De Baca County
Community Wildfire Protection Plan

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DE BACA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

Prepared for

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Prepared by

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The entities listed below participated in the development of and/or reviewed and are in support of the De Baca County Community Wildfire Protection Plan:

De Baca County
County Manager

John Nuttall — 5-27-08
Date

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The entities listed below participated in the development of and/or reviewed and are in support of the De Baca County Community Wildfire Protection Plan:

De Baca County
County Clerk

Laurie Pettigrew 5/27/08
Laurie Pettigrew Date

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The entities listed below participated in the development of and/or reviewed and are in support of the De Baca County Community Wildfire Protection Plan:

EMNRD Forestry Division Capitan District	Eddie Tudor	3/27/08 Date

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The entities listed below participated in the development of and/or reviewed and are in support of the De Baca County Community Wildfire Protection Plan:

EMNRD Forestry Division Capitan District Forester	William A Rogge III Bill Rogge	3/5/08 Date

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The entities listed below participated in the development of and/or reviewed and are in support of the De Baca County Community Wildfire Protection Plan:

EMNRD State Parks Division
Lake Sumner State Parks Supervisor David Sanchez 3-5-08 Date

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The entities listed below participated in the development of and/or reviewed and are in support of the De Baca County Community Wildfire Protection Plan:

BLM
Roswell Field Office Supervisor — Chuck Schmidt — 3-5-2008 — Date

Fire Management Specialist
For Chuck Schmidt

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The entities listed below participated in the development of and/or reviewed and are in support of the De Baca County Community Wildfire Protection Plan:

NM Department of Game and Fish Mark O. Holguin 3/24/08
Mark Holguin Date

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Valley Fire Department Chief	Dwayne Milliron	3-24-08 Date

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The entities listed below participated in the development of and/or reviewed and are in support of the De Baca County Community Wildfire Protection Plan:

Fort Sumner Fire Department
Chief

Dale Propps — May 12 2008
Dale Propps — Date

By: Kelly Gallegos
Village of Ft Sumner
Deputy Clerk - Treas.

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°F	degrees Fahrenheit
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe
BOR	Bureau of Reclamation
BTU	British Thermal Units
CARs	Communities at Risk
CBD	Canopy Bulk Density
CBH	Canopy Base Height
CC	Forest Canopy Cover
CH	Forest Canopy Height
ch/h	chains per hour
CRP	Conservation Reserve Program
CVAR	Community Values at Risk
CWPP	Community Wildfire Protection Plan
CWSF	Council of Western State Foresters
FBFM	Fire Behavior Fuel Model
FEMA	Federal Emergency Management Agency
FIREMON	Fire Effects Monitoring and Inventory System
FRCC	Fire Regime Condition Class
FRI	fire-return intervals
FSA	Farm Service Agency
GAID	Geographic Area Interagency Dispatch
GAO	General Accounting Office
GIS	geographic information system
GPS	global positioning system
HFRA	Healthy Forest Restoration Act
HIZ	Home Ignition Zone
IC	Incident Command
ICC	International Code Council
ISO	International Organization for Standardization
MFI	mean fire interval
NFP	National Fire Plan
NFPA	National Fire Protection Association
NMAC	New Mexico Association of Counties
NMDOT	New Mexico Department of Transportation
NM-FPTF	New Mexico Fire Planning Task Force
NIFC	National Interagency Fire Center
NMSF	New Mexico State Forestry Division
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
RAW	Remote Automated Weather
SAF	Society of American Foresters
SWCD	Soil and Water Conservations Districts

SWCA	SWCA Environmental Consultants
t/ac	ton per acre
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VFD	volunteer fire department
WUI	Wildland Urban Interface

Executive Summary

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

This document has been developed to address wildfire threat to communities in De Baca County; it provides recommendations to abate catastrophic wildfire and minimize their impacts to communities. De Baca County is a sparsely populated county that has a well preserved large scale ranching background combined with small scattered agricultural based communities. Although much of the County's population have grown-up fully aware of the prevalence of fire in these grassland ecosystems, for some the poorly-perceived low risk of fire in grasslands makes them ill-equipped in the event of a large scale fire event. The importance of public education and outreach in conjunction with recommended physical actions to reduce hazardous fuels are highlighted in this plan. A group of multi-jurisdictional agencies (federal, state, and local), organizations, and residents joined together as a Core Team to develop this plan which is termed the De Baca County Community Wildfire Protection Plan (DBCCWPP).

The purpose of the DBCCWPP is to assist in protecting human life and reducing property loss due to wildfire throughout the County. The plan is the result of a community-wide wildland fire protection planning process and the compilation of documents, reports, and data developed by a wide array of contributors. This plan was compiled in 2008 in response to the federal Healthy Forests Restoration Act (HFRA) of 2003.

The DBCCWPP meets the requirements of the HFRA by:

1) Having been developed collaboratively by multiple agencies at the state and local level in consultation with federal agencies and other interested parties.
2) Prioritizing and identifying fuel reduction treatments and recommending the types and methods of treatments to protect at-risk communities and pertinent infrastructure.
3) Suggesting multi-party mitigation, monitoring, and outreach.
4) Recommending measures and action items that residents and communities can take to reduce the ignitability of structures.
5) Facilitating public information meetings to educate and involve the community to participate in and contribute to the development of the CWPP.

The planning process served to identify many physical hazards throughout the County that could increase the threat of wildfire to communities. The public also helped to identify community values that they would most like to see protected. By incorporating public and Core Team input into the recommendations, treatments are tailored specifically for the County so as to be sensitive to local agricultural and ranching practices. The plan raises the importance of collaboration between multi-jurisdictional agencies in order to develop fuels mitigation treatment programs to address wildfire hazards. The County has a committed team of volunteer fire fighters, serving

three fire departments who work arduously to protect the life and property of De Baca citizens, but without homeowners taking on some of the responsibility for reducing fire hazards in and around their own homes, these resources are severely stretched. It is clear that it takes a combination of homeowner and community awareness, public education, and agency collaboration and treatments in order to fully reduce wildfire risk. It is important to stress that this document is an initial step in educating the public and treating areas of concern, and should serve as a tool in doing so. This CWPP should be treated as a *live document* to be updated approximately every 2 years. This plan should be revised to reflect changes, modifications, or new information that may contribute to an updated plan. These elements are essential to the success of mitigating wildfire risk throughout the County, and will be important in maintaining the ideas and priorities of the plan and the communities in the future.

1.0 INTRODUCTION

With increasing frequency, the national news media report tragic stories of communities impacted in the latest wave of severe wildfire. These fires are impacting not only forested landscapes but are becoming common events in grassland ecosystems across the Southwest. In order to mitigate their impacts, communities located in fire-prone environments need to have a plan to prepare for, reduce the risk of, and adapt to wildland fire events. Community Wildfire Protection Plans (CWPPs) help accomplish these goals. The CWPP provides recommendations that are intended to reduce, but not eliminate, the extreme severity or risk of wildland fire.

This CWPP, entitled the De Baca County CWPP (DBCCWPP), is a countywide plan that evaluates wildfire threat to communities and infrastructure and identifies measures that homeowners, land managers, and fire departments can take to reduce the impact of wildfire to life, property, and other community values at risk (CVARs). The plan provides background information, a risk assessment, and recommendations. Section 1 provides an overview of CWPPs and describes the De Baca County (hereafter referred to as the County) need for a plan; Section 2 provides demographic and background information about the County; Section 3 gives an overview of the fire environment; Section 4 describes the methodology for the risk assessment and the results in detail; and Section 5 provides recommendations that incorporate action plans for reducing fuels, initiating public education and outreach, reducing structural ignitability, and improving fire response capabilities. The plan does not require implementation of any of the recommendations. However, these recommendations may be used as guidelines for the implementation process if funding opportunities become available. The recommendations for fuels reduction projects are general in nature, meaning site-specific planning that addresses location, access, land ownership, topography, soils, and fuels would need to be employed upon implementation. Also, it is important to note that the recommendations are specific to wildland urban interface (WUI) areas and are expected to reduce the loss of life and property. Recommendations for the restoration of ecosystems and the role that fire plays in ecosystems are distinct from recommendations for WUI areas and are not addressed in detail in this plan.

1.1 OVERVIEW OF COMMUNITY WILDFIRE PROTECTION PLANS

The summer of 2000 demonstrated how devastating severe wildfires can be in New Mexico, particularly with the Cerro Grande fire, in Los Alamos. In response to that landmark season, the National Fire Plan (NFP) was established to develop a collaborative approach among various governmental agencies to actively respond to severe wildland fires and ensure sufficient firefighting capacity for the future. The NFP was followed by a report in 2001 entitled, *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-year Comprehensive Strategy*, which was updated in 2002 to include an implementation plan. This plan was updated once more in 2006, with a similar focus on using a collaborative framework for restoring fire-adapted ecosystems, reducing hazardous fuels, mitigating risks to communities, providing economic benefits, and improving fire-prevention and suppression strategies. However, the most recently updated implementation plan also emphasizes information sharing and monitoring of accomplishments and forest conditions, a long-term commitment to maintaining the essential resources for implementation, a landscape-level vision for restoration of fire-adapted ecosystems, the importance of using fire as a management tool, and continued improvements to collaboration efforts (Western Governors' Association 2006).

In 2003 the U.S. Congress recognized widespread declining forest health by passing the Healthy Forest Restoration Act (HFRA), and President Bush signed the act into law (P.L 108–148, 2003). The HFRA expedites the development and implementation of hazardous-fuels reduction projects on federal land and emphasizes the need for federal agencies to work collaboratively with communities. A key component of the HFRA is the development of CWPPs, which facilitates the collaboration between federal agencies and communities in order to develop hazardous fuels reduction projects and place priority on treatment areas identified by communities in a CWPP. A CWPP also allows communities to establish their own definition of the WUI. In addition, communities with an established CWPP are given priority for funding of hazardous fuels reduction projects carried out in accordance with the HFRA.

Although the HFRA and the specific guidelines are new, the principles behind the CWPP program are not. The National and State Fire Plans, the Western Governors' 10-Year Comprehensive Strategy, and the Federal Emergency Management Agency (FEMA) Disaster Mitigation Act of 2000 all mandate community-based planning efforts with full stakeholder participation, coordination, project identification, prioritization, funding review, and multi-agency cooperation.

The New Mexico State Forestry Division (NMSF) has statutory responsibilities for cooperation with federal, state, and local agencies in the development of systems and methods for the prevention, control, suppression, and use of prescribed fires on rural lands and within rural communities on all non-federal and non-municipal lands in the state (NMSA 1978, section 68-2-8). As a result, NMSF is involved in the CWPP planning process. The New Mexico Fire Planning Task Force (NM-FPTF) was created in 2003 by New Mexico legislature to identify the state WUI areas (Communities at Risk [CARs]) that are most vulnerable to wildland fire danger. The NM-FPTF updates its CARs list annually, reviews completed CWPPs, and approves those that are compliant with the HFRA. The 2007 Communities at Risk Plan identifies 300 CARs, an increase from the previous year's estimate of 234 CARs. Additionally, CARs identified in the annual plan are updated federally from the January 2001 Federal Register listing for CARs (NMSF 2007).

New Mexico CWPPs are a mix of county- and city-level plans; some CARs are represented in more than one plan (Council of Western State Foresters [CWSF] 2006). The NM-FPTF has adopted the International Code Council (ICC) WUI Code (NMSF 2007).

1.2 NEED FOR CWPP

De Baca County is rural, surrounded by shortgrass prairie grassland, agricultural land, and ranchland. Municipal areas are limited to Fort Sumner and Lake Sumner, and a group of farms south of Fort Sumner known locally as "the Valley." These communities are served solely by volunteer fire departments (VFDs) and emergency-response staff. While the County does not exhibit the typical characteristics of communities that are highly prone to fire, such as steep slopes or dense timber, these grassland areas experience strong winds and are currently undergoing prolonged drought, making them extremely prone to high-severity wildland fire. Grasslands have often been perceived as being at lower risk of wildland fire, particularly in relation to forested regions. As a result some communities are very poorly prepared for potentially large-scale fires, and the limited emergency response in the County exacerbates this

problem. Sadly, catastrophic losses have occurred recently throughout Southwestern grassland areas because communities were ill-equipped to mitigate or respond effectively to fires. In December 2005, a devastating wildfire ripped through the town of Cross Plains, Texas, destroying 85 single family homes and 25 mobile homes while killing 2 firefighters and 17 citizens. This town was not the mountain community packed in against dense forest stands and steep inaccessible terrain that people typically expect fires to overtake; it was a community in the northern Plains of Texas. This area is characterized predominantly by flat grassland and agricultural land use very similar to that found in De Baca County. Furthermore, structures were consumed not by the flaming front of the fire but by embers that burned after the main fire had passed, which ignited subsequent fires. The embers had passed through open vents, collected in unscreened foundations, or smoldered beneath wooden decks. This community, like several other communities scattered throughout the grasslands of the County, is as much at risk of wildland fire as their forested counterparts.

Fire is one of the most important ecological processes in grasslands. It occurred naturally for millennia and more recently as a result of anthropogenic practices such as land clearing by Native Americans and early pioneers (Rickel 2005). Fires helped rejuvenate the land, recycling nutrients and increasing productivity. However, as grasslands became increasingly settled, many landowners feared fire damage and fire suppression became a dominant practice. This altered the natural fire frequency and fire regime of New Mexico's eastern grasslands; species composition shifted in many areas and grass-dominated landscapes gave way to shrubs and trees (Rickel 2005). Over the last decade, fire rarely has been applied as a management tool, largely due to the prevalence of drought. Ranchers depend on spring rains to replenish grasses and grazing, and wildfire puts fodder production at risk. As a result fires continue to be suppressed in the County and throughout New Mexico.

The County is located in the eastern Plains of New Mexico, where grasses are the predominant fuel type and flat and rolling topography facilitates high-speed wind events. Rainfall in the summer often leads to increased fuels, and drought experienced in the fall or winter leaves these fuels dry and prone to ignition. With continuous fuels and high winds, fire can spread rapidly.

Grassland fires can be difficult to maintain. They move quickly across the landscape due to the speed and fire behavior with which these light, flashy fuels burn. Many factors contribute to fires in grassland ecosystems, including:

- Annual and seasonal fluctuations in precipitation
- Increased fuel loading resulting from set-aside programs and shifting land use practices
- Expansion of roads and railroad through grassland areas, which provide sources of ignition
- Growing WUI, which is encroaching into a fire-dependant ecosystem
- The number of animals carried on the land

Grass fuel loads, even those associated with lawns and suburban landscapes, experience a vigorous growing season in the spring and summer, particularly if increased rainfall occurs. These urban fuel loads are subject to human activity such as lawn maintenance in the home

ignition zone (30 feet surrounding the house). The WUI zone is also at high risk because more sources of human ignition can be found there.

1.3 GOAL OF CWPP

A CWPP enables local communities to improve their wildfire mitigation capacity and to work with government agencies to identify high fire risk areas and prioritize areas for mitigation, fire suppression, and emergency preparedness. The minimum requirements for a CWPP, as stated in the HFRA, are as follows:

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

2. **Prioritized Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous-fuels reduction and treatments; furthermore, it must recommend the types and methods of treatment that will protect at-risk communities and their essential infrastructures (SAF 2004).

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

The DBCCWPP addresses all the requirements for completion of a CWPP outlined in the HFRA, paying special attention to the desires and needs of the communities and multiple jurisdictions throughout the planning area.

1.4 PLANNING PROCESS

The SAF, in collaboration with the National Association of Counties, the National Association of State Foresters, the Western Governors' Association, and the Communities Committee developed a guide entitled, *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities* (SAF 2004) to provide communities with a clear process to use in developing a CWPP. The guide, which can be accessed at http://www.safnet.org/policyandpress/cwpphandbook.pdf, outlines eight steps for developing a CWPP and was followed in preparing the DBCCWPP. The eight recommended steps are as follows:

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

Step Two: Involve Federal Agencies. Identify and engage local representatives of the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM). Contact and involve other land management agencies as appropriate.

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

Step Four: Establish a Community Base Map. Work with partners to establish base maps defining the community's WUI and showing inhabited areas at risk, forested areas that contain critical human infrastructure, and forest areas at risk for large-scale fire disturbance. (Please see Appendix A for a series of base maps that informed the final risk assessment.)

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

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

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

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

1.5 CORE TEAM

The first step in the CWPP process was to bring together a broad group of stakeholders representing both agency and private interests to form a Core Team. An extensive distribution list (Appendix B) was developed to invite as many stakeholders to join the Core Team as possible. Private landowners were also invited through the public outreach process. The first Core Team meeting was held on September 21, 2007. Three additional meetings were held on October 29, 2007, January 24, 2008, and March 4, 2008. Average attendance at Core Team meetings was approximately 10 people.

1.6 PROJECT AREA

This CWPP is a countywide plan, so the planning area boundary coincides with the County boundary (Figure 1.1).

1.7 PUBLIC INVOLVEMENT

Engaging interested parties is critical in the CWPP process; substantive input from the public will ensure that the final document reflects the highest priorities of the local community. A key element in the CWPP process is the meaningful discussions it generates among community members regarding their priorities for local fire protection and forest management (SAF 2004).

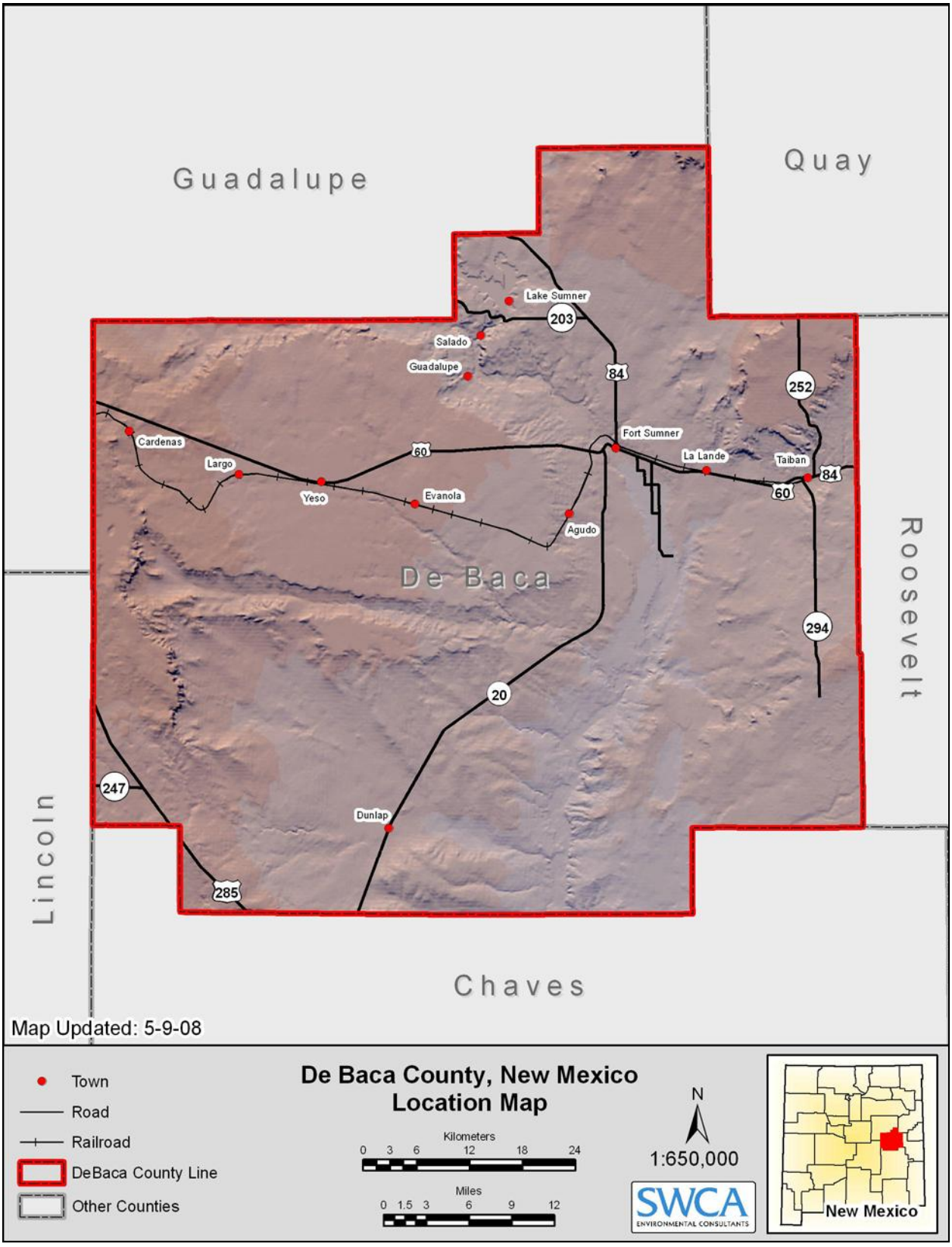

Figure 1.1. Project location map

The public-involvement process commenced with two public meetings. Because of the rural nature of the County, the Core Team warned that traditional public meetings would not be as successful as they have been in other areas. Instead, the main public meeting was held at a previously scheduled event, a football game at Fort Sumner High School, on October 5, 2007. A booth was set up at the entrance and football announcers made regular requests for people to visit the booth and fill out surveys. The event had been advertised in the *De Baca County News* the previous day and through announcements sent home with Fort Sumner schoolchildren and flyers posted throughout the County. Core Team members also distributed flyers and surveys throughout their jurisdictions.

The second public meeting was held immediately following the second Core Team meeting on October 29 in the hope that Core Team members could help facilitate the meeting and provide local expertise. This meeting comprised a PowerPoint presentation outlining the goals and objectives of the CWPP and provided details on the steps involved in the planning process. A facilitated question-and-answer period followed to gather comments, concerns, and suggestions from all attendees. All comments received during the public meetings were recorded. Attendance was poor at this meeting, but those who did attend provided detailed comments that were used throughout this plan. This meeting was also advertised using flyers and a memo distributed through local school districts.

Surveys regarding the CWPP were distributed at the public meetings and by the Core Team. Base maps in the CWPP were displayed at meetings for review by community members, and participants were given the opportunity to ask questions. Flyers and literature regarding defensible space and community preparedness were also distributed to attendees. (Please see Appendix C for community comments received at the public meetings and in the surveys.)

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2.0 DE BACA COUNTY BACKGROUND

2.1 LOCATION AND GEOGRAPHY

The County is located in the Great Plains physiographic province of east-central New Mexico and was founded in 1917, named for Ezequiel C. De Baca, New Mexico's second governor under statehood (De Baca County Extension 2007). The County seat of Fort Sumner is situated in the northeast corner of the County at 34°28'23" North, 104°14'32" West, and is surrounded by extensive cattle and sheep ranches. The County comprises an area of 6,045 km^2 (2,334 square miles), 0.38% of which is water. The most prominent topographic feature of the County is the Pecos River valley, and the surrounding area is made up of gently undulating hills, low mesas, and tributary canyons that drain into the Pecos River (Kemrer 1994).

The river valley provides irrigation for the surrounding area, so farming has long been a dominant component of the County's economy. A mosaic of land ownership exists throughout the County with the majority being private land and the remainder is BLM, Bureau of Reclamation (BOR), and state land. The Pecos River bisects the County from north to south, and a prominent feature in the northeastern-most extent of the County is Sumner Lake State Park, which was established in 1960 by the earlier damming of the Pecos River (Figure 2.1).

2.2 POPULATION

The following information is drawn primarily from 2000 U.S. census data (U.S. Census Bureau 2000). In 2000, the population of De Baca County was 2,240 people, with a population density of <1/km^2 (1person/square mile); the Census Bureau estimated that by 2006 the County's population had decreased by 11.1% to an estimated 1,991 people. In 2000 the County consisted of 922 households with a median household income of $27,377.

As of 2005, the County had 1,418 housing units, 680 of which can be found in Fort Sumner, which has a population of 1,249 people; Lake Sumner has a population of 86. Smaller communities in the County that are included in the WUI include Taiban, Yeso, and La Lande.

The main local transportation corridors include U.S. 60, which runs east/west through the center of the County; U.S. 84, which runs north/south through the northeastern corner of the County; and New Mexico State Highway 20, which runs north/south through the southern half of the County. Additional state routes run throughout the County, linking the town of Taiban to neighboring Quay County. Other county roads, one-lane gravel roads, four-wheel-drive dirt roads, and multiple dead-end roads are spread throughout as well. Fort Sumner lies at the intersection between U.S. 60 and U.S. 84 and State Highway 20. Fort Sumner is also served by the Burlington Northern Santa Fe Railway (BNSF) and the Fort Sumner Municipal Airport.

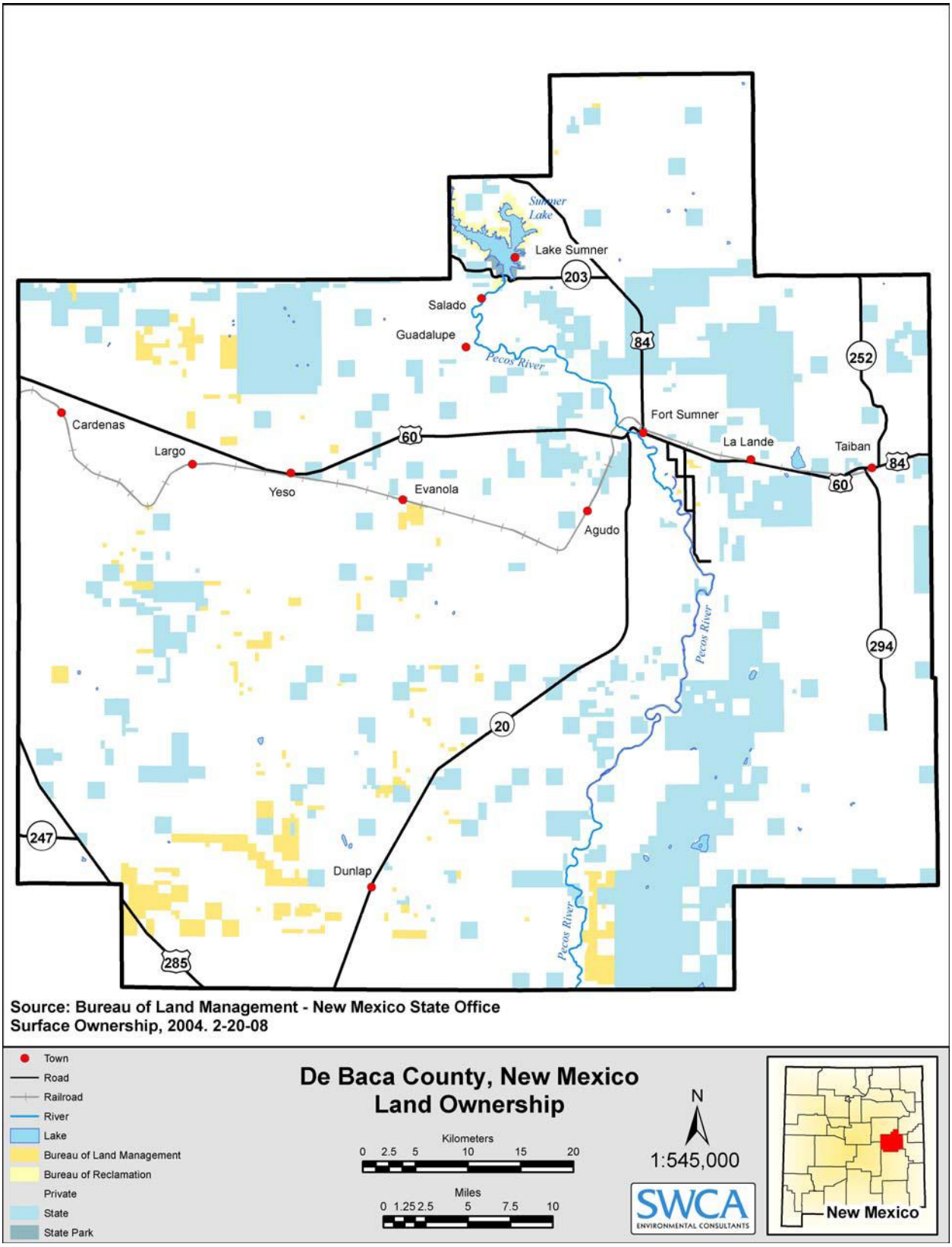

Figure 2.1. De Baca County landownership.

