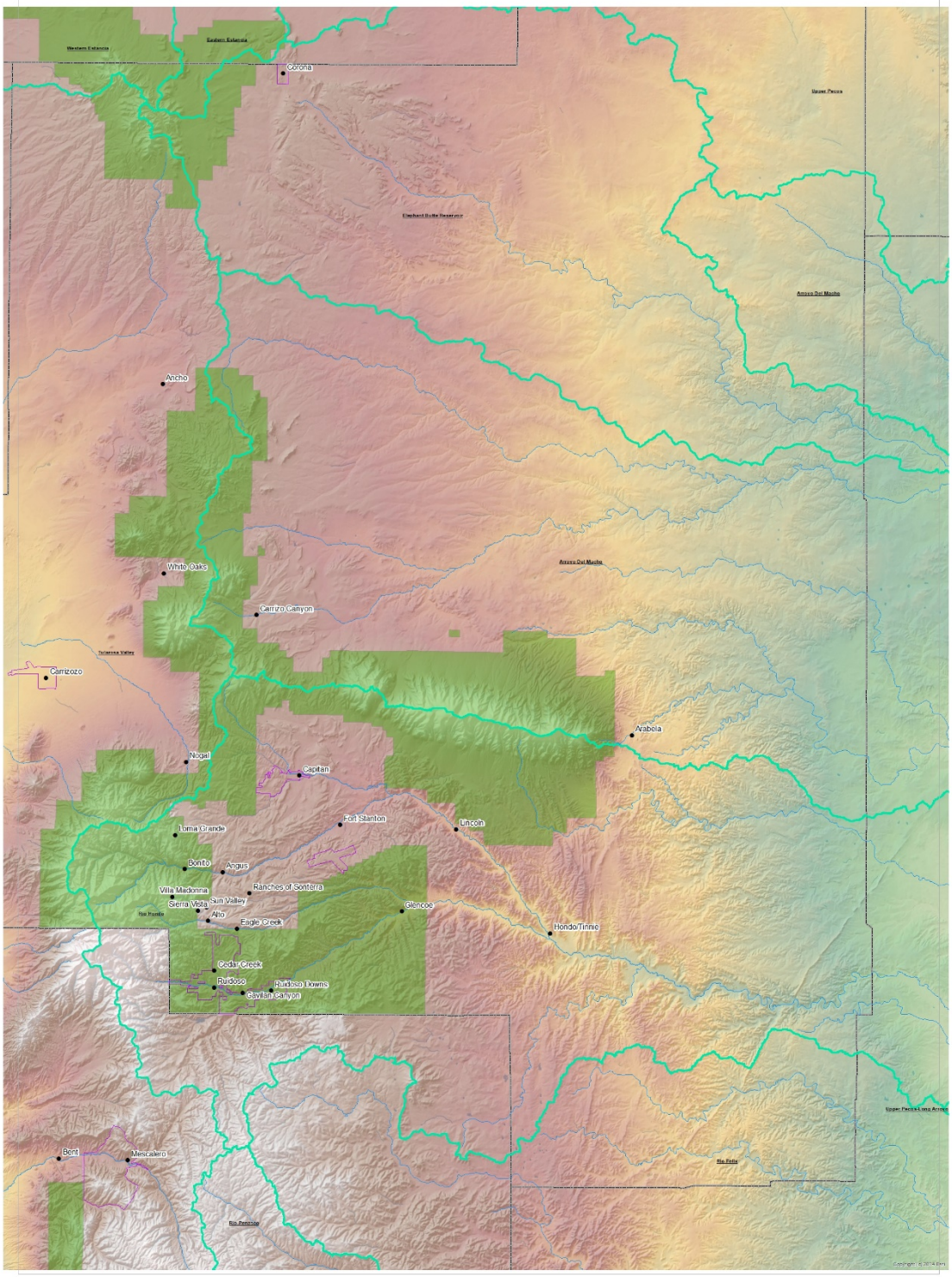

Lincoln County, New Mexico Large Fires (1911-2018)
Lincoln County
Large Fires (Greater than 100 Acres)
Fires (1911-2018)
N
W
E
S
0 5 10 20 Miles


Smokey Bear District
Landscape Scale Planning Areas
Ancho
US 54
White Oaks
NM 246
Carrizozo
US 380
NM 37
Nogal
Capitan
Lincoln
NM 48
NM 220
US 70
San Patricio
Hondo
NM 532
Alto
Glencoe
Ruidoso
Ruidoso Downs
Legend
Sierra Blanca Priority Area
Turkey-Gavilan Planning Area
Capitans Planning Area
Jicarilla Planning Area


Vegetation Treatment
Legend
ongoing
historical
completed
N
0 0.75 1.5 3 4.5
Miles


County Watershed Basemap
Middle Largo Canyon
Little Hasparos Canyon
Lower Hasparos Canyon
Big Pine Canyon
Outlet Ancho Gulch
Lavade Draw
Hogadero Draw
Coyote Canyon
Upper Reventon Draw
Pedernal Arroyo-Arroyo del Macho
Outlet White Oaks Draw
Middle Reventon Draw
Lower Reveton Draw
Headwaters White Oaks Draw
Reventon Draw-Arroyo del Macho
Nogal Draw
Aragon Creek
Cottonwood Canyon-Arroyo del Macho
Harkey Draw-Nogal Arroyo
Copeland Canyon-Seco Arroyo
Lemon Draw
Gyp Spring Canyon
Headwaters Salado Creek
Outlet Salado Creek
Salazar Canyon
Harkey Draw-Nogal Arroyo
Tortolita Arroyo
Nogal Creek
Chavez Canyon
Willow Draw
Magado Canyon
Fort Stanton
Lower Rio Bonita
Middle Rio Bonita
Cottonwood Creek
Upper Rio Bonita
Fort Stanton Mesa
Gamble Canyon-Three Rivers
Lower Rio Ruidoso
Devils Canyon
Golondrina Draw-Three Rivers
Upper Rio Ruidoso
Middle Rio Ruidoso
Water Hole Canyon
Alamo Canyon
Carrizo Creek
Lincoln
Otero
Rinconada Creek
Pajarita Flats
Outlet Casey Canyon
Maverick Canyon
Cherokee Bill Canyon
Turkey Canyon-Whitetail Canyon
Legend
Hydrologic_Unit_4th_Code
Municipal Boundary
Hydrologic_Unit_6th_Code
LNF_Boundary_Disolve
Lakes
Notes: Basemap data provided by USDA, NM State Forestry, Lincoln County & Otero County. RCD makes no warrenty as to the accuracy of data.
Author: M. Caggiano
Print Date: 11/12/13
North Fork Canyon
Pine Tree Canyon
Middle Tularosa Creek
Upper Tularosa Creek
Miles
0
2.25
4.5
9
Escalero
Headwaters Elk Canyon
South Fork Tularosa Creek
Turkey Canyon

County HUC 8 Watershed Basemap



APPENDIX B
Village of Ruidoso Accomplishments And Planned Projects

Subdivision	# of Properties	Year Completed
Country Club Heights SD	10	2013-2014
Granite Heights Condominiums	25	2013-2014
Granite Place Homesite SD	3	2013-2014
High View Condomimium Project	8	2013-2014
La Tierra Condomimiums	11	2013-2014
Mountain Shadows SD	12	2013-2014
Mountain View Estates SD	85	2013-2014
Mountain View Estates U-2	7	2013-2014
Pine Top Hills SD	21	2013-2014
Pinon Park Condominiums	76	2013-2014
Sierra Vista Condominiums	18	2013-2014
Skyvue Heights SD	22	2013-2014
The Crest-A Townhouse Project	13	2013-2014
Timbers SD	31	2013-2014
White Mountain Estates	409	2013-2014
White Mountain Villas	8	2013-2014
Misc Tracts of Land	1	2013-2014
White Mountain Estates 1st Add	11	2013-2014
Total	**771**	**2013-2014**

Subdivision	# of Properties	Year Completed
Aspen Run Condos	36	2014-2015
Buckner	12	2014-2015
Country Club Condos	10	2014-2015
Country Club Townhomes Units 1-9	9	2014-2015
Cree Meadow Heights - 1st	10	2014-2015
Cree Meadow Heights - 2nd	29	2014-2015
Cree Meadows Country Club	109	2014-2015
Debord Heights	2	2014-2015
Eagle Condos	4	2014-2015
Fairway Meadows	24	2014-2015
Golf Course Estates	202	2014-2015
Hamilton Terrace	38	2014-2015
Highwood Addition	93	2014-2015

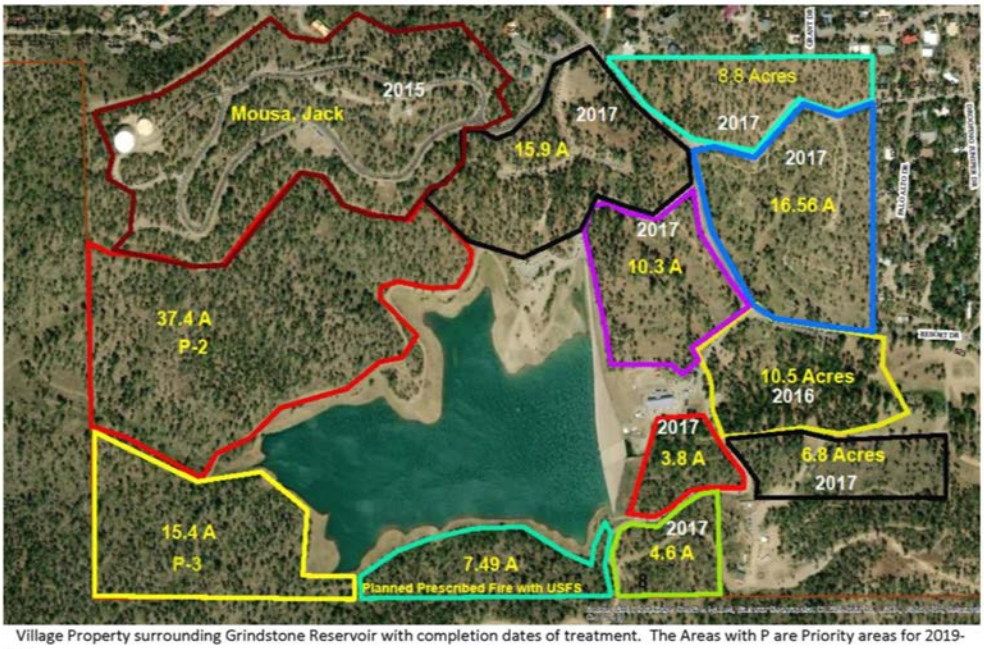
Subdivision	# of Properties	Year Completed
Lookout	26	2014-2015
Lookout Estates Condos	8	2014-2015
Misc Tracts of Land	14	2014-2015
Paradise Canyon 2nd Supplement	87	2014-2015
Paradise Canyon Heights	38	2014-2015
Riverside Addition Amended	34	2014-2015
Skyland Addition	44	2014-2015
Watts Tract	5	2014-2015
Hillside Addition	9	2014-2015
Total	**843**	**2014-2015**
Subdivision	**# of Properties**	**Year Completed**
Airport Tracts	5	2015-2016
Airport West 2nd Addition	63	2015-2016
Airport West 4th Addition	73	2015-2016
Country Club Estates SD	6	2015-2016
Country Club Heights SD	4	2015-2016
Cree Meadow Heights 1st Add.	6	2015-2016
Del Norte Addition	21	2015-2016
Devon Hills	1	2015-2016
Devon Place	6	2015-2016
Enchanted Hills SD	14	2015-2016
Hamilton Terrace	6	2015-2016
Indian Hills SD	46	2015-2016
Indian Hills SD 1st Addition	9	2015-2016
Keeth Tract, B	1	2015-2016
Navajo Condominiums	6	2015-2016
Navajo SD	8	2015-2016
Palmer Gateway SD	32	2015-2016
Paradise Canyon SD, 2nd Suppl.	15	2015-2016
Pinescape SD	6	2015-2016
Riverside Addition - Amended	7	2015-2016
Spring Cove	10	2015-2016
Starlite Addition	6	2015-2016
White Mountain Estates	80	2015-2016
Young Heights	67	2015-2016
Misc Tracts of Land	1	2015-2016
Cree Meadow Heights 3rd Add.	105	2015-2016
River Pines	4	2015-2016
Sierra Professional Center	3	2015-2016
Total	**611**	**2015-2016**