2.3 NEW MEXICO CLIMATE

New Mexico has a mild, arid to semiarid, continental climate characterized by abundant sunshine, light total precipitation, low relative humidity, and relatively large annual and diurnal temperature ranges (New Mexico Climate Center 2006). The average hours of annual sunshine range from nearly 3,700 hours in the southwestern portions of the state to 2,800 hours in the north-central portions. The freeze-free season ranges from more than 200 days in the southern valleys to fewer than 80 days in the northern mountains, where some high mountain valleys have freezes in the summer months.

In New Mexico, July is generally the warmest month of the year, with average monthly maximum temperatures ranging from 90 degrees Fahrenheit (ºF) at lower elevations to 75 ºF to 80ºF at higher elevations. A preponderance of clear skies and generally low relative humidity permit rapid cooling after sundown, resulting in comfortable summer nights. Generally, January is the coldest month, with average daytime temperatures ranging from the mid-50s ºF to the mid-30s ºF. Minimum temperatures below freezing are common throughout the state, but subzero temperatures are rare outside of high mountain habitats.

A wide variation in annual precipitation totals is characteristic of arid and semiarid climates. The climate of the Southwest shows strongly seasonal patterns both within and between years. Drought cycles are common and most annual precipitation comes in the course of a summer rainy season. Generally, July and August are the rainiest months of the year, contributing 30% to 40% of the state's annual precipitation. These rainfall events are often associated with brief but intense thunderstorms driven from unstable southeasterly air flows out of the Gulf of Mexico as well as thunderstorms that develop from the west. Lightning fires are common during this period but are typically small due to the generous precipitation (Pyne 1982). Winter is the driest season in New Mexico; precipitation primarily results from frontal activity associated with Pacific Ocean storms that move across the country from west to east. Much of this precipitation falls as snow in mountain areas.

Wind speeds across New Mexico are usually moderate. However, relatively strong and sometimes unpredictable winds can accompany frontal activity during the late winter and spring. Wind direction is typically from the southwest.

2.4 DE BACA COUNTY CLIMATE

According to Fort Sumner climate records that span from 1914 to 2007, De Baca County experiences a mild, semiarid climate, with annual average maximum temperatures of 73.9ºF and annual minimum temperatures of 42.2ºF (Western Regional Climate Center 2007). The highest temperatures are experienced from June through August and lowest temperatures from November through February (Figure 2.2). The average total annual precipitation is 15.01 inches, with an average annual snowfall of 9.2 inches. The majority of precipitation is received from June through September (Figure 2.3).

Like much of New Mexico, De Baca County has been in a period of prolonged drought for the last few years (New Mexico Drought Task Force 2008). During such periods, wildfire disasters are most likely and firefighting resources are placed under considerable strain.

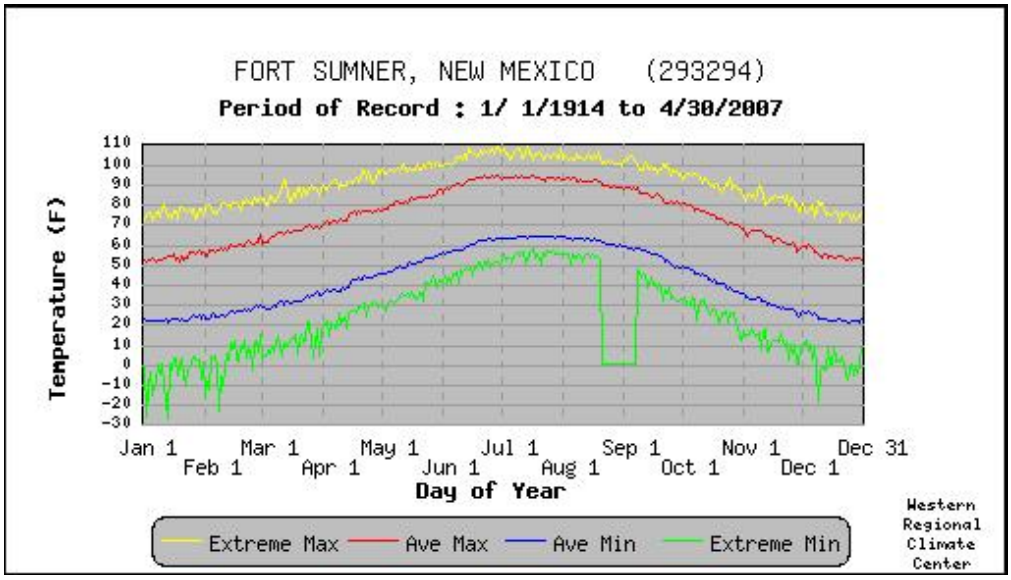

Figure 2.2. Average daily extreme and average temperatures for Fort Sumner (Western Regional Climate Center Data, retrieved August 2007).

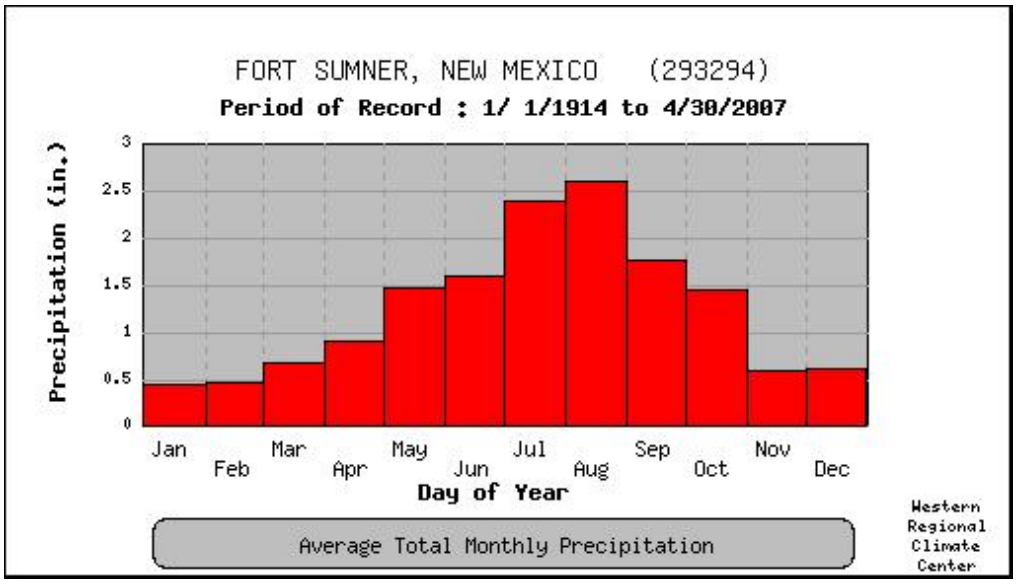

Figure 2.3. Monthly average total precipitation for Fort Sumner (Western Regional Climate Center Data, retrieved August 2007).

2.5 VEGETATION

Vegetation in De Baca County consists almost entirely of plains-mesa grassland interspersed with cultivated areas, as well as patches of plains-mesa sand scrub and Apacherian-Chihuahuan mesquite upland scrub (Dick-Peddie 1993). Plains-mesa grassland is the most extensive grassland in New Mexico, covering much of the eastern Plains. In its climax condition, plains-mesa grassland is composed almost entirely of grass, with blue grama (*Bouteloua gracilis*) as a common denominator and buffalograss (*Buchloe dachtyloides*) as a co-dominant. Plains-mesa sand scrub vegetation is made up of species that are deep-sand tolerant or sand adapted (Dick-Peddie 1993). Sand sagebrush (*Artemisia filifolia*) is the dominant species in sand scrub communities, in association with small soapweed (*Yucca glauca*), leadplant (*Amorpha canescens*), and shinoak (*Quercus havardii*). The shrubs are usually low growing (less than 18 feet) and are highly branched (Allred 1996). A sparse cover of one-seed juniper (*Juniperus monosperma*) occurs in higher elevations around Sumner Lake in the northeast corner of the County. Plains prickly pear (*Opuntia macrorhiza*), cholla (*Opuntia imbricate*), and Mormon tea (*Ephedra viridus*) also occur at these higher elevations (Kemrer 1994). Common grasses in the eastern region of the state are sand reed (*Calamovilfa gigantean*), red lovegrass (*Eragrostis oxylepis*), and sand bluestem (*Andropogon hallii*).

Apacherian-Chihuahuan or Chihuahuan semidesert grassland and steppe ecosystems are also present throughout the County. Vegetation within these grassland and shrub-steppe ecosystems is characteristic of the Chihuahuan Desert. Graminoid species may vary slightly, depending on substrate, but they typically include grama (*Bouteloua* spp.), muhly grass (*muhlenbergia cappillaris*), plains lovegrass (*Eragrostis intermedia*), James' galleta grass (*Pleuraphis jamesii*), and dropseed (*Sporobolus cryptandrus*). Shrub species that occur within this habitat type include yucca (*Yucca* spp.), four-wing saltbush (*Atriplex canescens*), Torrey's jointfir (*Ephedra torreyana*), and Mexican tea (*E. trifurca*). Tall shrub/short tree species include mesquite (*Prosopis* spp.) and various oaks (*Quercus* spp.). Many of these desert grassland areas have been converted to shrub habitat types due to the extensive encroachment of mesquite that has resulted from intensive grazing and other land uses.

In these plains-mesa grassland regions, the basic fine fuel is grass. The grasses, when not checked by fire, transition into desert succulents and woody species in some bottomland or lower elevation areas, or scattered across the plains. During drought years, grass fuels are reduced and give way to desert species that limit the transmission of fire. When rainfall replenishes the grassland; however, the fine fuel mass becomes more continuous across the landscape and risk of fire increases.

2.5.1 AGRICULTURE—CULTIVATED CROPS AND IRRIGATED AGRICULTURE

Agriculture-cultivated Crops and Irrigated Agriculture is a generic vegetation type that can encompass any type of agriculture. In De Baca County, agriculture, including cow and calf operations, is the primary industry (De Baca County Extension 2007). Alfalfa is a leading cash crop and is heavily irrigated (Figure 2.4). Fire occurrence within this land cover type is most typically human induced by agricultural burning and does not exhibit a typical fire behavior pattern.

Figure 2.4. Flood irrigation in the Valley portion of De Baca County.

2.5.2 DEVELOPED

Developed is another generic vegetation type. It describes human-made, developed areas and can include structures, parking lots, dirt lots, and roads. Although these areas are not typically described in a natural fire regime, the structures built there can be a receptive fuel, so developed areas are typically central to WUI areas of concern.

2.5.3 OTHER LAND COVER TYPES

Other Land Cover Types is a comprehensive category for vegetation types that exist within the County. This category accounts for 18 other land cover types and comprises less than 2% of the cover throughout De Baca County. These types include riparian areas along streams, rivers, and lakes; other shrub- and herbaceous-dominated vegetation types; areas of introduced species; barren areas; and open water.

2.6 HISTORIC CONDITIONS AND PRESENT CHANGES IN FIRE-ADAPTED ECOSYSTEMS

During the past few centuries, humans have altered the fire-adapted ecosystem in the Southwest. Prior to 1900, periodic, low-intensity surface fires burned through much of the landscape. This process reduced fuel loads by removing dense brush cover and encroachments of small trees. Thus, in the past, these fire-adapted ecosystems were routinely renewed, which supported healthy ecosystems.

Many different vegetation communities have been converted from their historic conditions. Native grasslands cover the majority of the County. These ecosystems contained native bunch grasses such as various grama species. Current conditions have been altered by past and continuous intensive grazing, which has denuded native grasslands. In some areas native grasses exist in sparse, patchy stands and are encroached upon by mesquite trees. Prior to European settlement, fire ignited by various Native American groups and lightning-caused fires were common and removed encroaching shrubs, forbs, and trees and promoted vigorous grassland vegetation (Pyne 1982). Juniper savannas and piñon-juniper woodlands have also changed over time and have expanded above their historic range and densities as a result of livestock grazing, fire suppression, and climatic variation (Allen and Breshears 1998; Swetnam et al. 1999).

2.6.1 NON-NATIVE AND INVASIVE SPECIES

Fire-tolerant, flammable, non-native species now exist within cottonwood and willow stands along the Pecos River corridor and around Lake Sumner. One species that deserves special mention with regard to wildfire is saltcedar. This species, also referred to as tamarisk, is common along the Pecos River and occurs within the CWPP planning area. Programs to reduce saltcedar have already been implemented in the County and have had proven success; these efforts should continue in the future to ensure the control of this invasive species (Figure 2.5).

Figure 2.5. Ongoing removal of Russian olive and saltcedar in De Baca County.

Campbell and Dick-Peddie (1964) reported that saltcedar did not occur in areas with a dense cottonwood overstory, but was found only on adjacent disturbed sites. Since the time of that publication, several cottonwood-dominated riparian communities have been described as having saltcedar occurring at varying densities in the subcanopy (Ellis 2001). Native cottonwood trees and willow are not fire adapted and thus are less capable of recovering from the effects of fire than non-native saltcedar and Russian olive trees (Stromberg et al. 2002; Stuever et al.1997). Extensive bosque fires could result in further shifts away from diverse mesic native plant communities to more xeric non-native woodlands and shrublands.

Once established, saltcedar can obtain water at deeper groundwater levels and has higher water-use efficiency than native riparian trees in both mature and post-fire communities (Busch 1995; Busch and Smith 1993). One of the major competitive advantages of saltcedar is its ability to sprout from the root crown following fire or other disturbances (e.g., flood, herbicides) that kill or severely injure aboveground portions of the plant (Brotherson and Field 1987; Brotherson and Winkel 1986; Smith et al. 1998). Saltcedar flammability increases with the buildup of dead and senescent woody material within the dense bases of the plant (Busch 1995). It can also contribute to increased canopy density, which creates volatile fuel ladders and increases the likelihood of wildfire (Stuever et al. 1997). Other non-native species, such as Russian olive and Siberian elm, also exist along the Pecos River and Lake Sumner and have created similar problems, although not as extensive, to those created by saltcedar.

Saltcedar and Russian olive are on the state list of noxious weeds for New Mexico. For more information on noxious weeds, refer to U.S. Department of Agriculture (USDA) noxious species lists by state, which can be found at http://plants.usda.gov/.

In neighboring Quay, Curry, and Guadalupe counties, concern grows for the dominance of wheeping love grass (*Eragrostis curvula)* on Conservation Reserve Program (CRP) lands and ranchlands. According to local (National Resource Conservation Service (NRCS) representatives on the Core Team, this grass is not yet considered a threat, but because of its prolific spread the County should keep apprised of its presence because it poses a considerable fire risk and its spread is difficult to control.

2.7 HISTORY AND LAND USE

De Baca County is possibly best known for the legendary outlaw William Bonney, alias "Billy the Kid," who was shot by Sheriff Pat Garrett on July 14, 1881, and is buried in the government cemetery southeast of Fort Sumner (Figure 2.6). The County has maintained its western rural character to this day and is still primarily a ranching community, with 90% of the cash receipts for all farm commodities coming from livestock ranching. Cow, calf, and stocker operators comprise most of the land use in the County (De Baca County Extension 2007), followed by sheep and horse operations. Alfalfa is also a leading cash crop, but weed and grass control is a challenge to producers (De Baca County Extension 2007). Pasture land is threatened by encroachment of brush and weeds, and the control of these non-native cover types is a priority for land managers. According to County Extension reports, water is one of the most important limiting resources for the County's agricultural capacity, and the long-term use of water for agriculture is threatened by urbanization and industrialization.

Figure 2.6. Grave of Billy the Kid.

The Pecos River valley has a long and diverse history. Human occupation is believed to date from the Late Pleistocene about 10,000 years ago, during the Paleoindian Period (ca. 10,000–6,000 B.C.). Most archaeologists believe that bands of mobile hunter-gatherers (Paleoindians) living during this time subsisted primarily on large game and Late Pleistocene megafauna, which was supported by the cooler, wetter environment of that era (Wase et al. 2003). The Paleoindian hunting-dependent subsistence strategy was rendered infeasible as the climate became increasingly warmer and drier around the Archaic Period (6,000 B.C.–A.D. 900), when large game animal populations declined. Agriculture-based subsistence began in the Ceramic Period (A.D. 600–1,300). Mobility decreased and farming hamlets appeared, according to the archaeological record (Kemrer 1994). By contrast, the Late Prehistoric Period (A.D. 1,300–1,600) saw major shifts in subsistence due to a dramatic increase in mobility; at this time, hunter-gathering and agriculture-based communities virtually disappeared. In A.D. 1,600–1,860, the Pecos River valley saw a transition from an aboriginal population to the Euro-American occupation. According to documentary accounts (Sebastian and Levine 1989), two cultural groups—the Comanche and the Apache—occupied the area (Kemrer 1994); these tribes were highly mobile, following the free-ranging bison herds.

Spanish settlement began in the region around 1821 with Luis C. De Baca, who petitioned for a land grant on the Upper Pecos. A gradual settlement during the nineteenth century occurred as the Spanish crown encouraged colonization of its new lands with land grants and other inducements. Ownership of the lands possessed and cultivated by local Native Americans was acknowledged by the Spanish in the form of land grants. Following the Mexican–American War

in 1846 to 1848, Euro-American occupation and use of the Pecos River valley intensified due to the political and military presence in the region. A number of forts were established along the Pecos River valley at Fort Union and Fort Stanton. During the Late Historic Period (1860–1940), the Civil War shaped the landscape of the Southwest. In 1862 Officer James Carleton led California-based Union forces to drive the Mescalero Apache and Navajo Indians to Bosque Redondo from their native homelands of Canyon de Chelly and the surrounding area. The movement became known as the Long Walk; thousands died en route due to poor conditions and mismanagement. In the same year, Fort Sumner was established at the Bosque Redondo site as a reservation for the various tribal groups that had been forced from their lands. Harsh conditions, insufficient resources, and mismanagement of the tribes by the U.S. Army resulted in a great number of deaths. The military fort was only in operation for six years before the Bosque Redondo reservation was determined to be a dismal failure; it was closed in 1868 (McAlavy and Kilmer 1980). The surviving Navajo people were allowed to leave in June 1868. A new Bosque Redondo memorial (Figure 2.7) is located just outside of Fort Sumner and is recognized by Core Team members and the public as a cultural value that should be protected from wildfire.

Figure 2.7. Bosque Redondo Memorial.

De Baca and surrounding counties have a long history of cattle driving. Charlie Goodnight and Oliver Loving were two well-known Texan cattle traders who took advantage of the military installments along the Pecos River and began regular cattle drives from Fort Worth, Texas, north up the river, to Fort Sumner. Their trail, which eventually extended beyond Fort Sumner to Santa Fe and later to Pueblo and Denver, Colorado, became known as the Goodnight–Loving Trail. The trail was soon utilized by Comanche and Comancheros (informal groups comprising

Hispanics, Mexicans, and displaced Native Americans) who would drive stolen herds and partake in various other illegal activities; accordingly, New Mexico became known as one of the most lawless places in the West. Billy the Kid's record added to this reputation. De Baca County's ranching background (Figure 2.8) and rich heritage illustrates the cultural importance of protecting such historic features from wildfire; this need for protection is recognized in the recommendations in this CWPP.

Figure 2.8. De Baca cattle and rangelands.

Rangelands have been subjected to various environmental pressures and influences, both natural and unnatural, because of their large extent and cultural importance in New Mexico (Finch and Dahms 2004). Traditionally, the most common uses of fire in livestock management are to eradicate noxious weeds, convert brush to pasture land, and retard the encroachment of woody species (Allen 1996). Once established, pasture lands tend to experience a gradual reduction in the use of broadcast burning in favor of mechanical and chemical vegetation management and lands become stocked with agricultural crops, including species that are neither native nor fire adapted. Much of the eastern Plains have therefore undergone widespread cover type conversion. However, with more intensive management and expansion of urban areas, fire has begun to disappear from ranching lands. Roads and development have broken up the continuity of the grassland fuels into a new mosaic. Heavy demand on grasses through grazing may have acted to reduce grassland fuel loads in many areas to a point where fire may be difficult to propagate. Similarly, urban lots and cultivated lawns may have reduced fuel loads, making some people feel that fire is not a risk to them. However, in the County the observed declining population and subdividing of some ranches and farms has meant that some areas have been taken out of production, which could provide increased fuel loads that threaten communities.

3.0 FIRE ENVIRONMENT

3.1 WILDLAND URBAN INTERFACE

The WUI is composed of both interface and intermix communities and is defined as areas where human habitation and development meet or intermix with wildland fuels (USDA and U.S. Department of Interior [USDI] 2001:752–753). Interface areas include housing developments that meet or are in the vicinity of continuous vegetation and consist of less than 50% vegetation. Intermix areas are those areas where structures are scattered throughout a wildland area of greater than 50% continuous vegetation and fuels and meet or exceed a minimum of one house per 40 acres. Depending on the surrounding fuel conditions, topography, and present structures, wildland areas of up to 1.5 miles from structures may be included in the WUI (Stewart et al. 2007).

The WUI creates an environment in which fire can move readily between structural and vegetative fuels, increasing the potential for wildland fire ignitions and the corresponding potential loss of life and property. Human encroachment upon wildland ecosystems within recent decades is increasing the extent of the WUI and is therefore having a significant influence on wildland fire management practices (Figure 3.1). The expansion of the WUI into areas with high fire risk combined with the collective effects of past fire management policies, resource management practices, land-use patterns, climate change, and insect and disease infestations has created an urgent need to modify fire management practices and policies and to understand and manage fire risk effectively in the WUI (Pyne 2001; Stephens and Ruth 2005). Mitigation techniques for fuels and fire management have been strategically planned and implemented in WUI areas and have proven effective; however, it is important to note that all WUI mitigation focus areas will be different and should be planned for accordingly.

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

The Core Team for the DBCCWPP identified five communities at risk: Fort Sumner (the municipal area and the Valley), Lake Sumner, Taiban, Yeso, and Salado (the new "River Ranch Development"). All are to be included in the designated WUI (Figure 3.2). The WUI was developed to encompass areas of critical infrastructure as well (illustrated in Map 2, Appendix A). Other values at risk included Lake Sumner State Park, the municipal airport, and evacuation routes along major roads and the railroad. It was decided that the WUI area around Fort Sumner would extend north to the airport along U.S. 84 and would extend to the southern extent of Highway 272 and due west to meet Highway 20. This would encompass the municipal areas and the Valley residents. A 1-mile buffer around the major roads and railroad would act as evacuation routes.

Figure 3.1. Typical WUI in De Baca County.

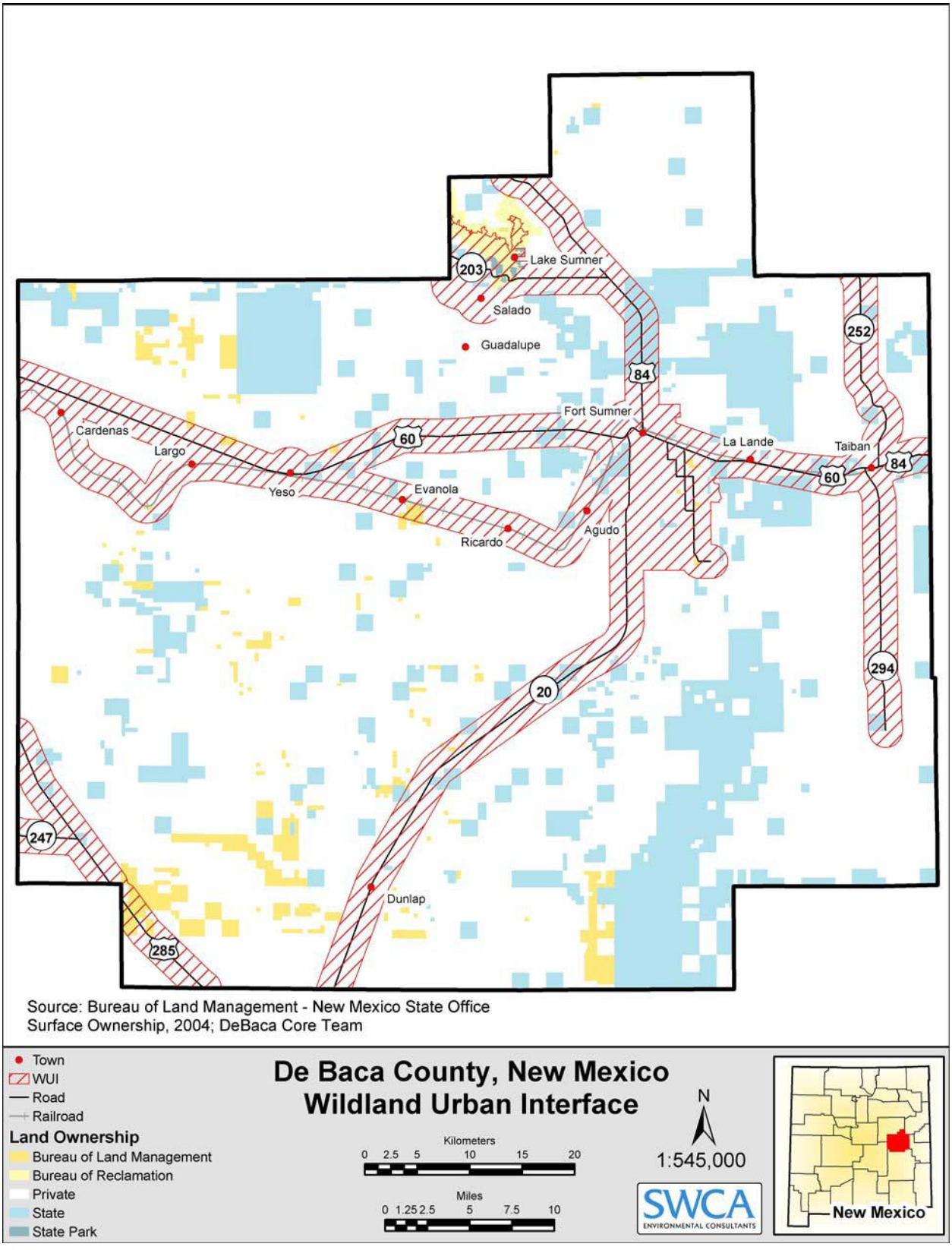

Figure 3.2. De Baca County WUI.

3.2 FIRE HISTORY

Most fire suppression experts believe that the threat of massive damage to human lives, private property, and natural resources is increasing throughout North America (Arno et al. 2000; National Fire Protection Association 1987). Wildland fires have become a major concern throughout New Mexico in recent decades for a number of reasons: (1) human activity patterns have changed the landscapes over the past three decades; (2) natural resources are now highly valued and protected against widespread wildfire; (3) national wildland firefighting budgets are shrinking; (4) more people are escaping the cities into the wildlands; (5) many rural areas are dependent on VFDs that have insufficient funds and resources to fight large conflagrations; and (6) climatic conditions such as drought can be like a match to volatile fuels.

3.2.1 PAST FIRE MANAGEMENT POLICIES AND LAND MANAGEMENT ACTIONS

Prior to European settlement throughout the West in the 1800s, lightning- and human-ignited fires burned more frequently and less intensely. After that time, a dramatic increase in livestock grazing, fire suppression, and other human-related activities tended to alter the landscape and the associated fire regimes. Some species of non-native vegetation were also introduced during that time period and eventually invaded many native landscapes across the West, altering natural fire-disturbance processes.