Subdivision	# of Properties	Year Completed
Adobe Condominiums	20	2016-2017
Airport West 2nd Addition	15	2016-2017
Big Pine Condominiums	16	2016-2017
Charlie Culver	3	2016-2017
Cherokee Addition	29	2016-2017
Cree Meadow Heights 1st Add	13	2016-2017
Cree Meadow Heights 3rd Add	26	2016-2017
Del Norte Addition	2	2016-2017
Devon Hills	7	2016-2017
Eldorado Heights	25	2016-2017
Hamilton Terrace	2	2016-2017
Motel	1	2016-2017
Navajo SD	10	2016-2017
Old Lincoln Townhomes	3	2016-2017
Palmer Gateway	143	2016-2017
Pepper Tree Place	16	2016-2017
Rancho Vista Townhomes	8	2016-2017
River Crossing Condominiums	13	2016-2017
Riverside Addition Amended	6	2016-2017
Ruidoso Springs	92	2016-2017
School District	22	2016-2017
Skyland Addition	94	2016-2017
Tres Rios Condominiums	16	2016-2017
Vista Grande Townhouse	14	2016-2017
White Mountain Estates	41	2016-2017
Misc Tracts of Land	22	2016-2017
Airport West 4th Addition	51	2016-2017
Aspenwood Townhomes	2	2016-2017
Enchanted Hills	3	2016-2017
Twin Spruce	1	2016-2017
Total	**716**	**2016-2017**

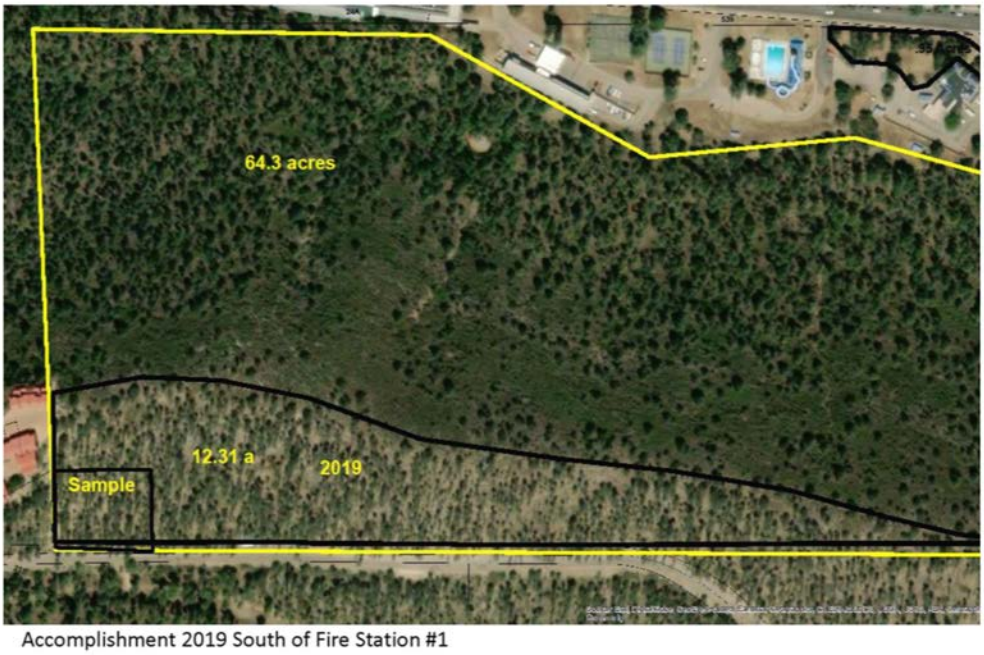
Subdivision	# of Properties	Year Completed
Camelot Condominiums	9	2017-2018
Camelot Crown Estates	91	2017-2018
Camelot Highlands SD	95	2017-2018
Camelot Mountain Tracts	76	2017-2018
Camelot Place Apartments	1	2017-2018
Camelot Subdivision - Amended	275	2017-2018
Camelot Vista Estates	95	2017-2018
High Ridge	113	2017-2018
Lakeview Estates Phase 4	7	2017-2018
Lakeview Estates Phase I	27	2017-2018
Lakeview Estates Phase II	21	2017-2018
Lakeview Estates Phase III	9	2017-2018
Legacy Point At Camelot	3	2017-2018
Sierra Estates	63	2017-2018
Tierra Del Sol Condo Resort	30	2017-2018
Misc Tracts of Land	3	2017-2018
Vista Del Sol	8	2017-2018
Whispering Pines Camelot	13	2017-2018
Total	**939**	**2017-2018**

Properties Planned for Thinning/Certification	Year
959	2019
1118	2020
912	2021
1220	2022
1123	2023

Priority List for Village of Ruidoso Thinning	# of Acres	Year
Crown Drive	12.3	2019
Ski Run Road South of Donkey St.	33	2019
West of Grindstone Lake	37.4	2019-2020
South of Grindstone Lake	15.4	2019-2020
East of Grindstone Lake	7.5	2020-2021
Ski Run Road	48	2020-2022
Ski Run Road	45	2020-2022
South of Fire Station #1	64	As Funds Are Available
South of Ball Fields on Ski Run Road	96.5	As Funds Are Available
East and South of Alto Lake	158	As Funds Are Available
Ruidoso Airport	560	As Funds Are Available
Moon Mountain	604	As Funds Are Available
Total Planned Acres	**1681.1**	



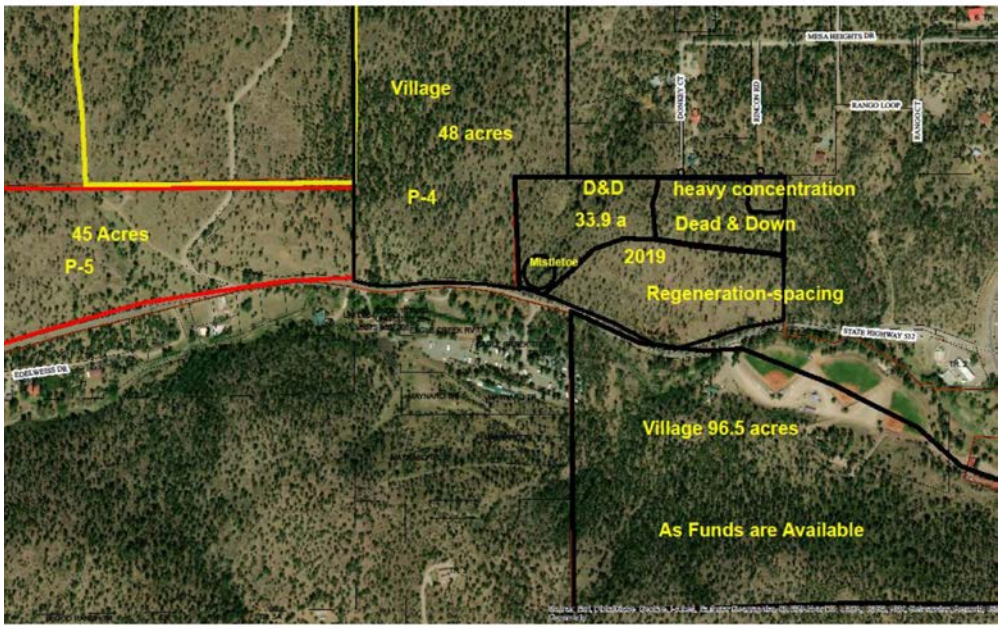
Village Property surrounding Grindstone Reservoir with completion dates of treatment. The Areas with P are Priority areas for 2019-024



Accomplishment 2019 South of Fire Station #1

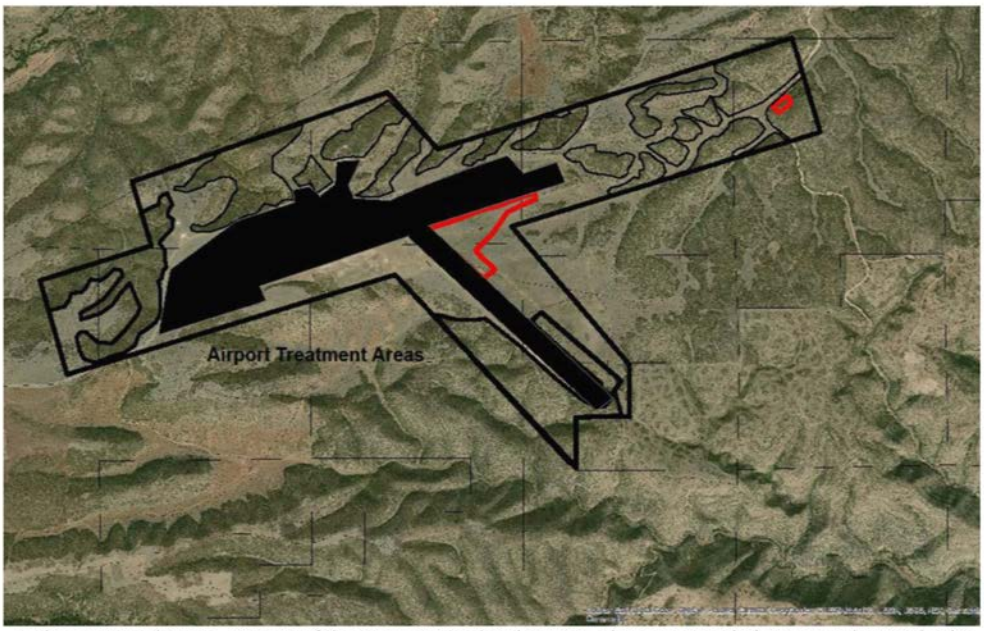
ıccomplishments 2013-2016

The Village of Ruidoso has a long term lease for the State Trust Land on Moon Mountain. A fuel Management plan is being prepared and should be completed in 2019.



Ski Run Road Thinning 2019-2014

he area was thinned in 2011-2012 And will be thinned again in the 2023-2026 time frame as funds become available.



Ruidoso Airport Thinning. 60 acres of thinning was completed in 2018. There are a total of 530 acres that need to be hinned as funds permit.

APPENDIX C
List of Acronyms and Abbreviations

BLM	Bureau of Land Management
BTU	British Thermal Unit
CFD	County Fire District
CRWB	Crew Boss
CWPP	Community Wildfire Protection Plan
DOZB	Dozer Boss
EA	Extended Attack
ENGB	Engine Boss
FBFM	Fire Behavior Fuel Model
FD	Fire District
FEMA	Federal Emergency Management Agency
FFT1	Advanced Firefighter/Squad Boss
FFT2	Firefighter
FRCC	Fire Regime Condition Class
F	Fahrenheit
g	gallon
GIS	Geographical Information System
HFRA	Healthy Forests Restoration Act
IA	Initial Attack
IJPA	Interagency Joint Powers Agreement
IRP	Ignition Risk Potential
IWUIC	International Wildland-Urban Interface Code
LANDFIRE	Landscape Fire and Resources Management Tools Project
MFD	Municipal Fire District
NEPA	National Environmental Policy Act
NFDRS	National Fire Danger Rating System
NFPA	National Fire Protection Association
NMSFD	New Mexico State Forestry Division
NRCS	National Resource Conservation Service
NWCG	National Wildfire Coordination Group
PPE	personal protective equipment
SWCD	Soil Water Conservation District
USFS	U.S. Forest Service
VFD	Volunteer Fire Department
WFU	Wildland Fire Use
WUI	Wildland-Urban Interface

APPENDIX D
List of Fire Behavior Terms

Aerial Fuels All live and dead vegetation in the forest canopy or above surface fuels, including tree branches, twigs, cones, snags, moss, and high brush.

Aspect Direction a slope faces.

Direct Attack A method of fire suppression where actions are taken directly along the fire's edge. In a direct attack, burning fuel is treated directly, such as by wetting, smothering, or chemically quenching the fire or by physically separating burning from unburned fuel.

Chain A unit of linear measurement equal to 66 feet.

Crown Fire The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire.

Dead Fuels Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Defensible Space An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, "defensible space" is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation by building and maintaining fire-safe communities compatible with the natural surroundings.

Firewise Firewise is a national program to serve as a resource for agencies, tribes, organizations, communities, fire departments, and private landowners who are working on the goal to reduce the loss of lives, property, and resources to wildfire.

Fire Behavior The manner in which a fire reacts to the influences of fuel, weather, and topography.

Fire Danger The broad-scale condition of fuels as influenced by environmental factors.