Beginning in the early 1900s, the policy for handling wildland fire, initiated by the USFS, leaned heavily toward suppression. Over the years, other agencies, such as the BLM, the Bureau of Indian Affairs (BIA), and the National Park Service (NPS), followed the lead of the USFS and adopted fire suppression as the accepted means for protecting the nation from wildfire. As a result, many areas now have excessive fuel buildups, dense and continuous vegetative cover, and tree and shrub encroachment upon open grasslands. This impacts local ranchers by reducing effective area for fodder and raises fire risk by increasing woody fuels. Grassland communities are usually influenced by seasonality and frequency of fire due to their evolutionary adaptations to particular habitat features and conditions (Ford and Johnson 2006). The fuels of semiarid grassland may support high rates of fire spread when cured (Rothermel 1983) or may conversely be too discontinuous or actively growing to carry a fire (Andrews 1986).

3.2.2 FIRE AND NATIVE PEOPLES

In the past, Native American tribes have used fire as a tool to open land for agricultural use or travel; to drive game for hunting; to promote desirable post-fire herbaceous vegetation; or for managing the land for habitat protection and resource use (Pyne 1982). As a result, human-caused fires have also played a role in influencing historical fire occurrences.

Research has indicated that these activities were focused around areas that were inhabited and took place primarily in localized regions during certain time periods across the Southwest; however, the specific influence that Native Americans had on historic fire regimes remains uncertain (Kaye and Swetnam 1999). For the most part, it is likely that the increase in the intensity of grazing activities and fire suppression that began in the latter part of the nineteenth century contributed most significantly to changing the natural historic fire regimes throughout the Southwest (Kaye and Swetnam 1999).

3.2.3 Historical Fire Regimes and Present Changes

Fire occurrence and behavior in the West have changed dramatically within the past several decades. Historically, frequent low-intensity surface fires burned throughout many areas within the County, creating a mosaic of different stages of vegetative structure across the landscape. For the most part, these fires helped to maintain an open vegetative community structure by consuming fuels on the ground surface, which maintained open grasslands, and by clearing them of encroaching vegetation.

Grasslands

Historic fire regimes in grasslands are not well understood; obtaining historic fire samples within these habitat types is difficult. Many authors have suggested that the mean fire-return intervals (FRI) (the arithmetic average of all fire frequencies for a specific study site) for grasslands throughout the seventeenth to early nineteenth centuries are thought to have been every 5–10 years (Leopold 1924; McPherson 1995; Swetnam et al. 1992). Fire-suppression policies may have contributed to declining fire frequency in this cover type, but other interacting factors also contribute. It is thought that about the time of the Civil War, intensive livestock grazing was responsible for a decline in grassland fires (West 1984). Heavy grazing reduced the fuel available to propagate fire spread and also reduced competition with herbaceous plants, tipping the balance in favor of the woody species. Woodland encroachment, increased tree density, and altered fire behavior characterize many former grasslands of the Southwest. Once woody plants become dominant, their long life spans and their ability to extract both shallow and deep soil moisture can maintain a woodland condition indefinitely (Burgess 1995). Frequent fire plays a significant role in grassland nutrient cycling and successional processes, and long-term exclusion may produce irreversible changes in ecosystem structure and function (McPherson 1995).

Shrublands

Piñon-juniper savannas are found in some northern portions of the planning area and are associated with deep soils. Most of the precipitation occurs during the summer monsoon season. Juniper savanna, the most common savanna in New Mexico, consists of widely scattered trees in a grass matrix (Dick-Peddie 1993). Similar to grasslands, the range of savannas has decreased as tree density has increased, but the mechanisms for the tree expansion are complex and the subject of current research. There is significant scientific debate currently over the natural FRI for savannas, but most experts agree that fire was more frequent in savannas than in modern times.

Riparian Areas

Although most of the County exhibits decreased occurrence of wildland fires compared to historical conditions, some areas within the County are actually experiencing an increase in fire occurrence and severity. Riparian ecosystems along the Pecos River were historically shaped by natural hydrologic regimes. Native riparian vegetation is not adapted to fire, and fires did not typically occur within this ecological zone. As a result, fire can actually influence the composition and structure of riparian ecosystems (Ellis 2001). The ecology of this habitat type has changed significantly over time, as fire-adapted invasive species such as saltcedar and Russian olive have invaded many areas. Once saltcedar has been established at a location, it increases the likelihood that the riparian area will burn and, as a result, alter the natural

disturbance regime. Saltcedar and Russian olive both sprout readily after fire, and although cottonwood will also regenerate after fire, it typically has limited survival of resprouting individuals. Studies have found that the density of saltcedar foliage is higher at burned sites than unburned sites within riparian areas (Smith et al. 2006).

3.2.4 Recent Fire Occurrence in the De Baca CWPP Planning Area

Ignition Sources in De Baca County

Lightning ignitions are the most common cause of fires within the County. Lightning is common throughout monsoon season, which typically takes place from April through August. Most of these fires are detected early and suppressed before they gain acreage; however, given the right conditions, these fires may grow large and become difficult to suppress. Another primary concern of residents in the interface is a growing number of human ignitions, particularly with the development and improvement of roads, railroads, residences, and recreational opportunities into wildland areas.

Recent Fire History

Wildfires can occur throughout the season (especially the monsoon season) and are typically suppressed before they gain any acreage. Most fires ignited within the region are less than 100 acres in size. However, within the last several years on record (by NMSF) for the County (1994 to 2007), 26 wildfires greater than 100 acres in size have occurred (Map 2, Appendix A).

A total of ten fires on record grew to greater than 1,000 acres, including the recent Gomez Fire, the Reynolds Fire, the Lumbre Fire, the Jackson Draw Fire, the Hisel Fire, and the Wilton Fire; the Johnny fire in 2000 grew to over 40,000 acres. Table 3.1 lists fires that have occurred and been reported to NMSF between 1994 and 2007.

Table 3.1. Fires Reported to NMSF within De Baca County (1994–2007)

Incident Name	Acres Burned	Cause	Cover Type	Fiscal Year
Reynolds	1,200	Miscellaneous	Grass	1994
Morgan	350	Miscellaneous	Grass	1995
Johnny Fire	40,000	Railroad	Grass	2000
Canyon	50	Lightning	Brush	2001
Bigote	30	Lightning	Grass	2004
Hisel	1,900	Not disclosed	Not disclosed	2005
Ward	500	Not disclosed	Not disclosed	2005
Bombing Range	350	Not disclosed	Not disclosed	2005
York	640	Not disclosed	Not disclosed	2005
Quay	2,200	Not disclosed	Not disclosed	2006
Lumbre	11,000	Not disclosed	Not disclosed	2006
Taiban Complex	5,500	Not disclosed	Not disclosed	2006
Reeder	10	Lightning	Grass	2006
South Camp	15	Lightning	Grass	2006
Guadalupe	20	Lightning	Grass	2006
May	220	Not disclosed	Not disclosed	2006
Koontz	25	Lightning	Grass	2006
Best	40	Lightning	Grass	2006
Leon	40	Lightning	Grass	2006
MM 158	50	Equipment use	Grass	2006
De Baca	200	Lightning	Grass	2006
Salado	200	Lightning	Grass	2006
May	220	Lightning	Grass	2006
Hawk	299	Lightning	Grass	2006
Ward	500	Lightning	Grass	2006
York	640	Lightning	Grass	2006
Garza	680	Lightning	Grass	2006
Jackson Draw	1,040	Lightning	Grass	2006
Hisel	1,900	Debris Burning	Grass	2006
Wilton	4,000	Lightning	Grass	2006
Cowchip	50	Lightning	Bosque	2007
Mcree	40	Lightning	Grass	2008
MM 299	40	Smoking	Grass	2008
Dry Tank	60	Lightning	Grass	2008
Page	150	Lightning	Grass	2008
Double V	250	Equipment use	Grass	2008
King	400	Equipment use	Grass	2008
McCollum	750	Lightning	Grass	2008
Gomez	2,800+	Not disclosed	Not disclosed	2008

3.3 CHALLENGES FOR FUTURE RESTORATION EFFORTS

In addition to all of the anthropogenic impacts that have degraded natural fire regimes, climate change has played an extensive role in altering fire occurrence and severity (Swetnam and Betancourt 1990, 1998). Climate change has influenced the vegetative cover and available burnable fuel across the West. In the past few years, fires have grown to record sizes and are burning earlier, longer, hotter, and more intensely than they have in the past (Westerling et al. 2006). According to the National Interagency Fire Center (NIFC), occurrence of catastrophic wildfires has greatly increased over the last 20 years. Westerling et al. (2006) claim that a study of large (>1000 acres) wildfires throughout the Western United States for the period 1970 to 2003 saw a pronounced increase in frequency of fire since the mid 1980s (1987–2003 fires were four times more frequent than the 1970–1986 average). The length of the fire season was also observed to increase by 78 days, comparing 1970–1986 to 1987–2003. Within just the last seven years, a record number of acreages have burned, and numbers are continually getting larger (NIFC 2006).

Changes in relative humidity are blamed for many of these conditions, as increased drying over much of the Southwest has led to an increase in days with high fire danger (Brown et al. 2004). Advanced computer models are now making national-scale simulations of ecosystems, providing predictions of how fire regimes will change in the twenty-first century (Neilson 2004). Western grasslands are predicted to undergo increased woody expansion of pinyon juniper associated with increased precipitation during typical wet seasons. Summer months are predicted to be hotter and longer contributing to increased fire risk (Neilson 2004). Under greater climatic extremes widely predicted throughout the United States, fire behavior is expected to become more erratic, with larger flame lengths, increased torching and crowning, and more rapid runs and blowups associated with extremely dry conditions (Brown et al. 2004).

In a General Accounting Office (GAO) report on climate change and federal lands (GAO 2007), natural resource experts from numerous federal and state governments, as well as leading academic experts, predict that climate change will cause forest fires to grow in size and severity. This in turn will impact the safety of communities located with in the WUI as well as over larger areas as a result of impaired air quality from vast smoke production. Experts working under the auspices of the Department of Energy Accelerated Climate Prediction Initiative similarly warn of the increased risks. Fire suppression costs, as well as the expense of fire preparedness, are likely to climb as occurrence of larger fires increases. Experts warn that Southwest fire and fuels management strategies and policies need to address these risks now in order to prepare for these changing regimes, while also accommodating complex changing ecosystems subject to growing human stresses (Brown et al. 2004).

Although fire suppression is still aggressively practiced, fire management techniques are continually adapting and improving. Due to scattered human developments (homes, ranches, and farms) and values (residential and commercial structures, historic and natural values) throughout the WUI, suppression will always have to be a priority. However, combining prescribed fire and wildland fire use with effective fuels management and restoration techniques have been proven to help reestablish natural fire regimes and reduce the potential for catastrophic wildfires on public lands. The use of prescribed fire on private land is a decision to be made by the rancher,

and it is acknowledged that given the prevailing drought such a management technique may not be feasible in the County.

3.4 FIRE REGIMES AND FIRE REGIME CONDITION CLASSES

Methods to assess the condition of wildland areas have been developed to help classify, prioritize, and plan for fuels treatments across a fire management region.

3.4.1 FIRE REGIMES

A natural fire regime, or historic fire regime, is a general classification of the role fire would play throughout a landscape in the absence of modern human intervention, and it includes the influence of aboriginal burning (Agee 1993; Brown 1995; Hann et al. 2003). Natural fire regime reference conditions have been developed for vegetation fuel class composition, fire frequency, and fire severity for the biophysical settings at a landscape level for the Southwest and most other parts of the United States (Hann et al. 2003).

The following five fire regime classifications are based on average number of years between fires (fire frequency or mean fire interval [MFI]), combined with the severity (amount of vegetation replacement) of the fire and its effect on the dominant overstory vegetation (Hann et al. 2003):

I 0–35 year frequency and low (mostly surface fires) to mixed severity (less than 75% of the dominant overstory vegetation is replaced)

II 0–35 year frequency and high severity (more than 75% of the dominant overstory vegetation is replaced)

III 35–200 or more year fire frequency and mixed severity (less than 75% of the dominant overstory vegetation is replaced)

IV 35–200 or more year fire frequency and high severity (more than 75% of the dominant overstory vegetation is replaced)

V 200 or more per year frequency and high severity (more than 75% of the dominant overstory vegetation is replaced)

3.4.2 FIRE REGIME CONDITION CLASS

The Fire Regime Condition Class (FRCC) is a measure of the degree of departure from reference conditions, possibly resulting in changes to key ecosystem components such as vegetation characteristics (species composition, structural stage, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances, such as insect and disease mortality, grazing, and drought (Hann et al. 2003).

The three FRCC rankings are as follows:

FRCC 1 No or low departure from the central tendency of the reference conditions.

FRCC 2 Moderate departure from the central tendency of the reference conditions.

FRCC 3 High departure from the central tendency of the reference conditions.

3.4.3 Fire Regime and Condition Classifications in De Baca County

Grasslands and shrublands within the planning area typically have an FRCC of 2 or 3 for the majority of the area. See Map 3, Appendix A, for an FRCC classification map of the County.

3.5 Fire Management Policy

The primary responsibility for WUI fire prevention and protection lies with property owners and state and local governments. Property owners must comply with existing state statutes and local regulations. These primary responsibilities should be carried out in partnership with the federal government and private sector areas (USDI 1995). The current Federal Fire Policy states that protection priorities are: (1) life, (2) property, and (3) natural resources. These priorities often limit flexibility in the decision-making process, especially when a wildland fire occurs within the WUI. Wildland fire suppression resources must be diverted to protect property, often of less value, when adjacent to intermixed natural resources.

3.6 Fire Response Capabilities

In areas of dense rural residential settlement, residential structures can add to the grassland fuel load available to a wildfire, increasing its size and magnitude. Many rural residents are ill-equipped to mitigate the effects of a wildland fire and instead rely on fire organizations such as VFDs for fire protection. De Baca County has three fire departments that consist entirely of volunteer firefighters (Table 3.2). The table below includes ISO (International Standards Organization) ratings. ISO collects information on municipal fire-protection efforts in communities throughout the United States. In each of those communities, ISO analyzes the relevant data using a Fire Suppression Rating Schedule (FSRS). Communities are then assigned Public Protection Classifications from 1 to 10. Class 1 represents exemplary public protection, and Class 10 indicates that the area's fire-suppression program doesn't meet ISO's minimum criteria (ISO 2008).

Table 3.2. De Baca County Firefighting Resources

Fire Department	Serves	Number of Firefighters	Number of Stations	International Organization for Standardization (ISO) Rating
Fort Sumner Village	Municipal area of Fort Sumner	30	1+EMS service	6
Lake Sumner	Lake Sumner and Salado	24	2	9
Valley	Unincorporated areas of Fort Sumner and southern portion of county	60	4	9

Appendix D provides a list of firefighting resources for the three fire departments in De Baca County. Also included in Appendix D is a summary of emergency-operation protocols taken from a document entitled, "Interagency Emergency Operations in Wildland Fire with New

Mexico State Forestry Division: Planning Projects and Incident Management." This unpublished document was developed by Dave Bervin of the NMSF to provide guidelines for emergency responders.

3.7 INTERNATIONAL URBAN-WILDLAND INTERFACE CODE OF THE INTERNATIONAL CODE COUNCIL

The Core Team was informed about the ICC code and the ability of the County to adopt the code to carry out enforcement of building regulations that would better meet structural ignitability standards and fire safety standards in the WUI. The Core Team decided that this code would not be adopted as part of this CWPP because they felt that the high levels of rural depopulation and limited new development would not warrant the cost of implementation. They were also concerned that no County employee would be available to enforce the code since all emergency-response personnel are volunteers from the community. However, it is recommended that should money become available, the County government should learn more about the code and its potential application for planning in the WUI. A copy of the code may be obtained from http://www.iccsafe.org.

3.8 FEDERAL TREATMENTS

No BLM or USFS treatments are planned in the CWPP planning area at this time.

4.0 RISK ASSESSMENT

4.1 PURPOSE

The purpose of developing the risk assessment model described here was to create a unique tool for evaluating the risk of wildland fires to communities within the WUI areas of the County.

Although many definitions exist for hazard and risk, for the purpose of this document these definitions follow those used by the firefighting community. *Hazard* is a fuel complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition and resistance to control. *Risk* is defined as the chance of a fire starting as determined by the presence and activity of causative agents (National Wildfire Coordinating Group 1998). The risk assessment is twofold and combines a geographic information system (GIS) model of hazard based on fire behavior and fuels modeling technology (Composite Risk/Hazard Assessment) and a field assessment of community hazards and values at risk (Community Risk/Hazard Assessment).

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

4.2 FIRE BEHAVIOR MODEL

4.2.1 OVERVIEW

The wildland fire environment consists of three factors that influence the spread of wildfire: fuels, topography, and weather. Understanding how these factors interact to produce a range of fire behavior is fundamental to determining treatment strategies and priorities in the WUI. In the wildland environment, vegetation is synonymous with fuels. When sufficient fuels for continued combustion are present, the level of risk for those residing in the WUI is heightened. Fire spreads in three ways: (1) surface fire spread—the flaming front remains on the ground surface (in grasses, shrubs, small trees, etc.) and resistance to control is comparatively low; (2) crown fire—the surface fire "ladders" up into the upper levels of the forest canopy and spreads through the tops (or crowns) independent of or along with the surface fire, and when sustained is often beyond the capabilities of suppression resources; and (3) spotting—embers are lifted and carried with the wind ahead of the main fire and ignite in receptive fuels; if embers are plentiful and/or long-range (>0.5 mile), resistance to control can be very high. Spotting is often the greatest concern to communities in the path of a wildland fire; in areas like Lake Sumner and the Valley, where the Pecos River valley and associated bosque fuels lay adjacent to communities, potential spotting from bosque timber to grassland fuels should be acknowledged.

Treating fuels in the WUI can lessen the risk of intense or extreme fire behavior. Studies and observations of fires burning in appropriately treated areas have shown that the fire either remains on or drops to the surface, thus avoiding destructive crown fire. Also, treating fuels decreases spotting potential and increases the ability to detect and suppress any spot fires that do

occur. Fuels mitigation efforts therefore should be focused specifically where these critical conditions could develop in or near communities at risk.

4.2.2 Fire Behavior Model Components

For this plan, an assessment of fire behavior was carried out using well-established fire behavior models: FARSITE, FlamMap, BehavePlus, and FireFamily Plus, as well as ArcGIS Desktop Spatial Analyst tools. Data used in the Composite Risk/Hazard Assessment was largely obtained from LANDFIRE.

LANDFIRE

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

Farsite

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

FlamMap

Like FARSITE, FlamMap uses a spatial component for its inputs but only provides fire behavior predictions for a single set of weather inputs. In essence, it gives fire behavior predictions across a landscape for a snapshot of time. FlamMap does not predict fire spread across the landscape. FlamMap was used in this project to predict fire behavior across the landscape under extreme (worst case) weather scenarios.

BehavePlus

BehavePlus also uses Rothermel equations. It is a multifaceted fire behavior model and was used to determine fuel moisture in this process.

4.2.3 Fire Behavior Model Inputs

Fuels

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

The general classification of fuels is by fire-carrying fuel type:

(NB) Nonburnable
(GR) Grass
(GS) Grass-Shrub
(SH) Shrub
(TU) Timber-Understory
(TL) Timber Litter
(SB) Slash-Blowdown
Source: Scott and Burgan 2005

A more detailed breakdown of the fuel types present in the planning area is presented in Table 4.1.

Table 4.1. Fuel Model Classification for DCCWPP Planning Area

1.	**Nearly pure grass and/or forb type (Grass)**
i.	**GR1:** Grass is short, patchy, and possibly heavily grazed. Spread rate is moderate (5–20 ch/h); flame length low (1–4 feet); fine fuel load 0.40 (t/ac).
ii.	**GR2:** Moderately coarse continuous grass, average depth about 1 foot. Spread rate high (20–50 ch/h), flame length moderate (4–8 feet); fine fuel load 1.10 (t/ac).
iii.	**GR4:** Moderately coarse continuous grass, average depth about 2 feet. Spread rate very high (50–150 ch/h); flame length high (8–12 feet); fine fuel load 2.15 (t/ac).
2.	**Mixture of grass and shrub, up to about 50% shrub cover (Grass-Shrub)**
i.	**GS1:** Shrubs are about 1 foot high, low grass load. Spread rate moderate (5–20 ch/h); flame length low (1–4 feet); fine fuel load 1.35 (t/ac).
ii.	**GS2:** Shrubs are 1–3 feet high, moderate grass load. Spread rate high (20–50 ch/h); flame length moderate (4–8 feet); fine fuel load 2.1 (t/ac).
3.	**Shrubs cover at least 50% of the site; grass sparse to nonexistent (Shrub)**
i.	**SH1:** Low shrub fuel load, fuelbed depth about 1 foot; some grass may be present. Spread rate very low (0–2 ch/h); flame length very low (0–1 foot); fine fuel load 1.7 (t/ac).
ii.	**SH2:** Moderate fuel load (higher than SH1), depth about 1 foot, no grass fuels present. Spread rate low (2–5 ch/h); flame length low (1–4 feet); fine fuel load 5.2 (t/ac).
iii.	**SH5:** Heavy shrub load, depth 4–6 feet. Spread rate very high (50–150 ch/h); flame length very high (12–25 feet); fine fuel load 6.5 (t/ac).
iv.	**SH7:** Very heavy shrub load, depth 4–6 feet. Spread rate lower than SH5, but flame length similar. Spread rate high (20–50 ch/h); flame length very high (12–25 feet); fine fuel load 6.9 (t/ac).
4.	**Grass or shrubs mixed with litter from forest canopy (Timber-Understory)**
i.	**TU1:** Fuelbed is low load of grass and/or shrub with litter. Spread rate low (2–5 ch/h); flame length low (1–4 feet); fine fuel load 1.3 (t/ac).
5.	**Dead and down woody fuel (litter) beneath a forest canopy (Limber Litter)**
i.	**TL3:** Moderate load. Spread rate very slow (0–2 ch/h); flame length low (1–4 foot); fine fuel load 0.5 (t/ac).
6.	**Insufficient wildland fuel to carry wildland fire under any condition (Nonburnable)**
i.	**NB1:** Urban or suburban development; insufficient wildland fuel to carry wildland fire.
ii.	**NB3:** Agricultural field, maintained in nonburnable condition.
iii.	**NB8:** Open water.
iv.	**NB9:** Bare ground.

Notes:
Based on Scott and Burgan's (2005) 40 Fuel Model System.
Climate is arid to semiarid for all fuel types.
Only categories present on the CWPP fuel maps are presented above. For more information refer to Scott and Burgan 2005.

Map 4 in Appendix A illustrates the fuels classification throughout the planning area. The dominant fuel type in the area is classified by Scott and Burgan (2005) as GR2 and GS2. GR2 is a moderately coarse continuous grass fuel with a depth of approximately 1 foot. Spread rate in these fuels is high (20–50 chains per hour [ch/h]) and flame lengths are low to moderate (2–8 feet). This fuel type makes up the majority of the County, with patches of GS2 fuels predominantly in the central and eastern portions. GS2 fuels are made up of shrubs that are 1 to 3 feet high with a moderate grass understory. Spread rates and flame length are comparable to the GS2 fuels. GR4 fuels are found scattered throughout the central portion and adjacent to the Pecos River valley. These fuels are moderate-load, coarse, continuous grasses with a depth of 2 feet that exhibit very high rates of fire spread (50–150 ch/h) and high flame lengths (8–12 feet). The bosque fuels are classified as moderate-load litter fuels (TL3) and low-load, dry-climate, timber-grass-shrub fuels (TU1); both these fuel types exhibit low spread rates (2–5 ch/h) and low flame lengths (1–4 feet).

Non-combustible fuels are also present throughout the planning area, with urban fuels (NB1) dominant throughout communities. Lake Sumner appears as fuel model NB8, depicting open water in the north-central portion of the County. The Valley community is surrounded by agricultural lands classified as NB3. These fuel types are considered noncombustible when input into the fire behavior model. This is important to note when determining risk in more rural areas, as fire risk associated with crop lands will vary seasonally. West of Fort Sumner is an area that is depicted as bare ground (NB9). This area is a portion of the County that burned prior to the compilation of the LANDFIRE fuels data. It appears as bare ground because of the consumption of the grass and shrubland vegetation. It is important to recognize that fuels are dynamic in nature and therefore the fire risk is not static and should be reassessed on a regular basis.

Topography

Topography is important in determining fire behavior. Steepness of slope, aspect (direction the slope faces), elevation, and landscape features can all affect fuels, local weather (by channeling winds and affecting local temperatures), and rate of spread of wildfire. The topography in the planning area is relatively uniform, with the greatest variation occurring around Lake Sumner. Aspect and slope can assert significant influence on fire behavior, so where topography does fluctuate, flame lengths and rate of spread could vary considerably. Other topographic features that could be significant are arroyos and tributaries that may funnel fire and intensify fire behavior. Narrow river channel width and presence of vegetated islands are also topographic features that could influence fire spread in bosque areas.

Weather

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

space is of vital importance in protecting communities from this type of fire. For instance, a carefully constructed fuel break placed in an appropriate location could protect homes or possibly an entire community from fire. This type of defensible space can also provide safer conditions for firefighters, improving their ability to suppress the fire and protect life and property.

One of the critical inputs for FlamMap are fuel moisture files. For this purpose weather data was obtained from FAMWEB (http://fam.nwcg.gov/fam-web/famweb/index$.startup), a fire weather database maintained by the National Wildfire Coordinating Group. With guidance from Chuck Maxwell, U.S. Fish and Wildlife Service (USFWS) meteorologist at the Southwest Area Coordination Center, a remote automated weather (RAW) station was selected (at 8 mile, Chavez County) and data was downloaded from the website. The weather station was selected based on the period of record (1986–2006), the reliability of the data, and the likelihood that data represented weather in the planning area.

Using an additional fire program (FireFamily Plus) with the RAW station data, weather files that included prevailing wind direction and 20-foot wind speed were created; fuel moisture files were then developed for downed (1 hour, 10 hour, and 100 hour) and live herbaceous and live woody fuels. These files represent weather inputs in FlamMap.

4.2.4 Fire Behavior Model Outputs

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

Flame Length

Map 5 in Appendix A illustrates the flame length classifications for the County. Flame lengths are determined by fuels, weather, and topography. Flame length is a particularly important component of the risk assessment because it relates to potential crown fire (particularly important in riparian areas) and suppression tactics. Direct attack by hand lines is usually limited to flame lengths less than 4 feet, In excess of 4 feet, indirect suppression is the dominant tactic. Suppression using engines and heavy equipment will move from direct to indirect with flame lengths in excess of 8 feet.

Flame lengths classified as high (>8 feet) are found scattered throughout the central and southern portions of the County and are consistent with the GS2 grass and shrub fuel types. Patches of predicted extreme flame lengths are also found along the Pecos River in the bosque fuels, which are classified as timber overstory-litter understory (TL3) and timber overstory/shrub and grass understory (TU1) fuels. Low flame lengths are recorded among the GR2 fuels, which are characteristic of the shortgrass prairie. Patches of GR4 fuels are found throughout the GS2 fuel bed; these are moderate-load, dry-climate grasses that are predicted to burn with moderate flame lengths.