Fire Front The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified, the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

Fire Hazard	The presence of ignitable fuel coupled with the influences of terrain and weather.
Fire Intensity	A general term relating to the heat energy released by a fire.
Fire Return Interval	The historic frequency that fire burns in a particular area or fuel type without human intervention.
Fire Regime	The characterization of fire's role in a particular ecosystem, usually characteristic of a particular vegetation and climatic regime, and typically a combination of fire return interval and fire intensity (i.e., high frequency low intensity/low frequency high intensity).
Fire Weather	Weather conditions that influence fire ignition, behavior, and suppression.
Flame Length	The distance from the base to the tip of the flaming front. Flame length is directly correlated with fire intensity.
Flaming Front	The zone of a moving fire where combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front.
Fuels	Combustible material; includes vegetation such as grass, leaves, ground litter, plants, shrubs, and trees that feed a fire. Not all vegetation is necessarily considered fuel; deciduous vegetation such as aspen actually serve more as a barrier to fire spread, and many shrubs are only available as fuels when they are drought-stressed.
Fuel Break	An area of land where fuel continuity and load is reduced to reduce wildfire rate of spread and severity and to improve control opportunities.
Fuel Loading	The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.
Fuel Model	Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.
Fuel Type	An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Ground Fuel	All combustible materials below the surface litter, including duff, tree or shrub roots, punchy wood, peat, and sawdust that normally support a glowing combustion without flame.
Hazard	Vegetation-fuel attributes that may be conducive to propagate and carry a fire.
Indirect Attack	A method of fire suppression where actions are taken some distance from the active edge of the fire due to intensity, terrain, or other factors that make direct attack difficult or undesirable.
Intensity	The level of heat radiated from the active flaming front of a fire, measured in British thermal units (BTUs) per foot.
Ladder Fuels	Fuels that provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. Ladder fuels help initiate and ensure the continuation of crowning.
Live Fuels	Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.
National Fire Danger Rating System (NFDRS)	A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.
Prescribed Fire	Any fire ignited by management actions under certain predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and National Environmental Policy Act (NEPA) requirements must be met prior to ignition.
Rate of Spread	The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, rate of forward spread of the fire front, or rate of increase in an area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history. Sometimes it is expressed as feet per minute; one chain per hour is equal to 1.1 feet per minute.
Risk	The probability that a fire will start from natural or human-caused ignition.
Surface Fuels	Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and

	medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.
Topography	Referred to as "terrain." The term also refers to parameters of the "lay of the land" that influence fire behavior and spread. Key elements are slope (in percent), aspect (the direction a slope faces), elevation, and specific terrain features such as canyons, saddles, "chimneys," and chutes.
Wildfire	A wildland fire that is unwanted and unplanned.
Wildland Fire	Any fire burning in wildland fuels, including prescribed fire, fire use, and wildfire.
Wildland Fire Use	The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

APPENDIX E

2019 Lincoln County Community Wildfire Protection Plan Update – Public Survey

A Community Wildfire Protection Plan (CWPP) is a way for communities to address their wildfire risk by evaluating wildfire risks and coming up with options for mitigating those risks. Lincoln County is in the process of updating the 2014 CWPP and is seeking input from residents about your concerns and ideas for how we can improve the plan and make our community more resilient to wildfire. We appreciate you taking the time to complete the survey (it should take less than 10 minutes). Your input is extremely valuable in helping us to create an effective Community Wildfire Protection Plan.

1. What neighborhood and/or community do you live in?
   - ☐ Ruidoso
   - ☐ Ruidoso Downs
   - ☐ Capitan
   - ☐ Carrizozo
   - ☐ Corona
   - ☐ Lincoln
   - ☐ Hondo Valley
   - ☐ Alto Area
   - ☐ Greater Lincoln County
   - ☐ Other (please specify) _____

2. What type of resident are you? (Please check all that apply)
   - ☐ Full-time Resident
   - ☐ Seasonal Resident
   - ☐ Homeowner
   - ☐ Renter
   - ☐ Owner of Undeveloped Lot(s)
   - ☐ Owner of a Home Rental Property
   - ☐ Owner of a Ranch or Farm Property
   - ☐ Business Owner

3. How concerned are you about wildfire in your area?
   - ☐ Not at all concerned
   - ☐ Slightly concerned
   - ☐ Moderately Concerned
   - ☐ Extremely Concerned

4. How much control do you feel you have over your risk from wildfire?
   - ☐ No control
   - ☐ A little control
   - ☐ A great deal of control
   - ☐ Complete control

5. How would you rate your home in terms of risk from Wildfire?
   - ☐ Low
   - ☐ Medium
   - ☐ High

6. My home is vulnerable to wildfire because of:

- ☐ Surrounding fuels on your property – trees, grass, shrubs, etc.
- ☐ Surrounding fuels on neighboring properties
- ☐ The type of building materials used in my home
- ☐ Lack of water supplies
- ☐ I live in an inaccessible area
- ☐ I do not feel my home is vulnerable to wildfire

7. My biggest challenge to making my home fire safe is: (check the option that applies the most)

- ☐ Time
- ☐ Money
- ☐ Not knowing what to do
- ☐ Neighboring properties that I have no control over
- ☐ I think my home is already safe

8. Under which of the following conditions would you be willing to do mitigation work on your property?

- ☐ I would do mitigation work regardless of what anyone else does.
- ☐ Only if the work would be cost shared with government or private agencies.
- ☐ Only if the work would be fully funded by government or private agencies.
- ☐ Only if I can be convinced that work will improve the ability of my home to survive wildfire.
- ☐ Under no circumstances
- ☐ Other (please specify) _____

9. Which of the following mitigation actions do you do each year to prepare for fire season? (Please check all that apply)

- ☐ Move firewood away from my home to a spot up slope and downwind.
- ☐ Cut grass and weeds around my house.
- ☐ Remove (or rake away) pine needles on the ground, roof and in the gutters.
- ☐ Repair or install screens to block sparks from blowing in and under my home, eave vents and outbuildings
- ☐ Remove flammable objects, including firewood, brush and other materials from under my wooden deck.

10. Since 2014 have you taken any of the following steps to reduce the risk of wildfire to your home? (Please check all that apply)

- ☐ Defensible space thinning
- ☐ Structural improvements (removed wooden deck, installed fire resistant building materials, etc.)
- ☐ Improvements to driveway
- ☐ Other (please specify)_____

11. How prepared is your community and Lincoln County for a large Wildfire?

- ☐ Poorly Prepared
- ☐ Moderately Prepared
- ☐ Prepared
- ☐ Well Prepared

12. How acceptable do you find each of the following practices?

Practice	Unacceptable	Somewhat Unacceptable	Neither Acceptable or Unacceptable	Somewhat Acceptable	Very Acceptable
Programs to assist with disposal of removed vegetation (chipping, etc)					
Structural FireWise ordinances for new buildings					
Structural FireWise ordinances to retrofit existing buildings					
One on one consultations on how to make my property/home FireWise					
Cost-share programs for reducing vegetation on private property					
Vegetation management ordinances					

13. Rate the importance of the following activities in making Lincoln County better prepared for wildfires:

Practice	Not Important At All	Somewhat Important	Important	Very Important	Not Sure
Clean-up by individual property owners					
Better fire-fighting equipment					
Improved Water Supply					
Fire mitigating fuel treatments on public lands					
Fire mitigating fuel treatments on private property					
Community Education					

14. Rate your comfort level with the following activities.

Practice	Very Uncomfortable	Somewhat Uncomfortable	Neither Uncomfortable or Comfortable	Comfortable	Very Comfortable
Cutting and chipping hazardous fuels (trees, limbs, brush and tall grasses) within 100 feet of my home.					
Using prescribed burns to reduce fuels on the Lincoln National Forest and other forested areas.					
Working collaboratively with other property owners to create shaded fuel breaks to stop or slow large wildfires before they reach my home.					
Cutting and chipping hazardous fuels and open space areas within local communities.					

15. How would you prioritize the following elements of community wildfire preparedness?

Practice	Not Important	Somewhat Important	Neutral	Important	Very Important
Hazardous fuels reduction open space and adjacent lands					
Defensible space around homes					
Emergency notification during a wildfire					
Homeowner education and outreach					
Evacuation notices and procedures					
Post-fire Recovery					

Other (please specify)_____

16. Which of the following best describes your household's current disaster/emergency plan in case of wildfire?

- ☐ My household does not have a disaster plan
- ☐ My household has a plan, but it is not written
- ☐ My household has a written plan

17. Do you have a prearranged meeting place for family members in the event of an evacuation?

- ☐ Yes
- ☐ No

18. How would you prefer to receive information regarding wildfire prevention? Please check all that apply.

❑ Local Newspaper ❑ Radio ❑ Television ❑ Family/Friends/Neighbors ❑ Internet ❑ Twitter

❑ Facebook ❑ Brochures ❑ Conversations with Local Government Representatives (county, city, etc)

❑ Local Fire Department ❑ Insurance Company ❑ Homeowners Association

19. How would you prefer to receive information during a wildfire emergency? Please check all that apply.

❑ Local Newspaper ❑ Radio ❑ Television ❑ Family/Friends/Neighbors ❑ Internet ❑ Twitter

❑ Facebook ❑ Brochures ❑ Local Government Representatives ❑ Local Fire Department

20. What additional priority actions should Lincoln County include in the 2019 CWPP update?

_____

_____

_____

_____

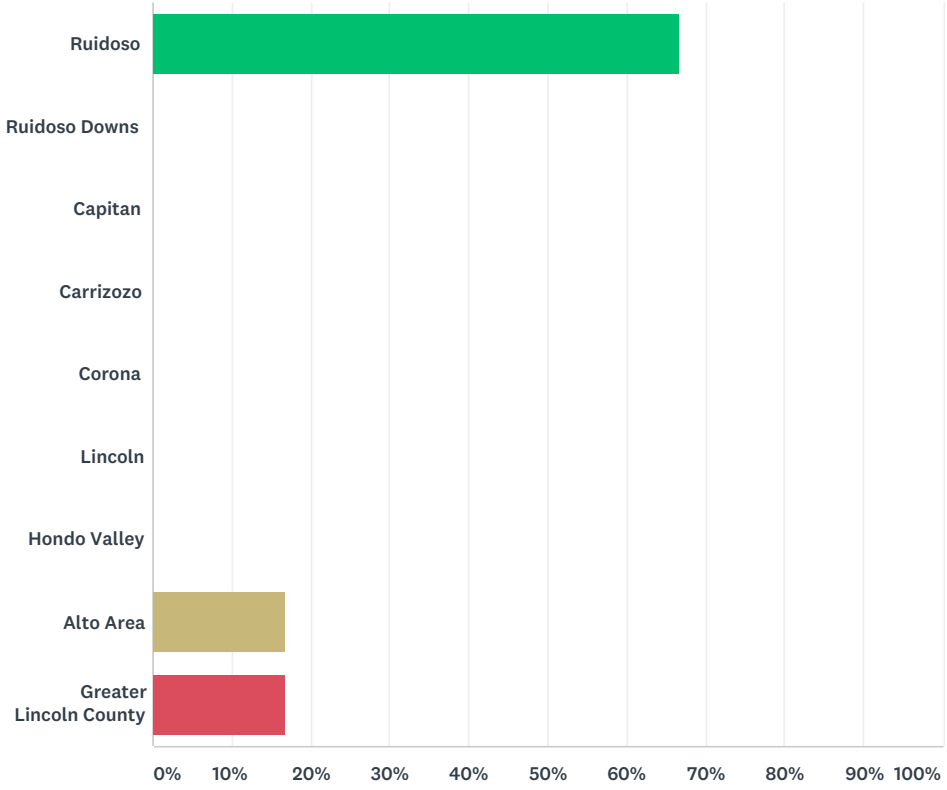
If you prefer you may complete this survey online at
https://www.surveymonkey.com/r/Lincoln_County_CWPP

Please return all surveys to: SCM RC&D Council, 201 Oak Grove Place, Ruidoso, NM 88345
You may also email completed surveys to laura@scmrcd.org.

Questions? Call 575-446-3973

Q1 What neighborhood and/or community do you live in?