Rate of Spread

Map 6 in Appendix A illustrates the rate of spread classifications for the planning area. The most extreme rates of spread are expected to occur in the GR4 fuel types, which are the moderate-load, dry-climate grasses. These occur along the Highway 20 corridor and the Pecos River corridor to the west of the County. Extreme spread rates are also predicted around Fort Sumner between Highway 20 and the Valley communities and between U.S. 60 and Lake Sumner. Spotted high and extreme spread rates are also observed around Lake Sumner and along U.S. 84,

north of Fort Sumner. Highway 60 between Fort Sumner and Taiban is another area of high and extreme rate of spread. These areas are the most heavily populated in the County, raising concern for fire risk. The grassland areas to the west of the County are predicted to burn with moderate rates of spread, with some patches of low spread rate being associated with the NB9 bare and barren land fuel classification. Agricultural and urban areas are clearly delineated in this model by their low rate of spread and are evident in the Valley communities and around Fort Sumner. An area just west of Fort Sumner, bounded by the railroad to the south and Highway 60 to the north, stands out as having a high spread rate instead of an extreme spread rate (as predicted for surrounding fuels). This area was an existing burn and so the reduced fuel loads have contributed to the lower spread rates. Because this data is based upon satellite images from 2006, landowners are cautioned that this area is likely to have regrown to a condition similar to adjacent ratings.

Fire Occurrence/Density of Starts

Map 2 in Appendix A illustrates the fire occurrence density for the planning area. Fire occurrence density was determined by performing a density analysis on fire start locations with ArcGIS Desktop Spatial Analyst. These locations were provided by NMSF and the USFS as GIS points, and the points showed the location of fire starts within the project area over the last 37 years (1970–2007). The density analysis was performed over a 5-mile search radius. The density of previous fire starts is used to determine the risk of ignition of a fire. Map 7 in Appendix A reveals a definite pattern of fires close to populated areas and along the highways, particularly along Highway 285 and Highway 20 south of Fort Sumner. High fire density is also observed southwest and northwest of Lake Sumner.

It may be argued that areas that have burned previously are less likely to burn in the immediate future due to lowered fuel loads, but post-burn regrowth in grassland fuels is often rapid, and dead and downed fuels in bosque and shrubland settings can contribute to increased fire risk in these previously burned areas; the fuels assessment used to determine the fuel models takes into account the fuel loading of recently burned areas as it is developed from 2006 imagery. Furthermore, the fire occurrence maps are used to provide information on areas where human- and lightning-ignited fires are prevalent and hence could be more prone to fire in the future.

4.2.5 GIS Overlay Process

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

All fire parameter datasets were converted raster format (a common GIS data format comprising a grid of cells or pixels, with each pixel containing a single value). The cell size for the data is 30 × 30 m (98 x 98ft). Each of the original cell values were reclassified with a new value between 1 and 4, based on the significance of the data (1 = lowest, 4 = highest). Prior to running the models on the reclassified datasets, each of the input parameters were weighted; that is, they were assigned a percentage value reflecting that parameter's importance in the model. The parameters were then placed into a Weighted Overlay Model, which "stacks" each geographically aligned dataset and evaluates an output value derived from each cell value of the overlaid dataset in combination with the weighted assessment. The resulting dataset contains only values 1 through 4 (1 = low, 2 = medium, 3 = high, 4 = extreme) to denote fire risk. This ranking shows the relative

fire risk of each cell based on the input parameters. Table 4.2 lists the individual datasets, the classes assigned to the data, and the relative weights assigned within the modeling framework

Table 4.2. Composite Risk/Hazard Assessment—Overlay

Layer	Source	Year	Weight (%)	Ranks
Flame Length	Landfire: Elevation, Aspect, Slope, Scott and Bergan 40 Fuel Model, Forest Canopy Base Height (CBH), Forest Canopy Bulk Density (CBD), Forest Canopy Cover (CC), Forest Canopy Height (CH)	2007	30	1: 0–4 feet 2: 4–8 feet 3: 8–12 feet 4: >12 feet
	8-Mile RAW Station (Weather)	1986–2006		
Fire Occurrence	NMSF	1970–2007	20	1: No fires/mile squared 2: 0–0.2 fire/mile squared 3: 0.2–1 fire/mile squared 4: >1 fire/mile squared
Rate of Spread	Landfire: Elevation, Aspect, Slope, Scott and Bergan 40 Fuel Model, CBH, CBD, CC, CH	2007	50	1: 0–5 feet/minute 2: 5–15 feet/minute 3: 15–40 feet/minute 4: >40 feet/minute
	8-Mile RAW Station (Weather)	1986–2006		

4.3 COMPOSITE RISK/HAZARD ASSESSMENT

Figure 4.1 is the risk assessment for the planning area; it combines all the fire behavior parameters described above. The risk assessment classifies the planning area into low, moderate, high, and extreme risk categories.

The risk assessment depicts risk in the County as largely moderate and high. Areas around the Valley are classified as low risk because of the agricultural nature of the fuels. As discussed previously, these areas would undergo seasonal fluctuations in terms of their fire risk because of changes in irrigation, curing, and harvesting. The high-risk areas are associated with grass-shrub fuel loads as classified using the Scott and Burgan (2005) system as GS2. These fuels generate high rates of spread and moderate flame lengths. Extreme risk is very minimal and is limited to riparian areas. The greatest concentration of extreme risk is found along the southern portion of the Pecos River valley in the timber bosque fuels. Furthermore, extreme risk is predicted southwest of Salado in the riparian area and around the edge of Lake Sumner. Salado is an area undergoing development and Lake Sumner is heavily utilized for recreation in summer months. Both of these areas should be the focus of fuels treatment. Areas of extreme risk are also found on the western boundary of Valley agricultural lands, raising concerns that fire spreading from already high-risk areas between Highway 20 and Valley communities could generate extreme fire behavior in this WUI area. This was further supported in Core Team discussions. The area to the south of Fort Sumner also exhibits extreme risk in patches, and this could threaten the municipal areas to the north, including many CVARs. The remainder of the County, which is predominantly made up of low-load, dry-climate grasslands (GR2) is classified as moderate risk. The lower risk is a consequence of the lower rates of spread and flame lengths predicted to occur in these shortgrass fuels.

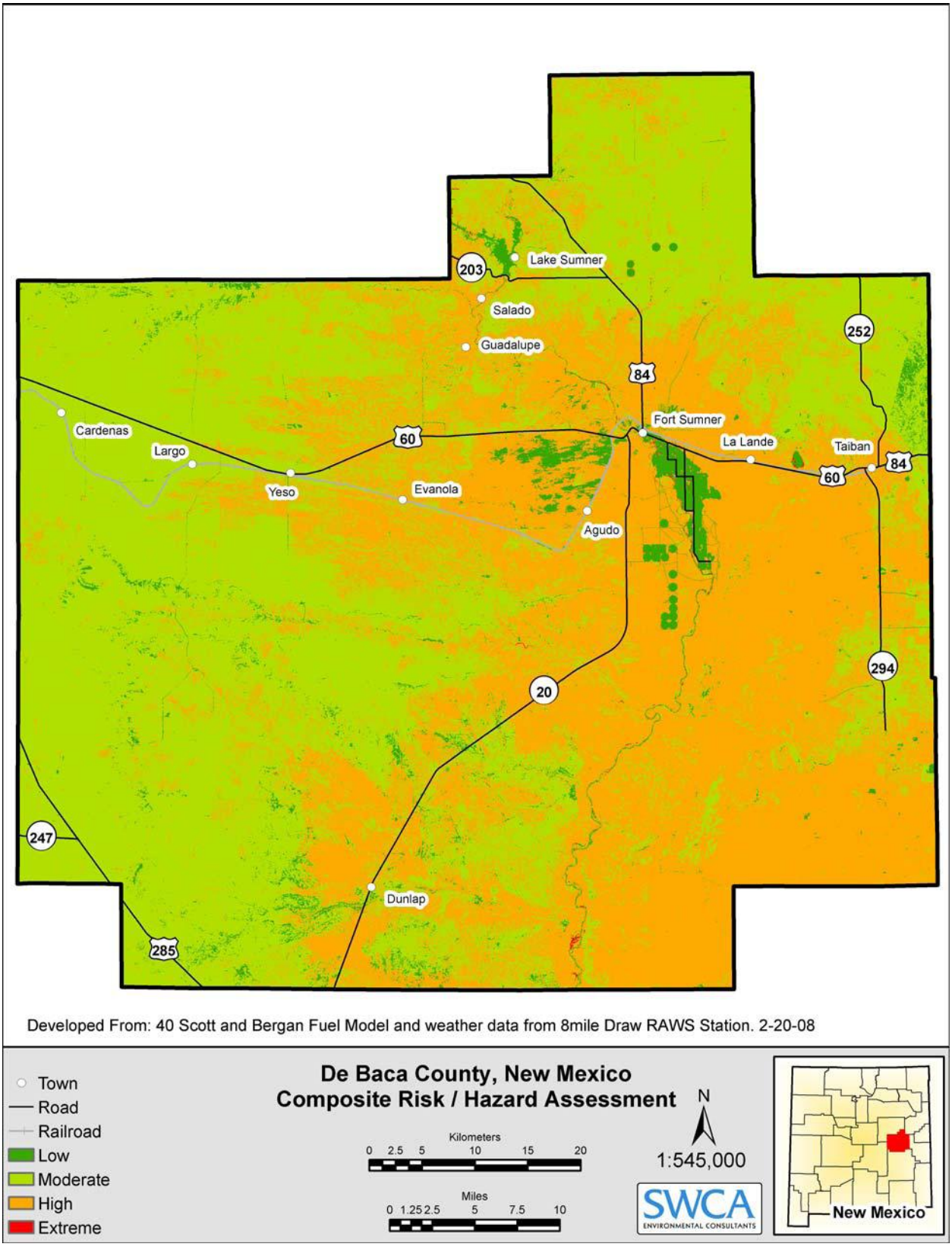

Figure 4.1. Composite Risk/Hazard Assessment map.

4.4 COMMUNITY RISK/HAZARD ASSESSMENTS

As part of the planning process, the Core Team compiled a list of communities within the planning area. In order to properly assess the hazards in and around these communities, a series of field days were implemented to carry out community assessments.

The purpose of the community WUI assessments and subsequent hazard ratings is to identify fire hazard and risks and prioritize areas requiring mitigation and more detailed planning. These assessments should not be seen as tactical pre-suppression plans or triage plans. The community assessment helps to drive the recommendations for mitigation of structural ignitability, community preparedness, and public education. It also helps to prioritize areas for fuels treatment based on the hazard rating (Table 4.3).

Table 4.3. Community Hazard Ratings

Community	Score	Hazard Rating
Lake Sumner	122.5	Extreme
Taiban	87.5	High
Yeso	86.5	High
Old Town (Sunnyside)	76.5	High
Valley	55.5	Moderate
Fort Sumner Village	54.5	Moderate

Risk Rating Classification:
<40 = Low
40–69 = Moderate
70–111 = High
>112 = Extreme

The community assessment was carried out using the National Fire Protection Association (NFPA) Wildland Fire Risk and Hazard Severity Form 1144. This form is based upon the NFPA Standard for Reducing Structure Ignition Hazards from Wildland Fire 2008 Edition, which was in turn developed by the Technical Committee on Forest and Rural Fire Protection and issued by the Standards Council on June 4, 2007. The standard focuses on individual structure hazards and requires a spatial approach to assessing and mitigating wildfire hazards around existing structures. It also includes ignition-resistant requirements for new construction. It is utilized by planners and developers in areas that are threatened by wildfire and is commonly applied in the development of Firewise Communities USA (for more information see www.firewise.org).

The assessments were conducted on January 24, 2008, and were completed with assistance from Gary Smith, a volunteer firefighter for the Lake Summer Fire Department. Each community was rated based on conditions within the community and immediately surrounding structures, including access, adjacent vegetation (fuels), defensible space, adjacent topography, roof and building characteristics, available fire protection, and placement of utilities. Where a range of conditions were less easily parsed out, a range of values was assigned on a single assessment form. Each score was given a corresponding adjective rating of low, moderate, high, or extreme. An example of the assessment form used in this plan can be found in Appendix E.

4.4.1 LAKE SUMNER

Lake Sumner was rated as extreme using this fire risk assessment protocol. The Core Team identified Lake Sumner as an area of particular concern. The lake has high densities of structures on small plots, with a large percentage of properties being of manufactured construction. When first established, Lake Sumner land was leased to homeowners by the BOR with small lot sizes

and many temporary residents. When the BOR made it possible for people to purchase land, many owners converted trailers or temporary structures into more permanent homes. Because of the limited building standards, this period of retrofitting created a significant fire threat because of the combustible construction of many homes (Figure 4.2). Furthermore, many homes are vacation homes with limited regular upkeep of the surrounding yards. Very little defensible space and increased hazard are caused by the adjacency of structures. Fuels are light to medium, with patches of piñon juniper and shrubland. A lot of structures are built close to slopes, with very little setback raising the risk in these categories. Although the community is served by the Lake Sumner Fire Department, no water storage or hydrants are available. Utilities are above ground and, because of lot sizes, are often close to structures.

Rating: Extreme

Figure 4.2. Structure with potential extreme combustibility.

4.4.2 TAIBAN

Taiban was rated as high using this fire risk assessment protocol. Taiban is a small isolated community that was recognized by the Core Team because of its proximity to the BNSF railway. The community has limited occupants with few values at risk; however, the risk rating is high because of poor defensible space around structures, poor construction with combustible materials, and adjacency to neighboring structures (Figure 4.3). Like other communities in the County, the area is threatened by potential extreme fire weather because of the prevalence of strong winds. Fuels are generally light, access is good, and the community and surrounding areas are served by the Valley Fire Department.

Rating: High

Figure 4.3. Structure showing risks due to adjacency.

4.4.3 YESO

Yeso was rated as high using this fire risk assessment protocol. Yeso is similar to Taiban in terms of fire risk conditions. The community is small and threatened by its adjacency to the railroad. Access is generally good but limited defensible space and poor construction raise the risk of fire. The area is surrounded by light fuels prone to extreme fire weather potential. The community is served by the Valley Fire Department.

Rating: High

4.4.4 OLD TOWN (SUNNYSIDE)

Old Town (Sunnyside) was rated as high using this fire risk assessment protocol. Old Town was identified by the Core Team and fire department personnel as a community at particularly high risk from wildfire. The community is located close to the railroad and river, with limited barrier between the tracks and bosque fuels. Furthermore, homes have insufficient defensible space, particularly given the potential risk of fire from surrounding wildlands (Figure 4.4); adjacent structures often have overlapping defensible space raising this threat. Old Town is also at risk because of poor access and limited turnaround space. Building construction is poor, with mostly combustible roofs, siding, and decks. The community is within 5 miles of the Village Fire Station and hydrants are available for suppression.

Rating: High

Figure 4.4. Old Town (Sunnyside) with limited barrier between wildland fuels.

4.4.5 VALLEY

The Valley was rated as moderate using this fire risk assessment protocol. The Valley community was identified as an area that could be at risk because of adjacent wildland fuels (Figure 4.5) with limited fuel breaks between the community and ignition sources (Highway 20 and railroad). Because a lot of this area is agricultural, however, this lowered the overall rating for hazard (Figure 4.6). It should be noted that fire risk in these agricultural areas will be seasonal, dictated by periods of irrigation and crop curing. Access is good throughout the community and larger lot sizes improve turnarounds and limit problems with overlapping defensible space. Defensible space is greater than in other communities in the County. Fuels are generally light, but the area is prone to severe fire weather potential because of strong winds. Structures are generally built using combustible materials with combustible decks and fences. The Valley is served by the Valley Fire Department (Figure 4.7); sprinkler systems are installed in the Bosque Memorial Building.

Rating: Moderate

Figure 4.5. Adjacent bosque fuels.

Figure 4.6. Irrigated fields and croplands in the Valley.

Figure 4.7. Valley Fire Department.

4.4.6 FORT SUMNER VILLAGE

Fort Sumner Village was rated as moderate using this fire risk assessment protocol. Fort Sumner scored well on accessibility, with multiple ingress and egress routes that could act as evacuation routes in the event of a fire. Fuels in the town are light, but defensible space is limited in some areas. Because of the risk of extreme fire behavior in the grasslands surrounding the village, the town rated high in that category. Many of the homes in the village had combustible siding and decks, no sprinkler systems, and above-ground utilities that could be a fire hazard. The village does have a fire department and hydrants, lowering its overall hazard rating. It should be noted that the village has a number of cultural and historic sites that the community would like to see protected (Figure 4.8).

Rating: Moderate

Figure 4.8. Village of Fort Sumner.

The community risk assessments and input from the public and Core Team was used to compile a table of CARs as required by the NM-FPTF. A copy of this list can be found in Appendix F. *NOTE: The risk assessment and communities at risk list does not discriminate between communities based on the value of homes or land.*

4.5 COMMUNITY VALUES AT RISK

Earlier compilation of the critical infrastructure in the planning area, coupled with the community assessments, public outreach, and Core Team input, helped in the development of a list of community values that are at risk from wildland fire (CVARs). The WUI boundary was developed and expanded to encompass the majority of these CVARs. CVARs were split into natural, social, and cultural classes. It is important to note that although an identification of CVARs can inform treatment recommendations, a number of factors must be considered in order to fully prioritize areas for treatment; these factors include appropriateness of treatment, land ownership constraints, locations of ongoing projects, available resources, and other physical, social, or ecological barriers to treatment.

The scope of this CWPP does not allow determination of the absolute natural, socioeconomic, and cultural values that could be impacted by wildfire in the planning area. In terms of socioeconomic values, the impact due to wildfire would cross many scales and sectors of the economy and call upon resources locally, regionally, and nationally. To understand the breadth of such an impact, land agencies and local communities may guide efforts towards completing a

comprehensive economic and demographic analysis in relation to wildfire impacts. This CWPP may be used to identify priority areas and communities that could experience the greatest economic strain. It is suggested that communities included in the DBCCWWP achieve a finer-grained analysis of the smaller jurisdictional and community wildfire concerns by pursuing further funding to complete a community-level CWPP.

4.5.1 NATURAL CVAR

The public outreach emphasized the importance of natural/ecological values to the general public. Examples of natural values identified by the public and the Core Team include:

- Pecos River ecosystem (Figure 4.9)
- Native species
- Wildlife habitat
- Lake Sumner
- Water resources
- Ranchland
- Air quality
- Open country

Figure 4.9. Pecos River adjacent to Old Town.

4.5.2 SOCIOECONOMIC CVAR

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

- Bosque Redondo Lake
- Valley County House
- De Baca County Fair Grounds
- Tree farms
- Feed lots
- Fire departments
- Fort Sumner Municipal Airport
- Village waste water
- School complex
- Medical complex
- Lake Sumner State Park campgrounds

4.5.3 CULTURAL CVAR

Many historical landmarks are scattered throughout the County. Particular CVARs that were identified by the Core Team and the public are:

- The Old Church of Guadalupe
- Fort Sumner Museum
- Billy the Kid Museum
- Bosque Redondo Memorial
- Old Town community
- Ranches and ranching artifacts
- Archeological sites

5.0 RECOMMENDATIONS AND ACTION ITEMS

This chapter addresses four different types of recommendations: (1) fuels reduction projects, (2) public education and outreach, (3) actions homeowners and communities can take to reduce structural ignitability, and (4) actions to improve firefighting capability. These recommendations are based on Core Team input, public outreach, the Composite Risk/Hazard Assessment, and the Community Risk/Hazard Assessment. The recommendations are general in nature to provide maximum flexibility in implementation. Potential funding opportunities that may be used for implementation of the recommendations are found in Appendix G.

5.1 RECOMMENDATION FOR FUELS REDUCTION PROJECTS

The purpose of any fuels reduction treatment is to protect life and property by reducing the potential for catastrophic wildfire, as well as to restore landscapes to a sustainable and healthy condition. Moderating extreme fire behavior, reducing structural ignitability, creating defensible space, providing safe evacuation routes, and maintaining all roads for firefighting access are methods of fuels reduction likely to be used around communities located in a WUI zone. Use of multiple treatment methods often magnifies the benefits.

As discussed in Chapter 4, the fuels within the County are predominantly composed of semiarid shortgrass prairie vegetation, which consists almost entirely of native grasses. Fire behavior in this fuel model will vary based on weather conditions, the vegetative life stage, and the density and structure of the existing vegetation. Spotting is not generally a problem in this fuel type since the fire activity remains mainly on the ground surface and it typically burns cooler than vegetation types with heavier fuels. The main objective of fuels treatment in this fuel type is to reduce fuels in areas where they have built up in order for engines and firefighters to be able to safely suppress the fire. Shrubs also represent a significant percentage of the vegetative cover within this ecosystem, and fuels treatment in shrublands should be a focus for the County.

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

The treatment list is by no means exhaustive and should be considered purely a sample of required projects for the future management of the County. Fire management cannot be a one-size-fits-all endeavor; this plan is designed to be flexible. Treatment approaches and methods will be site-specific and should be adapted to best meet the needs of the landowner and the resources available. It is the intent of this plan to be an evolving document that will incorporate additional areas of the County as they change in risk category over time.

Table 5.1. Fuels Reduction Treatment Recommendations

Project	Location	Land Ownership/ Management	Method	Serves to	Timelines for implementation	Priority (H,M,L)	Monitoring	Contact
Defensible space cost-sharing programs	All private land within CWPP planning area would be eligible; priority area: Lake Sumner	Private	Selective thinning; pruning (to about 25% of tree/shrub height); chip and/or remove debris; provide adequate defensible space.	Protect life and property by reducing spread of fire from wildland fuels to urban structures. Also improves vehicle access, increases tree health/vigor, and gives firefighters a margin of safety.	Spring 2009	H	Conduct on-site inspections with owners; consider photo documentation of pre- and post-treatment; apply adaptive management from best available information; determine if Firewise Communities techniques are being applied.	Soil and Water Conservation Districts (SWCD) already offer these programs. Extra funding would help in their efforts.
Defensible space assessments	All private land within DBCCWPP planning area would be eligible	Private	Firewise Communities -based assessments of individual homes. The professional assessment would help identify the most critical actions that an individual could take. Assessments could also include marking trees and shrubs suggested for removal.	Reduce risk of home ignitions. Empower homeowners to take the most effective actions. Allow funding to address a larger number of homes.	Fall 2009	H	Conduct on-site inspections with owners; identify and mark trees or shrubs for removal within the 100-foot safety zone.	NMSF, New Mexico Association of Counties (NMAC)
Create fuel breaks on the southwest edge of communities	All private land within DBCCWPP planning area (priority area): Old Town and Valley	Private	Strategic placement of treatments on private land will improve effectiveness. Fuel break prescriptions should be site-specific, depending upon fuel type, topography, soils, and adjacent land management practices.	Help mitigate extreme fire behavior and provide an area from which firefighters can suppress a fire.	Spring 2009	H	Regular maintenance needed to ensure access is clear of vegetation or obstructions. Monitoring should occur prior to fire season (February) and in the fall (October).	NMSF, SWCD

Table 5.1. Fuels Reduction Treatment Recommendations, continued

Project	Location	Land Ownership/ Management	Method	Serves to	Timelines for implementation	Priority (H,M,L)	Monitoring	Contact
Bosque thinning	Pecos River corridor and Lake Sumner; priority area: Old Town, Lake Sumner State Park campgrounds	Private and public	Thin-from-below treatments in cottonwood to raise crown base height to >8 feet. This helps to reduce potential crown fire in Cottonwood. Remove slash and dispose. Selectively remove non-natives from bosque ecosystem.	Help mitigate extreme fire behavior in timber fuels and reduce potential spread to communities adjoining the bosque.	Spring 2009	H	Monitor effects on wildlife populations, soils, understory vegetation, invasive species, and water yield. Potential for community monitoring programs that include schools and youth groups. Refer to Chapter 6, Levels 1–4.	BOR, NRCS, SWCD, NMSF
Fuels reduction	Valley community west to Highway 20; priority area: critical infrastructure point protection around Bosque Redondo Memorial	Private and public	Reduce shrub density and continuity; create patch structure with openings to promote herbaceous vegetation.	Slow the rate of spread of fire in shrubland fuels and lower flame length and fireline intensity.	Spring 2009	H	Regular maintenance needed to ensure clearance of vegetation and reduced fuels density. Monitoring of density should occur prior to fire season (February) and in the fall (October).	NRCS, Farm Service Agency (FSA), State Land Office, SWCD, BLM
Fuels reduction	Between railroad and Highway 60 west of Fort Sumner	Private and state	Reduce shrub density and continuity; create patch structure with openings to promote herbaceous vegetation.	Slow the rate of spread of fire in shrubland fuels and lower flame length and fireline intensity.	Fall 2009	M	Regular maintenance is needed to ensure that fuels density is reduced, especially surrounding railroad and highway. This is an area that has previously burned and is prone to ignition.	NRCS, FSA, State Land Office, SWCD,
Fuels reduction	Between railroad and Old Town	Private and state	Because of proximity to community, mechanical and prescribed fire may not be appropriate. Attempt the use of goats to reduce fuel loading on a temporary rotational basis.	Protect life and property by mitigating fire behavior in area of potential ignition from railroad.	Spring 2009	H	Regular monitoring is needed to prevent over utilization of the area for goat grazing. Monitor effects of grazing on a bimonthly basis on native species, wildlife, and invasive species. Utilize adaptive management principles to alter livestock numbers to minimize overuse.	De Baca County, NRCS, FSA, State Land Office

Table 5.1. Fuels Reduction Treatment Recommendations, continued

Project	Location	Land Ownership/ Management	Method	Serves to	Timelines for implementation	Priority (H,M,L)	Monitoring	Contact
Remove abandoned structures and clean up yard debris	Lake Sumner and Old Town	Private	Mechanical thinning and manual clearing. Develop program of enforcement for the County. Begin plans to implement ICC code in part or full to enforce building regulations in the WUI zone.	Protect life and property by preventing spread of fire from wildland to structural fuels. Improve firefighter safety by providing clear access to structures in the WUI.	Fall 2009	M	Fire chiefs to carryout assessments of defensible space.	De Baca County to enforce
Mow and remove invasive species along railroad	Railroad throughout extent of County; priority areas: Taiban, Yeso, Old Town	Private, state, BLM, BNSF	Mow a 70-foot buffer along edge of railroad. Regularly remove invasive species and shrub encroachment.	Protect ranchland and communities from potential ignition from railroad.	Spring 2009	H	Regular maintenance needed to ensure clearance of vegetation and reduced fuels density. Monitoring should occur prior to fire season (February) and in the fall (October).	BNSF, BLM, State Land Office
Mow along major highways	State and federal highways	Public	Mow to fenceline.	Protect life and property from fire spread from potential ignition source; protect evacuation routes in event of wildfire.	Spring 2009	H	Regular maintenance needed to ensure clearance of vegetation and reduced fuels density Monitoring should occur prior to fire season (February) and in the fall (October).	New Mexico Department of Transportation (NMDOT)
Remove mesquite	Private ranchland	Private	Mechanical clearance of mesquite and pile burning to remove residual slash. In areas of potential soil erosion, some residual slash should remain on the ground to reduce wind erosion.	Protect grassland ecosystem health by removing encroaching shrubland. Mitigate extreme fire behavior—rate of spread and flame length.	Spring 2009	H	Monitoring for soil erosion. Pre-and-post treatment monitoring needed. Continued monitoring twice a year is needed.	NRCS, FSA, State Land Office
Protect power lines and communication lines	All private land within DBBCWPP planning area	Utilities company/ private	Maintain clearance under powerlines and around posts.	Prevent destruction of energy or communications infrastructure in event of fire.	Fall 2008	H	Regular maintenance needed to ensure lines are clear of vegetation.	Utility companies

Table 5.1. Fuels Reduction Treatment Recommendations, continued

Project	Location	Land Ownership/ Management	Method	Serves to	Timelines for implementation	Priority (H,M,L)	Monitoring	Contact
Mow around southwest fencelines	Grassland areas on state land	State land	Mow a 70-foot buffer around ownership boundary.	Protect life and property by slowing the rate of spread to adjoining grasslands and communities in event of grassland fire.	Spring 2009	H	Monitor effects of treatments on species dynamics and species composition, particularly invasion of exotic species. Monitor regrowth and erosion and maintain clearance. Refer to Chapter 6, Levels 1–4. Monitoring should be carried out prior to fire season (February) and in the fall (October).	State Land Office
Fire effects monitoring	Entire DBCCWPP planning area	Private and public	Carry out fuels monitoring and fire effects monitoring following wildfire and/or prescribed fire.in grassland, shrubland, and riparian areas.	Improve understanding of the effectiveness of fuels treatments on fire behavior and provide an inventory of fuels loading to direct treatment.	Ongoing	H	Monitoring should be carried out for multiple (>3) years post-burn (both prescribed fire and wildfire) to assess vegetation response, wildlife response, soils, and hydrology. Refer to Chapter 6, Levels 1–4.	BLM, SWCD, NMAC, Youth Conservation Corps, Local high schools, NMSF
Create local fuels reduction task force	Landscape scale	Private	Formulate a task force of local practitioners who could develop best management practices for fuels treatment in grass and shrublands. Create demonstration sites and workshops to inform local ranchers.	Protect community and infrastructure by empowering local landowners to create mechanism to protect their own properties.	Ongoing	M	Monitor effects of treatments on species dynamics and species composition, particularly invasion of exotic species. Monitor regrowth and erosion, and maintain clearance. Refer to Chapter 6, Levels 1–4. Monitoring and maintenance should occur prior to fire season (February) and in the fall (October).	Collaboration of land managers in County to improve fire planning

Table 5.1. Fuels Reduction Treatment Recommendations, continued

Project	Location	Land Ownership/ Management	Method	Serves to	Timelines for implementation	Priority (H,M,L)	Monitoring	Contact
Preplanned fire breaks	Areas of stable soils	Public and private	Identify areas on public and private lands that would be appropriate for fire breaks. Select areas where soils are less erodible since all vegetation will be removed. Areas of the caprock would be recommended. On implemetation landowner or agency should chisel the land to retain root structure and prevent soil erosion.	Protect life and property in the event of a wildfire by having a preplanned area that could withstand fire break construction.	Ongoing	M	Would be a one-time-only treatment in response to wildfire.	Collaboration of land managers in County to improve fire planning

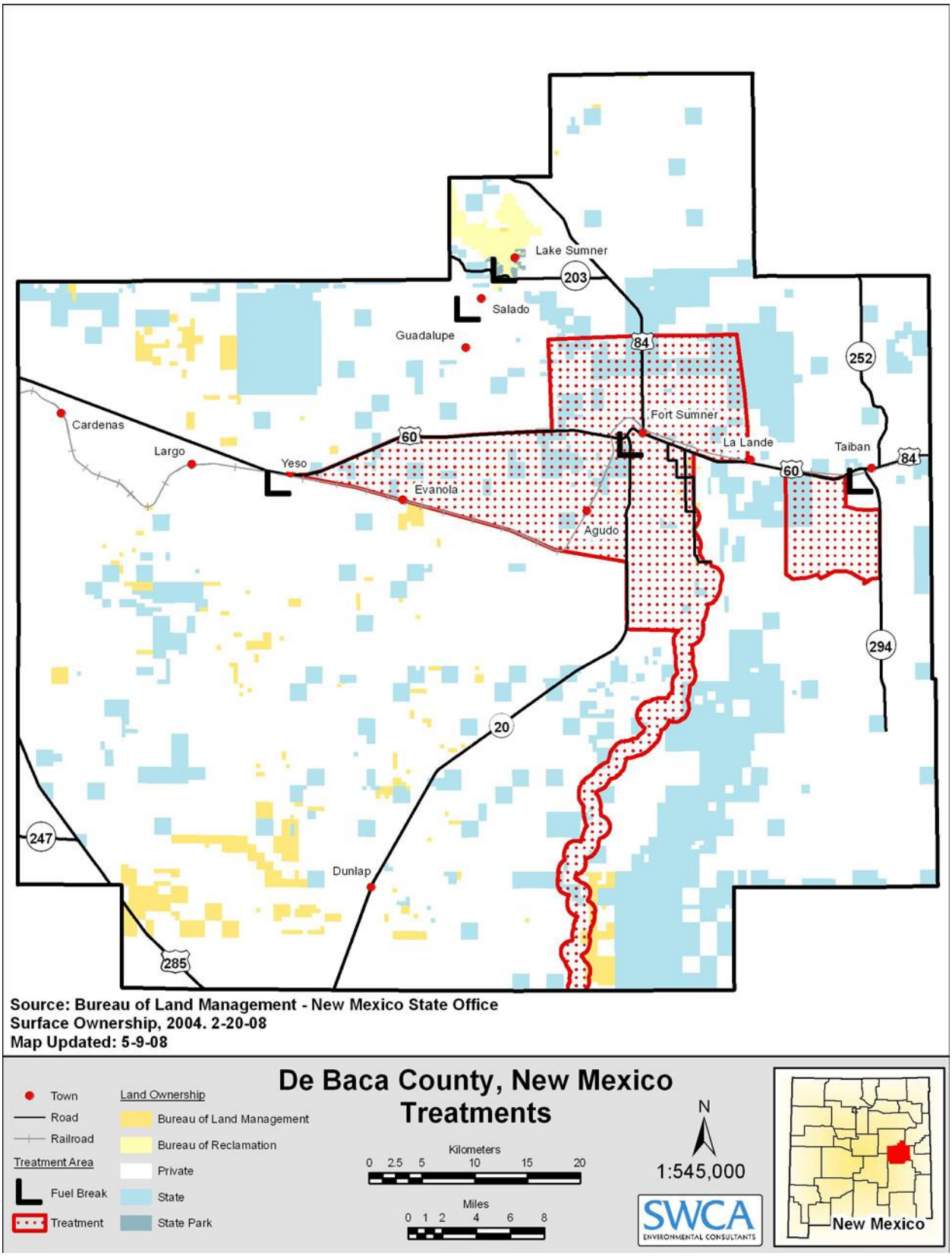

Figure 5.1. Fuels treatment recommendation map.

5.2. FUELS TREATMENT METHODS

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

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

5.1.1 CONSERVATION RESERVE PROGRAM (CRP) LANDS

Core Team members raised concern about the risk of fire in CRP grasslands because of the heavy fuel loads associated with the reduced production. Although CRP lands are minimal in the County, strict management practices are often associated with CRP contracts, which is why recommendations for possible treatment on CRP lands are included in this plan. In 1985, the CRP was initiated to remove fragile, marginal land from crop production. Producers who enrolled were required to convert marginal acreages to perennial vegetation for a 10-year period. The objectives of the program were to reduce soil erosion, decrease sedimentation, increase herbaceous cover, improve wildlife habitat, enhance water quality, and provide financial incentives for participants.

An important feature of the CRP is that the land is not simply idled from crop production, but is replanted in permanent vegetative cover—either grassland or trees. The government shares (50/50) with the farmer the cost of converting the lands to this permanent vegetative cover. Soils in the County are susceptible to wind erosion, which is why the CRP was originally initiated. Erosion concerns also apply to burning and wildfire because if surface vegetation is removed, dust is easily blown up under the strong winds experienced in the New Mexico eastern counties. The Core Team and public are concerned that current mid-management practices required under some CRP contracts are expensive and limiting for producers. Moreover many CRP landowners are absentee landowners and privacy laws prevent identification of the property owner. In order to target at risk areas, County staff and fire departments should work with their local FSA office to contact the appropriate landowner to discuss fire mitigation measures. Furthermore, many producers favor increased grazing of CRP lands, but currently grazing results in a 25% reduction in CRP payment. The current policy also states that grazing can only occur 1 in every 10 years over a 3 month period from July 1st to September 30th, which some members of the Core Team felt was inadequate in reducing fire risk. Efforts are underway to change this policy at the national level.

Mid-contract Management

Mid-contract management is required for certain practices starting with General CRP Signup 29. Each CRP contract requires some type of mid-management on 100% of the acres in the 10-year cycle. Management activity must be completed before the end of year 6 for 10-year contracts and before the end of year 9 for 15-year contracts. The purpose of this mid-management is to enhance CRP cover for wildlife by creating a more diverse vegetation community. Grassland areas need to be managed so that the grasses do not crowd out forbs and legumes, which provide wildlife benefits. The requirements of CRP contracts could be used to help landowners carry out fire mitigation treatments on their lands while remaining compliant with their CRP contracts. It is important to note, however, that there are some limitations of the mid-management:

- Mid-management cannot be performed during the nesting period for grassland bird species (March 1 through July 1).
- Mid-management should be limited/or excluded where it could impact the Lesser Prairie Chicken (State Candidate Species) and its habitat.
- The maximum amount that can be disturbed during any year of the contract is one-third of the land.
- No mid-management activities can be implemented on grassed waterways or riparian buffers of areas planted to trees or shrubs.
- Mid-management can not be carried out on environmentally sensitive areas such as areas prone to gully erosion or areas within 20 feet of a water resource.
- Handbook 2-CRP Par. 238 (page 10-13) states, "Participants are responsible for fire management on CRP acreage. Where appropriate, firebreaks shall be:
    - Included in the contract support document
    - Installed according to NRCS firebreak standard 394."

Mid-management options are available for new applicants, re-enrollments, and contract extensions. Table 5.2 outlines some of the mid-management activities that landowners can carry out on CRP lands.

Table 5.2. Action Items for Fuels Mitigation on CRP Lands

Create Fuel Break (reduce fuel loading and fuel bed depth)
Mowing must meet practice standard 528. • Mow or clear trees and shrubs to a minimum width of 10–16 feet around boundary of CRP lands or in strips orientated to minimize fire spread. • Remove vegetation exceeding 1.5 feet in height. • Inspect annually. • Monitor for weeds and remove. • No cost share available.
Create Fire Break (reduce fuels to mineral soil)
Firebreaks should be installed according to NRCS firebreak standard 394 (refer to Statement of Work Firebreak –Job Sheet 394 [2006] available from NRCS/FSA field offices). Fire breaks should be site-specific and located only in non-erodible soils in areas of high fire risk, along transportation corridors, and in rural communities and adjacent farmsteads. • Fire breaks may be temporary or permanent. • Fire breaks should be located to minimize the risk to the resources being protected. • Use existing natural or human-made barriers where possible. • In highly erodible soils chiseling a fire break to form a narrow strip of mineral soil reduces potential erosion as the root system is left intact within the soil. • Firebreaks should also be located on the contour where possible, to reduce erosion. • In less erodible soils, wider strips (6–8ft) can be cleared down to mineral soil. For best results locate within fuel break area. This strip should be inspected semi-annually for erosion and re-growth and all flammable material disposed of. • In all cases the designated conservationist shall document in the contract support document that no erosion hazard will result from the firebreak. • Adequate erosion control treatments must be installed and maintained where slopes exceed 5%. • If erosion becomes a problem remedial action shall be taken. • Grazing is not an option to remove vegetation on firebreaks. • Weed control is mandated in all fire and fuel breaks to remain within CRP compliance. • No cost share is available.
Remove Invasive Species
Spot treatment to remove invasive species—annually, if needed. Periodic mowing or mowing for generic weed control is prohibited. Only spot treatment is allowed. Can shred 100% of the acreage once in 10 years, usually no more than 50% in one year. If mid-management of weeds was written into the original CRP contract, landowners can shred for weeds using cost share.
Prescribed Grazing
A prescribed grazing plan may be developed with suggested stocking rates when emergency haying/grazing or managed haying/grazing is implemented. Must be in accordance with Practice 528. • Only outside of primary nesting season. • Stocking rates established as 1AUM (1 ac/head/month) for lovegrass or .5 AUM (2 ac/head/month) for native grasses. • Must observe FSA intervals set at 1 in 10 years. • Reduces payment by 25%. • Often CRP grasses are dense and have minimal nutrient value for livestock.

Table 5.2. Action Items for Fuels Mitigation on CRP Lands, continued

Convert CRP to Native Grasslands
This option could be suitable where a producer has stands of lovegrass or other non-natives and wants to reseed native grasses to benefit wildlife. This would lessen fuel loads. Must be carried out in accordance with practice standard 643. • Requires first eradicating the non-natives. • Mid-management cost share is available to replant with natives. Producers gain points to reinstate native grasses and this raises their chances of successfully re-enrolling in the program at the end of the 10-year contract. If the landowner is unsuccessful in reenrolling in CRP, having native grassland would increase the value of the land as natives are more palatable to cattle and other livestock. • At present the cost share for mid-management practices is 50%. It is possible that other partners could provide the other 50%; options include Quail Unlimited and the CP33 Wildlife Buffer Program (provides up to 90% cost share). Possible funding could also come from NRCS Conservation Innovation Grants. • The limitation of planting natives is that they usually require significant water in their first season. This could be the limiting factor in the east counties.
Spot Treatment
Although a treatment ban is in place from March 1 to July 1 for the nesting period, spot treatments such as fire breaks are allowed with permission. Producers should go to their local FSA offices to discuss CRP treatment options. NRCS is a technical advisor to the FSA, who administers the program. Landowners can do spot treatments (in the line of an approaching fire) without permission; however, they cannot treat 100% of the acres.
Emergency Grazing
Provisions in the past have been made for emergency grazing when areas are or have been threatened by severe fire risk. During the 2006 fire season, landowners were allowed to graze their CRP lands without losing their 25% of payment.
Prescribed Burning
Should comply with standard practice 643. • Requires permission and a burn plan that dictates parameters of the burn. • Quail Unlimited has been known to provide liability insurance for these burns. • Difficult to stay within the required 25–75% of acreage.

Source: Summarized from NRCS practice standards, specifications and job sheets (available at – http://www.nm.nrcs.usda.gov/technical/fotg/section-4/std-specs.html)

5.1.2 MOWING

Mowing of fuel breaks and around perimeters should take place at least once every growing season depending on the regrowth of vegetation over the course of the fire season. It is acknowledged that this may not be viable for all producers, in which case focus should be placed on areas that would pose greatest risk to life and property (e.g., the southwest edges of communities). Areas with cheatgrass or wheeping love grass species should be mowed in the early spring and later in the season, depending on the amount of regeneration that takes place throughout the course of the season. Although mowing will not permanently remove stands of exotics, limiting the production of seedheads will help control their density and spread over time.

In areas of encroaching shrubs or trees, more intensive fuels treatments may be necessary to keep the fire on the ground surface and reduce flame lengths. Within the fuel break, shrubs should be removed, and trees should be pruned to a height of 4 to 8 feet, depending on the height of the fuel below the canopy, and thinned with a spacing of at least 2 to 3 times the height of the trees to avoid movement of an active fire into the canopy.

5.1.3 PRESCRIBED BURNING

Prescribed burning is also a useful tool to reduce the threat of extreme fire behavior by removing excessive standing plant material, litter, and woody debris while limiting the encroachment of shrubby vegetation such as broom snakeweed (*Gutierrezia sarothrae*), piñon pine (*Pinus* spp.), juniper (*Juniperus* spp.), and other woody species into the grasslands. Similar to mowing, prescribed fires should be conducted along roads surrounding the WUI and around the particular areas at risk. On private lands the use of prescribed fire is likely to be limited due to concerns for fodder production and risk of escape. Where possible, prescribed fire could occur on public lands since fire is ecologically beneficial to the grassland community and wildlife habitat. Some areas, particularly along roadsides, may be susceptible to the invasion of exotic species, so this practice should be carried out with management of invasive species in mind. Current practice in the Valley is to burn roadside areas to reduce invasive species and limit competition for water (Figure 5.2). This practice could also serve to reduce spread of fire from wildland fuels into croplands. Prescribed fires within the grassland ecosystem should be implemented when conditions are dry enough for fine fuels to carry a fire, but not so dry that fire containment is difficult.

Figure 5.2. Roadside burning around Valley agricultural lands.

Using prescribed burns can initiate regeneration of grasslands and rangelands, as it facilitates natural ecosystem dynamics, such as nutrient and water cycling, which increase variability in vegetation composition and density. Grasslands across the Southwest are threatened by woody encroachment, which shades out desirable plant species and uses large amounts of water. Grasslands have adapted to fire, and fire can be used periodically to remove unwanted trees.

Fires provide restoration of productivity and diversity of grasslands, while controlling non-native or undesirable plant species and woody invasions (USFWS 2006).

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

5.1.4 Management of Non-native Plants

Like many ecosystems throughout New Mexico, the County landscape is undergoing gradual degradation as a result of infestation by non-native species (Parker et al. 2005). These species have contributed to changing fire regimes in the County, heightening the risk of fire. A number of methods have been developed for removal of non-natives; the appropriate technique will depend on the infestation density, management objectives, environmental concerns, costs, and social considerations (Parker et al. 2005). The USDA maintains a list of noxious weeds rated from A to C based on the current degree of infestation of the species and the potential for eradication (http://plants.usda.gov).

Treatments for Saltcedar Infestation

Riparian areas throughout the County have in recent years become overrun by saltcedar (*Tamarix* spp.). A vigorous program of removal is however ongoing and is showing success in many areas. Despite this, the eradication and control of saltcedar and long-term commitment are challenging, and multiple techniques are required to reduce its extent and minimize its spread. Techniques used for the management of saltcedar include mechanical, chemical, and biological methods. The current saltcedar removal programs should be used as a model for future treatments.

Mechanical treatments, such as hand-pulling and cutting, can be used for smaller stands of young saltcedar saplings, but these treatments become expensive and ineffective within large stands of shrub-sized individuals (Parker et al. 2005). Root cutting and bulldozing can be effective, but the benefits may not outweigh the problems resulting from soil damage and the expense of this method. Fire has been used with some success, but because saltcedars are fire adapted, they readily resprout. Flooding can also be used to control saltcedar if root crowns remain submerged for at least three months. Resprouting is likely to occur after using any of these methods, so it is highly recommended to combine methods and follow-up treatments to continue control of this species.

Chemical control is typically the most effective method used for saltcedar; however, application of herbicides should be site-specific. Aerial applications of imazapyr or an imazapyr-and-glyphosphate mixture should occur from late August through September. This method is slow-acting, and treated trees should not be removed for up to three years after the treatment to ensure root kill. It is important to only use herbicides that are approved for application near water.

Biological control methods have also shown some success. One such method is the use of saltcedar leaf beetle (*Diorhabda elongate)*, which asserts physiological stress on the tree through defoliation. This treatment, coupled with burning in the summer months under intense prescribed fire prescription, has been successful in some saltcedar stands. Significant damage to the root crown is required for high mortality; this may require supplementing fuel loading, particularly

around the root crown. The combination of cutting and/or chemical application to cut stumps or small-diameter whips is one of the most common management techniques used for saltcedar. The methods used will depend on the size of the saltcedar stand, the characteristics of the riparian area, and the distance to a community. Saltcedar eradication has been ongoing in De Baca County, and the BLM has also been carrying out saltcedar eradication in neighboring counties; sharing experiences and combining knowledge could aid in enhancing this ongoing effort.

5.1.5 FUEL BREAKS

The topography across the region is largely flat. Fuels treatment will vary depending on each specific targeted area, but mowing and prescribed burning are generally the most common methods for creating fuel breaks. Fire behavior in the County was modeled using FlamMap. This assessment provided estimates of flame length and rate of spread; the information should be used by land managers when prescribing treatments. Based on this assessment, in areas exhibiting extreme fire behavior (e.g., west of Highway 20 and adjacent to the Valley agricultural lands), more intensive fuels treatments such as fire breaks (cut fuels to mineral soil) may be required. However, given the high erodibility of soils in the County, it is recommended that where possible fuels breaks (reduce fuel loading by cutting or mowing) are employed instead of fire breaks to maintain some vegetation cover. Land managers are cautioned, however, that neither fire breaks nor fuel breaks will stop a fire under extreme fire behavior or strong winds; these should only be seen as a mitigating measure and not a fail-safe method for fire containment. Furthermore, fuel break utility is contingent upon regular maintenance, as regrowth in a fuel break can quickly reduce its effectiveness.

Within a fuel break, shrubs should be removed where they would generate high-severity fire behavior. In bosque areas, trees should be pruned to a height of 8 to 16 feet (depending on the height of the fuel below the canopy) to address FlamMap outputs that showed high flame lengths along the Pecos River corridor. It is not possible to provide a standard treatment prescription for the entire landscape because fuel break dimensions should be based on the local fuel conditions and prevailing weather patterns. For example, in some areas, clearing an area too wide could open the landscape to strong winds that could generate more intense fire behavior and/or create wind throw.

Strategic placement of fuel breaks is critical to prevent fire from moving from wildland fuels into adjacent neighborhoods. A fuel break of 100 to 300 feet in shrubland should modify fire behavior significantly enough to allow suppression by firefighters. It is important to note, however, that shrub fuels are often replaced by grassland fuels in shrubland fuel breaks; flame lengths and rates of spread could be faster in these grassland fuels, but fireline intensity (heat produced per unit area) will be reduced, allowing more effective suppression. For effective management of most fuels, fuel breaks should be prescribed based on the conditions in each particular treatment area. Some examples of this would be to place fuel breaks in areas where fuels are heavier or in areas with easy access for fire crews. Because of the dominant wind patterns in New Mexico (i.e., out of the southwest), fuel breaks are recommended on the south and west sides of communities. In areas where the vegetation is discontinuous, fuel treatments may not be necessary. In this situation it is best to leave the site in its current condition to avoid the introduction of more flammable, exotic species like Russian thistle (*Salsola tragus)* and cheatgrass (*Bromus tectorum*), which respond readily following disturbance.

It is the responsibility of local governments to gather input from affected stakeholders, then determine which method(s) will safely accomplish the fuels management objectives for a given area. Well-managed fuels reduction projects often result in ecological benefits to wildlife and watershed health. Simultaneously, planning and resource-management efforts should occur when possible while reducing fuels to ensure that the land remains viable for multiple uses in the long term. The effectiveness of any fuels reduction treatment will increase over time with a maintenance and monitoring plan. Monitoring will also ensure that objectives are being met in a cost-effective manner.

5.2 RECOMMENDATIONS FOR PUBLIC EDUCATION AND OUTREACH

Needs for public education and outreach have been emphasized throughout the DBCCWPP process by all participating parties. The Core Team consistently commented on the need for better education of the public for fire preparedness, and discussions with community members at public meetings indicated that most people were unaware of the danger of wildland fire in grassland communities and could be better informed of effective mitigation options. Table 5.3 lists recommendations for improving public education and outreach.

The people of the County have grown up with wildfire; however, it is important to continually raise awareness of fire risk and improve fire education (McCaffrey 2004; Winter and Fried 2000). One problem in reaching rural communities is that many local residents do not consider themselves to be part of any particular community. It is difficult to communicate with a large but diffuse population that is generally not organized into units such as townships or even neighborhood associations. Organizations that regularly communicate with landowners, such as the local SWCD, FSA office, NRCS, and the State Land Office, arguably are the most effective conduits for reaching the diverse population. Churches and schools may be other possible targets to help reach out to community members. The recruitment of volunteer neighborhood leaders to participate in planning efforts or attend workshops on fire behavior and defensible space may provide another option to disseminate available information.

Although many residents are familiar with Firewise Communities, many others could benefit from greater exposure to this program. Workshops demonstrating and explaining Firewise Communities principles have been suggested to increase homeowner understanding of home protection from wildfire. The NMSF administers a program to recognize Firewise Communities within the state. Information about the program is available at http://www.firewise.org/usa/index.htm. Greater participation in the Firewise Communities program could improve local understanding of wildfire and, in turn, improve protection and preparedness.

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

Table 5.3. Recommendations for Public Outreach and Education

Project	Description	Presented By	Target Date	Resources Needed	Serves To
Targeted wildfire info sessions	Fund development of materials and presentations to highlight how a fire might affect particular groups within the community, such as realtors, ranchers, acequia communities, and real estate developers.	Community fire representative or agency outreach personnel	2009	Funding for research, writing, and presentation of detailed information on how large-scale wildfire would affect the target audience and the measures that could be taken to reduce the threat.	Deliver a clear and consistent message that impacts of wildfire are far-reaching and that it is in the best interest of a diverse set of stakeholders to become involved in planning and preparing for fire.
VFD open invitation days	Raise awareness of the fire departments through open house and tours of equipment.	VFDs	Annually	Advertising, refreshments, handouts.	Protect communities and infrastructure by potentially increasing recruitment and financial support for the fire service.
Neighbors for defensible space	Organize a community group made up of residents and agency personnel to develop materials and communicate relevant defensible space messages.	SWCD, BLM, NMSF, local residents	2009	Funding to help cover costs of materials and participation.	Engage diverse stakeholders in reaching out to community members and encourage defensible space practices.
Coordination between VFDs and local ranchers	Community members that have available equipment and skills could be identified so VFDs know what equipment is available on each privately owned parcel of land.	VFDs, FSA	Annually	FSA members lists, contact information, meeting place.	Protect communities and infrastructure through increasing available resources and reducing response times.
Media involvement	Develop a local newspaper column that provides fire safety information, promotional information for VFDs, fire announcements, and emergency planning.	De Baca County Newspaper	Weekly column year-round	Columns, information, and articles to be provided by VFDs, NMSF, BLM, State Land Office, FSA, NRCS, County.	Protect communities and infrastructure through increasing public awareness and providing a channel for information regarding emergency fire response.
Involvement of railroad in fire and emergency planning	Increase coordination with railroad representatives to increase awareness of the ignition potential of the railroad and improving fire mitigation in the railroad corridor.	BNSF; County, state, and federal agencies	Summer 2008	Meeting venues, coordination, and facilitation.	Protect communities and infrastructure through uniting land managers in a plan to limit ignition potential and risks posed by the BNSF railway.
Increase signage	Increase fire-prevention signage along highways to reduce human ignitions. Also, post more signs with County Road numbers.	NMDOT	Summer 2008	Signs, posts, people to post signs.	Protect communities and infrastructure by raising awareness of local citizens and those traveling in the county about actions that can prevent fire.

Table 5.3. Recommendations for Public Outreach and Education, continued

Project	Description	Presented By	Target Date	Resources Needed	Serves To
Increase the use of prescribed burning as a fuels reduction method	Gain support for using prescribed burns to reduce fuel loads and to improve ecosystem health.	BLM, other applicable agencies, private landowners	Summer 2008	Prescribed burn prescription, type-6 engines, handcrews, equipment.	Protect communities and infrastructure by reducing fuel loads.
Homeowner's Guide	Develop a handbook that gives locally relevant and detailed information to help residents be more prepared for wildfire, including a defensible space checklist specific to local structural and wildland fuel considerations. Refer to Appendix H.	SWCD, local fire departments, State Cooperative Extension agents	2009	Funding to develop and print copies of the handbook. Volunteers to help distribute and explain the document.	Give residents detailed and locally specific tools that they can use to improve preparedness.
Emergency preparedness meetings	Utilize American Red Cross volunteers and other preparedness experts. Attend community functions and hold special meetings to provide guidance for creating household emergency plans.	American Red Cross, County personnel	Summer 2008, ongoing	Written materials.	Improve preparedness by facilitating the communication between family members and neighbors about what procedures to follow in the event of a wildfire.
Defensible space workshops	Attend all possible community meetings and hold additional workshops to educate homeowners about why and how to create effective defensible space.	Community fire representative or agency outreach personnel	Summer 2008, ongoing	Written materials, trained personnel.	Empower homeowners to make affordable and effective changes to reduce the vulnerability of individual homes.
Improved understanding of grass fire risk	Provide education and information about the risks associated with grass fires. Dispel misunderstanding that wildland fires affect only communities surrounded by timber.	VFDs, fire specialists, NRCS, BLM, private landowners	Summer 2008	Information about the risks associated with grassland fires and examples of communities affected by grassland fires.	Protect communities and infrastructure through increased awareness.
Plan evacuation routes and inform communities	Work with Emergency Management officials to plan evacuation routes and then inform the public about the routes.	Emergency Mmanagement officials	Fall 2008	GIS software or maps.	Protect communities and infrastructure through increased awareness.
Implement Firewise Communities programs	Work with communities to participate in Firewise Communities and prepare for fire events.	NMSF	Fall 2008	Firewise Communities educational materials.	Protect communities and infrastructure through increased awareness and defensible space.