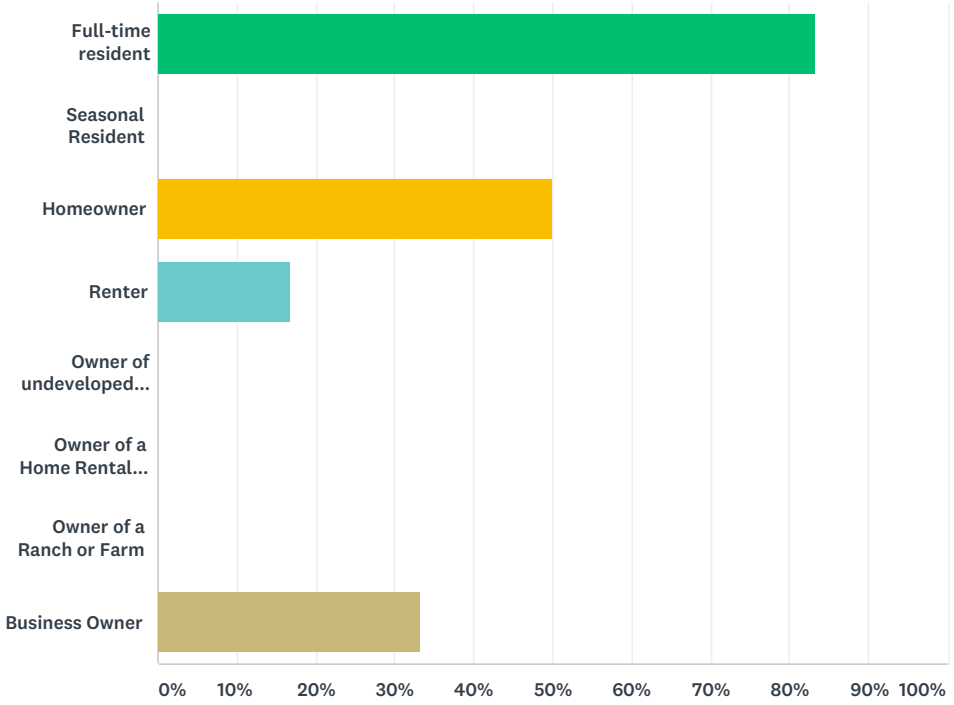
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Ruidoso	66.67%	4
Ruidoso Downs	0.00%	0
Capitan	0.00%	0
Carrizozo	0.00%	0
Corona	0.00%	0
Lincoln	0.00%	0
Hondo Valley	0.00%	0
Alto Area	16.67%	1
Greater Lincoln County	16.67%	1
Total Respondents: 6		

Q2 What type of resident are you? (Please check all that apply)

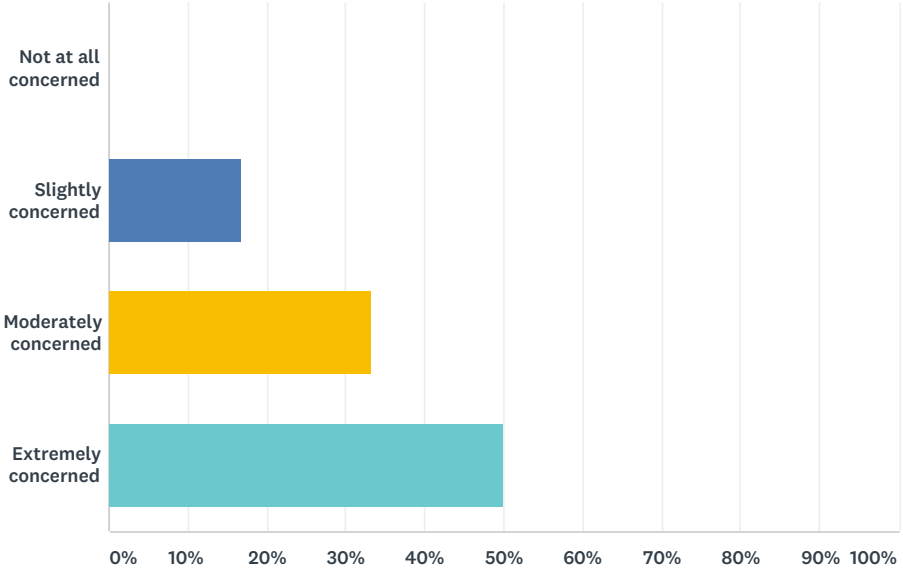
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Full-time resident	83.33%	5
Seasonal Resident	0.00%	0
Homeowner	50.00%	3
Renter	16.67%	1
Owner of undeveloped lot(s)	0.00%	0
Owner of a Home Rental Property	0.00%	0
Owner of a Ranch or Farm	0.00%	0
Business Owner	33.33%	2
Total Respondents: 6		

Q3 How concerned are you about wildfire in your area?

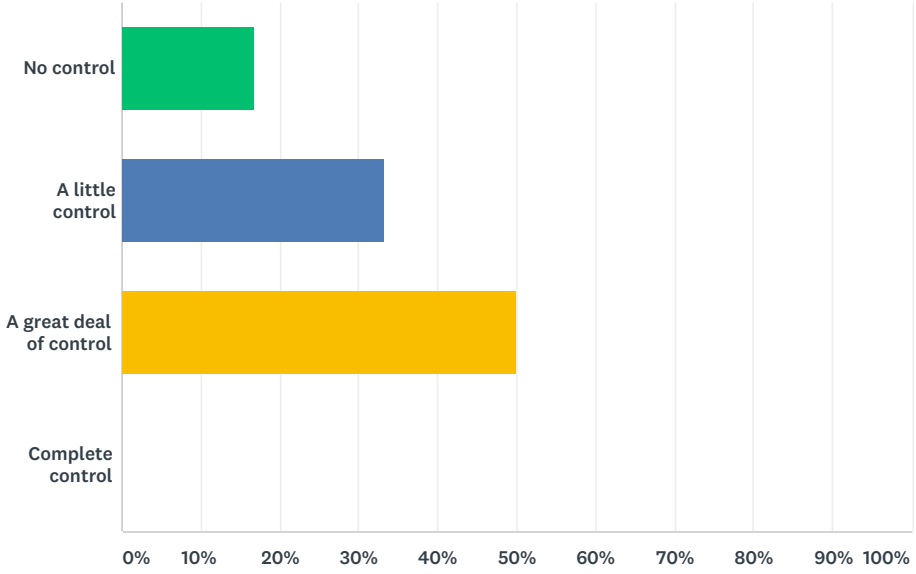
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Not at all concerned	0.00%	0
Slightly concerned	16.67%	1
Moderately concerned	33.33%	2
Extremely concerned	50.00%	3
TOTAL		6

Q4 How much control do you feel you have over your risk from wildfire?

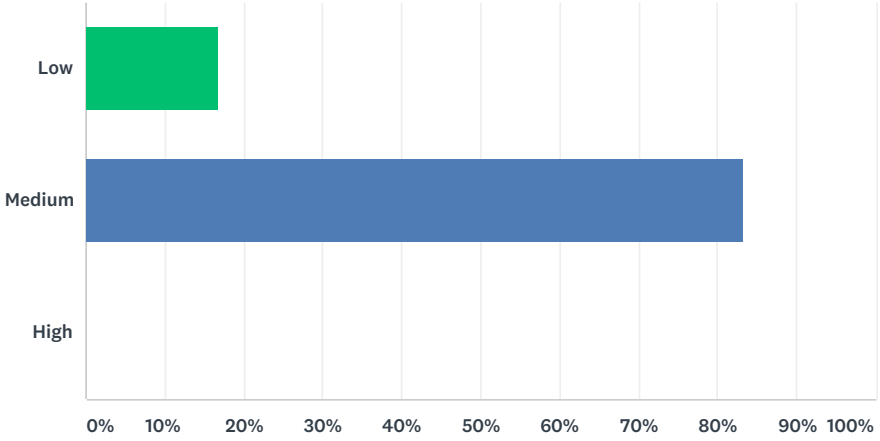
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
No control	16.67%	1
A little control	33.33%	2
A great deal of control	50.00%	3
Complete control	0.00%	0
TOTAL		6

Q5 How would you rate your home in terms of risk from Wildfire?

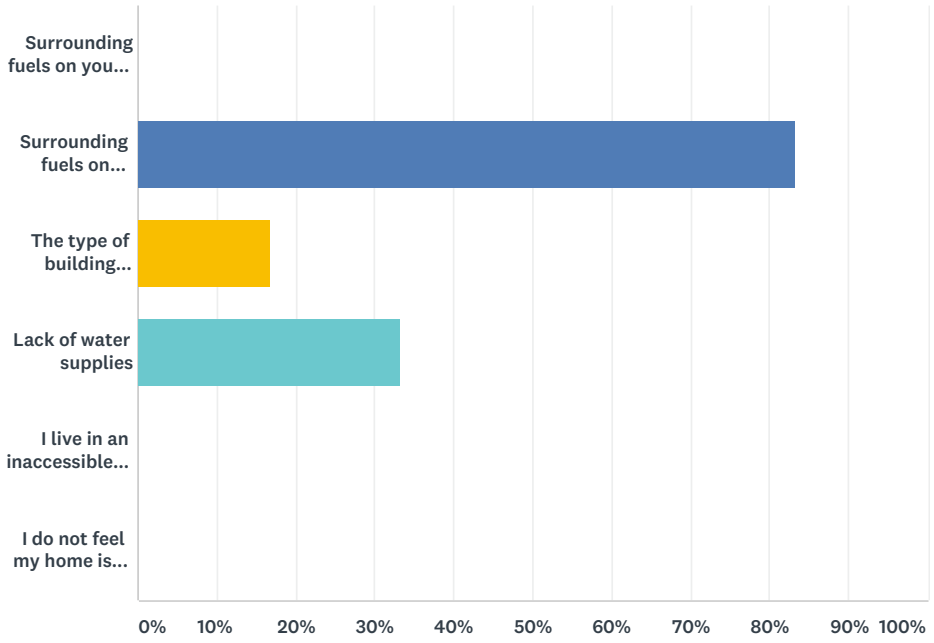
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Low	16.67%	1
Medium	83.33%	5
High	0.00%	0
Total Respondents: 6		

Q6 My home is vulnerable to wildfire because of:

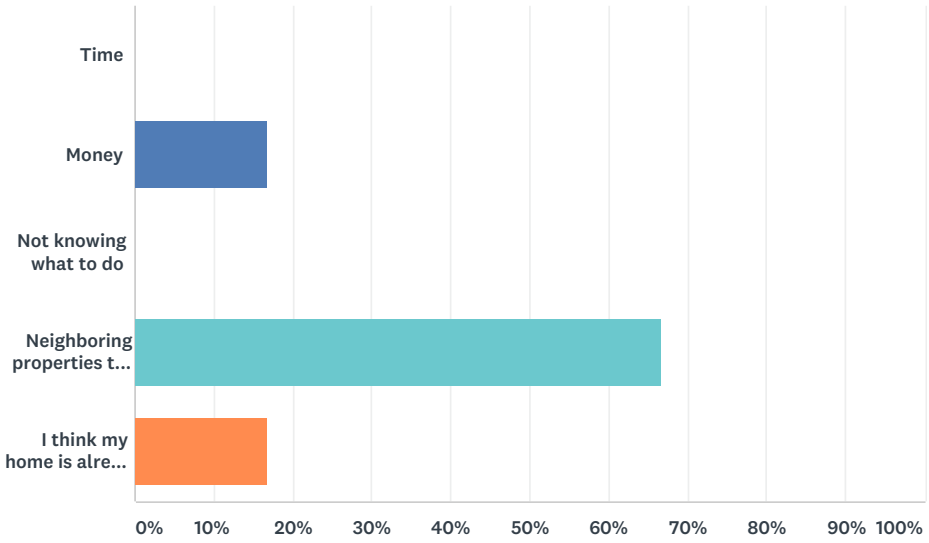
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Surrounding fuels on your property - trees, grass, shrubs, etc.	0.00%	0
Surrounding fuels on neighboring properties	83.33%	5
The type of building materials used in my home	16.67%	1
Lack of water supplies	33.33%	2
I live in an inaccessible area	0.00%	0
I do not feel my home is vulnerable to wildfire	0.00%	0
Total Respondents: 6		

Q7 My biggest challenge to making my home fire safe is: (Check the option that applies the most)

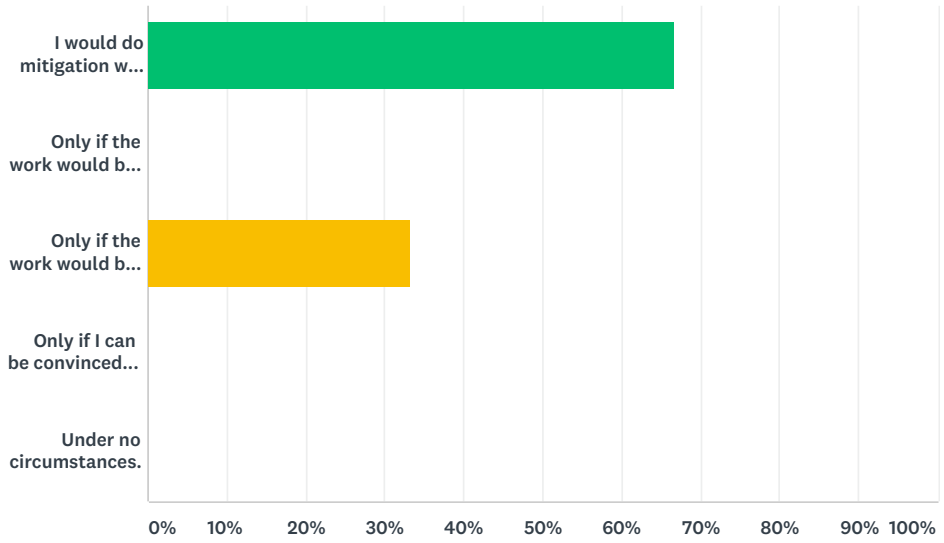
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Time	0.00%	0
Money	16.67%	1
Not knowing what to do	0.00%	0
Neighboring properties that I have no control over	66.67%	4
I think my home is already safe	16.67%	1
TOTAL		6

Q8 Under which of the following conditions would you be willing to do mitigation work on your property?

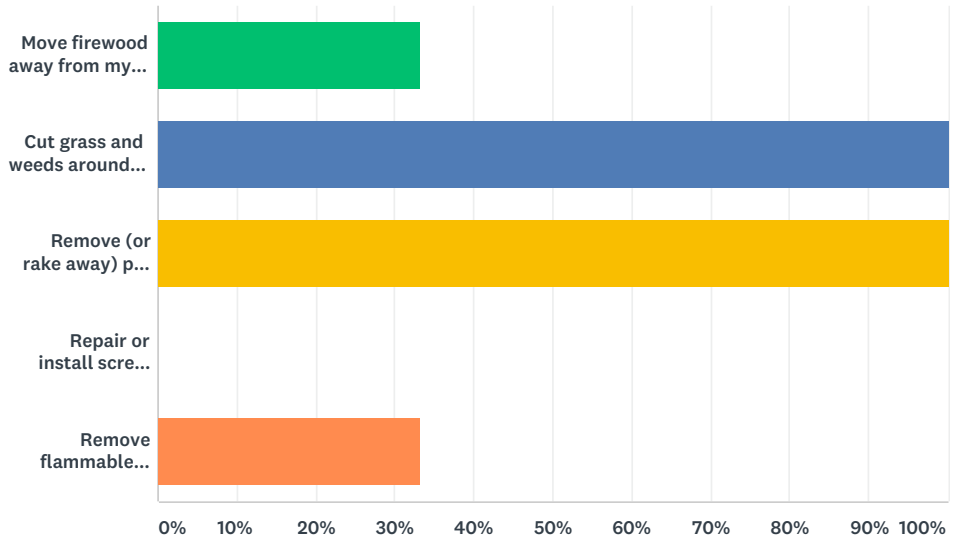
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
I would do mitigation work regardless of what anyone else does.	66.67%	4
Only if the work would be cost shared with government or private agencies.	0.00%	0
Only if the work would be fully funded by government or private agencies.	33.33%	2
Only if I can be convinced that work will improve the ability of my home to survive a wildfire.	0.00%	0
Under no circumstances.	0.00%	0
Total Respondents: 6		

Q9 Which of the following mitigation actions do you do each year to prepare for fire season? (Please check all that apply)

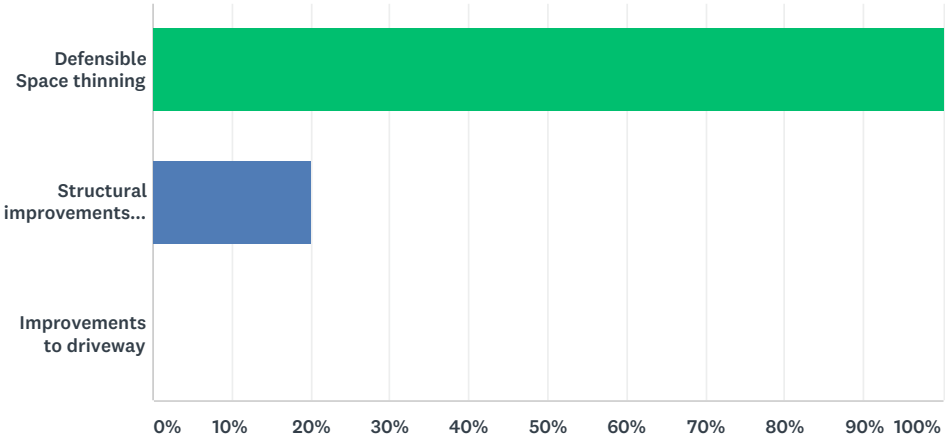
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Move firewood away from my home to a spot up slope and downwind.	33.33%	2
Cut grass and weeds around my house.	100.00%	6
Remove (or rake away) pine needles on the ground, roof and in the gutters.	100.00%	6
Repair or install screens to block sparks from blowing in and under my home, eave vents and outbuildings.	0.00%	0
Remove flammable objects, including firewood, brush and other materials from under my wooden deck.	33.33%	2
Total Respondents: 6		

Q10 Since 2014 have you taken any of the following steps to reduce the risk of wildfire to your home? (check all that apply)

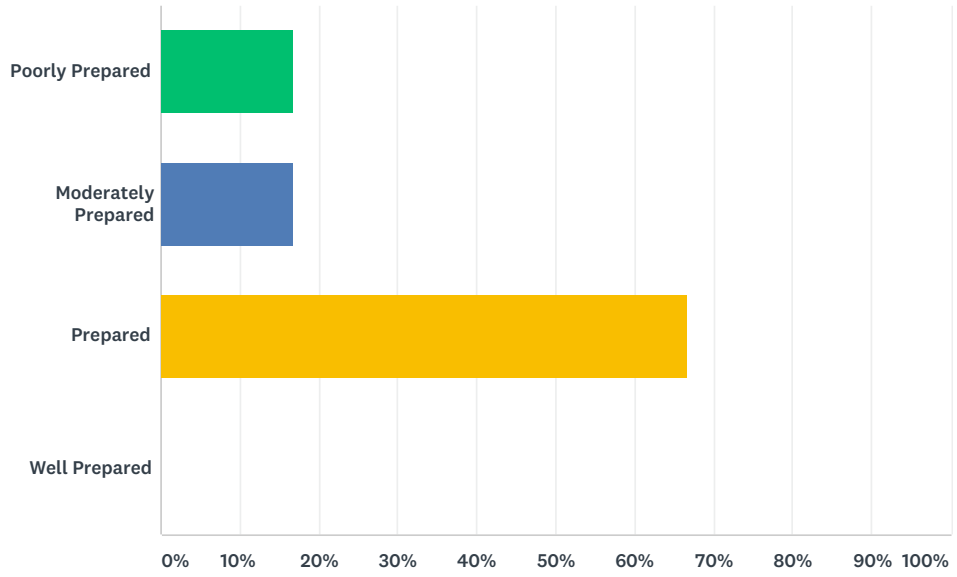
Answered: 5 Skipped: 1



ANSWER CHOICES	RESPONSES	
Defensible Space thinning	100.00%	5
Structural improvements (removed wooden deck, installed fire resistant building materials, etc.)	20.00%	1
Improvements to driveway	0.00%	0
Total Respondents: 5		

Q11 How prepared is your community and Lincoln County for a large Wildfire?

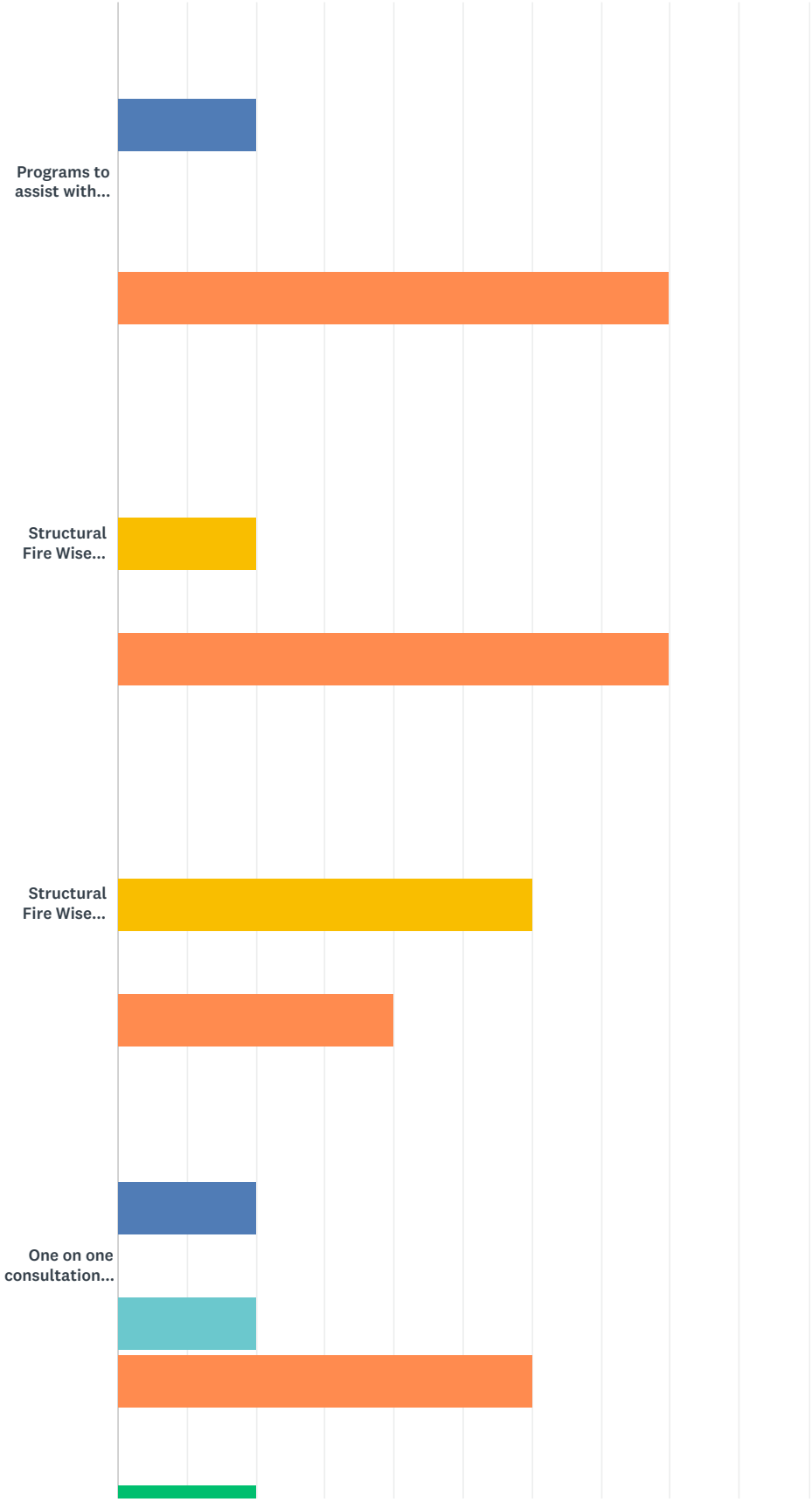
Answered: 6 Skipped: 0

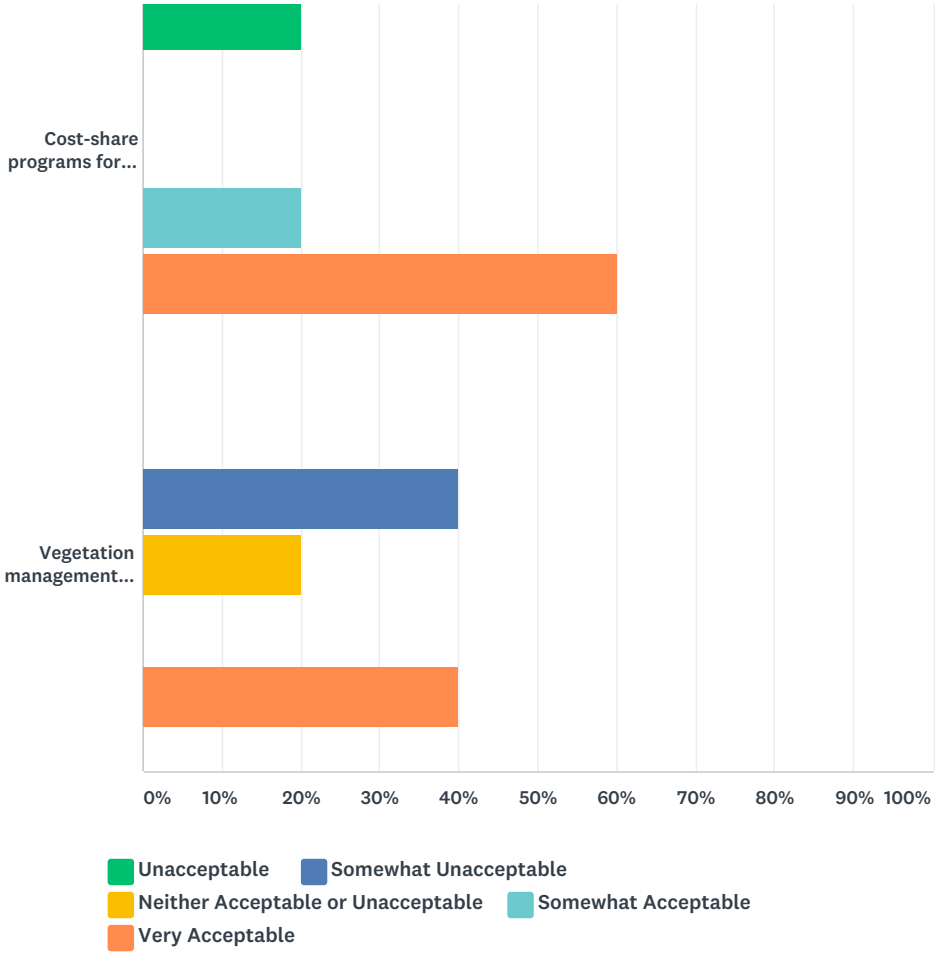


ANSWER CHOICES	RESPONSES	
Poorly Prepared	16.67%	1
Moderately Prepared	16.67%	1
Prepared	66.67%	4
Well Prepared	0.00%	0
Total Respondents: 6		