5.3 RECOMMENDATIONS FOR REDUCING STRUCTURAL IGNITABILITY

Table 5.4 provides a list of community-based recommendations that should be implemented throughout the DBCCWPP planning area. Reduction of structural ignitability depends largely on public education that provides homeowners the information they need to take responsibility for protecting their own property. Below is a list of action items that individual homeowners can follow (Section 5.3.1). Carrying out fuels reduction treatments on public lands may only be effective in reducing fire risk to some communities; however, if homeowners have failed to provide mitigation efforts on their own land, the risk of home ignition remains high and firefighter lives are put at risk when they carry out structural defense. Many committed members of the County serve their neighbors as volunteer firefighters, but these firefighting resources are continually stretched, particularly during a widespread wildfire. Preparing for wildland fire by creating defensible space around the home is an effective strategy for reducing structural ignitability. Studies have shown that burning vegetation beyond 120 feet of a structure is unlikely to ignite that property through radiant heat (Cohen and Butler 1996), but fire brands that travel independently of the flaming front have been known to destroy houses that had not been impacted by direct flame impingement. Education about managing the landscape around a structure, such as removing weeds and debris within a 30-foot radius and keeping the roof and gutters of a home clean, are two methods for creating defensible space. Educating people about the benefits of cutting trees and using Firewise Communities landscaping methods on their property is also essential for successful household protection.

It is important to note that no two properties are the same. Homeowners and communities are encouraged to research which treatments would have the most effect for their properties. Owners of properties on steep slopes, for example, should be aware that when constructing defensible space they have to factor in slope and topography, which would require extensions to the conventional 30-foot recommendations. A number of educational programs are now available to homeowners through local fire departments or NMSF; Firewise Communities is one example of such a scheme (www.firewise.org). More detailed information on structural ignitability can also be found in Appendix H (Homeowner's Guide).

Table 5.4 provides ideas for community projects to reduce structural ignitability. This is followed by a list of action items for individual homeowners to follow.

Table 5.4. Recommendations for Reducing Structural Ignitability

Project	Private Lands/ Homeowner	Public Lands	Programs Available	Description	Possible Contacts for more information	Priority
Offer fire protection workshops	All residents would be encouraged to participate	None	Community fire liaison, agency outreach personnel	Offer hands-on workshops to highlight individual home vulnerabilities and teach how-to techniques to reduce ignitability of common structural elements. Examples include installing metal flashing between house and fence or deck, and installing wire mesh over eaves, vents, and under decks.	State Firewise Communities personnel; NRCS, Fire Chiefs	High
Strengthen building codes for new development	County	None	International Wildland-Urban Interface Code	ICC enforces building codes and ordinances for new development in the WUI.	State fire marshal, State Forestry	Moderate
Construct defensible space	All residents would be encouraged to participate	None	Firewise Communities ; NMSF; local fire department liaison	Educate homeowners about defensible space practices. Remove all but scattered trees within 30 feet of structure. Keep grass mown and green within 100 feet of structure. Keep flammable materials at least 30 feet from structure. Surround foundations with rocks or gravel to a width of 1 foot.	www.firewise.org or local NMSF Firewise Communities-trained personnel. Possible land ownership assistance program through NMSF-sponsored program. Requires preparation of a Wildfire Mitigation Cost Share Assistance Application	High
Participate in defensible space cost-sharing programs	All private land within the DBCCWPP area would be eligible	None	SWCD in other counties are already offering these programs and could be used as a model	This project would provide additional funding to SWCDs to expand existing program and target new participants.	SWCD managers	High
Implement community chipper days	All residents would be encouraged to participate	None	NMSF	A chipper and operator would be provided free of charge in a central location for residents to bring small trees and brush. Chips could remain at chipper location or be utilized by participants.	NMSF	High
Assess and improve accessibility to property	All residents would be encouraged to participate	None	Fire departments; code enforcement officers	Inform homeowners about the importance of keeping driveways accessible to fire trucks and emergency responders.	Local fire department	Moderate
Provide a list of mitigation measures to homeowners with different scales of actions	All residents would be encouraged to participate	None	Fire departments; Firewise Communities ; NMSF literature; USFS literature; academic and peer-reviewed literature	See list of action items below.	SWCDs, NMSF, fire departments	High

5.3.1 Action Items for Homeowners to Reduce Structural Ignitability

Low or No Cost Investment (<$50)

- Regularly check fire extinguishers and have a 100-foot hose available to wet perimeter.
- Maintain defensible space for 30 feet around home (see Table 5.4). Work with neighbors to provide adequate fuels mitigation in the event of overlapping property boundaries.
- Make every effort to keep lawn mowed and green during fire season.
- Screen vents with noncombustible meshing with mesh opening not to exceed nominal 1/4-inch size.
- Ensure that house numbers are easily viewed from the street.
- Keep wooden fence perimeters free of dry leaves and combustible materials. If possible, noncombustible material should link the house and the fence.
- Keep gutters free of vegetative litter. Gutters can act as collecting points for fire brands and ashes.
- Store combustible materials (firewood, propane tanks, BBQs) away from the house; in shed, if available.
- Clear out materials from under decks and/or stacked against the structure. Stack firewood at least 30 feet from the home, if possible.
- Reduce your workload by considering local weather patterns. Since the prevailing winds in the area are often from the southwest, consider mitigating hazards on the southwest corner of your property first, then work around to cover the entire area.
- Seal up any gaps in roofing material and enclose gaps that could allow fire brands to enter under the roof tiles or shingles.
- Remove flammable materials from around propane tanks.

Minimal Investment (<$250)

- When landscaping in the Home Ignition Zone (HIZ) (approximately 30 feet around the property), select noncombustible plants, lawn furniture, and landscaping material. Combustible plant material like junipers and ornamental conifers should be pruned and kept away from siding. If possible, trees should be planted in islands and no closer than 10 feet to the house. Tree crowns should have a spacing of at least 18 feet when within the HIZ. Vegetation at the greatest distance from the structure and closest to wildland fuels should be carefully trimmed and pruned to reduce ladder fuels, and density should be reduced with approximately 6-foot spacing between trees crowns. (Figure 5.3)
- Box in eaves, attic ventilation, and crawl spaces with noncombustible material.
- Work on mitigating hazards on adjoining structures. Sheds, garages, barns, etc., can act as ignition points to your home.
- Enclose open space underneath permanently located manufactured homes using noncombustible skirting.

- Clear and thin vegetation along driveways and access roads so they can act as a safe evacuation route and allow emergency responders to access the home.
- Purchase or use a National Oceanic and Atmospheric Administration (NOAA) weather alert radio to hear fire weather announcements.

Figure 5.3. Structure requiring defensible space and fuels mitigation.

Moderate to High Investment (>$250)

- Construct a noncombustible wall or barrier between your property and wildland fuels. This could be particularly effective at mitigating the effect of radiant heat and fire spread where 30 feet of defensible space is not available around the structure.
- Construct or retrofit overhanging projections with heavy timber that is less combustible.
- Replace exterior windows and skylights with tempered glass or multilayered glazed panels.
- Invest in updating your roof to noncombustible construction. Look for materials that have been treated and given a fire-resistant roof classification of Class A. Wood materials are highly combustible unless they have gone through a pressure-impregnation fire-retardant process.
- Construct a gravel turnaround in your driveway to improve access and mobilization of fire responders.
- Treat construction materials with fire-retardant chemicals.

- Install a roof irrigation system.
- Replace wood or vinyl siding with nonflammable materials.
- Install an independent water supply that can be run for 24 hours or more.
- Relocate propane tanks underground.

5.4 RECOMMENDATIONS FOR IMPROVING FIREFIGHTING CAPABILITIES

De Baca County is served by three fire departments (Village, Valley, and Lake) and despite the fact that all stations are served by volunteers, each of these departments have been proactive in seeking funds to support their services. Educating the public so they can reduce their dependence on fire departments is essential as during fire season these resources are often stretched thin. Greater emergency planning for communities is necessary, particularly those communities in areas where response times for emergency services may be greater than in municipal zones. Table 5.5 provides recommendations for improving firefighting capabilities.

Table 5.5. Recommendations to Improve Firefighting Capability

Project	Fire Department	Possible Solution	Timeline	Contact
Continue to overhaul maps used by fire responders	All fire departments	Seek funding to aid the overhaul of county maps, and make them available in GIS and global positioning system (GPS) for fire responders. Update home occupancy information on an annual basis, and input information on maps.	Spring 2010	County Manager and rural addressing
Employ emergency alert system with greater range	All fire departments	Task intern or special county staff with implementation.	Spring 2009	County Emergency Managers and County Managers to approach county commissioners to raise the subject.
Reverse 911	All fire departments	Designate intern or special County staff to research system and develop budget and implementation schedule.	Spring 2010	County Emergency Managers and county managers to approach County commissioners to raise the subject.
Increase VFD recruitment (diversify age classes)	All fire departments	Target fire education in schools to encourage younger generations to become interested in firefighting. Carryout recruitment drives through open house and mailings.	Annually	Fire department chiefs, Fort Sumner School District
Increase funds for VFDs	All fire departments	1) Maintain contact with state fire marshals and regularly seek grant money. 2) Implement regular evaluations of resource needs for each volunteer fire department and make available to public to raise awareness of shortages. 3) Maintain updated list of fires in County and provide to NMSF. 4) Use local media to inform public of fire resources situation. Work with local newspaper editor to have a year-round column that documents fire department activities. 5) Apply for Rural Fire Assistance Program grants. 6) Improve ISO ratings.	Monthly review of grant opportunities	Fire department chiefs. County Emergency Managers and County Managers to approach County Commissioners to raise the issue in commissioner meetings.
Train volunteer firefighters	All fire departments	Research into funds that could provide stipend to volunteer firefighters to improve participation in three-week training course.	Spring 2009	Fire department chiefs
Create County fire staff	All fire departments	Research opportunities to fund a permanent deputy fire chief.	Spring 2009	Fire department chiefs, county commissioners
Improve emergency medical assistance	All fire departments	Need more trained Emergency Medical Technicians and American Red Cross-certified people in the County who could be called on in for emergencies.	Fall 2009	County Emergency Manager
Provide adequate water supplies at fire stations	All fire departments	Obtain funding to improve water supply systems at fire stations.	Summer 2008 (this is an ongoing process)	Fire department chiefs, County Commissioners
Increase water sources and water delivery systems, particularly in areas adjacent to WUI	All fire departments	Obtain funding to purchase equipment and to implement rain water harvesting or similar system on all VFD stations.	Summer 2008 (this is an ongoing process)	Fire department chiefs
Regularly seek funding to purchase improved equipment	All fire departments	Obtain funding to purchase equipment or make trade agreement with other fire stations.	Fall 2008 (this is an ongoing process)	Funding agencies
Map water supplies	All fire departments	Use GPS to map all available water supplies.	Spring 2009	Fire department chiefs, County Emergency Managers, and County Managers to approach County about potential funding

6.0 MONITORING AND IMPLEMENTATION

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

An often overlooked but critical component of fuels treatment is monitoring. It is important to evaluate whether fuels treatments have accomplished their defined objectives and whether any unexpected outcomes have occurred. In addition to monitoring mechanical treatments, it is important to carry out comprehensive monitoring of burned areas to establish the success of fuels reduction treatments on fire behavior, as well as monitoring for ecological impacts, repercussions of burning on wildlife, and effects on soil chemistry and physics. Adaptive management is a term that refers to adjusting future management based on the effects of past management. Monitoring is required to gather the information necessary to inform future management decisions. Economic and legal questions may also be addressed through monitoring. In addition, monitoring activities can provide valuable educational opportunities for students.

The monitoring of each fuels reduction project would be site-specific, and decisions regarding the timeline for monitoring and the type of monitoring to be used would be determined by project. Monitoring and reporting contribute to the long-term evaluation of changes in ecosystems, as well as the knowledge base about how natural resource management decisions affect both the environment and the people who live in it.

The most important part of choosing a monitoring program is selecting a method appropriate to the people, place, and available time. Several levels of monitoring activities meet different objectives, have different levels of time intensity, and are appropriate for different groups of people. They include the following:

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

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

Moderate—Level 2: Multiple Permanent Photo Points

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

High—Level 3: Basic Vegetation Plots

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

post-treatment. The monitoring agency should establish plot protocols based on the types of vegetation present and the level of detail needed to analyze the management objectives.

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

The protocol for this level would include the vegetation plots described above but would add more details regarding fuel loading. Crown height or canopy closure might be included for live fuels. Dead-and-downed fuels could be assessed using other methods, such as Brown's transects (Brown 1974) or an appropriate photo series (Ottmar et al. 2000) or fire monitoring (FIREMON) plots.

6.1 IDENTIFY TIMELINE FOR UPDATING THE DBCCWPP

The County is undergoing population shifts, with some areas like "River Ranches" undergoing development and others experiencing depopulation. These social shifts coupled with changing land uses and environmental fluctuations highlight the need for regular updates of the DBCCWPP. While a specific timeline for updating the plan has not been determined as part of this document, the Core Team should continue to communicate after the plan is completed to discuss the best method for making revisions to reflect changing conditions. The HFRA allows for maximum flexibility in the CWPP-planning process, permitting the Core Team to determine the timeframe for updating the CWPP. It is suggested that the plan be revised at least every 2 years.

6.2 IMPLEMENTATION

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

6.3 CONCLUSION

The De Baca County Community Wildfire Protection Plan was developed to meet the requirements of a CWPP as specified in the HFRA. The plan addresses how to prepare for wildland fire throughout the County and assesses the risk of this type of fire event creating damage to communities in WUI areas. Public perception in the County tends to be that grassland communities are not at risk of wildfire as compared to forested areas; this plan highlights that although grassland fuels are often not rated as severely in fire behavior models, additional parameters contribute to the risk associated with fire in grassland WUIs. The planning process emphasized public participation and collaborative planning among federal, state, County, and local governments and other contributing agencies. Organizations and stakeholders were contacted through local mailings and encouraged to participate in the development of the plan by

submitting comments at one of the public meetings or by mail. A number of local residents were also active Core Team members. The document makes recommendations for fuels reduction treatments, educational outreach activities, firefighting capabilities, and reduction of structural ignitability. The recommendations are based on a Composite Risk/Hazard Assessment, individual Community Risk/Hazard Assessments, identification of CVARs, and comments from Core Team and community members. The recommendations are general in nature to provide high levels of flexibility in the implementation phase. The goal of the DBCCWPP is to reduce the risk for catastrophic wildfire throughout the County by providing specific information regarding what is most at risk and how to protect these places and community values from future fires. Because fuels reduction is difficult in grassland areas, most emphasis was placed on the reduction of structural ignitability and action items that home owners can make to reduce the risk of fire to their property. All communities throughout the County are dependent on volunteer firefighting; with limited resources and funds, personnel become stretched particularly during fire season. The County is made up of largely private lands and so unlike some other counties that can depend on fuels management by state and federal agencies, much of the implementation recommended in this plan falls to private landowners. It will be important for land management agencies to provide knowledge, skills, and funding assistance to these private landowners in order that sufficient fire mitigation measures can be made. Moreover, collaboration between public and private entities is important in order to provide continuous landscape treatments to protect WUI communities. Lastly, the DBCCWPP is a living document and should be revised as environmental conditions change or social issues arise.

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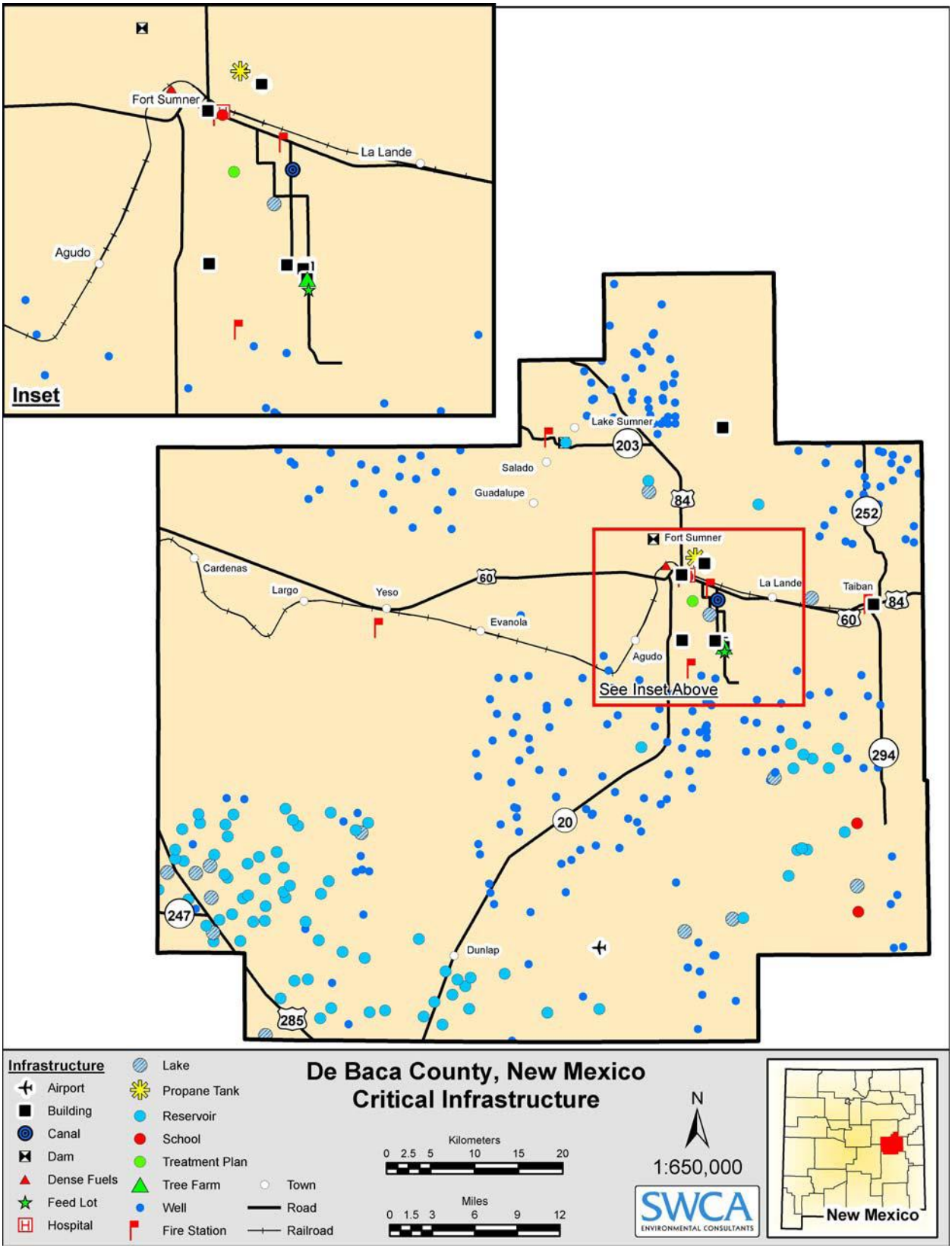
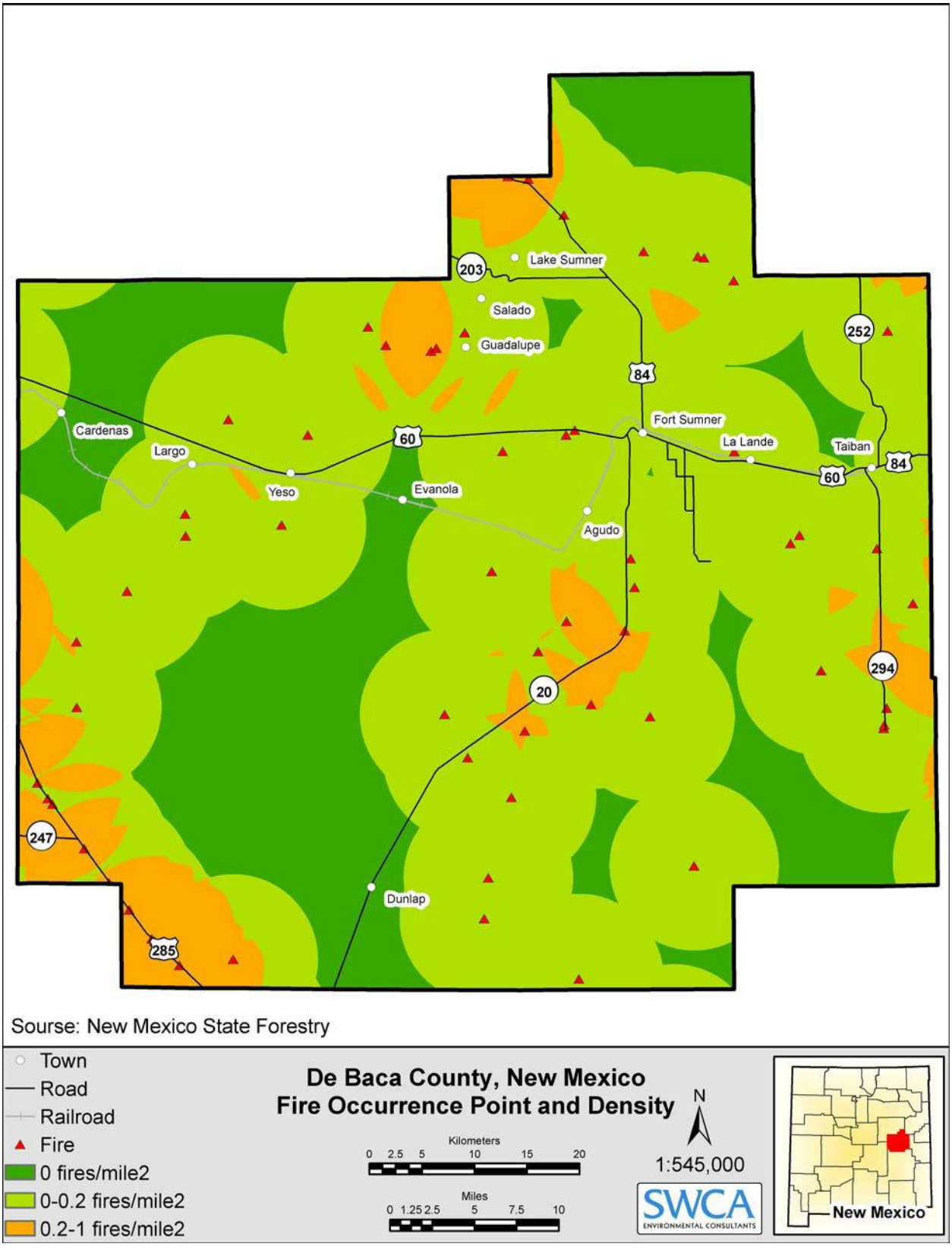
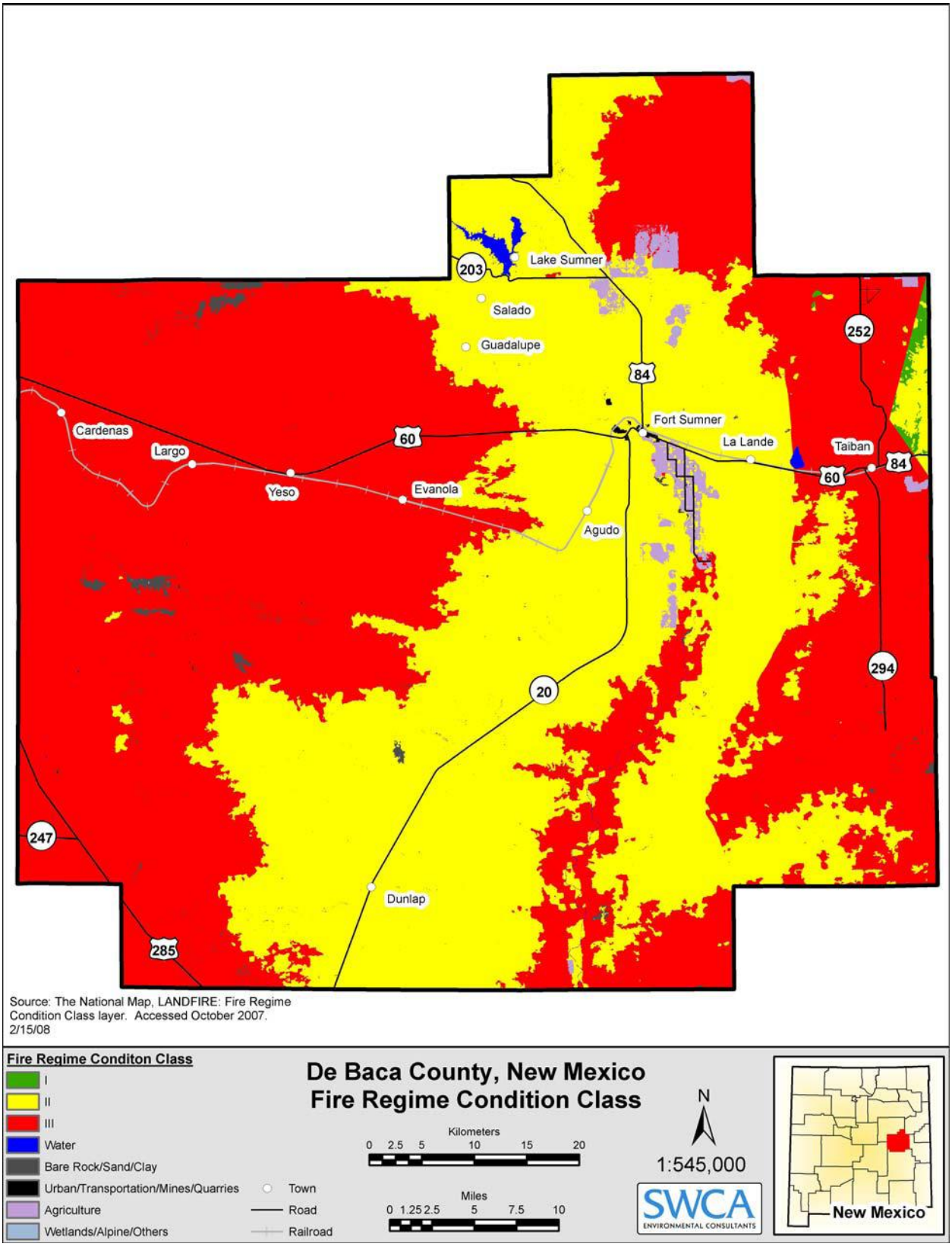
APPENDIX A
MAPS



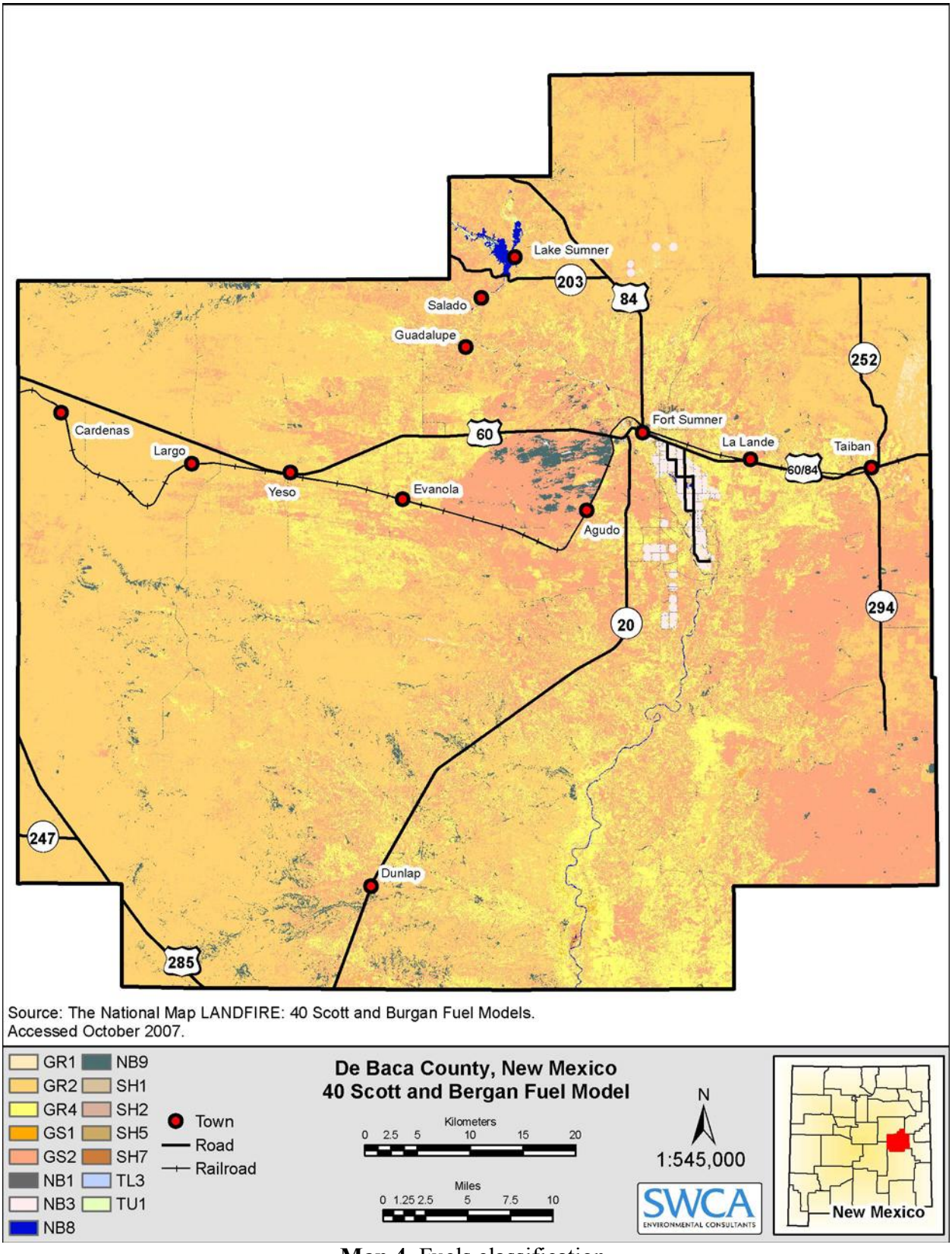
Map 1. Critical infrastructure.