Q12 How acceptable do you find each of the following practices?

Answered: 5 Skipped: 1



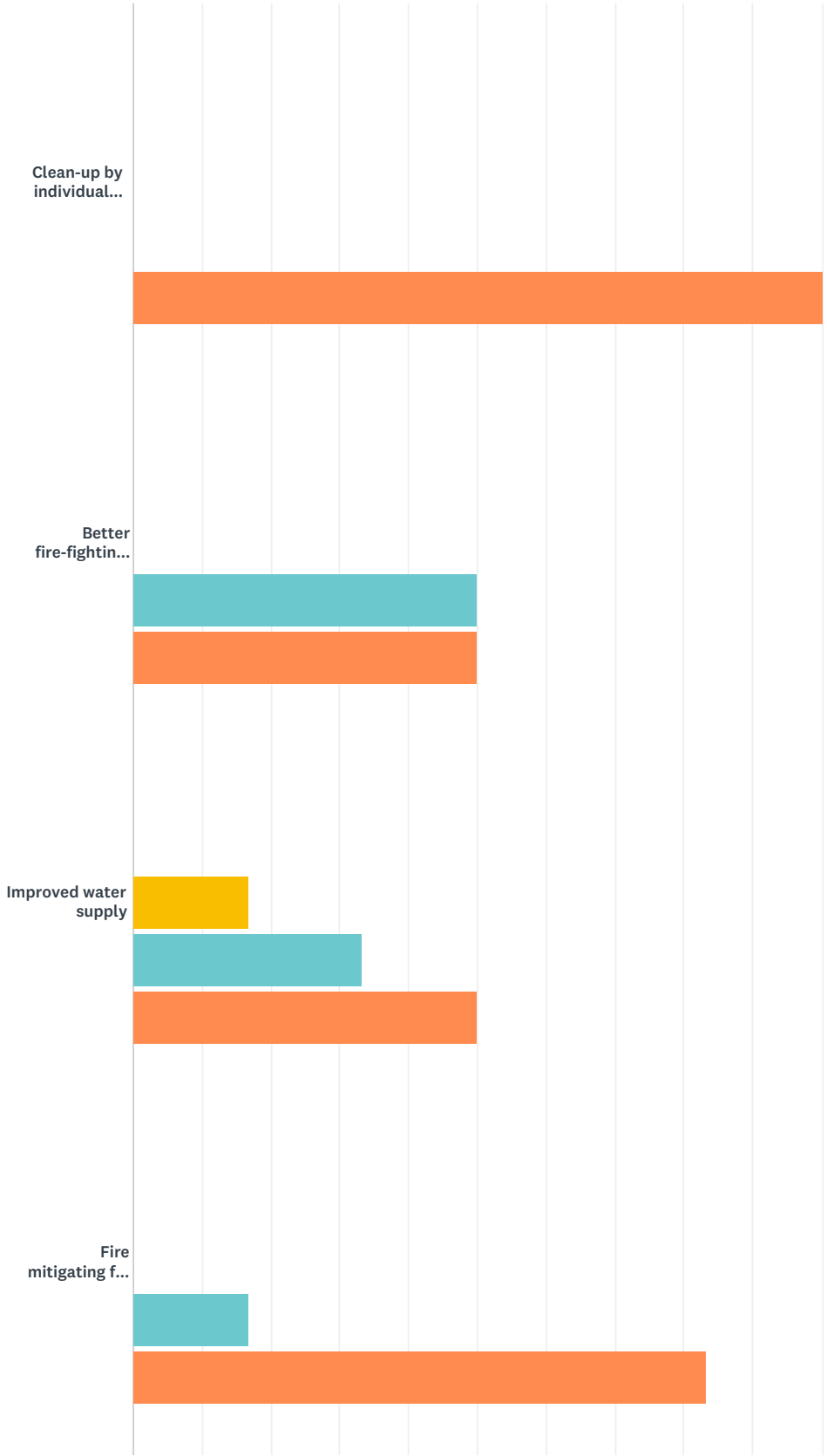


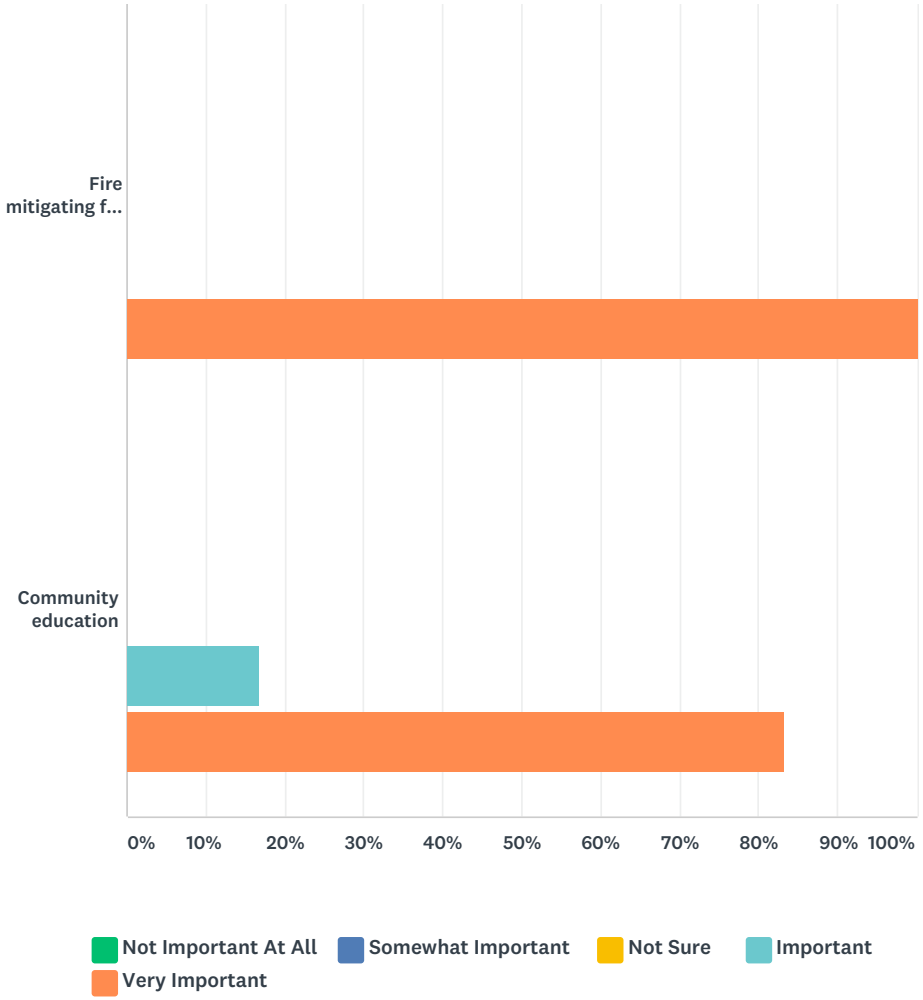
	UNACCEPTABLE	SOMEWHAT UNACCEPTABLE	NEITHER ACCEPTABLE OR UNACCEPTABLE	SOMEWHAT ACCEPTABLE	VERY ACCEPTABLE	TOTAL	WEIGHTED AVERAGE
Programs to assist with disposal of removed vegetation (chipping, etc)	0.00% 0	20.00% 1	0.00% 0	0.00% 0	80.00% 4	5	4.40
Structural Fire Wise ordinances for new buildings	0.00% 0	0.00% 0	20.00% 1	0.00% 0	80.00% 4	5	4.60
Structural Fire Wise ordinances to retrofit existing buildings	0.00% 0	0.00% 0	60.00% 3	0.00% 0	40.00% 2	5	3.80
One on one consultations on how to make my property/home Fire Wise	0.00% 0	20.00% 1	0.00% 0	20.00% 1	60.00% 3	5	4.20

Cost-share programs for reducing vegetation on private property	20.00% 1	0.00% 0	0.00% 0	20.00% 1	60.00% 3	5	4.00
Vegetation management ordinances	0.00% 0	40.00% 2	20.00% 1	0.00% 0	40.00% 2	5	3.40

Q13 Rate the importance of the following activities in making Lincoln County better prepared for wildfires.