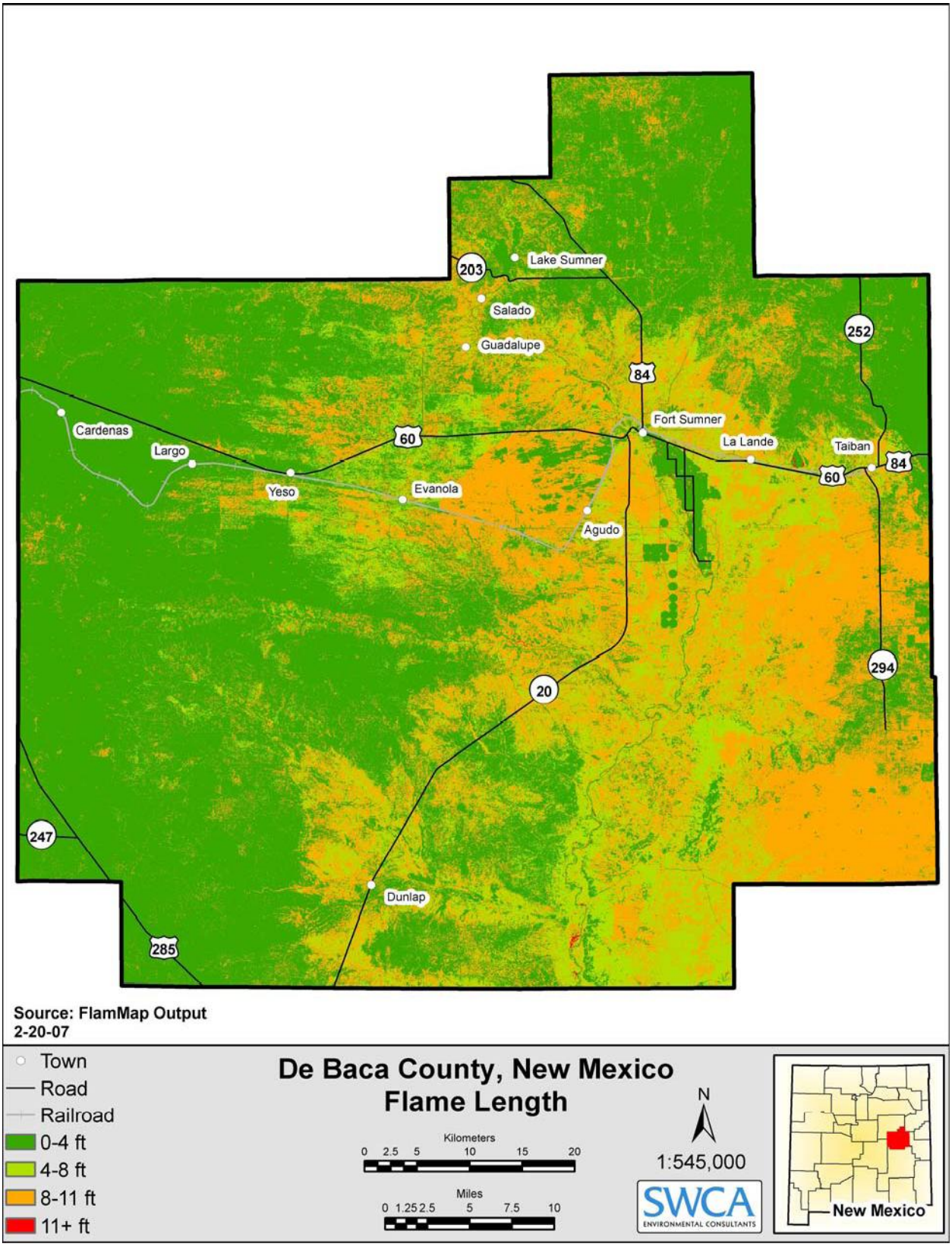
Map 2. Fire occurrence.



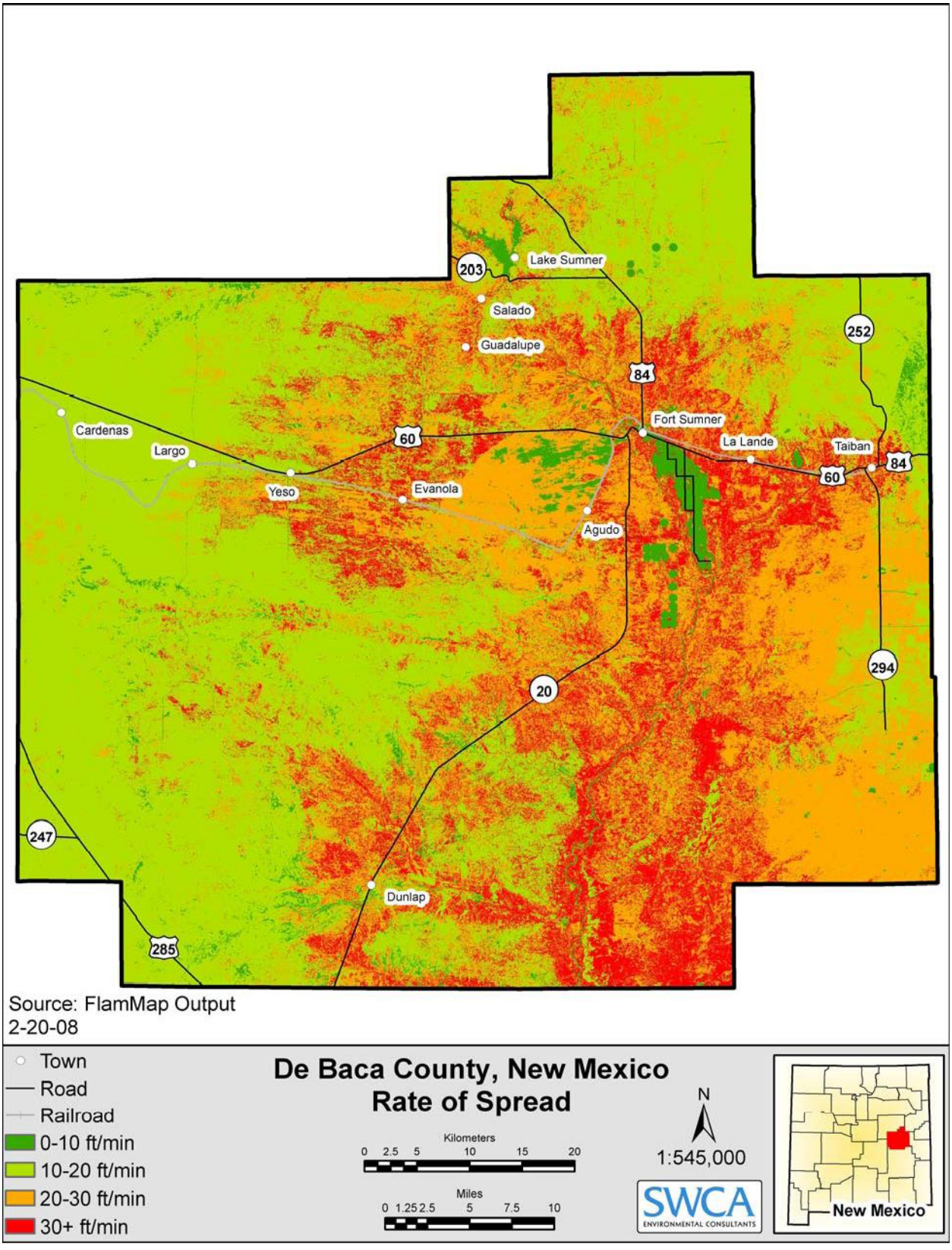
Map 3. Fire Regime Condition Class.



Map 4. Fuels classification.



Map 5. Flame length.



Map 6. Rate of spread.

APPENDIX B
CORE TEAM CONTACT LIST

De Baca County CWPP
Core Team List

Name	Agency or Organization	Position
Victoria Williams	SWCA	Lead Planner
Gary Smith	Lake Fire Department	Firefighter
Laurie Pettigrew	De Baca County	Clerk
Dale Propps	Fort Sumner Fire Department	Chief
Dwayne Milliron	Valley Fire Department	Chief
Ron Shields	Lake Sumner Fire Department	Chief
Mike Cantrell	Lake Sumner Dam/Carlsbad Irrigation	Dam Tender
Allen Sparks	De Baca County	Emergency Manager
Chuck Schmidt	BLM Roswell Field Office	District FMO
Rik Arndt	Bureau of Reclamation, Albuquerque	
Terrell Treat	NMSF	WUI Specialist
Bill Rogge	EMNRD Forestry Division,Capitan District	Fire
David Sanchez	EMNRD State Parks Division, Lake Sumner State Park	Manager
Wayne Atchley	City of Fort Sumner	Police Chief
Jimmy Butterfield	De Baca County Sheriff	Sheriff
Patricia Miller	Fort Sumner Schools	Superintendant
Mark Holguin	NM Game and Fish	Santa Rosa Dist.
Bob Addison	Addison Drug Store	Owner
Dave Bailey	Daves Grocery	Owner
D'Llaynn Bruce	USDA NRCS	
Knox Cortese	Cortese Feed and Supply/Ranches	Owner
Angie Manning	Fort Sumner State Monument	Manager
Jeff Bilberry	Bojax/Singelton Ranches	Manager
Tye Chesser	State Land Office	
Robert Mumford	Army Corps of Engineers Santa Rosa Dam	
Gary Cordova	Army Corps of Engineers Santa Rosa Dam	
Eddie Tudor	State Forestry Capitan District Forester	District Forester
Joe Steele	De Baca County	
Tommy Casados	NRCS	Range Management Specialist
Samantha Griego	Fort Sumner EMS and Fort Sumner FD	EMS Director
Mike Meyers	State Land Office	

APPENDIX C
COMMUNITY COMMENTS

De Baca County CWPP
Community Comments

1. What areas/features in the County are most AT RISK in the event of wildfire?

Natural
Wildlife
Bosque vegetation
Watershed
Pecos River, dense shrubs, and undergrowth
Native vegetation
Grasslands
Ranching land
Fodder
Cattle and other livestock
Lightning-strike areas
Man Made
Cultural sites
Old and historic buildings with wood construction
Propane storage
Old Town
Hay stacks, barns
Storage of chemical fertilizers
Storage of animal feeds
Lake Sumner, small tight lots with dilapidated or abandoned homes with grass going right up to structure
West side of valley, up to Fort Sumner village and to Black Ridge
Sunnyside—few mowed lawns, limited defensible space
Bridges
Houses, schools, businesses
Fences
Farm equipment
Churches
Bosque Redondo Memorial
Private structures, power lines, natural gas pipeline, railroad tracks/trestles, bridges, fences, roads/transportation

2. What areas/features in the County would you MOST LIKE TO SEE PROTECTED from wildfire?

Natural
Ranches
Bosque
Lake lands
Pecos River
Wildlife habitat
Cottonwood trees
Water quality
Water supply
West of Old Town area
Bosque Redondo Park
Grassland
Animal fodder
Crops
Man Made
Courthouse and town buildings
Highways access
Fort Sumner town
Houses and businesses
Schools
Railroad
Wind turbines at the wind plant, top of Cap Rock
Lake Sumner Village
Old and historic structures
Propane storage
Finney Farms and Cortez Feed
Fort Sumner Museum (Billy the Kid museum)
Bosque Redondo Memorial
Bosque Redondo Lake Picnic Area
Gas, electric, phone lines

3. How prepared is your community for a large wildfire? Rank 1 (low) to 5 (high)

2
2
1
2
4
3
1
3
1
2
3
5
3
3
3
3
3
2
2
2
1
2
3
1
Average = 2

4. What information or actions would help you be more prepared for a wildfire?

Fire alarms
Local weather conditions
Evacuation plan
Fire-safety classes
Learning the funding needs of our fire department
Education to homeowners about how to decrease risk to their property
Coordinated communication with overlapping agencies and public safety (fire and police)
Information on burning and permitting
Information on defensible space
Home-site preparation, evacuation plan for village
A system for quickly communicating the existence of a fire to local residents
Smokey the Bear posters
Fire literature for the public
Information on fuels in the area
Information on water availability
Information on equipment availability
Early warning system
Evacuation preparedness
Greater enforcement of state law for homeowners to clean up houses
More fire department meetings open to the public
Training firefighters for wildland fires
Providing funding for volunteer firefighters to take training
Better communication and interaction between the three volunteer fire departments to make better use of County resources
Grant money to provide brochures to the public to increase awareness
Countywide evacuation plan
Community event with information on how to protect your home from fire
Radio broadcasts telling people where they can go to get information on fire safety
Fire departments to go to schools to educate school children on fire safety
Reverse 911 system
Police and fire departments to work together to inform people on procedures in the event of a fire
Preplanning of evacuation shelters to be used in event of mass evacuation—i.e., Fort Sumner clinic
Keep an up to date list of people throughout the County who would need assistance in evacuating in the event of a fire (a list exists maintained by the Fort Sumner Clinic, but this needs to be kept current by pursuing funding)
What to do with animals and livestock
Phone numbers of people to contact on what to do and where to go
Money to continue prevention and fuel reduction along the river
Increased education about how fires start and spread
Money to build fireproof structures

APPENDIX D
FIREFIGHTING RESOURCES

Firefighting Resources

Three fire districts are in De Baca County: the Lake Sumner Fire District, the Valley Fire District, and the Village of Fort Sumner Fire District. The fire departments are 100% volunteer.

The following is a list of resources for each district:

Lake Sumner Fire District
24 members
Buildings/stations
1 main station
1 substation

Fire vehicles	Rescue vehicles
1 3,200 gallon tanker	2 rescue/ambulance
1 1,000 gallon class A pumper	1 rescue/command truck
1 500 gallon attack	
1 300 gallon attack	
1 175 gallon brush	

Valley Fire District
60 members
Buildings/stations
1 main station
1 substation Taiban
1 substation Yeso
1 substation Ricardo

Fire vehicles	Rescue vehicles
1 6,000 gallon tanker	No rescue vehicles
1 4,000 gallon tanker	
3 1,800 gallon 6 x 6 brush	
1 1,500 gallon 6 x 6 brush	
1 1,200 gallon 6 x 6 brush	
1 1,000 gallon class A pumper	
1 1,000 gallon 6 x 6 brush	
1 700 gallon	
1 400 gallon brush	
2 350 gallon brush/command	
1 300 gallon brush	

Village of Fort Sumner
30 members
Buildings/stations
1 main station
No substation

Fire vehicles	Ambulance service
1 7,000 gallon tanker	2 rescue vehicles
1 4,000 gallon tanker	
2 1,800 gallon 6 x 6 brush	
1 1,200 gallon 6 x 6 brush	
1 1,000 gallon class A pumper	
1 400 gallon brush	
1 350 gallon brush/command	
1 300 gallon brush	

Local Preparedness

a. An emergency management plan for the County was developed in 1999.
b. There is an emergency management plan for Lake Sumner State Park.
c. At present there is no Emergency Manager.
d. There are 8 dispatchers in the County; 2-3 paid paramedics; 4 village police; and 3 Sheriffs deputies.

Incident Management Protocol

This is a summary of a document entitled, "Interagency Emergency Operations in Wildland Fire with New Mexico State Forestry Division: Planning Projects and Incident Management." This unpublished document was developed by Dave Bervin of the NMSF to provide guidelines for emergency responders under the NMSF protocols. Actual Incident Response is likely to vary throughout the County.

Three factors are always present in any emergency incident, and all jurisdictions responding to a fire in the DBCCWPP planning area follow these three basic parameters:

- Life safety
- Incident stabilization
- Resource protection

There are a number of tiers to emergency management and emergency management planning. A Geographic Area Operations Plan is the overarching document that defines roles and responsibilities for the responders to an incident by jurisdiction and activity. The three levels to this plan are:

- State–Federal geographic area operations plan
- A local area operations plan
- Mutual aid plans

General Incident Operations

The following outlines the general set of procedures for wildland fire response:

1. Local resources (e.g., municipal, County, or VFD) are often the first to be called and dispatched when there is a report of a fire. The dispatch office that has jurisdictional authority will activate the initial attack.
2. The initial attack Incident Command (IC) will size up the fire in order to determine the need for additional resources.
3. An IC post is established and staging areas are set up.
4. Dispatched resources from all jurisdictions check in at staging area.
5. If the IC level changes (higher or lower), the IC holds a briefing to inform all concerned about any change of status or tactic.

For initial attack responders:

- No notification to NMSF is necessary for fires controlled at initial attack using municipal resources within legal fire districts.
- For an initial attack on fires in a County response area, notification to NMSF is necessary to get a fire number.
- For an initial attack response by federal agencies responders or BIA, notification must be made to the Geographic Area Interagency Dispatch (GAID)

- For federal jurisdiction fires, notification must be made to NMSF about who will contact the GAID to confirm resource needs and act as liaison.

For fires that activate Mutual Aid Agreements (e.g., spread potential, red flag warnings, values at risk):

- Municipal fire departments must notify NMSF if they respond.
- All requests for additional resources must be made through NMSF.
- For federal jurisdictions, NMSF will respond to all resource requests.
- For additional requests from federal jurisdictions, all additional requests must pass through GAID.

If the fire goes to extended attack, additional operation procedures are implemented:

- Dispatch responsibilities are transferred to GAID.
- Request activation of Type 3 Team.
- Establish IC post and unified command.
- Identify and establish a large staging area.
- Request activation of New Mexico resource mobilization plan.
- Request implementation of Emergency Preparedness Network.
- Notify Red Cross to set up rehab units.
- Begin collecting information for complexity analysis and wildland situation analysis.
- Notify Office of Emergency Management.
- Notify NMSF.
    - Type 3 Management Team
    - New Mexico resources mobilization plan
    - Air Attack Operations

APPENDIX E
WILDFIRE FIRE RISK AND HAZARD SEVERITY FORM
NFPA 1144

Wildfire Fire Risk and Hazard Severity Form NFPA 1144

Means of Access						
Ingress and Egress	**Points**					
Two or more roads in and out	0					
One road in and out	7					
Road Width						
>24 feet	0					
>20 feet, <24 feet	2					
<20 feet	4					
Road Conditions						
Surfaced road, grade <5%	0					
Surfaced road, grade >5%	2					
Nonsurfaced road, grade <5%	2					
Nonsurfaced road, grade >5%	5					
Other than all season	7					
Fire Access						
<300 feet with turnaround	0					
>300 feet with turnaround	2					
<300 feet with no turnaround	4					
>300 feet with no turnaround	5					
Street Signs						
Present–reflective	0					
Present–nonreflective	2					
Not present	5					
Vegetation (fuel models)						
Predominant veg						
Light–1,2,3	5					
Medium–5,6,7,8,9	10					
Heavy–4,10	20					
Slash–11,12,13	25					
Defensible Space						
>100 feet around structure	1					
>70 feet, <100 feet around structure	3					
>30 feet, <70 feet around structure	10					
<30 feet around structure	25					
Topography within 300 Feet of Structures						
Slope						
<9%	1					
10% to 20%	4					
21% to 30%	7					
31% to 40%	8					
>41%	10					
Additional Rating Factors (rate all that apply)						
Additional Factors						
Topographic features	0–5					
History of high fire occurrence	0–5					
Severe fire weather potential	0–5					
Separation of adjacent structures	0–5					

Roofing Assembly						
Roofing						
Class A	0					
Class B	3					
Class C	15					
Unrated	25					
Building Construction						
Materials (predominant)						
Noncombustible siding, eaves, deck	0					
Noncombustible siding/combustible desk	5					
Combustible siding and deck	10					
Building Set-back						
>30 feet to slope	1					
<30 feet to slope	5					
Available Fire Protection						
Water Sources						
Hydrants 500 gpm, <1000 feet apart	0					
Hydrants 250 gpm, <1000 feet apart	1					
Nonpressurized, >250 gpm/2 hrs	3					
Nonpressurized, <250 gpm/2hrs	5					
Water unavailable	10					
Organized Response						
Station <5 miles from structure	1					
Station >5 miles from structure	3					
Fixed Fire Protection						
NFPA sprinkler system	0					
None	5					
Placement of Gas and Electric Utilities						
Utilities						
Both underground	0					
One above, one below	3					
Both above ground	5					

Totals for Home or Subdivision						

Hazard Rating Scale
<40 Low
>40 Moderate
>70 High
>112 Extreme

APPENDIX F
COMMUNITY AT RISK LIST

DE BACA COUNTY CWPP
COMMUNITY AT RISK LIST

This Community at Risk (CAR) list is developed for the NM-FPTF. The communities listed are based upon Core Team input and the risk assessment carried out as part of this CWPP.

The communities are rated as high, moderate, low, or no risk. Because this is plan covers multiple communities and jurisdictions, it is recommended that more detailed analysis be carried out to a subdivision level in the future.

Community	Risk Rating
Lake Sumner	High
Taiban	High
Yeso	High
Old Town (Sunnyside)	High
Valley	Moderate
Fort Sumner Village	Moderate

APPENDIX G
FUNDING OPPORTUNITIES

DE BACA COUNTY CWPP
FUNDING OPPORTUNITIES

The following section provides information on federal, state, and private funding opportunities for conducting wildfire mitigation projects.

I. Federal Funding Information

Source: Predisaster Mitigation Grant Program
Agency: Department of Homeland Security Federal Emergency Management Agency (DHS FEMA)
Website: http://www.fema.gov/government/grant/pdm/index.shtm
Description: The DHS includes FEMA and the U.S. Fire Administration. FEMA's Federal Mitigation and Insurance Administration is responsible for promoting predisaster activities that can reduce the likelihood or magnitude of loss of life and property from multiple hazards, including wildfire. The Disaster Mitigation Act of 2000 created a requirement for states and communities to develop predisaster mitigation plans and established funding to support the development of the plans and to implement actions identified in the plans. This competitive grant program, known as PDM, has funds available to state entities, tribes, and local governments to help develop multihazard mitigation plans and to implement projects identified in those plans.

Source: Section 319 Base Grant to State Entities and Indian Tribes
Agency: Environmental Protection Agency (EPA)
New Mexico State 319 Coordinator
David Hogge
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502
Phone: (505) 827-2981
Fax: (505) 827-0160
david_hogge@nmenv.state.nm.us
Website: http://www.epa.gov
Description: Funding under this program is often used for reduction of nonpoint-source pollution; however, one community successfully used the grant to obtain funding to reduce hazardous fuels to protect the municipal watershed. For additional information on this success story, visit http://www.santafewatershed.com. To learn about obtaining this type of funding for your community, contact New Mexico's 319 Grant Coordinator, Dave Hogge, New Mexico Environmental Department at (505) 827-2981.

This funding opportunity is a Request for Proposals from state entities and Indian tribes for competitive grants under section 319 of the Clean Water Act (CWA). The purpose of this grant program is to provide funding to implement nonpoint-source management programs developed pursuant to CWA section 319(b). The primary goal of this management program is to control nonpoint-source pollution. This is done through implementation of management measures and practices to reduce pollutant loadings resulting from each category or subcategory of nonpoint-source identified in the grant recipient's nonpoint-source assessment report, which should be

developed pursuant to CWA section 319(a). The EPA has set aside a portion of section 319 funds appropriated by Congress for competitive grant awards to tribes for the purpose of funding the development and implementation of watershed-based plans and other on-the-ground watershed projects that result in a significant step toward solving nonpoint-source impairments on a watershed-wide basis. Please note that the funding opportunity described here is found in Section B of the full announcement. (Section A includes the EPA's national guidelines, which govern the process for awarding noncompetitive base grants to all eligible tribes.)

Source: Funding for Fire Departments and First Responders
Agency: DHS, U.S. Fire Administration
Website: http://www.usfa.dhs.gov/fireservice/grants/
Description: Includes grants and general information on financial assistance for fire departments and first responders. Programs include the Assistance to Firefighters Grant Program (AFGP), Reimbursement for Firefighting on Federal Property, State Fire Training Systems Grants, and National Fire Academy Training Assistance.

Source: Conservation Innovation Grants (CIG)
Agency: National Resource Conservation Service
Website: http://www.nm.nrcs.usda.gov/programs/cig/cig.html
Description: CIG State Component. CIG is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. Under CIG, Environmental Quality Incentives Program (EQIP) funds are used to award competitive grants to non-federal governmental or nongovernmental organizations, tribes, or individuals. CIG enables the Natural Resources Conservation Service (NRCS) to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with federal, state, and local regulations. The NRCS administers the CIG program. The CIG requires a 50/50 match between the agency and the applicant. The CIG has two funding components: national and state. Funding sources are available for water resources, soil resources, atmospheric resources, and grazing land and forest health.

Source: Volunteer Fire Assistance
Agency: USDA Forest Service
Website: http://www.fs.fed.us/fire/partners/vfa/
Description: USDA Forest Service funding will provide assistance, through the states, to volunteer fire departments to improve communication capabilities, increase wildland fire management training, and purchase protective fire clothing and firefighting equipment. For more information, contact your state representative; contact information can be found on the National Association of State Foresters website.

Source: Economic Action Programs
Agency: USDA Forest Service
Website: http://www.fs.fed.us/spf/coop/programs/eap/index.shtml
Description: USDA Forest Service funding will provide for Economic Action Programs that work with local communities to identify, develop, and expand economic opportunities related to traditionally underutilized wood products and to expand the utilization of wood removed through hazardous fuel reduction treatments. Information, demonstrations, application development, and training will be made available to participating communities. For more information, contact a Forest Service Regional Representative.