Answered: 6 Skipped: 0

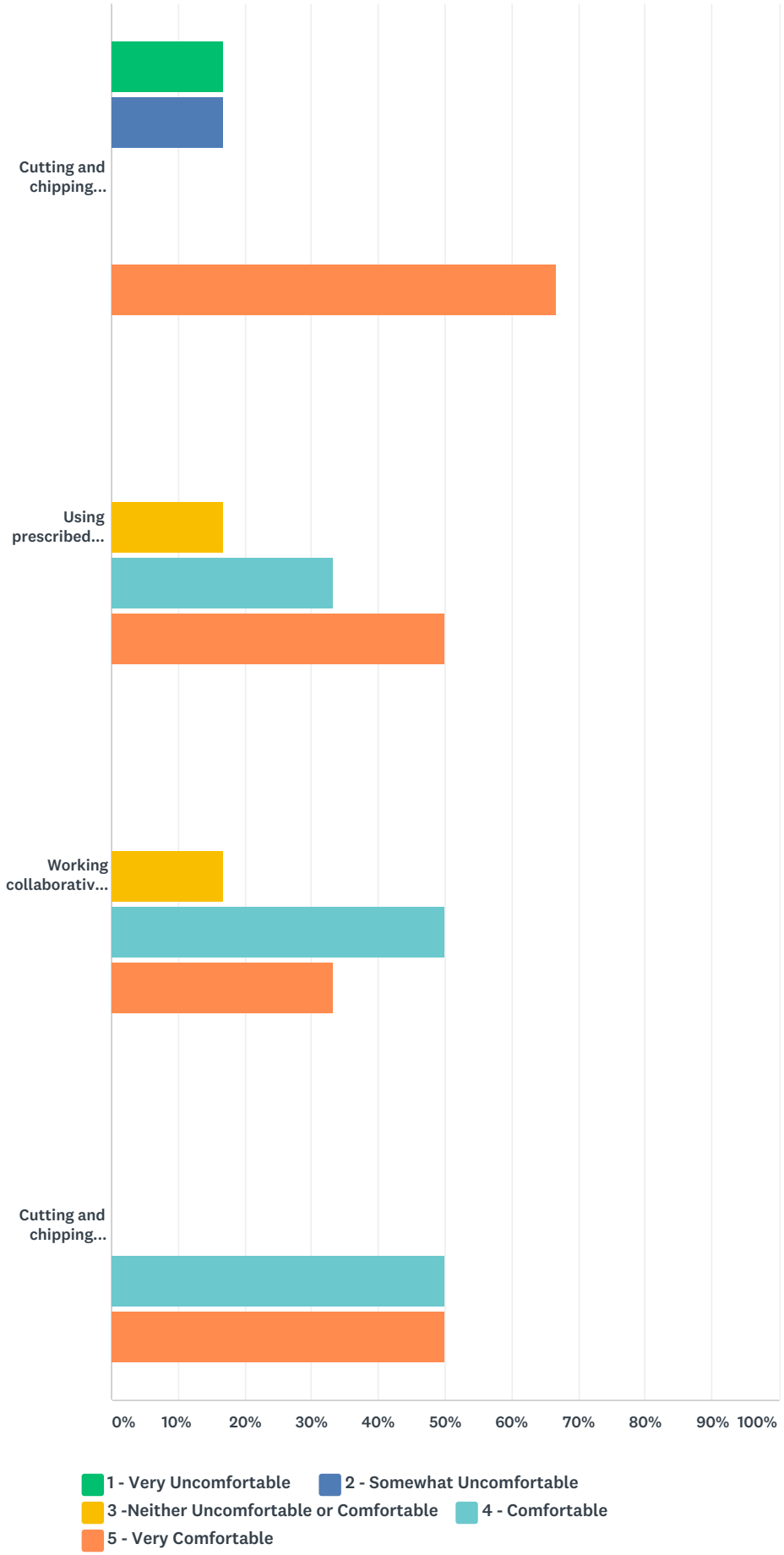




	NOT IMPORTANT AT ALL	SOMEWHAT IMPORTANT	NOT SURE	IMPORTANT	VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
Clean-up by individual property owners	0.00% 0	0.00% 0	0.00% 0	0.00% 0	100.00% 6	6	5.00
Better fire-fighting equipment	0.00% 0	0.00% 0	0.00% 0	50.00% 3	50.00% 3	6	4.50
Improved water supply	0.00% 0	0.00% 0	16.67% 1	33.33% 2	50.00% 3	6	4.33
Fire mitigating fuel treatments on public lands	0.00% 0	0.00% 0	0.00% 0	16.67% 1	83.33% 5	6	4.83
Fire mitigating fuel treatments on private property	0.00% 0	0.00% 0	0.00% 0	0.00% 0	100.00% 6	6	5.00
Community education	0.00% 0	0.00% 0	0.00% 0	16.67% 1	83.33% 5	6	4.83

Q14 Rate your comfort level with the following activities. Rate from low (very uncomfortable) = 1 to high (very comfortable) = 5

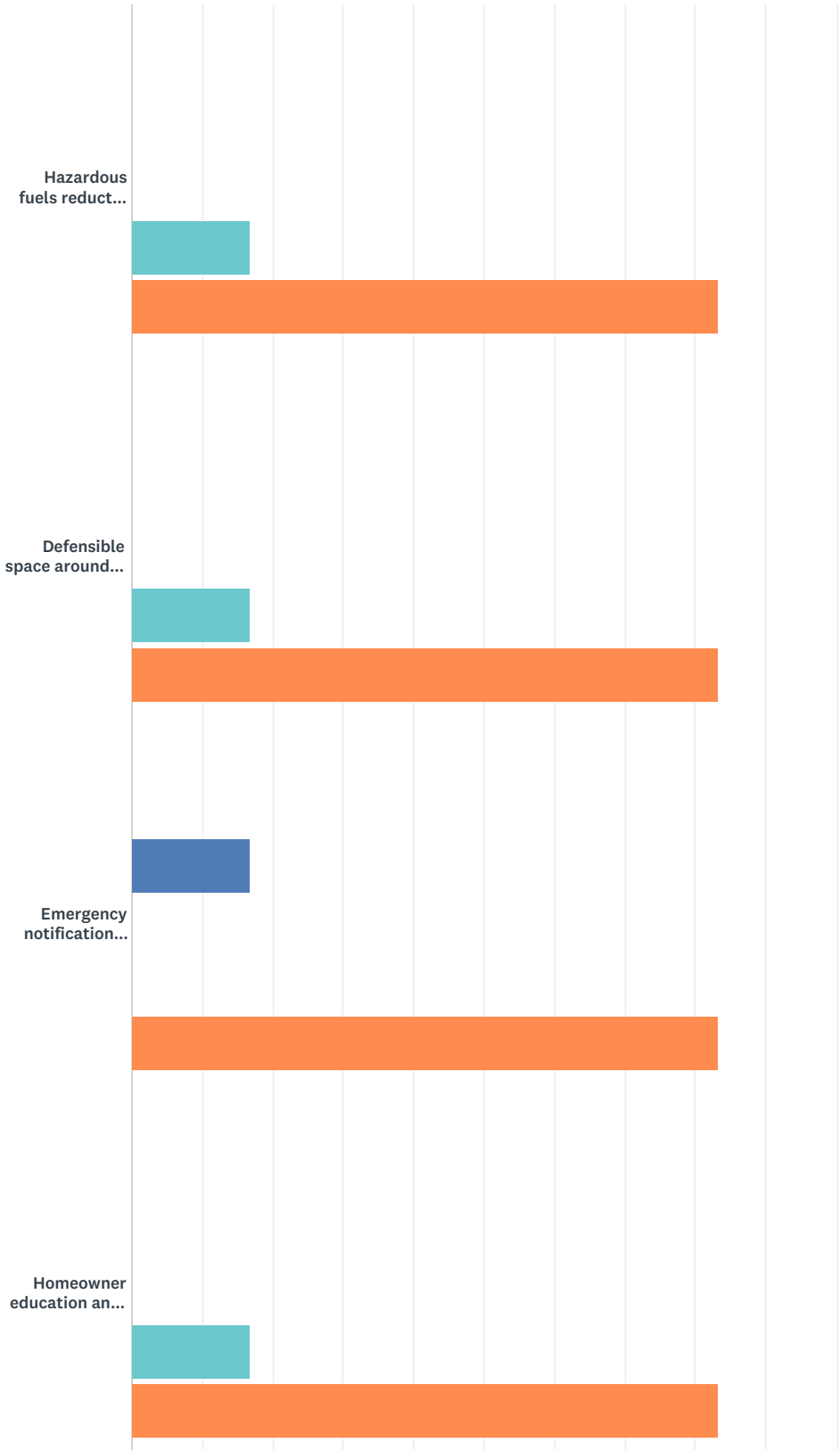
Answered: 6 Skipped: 0

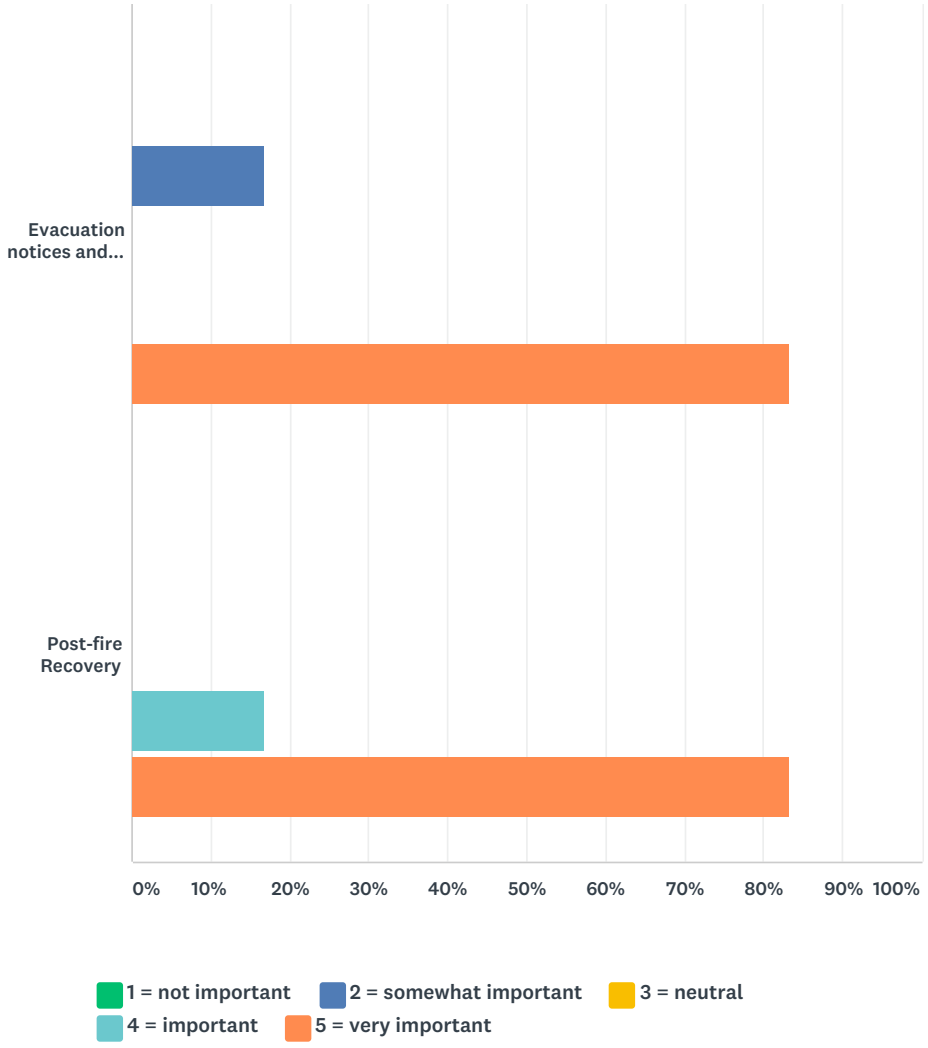

Cutting and chipping...
Using prescribed...
Working collaborativ...
Cutting and chipping...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
1 - Very Uncomfortable
2 - Somewhat Uncomfortable
3 -Neither Uncomfortable or Comfortable
4 - Comfortable
5 - Very Comfortable

	1 - VERY UNCOMFORTABLE	2 - SOMEWHAT UNCOMFORTABLE	3 -NEITHER UNCOMFORTABLE OR COMFORTABLE	4 - COMFORTABLE	5 - VERY COMFORTABLE	TOTAL	WEIGH AVERA
Cutting and chipping hazardous fuels (trees, limbs, brush and tall grasses) within 100 feet of my home.	16.67% 1	16.67% 1	0.00% 0	0.00% 0	66.67% 4	6	
Using prescribed burns to reduce fuels on the Lincoln National Forest and other forested areas.	0.00% 0	0.00% 0	16.67% 1	33.33% 2	50.00% 3	6	
Working collaboratively with other property owners to create shaded fuel breaks to stop or slow large wildfires before they reach my home.	0.00% 0	0.00% 0	16.67% 1	50.00% 3	33.33% 2	6	
Cutting and chipping hazardous fuels and open space areas within local communities.	0.00% 0	0.00% 0	0.00% 0	50.00% 3	50.00% 3	6	

Q15 How would you prioritize the following elements of community wildfire preparedness? Rate each from low (not at all important) = 1 to high (very important) = 5.

Answered: 6 Skipped: 0

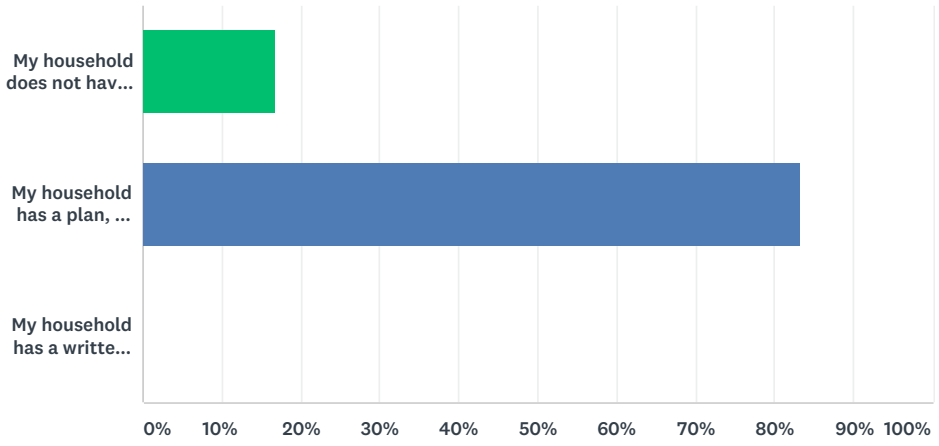




	1 = NOT IMPORTANT	2 = SOMEWHAT IMPORTANT	3 = NEUTRAL	4 = IMPORTANT	5 = VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
Hazardous fuels reduction in open space and adjacent lands	0.00% 0	0.00% 0	0.00% 0	16.67% 1	83.33% 5	6	4.83
Defensible space around homes	0.00% 0	0.00% 0	0.00% 0	16.67% 1	83.33% 5	6	4.83
Emergency notification during a wildfire	0.00% 0	16.67% 1	0.00% 0	0.00% 0	83.33% 5	6	4.50
Homeowner education and outreach	0.00% 0	0.00% 0	0.00% 0	16.67% 1	83.33% 5	6	4.83
Evacuation notices and procedures	0.00% 0	16.67% 1	0.00% 0	0.00% 0	83.33% 5	6	4.50
Post-fire Recovery	0.00% 0	0.00% 0	0.00% 0	16.67% 1	83.33% 5	6	4.83

Q16 Which of the following best describes your household's current disaster/emergency plan in case of wildfire?