Source: Collaborative Forest Restoration Program (CFRP)
Agency: USDA Forest Service
Website: http://www.fs.fed.us/r3/spf/cfrp/index.shtml
Description: The Community Forest Restoration Act of 2000 (Title VI, Public Law 106–393) established a cooperative forest restoration program in New Mexico to provide cost-share grants to stakeholders for forest restoration projects on public land to be designed through a collaborative process (the CFRP). Projects must include a diversity of stakeholders in their design and implementation, and should address specified objectives including: wildfire threat reduction; ecosystem restoration, including non-native tree species reduction; reestablishment of historic fire regimes; reforestation; preservation of old and large trees; increased utilization of small-diameter trees; and the creation of forest-related local employment. The act limits projects to four years and sets forth cost limits and provisions respecting collaborative project review and selection, joint monitoring and evaluation, and reporting. The act authorizes appropriations of up to $5 million annually and directs the Secretary to convene a technical advisory panel to evaluate proposals that may receive funding through the CFRP.

Source: Catalog of Federal Funding Sources for Watershed Protection
Agency: N/A
Website: http://cfpub.epa.gov/fedfund/
Examples of the types of grants found at this site are:

- Native Plant Conservation Initiative: http://www.nfwf.org/AM/Template.cfm?Section=Browse_All_Programs&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=3966
- Targeted Watershed Grants Program, http://www.epa.gov/owow/watershed/initiative/
- Predisaster Mitigation Program, http://www.fema.gov/government/grant/pdm/index.shtm
- Environmental Education Grants, http://www.epa.gov/enviroed/grants_contacts.html

Source: Firewise
Agency: Multiple
Website: http://www.firewise.org
Description: The Wildland/Urban Interface Working Team (WUIWT) of the National Wildfire Coordinating Group is a consortium of wildland fire organizations and federal agencies responsible for wildland fire management in the United States. The WUIWT includes the USDA Forest Service, USDI Bureau of Indian Affairs, USDI BLM, USDI Fish and Wildlife Service, USDI National Park Service, FEMA, U.S. Fire Administration, International Association of Fire Chiefs, National Association of State Fire Marshals, National Association of State Foresters, National Emergency Management Association, and National Fire Protection Association. Many different Firewise Communities activities are available help homes and whole neighborhoods become safer from wildfire without significant expense. Community cleanup days, awareness events, and other cooperative activities can often be successfully accomplished through partnerships among neighbors, local businesses, and local fire departments at little or no cost. The Firewise Communities recognition program page (http://www.firewise.org/usa) provides a number of excellent examples of these kinds of projects and programs.

The kind of help you need will depend on who you are, where you are, and what you want to do. Among the different activities individuals and neighborhoods can undertake, the following actions often benefit from some kind of seed funding or additional assistance from an outside source:

- Thinning/pruning/tree removal/clearing on private property—particularly on very large, densely wooded properties
- Retrofit of home roofing or siding to noncombustible materials
- Managing private forest
- Community slash pickup or chipping
- Creation or improvement of access/egress roads
- Improvement of water supply for firefighting
- Public education activities throughout the community or region

Some additional examples of what communities, counties, and states have done can be found in the National Database of State and Local Wildfire Hazard Mitigation Programs at http://www.wildfireprograms.usda.gov. You can search this database by keyword, state, jurisdiction, or program type to find information about wildfire mitigation education programs, grant programs, ordinances, and more. The database includes links to local websites and e-mail contacts.

Source: The National Fire Plan
Website: http://www.forestsandrangelands.gov/
Description: Many states are using funds from the NFP to provide funds through a cost-share with residents to help them reduce the wildfire risk to their private property. These actions are usually in the form of thinning or pruning trees, shrubs, and other vegetation and/or clearing the slash and debris from this kind of work. Opportunities are available for rural, state, and volunteer fire assistance.

Source: Staffing for Adequate Fire and Emergency Response (SAFER)
Agency: DHS
Website: http://www.firegrantsupport.com/safer/
Description: The purpose of SAFER grants is to help fire departments increase the number of frontline firefighters. The goal is for fire departments to increase their staffing and deployment capabilities and ultimately attain 24-hour staffing, thus ensuring that their communities have adequate protection from fire and fire-related hazards. The SAFER grants support two specific activities: (1) hiring of firefighters and (2) recruitment and retention of volunteer firefighters. The hiring of firefighters activity provides grants to pay for part of the salaries of newly hired firefighters over the five-year program. SAFER is part of the Assistance to Firefighters Grants and is under the purview of the Office of Grants and Training of the DHS.

Source: The Fire Prevention and Safety Grants (FP&S)
Agency: DHS
Website: http://www.firegrantsupport.com/fps/
Description: The FP&S are part of the Assistance to Firefighters Grants and are under the purview of the Office of Grants and Training in the DHS. FP&S offers support to projects that enhance the safety of the public and firefighters who may be exposed to fire and related hazards. The primary goal is to target high-risk populations and mitigate high incidences of death and injury. Examples of the types of projects supported by FP&S include fire-prevention and public-safety education campaigns, juvenile fire-setter interventions, media campaigns, and arson prevention and awareness programs. In fiscal year 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include firefighter safety research and development.

II. State Funding Information

Source: State and Private Forestry Programs
Agency: National Association of State Foresters
Website: http://www.stateforesters.org/S&PF/coop_fire.html
Description: The National Association of State Foresters recommends that funds become available through a competitive grant process on Wildland Urban Interface hazard mitigation projects. State fire managers see opportunities to use both the State Fire Assistance Program and the Volunteer Fire Assistance Program to improve the safety and effectiveness of firefighters in the interface, as well as in other wildland fire situations. To ensure firefighter safety, minimize property and resource loss, and reduce suppression costs, land management agencies, property owners, local leaders, and fire protection agencies must work cooperatively to mitigate interface fire risks, as well as to ensure that wildland firefighters receive the training, information, and equipment necessary to safely carry out their responsibilities.

The 2007 Western WUI Grant Program is a specific grant available under the State Fire Assistance Program. It includes opportunities for hazardous-fuels reduction, education, and community and homeowner actions. An application and instructions can be found at: http://www.firesafecouncil.org/news/ attachments/2007_CDF_application-proccess_final168.pdf

Source: New Mexico Association of Counties 2007–2008 Wildfire Risk Reduction Program
Agency: New Mexico Association of Counties
Website: http://www.nmcounties.org/wildfire.html
Description: This program targets at-risk communities by offering seed money to help defray the costs of community wildfire protection projects. During the past two years, the Wildfire Risk Reduction Grant Program has primarily funded projects for the development of Community Wildfire Protection Plans (CWPP), a prerequisite to all other activities. In 2007, priority was given to projects that requested funding for hazardous fuel reduction, wildfire prevention, and community outreach activities that were identified in completed CWPPs.

III. Private Funding Information

Source: The Urban Land Institute (ULI)
Website: http://www.uli.org
Description: ULI is a 501(c)(3) nonprofit research and education organization supported by its members. The institute has more than 22,000 members worldwide, representing the entire spectrum of land-use and real estate development disciplines, working in private enterprise and public service. The mission of the ULI is to provide responsible leadership in the use of land to enhance the total environment. ULI and the ULI Foundation have instituted Community Action Grants (http://www.uli.org/Content/NavigationMenu/MyCommunity/CommunityActionGrants/Community_Action_Gr.htm) that could be used for Firewise Communities activities. Applicants must be ULI members or part of a ULI District Council. Contact actiongrants@uli.org or review the web page to find your District Council and the application information.

Source: Environmental Systems Research Institute (ESRI)
Website: http://www.esri.com/grants
Description: ESRI is a privately held firm and the world's largest research and development organization dedicated to geographic information systems. ESRI provides free software, hardware, and training bundles under ESRI-sponsored Grants that include such activities as conservation, education, and sustainable development, and posts related non-ESRI grant opportunities under such categories as agriculture, education, environment, fire, public safety, and more. You can register on the website to receive updates on grant opportunities.

Source: StEPP Foundation
Website: http://www.steppfoundation.org/default.htm
Description: StEPP is a 501(c)(3) organization dedicated to helping organizations realize their vision of a clean and safe environment by matching projects with funders nationwide. The StEPP Foundation provides project oversight to enhance the success of projects, increasing the number of energy efficiency, clean energy, and pollution prevention projects implemented at the local, state, and national levels for the benefit of the public. The website includes an online project submittal system and a Request for Proposals page.

Source: The Public Entity Risk Institute (PERI)
Website: http://www.riskinstitute.org
Description: PERI is a not for profit, tax-exempt organization. Its mission is to serve public, private, and nonprofit organizations as a dynamic, forward-thinking resource for the practical enhancement of risk management. With its growing array of programs and projects, along with its grant funding, PERI's focus includes supporting the development and delivery of education and training on all aspects of risk management for public, nonprofit, and small business entities, and serving as a resource center and clearinghouse for all areas of risk management.

IV. IV. Other Funding information

The following resources may also provide helpful information for funding opportunities:

- National Agricultural Library Rural Information Center: http://www.nal.usda.gov/ric/ricpubs/fire_department_resources.htm
- Forest Service Fire Management website: http://www.fs.fed.us/fire/
- Insurance Services Office Mitigation Online (town fire ratings): http://www.isomitigation.com/
- National Fire Protection Association: http://www.nfpa.org
- National Interagency Fire Center, Wildland Fire Prevention/Education: http://www.nifc.gov/preved/rams.htm
- Department of Homeland Security U.S. Fire Administration: http://www.usfa.dhs.gov/fireservice/grants/rfff/

APPENDIX H
HOMEOWNERS GUIDE

DE BACA COUNTY CWPP HOMEOWNERS GUIDE

This guide has been developed to address site-specific information on wildfire for De Baca County. In public meetings and written comments, residents expressed a need for better information on reducing wildfire risk and what to do in the event of a wildfire. This document was developed to meet these expressed community needs, as well as to fulfill requirements for the Community Wildfire Protection Plan. This guide (1) suggests specific measures that can be taken by homeowners to reduce structure ignitability and (2) enhances overall preparedness in the planning area by consolidating preparedness information from several local agencies and departments.

BEFORE THE FIRE—PROTECTION AND PREVENTION

REDUCING STRUCTURE IGNITABILITY

Structural Materials

Roofing—The more fire-resistant the roofing material, the better. The roof is the portion of the house that is most vulnerable to ignition by falling embers, known as firebrands. Metal roofs afford the best protection against ignition from falling embers. Slate or tile roofs are also noncombustible, and Class-A asphalt shingles are recommended as well. The most dangerous type of roofing material is wood shingles. Removing debris from roof gutters and downspouts at least twice a year will help to prevent fire, along with keeping them functioning properly.

Siding—Noncombustible materials are ideal for the home exterior. Preferred materials include stucco, cement, block, brick, and masonry.

Windows—Double-pane windows are most resistant to heat and flames. Smaller windows tend to hold up better within their frames than larger windows. Tempered glass is best, particularly for skylights, because it will not melt as plastic will.

Fencing and trellises—Any structure attached to the house should be considered part of the house. A wood fence or trellis can carry fire to your home siding or roof. Consider using nonflammable materials or use a protective barrier such as metal or masonry between the fence and the house.

If you are designing a new home or remodeling your existing one, do it with fire safety as a primary concern. Use nonflammable or fire resistant materials and have the exterior wood treated with UL-approved fire-retardant chemicals. More information on fire-resistant construction can be found at http://www.firewise.org.

SCREEN OFF THE AREA BENEATH DECKS AND PORCHES

The area below an aboveground deck or porch can become a trap for burning embers or debris, increasing the chances of the fire transferring to your home. Screen off the area using screening

with openings no larger than one-half inch. Keep the area behind the screen free of all leaves and debris.

FIREWOOD, KINDLING, AND OTHER FLAMMABLES

Although convenient, stacked firewood on or below a wooden deck adds fuel that can feed a fire close to your home. Be sure to move all wood away from the home during fire season. Stack all firewood uphill, at least 30 feet and preferably 100 feet from your home.

When storing flammable materials such as paint, solvents, or gasoline, always store them in approved safety containers away from any sources of ignition such as hot water tanks or furnaces. The fumes from highly volatile liquids can travel a great distance after they turn into a gas. If possible, store the containers in a safe, separate location away from the main house.

The Public Service Company of New Mexico (PNM) does not have sufficient crews for frequent inspection of all its high-voltage power lines. If you have high-voltage lines running near your property, take a moment to walk underneath them and ensure that no tree branches are close to the towers or lines. If there is any situation that could be a fire hazard, contact a customer service representative from PNM.

CHIMNEYS AND FIREPLACE FLUES

Inspect your chimney and damper at least twice a year and have the chimney cleaned every year before first use. Have the spark arrestor inspected and confirm that it meets the latest safety code. Your local fire department will have the latest edition of National Fire Prevention Code 211 covering spark arrestors. Make sure to clear away dead limbs from within 15 feet of chimneys and stovepipes

FIREPLACE AND WOODSTOVE ASHES

Never take ashes from the fireplace and put them into the garbage or dump them on the ground. Even in winter, one hot ember can quickly start a grass fire. Instead, place ashes in a metal container, and as an extra precaution, soak them with water. Cover the container with its metal cover and place it in a safe location for a couple of days. Then either dispose of the cold ash with other garbage or bury the ash residue in the earth and cover it with at least 6 inches of mineral soil.

PROPANE TANKS

Your propane tank has many hundreds of gallons of highly flammable liquid that could become an explosive incendiary source in the event of a fire. The propane tank should be located at least 30 feet from any structure. Keep all flammables at least 10 feet from your tank. Learn how to turn the tank off and on. In the event of a fire, you should turn the gas off at the tank before evacuating, if safety and time allow.

SMOKE ALARMS

A functioning smoke alarm can help warn you of a fire in or around your home. Install smoke alarms on every level of your residence. Test and clean smoke alarms once a month and replace batteries at least once a year. Replace smoke alarms once every 10 years.

FIRE-SAFE BEHAVIOR

- If you smoke, always use an ashtray in your car and at home.
- Store and use flammable liquids properly.
- Keep doors and windows clear as escape routes in each room.

DEFENSIBLE SPACE

The removal of dense, flammable foliage from the area immediately surrounding the house reduces the risk of structure ignition and allows firefighters access to protect the home. A 100-foot safety zone, free of all trees and shrubs, is recommended by the fire department; the minimum distance is 30 feet. Steep slopes require increased defensible space because fire can travel quickly uphill.

Within the minimum 30-foot safety zone, plants should be limited to fire-resistant trees and shrubs. Focus on fuel breaks such as concrete patios, walkways, rock gardens, and irrigated garden or grass areas within this zone. Use mulch sparingly within the safety zone, and focus use in areas that will be watered regularly. In areas such as turnarounds and driveways, nonflammable materials such as gravel are much better than wood chips or pine needles.

Vegetative debris such as dead grasses or leaves provide important erosion protection for soil but also may carry a surface fire. It is simply not feasible to remove all the vegetative debris from around your property. However, it is a good idea to remove any accumulations within the safety zone and extending out as far as possible. This is particularly important if leaves tend to build up alongside your house or outbuildings. Removing dead vegetation and leaves and exposing bare mineral soil are recommended in a 2-foot-wide perimeter along the foundation of the house. Also, be sure to regularly remove all dead vegetative matter including grasses, flowers, and leaf litter surrounding your home and any debris from gutters, especially during summer months. Mow the lawn regularly and promptly dispose of the cuttings properly. If possible, maintain a green lawn for 30 feet around your home.

All trees within the safety zone should have lower limbs removed to a height of 6–10 feet. Remove any branches within 15 feet of your chimney or overhanging any part of your roof. Ladder fuels are short shrubs or trees growing under the eaves of the house or under larger trees. Ladder fuels carry fire from the ground level onto the house or into the tree canopy. Be sure to remove all ladder fuels within the safety zone first. The removal of ladder fuels within about 100 feet of the house will help to limit the risk of crown fire around your home. More information about defensible space is provided at http://www.firewise.org.

FIRE RETARDANTS

For homeowners who would like home protection beyond defensible space and fire-resistant structural materials, fire-retardant gels and foams are available. These materials are sold with

various types of equipment for applying the material to the home. They are similar to the substances applied by firefighters in advance of wildfire to prevent ignition of homes. Different products have different timelines for application and effectiveness. The amount of product needed is based on the size of the home, and prices may vary based on the application tools. Prices range from a few hundred to a few thousand dollars. An online search for "fire blocking gel" or "home firefighting" will provide a list of product vendors.

ADDRESS POSTING

Locating individual homes is one of the most difficult tasks facing emergency responders. Every home should have the address clearly posted with numbers at least three inches high. The colors of the address posting should be contrasting or reflective. The address should be posted so that it is visible to cars approaching from either direction.

ACCESS

Unfortunately, limited access may prevent firefighters from reaching many homes in De Baca County. Many of the access problems occur at the property line and can be improved by homeowners. First, make sure that emergency responders can get in your gate. This may be important not only during a fire but also to allow access during any other type of emergency response. If you will be gone for long periods during fire season, make sure a neighbor has access, and ask them to leave your gate open in the event of a wildfire in the area.

Ideally, gates should swing inward. A chain or padlock can be easily cut with large bolt cutters, but large automatic gates can prevent entry. Special emergency access red boxes with keys are sold by many gate companies but are actually not recommended by emergency services. The keys are difficult to keep track of and may not be available to the specific personnel that arrive at your home. An alternative offered by some manufacturers is a device that opens the gate in response to sirens. This option is preferred by firefighters but may be difficult or expensive to obtain.

Beyond your gate, make sure your driveway is uncluttered and at least 12 feet wide. The slope should be less than 10%. Trim any overhanging branches to allow at least 13.5 feet of overhead clearance. Also make sure that any overhead lines are at least 14 feet above the ground. If any lines are hanging too low, contact the appropriate phone, cable, or power company to find out how to address the situation.

If possible, consider a turnaround within your property at least 45 feet wide. This is especially important if your driveway is more than 300 feet in length. Even small fire engines have a hard time turning around and cannot safely enter areas where the only means of escape is by backing out. Any bridges must be designed with the capacity to hold the weight of a fire engine.

NEIGHBORHOOD COMMUNICATION

It is important to talk to your neighbors about the possibility of wildfire in your community. Assume that you will not be able to return home when a fire breaks out and may have to rely on your neighbors for information and assistance. Unfortunately, it sometimes takes tragedy to get

people talking to each other. Don't wait for disaster to strike. Strong communication can improve the response and safety of every member of the community.

PHONE TREES

Many neighborhoods use phone trees to keep each other informed of emergencies within and around the community. The primary criticism is that the failure to reach one person high on the tree can cause a breakdown of the system. However, if you have willing and able neighbors, particularly those that are at home during the day, the creation of a well-planned phone tree can often alert residents to the occurrence of a wildfire more quickly than media channels. Talk to your neighborhood association about the possibility of designing an effective phone tree.

NEIGHBORS IN NEED OF ASSISTANCE

Ask mobility-impaired neighbors if they have notified emergency responders of their specific needs. It is also a good idea for willing neighbors to commit to evacuating a mobility-impaired resident in the event of an emergency. Make sure that a line of communication is in place to verify the evacuation.

ABSENTEE OWNERS

Absentee owners are often not in communication with their neighbors. If a home near you is unoccupied for large portions of the year, try to get contact information for the owners from other neighbors or your neighborhood association. Your neighbors would probably appreciate notification in the event of an emergency. Also, you may want to contact them to suggest that they move their woodpile or make sure that the propane line to the house is turned off.

HOUSEHOLD EMERGENCY PLAN

A household emergency plan does not take much time to develop and will be invaluable in helping your family deal with an emergency safely and calmly. One of the fundamental issues in the event of any type of emergency is communication. Be sure to keep the phone numbers of neighbors with you rather than at home.

It is a good idea to have an out of state contact, such as a family member. When disaster strikes locally, it is often easier to make outgoing calls to a different area code than local calls. Make sure everyone in the family has the contact phone number and understands why they need to check in with that person in the event of an emergency. Also, designate a meeting place for your family. Having an established meeting site helps to ensure that family members know where to go, even if they can't communicate by phone.

CHILDREN

Local schools have policies for evacuation of students during school hours. Contact the school to get information on how the process would take place and where the children would likely go.

The time between when the children arrive home from school and when you return home from work is the most important timeframe that you must address. Fire officials must clear residential areas of occupants to protect lives and to allow access for fire engines and water drops from

airplanes or helicopters. If your area is evacuated, blockades may prevent you from returning home to collect your children. It is crucial to have a plan with a neighbor for them to pick up your children if evacuation is necessary.

PETS AND LIVESTOCK

Some basic questions about pets and livestock involve whether you have the ability to evacuate the animals yourself and where you would take them. Planning for the worst-case scenario may save your animals. An estimated 90% of pets left behind in an emergency do not survive. Don't expect emergency service personnel to prioritize your pets in an emergency. Put plans in place to protect your furry family members.

PETS

Assemble a pet disaster supply kit and keep it handy. The kit should contain a three-day supply of food and water, bowls, a litter box for cats, and a manual can opener if necessary. It is also important to have extra medication and medical records for each pet. The kit should contain a leash for each dog and a carrier for each cat. Carriers of some kind should be ready for birds and exotic pets. In case your pet must be left at a kennel or with a friend, also include an information packet that describes medical conditions, feeding instructions, and behavioral problems. A photo of each pet will help to put the right instructions with the right pet.

In the event of a wildfire you may be prevented from returning home for your animals. Talk to your neighbors and develop a buddy system in case you or your neighbors are not home when fire threatens. Make sure your neighbor has a key and understands what to do with your pets should they need to be evacuated.

If you and your pets were evacuated, where would you go? Contact friends and family in advance to ask whether they would be willing to care for your pets. Contact hotels and motels in the area to find out which ones accept pets. Boarding kennels may also be an option. Make sure your pets' vaccinations are up-to-date if you plan to board them.

Once you have evacuated your pets, continue to provide for their safety by keeping them cool and hydrated. Try to get your pets to an indoor location rather than leaving them in the car. Do not leave your pets in your vehicle without providing shade and water. It is not necessary to give your pets water while you are driving, but be sure to offer water as soon as you reach your destination.

LIVESTOCK

Getting livestock out of harm's way during a wildfire is not easy. You may not be able or allowed to return home to rescue your stock during a wildfire evacuation. Talk to your neighbors about how you intend to deal with an evacuation. If livestock are encountered by emergency responders, they will be released and allowed to escape the fire on their own. Make sure your livestock have some sort of identification. Ideally, your contact information should be included on a halter tag or ear tag so that you could be reached if your animal is encountered.

If you plan to evacuate your livestock, have a plan in place for a destination. Talk to other livestock owners in the area to find out whether they would be willing to board your stock in the event of an emergency. Often in large-scale emergencies, special accommodations can be made at fair and rodeo grounds, but personal arrangements may allow you to respond more quickly and efficiently.

If you do not own a trailer for your horses or other livestock, talk to a neighbor who does. Find out whether they would be willing to assist in the evacuation of your animals. If you do own a trailer, make sure it is in working condition with good, inflated tires and functioning signal lights. Keep in mind that even horses that are accustomed to a trailer may be difficult to load during an emergency. Practicing may be a good idea to make sure your animals are as comfortable as possible when being loaded into the trailer.

HOUSE AND PROPERTY

Insurance companies suggest that you make a video that scans each room of your house to help document and recall all items within your home. This video can make replacement of your property much easier in the unfortunate event of a large insurance claim. See more information on insurance claims in the "After the Fire" section below.

PERSONAL ITEMS

During fire season, items you would want to take with you during an evacuation should be kept in one readily accessible location. As an extra precaution, it may be a good idea to store irreplaceable mementos or heirlooms away from your home during fire season.

It is important to make copies of all important paperwork, such as birth certificates, titles, and so forth, and store them somewhere away from your home, such as in a safe deposit box. Important documents can also be protected in a designated firesafe storage box within your home.

IN THE EVENT OF A FIRE

NOTIFICATION

In the event of a wildfire, announcements from the local Emergency Management office will be broadcast over local radio and television stations. Media notification may be in the form of news reports or the Emergency Alert System (EAS). On the radio, the AM station 770 KOB generally provides frequent updates. On television, the emergency management message will scroll across the top of the screen on local channels. The notice is not broadcast on non-local satellite and cable channels.

One good way to stay informed about wildfire is to use a National Oceanic and Atmospheric Administration (NOAA) weather alert radio. The radios can be purchased at most stores that carry small appliances, such as Target, Sears, or Radio Shack. The radio comes with instructions for the required programming to tune the radio to your local frequency. The programming also determines the types of events for which you want to be alerted. The weather alert radio can be used for any type of large incident (weather, wildfire, hazardous materials, etc.), depending on how it is programmed. Local fire personnel can assist with programming if needed.

WHEN FIRE THREATENS

Before an evacuation order is given for your community, there are several steps you can take to make your escape easier and to provide for protection of your home. When evaluating what to do as fire threatens, the most important guideline is: DO NOT JEOPARDIZE YOUR LIFE.

Back your car into the garage or park it in an open space facing the direction of escape. Shut the car doors and roll up the windows. Place all valuables that you want to take with you in the vehicle. Leave the keys in the ignition or in another easily accessible location. Open your gate.

Close all windows, doors, and vents, including your garage door. Disconnect automatic garage openers and leave exterior doors unlocked. Close all interior doors as well.

Move furniture away from windows and sliding glass doors. If you have lightweight curtains, remove them. Heavy curtains, drapes, and blinds should be closed. Leave a light on in each room.

Turn off the propane tank or shut off gas at the meter. Turn off pilot lights on appliances and furnaces.

Move firewood and flammable patio furniture away from the house or into the garage.

Connect garden hoses to all available outdoor faucets and make sure they are in a conspicuous place. Turn the water on to "charge," or fill your hoses and then shut off the water. Place a ladder up against the side of the home, opposite the direction of the approaching fire, to allow firefighters easy access to your roof.

EVACUATION

When evacuation is ordered, you need to go ***immediately***. Evacuation not only protects lives, it also helps to protect property. Some roads in De Baca County are too narrow for two-way traffic, especially with fire engines. Fire trucks often can't get into an area until the residents are out. Also, arguably the most important tool in the WUI toolbox is aerial attack. Airplanes and helicopters can be used to drop water or retardant to help limit the spread of the fire, but these resources cannot be used until the area has been cleared of civilians.

Expect emergency managers to designate a check-out location for evacuees. This process helps to ensure that everyone is accounted for and informs emergency personnel as to who may be remaining in the community. Every resident should check out at the designated location before proceeding to any established family meeting spot.

A light-colored sheet closed in the front door serves as a signal to emergency responders that your family has safely left. This signal saves firefighters precious time, as it takes 12–15 minutes per house to knock on each door and inform residents of the evacuation.

AFTER THE FIRE

RETURNING HOME

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

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

INSURANCE CLAIMS

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

POST-FIRE REHABILITATION

Homes that may have been saved in the fire may still be at risk from flooding and debris flows. Burned Area Emergency Rehabilitation (BAER) teams are inter-disciplinary teams of professionals who work to mitigate the effects of post-fire flooding and erosion. These teams often work with limited budgets and manpower. Homeowners can assist the process by implementing treatments on their own properties as well as volunteering on burned public lands to help reduce the threat to valuable resources. Volunteers were instrumental in implementing many of the BAER treatments following the Cerro Grande fire. Volunteers can assist BAER team members by planting seeds or trees, hand mulching, or helping to construct straw-bale check dams in small drainages.

Volunteers can help protect roads and culverts by conducting storm patrols during storm events. These efforts dramatically reduce the costs of such work as installing trash racks, removing culverts, and re-routing roads.

Community volunteers can also help scientists to better understand the dynamics of the burned area by monitoring rain gauges and monitoring the efficacy of the installed BAER treatments.