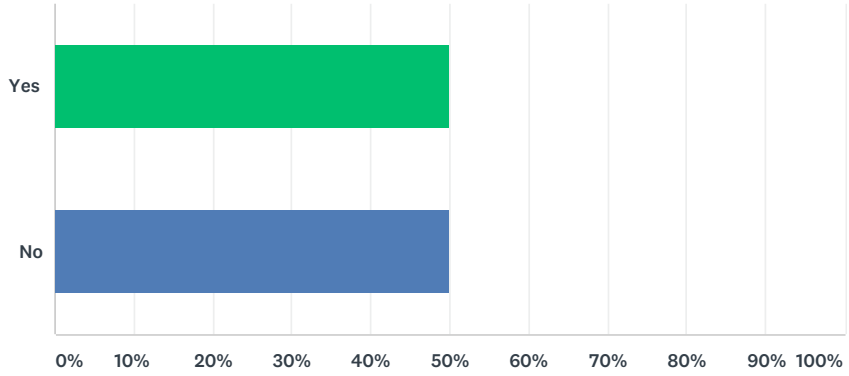
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
My household does not have a disaster plan	16.67%	1
My household has a plan, but it is not written	83.33%	5
My household has a written plan	0.00%	0
TOTAL		6

Q17 Do you have a prearranged meeting place for family members in the event of an evacuation?

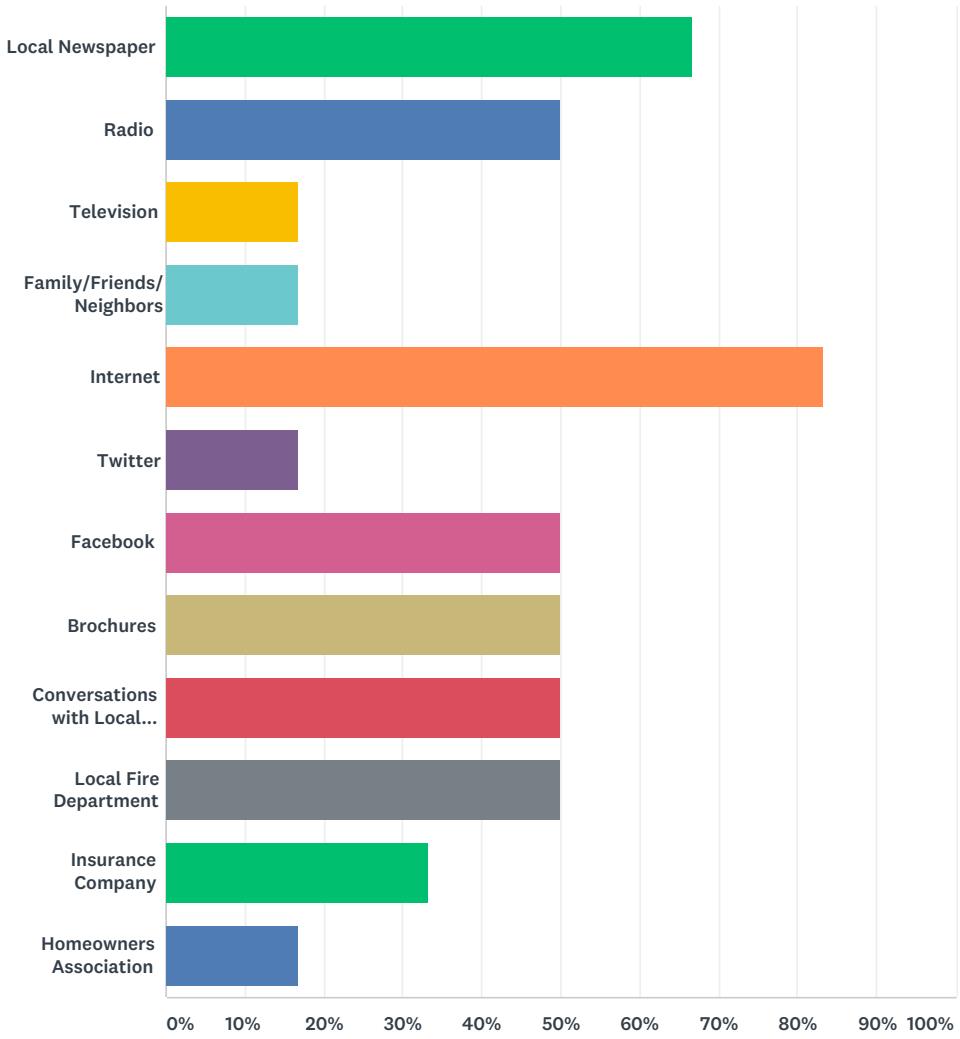
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	50.00%	3
No	50.00%	3
TOTAL		6

Q18 How would you prefer to receive information regarding wildfire prevention? Please check all that apply.

Answered: 6 Skipped: 0

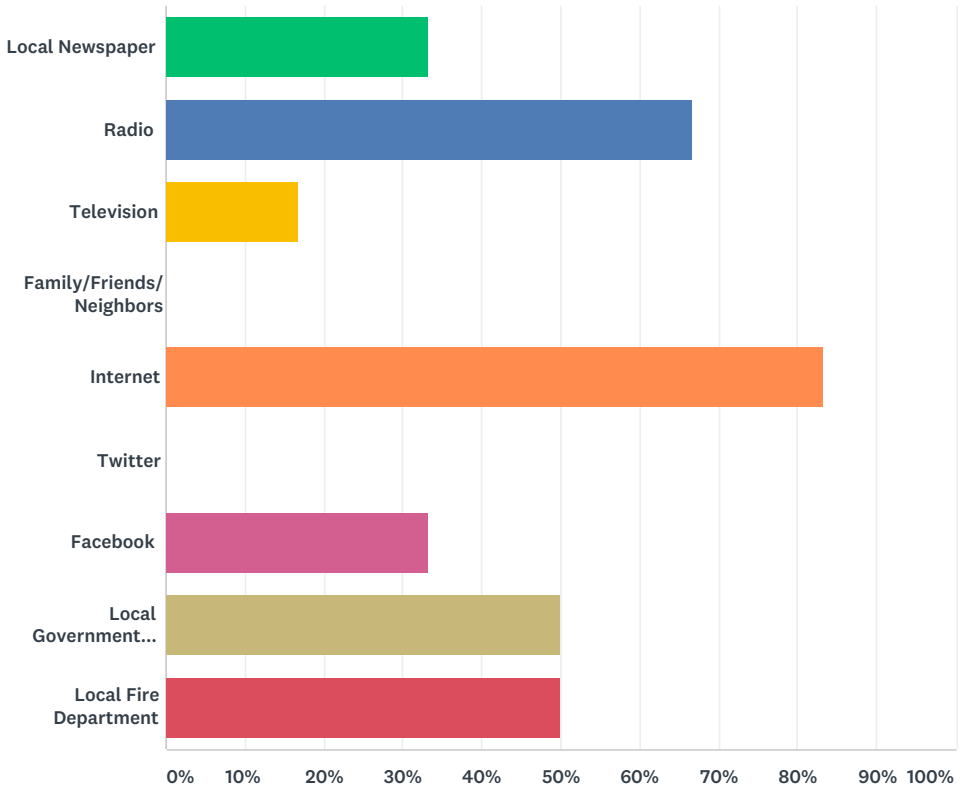


ANSWER CHOICES	RESPONSES	
Local Newspaper	66.67%	4
Radio	50.00%	3
Television	16.67%	1
Family/Friends/Neighbors	16.67%	1
Internet	83.33%	5
Twitter	16.67%	1
Facebook	50.00%	3
Brochures	50.00%	3
Conversations with Local Government Representatives (county, city, etc)	50.00%	3
Local Fire Department	50.00%	3

Insurance Company	33.33%	2
Homeowners Association	16.67%	1
Total Respondents: 6		

Q19 How would you prefer to receive information during a wildfire emergency? Please check all that apply.

Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Local Newspaper	33.33%	2
Radio	66.67%	4
Television	16.67%	1
Family/Friends/Neighbors	0.00%	0
Internet	83.33%	5
Twitter	0.00%	0
Facebook	33.33%	2
Local Government Representative	50.00%	3
Local Fire Department	50.00%	3
Total Respondents: 6		

Q20 What are additional priority actions should Lincoln County include in the 2019 CWPP update?

Answered: 4 Skipped: 2

BIBLIOGRAPHY

Anderson, H.D. 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. General Technical Report INT-122, USDA Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT.

Arvi, J., R. Gregiry, D. Ohlson, B. Blackwell, and R. Gray. 2006. Letdowns, Wake-up Calls, and Constructed Preferences: People's Response to Fuel and Wildfire Risks. Journal of Forestry. June.

BLM. 1991. Inspecting Fire Prone Property P-110: Instructors Guide. NFES 2190, National Interagency Fire Center, Bureau of Land Management National Fire & Aviation Training Support Group, Boise, ID.

_____. 1998. Wildfire Prevention Strategies. PMS 455 or NFES 1572, National Interagency Fire Center, Bureau of Land Management National Fire & Aviation Training Support Group, Boise, ID. March.

Brown, J.K. 2000. Ecological Principles, Shifting Fire Regimes and Management Considerations, In: Proceedings of the Society of American Foresters National Convention, September 18-22, 1994, Anchorage, Alaska. Society of American Foresters, Washington, D.C.

Cohen, J. 2000. What is the Wildland Fire Threat to Homes? Presentation to School of Forestry, Northern Arizona University, Flagstaff, AZ, April 10.

Cohen, J. and J. Saveland. 1997. Structure Ignition Assessment Can Help Reduce Fire Damages in the W-UI. Fire Management Notes 57(4): 19-23.

CSFS. 2005. Community Wildfire Protection Plan Guides for Implementation. Colorado State Forest Service. August.

Dennis, F.C. Undated. Fuel Break Guidelines for Forested Subdivisions and Communities. Colorado State Forest Service. Fort Collins, Colorado.

_____. 2006. Creating Wildfire Defensible Zones. Bulletin No. 6.302. Colorado State University Cooperative Extension, Fort Collins, Colorado (Internet access at www.colostate.edu/library/).

Fire Regime Condition Class. Internet Access: http://www.frcc.gov/index.html.

Firewise. Internet access: http://www. Firewise.org.

Hann, W.J. and D.L. Bunnell. 2001. Fire and Land Management Planning and Implementation Across Multiple Scales. International J. Wildland Fire 10:389-403.

Hardy, C.C. et al. 2001. Spatial Data for National Fire Planning and Fuel Management. International J. Wildland Fire 10:353-372.

National Climate Data Center. Internet access: http://www.ncdc.noaa.gov.

National Firewise Communities Program. Undated video set. Wildland/Urban Interface Hazard Assessment Training (available at http://www.firewise.org).

National Wildfire Coordinating Group. 2004. Fireline Handbook. PMS 410-1. National Interagency Fire Center, Bureau of Land Management National Fire & Aviation Training Support Group, Boise, ID, March

NFPA. 2002. Standards for Protection of Life and Property from Wildfire. National Fire Protection Association 1144, Quincy, MA.

Omi, P.N. and L.A. Joyce (Technical Editors). 2003. Fire, Fuel Treatments, and Ecological Restoration: Conference Proceedings. RMRS-P-29, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO.

Schmidt, K.M., et al. 2002. Development of Coarse-Scale Data for Wildland Fire and Fuel Management. General Technical Report, RMRS-GTR-87, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO.

Society of American Foresters. 2004. Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities. Bethesda, MD.

Undated pamphlet. Communities Compatible With Nature (available at www.firewise.org).

Village of Corona. 2004. Village of Corona Fire Plan. Corona, NM.

Village of Ruidoso. 2004. Community Wildfire Protection Plan for Jurisdictions and Stakeholders located within the Greater Ruidoso Area Wildland Urban Interface (available at http://www.ruidoso.net/forestconditions/wildfireplan.pdf).